

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

**ENVIRONMENTAL MONITORING REPORT NO. 5**

**For The Period**

**1 April - 30 June 1998**

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**for the**

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**Prepared for the United States Department of Energy  
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## ACRONYMS AND DEFINITIONS

Acurex	-	Acurex Environmental Corporation (now ARCADIS, Geraghty & Miller)
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 <sub>2</sub> ), carbon monoxide (CO), and carbon dioxide (CO <sub>2</sub> ) 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 National Energy Technology Laboratory (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 <sub>2</sub> ) over the stoichiometric balance for the production of methanol; also called H <sub>2</sub> 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 <sup>3</sup>	-	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
SI/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 <sub>2</sub> ) and carbon monoxide (CO), or mixtures of H <sub>2</sub> and CO; intended for "synthesis" in a reactor to form methanol and/or other hydrocarbons (synthesis gas may also contain CO <sub>2</sub> , water, and other gases)
Tie-in(s)	-	the interconnection(s) between the LPMEOH™ Process Demonstration Facility and the Eastman Facility
TOC	-	Total Organic Carbon
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 effort being conducted under a 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 tons-per-day (TPD)) of methanol from coal-derived synthesis gas (syngas) was designed, constructed, and began a four-year operational period in April of 1997 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 or H<sub>2</sub> Gas, carbon monoxide gas or CO Gas, and Balanced Gas) will be diverted from existing operations to the LPMEOH™ Demonstration Unit, thus providing the range of 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

Following 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) (issued 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 Special Topical Report will provide this information. 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, H<sub>2</sub> 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

The EMP identified that a noise survey around the 29K-01 Recycle Compressor was planned during the initial start-up of the demonstration unit.

TABLE 4.1

LPMEOH™ DEMONSTRATION UNIT

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

Environmental Media

General Parameters

Coal	Pressure, Temperature, Coal Analysis
Oxygen to Gasifier	Pressure, Temperature, %O <sub>2</sub>
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 <sub>2</sub>
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**

<b><u>Environmental Media</u></b>	<b><u>General Parameters</u></b>
CO Gas to LPMEOH™ Demonstration Unit	Cumulative Flow for Quarter
H <sub>2</sub> 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. During the reporting period, the LPMEOH™ Demonstration Unit completed the longest continuous operating campaign to date (65 days), and has maintained an availability in excess of 99% for the calendar year to date. 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**

As defined in Section 7.1 of the Environmental Monitoring Plan, 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 in a Special Topical Report. If a significant change in gasifier facility operation (e.g., feedstock change, equipment modifications or additions, etc.) occurs, then an update will be provided in a future EMR.

### **6.2 10C-30 Catalyst Guard Bed**

As defined in Section 7.1 of the Environmental Monitoring Plan, publicly available technical data on the trace impurities entering and leaving the Catalyst Guard Bed will be issued in a Special Topical Report.

During the reporting period, there was no change of adsorbent or process change related to the operation of the 10C-30 Catalyst Guard Bed. If a significant change occurs, then an update will be provided in a future EMR.

### **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 in a Special Topical Report. 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 Plant Onstream Time and Outages - April/June 1998**

Operation Start	Operation End	Operating Hours	Shutdown Hours	Reason for Shutdown
4/1/98 00:01	4/21/98 01:40	480.6	0.5	ESD on Bad Reactor TT
4/21/98 02:10	4/22/98 20:10	42.0	0.8	ESD on Bad Reactor TT
4/22/98 21:00	4/27/98 12:42	111.7	10.2	Tubing Leak on K-01
4/27/98 22:52	5/18/98 19:50	501.0	9.0	Fitting Leak on K-01
5/19/98 04:50	5/19/98 04:50	0.0	154.8	Syngas Outage
5/25/98 15:40	6/9/98 19:40	364.0	43.4	Syngas Outage
6/11/98 15:05	6/11/98 21:35	6.5	15.5	Syngas Outage
6/12/98 13:05	6/12/98 13:55	0.8	66.3	Syngas Outage
6/15/98 08:10	6/30/98 23:59	375.8		End of Reporting Period
<b>Total Operating Hours</b>			<b>1882.5</b>	
<b>Syngas Available Hours</b>			<b>1903.0</b>	
<b>Plant Availability, %</b>			<b>98.92</b>	

## **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. During the development of the EMP, it was anticipated that the new tie-in from the LPMEOH™ Demonstration Unit to the Eastman fuel header would require testing as a new source. After the EMP was published, it was determined that the new tie-in was not considered a significant change and did not require testing. Therefore, with the current sampling schedule, 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 at the LPMEOH™ Demonstration Unit is scheduled for the third quarter of calendar year 1998.

#### **7.2.2 Ambient Carbon Monoxide Background Concentration**

Appendix B contains the results of a one-time study which recorded the concentration of CO that is encountered by a LPMEOH™ operations person during the course of a normal day of plant operations. Both the time-weighted average and the peak values for CO were below the established limits by the Tennessee Operational Health and Safety Administration.

### **7.3 Particulate Emissions**

This one-time study was completed in July of 1997, and documents 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 Environmental Monitoring Report No. 1. Some engineering modifications to the catalyst loading system are planned to reduce the dust concentration and potential personnel exposure.

### **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. As noted in Section 6.3, a comparison of the flow,



composition, and BOD load of this stream before and after the addition of the LPMEOH™ Demonstration Unit will be included in a Special Topical Report on publicly available technical data from the Eastman “Chemicals-from-Coal” facility.

## **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. Approximately 4,640,000 gallons (15,300 tons) of methanol (Refined and Crude Grades) were produced during the reporting period.

### **8.2 Oil/Water Separator**

No oil was removed from the Oil/Water Separator during the reporting period.

### **8.3 Compressor and Pump Lubricants**

No material was generated during the reporting period.

### **8.4 Spent Catalyst Slurry**

No spent catalyst slurry was generated during the reporting period.

### **8.5 29C-40 Catalyst Guard Bed Spent Adsorbent**

No material was generated during the reporting period.

### **8.6 Noise**

The results of noise dosimetry measurements of the entire LPMEOH™ Demonstration Unit were reported in Environmental Monitoring Report No. 1. The results of an area noise survey at each platform of the LPMEOH™ Demonstration Unit and around the 29K-01 Recycle Compressor were reported in Environmental Monitoring Report No. 2. No additional surveys were performed during the reporting period.

**Table 8-1****Synthesis Gas Use and Methanol Production - April/June 1998  
LPMEOH™ Demonstration Unit**

	<b>April 1998</b>	<b>May 1998</b>	<b>June 1998</b>	<b>Total</b>
<b>Consumption, KSCF</b>				
Balanced Gas	397,526.6	369,076.3	395,818.0	1,162,420.9
CO Gas	0.0	0.0	40.3	40.3
H <sub>2</sub> Gas	0.0	0.0	0.0	0.0
<b>Production, Tons</b>				
Crude Methanol	1,495.1	1,405.6	1,490.1	4,390.8
Refined Methanol	3,659.7	3,581.8	3,698.3	10,939.8
Total Purge Gas, KSCF	44,815.8	39,842.1	45,605.3	130,263.2

## **9. Compliance**

### **9.1 Compliance with Permit Limits**

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

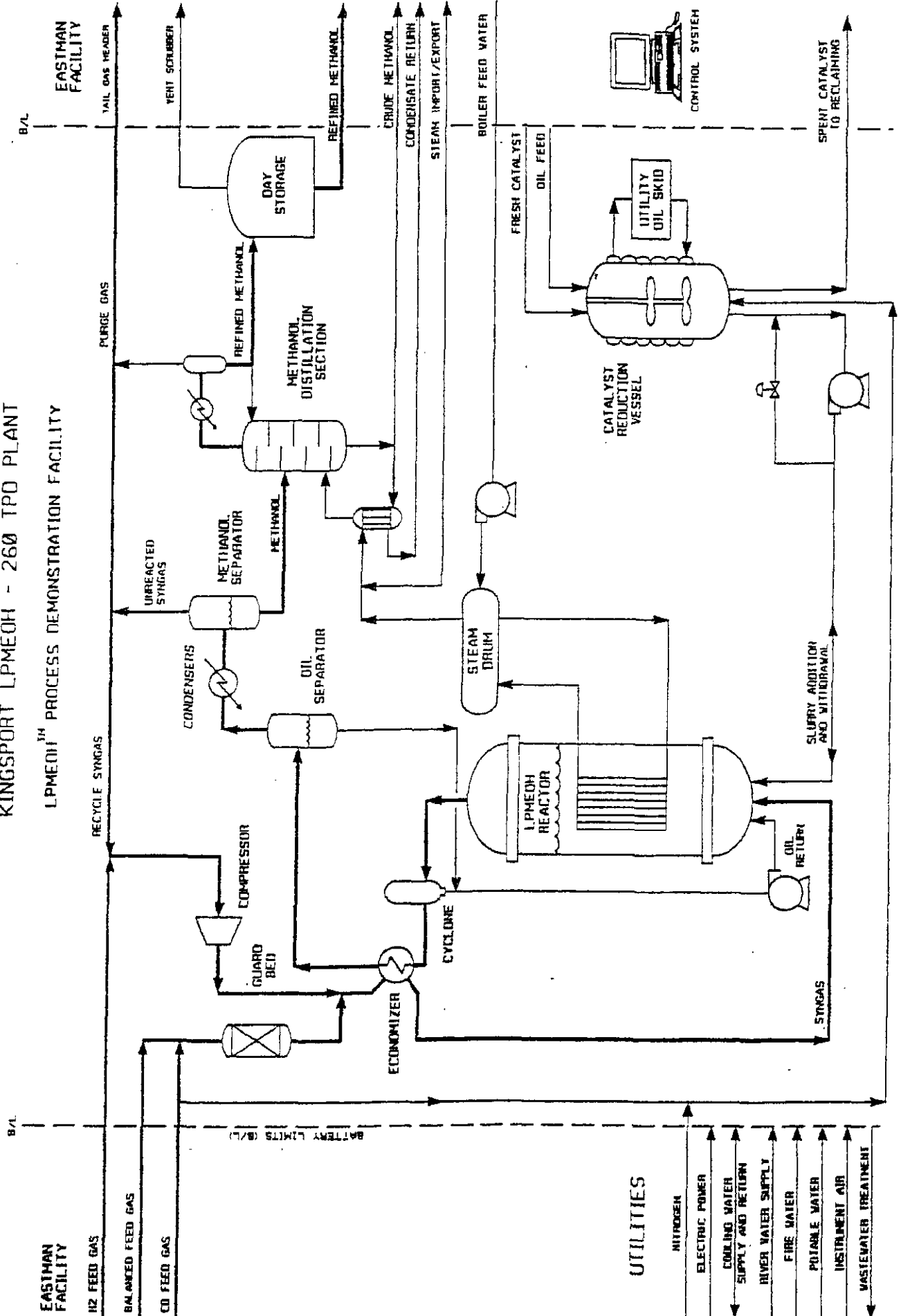
## **10. Problems and Recommendations**

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

**APPENDICES**

**APPENDIX A - SIMPLIFIED PROCESS FLOW DIAGRAM**

# SIMPLIFIED PROCESS DIAGRAM KINGSFORT LPMEOH - 2600 TPD PLANT LPMEOH™ PROCESS DEMONSTRATION FACILITY



**APPENDIX B - REPORT ON AMBIENT CARBON MONOXIDE BACKGROUND  
CONCENTRATION**

From: Steve L. Drushel, Industrial Hygiene  
 Subject: IH Report #40980084

Title: Carbon Monoxide (CO) Measurements, B-486, Plant 29

Recommendations: None

Abstract: Carbon monoxide levels were found to be less than the TOSHA Permissible Exposure Limit (PEL) and Ceiling Value.

From May 27 - June 23, 1998, Plant 29 operators wore Drager PAC III dosimeters for four days to obtain CO measurements throughout the shift. These measurements were collected for the purpose of updating the current exposure assessment data base for this area.

These measurements were as follows:

Description	Date	CO Conc. (ppm)	
		Time-Weighted Avg.	Peak
Plt 29 Operator	5-27	3.8	39.0(1)
" " "	6-4	5.4	170.0(2)
" " "	6-17	<0.1	13.0
" " "	6-23	<0.1	8.0

- Note: (1) - Peak concentration during collection of "bomb" sample from reactor  
 (2) - Peak concentration during transfer of "guard drum" catalyst from one drum to another

These measurements indicate that carbon monoxide levels are in an acceptable range and less than the established limits for CO. The PEL (expressed as a full-shift time-weighted average) is 35 ppm and the Ceiling Limit is a maximum of 200 ppm. Please inform all operators working in Plant 29 of the results of this report.

Steve L. Drushel

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



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

002 G  
 DISCHARGE NUMBER

FORM APPROVED  
 OMB No. 2040-0004

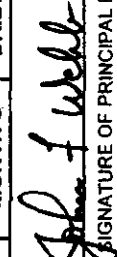
INDUSTRIAL PROCESS WASTEWATER  
 EFFLUENT

MONITORING PERIOD

FROM 98-04-01 TO 98-04-30

\*\* NO DISCHARGE [ ] \*\*

NOTE: Read instructions before completing this form.

PARAMETER (32-37)	(3 Card Only) (46-53)			(4 Card Only) (38-45)			Quantity or Concentration (54-61)			NO. EX (62-63)	Frequency of Analysis (64-68)	Sample Type (69-70)
	AVERAGE	MINIMUM	MAXIMUM	UNIT	MINIMUM	AVERAGE	MAXIMUM	UNIT				
PH	MEASUREMENT	*****	*****	*****	7.0	*****	*****	(12)	0	Continuous	N/A	
00400 1 0 0	PERMIT REQUIREMENT	*****	*****	*****	6.0	*****	*****	SU		CONTINUOUS	RECORDER	
SOLIDS, TOTAL SUSPENDED	MEASUREMENT	1,774	3,333	(26)	*****	*****	*****		0	30/30	Composite	
00530 1 0 0	PERMIT REQUIREMENT	11111	35954	LBS/DAY	*****	*****	*****	****		DAILY	COMPOSITE	
NITROGEN, AMMONIA TOTAL (AS N)	MEASUREMENT	< 26	95	(26)	*****	*****	*****	(19)	0	30/30	Composite	
00610 2 0 0	PERMIT REQUIREMENT	6000	12000	LBS/DAY	*****	*****	*****	MG/L		DAILY	COMPOSITE	
CYANIDE, TOTAL (AS CN)	MEASUREMENT	BDL	BDL	(26)	*****	*****	*****	(19)	0	1/7	Grab	
00720 2 0 0	PERMIT REQUIREMENT	14.51	104.83	LBS/DAY	*****	*****	*****	MG/L		WEEKLY	GRAB	
CHROMIUM, TOTAL (AS CR)	MEASUREMENT	3.00	3.34	(26)	*****	*****	*****	(19)	0	1/7	Composite	
01034 2 0 0	PERMIT REQUIREMENT	12.51	25.02	LBS/DAY	*****	*****	*****	MG/L		WEEKLY	COMPOSITE	
COPPER, TOTAL (AS CU)	MEASUREMENT	2.56	3.29	(26)	*****	*****	*****	(19)	0	1/7	Composite	
01042 2 0 0	PERMIT REQUIREMENT	12.51	25.02	LBS/DAY	*****	*****	*****	MG/L		WEEKLY	COMPOSITE	
LEAD, TOTAL (AS PB)	MEASUREMENT	BDL	BDL	(26)	*****	*****	*****	(19)	0	1/7	Composite	
01051 2 0 0	PERMIT REQUIREMENT	43.03	172.64	LBS/DAY	*****	*****	*****	MG/L		WEEKLY	COMPOSITE	
NAME / TITLE PRINCIPAL EXECUTIVE OFFICER	H. H. Holliman, President Tennessee Eastman Division SIGNED AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here) 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.											
OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE  OFFICER OR AUTHORIZED AGENT											
TELEPHONE	(423) 229-2000											
DATE	98 - 05 - 12											
AREA CODE NUMBER	(423) 229-2000											
YEAR MO DAY	98 - 05 - 12											

PERMITTEE NAME/ADDRESS:  
 TN EASTMAN DIVISION  
 DIVISION OF EASTMAN CHEMICAL CO.  
 P.O. BOX 1993  
 KINGSPOST, TN 37662-5393  
 Facility: TN EASTMAN - KINGSPOST  
 Location: SULLIVAN COUNTY TN 37662-5393

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)  
 MAJOR (SUBR 06)  
 DISCHARGE MONITORING REPORT (DMR)  
 002 G  
 DISCHARGE NUMBER  
 F - FINAL  
 INDUSTRIAL PROCESS WASTEWATER  
 EFFLUENT  
 MONITORING PERIOD  
 FROM 98 - 04 - 01 TO 98 - 04 - 30  
 \*\* NO DISCHARGE [ ] \*\*

FORM APPROVED  
 OMB No. 2040-0004

PARAMETER (32-37)	(3 Card Only) (46-53)			(4 Card Only) (38-45)			Quantity or Concentration (54-61)			NO. EX (62-63)	Frequency of Analysis (64-68)	Sample Type (69-70)
	AVERAGE	MAXIMUM	UNIT	MINIMUM	AVERAGE	UNIT	MAXIMUM	UNIT				
NICKEL, TOTAL (AS NI)	3.94	6.44	(26)	*****	0.020	(19)	0.031	(19)	0	1/7	Composite	
01067 2 0 0 EFFLUENT NET VALUE	422.84 MON AVG	995.80 DAILY MAX	LBS/DAY	*****	1.690 MON AVG	MG/L	3.980 DAILY MAX	MG/L	0	WEEKLY	COMPOSITE	
ZINC, TOTAL (AS ZN)	< 6.93	14.21	(26)	*****	< 0.036	(19)	0.075	(19)	0	1/7	Composite	
01092 2 0 0 EFFLUENT NET VALUE	158.00 MON AVG	317.75 DAILY MAX	LBS/DAY	*****	0.635 MON AVG	MG/L	1.270 DAILY MAX	MG/L	0	WEEKLY	COMPOSITE	
FLOW, IN CONDUIT OR THRU TREATMENT PLANT	24.82	31.31	(03)	*****	*****	*****	*****	*****	0	Continuous	N/A	
50050 1 0 0 EFFLUENT GROSS VALUE	REPORT MON AVG	REPORT DAILY MAX	MGD	*****	*****	*****	*****	*****	0	CONTINUOUS	RECORDER	
BOD, CARBONACEOUS 05 DAY, 20C	850	1,512	(26)	*****	*****	*****	*****	*****	0	30/30	Composite	
80082 2 W 0 EFFLUENT NET VALUE	6000 MON AVG	13000 DAILY MAX	LBS/DAY	*****	*****	*****	*****	*****	0	DAILY	COMPOSITE	
SAMPLE MEASUREMENT												
PERMIT REQUIREMENT												
SAMPLE MEASUREMENT												
PERMIT REQUIREMENT												
SAMPLE MEASUREMENT												
PERMIT REQUIREMENT												
SAMPLE MEASUREMENT												
PERMIT REQUIREMENT												
SAMPLE MEASUREMENT												
PERMIT REQUIREMENT												

NOTE: Read instructions before completing this form.

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY  
 DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL  
 PROPERLY OBTAIN AND EVALUATE THE INFORMATION SUBMITTED BASED ON MY KNOWLEDGE OF THE PERSON OR PERSONS  
 WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR OBTAINING THE INFORMATION. THE  
 INFORMATION SUBMITTED IS TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM  
 AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY  
 OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

NAME / TITLE: H. H. Holliman, President  
 Tennessee Eastman Division  
 TYPED OR PRINTED: \_\_\_\_\_  
 SIGNATURE OF PRINCIPAL EXECUTIVE: *John F. Webb*  
 OFFICER OR AUTHORIZED AGENT: \_\_\_\_\_  
 TELEPHONE: \_\_\_\_\_  
 DATE: 98 - 05 - 12  
 AREA CODE NUMBER: (423) 229-2000  
 FORMS BY WinbowChem(707)864-0645, p.01/090, v.5 01/4/196

COMMENT AND EXPLANATION OF ANY VIOLATIONS  
 (Reference all attachments here)  
 In addition to taking reasonable steps to prevent instances of noncompliance through the implementation of SPC and SPC-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: NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)  
 TN EASTMAN DIVISION MAJOR (SUBR 06)  
 DIVISION OF EASTMAN CHEMICAL CO. DISCHARGE MONITORING REPORT (DMR) 002 G  
 P.O. BOX 1993 PERMIT NUMBER DISCHARGE NUMBER  
 KINGSPOST, TN 37662-5393 FROM 98-05-01 TO 98-05-31  
 Facility: TN EASTMAN - KINGSPOST MONITORING PERIOD  
 Location: SULLIVAN COUNTY TN 37662-5393

INDUSTRIAL PROCESS WASTEWATER EFFLUENT

\*\* NO DISCHARGE [ ] \*\*

NOTE: Read instructions before completing this form.

PARAMETER (32-37)	SAMPLE MEASUREMENT	(3 Card Only) (46-53)			Quantity or Loading (4 Card Only) (38-45)			Concentration (54-61)			NO. EX (62-63)	Frequency of Analysis (64-68)	Sample Type (69-70)
		AVERAGE	MINIMUM	MAXIMUM	UNIT	MINIMUM	AVERAGE	MAXIMUM	UNIT	MAXIMUM			
PH	MEASUREMENT	*****	7.0	*****	*****	*****	*****	*****	*****	*****	0	Continuous	N/A
00400 1 0 0 EFFLUENT GROSS VALUE	PERMIT REQUIREMENT	*****	6.0 MINIMUM	*****	*****	*****	*****	*****	*****	*****	0	CONTINUOUS	REGORDER
SOLIDS, TOTAL SUSPENDED	MEASUREMENT	2,148	*****	3,891	(26)	*****	*****	*****	*****	*****	0	31/31	Composite
00530 1 0 0 EFFLUENT GROSS VALUE	PERMIT REQUIREMENT	1111 MON AVG	*****	3584 DAILY MAX	LBS/DAY	*****	*****	*****	*****	*****	0	DAILY	COMPOSITE
NITROGEN, AMMONIA TOTAL (AS N)	MEASUREMENT	< 31	*****	113	(26)	*****	*****	*****	*****	*****	0	31/31	Composite
00610 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	6000 MON AVG	*****	12000 DAILY MAX	LBS/DAY	*****	*****	*****	*****	*****	0	DAILY	COMPOSITE
CYANIDE, TOTAL (AS CN)	MEASUREMENT	BDL	*****	BDL	(26)	*****	*****	*****	*****	*****	0	1/7	Grab
00720 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	14.51 MON AVG	*****	104.83 DAILY MAX	LBS/DAY	*****	*****	*****	*****	*****	0	WEEKLY	GRAB
CHROMIUM, TOTAL (AS CR)	MEASUREMENT	< 2.70	*****	3.57	(26)	*****	*****	*****	*****	*****	0	1/7	Composite
01034 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	12.51 MON AVG	*****	25.02 DAILY MAX	LBS/DAY	*****	*****	*****	*****	*****	0	WEEKLY	COMPOSITE
COPPER, TOTAL (AS CU)	MEASUREMENT	1.83	*****	2.19	(26)	*****	*****	*****	*****	*****	0	1/7	Composite
01042 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	12.51 MON AVG	*****	25.02 DAILY MAX	LBS/DAY	*****	*****	*****	*****	*****	0	WEEKLY	COMPOSITE
LEAD, TOTAL (AS PB)	MEASUREMENT	BDL	*****	BDL	(26)	*****	*****	*****	*****	*****	0	1/7	Composite
01051 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	43.03 MON AVG	*****	172.64 DAILY MAX	LBS/DAY	*****	*****	*****	*****	*****	0	WEEKLY	COMPOSITE

NAME / TITLE: PRINCIPAL EXECUTIVE OFFICER  
 H. H. Holliman, President  
 Tennessee Eastman Division  
 TYPED OR PRINTED  
 OFFICER OR AUTHORIZED AGENT  
 SIGNATURE OF PRINCIPAL EXECUTIVE  
 (423) 229-2000  
 AREA CODE NUMBER  
 TELEPHONE  
 DATE  
 98 - 06 - 12  
 YEAR MO DAY

**PERMITTEE NAME/ADDRESS:**  
 TN EASTMAN DIVISION  
 DIVISION OF EASTMAN CHEMICAL CO.  
 P.O. BOX 1993  
 KINGSPOST, TN 37662-5393  
 Facility: TN EASTMAN - KINGSPOST  
 Location: SULLIVAN COUNTY TN 37662-5393

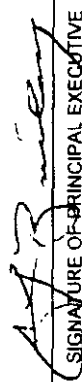
**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)**  
**DISCHARGE MONITORING REPORT (DMR)**  
 MAJOR (SUBR 06)  
 F - FINAL  
 INDUSTRIAL PROCESS WASTEWATER EFFLUENT

TN0002640  
 PERMIT NUMBER  
 002 G  
 DISCHARGE NUMBER

**MONITORING PERIOD**  
 FROM 98-05-01 TO 98-05-31

FORM APPROVED  
 OMB No. 2040-0004

NOTE: Read instructions before completing this form.

PARAMETER (32-37)	Quantity or Loading (4 Card Only) (38-45)			Quantity or Concentration (54-61)			NO. EX (62-63)	Frequency of Analysis (64-68)	Sample Type (69-70)
	AVERAGE (46-53)	MINIMUM (38-45)	MAXIMUM (54-61)	AVERAGE (46-53)	MINIMUM (38-45)	MAXIMUM (54-61)			
NICKEL, TOTAL (AS NI)	< 2.74	*****	3.93	< 0.013	*****	0.020	0	1/7	Composite
01067 2 0 0 EFFLUENT NET VALUE	422.84 MON AVG	*****	996.90 DAILY MAX	1.690 MON AVG	*****	3.980 DAILY MAX		WEEKLY	COMPOSITE
ZINC, TOTAL (AS ZN)	< 3.86	*****	6.73	< 0.018	*****	0.034	0	1/7	Composite
01092 2 0 0 EFFLUENT NET VALUE	158.00 MON AVG	*****	317.75 DAILY MAX	0.635 MON AVG	*****	1.270 DAILY MAX		WEEKLY	COMPOSITE
FLOW, IN CONDUIT OR THRU TREATMENT PLANT	24.98	*****	28.27	*****	*****	*****	0	Continuous	N/A
50050 1 0 0 EFFLUENT GROSS VALUE	REPORT MON AVG	*****	REPORT DAILY MAX	*****	*****	*****		CONTINUOUS	RECORDER
BOD, CARBONACEOUS 05 DAY, 20C	835	*****	1,202	*****	*****	*****	0	31/31	Composite
80082 2 W 0 EFFLUENT NET VALUE	4000 MON AVG	*****	8500 DAILY MAX	*****	*****	*****		DAILY	COMPOSITE
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
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 (423) 229-2000 AREA CODE NUMBER 98-06-12 YEAR MO DAY									

COMMENT AND EXPLANATION OF ANY VIOLATIONS  
 (Reference all attachments here)

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.)

FORMS BY WINDOW-CHEM(707)364 0845 pml1090.v5 01/4/196

PAGE 3 OF 6

MAJOR  
(SUBR 06)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

PERMITTEE NAME/ADDRESS:

TN EASTMAN DIVISION  
DIVISION OF EASTMAN CHEMICAL CO.  
P O BOX 1993

DISCHARGE MONITORING REPORT (DMR)

002 G	DISCHARGE NUMBER
TN0002640	PERMIT NUMBER

F - FINAL  
INDUSTRIAL PROCESS WASTEWATER  
EFFLUENT

KINGSPORT, TN 37662-5393

Facility: TN EASTMAN - KINGSPORT

Location: SULLIVAN COUNTY TN 37662-5393

MONITORING PERIOD

FROM	98 - 06 - 01	TO	98 - 06 - 30
------	--------------	----	--------------

\*\*\* NO DISCHARGE [ ] \*\*\*

NOTE: Read instructions before completing this form.

PARAMETER (32-37)	(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	PERMIT	Maximum	PERMIT		Minimum	Average	Maximum	Minimum	Maximum	Unit			
PH														
00400 1 0 0 EFFLUENT GROSS VALUE														
SOLIDS, TOTAL SUSPENDED					(26)									
00530 1 0 0 EFFLUENT GROSS VALUE					LBS/DAY									
NITROGEN, AMMONIA TOTAL (AS N)					(26)									
00610 2 0 0 EFFLUENT NET VALUE					LBS/DAY									
CYANIDE, TOTAL (AS CN)					(26)									
00720 2 0 0 EFFLUENT NET VALUE					LBS/DAY									
CHROMIUM, TOTAL (AS CR)					(26)									
01034 2 0 0 EFFLUENT NET VALUE					LBS/DAY									
COPPER, TOTAL (AS CU)					(26)									
01042 2 0 0 EFFLUENT NET VALUE					LBS/DAY									
LEAD, TOTAL (AS PB)					(26)									
01051 2 0 0 EFFLUENT NET VALUE					LBS/DAY									
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	<p><i>John F. Welke</i> SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER</p> <p>OFFICER OR AUTHORIZED AGENT</p>													
H. H. Holliman, President														
Tennessee Eastman Division														
TYPED OR PRINTED														
	<p>(423) 229-2000 AREA CODE NUMBER</p> <p>98 - 07 - 13 YEAR MO DAY</p>													

COMMENT AND EXPLANATION OF ANY VIOLATIONS

(Reference all attachments here)

In addition to taking reasonable steps to prevent instances of noncompliance through the implementation of SPCC and SPC-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 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

FORM APPROVED  
 OMB NO 2040-0004

MONITORING PERIOD  
 FROM 98 - 04 - 01 TO 98 - 06 - 30

002 Q  
 DISCHARGE NUMBER

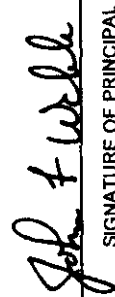
\*\*\* NO DISCHARGE [ ] \*\*\*  
 NOTE: Read instructions before completing this form.

PARAMETER (32-37)	MEASUREMENT REQUIREMENT	(3 Card Only) (46-53)		Loading Unit	(4 Card Only) (38-45)		Concentration (54-61)		NO. EX (62-63)	Frequency of analysis (64-69)	Sample Type (69-70)
		Average	Maximum		Minimum	Average	Maximum	Unit			
CARBON TETRACHLORIDE	SAMPLE MEASUREMENT	BDL	BDL	(26)	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	4.50 MON AVG	9.51 DAILY MAX	LBS/DAY	*****	*****	0.018 MON AVG	0.038 DAILY MAX	MG/L	QUARTERLY	GRAB
1,2-DICHLOROETHANE	SAMPLE MEASUREMENT	BDL	BDL	(26)	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	17.01 MON AVG	52.79 DAILY MAX	LBS/DAY	*****	*****	0.068 MON AVG	0.211 DAILY MAX	MG/L	QUARTERLY	GRAB
CHLOROFORM	SAMPLE MEASUREMENT	BDL	BDL	(26)	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	5.25 MON AVG	11.51 DAILY MAX	LBS/DAY	*****	*****	0.021 MON AVG	0.046 DAILY MAX	MG/L	QUARTERLY	GRAB
32106 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT	BDL	BDL	(26)	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	6.51 MON AVG	20.02 DAILY MAX	LBS/DAY	*****	*****	0.026 MON AVG	0.080 DAILY MAX	MG/L	QUARTERLY	GRAB
ACENAPHTHYLENE	SAMPLE MEASUREMENT	BDL	BDL	(26)	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	2.00 MON AVG	4.06 DAILY MAX	LBS/DAY	*****	*****	0.008 MON AVG	0.019 DAILY MAX	MG/L	QUARTERLY	GRAB
34200 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT	BDL	BDL	(26)	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	5.50 MON AVG	14.76 DAILY MAX	LBS/DAY	*****	*****	0.022 MON AVG	0.059 DAILY MAX	MG/L	QUARTERLY	GRAB
ACRYLONITRILE	SAMPLE MEASUREMENT	BDL	BDL	(26)	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	24.02 MON AVG	60.55 DAILY MAX	LBS/DAY	*****	*****	0.096 MON AVG	0.242 DAILY MAX	MG/L	QUARTERLY	GRAB
34215 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT	BDL	BDL	(26)	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	24.02 MON AVG	60.55 DAILY MAX	LBS/DAY	*****	*****	0.096 MON AVG	0.242 DAILY MAX	MG/L	QUARTERLY	GRAB
I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 USC 1001 AND 11 USC 1119. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO \$10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS.)											
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT  OFFICER OR AUTHORIZED AGENT											
TELEPHONE (423) 229-2000 AREA CODE NUMBER											
DATE 98 - 07 - 13 YEAR MO DAY											

COMMENT AND EXPLANATION OF ANY VIOLATIONS  
 (Reference all attachments here)  
 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.)

\*\*\* NO DISCHARGE  \*\*\*  
 NOTE: Read instructions before completing this form.

MONITORING PERIOD  
 FROM 98-04-01 TO 98-06-30

PARAMETER (32-37)	X	(3 Card Only) (46-53)		Quantity or Loading (54-61)		(4 Card Only) (38-45)		Quality or Concentration (54-61)		NO. EX (62-63)	Frequency of analysis (64-68)	Sample Type (69-70)
		Average	Maximum	Maximum	Unit	Minimum	Average	Maximum	Unit			
ANTHRACENE	SAMPLE MEASUREMENT	*****	BDL	BDL	(26)	*****	*****	*****	BDL	0	2/Quarter	Grab
34220 2 0 0	PERMIT REQUIREMENT	0.25	0.41	DAILY MAX	LBS/DAY	*****	*****	0.001	0.002	0	QUARTERLY	GRAB
BENZENE, DISSOLVED	SAMPLE MEASUREMENT	*****	BDL	BDL	(26)	*****	*****	*****	BDL	0	2/Quarter	Grab
34235 2 0 0	PERMIT REQUIREMENT	9.26	34.03	DAILY MAX	LBS/DAY	*****	*****	0.037	0.136	0	QUARTERLY	GRAB
BENZO (K) FLUORANTHENE	SAMPLE MEASUREMENT	*****	BDL	BDL	(26)	*****	*****	*****	BDL	0	2/Quarter	Grab
34242 2 0 0	PERMIT REQUIREMENT	2.00	4.06	DAILY MAX	LBS/DAY	*****	*****	0.008	0.016	0	QUARTERLY	GRAB
BENZO (A) PYRENE	SAMPLE MEASUREMENT	*****	BDL	BDL	(26)	*****	*****	*****	BDL	0	2/Quarter	Grab
34247 2 0 0	PERMIT REQUIREMENT	2.00	4.06	DAILY MAX	LBS/DAY	*****	*****	0.008	0.016	0	QUARTERLY	GRAB
CHLOROBENZENE	SAMPLE MEASUREMENT	*****	BDL	BDL	(26)	*****	*****	*****	BDL	0	2/Quarter	Grab
34301 2 0 0	PERMIT REQUIREMENT	3.75	7.01	DAILY MAX	LBS/DAY	*****	*****	0.015	0.028	0	QUARTERLY	GRAB
CHRYSENE	SAMPLE MEASUREMENT	*****	BDL	BDL	(26)	*****	*****	*****	BDL	0	2/Quarter	Grab
34320 2 0 0	PERMIT REQUIREMENT	0.25	0.41	DAILY MAX	LBS/DAY	*****	*****	0.001	0.002	0	QUARTERLY	GRAB
DIETHYL PHTHALATE	SAMPLE MEASUREMENT	*****	BDL	BDL	(26)	*****	*****	*****	BDL	0	2/Quarter	Grab
34336 2 0 0	PERMIT REQUIREMENT	20.27	50.79	DAILY MAX	LBS/DAY	*****	*****	0.081	0.203	0	QUARTERLY	GRAB
EFFLUENT NET VALUE	MEASUREMENT	*****	BDL	BDL	(26)	*****	*****	*****	BDL	0	2/Quarter	Grab
EFFLUENT NET VALUE	PERMIT REQUIREMENT	*****	*****	DAILY MAX	LBS/DAY	*****	*****	0.081	0.203	0	QUARTERLY	GRAB
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER H. H. Holliman, President Tennessee Eastman Division TYPED OR PRINTED												
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT  SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT												
										TELEPHONE		DATE
										(423) 229-2000		98-07-13
										AREA CODE NUMBER		YEAR MO DAY

COMMENT AND EXPLANATION OF ANY VIOLATIONS  
 (Reference all attachments here)

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.)

PAGE 2 OF 8



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

MONITORING PERIOD  
 FROM 98 - 04 - 01 TO 98 - 06 - 30

PARAMETER (32-37)	SAMPLE 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	MON AVG	Maximum	DAILY MAX		Minimum	Average	Maximum	Minimum	Average	Maximum				Unit	
DIMETHYL PHTHALATE	SAMPLE MEASUREMENT REQUIREMENT	BDL	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	(19)	0	2/Quarter	Grab		
34341 2 0 0	EFFLUENT NET VALUE	4.75	11.76	BDL	BDL	LBS/DAY	BDL	BDL	0.019	0.047	DAILY MAX	MG/L	0	QUARTERLY	GRAB		
FLUORANTHENE	SAMPLE MEASUREMENT REQUIREMENT	BDL	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	(19)	0	2/Quarter	Grab		
34376 2 0 0	EFFLUENT NET VALUE	6.26	17.01	BDL	BDL	LBS/DAY	BDL	BDL	0.025	0.068	DAILY MAX	MG/L	0	QUARTERLY	GRAB		
FLUORENE	SAMPLE MEASUREMENT REQUIREMENT	BDL	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	(19)	0	2/Quarter	Grab		
34381 2 0 0	EFFLUENT NET VALUE	0.25	0.41	BDL	BDL	LBS/DAY	BDL	BDL	0.001	0.002	DAILY MAX	MG/L	0	QUARTERLY	GRAB		
HEXACHLOROBTADIENE	SAMPLE MEASUREMENT REQUIREMENT	BDL	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	(19)	0	2/Quarter	Grab		
34391 2 0 0	EFFLUENT NET VALUE	5.00	12.26	BDL	BDL	LBS/DAY	BDL	BDL	0.020	0.049	DAILY MAX	MG/L	0	QUARTERLY	GRAB		
HEXACHLOROETHANE	SAMPLE MEASUREMENT REQUIREMENT	BDL	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	(19)	0	2/Quarter	Grab		
34396 2 0 0	EFFLUENT NET VALUE	5.25	13.51	BDL	BDL	LBS/DAY	BDL	BDL	0.021	0.054	DAILY MAX	MG/L	0	QUARTERLY	GRAB		
METHYL CHLORIDE	SAMPLE MEASUREMENT REQUIREMENT	BDL	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	(19)	0	2/Quarter	Grab		
34418 2 0 0	EFFLUENT NET VALUE	21.52	47.54	BDL	BDL	LBS/DAY	BDL	BDL	0.086	0.190	DAILY MAX	MG/L	0	QUARTERLY	GRAB		
METHYLENE CHLORIDE	SAMPLE MEASUREMENT REQUIREMENT	BDL	BDL	BDL	BDL	(26)	BDL	BDL	BDL	BDL	BDL	(19)	0	2/Quarter	Grab		
34423 2 0 0	EFFLUENT NET VALUE	10.01	22.27	BDL	BDL	LBS/DAY	BDL	BDL	0.040	0.089	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 OR AUTHORIZED AGENT  SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT																	
														AREA CODE NUMBER (423) 229-2000		YEAR MO DAY 98 - 07 - 13	

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)  
 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.)

PERMITTEE NAME/ADDRESS: **IN EASTMAN DIVISION**  
**DIVISION OF EASTMAN CHEMICAL CO.**  
**P.O BOX 1993**  
**KINGSPORT TN 37662-5393**  
 Facility: **IN EASTMAN - KINGSPORT**  
 Location: **SULLIVAN COUNTY TN 37662-5393**

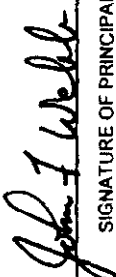
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)  
 DISCHARGE MONITORING REPORT (DMR)  
 MAJOR (SUBR 06)  
 F - FINAL  
 PROCESSED WW QUARTERLY REPORT  
 EFFLUENT

002 Q  
 DISCHARGE NUMBER

TN0002640  
 PERMIT NUMBER

**MONITORING PERIOD**  
 FROM 98 - 04 - 01 TO 98 - 06 - 30

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

PARAMETER (32-37)	SAMPLE MEASUREMENT PERMIT REQUIREMENT	(3 Card Only) (46-53)		Loading Unit	(4 Card Only) (58-65)		Concentration (54-61)		NO. EX (62-63)	Frequency of analysis (64-68)	Sample Type (69-70)		
		Average	Maximum		Minimum	Average	Maximum	Unit					
NITROBENZENE	MEASUREMENT	BDL	BDL	(26)	*****	*****	BDL	(19)	0	2/Quarter	Grab		
	PERMIT	6.76	17.01	LBS/DAY	*****	*****	0.068	MG/L		QUARTERLY	GRAB		
	REQUIREMENT	MON AVG	DAILY MAX		*****	*****	DAILY MAX						
PHENANTHRENE	MEASUREMENT	BDL	BDL	(26)	*****	*****	BDL	(19)	0	2/Quarter	Grab		
	PERMIT	0.25	0.41	LBS/DAY	*****	*****	0.002	MG/L		QUARTERLY	GRAB		
	REQUIREMENT	MON AVG	DAILY MAX		*****	*****	DAILY MAX						
PYRENE	MEASUREMENT	BDL	BDL	(26)	*****	*****	BDL	(19)	0	2/Quarter	Grab		
	PERMIT	0.25	0.41	LBS/DAY	*****	*****	0.002	MG/L		QUARTERLY	GRAB		
	REQUIREMENT	MON AVG	DAILY MAX		*****	*****	DAILY MAX						
TETRACHLOROETHYLENE	MEASUREMENT	BDL	BDL	(26)	*****	*****	BDL	(19)	0	2/Quarter	Grab		
	PERMIT	5.50	14.01	LBS/DAY	*****	*****	0.056	MG/L		QUARTERLY	GRAB		
	REQUIREMENT	MON AVG	DAILY MAX		*****	*****	DAILY MAX						
1,1 - DICHLOROETHANE	MEASUREMENT	BDL	BDL	(26)	*****	*****	BDL	(19)	0	2/Quarter	Grab		
	PERMIT	5.50	14.76	LBS/DAY	*****	*****	0.059	MG/L		QUARTERLY	GRAB		
	REQUIREMENT	MON AVG	DAILY MAX		*****	*****	DAILY MAX						
34501 2 0 0 EFFLUENT NET VALUE	MEASUREMENT	BDL	BDL	(26)	*****	*****	BDL	(19)	0	2/Quarter	Grab		
	PERMIT	4.00	6.26	LBS/DAY	*****	*****	0.025	MG/L		QUARTERLY	GRAB		
	REQUIREMENT	MON AVG	DAILY MAX		*****	*****	DAILY MAX						
34506 2 0 0 EFFLUENT NET VALUE	MEASUREMENT	BDL	BDL	(26)	*****	*****	BDL	(19)	0	2/Quarter	Grab		
	PERMIT	5.25	13.51	LBS/DAY	*****	*****	0.054	MG/L		QUARTERLY	GRAB		
	REQUIREMENT	MON AVG	DAILY MAX		*****	*****	DAILY MAX						
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER <b>H. H. Holliman, President</b>													
TYPED OR PRINTED <b>Tennessee Eastman Division</b>													
COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here) In addition to taking reasonable steps to prevent instances of noncompliance through the implementation of SPCC and SPC-C-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.													
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT 										AREA CODE NUMBER <b>(423) 229-2000</b>		YEAR MO DAY <b>98 - 07 - 13</b>	

DISCHARGE MONITORING REPORT (DMR)  
002 Q  
DISCHARGE NUMBER

PERMIT NUMBER

TN0002640

TN EASTMAN DIVISION  
DIVISION OF EASTMAN CHEMICAL CO.  
P.O. BOX 1993  
KINGSPORT, TN 37662-5393

PROCESSED WW QUARTERLY REPORT  
EFFLUENT

\*\*\* NO DISCHARGE [ ] \*\*\*

MONITORING PERIOD

FROM 98-04-01 TO 98-06-30

NOTE: Read instructions before completing this form.

PARAMETER (32-37)	(3 Card Only) (46-53)			(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	Maximum	Unit	Minimum	Average	Maximum	Unit	Minimum	Average	Maximum			
1,1,2 - TRICHLOROETHANE	5.25	BDL	(26)	*****	*****	(19)	*****	*****	BDL	(19)	0	2/Quarter	Grab
34511 2 0 0 EFFLUENT NET VALUE	MON AVG	DAILY MAX	LBS/DAY	*****	*****	MGL	*****	*****	0.054	MGL	0	QUARTERLY	GRAB
BENZO (A) ANTHRACENE	*****	BDL	(26)	*****	*****	(19)	*****	*****	BDL	(19)	0	2/Quarter	Grab
34526 2 0 0 EFFLUENT NET VALUE	MON AVG	DAILY MAX	LBS/DAY	*****	*****	MGL	*****	*****	0.015	MGL	0	QUARTERLY	GRAB
1,2 - DICHLOROBENZENE	2.00	BDL	(26)	*****	*****	(19)	*****	*****	BDL	(19)	0	2/Quarter	Grab
34536 2 0 0 EFFLUENT NET VALUE	MON AVG	DAILY MAX	LBS/DAY	*****	*****	MGL	*****	*****	0.163	MGL	0	QUARTERLY	GRAB
1,2 - DICHLOROPROPANE	19.27	BDL	(26)	*****	*****	(19)	*****	*****	BDL	(19)	0	2/Quarter	Grab
34541 2 0 0 EFFLUENT NET VALUE	MON AVG	DAILY MAX	LBS/DAY	*****	*****	MGL	*****	*****	0.230	MGL	0	QUARTERLY	GRAB
1,2 - TRANS - DICHLOROETHYLENE	35.28	BDL	(26)	*****	*****	(19)	*****	*****	BDL	(19)	0	2/Quarter	Grab
34546 2 0 0 EFFLUENT NET VALUE	MON AVG	DAILY MAX	LBS/DAY	*****	*****	MGL	*****	*****	0.054	MGL	0	QUARTERLY	GRAB
1,2,4 - TRICHLORO - BENZENE	5.25	BDL	(26)	*****	*****	(19)	*****	*****	BDL	(19)	0	2/Quarter	Grab
34551 2 0 0 EFFLUENT NET VALUE	MON AVG	DAILY MAX	LBS/DAY	*****	*****	MGL	*****	*****	0.140	MGL	0	QUARTERLY	GRAB
1,3 - DICHLOROPROPENE, TOTAL WEIGHT	17.01	BDL	(26)	*****	*****	(19)	*****	*****	BDL	(19)	0	2/Quarter	Grab
34551 2 0 0 EFFLUENT NET VALUE	MON AVG	DAILY MAX	LBS/DAY	*****	*****	MGL	*****	*****	0.044	MGL	0	QUARTERLY	GRAB
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	H. H. Holliman, President SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT												
Tennessee Eastman Division	(423) 229-2000 AREA CODE NUMBER TELEPHONE DATE 98 - 07 - 13 YEAR MO DAY												

(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 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  
 KINGSPOST, TN 37662-5393  
 Facility: TN EASTMAN - KINGSPOST  
 Location: SULLIVAN COUNTY TN 37662-5393

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)  
 DISCHARGE MONITORING REPORT (DMR)  
 MAJOR (SUBR 06)  
 F - FINAL  
 PROCESSED WW QUARTERLY REPORT  
 EFFLUENT

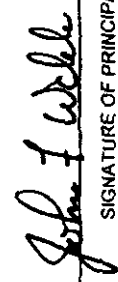
FORM APPROVED  
 OMB No. 2040-0004

002 Q  
 DISCHARGE NUMBER

TN0002640  
 PERMIT NUMBER

MONITORING PERIOD  
 FROM 98 - 04 - 01 TO 98 - 06 - 30

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

PARAMETER (32-37)	X	(3 Card Only) (46-53)		Quantity or (54-61)		Loading		(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	Maximum	Maximum	Unit	Minimum	Average	Maximum	Unit	Minimum	Average	Maximum	Unit			
1,3 - DICHLOROBENZENE	SAMPLE MEASUREMENT	*****	BDL	BDL	(26)	*****	BDL	BDL	(19)	*****	BDL	BDL	0	2/Quarter	Grab	
34566 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	7.76	11.01 DAILY MAX	11.01 DAILY MAX	LBS/DAY	*****	BDL	0.031 MON AVG	MG/L	0.031 MON AVG	DAILY MAX	DAILY MAX	0	QUARTERLY	GRAB	
1,4 - DICHLOROBENZENE	SAMPLE MEASUREMENT	*****	BDL	BDL	(26)	*****	BDL	*****	(19)	*****	BDL	BDL	0	2/Quarter	Grab	
34571 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	3.75	7.01 DAILY MAX	7.01 DAILY MAX	LBS/DAY	*****	BDL	0.015 MON AVG	MG/L	0.015 MON AVG	DAILY MAX	DAILY MAX	0	QUARTERLY	GRAB	
2 - CHLOROPHENOL	SAMPLE MEASUREMENT	*****	BDL	BDL	(26)	*****	BDL	*****	(19)	*****	BDL	BDL	0	2/Quarter	Grab	
34586 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	7.76	24.52 DAILY MAX	24.52 DAILY MAX	LBS/DAY	*****	BDL	0.031 MON AVG	MG/L	0.031 MON AVG	DAILY MAX	DAILY MAX	0	QUARTERLY	GRAB	
2 - NITROPHENOL	SAMPLE MEASUREMENT	*****	BDL	BDL	(26)	*****	BDL	*****	(19)	*****	BDL	BDL	0	2/Quarter	Grab	
34591 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	10.26	17.26 DAILY MAX	17.26 DAILY MAX	LBS/DAY	*****	BDL	0.041 MON AVG	MG/L	0.041 MON AVG	DAILY MAX	DAILY MAX	0	QUARTERLY	GRAB	
2,4 - DICHLOROPHENOL	SAMPLE MEASUREMENT	*****	BDL	BDL	(26)	*****	BDL	*****	(19)	*****	BDL	BDL	0	2/Quarter	Grab	
34601 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	9.76	28.02 DAILY MAX	28.02 DAILY MAX	LBS/DAY	*****	BDL	0.039 MON AVG	MG/L	0.039 MON AVG	DAILY MAX	DAILY MAX	0	QUARTERLY	GRAB	
2,4 - DIMETHYLPHENOL	SAMPLE MEASUREMENT	*****	BDL	BDL	(26)	*****	BDL	*****	(19)	*****	BDL	BDL	0	2/Quarter	Grab	
34606 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	4.50	9.01 DAILY MAX	9.01 DAILY MAX	LBS/DAY	*****	BDL	0.018 MON AVG	MG/L	0.018 MON AVG	DAILY MAX	DAILY MAX	0	QUARTERLY	GRAB	
2,4 - DINITROTOLUENE	SAMPLE MEASUREMENT	*****	BDL	BDL	(26)	*****	BDL	*****	(19)	*****	BDL	BDL	0	2/Quarter	Grab	
34611 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	28.27	71.31 DAILY MAX	71.31 DAILY MAX	LBS/DAY	*****	BDL	0.113 MON AVG	MG/L	0.113 MON AVG	DAILY MAX	DAILY MAX	0	QUARTERLY	GRAB	
I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 USC 1061 AND 31 USC 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO \$10,000 AND/OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS.)																
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER H. H. Holliman, President														SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER 		OFFICER OR AUTHORIZED AGENT
Tennessee Eastman Division TYPED OR PRINTED														(423) 229-2000 AREA CODE NUMBER		98 - 07 - 13 YEAR MO DAY

COMMENT AND EXPLANATION OF ANY VIOLATIONS  
 (Reference all attachments here)  
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 EPA FORM 3320-1 (REV. 9-88) Previous editions may be used. (REPLACES EPA FORM T-40 WHICH MAY NOT 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

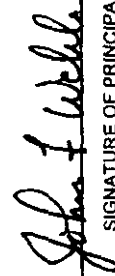
DISCHARGE MONITORING REPORT (DMR)  
 002 Q  
 DISCHARGE NUMBER

\*\*\* NO DISCHARGE [ ] \*\*\*

NOTE: Read instructions before completing this form.

MONITORING PERIOD

FROM 98 - 04 - 01 TO 98 - 06 - 30

PARAMETER (32-37)	(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	Maximum		Minimum	Average	Maximum	Unit						
2,4 - DINITROPHENOL		BDL	BDL	(26)	*****	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab	
34616 2 0 0 EFFLUENT NET VALUE	17.76	30.77	30.77	LBS/DAY	*****	*****	0.071	MON AVG	0.123	MG/L		QUARTERLY	GRAB	
2,6 - DINITROTOLUENE		BDL	BDL	(26)	*****	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab	
34626 2 0 0 EFFLUENT NET VALUE	63.80	160.38	160.38	LBS/DAY	*****	*****	0.255	MON AVG	0.641	MG/L		QUARTERLY	GRAB	
4 - NITROPHENOL		BDL	BDL	(26)	*****	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab	
34646 2 0 0 EFFLUENT NET VALUE	18.01	31.02	31.02	LBS/DAY	*****	*****	0.072	MON AVG	0.124	MG/L		QUARTERLY	GRAB	
4,6 - DINITRO - O - CRESOL		BDL	BDL	(26)	*****	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab	
34657 2 0 0 EFFLUENT NET VALUE	19.52	69.31	69.31	LBS/DAY	*****	*****	0.078	MON AVG	0.277	MG/L		QUARTERLY	GRAB	
PHENOL, SINGLE COMPOUND		BDL	BDL	(26)	*****	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab	
34694 2 0 0 EFFLUENT NET VALUE	3.76	6.51	6.51	LBS/DAY	*****	*****	0.015	MON AVG	0.026	MG/L		QUARTERLY	GRAB	
NAPHTHALENE		BDL	BDL	(26)	*****	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab	
34696 2 0 0 EFFLUENT NET VALUE	5.50	14.76	14.76	LBS/DAY	*****	*****	0.022	MON AVG	0.059	MG/L		QUARTERLY	GRAB	
ETHYL BENZENE		BDL	BDL	(26)	*****	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab	
37371 2 0 0 EFFLUENT NET VALUE	8.01	27.02	27.02	LBS/DAY	*****	*****	0.032	MON AVG	0.108	MG/L		QUARTERLY	GRAB	
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT  JOHN F. WHITE													
H. H. Holliman, President	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT H. H. HOLLIMAN													
Tennessee Eastman Division	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT TENNESSEE EASTMAN CHEMICAL CO.													
TYPED OR PRINTED	OFFICER OR AUTHORIZED AGENT JOHN F. WHITE													
COMMENT AND EXPLANATION OF ANY VIOLATIONS	(Reference all attachments here) 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.													
	AREA CODE NUMBER (423) 229-2000											YEAR 98	MO 07	DAY 13

\*\*\* NO DISCHARGE  \*\*\*  
 NOTE: Read instructions before completing this form.

002 Q  
 DISCHARGE NUMBER

MONITORING PERIOD  
 FROM 98 - 04 - 01 TO 98 - 06 - 30

PARAMETER (32-37)	(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. EX (62-63)	Frequency of analysis (64-66)	Sample Type (69-70)
		Average	Maximum			Minimum	Average					
BIS (2-ETHYLHEXYL) PHTHALATE	MEASUREMENT	BDL	BDL	(26)	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	25.77 MON AVG	69.81 DAILY MAX	LBS/DAY	*****	0.103 MON AVG	*****	0.279 DAILY MAX	MGL	0	QUARTERLY	GRAB
DI-N-BUTYL PHTHALATE	MEASUREMENT	BDL	BDL	(26)	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	6.76 MON AVG	14.28 DAILY MAX	LBS/DAY	*****	0.027 MON AVG	*****	0.057 DAILY MAX	MGL	0	QUARTERLY	GRAB
VINYL CHLORIDE	MEASUREMENT	BDL	BDL	(26)	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	26.02 MON AVG	67.05 DAILY MAX	LBS/DAY	*****	0.104 MON AVG	*****	0.268 DAILY MAX	MGL	0	QUARTERLY	GRAB
TRICHLOROETHYLENE	MEASUREMENT	BDL	BDL	(26)	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	5.25 MON AVG	13.51 DAILY MAX	LBS/DAY	*****	0.021 MON AVG	*****	0.054 DAILY MAX	MGL	0	QUARTERLY	GRAB
39190 2 0 0 EFFLUENT NET VALUE	MEASUREMENT	BDL	BDL	(26)	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	0.05 MON AVG	0.09 DAILY MAX	LBS/DAY	*****	0.000186 MON AVG	*****	0.000372 DAILY MAX	MGL	0	QUARTERLY	GRAB
HEXACHLOROBENZENE	MEASUREMENT	BDL	BDL	(26)	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	2.00 MON AVG	4.06 DAILY MAX	LBS/DAY	*****	0.008 MON AVG	*****	0.016 DAILY MAX	MGL	0	QUARTERLY	GRAB
39700 2 0 0 EFFLUENT NET VALUE	MEASUREMENT	BDL	BDL	(26)	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	26.02 MON AVG	67.05 DAILY MAX	LBS/DAY	*****	0.104 MON AVG	*****	0.268 DAILY MAX	MGL	0	QUARTERLY	GRAB
3,4 BENZOFLOURANTHENE	MEASUREMENT	BDL	BDL	(26)	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	2.00 MON AVG	4.06 DAILY MAX	LBS/DAY	*****	0.008 MON AVG	*****	0.016 DAILY MAX	MGL	0	QUARTERLY	GRAB
79631 2 0 0 EFFLUENT NET VALUE	MEASUREMENT	BDL	BDL	(26)	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	26.02 MON AVG	67.05 DAILY MAX	LBS/DAY	*****	0.104 MON AVG	*****	0.268 DAILY MAX	MGL	0	QUARTERLY	GRAB
CHLOROETHANE	MEASUREMENT	BDL	BDL	(26)	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	26.02 MON AVG	67.05 DAILY MAX	LBS/DAY	*****	0.104 MON AVG	*****	0.268 DAILY MAX	MGL	0	QUARTERLY	GRAB
85811 2 0 0 EFFLUENT NET VALUE	MEASUREMENT	BDL	BDL	(26)	*****	*****	*****	BDL	(19)	0	2/Quarter	Grab
	PERMIT REQUIREMENT	26.02 MON AVG	67.05 DAILY MAX	LBS/DAY	*****	0.104 MON AVG	*****	0.268 DAILY MAX	MGL	0	QUARTERLY	GRAB
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER										TELEPHONE		YEAR MO DAY
H. H. Holliman, President										(423) 229-2000		
Tennessee Eastman Division										SIGNATURE OF PRINCIPAL EXECUTIVE		AREA CODE NUMBER
TYPED OR PRINTED										OFFICER OR AUTHORIZED AGENT		YEAR MO DAY

*John F. Weller*  
 SIGNATURE OF PRINCIPAL EXECUTIVE

COMMENT AND EXPLANATION OF ANY VIOLATIONS  
 (Reference all attachments here)  
 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.)

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## ACRONYMS AND DEFINITIONS

Acurex	-	Acurex Environmental Corporation (now ARCADIS, Geraghty & Miller)
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 <sub>2</sub> ), carbon monoxide (CO), and carbon dioxide (CO <sub>2</sub> ) 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-NETL	-	The DOE's National Energy Technology Laboratory (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 <sub>2</sub> ) over the stoichiometric balance for the production of methanol; also called H <sub>2</sub> 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 <sup>3</sup>	-	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 <sub>2</sub> ) and carbon monoxide (CO), or mixtures of H <sub>2</sub> and CO; intended for "synthesis" in a reactor to form methanol and/or other hydrocarbons (synthesis gas may also contain CO <sub>2</sub> , water, and other gases)
Tie-in(s)	-	the interconnection(s) between the LPMEOH™ Process Demonstration Facility and the Eastman Facility
TOC	-	Total Organic Carbon
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 effort being conducted under a 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 tons-per-day (TPD)) of methanol from coal-derived synthesis gas (syngas) was designed, constructed, and began a four-year operational period in April of 1997 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 10,000 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 or H<sub>2</sub> Gas, carbon monoxide gas or CO Gas, and Balanced Gas) will be diverted from existing operations to the LPMEOH™ Demonstration Unit, thus providing the range of 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

Following 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) (issued 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 Special Topical Report will provide this information. 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, H<sub>2</sub> 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

The EMP identified that a noise survey around the 29K-01 Recycle Compressor was planned during the initial start-up of the demonstration unit.

**TABLE 4.1**

**LPMEOH™ DEMONSTRATION UNIT**

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

**Environmental Media**

**General Parameters**

Coal	Pressure, Temperature, Coal Analysis
Oxygen to Gasifier	Pressure, Temperature, %O <sub>2</sub>
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 <sub>2</sub>
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**

<b><u>Environmental Media</u></b>	<b><u>General Parameters</u></b>
CO Gas to LPMEOH™ Demonstration Unit	Cumulative Flow for Quarter
H <sub>2</sub> 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. During the reporting period, availability for the LPMEOH™ Demonstration Unit was 100%, as the plant continued to operate through the longest continuous campaign to date (67 days) as of 30 September 1998. 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**

As defined in Section 7.1 of the Environmental Monitoring Plan, 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 in a Special Topical Report. If a significant change in gasifier facility operation (e.g., feedstock change, equipment modifications or additions, etc.) occurs, then an update will be provided in a future EMR.

### **6.2 10C-30 Catalyst Guard Bed**

As defined in Section 7.1 of the Environmental Monitoring Plan, publicly available technical data on the trace impurities entering and leaving the Catalyst Guard Bed will be issued in a Special Topical Report.

During the reporting period, there was no change of adsorbent or process change related to the operation of the 10C-30 Catalyst Guard Bed. If a significant change occurs, then an update will be provided in a future EMR.

### **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 in a Special Topical Report. 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 Plant Onstream Time and Outages - July/September 1998**

Operation Start	Operation End	Operating Hours	Shutdown Hours	Reason for Shutdown
7/1/98 00:01	7/14/98 12:45	324.7	258.5	Syngas Outage End of Reporting Period
7/25/98 07:12	9/30/98 23:59	1624.8		
Total Operating Hours			1949.5	
Syngas Available Hours			1949.5	
Plant Availability, %			100.00	

## **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. During the development of the EMP, it was anticipated that the new tie-in from the LPMEOH™ Demonstration Unit to the Eastman fuel header would require testing as a new source. After the EMP was published, it was determined that the new tie-in was not considered a significant change and did not require testing. Therefore, with the current sampling schedule, 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)**

Appendix B contains the latest report on Leak Detection and Repair at the LPMEOH™ Demonstration Unit. All items (valves, pump seals, fittings) which were found to exceed the allowable leakage rate (as measured by concentration levels in air) were able to be repaired by Eastman.

#### **7.2.2 Ambient Carbon Monoxide Background Concentration**

This one-time study was completed in June of 1998, and documents the concentration of CO that is encountered by a LPMEOH™ operations person during the course of a normal day of plant operations. The report on this study is included in Environmental Monitoring Report No. 5. Both the time-weighted average and the peak values for CO were below the established limits by the Tennessee Operational Health and Safety Administration.

### **7.3 Particulate Emissions**

This one-time study was completed in July of 1997, and documents 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 Environmental Monitoring Report No. 1. Some engineering modifications to the catalyst loading system are planned to reduce the dust concentration and potential personnel exposure.

### **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. As noted in Section 6.3, a comparison of the flow, composition, and BOD load of this stream before and after the addition of the LPMEOH™ Demonstration Unit will be included in a Special Topical Report on publicly available technical data from the Eastman "Chemicals-from-Coal" facility.

## **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. Approximately 5,420,000 gallons (17,900 tons) of methanol (Refined and Crude Grades) were produced during the reporting period.

### **8.2 Oil/Water Separator**

No oil was removed from the Oil/Water Separator during the reporting period.

### **8.3 Compressor and Pump Lubricants**

No material was generated during the reporting period.

### **8.4 Spent Catalyst Slurry**

No spent catalyst slurry was generated during the reporting period.

### **8.5 29C-40 Catalyst Guard Bed Spent Adsorbent**

No material was generated during the reporting period.

### **8.6 Noise**

The results of noise dosimetry measurements of the entire LPMEOH™ Demonstration Unit were reported in Environmental Monitoring Report No. 1. The results of an area noise survey at each platform of the LPMEOH™ Demonstration Unit and around the 29K-01 Recycle Compressor were reported in Environmental Monitoring Report No. 2. No additional surveys were performed during the reporting period.

**Table 8-1****Synthesis Gas Use and Methanol Production - July/September 1998  
LPMEOH™ Demonstration Unit**

	<b>July 1998</b>	<b>August 1998</b>	<b>Sept. 1998</b>	<b>Total</b>
<b>Consumption, KSCF</b>				
Balanced Gas	315,892.0	507,659.0	526,903.0	1,350,454.0
CO Gas	0.0	0.0	121.0	121.0
H <sub>2</sub> Gas	0.0	0.0	0.0	0.0
<b>Production, Tons</b>				
Crude Methanol	1,194.9	2,079.8	2,449.6	5,724.2
Refined Methanol	2,963.9	4,720.9	4,487.4	12,172.2
Total Purge Gas, KSCF	41,323.0	49,739.0	65,132.0	156,194.0

## **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.

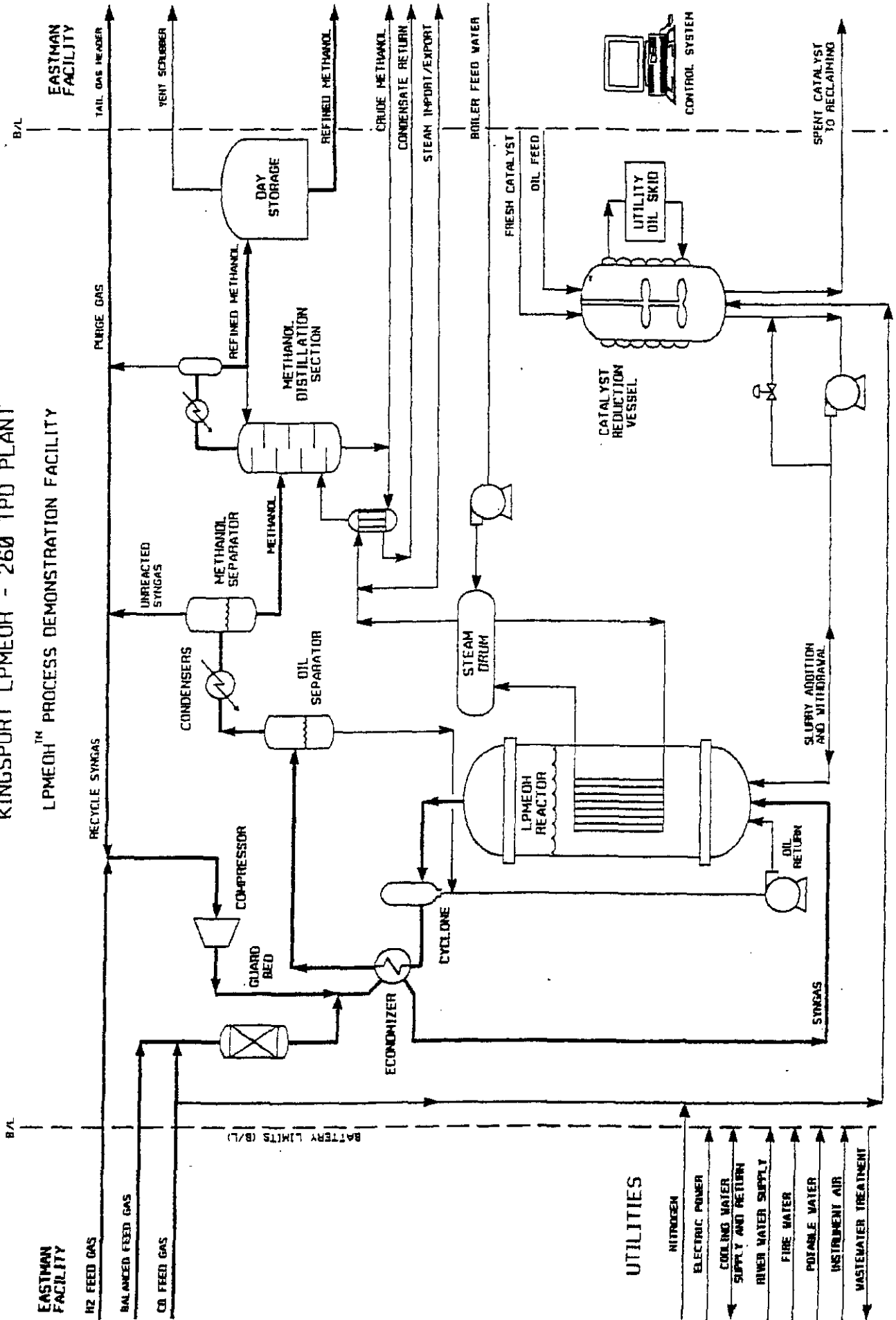


**APPENDICES**

**APPENDIX A - SIMPLIFIED PROCESS FLOW DIAGRAM**

# SIMPLIFIED PROCESS DIAGRAM KINGSFORT LPMEOH - 260 TPD PLANT

## LPMEOH™ PROCESS DEMONSTRATION FACILITY



**APPENDIX B - LEAK DETECTION AND REPAIR REPORT**

SEMI ANNUAL  
40 CFR Part 63 SubPart H -- Semi-Annual Monitoring Summary  
EASTMAN CHEMICAL  
P.O. Box 511  
Kingsport, TN 37662

Period: 01/01/1998 to 06/30/1998

PROCESS UNIT: METHANOL 29

COMPONENT CLASS: VALVES

PERIOD START	PERIOD END	NUMBER TESTED	NUMBER LEAKERS	PERCENT LEAKERS	NUMBER UNREPAIRED	NUMBER NOT REPAIRABLE
01/01/1998	03/31/1998	0	0	N/A	0	0

PROCESS UNIT: METHANOL 29

COMPONENT CLASS: PUMPS

PERIOD START	PERIOD END	NUMBER TESTED	NUMBER LEAKERS	PERCENT LEAKERS	NUMBER UNREPAIRED	NUMBER NOT REPAIRABLE
01/01/1998	01/31/1998	11	0	0.00	0	0
02/01/1998	02/28/1998	11	0	0.00	0	0
03/01/1998	03/31/1998	11	0	0.00	0	0
04/01/1998	04/30/1998	11	0	0.00	0	0
05/01/1998	05/31/1998	11	1	9.09	0	0
06/01/1998	06/30/1998	11	0	0.00	0	0

PROCESS UNIT: METHANOL 29

COMPONENT CLASS: COMPRESSORS

PERIOD START	PERIOD END	NUMBER TESTED	NUMBER LEAKERS	PERCENT LEAKERS	NUMBER UNREPAIRED	NUMBER NOT REPAIRABLE
-----------------	---------------	------------------	-------------------	--------------------	----------------------	--------------------------

\* \* \* No COMPRESSORSs In CMPU \* \* \*

PROCESS UNIT: METHANOL 29

COMPONENT CLASS: AGITATORS

PERIOD START	PERIOD END	NUMBER TESTED	NUMBER LEAKERS	PERCENT LEAKERS	NUMBER UNREPAIRED	NUMBER NOT REPAIRABLE
-----------------	---------------	------------------	-------------------	--------------------	----------------------	--------------------------

\* \* \* No AGITATORSs In CPU \* \* \*

PROCESS UNIT: METHANOL 29

COMPONENT CLASS: CONNECTORS

PERIOD START	PERIOD END	NUMBER TESTED	NUMBER LEAKERS	PERCENT LEAKERS	NUMBER UNREPAIRED	NUMBER NOT REPAIRABLE
04/01/1997	03/31/1998	528	0	0.00	0	0

End Of Report - ( ver. 2.4 )



40CFR Part 63 SubPart H - Semi Annual Delayed Repairs Report  
EASTMAN CHEMICAL  
P.O. Box 511  
Kingsport, TN 37662

Period: 01/01/1998 to 06/30/1998

PROCESS UNIT: METHANOL 29

=====

COMPONENT	DRAWING	COMPONENT	INSPECTION
TAG	NUMBER	CLASS	DATE

-----

REASON FOR DELAYED REPAIR

=====

\* \* \* No delayed repairs logged for period. \* \* \*

End Of Report

40 CFR Part 63 SubPart H -- Semi-Annual Exempt Compressor Report  
EASTMAN CHEMICAL  
P.O. Box 511  
Kingsport, TN 37662

Period: 01/01/1998 to 06/30/1998

PROCESS UNIT: METHANOL 29

INSPECTION DATE	DRAWING NUMBER	COMPONENT TAG	BACK- GROUND	TEST READING	NET READING	TEST RESULT
--------------------	-------------------	------------------	-----------------	-----------------	----------------	----------------

\* \* \* No Exempt Compressors In CPU \* \* \*

End Of Report

40 CFR Part 63 SubPart H -- Semi-Annual Pressure Relief Device Report  
EASTMAN CHEMICAL  
P.O. Box 511  
Kingsport, TN 37662

Period: 01/01/1998 to 06/30/1998

PROCESS UNIT: METHANOL 29

INSPECTION DATE	DRAWING NUMBER	COMPONENT TAG	BACK- GROUND	TEST READING	NET READING	TEST RESULT
--------------------	-------------------	------------------	-----------------	-----------------	----------------	----------------

\* \* \* No Pressure Relief Devices In CPU \* \* \*

End Of Report

40 CFR Part 63 SubPart H -- Semi-Annual Closed Vent System Report  
EASTMAN CHEMICAL  
P.O. Box 511  
Kingsport, TN 37662

Period: 01/01/1998 to 06/30/1998

PROCESS UNIT: METHANOL 29

INSPECTION DATE	DRAWING NUMBER	COMPONENT TAG	BACK- GROUND	TEST READING	NET READING	TEST RESULT
--------------------	-------------------	------------------	-----------------	-----------------	----------------	----------------

\* \* \* No Data Logged For CLOSED VENT SYSTEMS \* \* \*

End Of Report

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

**PERMITTEE NAME/ADDRESS:**  
 TN EASTMAN DIVISION  
 DIVISION OF EASTMAN CHEMICAL CO.  
 P.O. BOX 1993  
 KINGSPOST, TN 37662-5393  
 Facility: TN EASTMAN - KINGSPOST  
 Location: SULLIVAN COUNTY TN 37662-5393

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)**  
 MAJOR (SUBR 06)  
 DISCHARGE MONITORING REPORT (DMR)  
 002 G  
 DISCHARGE NUMBER  
 F - FINAL

**INDUSTRIAL PROCESS WASTEWATER EFFLUENT**  
**MONITORING PERIOD**  
 FROM 98-07-01 TO 98-07-31

\*\* NO DISCHARGE  \*\*

FORM APPROVED  
OMB NO. 2040-0004

PARAMETER (32-37)	(3 Card Only) (46-53)			(4 Card Only) (38-45)			Quantity or Concentration (54-61)			NO. EX (62-63)	Frequency of Analysis (64-66)	Sample Type (69-70)	
	AVERAGE	MAXIMUM	UNIT	MINIMUM	AVERAGE	UNIT	MAXIMUM	UNIT					
PH	MEASUREMENT	*****	*****	7.0	*****	*****	(12)	*****	0	Continuous	N/A		
00400 1 0 0	PERMIT REQUIREMENT	*****	*****	6.0	*****	*****	SU	*****	0	CONTINUOUS	RECORDER		
SOLIDS, TOTAL	MEASUREMENT	1,749	2,916	*****	*****	*****	*****	*****	0	31/31	Composite		
00530 1 0 0	PERMIT REQUIREMENT	11111	36954	*****	*****	*****	*****	*****	0	DAILY	COMPOSITE		
NITROGEN, AMMONIA TOTAL (AS N)	MEASUREMENT	< 37	160	*****	*****	*****	(19)	*****	0	31/31	Composite		
00610 2 0 0	PERMIT REQUIREMENT	6000	12000	*****	*****	*****	MG/L	*****	0	DAILY	COMPOSITE		
EFFLUENT NET VALUE	MEASUREMENT	BDL	BDL	*****	*****	*****	(19)	*****	0	1/7	Grab		
CYANIDE, TOTAL (AS CN)	PERMIT REQUIREMENT	14.51	104.83	*****	*****	*****	MG/L	*****	0	WEEKLY	GRAB		
00720 2 0 0	MEASUREMENT	< 2.45	3.20	*****	*****	*****	(19)	*****	0	1/7	Composite		
EFFLUENT NET VALUE	PERMIT REQUIREMENT	12.51	2502	*****	*****	*****	MG/L	*****	0	WEEKLY	COMPOSITE		
CHROMIUM, TOTAL (AS CR)	MEASUREMENT	1.49	3.11	*****	*****	*****	(19)	*****	0	1/7	Composite		
01034 2 0 0	PERMIT REQUIREMENT	12.51	2502	*****	*****	*****	MG/L	*****	0	WEEKLY	COMPOSITE		
EFFLUENT NET VALUE	MEASUREMENT	BDL	BDL	*****	*****	*****	(19)	*****	0	1/7	Composite		
LEAD, TOTAL (AS PB)	PERMIT REQUIREMENT	43.03	172.64	*****	*****	*****	MG/L	*****	0	WEEKLY	COMPOSITE		
01051 2 0 0	MEASUREMENT	BDL	BDL	*****	*****	*****	(19)	*****	0	1/7	Composite		
EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	*****	*****	*****	(19)	*****	0	WEEKLY	COMPOSITE		
NAME / TITLE PRINCIPAL EXECUTIVE OFFICER H. H. Holliman, President Tennessee Eastman Division											TELEPHONE (423) 229-2000	AREA CODE NUMBER (423) 229-2000	YEAR MO DAY 98 - 08 - 10
TYPED OR PRINTED											OFFICER OR AUTHORIZED AGENT <i>John F. White</i> SIGNATURE OF PRINCIPAL EXECUTIVE		

NOTE: Read instructions before completing this form.  
 COMMENT AND EXPLANATION OF ANY VIOLATIONS  
 (Reference all attachments here)  
 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.









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

002 G  
 DISCHARGE NUMBER

FORM APPROVED  
 OMB No. 2040-0004

MAJOR

(SUBR 06)

F - FINAL

INDUSTRIAL PROCESS WASTEWATER

EFFLUENT

MONITORING PERIOD

FROM 98-09-01 TO 98-09-30

\*\* NO DISCHARGE [ ] \*\*

NOTE: Read instructions before completing this form.

PARAMETER (32-37)	(3 Card Only) (46-53)		(4 Card Only) (38-45)		Quantity or (46-53)		Concentration (54-61)		NO. EX (62-63)	Frequency of Analysis (64-68)	Sample Type (69-70)
	AVERAGE	MAXIMUM	MINIMUM	AVERAGE	MINIMUM	MAXIMUM	UNIT				
PH	MEASUREMENT	*****	6.9	*****	*****	*****	7.5	(12)	0	Continuous	N/A
00400 1 0 0 EFFLUENT GROSS VALUE	PERMIT REQUIREMENT	*****	6.0	MINIMUM	*****	*****	9.0 MAXIMUM	SU	0	CONTINUOUS	RECORDER
SOLIDS, TOTAL SUSPENDED	MEASUREMENT	2,577	*****	*****	*****	*****	*****	*****	0	30/30	Composite
00530 1 0 0 EFFLUENT GROSS VALUE	PERMIT REQUIREMENT	11,111 MON AVG	*****	*****	*****	*****	*****	*****	0	DAILY	COMPOSITE
NITROGEN, AMMONIA TOTAL (AS N)	MEASUREMENT	63	185	*****	*****	*****	1	(19)	0	30/30	Composite
00610 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	6000 MON AVG	*****	*****	*****	*****	61 DAILY MAX	MG/L	0	DAILY	COMPOSITE
CYANIDE, TOTAL (AS CN)	MEASUREMENT	BDL	BDL	*****	*****	*****	BDL	(19)	0	1/7	Grab
00720 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	14.61 MON AVG	*****	*****	*****	*****	0.419 DAILY MAX	MG/L	0	WEEKLY	GRAB
CHROMIUM, TOTAL (AS CR)	MEASUREMENT	4.55	9.79	*****	*****	*****	0.047	(19)	0	1/7	Composite
01034 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	12.51 MON AVG	*****	*****	*****	*****	0.100 DAILY MAX	MG/L	0	WEEKLY	COMPOSITE
COPPER, TOTAL (AS CU)	MEASUREMENT	< 2.75	5.16	*****	*****	*****	0.025	(19)	0	1/7	Composite
01042 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	12.61 MON AVG	*****	*****	*****	*****	0.100 DAILY MAX	MG/L	0	WEEKLY	COMPOSITE
LEAD, TOTAL (AS PB)	MEASUREMENT	BDL	BDL	*****	*****	*****	BDL	(19)	0	1/7	Composite
01051 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	43.03 MON AVG	*****	*****	*****	*****	0.890 DAILY MAX	MG/L	0	WEEKLY	COMPOSITE
I CERTIFY UNDER PENALTY OF LAW THAT THE DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY OBTAIN AND EVALUATE THE INFORMATION SUBMITTED BASED ON MY KNOWLEDGE OF THE PERSON OR PERSONS WHO MANAGE THE FACILITY OR THESE PERSONS CORRECTLY RESPONSIBLE FOR OBTAINING THE INFORMATION. THE INFORMATION SUBMITTED IS TO THE BEST OF MY KNOWLEDGE AND BELIEF TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SEVERAL PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF THE AND IMPROPERMENT FOR KNOWING VIOLATIONS.											
NAME / TITLE PRINCIPAL EXECUTIVE OFFICER H. H. Holliman, President Tennessee Eastman Division											
TYPED OR PRINTED OFFICER OR AUTHORIZED AGENT (423) 229-2000 AREA CODE NUMBER YEAR MO DAY 98 - 10 - 09											
COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here) In addition to taking reasonable steps to prevent instances of noncompliance through the implementation of SPCC and SPCG-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.											

Forms by VHS/DocChem/707864-0645;part1/086;v4 01/4/06

PERMITTEE NAME/ADDRESS:  
 TN EASTMAN DIVISION  
 DIVISION OF EASTMAN CHEMICAL CO.  
 P.O. BOX 1993  
 KINGSFORT, TN 37662-5393  
 Facility: TN EASTMAN - KINGSFORT  
 Location: SULLIVAN COUNTY TN 37662-5393

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)  
 MAJOR DISCHARGE MONITORING REPORT (DMR)  
 (SUBR 06)  
 F - FINAL  
 INDUSTRIAL PROCESS WASTEWATER EFFLUENT  
 MONITORING PERIOD  
 FROM 98 - 09 - 01 TO 98 - 09 - 30  
 \*\* NO DISCHARGE \*\*

FORM APPROVED  
 OMB No. 2040-0004

PARAMETER (32-37)	(3 Card Only) (46-53)			(4 Card Only) (38-45)			Quantity or Concentration (54-61)			NO. EX (62-63)	Frequency of Analysis (64-68)	Sample Type (69-70)
	AVERAGE	MAXIMUM	UNIT	MINIMUM	AVERAGE	UNIT	MAXIMUM	UNIT				
NICKEL, TOTAL (AS NI)	4.73	7.69	(26)	*****	0.025	0.045	(19)	0	1/7	Composite		
01067 2 0 0 EFFLUENT NET VALUE	122.84 MON AVG	393.00 DAILY MAX	LBS/DAY	*****	1.690 MON AVG	3.980 DAILY MAX	MGL	0	WEEKLY	COMPOSITE		
ZINC, TOTAL (AS ZN)	9.25	12.52	(26)	*****	0.048	0.061	(19)	0	1/7	Composite		
01082 2 0 0 EFFLUENT NET VALUE	18000 MON AVG	31775 DAILY MAX	LBS/DAY	*****	0.635 MON AVG	1.270 DAILY MAX	MGL	0	WEEKLY	COMPOSITE		
FLOW, IN CONDUIT OR THRU TREATMENT PLANT	22.62	24.75	(03)	*****	*****	*****		0	Continuous	N/A		
50050 1 0 0 EFFLUENT GROSS VALUE	REPORT MON AVG	REPORT DAILY MAX	MGD	*****	*****	*****	****	0	CONTINUOUS	RECORDER		
BOD, CARBONACEOUS 05 DAY, 20C	924	1,780	(26)	*****	*****	*****		0	30/30	Composite		
80082 2 W 0 EFFLUENT NET VALUE	4000 MON AVG	8500 DAILY MAX	LBS/DAY	*****	*****	*****	****	0	DAILY	COMPOSITE		
MEASUREMENT												
PERMIT REQUIREMENT												
MEASUREMENT												
PERMIT REQUIREMENT												
MEASUREMENT												
PERMIT REQUIREMENT												

NAME / TITLE: 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 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.

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT  
 (423) 229-2000  
 AREA CODE NUMBER  
 98 - 10 - 09  
 YEAR MO DAY

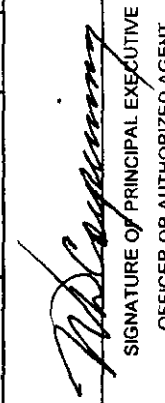
TELEPHONE

DATE

\*\*\* NO DISCHARGE  \*\*\*  
 NOTE: Read instructions before completing this form.

MONITORING PERIOD  
 FROM 98-07-01 TO 98-09-30

Facility: TN EASTMAN - KINGSPOST  
 Location: SULLIVAN COUNTY TN 37662-5393

PARAMETER (32-37)	MEASUREMENT	(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	Maximum	Minimum	Maximum		Average	Maximum	Minimum	Maximum	Unit				
CARBON TETRACHLORIDE	SAMPLE MEASUREMENT	*****	BDL	*****	BDL	(26)	*****	*****	*****	*****	BDL	(19)	0	1/Quarter	Grab
	PERMIT REQUIREMENT	4.60 MON AVG	9.51 DAILY MAX	*****	*****	LBS/DAY	*****	0.018 MON AVG	0.038 DAILY MAX	*****	*****	MG/L	0	QUARTERLY	GRAB
1,2-DICHLOROETHANE	SAMPLE MEASUREMENT	*****	BDL	*****	BDL	(26)	*****	*****	*****	*****	BDL	(19)	0	1/Quarter	Grab
	PERMIT REQUIREMENT	17.00 MON AVG	37.79 DAILY MAX	*****	*****	LBS/DAY	*****	0.068 MON AVG	0.211 DAILY MAX	*****	*****	MG/L	0	QUARTERLY	GRAB
CHLOROFORM	SAMPLE MEASUREMENT	*****	BDL	*****	BDL	(26)	*****	*****	*****	*****	BDL	(19)	0	1/Quarter	Grab
	PERMIT REQUIREMENT	5.25 MON AVG	11.51 DAILY MAX	*****	*****	LBS/DAY	*****	0.021 MON AVG	0.046 DAILY MAX	*****	*****	MG/L	0	QUARTERLY	GRAB
TOLUENE	SAMPLE MEASUREMENT	*****	BDL	*****	BDL	(26)	*****	*****	*****	*****	BDL	(19)	0	1/Quarter	Grab
	PERMIT REQUIREMENT	6.51 MON AVG	26.02 DAILY MAX	*****	*****	LBS/DAY	*****	0.026 MON AVG	0.080 DAILY MAX	*****	*****	MG/L	0	QUARTERLY	GRAB
ACENAPHTHYLENE	SAMPLE MEASUREMENT	*****	BDL	*****	BDL	(26)	*****	*****	*****	*****	BDL	(19)	0	1/Quarter	Grab
	PERMIT REQUIREMENT	2.00 MON AVG	4.06 DAILY MAX	*****	*****	LBS/DAY	*****	0.008 MON AVG	0.016 DAILY MAX	*****	*****	MG/L	0	QUARTERLY	GRAB
34200 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT	*****	BDL	*****	BDL	(26)	*****	*****	*****	*****	BDL	(19)	0	1/Quarter	Grab
	PERMIT REQUIREMENT	5.90 MON AVG	14.76 DAILY MAX	*****	*****	LBS/DAY	*****	0.022 MON AVG	0.059 DAILY MAX	*****	*****	MG/L	0	QUARTERLY	GRAB
ACRYLONITRILE	SAMPLE MEASUREMENT	*****	BDL	*****	BDL	(26)	*****	*****	*****	*****	BDL	(19)	0	1/Quarter	Grab
	PERMIT REQUIREMENT	24.02 MON AVG	60.55 DAILY MAX	*****	*****	LBS/DAY	*****	0.096 MON AVG	0.242 DAILY MAX	*****	*****	MG/L	0	QUARTERLY	GRAB
IDENTIFY UNDER PENALTY OF LAW THAT HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 USC 1001 AND 31 USC 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO \$10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)															
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER  OFFICER OR AUTHORIZED AGENT															
AREA CODE NUMBER (423) 229-2000 TELEPHONE (423) 229-2000 DATE 98-10-09 YEAR MO DAY 98 10 09															

COMMENT AND EXPLANATION OF ANY VIOLATIONS  
 TYPED OR PRINTED  
 Tennessee Eastman Division  
 H. H. Holliman, President  
 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.)  
 EPA FORM 3320-1 (REV. 9-88) Previous editions may be used.  
 PAGE 1 OF 8

PERMITTEE NAME/ADDRESS:  
 TN EASTMAN DIVISION  
 DIVISION OF EASTMAN CHEMICAL CO.  
 P.O. BOX 1993  
 KINGSPORT, 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

FORM APPROVED  
 OMB No. 2040-0004

Facility: TN EASTMAN - KINGSPORT  
 Location: SULLIVAN COUNTY TN 37662-5393

MONITORING PERIOD  
 FROM 98-07-01 TO 98-09-30

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

PARAMETER (32-37)	SAMPLE MEASUREMENT	(3 Card Only) (46-53)		Quantity or Loading (54-61)		(4 Card Only) (38-45)		Quality or Concentration (46-53)		NO. EX (62-63)	Frequency of analysis (64-68)	Sample Type (69-70)	
		Average	Maximum	Unit	Maximum	Minimum	Average	Maximum	Unit				
34220 2 0 0 EFFLUENT NET VALUE BENZENE, DISSOLVED	PERMIT REQUIREMENT	0.025 MON AVG	BDL DAILY MAX	(26) LBS/DAY	0.001 MON AVG	0.002 DAILY MAX	(19) MG/L	0	1/Quarter	0	QUARTERLY	Grab	
34235 2 0 0 EFFLUENT NET VALUE BENZO (K) FLUORANTHENE	PERMIT REQUIREMENT	0.037 MON AVG	BDL DAILY MAX	(26) LBS/DAY	0.037 MON AVG	0.136 DAILY MAX	(19) MG/L	0	1/Quarter	0	QUARTERLY	Grab	
34242 2 0 0 EFFLUENT NET VALUE BENZO (A) PYRENE	PERMIT REQUIREMENT	2.00 MON AVG	4.06 DAILY MAX	(26) LBS/DAY	0.008 MON AVG	0.016 DAILY MAX	(19) MG/L	0	1/Quarter	0	QUARTERLY	Grab	
34247 2 0 0 EFFLUENT NET VALUE CHLOROBENZENE	PERMIT REQUIREMENT	2.00 MON AVG	4.06 DAILY MAX	(26) LBS/DAY	0.008 MON AVG	0.016 DAILY MAX	(19) MG/L	0	1/Quarter	0	QUARTERLY	Grab	
34301 2 0 0 EFFLUENT NET VALUE CHRYSENE	PERMIT REQUIREMENT	7.01 MON AVG	BDL DAILY MAX	(26) LBS/DAY	0.015 MON AVG	0.028 DAILY MAX	(19) MG/L	0	1/Quarter	0	QUARTERLY	Grab	
34320 2 0 0 EFFLUENT NET VALUE DIETHYL PHTHALATE	PERMIT REQUIREMENT	0.025 MON AVG	BDL DAILY MAX	(26) LBS/DAY	0.001 MON AVG	0.002 DAILY MAX	(19) MG/L	0	1/Quarter	0	QUARTERLY	Grab	
34336 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	20.27 MON AVG	50.79 DAILY MAX	(26) LBS/DAY	0.081 MON AVG	0.203 DAILY MAX	(19) MG/L	0	1/Quarter	0	QUARTERLY	Grab	
I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 USC 1001 AND 31 USC 1319 (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO \$10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 3 YEARS.)													
H. H. Holliman, President Tennessee Eastman Division TYPED OR PRINTED										SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER 		OFFICER OR AUTHORIZED AGENT	
										(423) 229-2000 AREA CODE NUMBER		98 - 10 - 09 YEAR MO DAY	

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

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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  
 KINGSPOST, TN 37662-5393

Facility: TN EASTMAN - KINGSPORT  
 Location: SULLIVAN COUNTY TN 37662-5393

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)  
 DISCHARGE MONITORING REPORT (DMR)  
 002 Q  
 DISCHARGE NUMBER

MAJOR (SUBR 06)  
 F - FINAL  
 PROCESSED WW QUARTERLY REPORT  
 EFFLUENT

FORM APPROVED  
 OMB No. 2040-0004

\*\*\* NO DISCHARGE  \*\*\*  
 NOTE: Read instructions before completing this form.

MONITORING PERIOD  
 FROM 98-07-01 TO 98-09-30

PARAMETER (32-37)	SAMPLE MEASUREMENT	(3 Card Only) (48-53)		(4 Card Only) (38-49)		Quality or (46-53)		Concentration (54-61)		NO. EX (62-63)	Frequency of analysis (64-68)	Sample Type (69-70)
		Average	Maximum	Minimum	Average	Maximum	Unit	Unit				
34341 2 0 0 EFFLUENT NET VALUE FLUORANTHENE	PERMIT REQUIREMENT	BDL	DAILY MAX	BDL	MON AVG	0.019	MON AVG	BDL	0.047	0	1/Quarter	Grab
34376 2 0 0 EFFLUENT NET VALUE FLUORENE	PERMIT REQUIREMENT	BDL	DAILY MAX	BDL	MON AVG	0.025	MON AVG	BDL	0.068	0	QUARTERLY	GRAB
34381 2 0 0 EFFLUENT NET VALUE HEXACHLOROBUTADIENE	PERMIT REQUIREMENT	BDL	DAILY MAX	BDL	MON AVG	0.001	MON AVG	BDL	0.002	0	1/Quarter	Grab
34391 2 0 0 EFFLUENT NET VALUE HEXACHLOROETHANE	PERMIT REQUIREMENT	BDL	DAILY MAX	BDL	MON AVG	0.020	MON AVG	BDL	0.049	0	1/Quarter	Grab
34396 2 0 0 EFFLUENT NET VALUE METHYL CHLORIDE	PERMIT REQUIREMENT	BDL	DAILY MAX	BDL	MON AVG	0.021	MON AVG	BDL	0.054	0	QUARTERLY	GRAB
34418 2 0 0 EFFLUENT NET VALUE METHYLENE CHLORIDE	PERMIT REQUIREMENT	BDL	DAILY MAX	BDL	MON AVG	0.086	MON AVG	BDL	0.190	0	1/Quarter	Grab
34423 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	DAILY MAX	BDL	MON AVG	0.040	MON AVG	BDL	0.089	0	QUARTERLY	GRAB
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER												TELEPHONE
H. H. Holliman, President												
Tennessee Eastman Division												(423) 229-2000
TYPED OR PRINTED												AREA CODE NUMBER
												88 - 10 - 09
												YEAR MO DAY
												OFFICER OR AUTHORIZED AGENT
												SIGNATURE OF PRINCIPAL EXECUTIVE

*H. H. Holliman*

COMMENT AND EXPLANATION OF ANY VIOLATIONS  
 (Reference all attachments here)

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PERMITTEE NAME/ADDRESS:  
 TN EASTMAN DIVISION  
 DIVISION OF EASTMAN CHEMICAL CO.  
 P.O BOX 1993  
 KINGSPOST, TN 37662-5393

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)  
 DISCHARGE MONITORING REPORT (DMR)  
 002 Q  
 DISCHARGE NUMBER

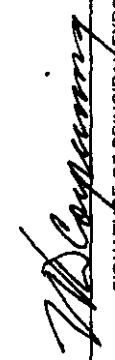
MAJOR (SUBR 06)  
 F - FINAL  
 PROCESSED WW QUARTERLY REPORT  
 EFFLUENT

FORM APPROVED  
 OMB No. 2040-0004

Facility: TN EASTMAN - KINGSPOST  
 Location: SULLIVAN COUNTY TN 37662-5393

MONITORING PERIOD  
 FROM 98 - 07 - 01 TO 98 - 09 - 30

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

PARAMETER (32-37)	MEASUREMENT REQUIREMENT	(3 Card Only) (46-53)		Quantity or (64-61)		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	Maximum	Average	Maximum		Minimum	Maximum	Average	Maximum	Unit	Unit				
NITROBENZENE	SAMPLE MEASUREMENT	BDL	BDL	(26)	BDL	(26)	BDL	BDL	BDL	BDL	BDL	(19)	0	1/Quarter	Grab	
34447 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	0.76 MON AVG	1.701 DAILY MAX	LBS/DAY	BDL	LBS/DAY	0.027 MON AVG	0.068 DAILY MAX	0.027 MON AVG	0.068 DAILY MAX	0.068 DAILY MAX	MG/L	0	QUARTERLY	GRAB	
PHENANTHRENE	SAMPLE MEASUREMENT	BDL	BDL	(26)	BDL	(26)	BDL	BDL	BDL	BDL	BDL	(19)	0	1/Quarter	Grab	
34461 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	BDL	BDL	LBS/DAY	BDL	LBS/DAY	0.001 MON AVG	0.002 DAILY MAX	0.001 MON AVG	0.002 DAILY MAX	0.002 DAILY MAX	MG/L	0	QUARTERLY	GRAB	
PYRENE	SAMPLE MEASUREMENT	BDL	BDL	(26)	BDL	(26)	BDL	BDL	BDL	BDL	BDL	(19)	0	1/Quarter	Grab	
34469 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	0.26 MON AVG	0.41 DAILY MAX	LBS/DAY	BDL	LBS/DAY	0.001 MON AVG	0.002 DAILY MAX	0.001 MON AVG	0.002 DAILY MAX	0.002 DAILY MAX	MG/L	0	QUARTERLY	GRAB	
TETRACHLOROETHYLENE	SAMPLE MEASUREMENT	BDL	BDL	(26)	BDL	(26)	BDL	BDL	BDL	BDL	BDL	(19)	0	1/Quarter	Grab	
34475 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	5.50 MON AVG	14.01 DAILY MAX	LBS/DAY	BDL	LBS/DAY	0.022 MON AVG	0.066 DAILY MAX	0.022 MON AVG	0.066 DAILY MAX	0.066 DAILY MAX	MG/L	0	QUARTERLY	GRAB	
1,1 - DICHLOROETHANE	SAMPLE MEASUREMENT	BDL	BDL	(26)	BDL	(26)	BDL	BDL	BDL	BDL	BDL	(19)	0	1/Quarter	Grab	
34496 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	5.50 MON AVG	14.01 DAILY MAX	LBS/DAY	BDL	LBS/DAY	0.022 MON AVG	0.066 DAILY MAX	0.022 MON AVG	0.066 DAILY MAX	0.066 DAILY MAX	MG/L	0	QUARTERLY	GRAB	
1,1 - DICHLOROETHYLENE	SAMPLE MEASUREMENT	BDL	BDL	(26)	BDL	(26)	BDL	BDL	BDL	BDL	BDL	(19)	0	1/Quarter	Grab	
34501 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	4.00 MON AVG	6.26 DAILY MAX	LBS/DAY	BDL	LBS/DAY	0.016 MON AVG	0.025 DAILY MAX	0.016 MON AVG	0.025 DAILY MAX	0.025 DAILY MAX	MG/L	0	QUARTERLY	GRAB	
1,1,1 - TRICHLOROETHANE	SAMPLE MEASUREMENT	BDL	BDL	(26)	BDL	(26)	BDL	BDL	BDL	BDL	BDL	(19)	0	1/Quarter	Grab	
34506 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	5.25 MON AVG	13.61 DAILY MAX	LBS/DAY	BDL	LBS/DAY	0.021 MON AVG	0.064 DAILY MAX	0.021 MON AVG	0.064 DAILY MAX	0.064 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 OR AUTHORIZED AGENT 																
													(423) 229-2000	AREA CODE NUMBER	98 - 10 - 09	YEAR MO DAY

COMMENT AND EXPLANATION OF ANY VIOLATIONS  
 (Reference all attachments here)

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MONITORING PERIOD  
 FROM 98 - 07 - 01 TO 98 - 09 - 30

PARAMETER (32-37)	SAMPLE MEASUREMENT	(3 Card Only) (46-53)		Quantity or Loading (54-61)		(4 Card Only) (38-45)		Quality or Concentration (46-53)		NO. EX (62-63)	Frequency of analysis (64-68)	Sample Type (69-70)			
		Average	Maximum	Unit	Minimum	Average	Maximum	Unit							
1,1,2 - TRICHLOROETHANE	SAMPLE MEASUREMENT	BDL	BDL	(26)	BDL	BDL	(19)	BDL	BDL	0	1/Quarter	Grab			
34511 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	625 MON AVG	1051 DAILY MAX	LBS/DAY	BDL	BDL	MG/L	0.021 MON AVG	0.054 DAILY MAX	0	QUARTERLY	GRAB			
BENZO (A) ANTHRACENE	SAMPLE MEASUREMENT	BDL	BDL	(26)	BDL	BDL	(19)	BDL	BDL	0	1/Quarter	Grab			
34526 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	200 MON AVG	406 DAILY MAX	LBS/DAY	BDL	BDL	MG/L	0.008 MON AVG	0.016 DAILY MAX	0	QUARTERLY	GRAB			
1,2 - DICHLOROBENZENE	SAMPLE MEASUREMENT	BDL	BDL	(26)	BDL	BDL	(19)	BDL	BDL	0	1/Quarter	Grab			
34636 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	19.27 MON AVG	40.78 DAILY MAX	LBS/DAY	BDL	BDL	MG/L	0.077 MON AVG	0.163 DAILY MAX	0	QUARTERLY	GRAB			
1,2 - DICHLOROPROPANE	SAMPLE MEASUREMENT	BDL	BDL	(26)	BDL	BDL	(19)	BDL	BDL	0	1/Quarter	Grab			
34641 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	38.28 MON AVG	67.55 DAILY MAX	LBS/DAY	BDL	BDL	MG/L	0.153 MON AVG	0.230 DAILY MAX	0	QUARTERLY	GRAB			
1,2 - TRANS - DICHLOROETHYLENE	SAMPLE MEASUREMENT	BDL	BDL	(26)	BDL	BDL	(19)	BDL	BDL	0	1/Quarter	Grab			
34546 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	625 MON AVG	1315 DAILY MAX	LBS/DAY	BDL	BDL	MG/L	0.021 MON AVG	0.054 DAILY MAX	0	QUARTERLY	GRAB			
1,2,4 - TRICHLORO - BENZENE	SAMPLE MEASUREMENT	BDL	BDL	(26)	BDL	BDL	(19)	BDL	BDL	0	1/Quarter	Grab			
34551 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	17.01 MON AVG	BDL DAILY MAX	LBS/DAY	BDL	BDL	MG/L	0.043 MON AVG	0.140 DAILY MAX	0	QUARTERLY	GRAB			
1,3 - DICHLOROPROPENE, TOTAL WEIGHT	SAMPLE MEASUREMENT	BDL	BDL	(26)	BDL	BDL	(19)	BDL	BDL	0	1/Quarter	Grab			
34561 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	128 MON AVG	180 DAILY MAX	LBS/DAY	BDL	BDL	MG/L	0.029 MON AVG	0.044 DAILY MAX	0	QUARTERLY	GRAB			
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER											TELEPHONE	AREA CODE NUMBER	YEAR	MO	DAY
H. H. Holliman, President											(423) 229-2000	98 - 10 - 09			
Tennessee Eastman Division											OFFICER OR AUTHORIZED AGENT				
TYPED OR PRINTED											SIGNATURE OF PRINCIPAL EXECUTIVE				
											<i>H. H. Holliman</i>				

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)  
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PERMITTEE NAME/ADDRESS:  
 TN EASTMAN DIVISION  
 DIVISION OF EASTMAN CHEMICAL CO  
 P.O BOX 1993  
 KINGSPORT, TN 37662-5393

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

MAJOR (SUBR 06)  
 F - FINAL  
 PROCESSED WW QUARTERLY REPORT  
 EFFLUENT

FORM APPROVED  
 OMB No.2040-0004

Facility: TN EASTMAN - KINGSPORT  
 Location: SULLIVAN COUNTY TN 37662-5393

TN002640  
 PERMIT NUMBER

002 Q  
 DISCHARGE NUMBER

MONITORING PERIOD  
 FROM 98-07-01 TO 98-09-30

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

PARAMETER (32-37)	MEASUREMENT	(3 Card Only) (46-53)		Quantity or Loading (54-61)		(4 Card Only) (38-45)		Quality or Concentration (46-53) (54-61)		NO. EX (62-63)	Frequency of analysis (64-68)	Sample Type (69-70)
		Average	Maximum	Unit	Unit	Minimum	Average	Maximum	Unit			
1,3 - DICHLOROBENZENE	SAMPLE MEASUREMENT	776	BDL	(26)	BDL	(26)	BDL	(19)	BDL	0	1/Quarter	Grab
34566 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	MON AVG	14.01 DAILY MAX	LBS/DAY	DAILY MAX	LBS/DAY	0.031 DAILY MAX	MG/L	0.044 DAILY MAX	0	QUARTERLY	GRAB
1,4 - DICHLOROBENZENE	SAMPLE MEASUREMENT	375	BDL	(26)	BDL	(26)	BDL	(19)	BDL	0	1/Quarter	Grab
34571 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	MON AVG	7.01 DAILY MAX	LBS/DAY	DAILY MAX	LBS/DAY	0.015 DAILY MAX	MG/L	0.028 DAILY MAX	0	QUARTERLY	GRAB
2 - CHLOROPHENOL	SAMPLE MEASUREMENT	776	BDL	(26)	BDL	(26)	BDL	(19)	BDL	0	1/Quarter	Grab
34586 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	MON AVG	24.52 DAILY MAX	LBS/DAY	DAILY MAX	LBS/DAY	0.031 DAILY MAX	MG/L	0.098 DAILY MAX	0	QUARTERLY	GRAB
2 - NITROPHENOL	SAMPLE MEASUREMENT	1026	BDL	(26)	BDL	(26)	BDL	(19)	BDL	0	1/Quarter	Grab
34591 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	MON AVG	17.26 DAILY MAX	LBS/DAY	DAILY MAX	LBS/DAY	0.041 DAILY MAX	MG/L	0.069 DAILY MAX	0	QUARTERLY	GRAB
2,4 - DICHLOROPHENOL	SAMPLE MEASUREMENT	976	BDL	(26)	BDL	(26)	BDL	(19)	BDL	0	1/Quarter	Grab
34601 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	MON AVG	28.02 DAILY MAX	LBS/DAY	DAILY MAX	LBS/DAY	0.039 DAILY MAX	MG/L	0.112 DAILY MAX	0	QUARTERLY	GRAB
2,4 - DIMETHYLPHENOL	SAMPLE MEASUREMENT	1750	BDL	(26)	BDL	(26)	BDL	(19)	BDL	0	1/Quarter	Grab
34606 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	MON AVG	9.01 DAILY MAX	LBS/DAY	DAILY MAX	LBS/DAY	0.018 DAILY MAX	MG/L	0.036 DAILY MAX	0	QUARTERLY	GRAB
2,4 - DINITROTOLUENE	SAMPLE MEASUREMENT	2227	BDL	(26)	BDL	(26)	BDL	(19)	BDL	0	1/Quarter	Grab
34611 2 0 0 EFFLUENT NET VALUE	PERMIT REQUIREMENT	MON AVG	71.31 DAILY MAX	LBS/DAY	DAILY MAX	LBS/DAY	0.113 DAILY MAX	MG/L	0.285 DAILY MAX	0	QUARTERLY	GRAB
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER												TELEPHONE
H. H. Hoffiman, President												(423) 229-2000
Tennessee Eastman Division												AREA CODE NUMBER
TYPED OR PRINTED												98 - 10 - 09
COMMENT AND EXPLANATION OF ANY VIOLATIONS												YEAR MO DAY
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SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

PARAMETER (32-37)	(3 Card Only) (46-53)		(4 Card Only) (58-65)		Quality or (46-53)		Concentration (54-61)		NO. EX (62-63)	Frequency of analysis (64-66)	Sample Type (68-70)
	Average	Maximum	Minimum	Maximum	Average	Maximum	Unit	Unit			
2,4-DINITROPHENOL	SAMPLE MEASUREMENT	BDL	BDL	BDL	*****	BDL	(19)	BDL	0	1/Quarter	Grab
	PERMIT REQUIREMENT	17.76 MON AVG	30.77 DAILY MAX	*****	0.071 MON AVG	0.123 DAILY MAX	MG/L	QUARTERLY		QUARTERLY	GRAB
2,6-DINITROTOLUENE	SAMPLE MEASUREMENT	BDL	BDL	BDL	*****	BDL	(19)	BDL	0	1/Quarter	Grab
	PERMIT REQUIREMENT	63.80 MON AVG	100.38 DAILY MAX	*****	0.255 MON AVG	0.641 DAILY MAX	MG/L	QUARTERLY		QUARTERLY	GRAB
4-NITROPHENOL	SAMPLE MEASUREMENT	BDL	BDL	BDL	*****	BDL	(19)	BDL	0	1/Quarter	Grab
	PERMIT REQUIREMENT	18.01 MON AVG	31.02 DAILY MAX	*****	0.072 MON AVG	0.124 DAILY MAX	MG/L	QUARTERLY		QUARTERLY	GRAB
4,6-DINITRO-O-CRESOL	SAMPLE MEASUREMENT	BDL	BDL	BDL	*****	BDL	(19)	BDL	0	1/Quarter	Grab
	PERMIT REQUIREMENT	19.52 MON AVG	69.31 DAILY MAX	*****	0.078 MON AVG	0.277 DAILY MAX	MG/L	QUARTERLY		QUARTERLY	GRAB
PHENOL, SINGLE COMPOUND	SAMPLE MEASUREMENT	BDL	BDL	BDL	*****	BDL	(19)	BDL	0	1/Quarter	Grab
	PERMIT REQUIREMENT	3.75 MON AVG	6.51 DAILY MAX	*****	0.015 MON AVG	0.026 DAILY MAX	MG/L	QUARTERLY		QUARTERLY	GRAB
34694 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT	BDL	BDL	BDL	*****	BDL	(19)	BDL	0	1/Quarter	Grab
	PERMIT REQUIREMENT	5.50 MON AVG	14.76 DAILY MAX	*****	0.022 MON AVG	0.059 DAILY MAX	MG/L	QUARTERLY		QUARTERLY	GRAB
NAPHTHALENE	SAMPLE MEASUREMENT	BDL	BDL	BDL	*****	BDL	(19)	BDL	0	1/Quarter	Grab
	PERMIT REQUIREMENT	8.01 MON AVG	27.02 DAILY MAX	*****	0.032 MON AVG	0.108 DAILY MAX	MG/L	QUARTERLY		QUARTERLY	GRAB
34696 2 0 0 EFFLUENT NET VALUE	SAMPLE MEASUREMENT	BDL	BDL	BDL	*****	BDL	(19)	BDL	0	1/Quarter	Grab
	PERMIT REQUIREMENT	8.01 MON AVG	27.02 DAILY MAX	*****	0.032 MON AVG	0.108 DAILY MAX	MG/L	QUARTERLY		QUARTERLY	GRAB
I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY KNOWLEDGE OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 USC 1001 AND 33 USC 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO \$10,000 AND/OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 3 YEARS.)											
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER H. H. Hoffiman, President Tennessee Eastman Division TYPED OR PRINTED											
OFFICER OR AUTHORIZED AGENT SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT (423) 229-2000 AREA CODE NUMBER 98 - 10 - 09 YEAR MO DAY											

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 KINGSPOST, TN 37662-5393

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FORM APPROVED  
 OMB No. 2040-0004

Facility: TN EASTMAN - KINGSPOST  
 Location: SULLIVAN COUNTY TN 37662-5393

MONITORING PERIOD  
 FROM 98 - 07 - 01 TO 98 - 09 - 30

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PARAMETER (32-37)	(3 Card Only) (46-53)		Quantity or (54-61)		Loading		(4 Card Only) (98-105)		Quality or (46-53)		Concentration (54-61)		NO. EX (62-63)	Frequency of analysis (64-68)	Sample Type (69-70)
	Average	Maximum	Minimum	Maximum	Unit	Unit	Minimum	Average	Maximum	Unit	Unit				
BIS (2 - ETHYLHEXYL) PHTHALATE	2577	BDL	BDL	BDL	(26)	BDL	BDL	*****	BDL	(19)	BDL	0	1/Quarter	Grab	
39100 2 0 0 EFFLUENT NET VALUE	MON AVG	DAILY MAX	DAILY MAX	DAILY MAX	LBS/DAY	DAILY MAX	0.103	MON AVG	DAILY MAX	MG/L	0.279	0	QUARTERLY	GRAB	
DI - N - BUTYL PHTHALATE	*****	BDL	BDL	BDL	(26)	BDL	*****	*****	BDL	(19)	BDL	0	1/Quarter	Grab	
39110 2 0 0 EFFLUENT NET VALUE	MON AVG	DAILY MAX	DAILY MAX	DAILY MAX	LBS/DAY	DAILY MAX	0.027	MON AVG	DAILY MAX	MG/L	0.057	0	QUARTERLY	GRAB	
VINYL CHLORIDE	*****	BDL	BDL	BDL	(26)	BDL	*****	*****	BDL	(19)	BDL	0	1/Quarter	Grab	
39175 2 0 0 EFFLUENT NET VALUE	MON AVG	DAILY MAX	DAILY MAX	DAILY MAX	LBS/DAY	DAILY MAX	0.104	MON AVG	DAILY MAX	MG/L	0.268	0	QUARTERLY	GRAB	
TRICHLOROETHYLENE	*****	BDL	BDL	BDL	(26)	BDL	*****	*****	BDL	(19)	BDL	0	1/Quarter	Grab	
39180 2 0 0 EFFLUENT NET VALUE	MON AVG	DAILY MAX	DAILY MAX	DAILY MAX	LBS/DAY	DAILY MAX	0.021	MON AVG	DAILY MAX	MG/L	0.054	0	QUARTERLY	GRAB	
HEXACHLOROBENZENE	*****	BDL	BDL	BDL	(26)	BDL	*****	*****	BDL	(19)	BDL	0	1/Quarter	Grab	
39700 2 0 0 EFFLUENT NET VALUE	MON AVG	DAILY MAX	DAILY MAX	DAILY MAX	LBS/DAY	DAILY MAX	0.000186	MON AVG	DAILY MAX	MG/L	0.000372	0	QUARTERLY	GRAB	
3,4 BENZOFUORANTHENE	*****	BDL	BDL	BDL	(26)	BDL	*****	*****	BDL	(19)	BDL	0	1/Quarter	Grab	
79531 2 0 0 EFFLUENT NET VALUE	MON AVG	DAILY MAX	DAILY MAX	DAILY MAX	LBS/DAY	DAILY MAX	0.008	MON AVG	DAILY MAX	MG/L	0.016	0	QUARTERLY	GRAB	
CHLOROETHANE	*****	BDL	BDL	BDL	(26)	BDL	*****	*****	BDL	(19)	BDL	0	1/Quarter	Grab	
95811 2 0 0 EFFLUENT NET VALUE	MON AVG	DAILY MAX	DAILY MAX	DAILY MAX	LBS/DAY	DAILY MAX	0.104	MON AVG	DAILY MAX	MG/L	0.268	0	QUARTERLY	GRAB	
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	<p>H. H. Holliman, President</p> <p>Tennessee Eastman Division</p> <p>SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT</p>														
TYPED OR PRINTED	<p>(423) 229-2000</p> <p>AREA CODE NUMBER</p> <p>98 - 10 - 09</p> <p>YEAR MO DAY</p>														

COMMENT AND EXPLANATION OF ANY VIOLATIONS  
 (Reference all attachments here)

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.)

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