TriEst AG Group, Inc.
PERIODIC MONITORING PLAN
PERMIT 057-1054-004-AV

DATED:	02/09/01
REVISION DATE:	09/06/01
2ND REVISION DATE:	03/12/02
3RD REVISION DATE:	03/2/03
4th REVISION DATE:	12/30/08
5th REVISION DATE:	2/02/09
6th REVISION DATE:	1/09/14

OBJECTIVE

To ensure compliance with permit conditions 7, 11 and 12. These conditions are as follows:

7. The permittee shall allow no person to store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds (VOC) or organic solvents without applying known and existing vapor emission control devices or systems deemed necessary and ordered by the Department or its delegated agent, the Environmental Protection Commission of Hillsborough County. Known and existing vapor emission control devices or systems include, but are not limited to, the following:

General:

1) Equipping all pressure relief valves with diaphragms;
2) Maintaining the connections from the front decanting area, the back decanting area; the rail car unloading, the storage tanks, the main scales, the pressure relief stations, and all the system piping to the vapor processing equipment;
3) Maintaining the vapor processing equipment in good working order; and
4) On a weekly basis, inspecting all components (i.e., valves, compressor seals, pressure relief valves, and connectors) for leaks. Detection methods incorporating sight, sound, and smell are acceptable. All detected leaks shall be repaired immediately.

Methyl Bromine Processing:

5) Using the vapor processing equipment (Barney System) to recover the Methyl Bromide and Chloropicrin on each and every purge;

6) At the end of each day of operations, purging the methyl bromide and vapor recovery equipment lines with nitrogen and emptying the Chloropicrin lines of liquid product, and directing the exhaust to the vapor processing equipment;
7) Before air purging any outdated DOT cylinders and pigs, purging twice with nitrogen while directing all the exhaust to the vapor processing equipment.

Telone Processing:

8) All displaced air from the cylinder or pigs in the Telone (1,3-Dichloropropene) must be vented through an activated carbon canister before being discharged to the ambient air. [Rule 62-296.320(1), F.A.C.].

11. The permittee shall generate and maintain the following records at the frequency specified:

Frequency	**Recordkeeping Requirement**
Daily	- purging and emptying of product lines
Weekly	- hours of operation - inspection of components, including any repairs made
Monthly	- amount of each chemical received and/or processed including total amounts for the most recent twelve-month period.

[Rule 62-213.440(1) (b) 1.b., F.A.C.].

12. The permittee shall maintain and operate the Vapor Processing Equipment in accordance with the Period Monitoring Plan submitted to the Environmental Protection Commission of Hillsborough County, including all parameters to be monitored, parameter operating ranges, and averaging times to ensure proper operation and compliance.

PROCEDURES

The frequency of monitoring; duration of monitoring; averaging time; range of values needed to show compliance; correlation of values to permit limits; and corrective actions to be taken are listed in Table 1.

Daily Leak Checks:

The daily leak checking procedure for all valves, lines, fittings, and pumps is to use a liquid bubble check in addition to a sight, sound, and smell inspection of all listed devices. (It should be noted that all chemicals used are readily smelled with odor thresholds reported to be:

Telone	1.0 ppm
Chloropicrin (PIC)	1.1 ppm
Methyl Bromide with Chloropicrin	1.1 ppm (as PIC)
Methyl Iodide	Pungent Odor (Unkown ppm)

All leaks will be repaired immediately and re-inspected prior to being put back into normal service. A daily log will be kept with entries for:

Day
Time
Inspector
Confirmed Leaks
Corrective Actions
Re-inspection.

All gas service lines will be purged at the end of each workday that they were in-service. This purging will de-pressurize the valves, lines, and fittings in gas service and reduce the likelihood of leaks.

Daily Control Systems Checks:

A) Barney Condensing System

The Barney condensing system controls the emissions from the Methyl Bromide and Chloropicrin blending and packaging area. The main daily check of the Barney system is to check that the gas temperature leaving the compressor is less than 38 ^{o} F. As long as this temperature limit is not exceeded, the system should be operating correctly.

A daily log will be kept with entries for:

Day
Time
Inspector
Temperature Reading
Corrective Action

B) Activated Carbon Systems

Separate activated carbon control systems service the Telone formulation and repackaging area and the Methyl Iodide formulation and repackaging area. All cylinders and pigs (large cylinders) are filled while vented through the carbon system and all returned cylinders and pigs are vented through a carbon system when they are de-pressurized.

Each carbon system consists of three (3) drums with activated carbon charges (see Attachment 1). The vented gases go through the #1 drum, then through the #2 drum (the backup drum), and then through the #3 drum (a second backup drum to ensure capture of breakthrough concentrations) before being released to the atmosphere.

Daily sampling between #2 and #3 drums, is performed during normal operations, in order to obtain readings of the gas concentrations prior to being exhausted to the atmosphere. Upon exceeding a "breakthrough" level of (Telone: 30 ppm as Telone or 120 ppm as Isobutylene [the daily calibration gas] or Methyl Iodide: 30 ppm as Methyl Iodide), corrective action will be taken as follows:

1) The #1 Drum will be taken out of service and sealed for off-site disposal.

2) The #2 Drum will become the new #1 drum and a new drum will become the second in-line drum.

3) Re-sample to document that no breakthrough is occurring.

A daily log will be kept with entries for:

Day
Time
Inspector
Sampling Readings
Breakthrough Detected
Corrective Action
Re-sampling Results

1 - Telone Monitoring

A Photoionization Detector (PID) instrument that has been calibrated to specific detection tubes for 1,3-Dichloropropene (Telone) will be used. The PID will be calibrated with 96 ppm Isobutylene calibration gas on a daily basis on each day that the PID is used per this plan.

Based on a calibration performed on December 28, 2001, a calibration factor of 0.25 has been established based on the following calibration data:

PID (calibrated on 96 ppm Isobutylene) (ppm)	Telone Detection Tube (ppm)
1	0.25
2	0.50
3	0.75
4	1.0

Alternatively, a Telone detection tube can be used directly to check for breakthrough. The colormeteric tubes (Tube#132SC) used is made to detect Vinyl Chloride which detects 1,3-

Dichlorpropene that is the major ingredient in Telone II. The detection tube has the range of 0.4 to 12 ppm of 1,3-Dichloropropene. Another detection tube used is #194S which detects 1,3-Dichloropropene with a range of 10-500 ppm. Either tubes can be used to if the reading is less than 12 ppm. Readings greater than 12 ppm must be taken using tube #194S.

2 - Methyl Iodide Monitoring

Specific chemical detection tubes (Tube # 176S) will be used to test the concentration between the second and third carbon drum. The detection tube has the range of from 2 to 40 ppm of Methyl Iodide.

TABLE 1
TRIEST AG GROUP, INC>
PERIODIC MONITORING PLAN

PERIODIC PLAN3.XLS

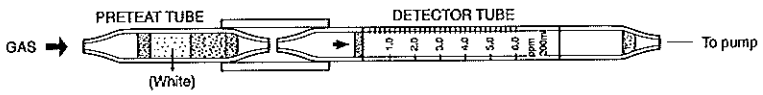
1/13/2014

COMPLIANCE PARAMETER	ACTION	FREQUENCY	DURATION	AVG. TIME	RANGE OF VALUES TO COMPLY	CORRELATION	CORRECTIVE ACTIONS		COMMENTS
VALVE LEAKS	SNOOP TEST (SOAP BUBBLES CHECK) AND SIGHT, SMELL AND SOUND INSPECTION	DAILY	ONCE	AS NEEDED	NO LEAK DETECTED	DIRECT 1:1	FIX LEAK IMMEDIATELY		
LINE LEAKS	SNOOP TEST (SOAP BUBBLES CHECK) AND SIGHT, SMELL AND SOUND INSPECTION	DAILY	ONCE	AS NEEDED	NO LEAK DETECTED	DIRECT 1:1	FIX LEAK IMMEDIATELY		
FITTING LEAKS	SNOOP TEST (SOAP BUBBLES CHECK) AND SIGHT, SMELL AND SOUND INSPECTION	DAILY	ONCE	AS NEEDED	NO LEAK DETECTED	DIRECT 1:1	FIX LEAK IMMEDIATELY		
PUMP LEAKS	SNOOP TEST (SOAP BUBBLES CHECK) AND SIGHT, SMELL AND SOUND INSPECTION	DAILY	ONCE	AS NEEDED	NO LEAK DETECTED	DIRECT 1:1	FIX LEAK IMMEDIATELY		
	SNOOP TEST (SOAP BUBBLES CHECK)	DAILY	ONCE	AS NEEDED	NO LEAK DETECTED	DIRECT 1:1	FIX LEAK IMMEDIATELY		
BREAK THROUGH IN THE CARBON CONTROL SYSTEM : TELONE II		DAILY	ONCE	5 MINUTES	< 30 PPM AS TELONE (120 PPM AS ISOBUTYLENE THE PID'S CALIBRATION GAS)	DIRECT READING	REPLACE #1 DRUM WITH #2 DRUM AND BRING A NEW DRUM ON-LINE TO BE THE SECOND DRUM		TO USE PID DETECTOR THAT IS CALIBRATED DAILY ON ISOBUTYLENE CERTIFIED GAS (~100 PPM). ALTERNATIVE IS TO USE A DETECTION TUBE DIRECTLY(NO PID)
METHYL IODIDE		DAILY	ONCE	5 MINUTES	< 30 PPM AS METHYL IODIDE	DIRECT READING	REPLACE #1 DRUM WITH #2 DRUM AND BRING A NEW DRUM ON-LINE TO BE THE SECOND DRUM		USE DETECTION TUBE

*DAILY = OPERATING DAY BUT AT LEAST ONCE PER WEEK

Tube No.
132SC

VINYL CHLORIDE



1. PERFORMANCE

1) Measuring range : 0.4-12.0 ppm 0.2-6.0 ppm 0.1-3.0 ppm
   Number of pump strokes 1 (100mℓ) 2 (200mℓ) 4 (400mℓ)
2) Sampling time : 3 minutes/2 pump strokes
3) Detectable limit : 0.05 ppm (400mℓ)
4) Shelf life : 3 years
5) Operating temperature : 0 ~ 40℃
6) Temperature compensation : Necessary (0 ~ 15℃) (See "TEMPERATURE CORRECTION TABLE")
7) Reading : Direct reading from the scale calibrated by 2 pump strokes
8) Colour change : Greenish yellow → Pink

2. RELATIVE STANDARD DEVIATION

RSD-low : 10% RSD-mid. : 10% RSD-high : 10%

3. CHEMICAL REACTION

By decomposing with an Oxidizer, Hydrogen chlorine is produced and PH indicator is discoloured.

$CH_2 = CHCl + CrO_3 + H_2SO_4 \rightarrow HCl$

4. CALIBRATION OF THE TUBE

GAS CHROMATOGRAPHY

5. INTERFERENCE AND CROSS SENSITIVITY

Substance	Interference	ppm	Coexistence
Acetylene		1%	Lower readings are given.
Ethylene FIG.1		300	〃
Hydrogen chloride		200	Higher readings are given.
Chlorine	Similar stain is produced.	10 × Vinyl chloride conc.	〃

(NOTE)

In case of 1 or 4 pump strokes, following formula is available for the actual concentration.

Actual concentration = Temperature corrected value × 2/Number of strokes

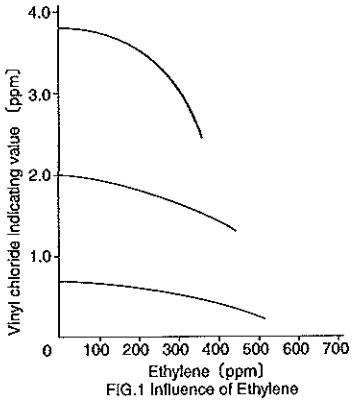


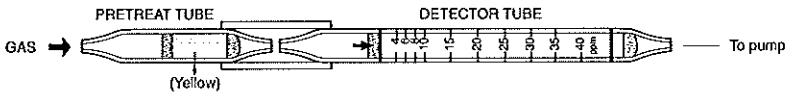
FIG.1 Influence of Ethylene

TEMPERATURE CORRECTION TABLE

Scale Readings (ppm)	True Concentration (ppm)			
	0℃ (32°F)	5℃ (41°F)	10℃ (50°F)	15~40℃ (59°F)(104°F)
6.0	10.0	8.2	7.0	6.0
5.0	8.2	6.8	5.7	5.0
4.0	6.7	5.5	4.7	4.0
3.0	4.9	4.1	3.5	3.0
2.0	3.3	2.7	2.3	2.0
1.0	1.6	1.3	1.2	1.0

Tube No.
176S

METHYL IODIDE



1. PERFORMANCE

1) Measuring range : 4-40 ppm 2-20 ppm
Number of pump strokes 2 (200mℓ) 4 (400mℓ)
2) Sampling time : 4 minutes/2 pump strokes
3) Detectable limit : 0.5 ppm (400mℓ)
4) Shelf life : 8 months
5) Operating temperature : 10 ~ 40℃
6) Temperature compensation : Necessary (See "TEMPERATURE CORRECTION TABLE")
7) Reading : Direct reading from the scale calibrated by 2 pump strokes
8) Colour change : White → Grey

2. RELATIVE STANDARD DEVIATION

RSD-low : 10% RSD-mid. : 10% RSD-high : 10%

3. CHEMICAL REACTION

Iodine pentoxide is reduced.

$$CH_3I + I_2O_5 + H_2SO_4 \rightarrow I_2 + CO_2 + H_2O$$

4. CALIBRATION OF THE TUBE

GAS CHROMATOGRAPHY

5. INTERFERENCE AND CROSS SENSITIVITY

Substance	Interference	ppm	Coexistence
Acetone	Similar stain is produced.	700	Higher readings are given.
Hydrogen sulphide FIG.1	〃	7	〃
Hexane FIG.2	〃	500	〃
Benzene		2	Lower readings are given.
Toluene		2	〃
Xylene		2	〃
Halogenated hydrocarbons			Double-layer stain is produced and accurate readings are affected.

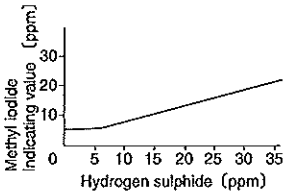


FIG.1 Influence of Hydrogen sulphide

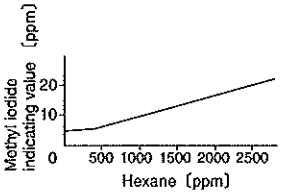


FIG.2 Influence of Hexane

TEMPERATURE CORRECTION TABLE

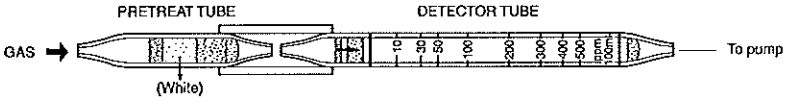
Scale Readings (ppm)	True Concentration (ppm)				
	0℃ (32°F)	10℃ (50°F)	20℃ (68°F)	30℃ (86°F)	40℃ (104°F)
40	—	—	40	46	52
35	—	52	35	42	49
30	54	39	30	37	44
25	37	27	25	25	23
20	30	22	20	23	30
15	24	17	15	17	24
10	17	11	10	12	17
5	10	5	5	5	10

(NOTE)

In case of 4 pump strokes, following formula is available for the actual concentration.
Actual concentration = 1/2 × Tmperature corrected value

Tube No.
194S

1,3-DICHLOROPROPANE



1. PERFORMANCE

1) Measuring range	: 10-500 ppm
Number of pump strokes	1 (100mℓ)
2) Sampling time	: 1.5 minutes/1 pump stroke
3) Detectable limit	: 1 ppm
4) Shelf life	: 1 year (Necessary to store in a refrigerated place ; 0 ~ 10 ℃)
5) Operating temperature	: 0 ~ 40 ℃
6) Temperature compensation	: Necessary (See "TEMPERATURE CORRECTION TABLE")
7) Reading	: Direct reading from the scale calibrated by 1 pump stroke
8) Colour change	: White → Orange

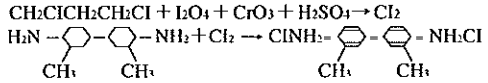
2. RELATIVE STANDARD DEVIATION

RSD-low : 15 % RSD-mid. : 15 % RSD-high : 10 %

3. CHEMICAL REACTION

By decomposing with an Oxidizer, chlorine is produced. Yellowish Orthoquinone is produced by reacting between this Chlorine and *o*-Toulidine.

$$CH_2ClCH_2CH_2Cl + I_2O_4 + CrO_3 + H_2SO_4 \rightarrow Cl_2$$



4. CALIBRATION OF THE TUBE

GAS CHROMATOGRAPHY

5. INTERFERENCE AND CROSS SENSITIVITY

Substance	Interference	Coexistence
Alcohols	The accuracy of readings is not affected.	The accuracy of readings is not affected.
Esters	〃	〃
Aromatic hydrocarbons	〃	〃
Aliphatic hydrocarbons FIG.1	〃	〃
Halogenated hydrocarbons FIG.2	Similar stain is produced.	Higher readings are given.

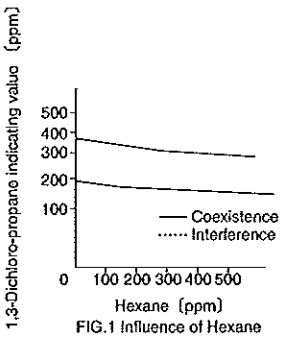


FIG.1 Influence of Hexane

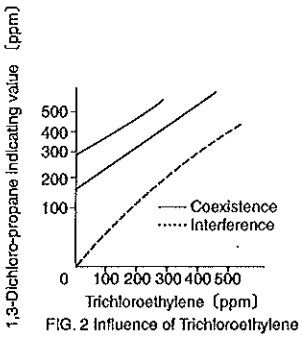


FIG. 2 Influence of Trichloroethylene

TEMPERATURE CORRECTION TABLE

Scale Readings (ppm)	True Concentration (ppm)				
	0℃ (32°F)	10℃ (50°F)	20℃ (68°F)	30℃ (86°F)	40℃ (104°F)
500	—	685	500	415	350
400	—	550	400	330	275
300	—	400	300	240	200
200	380	265	200	165	130
100	175	130	100	75	60
50	90	70	50	40	37
30	55	40	30	20	15
10	20	14	10	7	5

TELONE STATION/CARBON DRUM REPORT

MONTH _____/YR _____

Day	Start Time	PPM	End Time	Net Time	Product Ran	Leaks Detected	Inspected By	Changes in Drum, Pump, Antifreeze / Repairs / Comments
1 .						Yes / No		
2 .						Yes / No		
3 .						Yes / No		
4 .						Yes / No		
5 .						Yes / No		
6 .						Yes / No		
7 .						Yes / No		
8 .						Yes / No		
9 .						Yes / No		
10 .						Yes / No		
11 .						Yes / No		
12 .						Yes / No		
13 .						Yes / No		
14 .						Yes / No		
15 .						Yes / No		
16 .						Yes / No		
17 .						Yes / No		
18 .						Yes / No		
19 .						Yes / No		
20 .						Yes / No		
21 .						Yes / No		
22 .						Yes / No		
23 .						Yes / No		
24 .						Yes / No		
25 .						Yes / No		
26 .						Yes / No		
27 .						Yes / No		
28 .						Yes / No		
29 .						Yes / No		
30 .						Yes / No		
31 .						Yes / No		
_____	# of Days		Month Total Time					

Revised: 1/12/2014

Barney's Pump Material Recovery Report

Month _____/Yr_____

PIG SER. #		Start Weight	Start Time	Temp Below 38°F	End Weight	End Time	Net Pounds	Net Time	Mix	Total Production	%	Leaks Detected	Inspected By	Oil Change / Down Time / Repairs / Comments
	1 .			Yes / No								Yes / No		
	2 .			Yes / No								Yes / No		
	3 .			Yes / No								Yes / No		
	4 .			Yes / No								Yes / No		
	5 .			Yes / No								Yes / No		
	6 .			Yes / No								Yes / No		
	7 .			Yes / No								Yes / No		
	8 .			Yes / No								Yes / No		
	9 .			Yes / No								Yes / No		
	10 .			Yes / No								Yes / No		
	11 .			Yes / No								Yes / No		
	12 .			Yes / No								Yes / No		
	13 .			Yes / No								Yes / No		
	14 .			Yes / No								Yes / No		
	15 .			Yes / No								Yes / No		
	16 .			Yes / No								Yes / No		
	17 .			Yes / No								Yes / No		
	18 .			Yes / No								Yes / No		
	19 .			Yes / No								Yes / No		
	20 .			Yes / No								Yes / No		
	21 .			Yes / No								Yes / No		
	22 .			Yes / No								Yes / No		
	23 .			Yes / No								Yes / No		
	24 .			Yes / No								Yes / No		
	25 .			Yes / No								Yes / No		
	26 .			Yes / No								Yes / No		
	27 .			Yes / No								Yes / No		
	28 .			Yes / No								Yes / No		
	29 .			Yes / No								Yes / No		
	30 .			Yes / No								Yes / No		
	31 .			Yes / No								Yes / No		
# of Days					Month Totals									