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**COMMERCIAL-SCALE DEMONSTRATION OF THE
LIQUID PHASE METHANOL (LPMEOH™) PROCESS**

ENVIRONMENTAL MONITORING REPORT NO. 1

For The Period

1 April - 30 June 1997

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ACRONYMS AND DEFINITIONS

Acurex	-	Acurex Environmental Corporation
Air Products	-	Air Products and Chemicals, Inc.
AFDU	-	Alternative Fuels Development Unit - The "LaPorte PDU"
Balanced Gas	-	A syngas with a composition of hydrogen (H ₂), carbon monoxide (CO), and carbon dioxide (CO ₂) in stoichiometric balance for the production of methanol
BOD	-	Biochemical Oxygen Demand
Carbon Monoxide Gas	-	A syngas containing primarily carbon monoxide (CO); also called CO Gas
Crude Grade Methanol	-	Underflow from rectifier column (29C-20), defined as 80 wt% minimum purity; requires further distillation in existing Eastman equipment prior to use
DME	-	dimethyl ether
DOE	-	United States Department of Energy
DOE-FETC	-	The DOE's Federal Energy Technology Center (Project Team)
DOE-HQ	-	The DOE's Headquarters - Coal Fuels and Industrial Systems (Project Team)
DTP	-	Demonstration Test Plan - The four-year Operating Plan for Phase 3, Task 2 Operation
DVT	-	Design Verification Testing
Eastman	-	Eastman Chemical Company
EIV	-	Environmental Information Volume
EMP	-	Environmental Monitoring Plan
EMR	-	Environmental Monitoring Report
EPRI	-	Electric Power Research Institute
HAPs	-	Hazardous Air Pollutants
Hydrogen Gas	-	A syngas containing an excess of hydrogen (H ₂) over the stoichiometric balance for the production of methanol; also called H ₂ Gas
IGCC	-	Integrated Gasification Combined Cycle, a type of electric power generation plant
IGCC/OTM	-	An IGCC plant with a "Once-Thru Methanol" plant (the LPMEOH™ Process) added-on
KSCF	-	Thousand Standard Cubic Feet
KSCFH	-	Thousand Standard Cubic Feet per Hour
LaPorte PDU	-	The DOE-owned experimental unit (PDU) located adjacent to Air Products' industrial gas facility at LaPorte, Texas, where the LPMEOH™ process was successfully piloted
LDAR	-	Leak Detection and Repair
LPDME	-	Liquid Phase DME process, for the production of DME as a mixed coproduct with methanol
LPMEOH™	-	Liquid Phase Methanol (the technology to be demonstrated)
Main Plant Purge	-	Unreacted synthesis gas stream from LPMEOH™ process returned to Eastman's fuel gas header
mg/m ³	-	Milligrams per cubic meter
NEPA	-	National Environmental Policy Act
NPDES	-	National Pollutant Discharge Elimination System
OSHA	-	Occupational Safety and Health Administration
Partnership	-	Air Products Liquid Phase Conversion Company, L.P.
PDU	-	Process Development Unit
PFD	-	Process Flow Diagram(s)
ppbv	-	parts per billion (volume basis)
Project	-	Production of Methanol/DME Using the LPMEOH™ Process at an Integrated Coal Gasification Facility
psia	-	Pounds per Square Inch (Absolute)
psig	-	Pounds per Square Inch (gauge)
P&ID	-	Piping and Instrumentation Diagram(s)
RCRA	-	Resource and Conservation Recovery Act
Refined Grade Methanol	-	Distilled methanol, defined as 99.8wt% minimum purity; used directly in downstream Eastman processes
SCFH	-	Standard Cubic Feet per Hour
SL/hr-kg	-	Standard Liter(s) per Hour per Kilogram of Catalyst

ACRONYMS AND DEFINITIONS (cont'd)

Syngas	-	Abbreviation for Synthesis Gas
Synthesis Gas	-	A gas containing primarily hydrogen (H ₂) and carbon monoxide (CO), or mixtures of H ₂ and CO; intended for "synthesis" in a reactor to form methanol and/or other hydrocarbons (synthesis gas may also contain CO ₂ , water, and other gases)
Tie-in(s)	-	the interconnection(s) between the LPMEOH™ Process Demonstration Facility and the Eastman Facility
TLV	-	Threshold Limit Value
TPD	-	Ton(s) per Day
WBS	-	Work Breakdown Structure
wt	-	Weight

1. Introduction

The Liquid Phase Methanol (LPMEOH™) demonstration project at Kingsport, Tennessee, is a \$213.7 million cooperative agreement between the U.S. Department of Energy (DOE) and Air Products Liquid Phase Conversion Company, L. P. (the Partnership). Air Products and Chemicals, Inc. (Air Products) and Eastman Chemical Company (Eastman) formed the Partnership to execute the Demonstration Project. A demonstration unit producing 80,000 gallons per day (260 TPD) of methanol was designed, constructed, and has begun operation at a site located at the Eastman complex in Kingsport. The Partnership will own and operate the facility for the four-year demonstration period.

This project is sponsored under the DOE's Clean Coal Technology Program, and its primary objective is to "demonstrate the production of methanol using the LPMEOH™ Process in conjunction with an integrated coal gasification facility." The project will also demonstrate the suitability of the methanol produced for use as a chemical feedstock or as a low-sulfur dioxide, low-nitrogen oxides alternative fuel in stationary and transportation applications. The project may also demonstrate the production of dimethyl ether (DME) as a mixed coproduct with methanol, if laboratory- and pilot-scale research and market verification studies show promising results. If implemented, the DME would be produced during the last six months of the four-year demonstration period.

The LPMEOH™ process is the product of a cooperative development effort by Air Products and the DOE in a program that started in 1981. It was successfully piloted at a 10-TPD rate in the DOE-owned experimental unit at Air Products' LaPorte, Texas, site. This demonstration project is the culmination of that extensive cooperative development effort.

2. Project Description

The demonstration unit, which occupies an area of 0.6 acre, is integrated into the existing 4,000-acre Eastman complex located in Kingsport, Tennessee. The Eastman complex employs approximately 12,000 people. In 1983, Eastman constructed a coal gasification facility utilizing Texaco technology. The syngas generated by this gasification facility is used to produce carbon monoxide and methanol. Both of these products are used to produce methyl acetate and ultimately cellulose acetate and acetic acid. The availability of this highly reliable coal gasification facility was the major factor in selecting this location for the LPMEOH™ Process Demonstration. Three different feed gas streams (hydrogen gas, carbon monoxide gas, and balanced gas) will be diverted from existing operations to the LPMEOH™ Demonstration Unit, thus providing the range of coal-derived synthesis gas (syngas) ratios (hydrogen to carbon monoxide) needed to meet the technical objectives of the demonstration project.

For descriptive purposes and for design and construction scheduling, the project has been divided into four major process areas with their associated equipment:

- *Reaction Area* - Syngas preparation and methanol synthesis reaction equipment.
- *Purification Area* - Product separation and purification equipment.
- *Catalyst Preparation Area* - Catalyst and slurry preparation and disposal equipment.
- *Storage/Utility Area* - Methanol product, slurry, and oil storage equipment.

The physical appearance of this facility closely resembles the adjacent Eastman process plants, including process equipment in steel structures.

- *Reaction Area*

The reaction area includes feed gas compressors, catalyst guard beds, the reactor, a steam drum, separators, heat exchangers, and pumps. The equipment is supported by a matrix of structural steel. The most salient feature is the reactor, since with supports, it is approximately 84-feet tall.

- *Purification Area*

The purification area features two distillation columns with supports; one is approximately 82-feet tall, and the other 97-feet tall. These vessels resemble the columns of the surrounding process areas. In addition to the columns, this area includes the associated reboilers, condensers, air coolers, separators, and pumps.

- *Catalyst Preparation Area*

The catalyst preparation area consists of a building with a roof and partial walls, in which the catalyst preparation vessels, slurry handling equipment, and spent slurry disposal equipment are housed. In addition, a hot oil utility system is included in the area.

- *Storage/Utility Area*

The storage/utility area includes two diked lot-tanks for methanol, two tanks for oil storage, a slurry holdup tank, a trailer loading/unloading area, and an underground oil/water separator. A vent stack for safety relief devices is located in this area.

3. Process Description

The LPMEOH™ Demonstration Unit is integrated with Eastman's coal gasification facility. A simplified process flow diagram is included in Appendix A. Syngas is introduced into the slurry reactor, which contains a slurry of liquid mineral oil with suspended solid particles of catalyst. The syngas dissolves through the mineral oil, contacts the catalyst, and reacts to form methanol. The heat of reaction is absorbed by the slurry and is removed from the slurry by steam coils. The methanol vapor leaves the reactor, is condensed to a liquid, sent to the distillation columns for removal of higher alcohols, water, and other impurities, and is then stored in the day tanks for sampling before being sent to Eastman's methanol storage. Most of the unreacted syngas is recycled back to the reactor with the syngas recycle compressor, improving cycle efficiency. The methanol will be used for downstream

feedstocks and in off-site fuel testing to determine its suitability as a transportation fuel and as a fuel for stationary applications in the power industry.

Demonstration Test Plan

After the start-up of the LPMEOH™ Demonstration Unit, a four-year test plan is being performed by Air Products and Eastman. The goals of the Test Plan are structured to meet the commercialization objectives for the LPMEOH™ Process. Excerpts from Commercialization Objectives from the program Statement of Work are included here to provide the global perspective of the Demonstration Plan:

"Primary Objective

The primary objective of the Project is to demonstrate the commercial scale production of methanol using the LPMEOH™ Process...

The LPMEOH™ Process technology is expected to be commercialized as part of an IGCC electric power generation system. Therefore, the Project incorporates the commercially important aspects of the operation of the LPMEOH™ Process which would enhance IGCC power generation. These important aspects of LPMEOH™ Process integrations are:

- The coproduction of electric power and of high value liquid transportation fuels and/or chemical feedstocks from coal. This coproduction requires that the partial conversion of synthesis gas to storable liquid products be demonstrated.
- Using an energy load following operating concept which allows conversion of off-peak energy, at attendant low value, into peak energy commanding a higher value. The load-following concept makes use of gasifier capacity that is under utilized during low-demand periods by using the LPMEOH™ Process to convert the excess synthesis gas to a storable liquid fuel for use in electric power generation during the peak energy periods. This operating concept requires that on/off and synthesis gas load following capabilities be demonstrated...

During operation, the instrumentation system will allow for the collection of engineering data, analysis and reporting which will be done by on-site technical personnel. Typical reporting will include on-stream factors, material and energy balances, reactor and equipment performance, comparison with laboratory and LaPorte Alternative Fuels Development Unit (AFDU) results, conversion efficiencies and catalyst activity...

Secondary Objective

A secondary objective of the Project is to demonstrate the production of DME (Dimethyl ether) as a mixed coproduct with methanol...

Subject to Design Verification Testing (DVT), the Partnership proposes to enhance the Project by including the demonstration of the slurry reactor's capability to produce DME as a mixed co-product with methanol...

DVT is required to address issues such as catalyst activity and stability and to provide data for engineering design and demonstration decision making...

At the conclusion of the DVT Steps, a joint Partnership/DOE decision will be made regarding continuation of the methanol/DME demonstration. Timing of the final decision must ensure that the necessary design, procurement, construction and commissioning can be completed to allow for (Phase 3, Task 2.2) operation at the end of the primary LPMEOH™ process demonstration period."

The full Demonstration Test Plan (issued September 1996) provides details in the strategy and conditions to be tested during the four-year operating period.

4. Environmental Monitoring Plan (EMP) Description

Air Products Liquid Phase Conversion Company, L.P., has constructed and is operating the 260 ton-per-day Liquid Phase Methanol (LPMEOH™) Demonstration Unit at the Eastman Chemical facility in Kingsport, Tennessee. As specified in the Cooperative Agreement, the Partnership developed an Environmental Monitoring Plan (EMP) (August 1996) which describes in detail the environmental monitoring activities to be performed during the operation of the LPMEOH™ Demonstration Unit. The purpose of the EMP is to: 1) document the extent of compliance monitoring activities, i.e., those activities required to meet permit requirements, 2) confirm the specific environmental impacts predicted in the National Environmental Policy Act documentation, and 3) establish an information base for the assessment of the environmental performance of the technology for future commercialization.

The EMP describes three categories of environmental monitoring which are performed as a result of the operation of the LPMEOH™ Demonstration Unit. Details of streams internal to the demonstration unit are available in the Technical Progress Reports for the Project.

4.1 Eastman Reporting of Publicly Available Technical Data

As defined in the Statement of Work for the Demonstration project, Eastman will provide data on three areas of operation of the Chemicals-from-Coal complex (refer to Table 4.1 for a breakdown of the streams to be monitored):

- 1) Gasifier material balance data
- 2) 10C-30 Guard Bed operating data
- 3) Wastewater and alcohols to wastewater treatment system

This technical information provides information from Eastman's existing facilities to provide an overall assessment of the LPMEOH™ technology. A separate Topical Report

(during Year 1 of the operation of the demonstration unit) provides this information, and a summary is available in the Year 1 Annual Environmental Monitoring Report (EMR). Updates, if any, are included in Quarterly EMRs if a significant change occurs.

4.2 Compliance Monitoring

Four areas of compliance monitoring have been identified to satisfy the permit requirements for the demonstration unit (Table 4.2):

- 1) Combined Vapor Flow from Demonstration Unit to Boiler
- 2) Fugitive Emissions
- 3) Particulate Emissions
- 4) Wastewater Treatment System Outlet Stream

Each of these sources is monitored at a frequency mandated by the relevant permit or industrial hygiene practice. The EMRs will include the results of any compliance monitoring generated during the reporting period.

4.3 Supplemental Monitoring

Three areas of supplemental monitoring have been identified in the EMP (Table 4.3):

Summary of Major Material Balance Streams for Demonstration Unit

The major feed streams (CO Gas, H₂ Gas, Balanced Gas) and product flows (Refined Grade Methanol, Crude Grade Methanol, Main Plant Purge) are provided as a summary table of the cumulative stream flows for the reporting period.

Solid/Liquid Discharges

Four other streams can be generated from the demonstration unit:

- 1) Compressor and Pump Lubricants
- 2) Oil Recovered in Oil/Water Separator
- 3) Spent Catalyst
- 4) 29C-40 Guard Bed Adsorbent

Any quantities generated during the reporting period are included in the EMR.

Noise

A noise survey around the 29K-01 Recycle Compressor is planned during the initial start-up of the demonstration unit. The EMR covering activities during the initial operation of the demonstration unit will include the results of this noise survey.

TABLE 4.1

LPMEOH™ DEMONSTRATION UNIT

PUBLICLY AVAILABLE TECHNICAL DATA FROM EASTMAN
CHEMICALS-FROM-COAL COMPLEX

<u>Environmental Media</u>	<u>General Parameters</u>
Coal	Pressure, Temperature, Coal Analysis
Oxygen to Gasifier	Pressure, Temperature, %O ₂
Water to Gasifier	Pressure, Temperature
Waste Water from Gasifier	Pressure, Temperature, Total Organic Carbon
Clean Synthesis Gas from Gasifier	Pressure, Temperature, Flow
Sulfur Recovered from Gasifier	Pressure, Temperature, Flow, %S
Carbon Dioxide from Gasifier	Pressure, Temperature, Flow, %CO ₂
Slag from Gasifier	Pressure, Temperature, Flow
Balanced Gas from 10C-30 Guard Bed	Pressure, Temperature, Flow, Composition
Wastewater and Alcohols to Wastewater Treatment System	Flow, Composition, BOD

TABLE 4.2

LPMEOH™ DEMONSTRATION UNIT

COMPLIANCE MONITORING

Environmental Media

General Parameters

Combined Vapor Flow from Demonstration
Unit to Boiler

Composition

Fugitive Emissions

Leak Detection and Repair (LDAR)
Report, Volatile Organic Carbon (VOC),
Background Ambient CO Concentration

Particulate Emissions

Threshold Limit Value (TLV)

Wastewater Treatment System Outlet
Stream

Flow, Total Organic Carbon, pH

TABLE 4.3

LPMEOH™ DEMONSTRATION UNIT

SUPPLEMENTAL MONITORING

Environmental MediaGeneral Parameters

CO Gas to LPMEOH™ Demonstration Unit	Cumulative Flow for Quarter
H ₂ Gas to LPMEOH™ Demonstration Unit	Cumulative Flow for Quarter
Balanced Gas to LPMEOH™ Demonstration Unit	Cumulative Flow for Quarter
Main Vapor Purge from LPMEOH™ Demonstration Unit	Cumulative Flow for Quarter
Refined Grade Methanol	Cumulative Flow for Quarter
Crude Grade Methanol	Cumulative Flow for Quarter
Compressor and Pump Lubricants	Weight or Volume
Oil Recovered in Oil/Water Separator	Weight or Volume
Spent Catalyst	Weight, Weight% Solids
29C-40 Guard Bed Adsorbent	Weight or Volume
Noise Survey for 29K-01 Recycle Compressor	dBa

5. Project Summary

Synthesis gas was first introduced to the LPMEOH™ Demonstration Unit on 02 April 1997. The nameplate capacity of 80,000 gallons of methanol per day (260 tons-per-day) was achieved on 06 April 1997. Table 5.1 summarizes the onstream time and outages of the LPMEOH™ Demonstration Unit during the reporting period.

6. Updates on Eastman "Chemicals-from Coal" Facility Publicly Available Technical Data

6.1 Gasifier Facility

The report on publicly available technical data from the Eastman "Chemicals-from-Coal" facility, which includes data on the streams associated with the Gasifier facility, will be issued during the first year of operation of the LPMEOH™ Demonstration Unit.

6.2 10C-30 Catalyst Guard Bed

The report on publicly available technical data from the Eastman "Chemicals-from-Coal" facility, which includes data on the streams around and the operation of the 10C-30 Catalyst Guard Bed, will be issued during the first year of operation of the LPMEOH™ Demonstration Unit.

There was no change in the operation of the 10C-30 Catalyst Guard Bed during the reporting period. No new catalyst was added to or removed from the vessel.

6.3 Wastewater and Alcohols to Wastewater Treatment System

The report on publicly available technical data from the Eastman "Chemicals-from-Coal" facility, which includes data on the streams associated with the wastewater and alcohols to the Wastewater Treatment System, will be issued during the first year of operation of the LPMEOH™ Demonstration Unit. This will consist of a comparison of the flow, composition, and BOD load of this stream before and after the addition of the LPMEOH™ Demonstration Unit.

Table 5.1

Summary of LPMEOH™ Demonstration Unit Onstream Time and Outages - April/June 1997

Operation Start	Operation End	Operating Hours	Shutdown Hours	Reason for Shutdown
4/2/97 09:00	4/2/97 16:15	7.3	4.8	Syngas Unavailable to LPMEOH™ Demonstration Unit
4/2/97 21:05	4/2/97 21:25	0.3	23.3	Liquids to K-01
4/3/97 20:40	4/4/97 11:00	14.3	24.8	Syngas Unavailable to LPMEOH™ Demonstration Unit
4/5/97 11:45	4/6/97 01:45	13.0	5.8	C-03 Outlet Plugged
4/6/97 07:30	4/7/97 13:05	29.6	2.1	C-03 Outlet Plugged
4/7/97 15:10	4/8/97 06:30	15.3	21.5	Syngas Unavailable to LPMEOH™ Demonstration Unit
4/9/97 04:00	4/9/97 05:30	1.5	4.0	ESD on C-02 Level
4/9/97 09:30	4/9/97 14:20	4.8	9.7	Syngas Unavailable to LPMEOH™ Demonstration Unit
4/10/97 00:00	4/11/97 08:25	32.4	14.8	Syngas Unavailable to LPMEOH™ Demonstration Unit
4/11/97 23:15	4/18/97 18:05	162.8	0.7	Syngas Unavailable to LPMEOH™ Demonstration Unit
4/18/97 18:45	4/19/97 07:50	13.1	0.7	Syngas Unavailable to LPMEOH™ Demonstration Unit
4/19/97 08:30	4/23/97 00:20	87.8	20.7	Replace TV-101 Trim
4/23/97 21:00	4/23/97 21:00	0.0	12.0	* Syngas Unavailable to LPMEOH™ Demonstration Unit
4/24/97 09:00	5/8/97 23:59	351.0	950.1	** Syngas Unavailable to LPMEOH™ Demonstration Unit
6/17/97 14:05	6/30/97 23:59	321.9		
Total Operating Hours			1055.2	
Syngas Available Hours			1112.0	
Plant Availability, %			94.9	

* Plant was ready to startup, but Eastman waited 12 hours to give the day crew training on startup procedures.

** Eastman complex outage.

7. Compliance Monitoring

7.1 Combined Vapor Flow from Demonstration Unit to Boiler

A sample of the header gas from the LPMEOH™ Demonstration Unit must be analyzed as part of the Boiler and Industrial Furnace regulations within RCRA. Sampling is currently required every three years. The next sample will be taken in February of 2000.

No activity occurred during the reporting period.

7.2 Fugitive Emissions

7.2.1 Leak Detection and Repair (LDAR)

No activity occurred during the reporting period. The next report on Leak Detection and Repair is anticipated for December of 1997.

7.2.2 Ambient Carbon Monoxide Background Concentration

This one-time study will record the concentration of CO that is encountered by a LPMEOH™ operations person during the course of a normal day of plant operations.

No activity occurred during the reporting period. The ambient CO background concentration study is scheduled to be performed during the first quarter of 1998.

7.3 Particulate Emissions

This one-time study will record the exposure level to particulate emissions that is encountered by a LPMEOH™ operations person during the catalyst charging process.

The report on this study is included in Appendix B. The results show that the concentrations of aluminum and zinc were below the Threshold Limit Value (TLV) of 10 mg/m³, but that the copper concentrations may exceed the TLV. However, it should be noted that operators use respiratory protection during the catalyst loading operation. Some engineering modifications are planned to reduce the dust concentration.

7.4 Wastewater Treatment System Outlet Stream

The reports on the outfall from the Wastewater Treatment System (Discharge Number 002) for the reporting period is attached in Appendix C. There were no permit excursions.

A process stream within the existing Eastman facility which is impacted by the operation of the LPMEOH™ Demonstration Unit contains the byproduct alcohols and water which are generated in parallel with the production of methanol. This stream is sent to the Eastman Wastewater Treatment System. The annual EMR will contain a comparison of the flow,

composition, and BOD load of this stream before and after the addition of the LPMEOH™ Demonstration Unit.

8. Supplemental Monitoring

8.1 Total Synthesis Gas Use and Methanol Production

Table 8.1 contains the summary of the major process flows to and from the LPMEOH™ Demonstration Unit for the reporting period. Almost 3,000,000 gallons of methanol (Refined and Crude Grades) were produced during the reporting period.

8.2 Oil/Water Separator

Since the startup of the LPMEOH™ Demonstration Unit, about 16,000 pounds of oil have been removed from the Oil/Water Separator. This material is presently stored in drums awaiting final disposition by incineration for energy recovery.

8.3 Compressor and Pump Lubricants

No material was generated during the reporting period.

8.4 Spent Catalyst Slurry

Approximately 300 pounds of methanol synthesis catalyst were removed from the LPMEOH™ reactor during the outage between 08 May and 17 June 1997. This material is presently stored onsite and will be included as part of the first large shipment of spent catalyst to the off-site catalyst reclaimer.

8.5 29C-40 Catalyst Guard Bed Spent Adsorbent

No material was generated during the reporting period.

8.6 Noise

A noise survey of the entire LPMEOH™ Demonstration Unit was performed during the reporting period. This was performed to determine if operators working in the plant were exposed to sound levels at which annual audiometric testing would be required. The results of this survey are included in Appendix D. Noise dosimetry results found operator exposures to be less than the 50% of the threshold dose for placement of operators working in the LPMEOH™ Demonstration Unit on a list for required annual audiometric testing. No additional testing of operators is required.

The noise survey around the 29K-01 Recycle Compressor is a one-time test and is scheduled to be completed during the third quarter of 1997.

Table 8-1

Synthesis Gas Use and Methanol Production - April/June 1997
 LPMEOH™ Demonstration Unit

	April 1997	May 1997	June 1997	Total
Consumption, KSCF				
Balanced Gas	449,783.0	123,586.5	211,488.0	784,857.5
CO Gas	0.0	1,496.4	0.0	1,496.4
H ₂ Gas	0.0	0.0	0.0	0.0
Production, Tons				
Crude Methanol	1,530.1	367.2	597.0	2,494.3
Refined Methanol	3,940.5	1,077.0	2,061.5	7,079.0
 Total Purge Gas, KSCF	 33,400.0	 19,938.0	 28,495.6	 81,833.6

9. Compliance

9.1 Compliance with Permit Limits

There were no excursions outside permit limits associated with the operation of the LPMEOH™ Demonstration Unit.

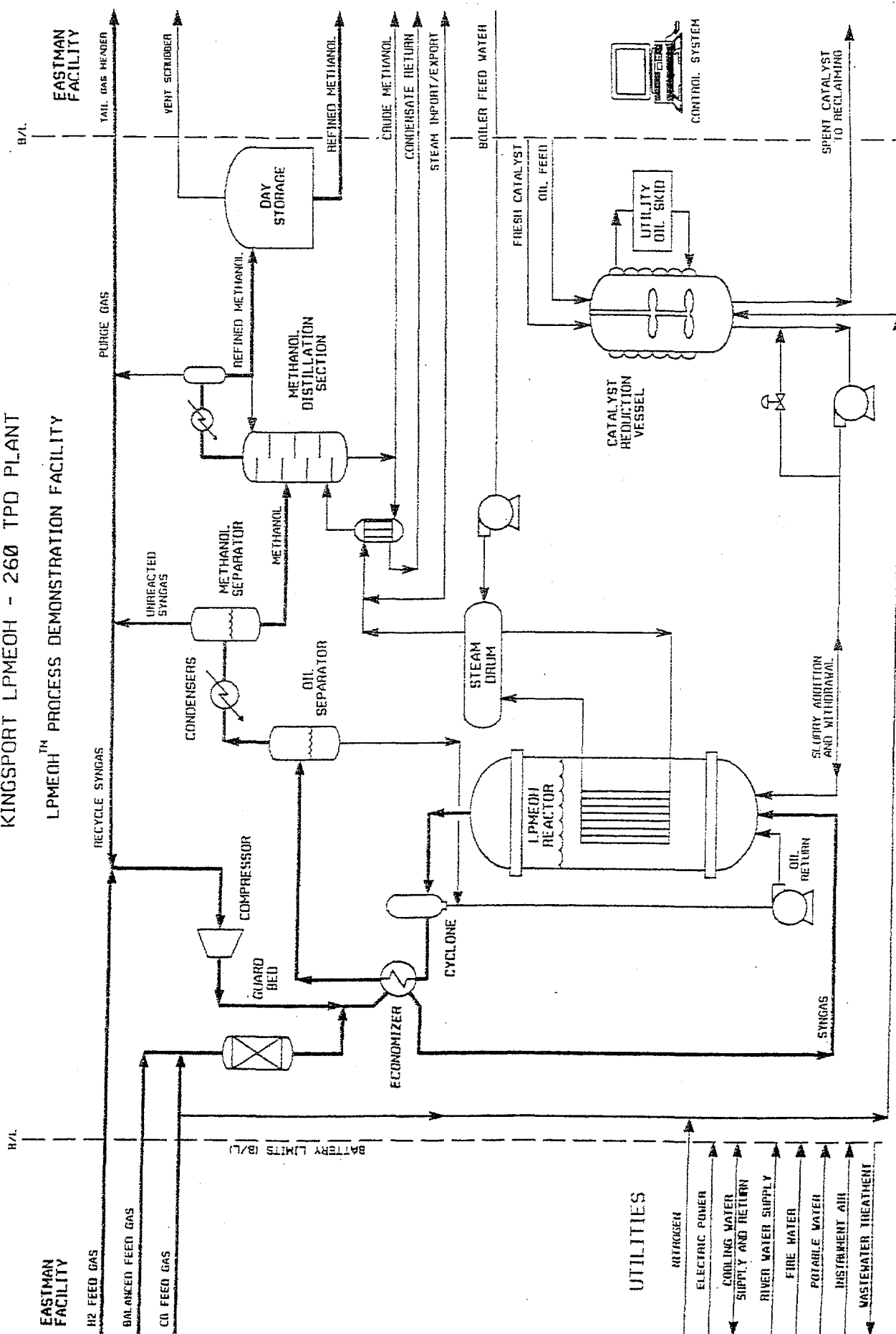
10. Problems and Recommendations

There have been no significant problems arising in the environmental area.

APPENDICES

APPENDIX A - SIMPLIFIED PROCESS FLOW DIAGRAM

SIMPLIFIED PROCESS DIAGRAM KINGSPORT LPMEOH - 260 TPD PLANT LPMEOH™ PROCESS DEMONSTRATION FACILITY



APPENDIX B - DUST EXPOSURE SURVEY DURING CATALYST LOADING

Title: Operator Exposures to Aluminum, Copper & Zinc - Liquid Phase Methanol Plant, B-486

Abstract: Copper dust concentrations may exceed the ACGIH Threshold Limit Value (TLV) of 1 mg/m³ during the catalyst charging operation. Respiratory protection is currently used to ensure exposure is controlled to an acceptable level.

Recommendation: 1) Implement planned engineering modifications to reduce dust concentrations during the charging of catalyst.

On July 22, 1997, breathing zone (BZ) samples were collected during the charging of copper catalyst in B-486 as a follow-up to earlier data collected in March. In March, sampling data indicated that airborne copper concentrations may exceed the TLV. In addition, samples for the aluminum and zinc components of the catalyst were collected. Normally, six drums (1050 kg) of catalyst are charged to a hopper using a drum hoist. Catalyst make-up is done about once every 2-3 weeks.

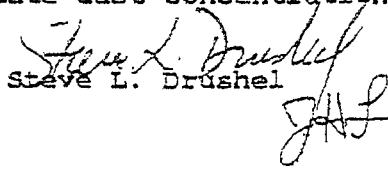
The following 8-hr time-weighted copper concentrations were found:

Copper	3/16	3/26	7/22
	----	----	----
Mean (mg/m ³)	>1.0*	0.7	0.2
Range (mg/m ³)	0.1 - >2.0*	0.6 - 0.7	0.1 - 0.4

Note: asterisk denotes concentrations above 1 mg/m³ TLV

Currently, dust generation is minimized by means of a "plastic sock" which is attached to the drums prior to charging. This interim measure appears to be successful as indicated by the above copper concentrations. The planned engineering modifications include a funnel system on the drum hoist.

The (BZ) samples collected for aluminum and zinc found all concentrations to be substantially less than the ACGIH TLV of 10 mg/m³ established for these materials. Please share the results of this report with all operators involved in the catalyst charging process. Also, please contact Industrial Hygiene to reevaluate dust concentrations after completion of the equipment modifications.


Steve L. Drushel

**APPENDIX C - NPDES REPORTS FOR WASTEWATER TREATMENT SYSTEM
OUTLET STREAM**

*** NO DISCHARGE [] ***

NOTE: Read instructions before completing this form.

MONITORING PERIOD

FROM 97-04-01 TO 97-04-30

PARAMETER (17-21)	MEASUREMENT REQUIREMENT	(3 Card Only) (46-53)		Loading (26)	Quantity or (54-61)		Quality or (66-73)		(4 Card Only) (38-45)		Concentration (54-61)		Unit	NO. EX (62-63)	Frequency of analysis (64-69)	Sample Type (69-70)
		Average	Maximum		Average	Maximum	Minimum	Maximum	Average	Maximum						
PH	SAMPLE MEASUREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	(12)	0	Continuous	N/A
00400 1 0 0 EFFLUENT GROSS VALUE	PERMIT REQUIREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
SOLIDS, TOTAL SUSPENDED	SAMPLE MEASUREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
00630 1 0 0 EFFLUENT GROSS VALUE	PERMIT REQUIREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NITROGEN, AMMONIA TOTAL (AS N)	SAMPLE MEASUREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
00610 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
CYANIDE, TOTAL (AS CN)	SAMPLE MEASUREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
00720 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
CHROMIUM, TOTAL (AS CR)	SAMPLE MEASUREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
01034 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
COPPER, TOTAL (AS CU)	SAMPLE MEASUREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
01042 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
LEAD, TOTAL (AS PB)	SAMPLE MEASUREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
01061 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER H. H. Holliman, President Tennessee Eastman Division																
SIGNATURE OF PRINCIPAL EXECUTIVE <i>John F. Well</i> OFFICER OR AUTHORIZED AGENT																
TELEPHONE (423) 229-2000																
DATE 97-05-13																
AREA CODE NUMBER YEAR NO DAY																

COMMENT AND EXPLANATION OF ANY VIOLATIONS
 In addition to taking reasonable steps to prevent instances of noncompliance through the implementation of SPCC and SPCC-type plans, employee training, etc. when a potentially significant instance occurs, we notify the Division and provide information concerning the steps taken or planned to reduce, eliminate, and prevent recurrence of the instance.
 EPA FORM 3120-1 (REV. 8-88) Previous editions may be used. (REPLACES EPA FORM T-40 WHICH MAY NOT BE USED.)

MAJOR
(SUBR 06)
F - FINAL
INDUSTRIAL PROCESS WASTEWATER
EFFLUENT

DISCHARGE MONITORING REPORT (DMR)
002 G
DISCHARGE NUMBER

DISCHARGE MONITORING REPORT (DMR)
002 G
DISCHARGE NUMBER

TN EASTMAN DIVISION
DIVISION OF EASTMAN CHEMICAL CO.
P.O BOX 1993
KINGSPORT, TN 37662-5393
Facility: TN EASTMAN - KINGSPORT
Location: SULLIVAN COUNTY TN 37662-5393

*** NO DISCHARGE [] ***
NOTE: Read Instructions before completing this form.

MONITORING PERIOD
FROM 07 - 05 - 01 TO 07 - 05 - 31

PARAMETER (12-17)	MEASUREMENT REQUIREMENT	(3 Card Only) (46-53)			(4 Card Only) (18-45)			Concentration (54-61)			NO. EX (62-63)	Frequency of analysis (64-69)	Sample Type (69-70)
		Average	Maximum	Unit	Minimum	Average	Maximum	Unit	Maximum	Unit			
PH	SAMPLE	.....	.....	.....	6.7	.....	7.8	(12)	7.8	SU	0	Continuous	N/A
00400 1 0 0 EFFLUENT GROSS VALUE	PERMIT REQUIREMENT	.....	.....	.....	MINIMUM	.....	MAXIMUM	.....	.....	.....	.....	CONTINUOUS	REORDER
SOLIDS, TOTAL SUSPENDED	SAMPLE	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	31/31	Composite
00630 1 0 0 EFFLUENT GROSS VALUE	PERMIT REQUIREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	DAILY	COMPOSITE
NITROGEN, AMMONIA TOTAL (AS N)	SAMPLE	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	31/31	Composite
00610 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	DAILY	COMPOSITE
CYANIDE, TOTAL (AS CN)	SAMPLE	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	1/7	Grab
00720 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	WEEKLY	GRAB
CHROMIUM, TOTAL (AS CR)	SAMPLE	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	1/7	Composite
01034 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	WEEKLY	COMPOSITE
COPPER, TOTAL (AS CU)	SAMPLE	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	1/7	Composite
01042 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	WEEKLY	COMPOSITE
LEAD, TOTAL (AS PB)	SAMPLE	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	1/7	Composite
01051 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	WEEKLY	COMPOSITE
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	MEASUREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	1/7	Composite
H. H. Holliman, President	PERMIT REQUIREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	WEEKLY	COMPOSITE
Tennessee Eastman Division	MEASUREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	1/7	Composite
TYPED OR PRINTED	PERMIT REQUIREMENT	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	WEEKLY	COMPOSITE
SIGNATURE OF PRINCIPAL EXECUTIVE										TELEPHONE			
OFFICER OR AUTHORIZED AGENT										DATE			
.....										(423) 229-2000			
.....										97 - 06 - 11			
.....										YEAR MO DAY			

COMMENT AND EXPLANATION OF ANY VIOLATIONS
In addition to taking reasonable steps to prevent instances of noncompliance through the implementation of SPCC and SPOC-type plans, employee training, etc. when a potentially significant instance occurs, we notify the Division and provide information concerning the steps taken or planned to reduce, eliminate, and prevent recurrence of the instance.
EPA FORM 3320-1 (REV. 9-88) Previous editions may be used. (REPLACES EPA FORM T-40 WHICH MAY NOT BE USED.)

PERMITTEE NAME/ADDRESS:

TN EASTMAN DIVISION

DIVISION OF EASTMAN CHEMICAL CO.

P O BOX 1993

KINGSPORT, TN 37682-5393

Facility: TN EASTMAN - KINGSPORT

Location: SULLIVAN COUNTY TN 37662-5393

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

PERMIT NUMBER

TN0002640

002 G

DISCHARGE NUMBER

MAJOR

(SUBR 08)

F - FINAL

INDUSTRIAL PROCESS WASTEWATER

EFFLUENT

FORM APPROVED

OAGB No. 204-0-0004

*** NO DISCHARGE ***

NOTE: Read instructions before completing this form.

MONITORING PERIOD

FROM 97 - 06 - 01 TO 97 - 06 - 30

PARAMETER (92-97)	(3 Card Only) (66-69)			Loading Unit	(4 Card Only) (68-69)			Quantity or (64-65)		Concentration (54-61)	Unit	NO. EX (62-63)	Frequency of analysis (64-69)	Sample Type (65-70)
	Average	Maximum	Minimum		Average	Maximum	Minimum	Average	Maximum					
PH														
00400 1 0 0 EFFLUENT GROSS VALUE	SAMPLE MEASUREMENT													
SOLIDS, TOTAL	PERMIT REQUIREMENT													
SUSPENDED	SAMPLE MEASUREMENT													
00630 1 0 0 EFFLUENT GROSS VALUE	PERMIT REQUIREMENT													
NITROGEN, AMMONIA	SAMPLE MEASUREMENT													
TOTAL (AS N)	PERMIT REQUIREMENT													
00610 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT													
CYANIDE, TOTAL (AS CN)	PERMIT REQUIREMENT													
00720 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT													
CHROMIUM, TOTAL (AS CR)	PERMIT REQUIREMENT													
01034 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT													
COPPER, TOTAL (AS CU)	PERMIT REQUIREMENT													
01042 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT													
LEAD, TOTAL (AS PB)	PERMIT REQUIREMENT													
01061 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT													
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER														
H. H. Holliman, President														
Tennessee Eastman Division														
TYPED OR PRINTED														

[Signature]

SIGNATURE OF PRINCIPAL EXECUTIVE

OFFICER OR AUTHORIZED AGENT

(Reference all attachments here)

COMMENT AND EXPLANATION OF ANY VIOLATIONS

In addition to taking reasonable steps to prevent instances of noncompliance through the implementation of SPCC and SPCC-type plans, employee training, etc. when a potentially significant instance occurs, write to the Division and provide information concerning the steps taken or planned to reduce, eliminate, and prevent recurrence of the instance.

EPA FORM 3320-1 (REV. 8-88) Previous editions may be used.

(REPLACES EPA FORM T-40 WHICH MAY NOT BE USED.)

PERMITTEE NAME/ADDRESS:

TN EASTMAN DIVISION
DIVISION OF EASTMAN CHEMICAL CO.
P.O. BOX 1993
KINGSPORT, TN 37662-5393
Facility: TN EASTMAN - KINGSPORT
Location: SULLIVAN COUNTY TN 37662-5393

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

DISCHARGE MONITORING REPORT (DMR)
002 Q
DISCHARGE NUMBER

MAJOR (SUBR 06)
F - FINAL

PROCESSED W/QUARTERLY REPORT
EFFLUENT

FORM APPROVED
OASB No. 2040-0004

*** NO DISCHARGE [] ***

NOTE: Read instructions before completing this form.

MONITORING PERIOD

FROM 97-04-01 TO 97-06-30

PARAMETER (2-37)	MEASUREMENT REQUIREMENT	(3 Card Only) (46-53)			Quantity or (54-61)			Loading Unit	(4 Card Only) (38-45)			Quality or (46-53)		Concentration (54-61)		NO. EX (62-63)	Frequency of analysis (64-68)	Sample Type (69-70)
		Average	Minimum	Maximum	Average	Minimum	Maximum		Average	Minimum	Maximum	Unit	Unit					
CARBON TETRACHLORIDE	SAMPLE MEASUREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0	2/Quarter	Grab
31102 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0	QUARTERLY	GRAB
1,2-DICHLOROETHANE	SAMPLE MEASUREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0	2/Quarter	Grab
31103 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0	QUARTERLY	GRAB
CHLOROFORM	SAMPLE MEASUREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0	2/Quarter	Grab
31106 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0	QUARTERLY	GRAB
TOLUENE	SAMPLE MEASUREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0	2/Quarter	Grab
31106 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0	QUARTERLY	GRAB
ACENAPHTHYLENE	SAMPLE MEASUREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0	2/Quarter	Grab
31200 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0	QUARTERLY	GRAB
ACENAPHTHENE	SAMPLE MEASUREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0	2/Quarter	Grab
31205 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0	QUARTERLY	GRAB
ACRYLONITRILE	SAMPLE MEASUREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0	2/Quarter	Grab
31215 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0	QUARTERLY	GRAB
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER																		
H. H. Holliman, President																		
Tennessee Eastman Division																		
TYPED OR PRINTED																		
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER																		
OFFICER OR AUTHORIZED AGENT																		
TELEPHONE																		
DATE																		
AREA CODE NUMBER																		
YEAR MO DAY																		

COMMENT AND EXPLANATION OF ANY VIOLATIONS
In addition to taking reasonable steps to prevent instances of noncompliance through the implementation of SPCC and SPCC-type plans, employee training, etc. when a potentially significant instance occurs, we notify the Division and provide information concerning the steps taken or planned to reduce, eliminate, and prevent recurrence of the instance.

EPA FORM 3320-1 (REV. 9-88) Previous editions may be used.

TN EASTMAN DIVISION
DIVISION OF EASTMAN CHEMICAL CO.
P.O. BOX 1993
KINGSPORT, TN 37662-5393
Facility: TN EASTMAN - KINGSPORT
Location: SULLIVAN COUNTY TN 37662-5393

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

MAJOR (SUBR 06)
F - FINAL
FORM APPROVED
OMB No. 2040-0004

DISCHARGE MONITORING REPORT (DMR)

TN0002840
PERMIT NUMBER

1002 Q
DISCHARGE NUMBER

PROCESSED WAW QUARTERLY REPORT
EFFLUENT

*** NO DISCHARGE [] ***

NOTE: Read instructions before completing this form.

MONITORING PERIOD

FROM 97 - 04 - 01 TO 97 - 06 - 30

PARAMETER (31-37)	X	(3 Card Only) (46-53)		Quantity or (54-61)		Loading Unit	(4 Card Only) (38-45)		Quality or (46-53)		Concentration (54-61)		Unit	NO. EK (62-69)	Frequency of analysis (64-68)	Sample Type (69-70)
		Average	Maximum	Minimum	Maximum		Minimum	Average	Maximum							
ANTHRACENE	SAMPLE	MEASUREMENT	BDL	(26)	LBS/DAY	BDL	0.001 MON AVE	0.002 DAILY MAX	BDL	(19)	MG/L	0	2/Quarter	GRAB		
14220 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	0.001 MON AVE	0.002 DAILY MAX	(26)	LBS/DAY	0.001 MON AVE	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX
BENZENE, DISSOLVED	SAMPLE	MEASUREMENT	BDL	(26)	LBS/DAY	BDL	0.001 MON AVE	0.002 DAILY MAX	BDL	(19)	MG/L	0	2/Quarter	GRAB		
34236 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	0.001 MON AVE	0.002 DAILY MAX	(26)	LBS/DAY	0.001 MON AVE	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX
BENZO (K) FLUORANTHENE	SAMPLE	MEASUREMENT	BDL	(26)	LBS/DAY	BDL	0.001 MON AVE	0.002 DAILY MAX	BDL	(19)	MG/L	0	2/Quarter	GRAB		
34242 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	0.001 MON AVE	0.002 DAILY MAX	(26)	LBS/DAY	0.001 MON AVE	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX
BENZO (A) PYRENE	SAMPLE	MEASUREMENT	BDL	(26)	LBS/DAY	BDL	0.001 MON AVE	0.002 DAILY MAX	BDL	(19)	MG/L	0	2/Quarter	GRAB		
34247 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	0.001 MON AVE	0.002 DAILY MAX	(26)	LBS/DAY	0.001 MON AVE	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX
CHLOROBENZENE	SAMPLE	MEASUREMENT	BDL	(26)	LBS/DAY	BDL	0.001 MON AVE	0.002 DAILY MAX	BDL	(19)	MG/L	0	2/Quarter	GRAB		
34301 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	0.001 MON AVE	0.002 DAILY MAX	(26)	LBS/DAY	0.001 MON AVE	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX
CHRYSENE	SAMPLE	MEASUREMENT	BDL	(26)	LBS/DAY	BDL	0.001 MON AVE	0.002 DAILY MAX	BDL	(19)	MG/L	0	2/Quarter	GRAB		
34320 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	0.001 MON AVE	0.002 DAILY MAX	(26)	LBS/DAY	0.001 MON AVE	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX
DIETHYL PHTHALATE	SAMPLE	MEASUREMENT	BDL	(26)	LBS/DAY	BDL	0.001 MON AVE	0.002 DAILY MAX	BDL	(19)	MG/L	0	2/Quarter	GRAB		
34338 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	0.001 MON AVE	0.002 DAILY MAX	(26)	LBS/DAY	0.001 MON AVE	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX	0.001 MON AVE	0.002 DAILY MAX
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER																
H. H. Holliman, President																
Tennessee Eastman Division																
TYPED OR PRINTED																
TELEPHONE (423) 229-2000																
DATE 97 - 07 - 11																
AEEA CODE NUMBER																
YEAR MO DAY																

(Reference all attachments here)

REPLACES EPA FORM T-40 WHICH MAY NOT BE USED.)

IN ADDITION TO TAKING REASONABLE STEPS TO PREVENT INSTANCES OF NONCOMPLIANCE THROUGH THE IMPLEMENTATION OF SPCC AND SPCC-type plans, employee training, etc. when a potentially significant instance occurs, we notify the Division and provide information concerning the steps taken or planned to reduce, eliminate, and prevent recurrence of the instance.

REPLACES EPA FORM T-40 WHICH MAY NOT BE USED.)

PERMITTEE NAME/ADDRESS:

TN EASTMAN DIVISION
DIVISION OF EASTMAN CHEMICAL CO.
P.O. BOX 1993
KINGSPORT, TN 37682-5393
Facility: TN EASTMAN - KINGSPORT
Location: SULLIVAN COUNTY TN 37682-5393

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

DISCHARGE MONITORING REPORT (DMR)
002 Q
DISCHARGE NUMBER
TN0002840
PERMIT NUMBER

MAJOR

(SUBR 06)

F - FINAL
PROCESSED WW QUARTERLY REPORT
EFFLUENT

FORM APPROVED

OMB No. 2040-0084

*** NO DISCHARGE ***

NOTE: Read instructions before completing this form.

MONITORING PERIOD

FROM 97-04-01 TO 97-06-30

PARAMETER (02-57)	SAMPLE MEASUREMENT PERMIT REQUIREMENT	(3 Card Only) (44-53)			Quantity or Loading (54-61)	Unit	(4 Card Only) (18-45)			Quality or (46-53)	Concentration (54-61)	Unit	NO. EX (02-43)	Frequency of analysis (44-48)	Sample Type (02-70)
		Average	Minimum	Maximum			Average	Minimum	Maximum						
DIMETHYL PHTHALATE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	.....	BDL	(26)	LBS/DAY	.....	.....	BDL	(19)	MG/L	0	2/Quarter	Grab	
34341 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	.....	BDL	(26)	LBS/DAY	.....	.....	BDL	(19)	MG/L	0	2/Quarter	Grab	
FLUORANTHENE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	.....	BDL	(26)	LBS/DAY	.....	.....	BDL	(19)	MG/L	0	2/Quarter	Grab	
34378 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	.....	BDL	(26)	LBS/DAY	.....	.....	BDL	(19)	MG/L	0	2/Quarter	Grab	
FLUORENE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	.....	BDL	(26)	LBS/DAY	.....	.....	BDL	(19)	MG/L	0	2/Quarter	Grab	
34381 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	.....	BDL	(26)	LBS/DAY	.....	.....	BDL	(19)	MG/L	0	2/Quarter	Grab	
HEXACHLOROBUTADIENE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	.....	BDL	(26)	LBS/DAY	.....	.....	BDL	(19)	MG/L	0	2/Quarter	Grab	
34391 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	.....	BDL	(26)	LBS/DAY	.....	.....	BDL	(19)	MG/L	0	2/Quarter	Grab	
HEXACHLOROETHANE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	.....	BDL	(26)	LBS/DAY	.....	.....	BDL	(19)	MG/L	0	2/Quarter	Grab	
34396 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	.....	BDL	(26)	LBS/DAY	.....	.....	BDL	(19)	MG/L	0	2/Quarter	Grab	
METHYL CHLORIDE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	.....	BDL	(26)	LBS/DAY	.....	.....	BDL	(19)	MG/L	0	2/Quarter	Grab	
34418 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	.....	BDL	(26)	LBS/DAY	.....	.....	BDL	(19)	MG/L	0	2/Quarter	Grab	
METHYLENE CHLORIDE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	.....	BDL	(26)	LBS/DAY	.....	.....	BDL	(19)	MG/L	0	2/Quarter	Grab	
34423 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	.....	BDL	(26)	LBS/DAY	.....	.....	BDL	(19)	MG/L	0	2/Quarter	Grab	
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER H. H. Holliman, President TELEPHONE (423) 229-2000 AREA CODE NUMBER 97-07-11 DATE															
OFFICER OR AUTHORIZED AGENT John F. Welch															

COMMENT AND EXPLANATION OF ANY VIOLATIONS

In addition to taking reasonable steps to prevent instances of noncompliance through the implementation of SPCC and SPCC-type plans, employee training, etc. when a potentially significant instance occurs, we notify the Division and provide information concerning the steps taken to reduce, eliminate, and prevent recurrence of the instance.

EPA FORM 3320-1 (REV. 8-88) Previous editions may be used.

(REPLACES EPA FORM T-40 WHICH MAY NOT BE USED.)

MAJOR
(SUBR 06)
F - FINAL

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

IN EASTMAN DIVISION
DIVISION OF EASTMAN CHEMICAL CO.
P.O. BOX 1993
KINGSPORT, TN 37662-5393
Facility: TN EASTMAN - KINGSPORT
Location: SULLIVAN COUNTY TN 37662-5393

PROCESSED WW QUARTERLY REPORT
EFFLUENT

002 Q
DISCHARGE NUMBER

TN0002640
PERMIT NUMBER

NO DISCHARGE []

MONITORING PERIOD
FROM 97-04-01 TO 97-06-30

NOTE: Read instructions before completing this form.

PARAMETER (12-17)	MEASUREMENT REQUIREMENT	(3 Card Only) (46-53)			Loading Unit	(4 Card Only) (28-45)			Concentration (54-61)			NO. EX (62-63)	Frequency of analysis (64-68)	Sample Type (69-70)
		Average	Maximum	Minimum		Average	Maximum	Minimum	Average	Maximum	Unit			
1,1,2 - TRICHLOROETHANE	SAMPLE													
34511 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26) LBS/DAY	BDL	BDL	BDL	BDL	BDL	(19) MG/L	0	2/Quarter	Grab
BENZO (A) ANTHRACENE	SAMPLE													
34526 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26) LBS/DAY	BDL	BDL	BDL	BDL	BDL	(19) MG/L	0	2/Quarter	Grab
1,2 - DICHLOROBENZENE	SAMPLE													
34536 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26) LBS/DAY	BDL	BDL	BDL	BDL	BDL	(19) MG/L	0	2/Quarter	Grab
1,2 - DICHLOROPROPANE	SAMPLE													
34541 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26) LBS/DAY	BDL	BDL	BDL	BDL	BDL	(19) MG/L	0	2/Quarter	Grab
1,2 - TRANS - DICHLOROETHYLENE	SAMPLE													
34546 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26) LBS/DAY	BDL	BDL	BDL	BDL	BDL	(19) MG/L	0	2/Quarter	Grab
1,2,4 - TRICHLORO - BENZENE	SAMPLE													
34551 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26) LBS/DAY	BDL	BDL	BDL	BDL	BDL	(19) MG/L	0	2/Quarter	Grab
1,3 - DICHLOROPROPENE, TOTAL WEIGHT	SAMPLE													
34551 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26) LBS/DAY	BDL	BDL	BDL	BDL	BDL	(19) MG/L	0	2/Quarter	Grab
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER														
H. H. Holliman, President														
Tennessee Eastman Division														
TYPED OR PRINTED														
COMMENT AND EXPLANATION OF ANY VIOLATIONS														
In addition to taking reasonable steps to prevent instances of noncompliance through the implementation of SPCC and SPOC-type plans, employee training, etc. when a potentially significant instance occurs, we notify the Division and provide information concerning the steps taken or planned to reduce, eliminate, and prevent recurrence of the instance.														
EPA FORM 3320-1 (REV. 9-88) Previous editions may be used.														

John F. Webb

SIGNATURE OF PRINCIPAL EXECUTIVE
OFFICER OR AUTHORIZED AGENT

(423) 229-2000
AREA CODE NUMBER

97 - 07 - 11
YEAR MO DAY

TELEPHONE

DATE

PERMITTEE NAME/ADDRESS:

TN EASTMAN DIVISION
DIVISION OF EASTMAN CHEMICAL CO.
P.O. BOX 1993
KINGSPORT, TN 37662-5393
Facility: TN EASTMAN - KINGSPORT
Location: SULLIVAN COUNTY TN 37662-5393

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

TN0002640
PERMIT NUMBER

MAJOR

(SUBR 06)

F - FINAL

PROCESSED WW QUARTERLY REPORT

EFFLUENT

*** NO DISCHARGE [] ***

NOTE: Read instructions before completing this form.

MONITORING PERIOD

FROM 97 - 04 - 01 TO 97 - 06 - 30

PARAMETER (22-17)	X	(3 Card Only) (46-53)			Quantity or (54-61)			Loading Unit	(4 Card Only) (18-45)			Quality or (46-53)			Concentration (34-61)			Unit	NO. EX (62-67)	Frequency of analysis (68-69)	Sample Type (69-70)				
		Average	Maximum	Minimum	Average	Maximum	Minimum		Average	Maximum	Minimum	Average	Maximum	Minimum	Average	Maximum	Minimum								
1,3 - DICHLOROBENZENE	SAMPLE																								
34666 2 0 0 EFFLUENT NET VALUE	MEASUREMENT PERMIT REQUIREMENT	0.031 MON AVG	0.044 DAILY MAX		0.031 MON AVG	0.044 DAILY MAX	LBS/DAY		0.031 MON AVG	0.044 DAILY MAX	0.031 MON AVG		0.044 DAILY MAX		0.031 MON AVG	0.044 DAILY MAX	MG/L		0	2/Quarter	Grab				
1,4 - DICHLOROBENZENE	SAMPLE																								
34671 2 0 0 EFFLUENT NET VALUE	MEASUREMENT PERMIT REQUIREMENT	0.016 MON AVG	0.029 DAILY MAX		0.016 MON AVG	0.029 DAILY MAX	LBS/DAY		0.016 MON AVG	0.029 DAILY MAX	0.016 MON AVG		0.029 DAILY MAX		0.016 MON AVG	0.029 DAILY MAX	MG/L		0	2/Quarter	Grab				
2 - CHLOROPHENOL	SAMPLE																								
34686 2 0 0 EFFLUENT NET VALUE	MEASUREMENT PERMIT REQUIREMENT	0.031 MON AVG	0.044 DAILY MAX		0.031 MON AVG	0.044 DAILY MAX	LBS/DAY		0.031 MON AVG	0.044 DAILY MAX	0.031 MON AVG		0.044 DAILY MAX		0.031 MON AVG	0.044 DAILY MAX	MG/L		0	2/Quarter	Grab				
2 - NITROPHENOL	SAMPLE																								
34591 2 0 0 EFFLUENT NET VALUE	MEASUREMENT PERMIT REQUIREMENT	0.041 MON AVG	0.069 DAILY MAX		0.041 MON AVG	0.069 DAILY MAX	LBS/DAY		0.041 MON AVG	0.069 DAILY MAX	0.041 MON AVG		0.069 DAILY MAX		0.041 MON AVG	0.069 DAILY MAX	MG/L		0	2/Quarter	Grab				
2,4 - DICHLOROPHENOL	SAMPLE																								
34601 2 0 0 EFFLUENT NET VALUE	MEASUREMENT PERMIT REQUIREMENT	0.039 MON AVG	0.044 DAILY MAX		0.039 MON AVG	0.044 DAILY MAX	LBS/DAY		0.039 MON AVG	0.044 DAILY MAX	0.039 MON AVG		0.044 DAILY MAX		0.039 MON AVG	0.044 DAILY MAX	MG/L		0	2/Quarter	Grab				
2,4 - DIMETHYLPHENOL	SAMPLE																								
34606 2 0 0 EFFLUENT NET VALUE	MEASUREMENT PERMIT REQUIREMENT	0.039 MON AVG	0.044 DAILY MAX		0.039 MON AVG	0.044 DAILY MAX	LBS/DAY		0.039 MON AVG	0.044 DAILY MAX	0.039 MON AVG		0.044 DAILY MAX		0.039 MON AVG	0.044 DAILY MAX	MG/L		0	2/Quarter	Grab				
2,4 - DINITROTOLUENE	SAMPLE																								
34611 2 0 0 EFFLUENT NET VALUE	MEASUREMENT PERMIT REQUIREMENT	0.015 MON AVG	0.026 DAILY MAX		0.015 MON AVG	0.026 DAILY MAX	LBS/DAY		0.015 MON AVG	0.026 DAILY MAX	0.015 MON AVG		0.026 DAILY MAX		0.015 MON AVG	0.026 DAILY MAX	MG/L		0	2/Quarter	Grab				
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		John F. Webb																				TELEPHONE		DATE	
H. H. Holliman, President		SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT																				AREA CODE NUMBER		YEAR MO DAY	
Tennessee Eastman Division		(423) 229-2000																				97 - 07 - 11			
TYPED OR PRINTED																									

(Reference all attachments here)

COMMITTEE NAME/ADDRESS:

In addition to taking reasonable steps to prevent instances of noncompliance through the implementation of SPCC and SPCC-type plans, employee training, etc. when a potentially significant instance occurs, we notify the Division and provide information concerning the steps taken or planned to reduce, eliminate, and prevent recurrence of the instance.

EPA FORM 3320-1 (REV. 9-88) Previous editions may be used.

(REPLACES EPA FORM T-40 WHICH MAY NOT BE USED.)

MAJOR
(SUBR 08)
F - FINAL

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

002 Q
DISCHARGE NUMBER

PROCESSED WAW QUARTERLY REPORT
EFFLUENT

*** NO DISCHARGE L ***

NOTE: Read instructions before completing this form.

MONITORING PERIOD

FROM 97 - 04 - 01 TO 97 - 06 - 30

TN EASTMAN DIVISION
DIVISION OF EASTMAN CHEMICAL CO.
P.O. BOX 1993
KINGSPORT, TN 37662-5393
Facility: TN EASTMAN - KINGSPORT
Location: SULLIVAN COUNTY TN 37662-5393

PARAMETER (32-37)	SAMPLE MEASUREMENT PERMIT REQUIREMENT	(3 Card Only) (44-53)		Loading Unit (26)	Quantity or (34-41)		(4 Card Only) (18-43)		Quality or (44-53)		Concentration Maximum (34-41)	Unit (19)	NO. EX (62-63)	Frequency of analysis (47-49)	Sample Type (69-70)
		Average	Maximum		Minimum	Average	Maximum								
2,4 - DINITROPHENOL	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	BDL	(26)	.....	BDL	.....	.....	.....	.....	BDL	(19)	0	2/Quarter	Grab
34816 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	BDL	LBS/DAY	.....	DAILY MAX	.....	.....	.....	.....	DAILY MAX	MG/L	0	QUARTERLY	GRAB
2,6 - DINITROTOLUENE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	BDL	(26)	.....	BDL	.....	.....	.....	.....	BDL	(19)	0	2/Quarter	Grab
34626 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	BDL	LBS/DAY	.....	DAILY MAX	.....	.....	.....	.....	DAILY MAX	MG/L	0	QUARTERLY	GRAB
4 - NITROPHENOL	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	BDL	(26)	.....	BDL	.....	.....	.....	.....	BDL	(19)	0	2/Quarter	Grab
34846 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	BDL	LBS/DAY	.....	DAILY MAX	.....	.....	.....	.....	DAILY MAX	MG/L	0	QUARTERLY	GRAB
4,6 - DINITRO - O - CRESOL	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	BDL	(26)	.....	BDL	.....	.....	.....	.....	BDL	(19)	0	2/Quarter	Grab
34637 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	BDL	LBS/DAY	.....	DAILY MAX	.....	.....	.....	.....	DAILY MAX	MG/L	0	QUARTERLY	GRAB
PHENOL, SINGLE COMPOUND	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	BDL	(26)	.....	BDL	.....	.....	.....	.....	BDL	(19)	0	2/Quarter	Grab
34694 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	BDL	LBS/DAY	.....	DAILY MAX	.....	.....	.....	.....	DAILY MAX	MG/L	0	QUARTERLY	GRAB
NAPHTHALENE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	BDL	(26)	.....	BDL	.....	.....	.....	.....	BDL	(19)	0	2/Quarter	Grab
34696 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	BDL	LBS/DAY	.....	DAILY MAX	.....	.....	.....	.....	DAILY MAX	MG/L	0	QUARTERLY	GRAB
ETHYL BENZENE	SAMPLE MEASUREMENT PERMIT REQUIREMENT	.....	BDL	(26)	.....	BDL	.....	.....	.....	.....	BDL	(19)	0	2/Quarter	Grab
37371 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	.....	BDL	LBS/DAY	.....	DAILY MAX	.....	.....	.....	.....	DAILY MAX	MG/L	0	QUARTERLY	GRAB
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER															
H. H. Holliman, President															
Tennessee Eastman Division															
TYPED OR PRINTED															
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER <i>John F. Webb</i>															
OFFICER OR AUTHORIZED AGENT															
AREA CODE NUMBER (423) 229-2000															
DATE 97 - 07 - 11															
YEAR MO DAY															

COMMENT AND EXPLANATION OF ANY VIOLATIONS
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MAJOR
(SUBR 06)
F - FINAL
PROCESSED WW QUARTERLY REPORT
EFFLUENT

002 Q
DISCHARGE NUMBER

TN0002640
PERMIT NUMBER

MONITORING PERIOD
FROM 97-04-01 TO 97-06-30

NOTE: Read instructions before completing this form.

*** NO DISCHARGE ***

PARAMETER (172-37)	SAMPLE MEASUREMENT PERMIT REQUIREMENT	(3 Card Only) (46-53)			Loading Unit	(4 Card Only) (38-45)			Concentration (54-61)		NO. EX (62-63)	Frequency of analysis (64-68)	Sample Type (69-70)
		Average	Maximum	Minimum		Average	Maximum	Minimum	Unit	Unit			
BIS (2-ETHYLHEXYL) PHTHALATE	MEASUREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	(19)	MGL	0	2/Quarter	Grab
39100 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	(19)	MGL	0	2/Quarter	Grab
DI-N-BUTYL PHTHALATE	MEASUREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	(19)	MGL	0	2/Quarter	Grab
39110 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	(19)	MGL	0	2/Quarter	Grab
VINYL CHLORIDE	MEASUREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	(19)	MGL	0	2/Quarter	Grab
39176 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	(19)	MGL	0	2/Quarter	Grab
TRICHLOROETHYLENE	MEASUREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	(19)	MGL	0	2/Quarter	Grab
39180 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	(19)	MGL	0	2/Quarter	Grab
HEXACHLOROBENZENE	MEASUREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	(19)	MGL	0	2/Quarter	Grab
39700 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	(19)	MGL	0	2/Quarter	Grab
3,4-BENZOFUORANTHENE	MEASUREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	(19)	MGL	0	2/Quarter	Grab
79531 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	(19)	MGL	0	2/Quarter	Grab
CHLOROETHANE	MEASUREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	(19)	MGL	0	2/Quarter	Grab
89811 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	BDL	(26)	BDL	BDL	BDL	(19)	MGL	0	2/Quarter	Grab
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER													
H. H. Holliman, President													
Tennessee Eastman Division													
TYPED OR PRINTED													
SIGNATURE OF PRINCIPAL EXECUTIVE													
OFFICER OR AUTHORIZED AGENT													
TELEPHONE													
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(423) 229-2000													
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COMMENT AND EXPLANATION OF ANY VIOLATIONS

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APPENDIX D - PLANT-WIDE NOISE DOSIMETRY MEASUREMENTS

Title: Noise Dosimetry Measurements - Liquid Phase Methanol, Plant 29

Abstract: Noise dosimetry results found operator exposures associated with this job code to be less than the 50% threshold dose for placement on the list for annual audiograms.

Recommendation: Inform operators working in Plant 29 of the results of this report.

On April 26-27 and May 5, 1997, measurements were taken to initially determine operator exposure to noise in the newly-constructed Liquid Phase Methanol Plant. This information is used to determine the persons to receive annual audiometric testing by job code or description.

The five measurements indicated noise doses ranging from 16.2% - 39.7% with a mean value of 26.3%. A 50% dose (equivalent to 82 dBA as averaged over 12 hours) is the threshold criteria. Based on this information, the operators working in Plant 29 will not be placed on the annual audiometric testing list as a result of charging time to cost center 4113.

Steve L. Drushel
Steve L. Drushel

JHL
6-9-97