A-92-45
II-A-9

United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park, NC 27711

EPA-453/R-95-003a
March 1995

Air

EPA

ENVIRONMENTAL
PROTECTION
AGENCY
DALLAS, TEXAS
LIBRARY

APR 1 2 1995

Hazardous Air Pollutant Emissions from Process Units in the Thermoplastics Manufacturing Industry--

Supplementary Information Document for Proposed Standards

NESHAP

EPA-453/R-95-003a

Hazardous Air Pollutant Emissions From Process Units in the Thermoplastics Manufacturing Industry--

Supplementary Information Document for Proposed Standards

Emission Standards Division

U.S. Environmental Protection Agency
Office of Air And Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

March 1995

DISCLAIMER

This Report has been reviewed by the Emission Standards Division of the Office of Air Quality Planning and Standards, EPA, and approved for publication. Mention of trade names or commercial products is not intended to constitute endorsement or recommendation for use.

ENVIRONMENTAL PROTECTION AGENCY

Hazardous Air Pollutant Emissions from Process Units in the Thermoplastics Manufacturing Industry -- Supplementary Information Document for Proposed Standards

1. The standards regulate organic hazardous air pollutant (HAP) emissions from the production of acrylonitrile butadiene styrene (ABS) resin, styrene acrylonitrile (SAN) resin, methyl methacrylate acrylonitrile butadiene styrene (MABS) resin, methyl methacrylate butadiene styrene (MBS) resin, polystyrene resin, poly(ethylene terephthalate) (PET) resin, and nitrile resin. Only those thermoplastic product process units that are part of major sources under section 112(d) of the Clean Air Act (Act) will be regulated.

2. For additional information contact:

Mr. Leslie Evans
Organic Chemicals Group
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711
Telephone: (919) 541-5410

3. Paper copies of this document may obtained from:

U.S. Environmental Protection Agency Library (MD-36)
Research Triangle Park, NC 27711
Telephone: (919) 541-2777

National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, VA 22161
Telephone: (703) 487-4650

OVERVIEW

This Supplementary Information Document (SID) contains memoranda providing rationale and information used in developing the Polymers and Resins Group IV Thermoplastics proposal package. These memoranda were written by Pacific Environmental Services, Inc. under contract to the U. S. Environmental Protection Agency (EPA). The data and information contained in these memoranda were obtained through literature searches, industry meetings, plant visits, and replies to section 114 letters sent to industry.

The memoranda included in this SID are referred to in the Basis and Purpose Document and in the preamble to the proposed rule. These memoranda were compiled into this single document to allow interested parties more convenient access to this information. The memoranda included herein are also available from the docket (Docket A-92-45).

The memoranda included in this SID are listed below along with their document numbers.

Document No.	Description
II-B-13	P. Dautenhahn, PES, to L. Evans, EPA:OAQPS. December 29, 1993. Summary of Capture and Control Devices and Pollution Prevention Technologies. 41 pages.
II-B-16	K. Meardon, PES, to L. Evans, EPA: OAQPS. July 21, 1994. Collocation of Group IV Resins Facilities. 5 pages.
II-B-19	K. Meardon, PES, to Group IV Resins Docket No. A-92-45. December 21, 1994. Estimated New Growth for Group IV Resins Sources. 9 pages.

Document No.	Description
II-B-20	B, King, PES, to L. Evans, EPA:OAQPS. March 22, 1995. Process Vents Levels of Control for Methyl Methacrylate Butadiene Styrene (MBS) Sources - New Level of Control More Stringent than Existing Level of Control. 3 pages.
II-B-21	B. King, PES, to Group IV Resins Docket No. A-92-45. March 22, 1995. Process Vent MACT Floors Considered More Stringent than the Hazardous Organic NESHAP (HON) and Batch Processes Alternative Control Techniques (ACT). 8 pages.
II-B-22	B. King, PES, to L. Evans, EPA:OAQPS. March 24, 1995. Methodology for Estimation of Preliminary Monitoring, Recordkeeping, and Reporting Costs for the Economic Impact Analysis for the Polymers and Resins IV NESHAP.
II-B-23	B. King, PES, to Group IV Resins Docket No. A-92-45. March 24, 1995. Storage Tank MACT Floors Considered More Stringent than the Hazardous Organic NESHAP (HON).
II-B-24	B. King, PES, to L. Evans, EPA:OAQPS. March 24, 1995. Methodology for Estimation of Secondary Environmental Impacts.
II-B-25	B. King, PES, to L. Evans, EPA:OAQPS. March 24, 1995. Baseline Emissions Estimates for the Group IV Thermoplastics.
II-B-26	B. King, PES, to L. Evans, EPA:OAQPS. March 24, 1995. Methodology for Extrapolation of Impacts for Facilities Without Sufficient Data.
II-B-27	B. King, PES, to L. Evans, EPA:OAQPS. March 24, 1995. Summary of Cost, Emission Reduction, and Energy Impacts for Group IV Resins Sources.

Document No.	Description
II-B-28	B. King, PES, to Group IV Resins Docket No. A-92-45. March 24, 1995. MACT Floor Analysis and Development of Regulatory Alternatives for Wastewater Operations, Storage Vessels, Process Vents, and Process Contact Cooling Towers .
II-B-29	K. Meardon, PES, to Group IV Resins Docket No. A-92-45. March 24, 1995. Determination of MACT Floors for Equipment Leaks.

II-B-13

PACIFIC ENVIRONMENTAL SERVICES, INC.

Central Park West
5001 South Miami Boulevard
PO Box 12077
Research Triangle Park, NC 27709-2077
(919) 941-0333 FAX (919) 941-0234

MEMORANDUM

TO: Les Evans
U. S. Environmental Protection Agency (EPA)

FROM: Pam Dautenhahn
Pacific Environmental Services, Inc. (PES)

DATE: December 29, 1993

SUBJECT: Summary of Capture and Control Devices and Pollution Prevention Technologies

The purpose of this memo is to summarize the capture and control devices and pollution prevention technologies that have been provided in the Section 114 questionnaire and information collection request (ICR) responses for the polymers and resins in the Group IV national emission standard for hazardous air pollutants (NESHAP).

PES has reviewed the answers to the optional questions, the information provided in the Section 114 questionnaires for control devices, the information given in Table 4 of the ICR, and any additional information provided in the clarification responses. This information was used to compile the information given in Attachments A and B to this memo. Attachment A provides information by facility on control devices and pollution prevention technologies used by the industry to control emissions from storage, process vents, wastewater, and waste; Attachment B provides information on control programs for equipment leaks. The following discussion gives an overall summary of the controls being used.

Tables 1 through 3 provide a breakdown of the information on controls by emission type and type of control obtained on control technologies. Table 1 shows the number of facilities that use some type of control device during their polymer manufacturing process(es). Table 2 gives the number of facilities that use a specific type of control device. Table 3 shows the types of control devices that are used in each manufacturing area.

STYRENE-BASED POLYMERS SUMMARY

Storage Tank Controls

The information in the attachment shows that approximately 26 out of 45 styrene-based resin facilities control their storage tank emissions to some degree. Some facilities control all of their storage tanks and others control only specific storage tanks. Some facilities identified the type of tank, such as fixed roof, floating roof, or pressurized tanks,

TABLE 1. Number of Facilities Having Some Capture and/or Control for Each of the Emission Types

Polymer Type	Storage	Process Vents	Wastewater	Waste	Equipment Leaks
Styrene-based Polymers	26	43	9	5	3
PET	7	7	1	1	0

TABLE 2. Number of Facilities Using Each Type of Control

Polymer Type	Condenser	Scrubber	Carbon Adsorber	Catalytic Incinerator	Thermal Incinerator/Boiler	Flare
Styrene-based Polymers	32	20	10	2	26	1
PET	4	3	0	1	4	0

TABLE 3. Type of Control Devices Used for Each Emission Type

Type of Control Device	Storage	Process Vents	Wastewater	Waste	Equipment Leaks[a]
Condenser	12	28	0	0	0
Scrubber	6	16	1	0	0
Carbon Adsorber	7	3	0	0	1
Catalytic Incinerator	0	3	0	0	0
Thermal Incinerator	6	20	1	3	0
Flare	0	1	0	0	1

[a] Note: At least one other facility is sending equipment leaks to a control device; however, the specific control device was not given, but is believed to be an incinerator.

being used for storage and others did not. The specific type of tank is generally not identified in the attachment.

A few facilities use vapor return systems to the tank trucks when loading styrene into the storage tanks to control working loss emissions. Several control technologies are being used to reduce the breathing emissions from the styrene storage tanks. These technologies include surface condensers, refrigeration systems, carbon adsorption systems, and industrial boilers. The main purpose of most of the condensers is to keep the storage tanks at a specific temperature, which in many cases reduces the breathing losses from the storage tanks. In the case of the industrial boilers, these boilers are generally being used to control process emissions with the raw material storage emissions being a minor addition.

Several control technologies are also being used on the storage of the other raw materials. Carbon adsorption systems are being used on methyl methacrylate, ethyl acrylate, ethylbenzene, and recycle tanks. Horizontal and pressurized storage tanks are being used on butadiene storage with some tanks being further controlled with surface condensers. One facility uses a steam-assisted flare on the emissions from butadiene bullet and sphere type storage tanks. An air-assisted flare is also used on butadiene storage, unloading, and sampling. Acrylonitrile storage tanks tend to be pressurized and vapor balancing is also used when loading acrylonitrile. Many acrylonitrile tanks that are not pressurized tend to have floating roofs. One facility has a double-sealed floating roof on acrylonitrile that results in no emissions. Those facilities that use hydrochloric acid in their process use a scrubber to control the emissions from the storage of the acid.

Process Controls

Approximately 44 styrene-based facilities capture and/or control some of their process emissions in one way or the other. Several facilities have made improvements in their processes to increase conversion of the monomer and thus reduce monomer vapor emissions. In many cases, material recovery processes are used to recover the unconverted monomer and return it to storage for use in the process at another time.

Thermal incineration is used to control emissions from the reactors in some cases. One facility collects all of the process emissions and sends them to a thermal incinerator for destruction. Some facilities combine many of the emission points and send them to a burner or incinerator. Steam-assisted flares are used at some facilities on various emission sources, such as butadiene purification, which involves inhibitor stripping, reactors, and knock-out drums.

Some facilities use scrubbers or mist demisters on their extrusion or die head systems. Electrostatic precipitators are also commonly used on the die head/extrusion systems.

However, the electrostatic precipitators and mist demisters are designed to remove oil, mist, smoke, and oligomers from a process area rather than significant hazardous air pollutant (HAP) emissions.

Many processes have surface condensers on the reactors and/or the devolatilizers. However, in general, the condensers represent an integral part of the process rather than a control device. Some facilities use condensers followed by carbon adsorption on the reactors. Liquid waste of monomer is also used in some cases as the fuel for burners used to control the air emissions.

Wastewater Controls

Although very few facilities reported any detailed information about wastewater generation and its air emissions, some did provide information and actually control the emissions from the wastewater. One controls the emissions by collecting the emissions from the wastewater sump along with the process emissions where they are sent to a thermal incinerator. A few facilities collect the wastewater and send it through a carbon filter system before dumping into the storm drain. Another facility hard pipes the wastewater into an enclosed biological system where the air emissions from the system are treated by carbon adsorption. Many facilities have a wastewater treatment system, but do not control the air emissions occurring during treatment. Some facilities have covered manhole systems to the treatment facility. Some facilities do not have any treatment system, but send the water to a neighboring facility's treatment or to a industrial complex wastewater treatment system.

Waste Controls

Waste is reported even less frequently than wastewater. However, some liquid styrene waste that is produced is sent to boilers as fuel, recycled, or collected and shipped off-site for incineration.

Equipment Leak Controls

Most facilities have an equipment leak control program. Only a few facilities stated that they do not have any equipment leak control programs.

Based on the information provided, there is a wide range of programs being used to control equipment leak emissions. Most of the programs include those that are similar to the CTG, NSPS, and HON equipment leak control programs. At least two programs target a specific leak frequency for most of the components, and one program targets "no evidence of leaks." One facility identified the use of continuous area monitors for the detection of acrylonitrile and styrene with a leak detection level of 2 ppm.

Some facilities apply their program depending on the HAP in the line (e.g., applies only to those in acrylonitrile service). Some facilities vary the monitoring period according to the particular HAP (e.g., monthly for butadiene, quarterly for acrylonitrile). Still others may vary the leak definition depending on the component or HAP. None of the facilities specifically indicated that components in heavy liquid service were part of their programs.

The following paragraphs summarize the various leak equipment control programs that are similar to the CTG, NSPS, and HON type programs by component type. Following these paragraphs, the other two types of programs are discussed.

CTG, NSPS, HON-type Control Programs

Valves, gas service. Most facilities monitor valves in gas service either on a monthly basis or a quarterly basis. The most common leak definition is 10,000 ppm, although 1,000 ppm is used fairly frequently. Many of the facilities noted that they are in the "skip period" for monitoring (which allows them to monitor on a less frequent period) due to the low level of leakers (i.e., less than 2 percent leaking). Other reported monitoring periods included semi-annual and annual, and other leak definitions used included 100 and 500 ppm.

Valves, light liquid service. The same basic monitoring frequency and leak definitions used for valves in gas service are also used for valves in light liquid service. Some facilities use sealless valves as a control.

Pumps, light liquid service. As for valves, most facilities reported either monthly or quarterly monitoring of pumps in light liquid service. Except for a few instances, the monitoring period used for valves and pumps were the same. Many facilities also noted weekly visual inspections of pumps. A number of facilities reported the use of pumps with double mechanical seals and the use of sealless pumps. Usually these pumps represented a portion of all the pumps in use at the facility. The leak definition was usually the same as that used for valves, and ranged from 100 ppm to 10,000 ppm.

Pressure relief devices. The types of controls reported for pressure relief devices were generally spread over several types. A number of facilities identified "no detectable emissions" (leak definition = 500 ppm) as the standard being complied with. Many identified in-line rupture disks. Others noted a more typically monitoring of the PRD with the leak definition varying among facilities. Two facilities indicated that some of the PRDs were tied into a control device (a flare in one instance and possibly a thermal incinerator in the other instance). A few facilities appear not to provide any control program.

Open-ended lines. Almost without fail, all of the facilities that reported open-ended lines indicated that they all were capped or similarly controlled. Only in a few instances did it appear that some OELs were uncontrolled at facilities that had equipment leak control programs.

Compressors. Most facilities that reported the presence of compressors indicated the use of barrier fluids as the control technique. A few noted that "if seen leaking, they are fixed" as the level of control. A few others noted a monitoring program (e.g., quarterly or annually with a leak definition of 10,000 ppm). In one instance, a facility indicated that a closed purge system was being used to control emissions. Several facilities noted that their compressors were under vacuum, which would exempt them from an equipment leak control program.

Sampling Connections. Many of the facilities that reported the presence of sampling connections indicated the use of a closed purge system. Many others indicated no control. (Some companies reported the use of caps, etc., and/or monitoring but these controls are associated with the sampling connections as an open-ended lines, and are not controls for the actual sampling.) One facility indicated that three of the sampling connections are hooked into a carbon bed adsorber, but no control efficiency was identified because, according to the company, the carbon beds are used for odor control.

Flanges and other connectors. About one-half of the facilities indicated that they monitored flanges and other connectors, while the other half indicated no control. For those that did monitor, the monitoring period included monthly, quarterly, and annually. Leak definitions also ranged widely, from as low as 100 ppm up to 10,000 ppm. One company reported a policy of "inspect as suspect" of a leak. Another company also pointed out specifically that they had eliminated a large number of flanges by incorporating welded joints wherever possible.

Other Programs

At least two facilities implement a program whose goal is to maintain less than 0.5 percent leakers from valves (leak definition of 10,000 ppm) and less than 1 percent leakers (leak definition of 10,000 ppm) from pumps, pressure relief devices, compressors, sampling connections, and flanges and other connectors.

One facility has a similar program where the goal is to maintain less than 2 percent leakers with a leak definition of 10,000 ppm.

PET POLYMER SUMMARY

Storage Tank Controls

The information from the questionnaires and clarification responses shows that approximately seven PET facilities control or capture any of their storage tank emissions. Venturi scrubbers and one other type of scrubber are used on storage tanks at three of the facilities. The scrubbers are used on tanks containing a variety of materials: ethylene glycol, DMT, methanol and some unspecified raw materials (additives or catalysts). Condensers are used on storage tanks at the other four PET facilities. A surface condenser is used at one facility on the raw material storage tanks and a heat exchanger is used on the tank farm. The condensers used at two other facilities are either for by-product storage or recycled/purified material storage. One other facility uses a condenser on their methanol storage and a slot hood during catalyst handling. In general, the condensers on storage tanks are used for temperature control, and although they may reduce breathing losses from the tank, their primary function is not as an emissions control device.

Process Controls

The information shows that only seven of the 22 PET facilities reported any type of capture and/or control devices on their process vents. Various types of condensers are used at many PET facilities. In many instances the condensers that are used in a PET manufacturing process are an inherent part of the process and not designed for use as control devices. For this reason, it is often difficult to determine if the condenser information provided in the questionnaire responses is applicable as control technologies. For example, one facility uses a number of barometric condensers, many in series, on their condenser and reactor jets. These condensers may have been added to reduce emissions from the process, but they may also be part of an elaborate recovery system. Another facility uses a surface condenser on a vacuum system in their TPA continuous process. Condensers are used during the esterification process at one facility. One other facility also uses condensers on their esterification process and on a vacuum pump. A facility that uses a DMT continuous process to produce PET has a heat exchanger on the ethylene glycol refining columns that are used for ethylene glycol recovery/purification.

One of two types of incineration (either thermal or catalytic) is used at four PET facilities. One facility uses thermal incineration on preheater surge bins, reactors, seal tanks, and a knock-out tank. Many of the streams at this facility are combined and vent to the same incinerator. Another facility uses both thermal and catalytic incineration. Thermal incineration is used at this facility on the refining and vacuum systems on one of their process lines. On another of their process lines, this same facility uses catalytic incineration during the reaction and drying steps of a solid state process. A third facility uses thermal incineration on their organic stripper column, and the fourth facility uses a thermal incinerator for their reactor vents, vacuum pump, and crystallizer/cyclones.

Three PET facilities use scrubbers on their processes. One facility uses two types of scrubbers: packed bed scrubbers for refining, vacuum, reaction and drying systems on two of their process lines, and a venturi scrubber on the reaction and drying steps on another line. One facility produces PET using three different types of processes and all three processes use scrubbers. The continuous TPA process at this facility uses scrubbers on distillation and vacuum systems in addition to on the solid state reactor. During the DMT batch operation, scrubbers are used on the reactor, ethylene glycol recovery and distillation, and during sludge trailer loading. The DMT continuous process at this same facility uses scrubbers on methanol recovery, vacuum, reactor, and sludge handling units. The third facility uses a glycol scrubber on the esterification process.

One facility uses a slot hood on their ethylene glycol process tanks to capture the emissions.

Wastewater Controls

Although many PET facilities have on-site wastewater treatment plants, only one facility reported any specific control technologies for wastewater. This facility provided information on their dioxane recovery as an emissions reduction project. Process wastewater from various production areas at the facility is collected and fed to a distillation column. The overheads from the distillation column are fed to a thermal oxidation unit that removes 99 percent of the combustible materials.

As part of an emissions reduction program, one other facility has implemented changes to reduce the amount of ethylene glycol released from the process cooling water in the cooling towers. This reduction of ethylene glycol has been accomplished by maximizing the flow of the process water to the glycol distillation column, replacing the cooling tower fill which increases the tower efficiency, and allowing the distillation column to operate continuously during the summer. These changes have decreased the ethylene glycol present in the cooling water by approximately 7.5 percent.

Waste Controls

Only one PET facility reported any type of control for waste handling. This facility uses a scrubber to control the emissions during sludge or waste handling for their DMT batch and DMT continuous processes. Another facility uses two wall fans in their waste handling area for ventilation.

Equipment Leak Controls

Only one of the facilities reported a LDAR program for equipment leaks based on the traditional programs identified in the various NSPS/NESHAP. At this facility, the program, which is currently being implemented at only one process line, is based on the NSPS, where valves and pumps are monitored monthly with a leak definition of 10,000 ppm. This facility stated that all new lines will have a LDAR monitoring program, and that the site is undergoing a major effort to begin compliance efforts for the proposed SOCMI HON.

One other facility noted that all pressure relief devices have rupture disks.

At least four facilities noted that their "LDAR" programs are based on repairing as quickly as possible all visually detected leaks. One of these facilities stated that the main emphasis of their LDAR program is to seal air leaks into the process rather than prevent emissions to the atmosphere. Since it appears to be common maintenance practice, many of the PET facilities may not have reported the repair of all visually detected leaks as a "LDAR" program.

ATTACHMENT A

SUMMARY OF CONTROL DEVICES AND POLLUTION PREVENTION TECHNOLOGIES

The following sections summarize the current technologies being used by the different companies for the processes used in the manufacturing of the polymers and resins in Group IV. The technologies are given by each area of the process (i.e., storage, process, wastewater, and waste).

STORAGE

Facility AR: ABS	Uses double-seal floating roofs on the acrylonitrile storage tanks.
Facility Y: ABS & SAN	ABS: Uses a packed tower scrubber on monomer recovery the monomer recovery system.
Facility AA: ABS, SAN, PS	Uses a steam-assisted flare on the butadiene bullet and sphere tanks. Uses a boiler on the rubber additive tanks and an oxidizer on the rubber slurry tanks.
Facility AM: ABS, SAN, & PS	Uses process heaters (thermal incineration) on some storage tanks.
Facility AL: ABS & PS	Uses an industrial boiler on ethylbenzene storage tanks. Uses vapor balancing and pressure vessels with acrylonitrile storage.
Facility AN: ABS & PS	Uses a surface condenser and burner on tanks containing a mixture of HAP's. Uses surface condensers on styrene storage tanks. Uses a burner on a storage tank of ethylbenzene and styrene and a tank of ethylbenzene. Uses vapor balancing on acrylonitrile storage tanks.
Facility AQ: ABS & PS	Uses an industrial boiler on emissions from some raw material and recycle storage tanks.
Facility A: PS	Has a vapor transfer system on the styrene storage tank to the delivery truck.
	Has a carbon filter to capture the VOC's due to breathing from the styrene storage tank.
Facility B: PS	Has underground styrene storage tanks with each being equipped with a vent line to a single carbon canister for adsorption of ethylbenzene/styrene emission vapors.
	Has another underground tank which is a split tank. Each compartment is equipped with a vent line connected to a single carbon canister for adsorption of ethylbenzene/styrene emission vapors.

Facility K: PS	Has a vapor recovery system on the styrene storage tanks to the tank trucks.
Facility P: PS	Continuous PS: Uses a surface condenser on the styrene storage and day tanks. Use a surface condenser on the ethylbenzene storage tank.
	Suspension PS: Uses a surface condenser on the raw material storage tanks.
Facility AE: PS	Uses vapor return on the styrene storage tanks and the product storage silos.
Facility AJ: PS	Uses a refrigeration system on styrene storage tanks.
Facility S: PS & EPS	Continuous PS: Uses a surface condenser on ethylbenzene storage, recycle storage, and purge tank. Use a surface condenser on other raw material storage tanks.
	EPS and Batch PS: Uses vapor return during styrene loading/unloading. Uses a surface condenser on styrene storage.
Facility AF: PS & EPS	Uses a venturi scrubber on the acid storage tanks.
Facility AG: EPS	Uses carbon adsorption on the styrene storage tanks.
Facility Q: EPS	Uses a surface condenser on the styrene storage tank.
Facility R: EPS	Uses a surface condenser on some of the raw material storage tanks.
Facility AT: PS & ASA/AMSAN	Uses fixed carbon beds on the storage tanks. On a couple of storage tanks the facility also uses a refrigerated brine condenser.
	ASA/AMSAN: Uses a packed bed scrubber on acrylonitrile storage (also surface condenser), alpha-methyl styrene storage (also surface condenser), mixture of acrylonitrile and styrene (also thermal afterburner), mixture of acrylonitrile, styrene, and alpha-methyl styrene (also thermal afterburner).
Facility AS: SAN	Uses a refrigerated surface condenser on the styrene and methylmethacrylate storage tanks to eliminate breathing losses. Uses the process incinerator on the methlyethyl ketone storage tank.
Facility G: MBS	Uses carbon adsorption-canister type systems on styrene storage/unloading, methyl methacrylate storage, and ethyl acrylate storage tanks. Uses a sphere for butadiene storage

Facility T: MBS	Uses horizontal and pressurized storage tanks plus surface condensers on butadiene storage. Uses surface condensers on styrene and methylmethacrylate storage tanks. (Company does not consider the condensers as reducing emissions.) Uses a water spray scrubber on the hydrochloric acid storage tanks.
Facility AC: MBS	Uses a flare on the butadiene storage, unloading, and sampling. Uses a venturi scrubber on the acid storage tanks.
Facility W: NITRILE	Uses a fixed carbon bed on the recovered monomer tank.
Facility U: SAC	Has a carbon adsorption system with vapor return to the cargo tanks on the styrene and methyl methacrylate storage tanks.
Facility AK: SAC	Uses pressure/vacuum vents on all raw material storage tanks.
Facility AW: PET	Uses a venturi scrubber on ethylene glycol and DMT storage tanks.
Facility AX: PET	Uses a surface condenser on raw material storage and tank farm. Use heat exchanger (vent condenser) on tank farm.
Facility AY: PET	Uses a venturi scrubber on methanol storage.
Facility AZ: PET	Uses condensers on crude glycol storage obtained from process lines.
Facility BA: PET	Use condenser on by-product storage associated with continuous TPA process.
Facility BB: PET	Uses a scrubber on the raw material storage.
Facility BC: PET	Uses a slot hood on catalyst handling. Use a condenser on methanol storage.

PROCESS

Facility X: ABS	Uses a gas collection system to collect emission from each point of the process, with the emission discharges coming from enclosed pressurized process equipment. The collected gases are then sent to a thermal incinerator. Uses a surface condenser after the vacuum system on the reactor. Uses a surface condenser after the vacuum system associated with the thin film evaporator system.

Facility AR: ABS	Made a formulation change to increase conversion of monomers. Uses a packed absorption column on reactor system. Uses a catalytic incinerator for exhausts from absorber, latex treatment system, and resin dewatering rotary filter.
Facility AU: ABS & MABS	Replaced rotary dryer with fluid bed dryer. Has a fume burner (catalytic incinerator) on all vents in the process. Increased monomer conversion. Plans to phase out use of open top reactors.
Facility Y: ABS & SAN	ABS: Uses closed hoods on the extrusion purge bin and pellet dryer and a suspended hood on the extrusion pelletizer. Uses a steam assisted flare on a knockout drum and the charge/purge and strip tank associated with this drum. Uses a venturi scrubber on product drying-cyclone. Use a baghouse on product drying-rotary dryer. Uses a surface condenser on a rubber dissolver, initial polymer reactor, and on a suspension reactor. SAN: Uses a surface condenser on the reactor. Uses a baghouse on the rotary dry-dust collector.
Facility AA: PS, ABS, & SAN	ABS: Uses a thermal boiler on feedstock premixing tanks, rubber dissolvers, reactor charging, distillate recovery tanks, intermediate storage tank, final product cooling-cooler, final product storage and drying hold tanks, centrifuge, coagulation, product drying-high and low vacuum vent, fluid bed and rotary dryers, spent feedstock storage. Uses a steam assisted flare on the reactors, intermediate product cooling-cooler, intermediate storage tank. Uses a canopy hood on diehead/extruder stranding. Uses a vent scrubber on reactor-process equipment, recycled feedstock storage, and spent feedstock storage tank-rubber adds. Uses a fume scrubber and thermal oxidizer on feedstock storage tank-rubber slurry and product stranding-extruder. SAN: Uses a thermal boiler on feedstock premixing, feedstock recovery, reactor system, product hold tanks, and spent monomer storage tanks. Uses a canopy hood on die heads/extruder stranding. Polystyrene processes: Uses a canopy hood on the die heads. Uses thermal boiler on reactor-process equipment and spent feedstock storage tank.
Facility AM: ABS, SAN & PS	SAN: Uses a packed tower scrubber in the devolatilization area for material recovery. Uses a cyclone on finishing operations. ABS: Uses a packed absorption tower on the feed system. Uses a demister filter on devolatilization and pelletizing. PS: Uses process heaters (thermal incineration) as emission control devices on the majority of the process tanks and equipment.

Facility AL: ABS & PS	PS: Uses a condenser on part of the emissions from devolatilizer and pelletizer and use two condensers on the other part. Uses a thermal boiler on the condenser exhausts. Uses a demister element on the die.
	ABS: Uses condensers in the devolatilization and pelletizing areas. Uses an industrial boiler on the feed preparation and the condensers associated with the devolatilization and pelletizing areas. Uses a demister element on the die.
Facility AN: PS & ABS	PS: Uses a burner on the polymerization and devolatilization emissions. Uses a demister filter on pelletizing.
	ABS: Uses a burner on devolatilization. Uses a demister filter on pelletizing.
Facility AQ: PS & ABS	Uses process heater on exhausts from condenser off stripper and reactor and exhaust from feed preparation. Uses a demister on the die.
Facility A: PS	Has one process vent to the atmosphere, which is from the first stage reactor. The condensate from a process stripper is recycled to the ethylbenzene tank. Vapors from the tower in the continuous polystyrene process are recycled to the ethylbenzene tank. Vapors from the tower are recycled to the first stage reactor.
Facility B: PS	All vessels are vented into a vapor recovery unit. The vapor recovery unit consists of a 3 stage vapor condensing/recovery system. The temperature of the HAP saturated air is progressively lowered as the gaseous mixture passes through the three condensers. The condensate is then recycled back to the raw material storage tanks.
Facility C: PS	Uses thermal incineration on the emissions from the reactors.
Facility D: PS	Uses a surface condenser on the reactor and on the vacuum flashing and reactor condenser units. Has a central vacuum system followed by a recovery unit in which one solution from the recovery is sent to styrene and toluene storage. The other solution from the recovery is sent to off-site wastewater handling.
Facility E: PS	Some fugitives are captured in a building vent. Uses an exhaust duct manifold to all reactors. Uses condensers that are part of the devolatilization area, which is under vacuum.
Facility F: PS	Mass: A portion of ethylbenzene and styrene from the devolatilization area is recycled. The devolatilization system is operated under a vacuum. Has ceiling and wall fans throughout the process rooms. Has a canopy hood over the extruder die outlet.
	Suspension: Has a canopy hood over each reactor manway.

Facility I: PS	Has a condenser on their devolatilization step for one of their process lines. Has suspended hoods on the die heads.
Facility K: PS	Has a packed bed scrubber on their organic trap system. Has a countercurrent liquid spray scrubber on one of their extrusion baths. Has a mist coalescer condenser on a different extrusion bath.
Facility L: PS	Vapor streams are hard-piped and directed to process heaters for destruction. The process heater is fired on purged monomer.
Facility O: PS	Uses reverse osmosis treatment to reduce number of deionizer regenerations. Deionizer is used on the acid between storage and entering the mix tank.
Facility P: PS	Continuous PS: Uses a fume scrubber on the die heads. Uses surface condensers on the boiling reactor and the devolatilization system. Uses a surface condenser on the styrene mixture tank from devolatization and condensers before the spent tank. Suspension PS: Uses surface condensers on the prepolymerizer reactor and the suspension reactor.
Facility R: PS	Uses surface condensers on the polymerization reactors and the devolatilizers.
Facility S: PS	General Purpose PS: Uses a high energy ejector type scrubber on the extrusion die fume exhaust. Use a surface condenser on all of the reactors. Continuous High Impact PS: Uses a high energy ejector type scrubber on the granulation/pelletizer. Uses surface condensers on the prepolymerizer reactors and on the devolatilizers from reactors.
Facility Z: PS	Has a slot hood for each ventilation system.
Facility AB: PS	Information is confidential.
Facility AD: PS	Uses an electrostatic precipitator on extrusion. Has a vapor recovery system on processing.
Facility AE: PS	Uses an electrostatic precipitator on the die head extrusion cycle. Uses a surface condenser on devolatilization system. Uses a surface condenser on reactor and holding tank. Uses vapor recovery in each area.
Facility AH: PS	Uses a forced draft hood and an electrostatic precipitator on the die head/extruder quench system. Uses a surface condenser on the devolatilizer and the condensate recovery unit.

Facility AI: PS	Uses a forced draft hood and an electrostatic precipitator on the die head/extruder quench system. Uses a surface condenser on the reactor and the devolatilizer.
Facility AJ: PS	Uses a surface condenser on material recovery-devolatilization area. Use a demister vessel on a different devolatilization area. Rubber dissolver and feed tank are completely sealed and fully insulated. They are maintained under constant pressure.
Facility AO: PS	Uses a demisting element on die exhaust hoods for polymer dies and pelletizing. Uses lower temperature to reduce emissions from monomer recovery from monomer separation off reactor system.
Facility AP: PS	Uses a demister on the die vent.
Facility M: PS & EPS	Uses reverse osmosis treatment to reduce number of deionizer regenerations. Deionizer is used on the acid between storage and entering the mix tank.
Facility AF: PS & EPS	Uses a dedicated condenser on each polystyrene reactor vent. Uses a venturi scrubber on the expandable polystyrene wash kettle.
Facility AG: EPS	Uses carbon adsorption systems in addition to surface condensers on the reactors.
Facility AT: PS & ASA/AMSAN	PS: Emissions from vacuum system appear to have a brine condenser and an hydrotherm hot oil heater on them. Uses a carbon adsorption system on extruder, slurry drum, feed filters before extrusion, product kneaders before extrusion, and extrusion vents. ASA/AMSAN: Uses a packed bed scrubber and a thermal afterburner on reactor for ASA, reactor for AMSAN, water from vacuum jet vent condenser, water from suspension reactor, water from reactor for ASA, water from centrifuge, liquid from scrubber to reactor. Uses carbon adsorption on extruder and on dryer.
Facility AS: SAN	Improved vent condenser efficiency by increasing cooling capacity. Switched monomer service pumps to canned pumps. Increased purity of styrene monomer. Uses a thermal incinerator on the condensers used with the reactor and devolatilizer area. Uses a cyclone dust collector on dryer.
Facility G: MBS	Has a steam assisted flare on the butadiene purification-inhibitor stripping and on the graft and rubber reactors. Use pressure tanks with rupture disks for the monomer mix systems.
Facility T: MBS	Reaction conditions were changed to drive the reaction closer to completion. A natural gas fueled fire tube boiler is used on most of the exhausts from the process. The reactor waste gas enters the boiler through the burner in a separate fuel line.

Facility AC: MBS	Uses a venturi scrubber on reactor tanks and mix/feed tanks. Uses a no assist flare on the reactor. Use a gas-fired boiler on a gas-fired furnace on the dryer emissions.
Facility W: NITRILE	Uses vapor recovery on the process lines. Has a closed hood on each of the screening lines. Has a packed bed scrubber on each or the screening areas. Has a baghouse on a new fines dryer. Uses a thermal incineration on the vacuum pumps associated with the reactors-condensers from the process lines.
Facility U: SAC	Has water cooled condensers on the reactors which are considered part of the process. Has water cooled condensers ont he thin tanks which are considered part of the process. All vessels from this process feed into a tank which represents the final control device acts as an air cooled condensers. In addition, the facility is relatively new and has been designed to have a minimal amount of HAP material entering any waste stream.
Facility V: SAE & SAC	Has a packed bed scrubber on two reactors. Uses another packed bed scrubber on another reactor. Uses a surface condenser on the prefilters and a scrubber on the feed tanks. Uses surface condensers on the reactor systems and on the reactors and the strip tank. Has lowered the purge rates of he inert gas on the exhaust from one of the reactors and has decreased inert gas flow on one of the tanks.
Facility AK: SAC	Uses condensers on the reactors.
Facility AV: PET	Has a barometric condensers on condenser jets, and reactor jets and condensers. Some of the barometric condensers are used in series. Uses thermal incineration on four preheater surge bins. Uses thermal incineration on reactors and seal tanks from the process lines and one line from the knock-out tank.
Facility AX: PET	Uses venturi scrubbers on Line 1 vacuum systems. Uses thermal incineration on refining and vacuum systems on Line 2. Uses a packed bed scrubber on refining and vacuum systems on Line 3. Uses a packed bed scrubber on reaction and drying on Line 4. Uses catalytic incineration on reaction and drying on Line 5. Uses a venturi scrubber on reaction and drying on Line 6.
Facility BA: PET	Uses scrubbers on distillation, vacuum system, and solid state reactor associated with continuous TPA process. Uses condenser associated with continuous TPA process.
	DMT Batch: Uses scrubbers on gas-solid reactor, ethylene glycol recovery and distillation, and sludge trailer loading.

Facility BA: PET	DMT Continuous: Uses scrubbers on methanol recovery condenser, vacuum system, and ethylene glycol tanks. Uses heat exchanger on ethylene glycol refining columns. Uses a scrubber on the solid state reactor. Uses a scrubber on the ethylene glycol sludge handling.
Facility BC: PET	Uses a slot hood on the ethylene glycol process tanks. Uses a thermal incinerator on the organic stripper column.
Facility BD: PET	Uses condenser on the primary esterifiers and esterification process. Uses a glycol scrubber on the esterification process.
Facility BE: PET	Uses a condenser on the esterification process and vacuum pump. Maximized flow of process water to distillation column to reduce ethylene glycol emissions from the process cooling tower.
Facility BF: PET	Uses a thermal incinerator on the reactor vents, vacuum pump, and crystalizer/cyclones.

<u>WASTEWATER</u>

Facility X: ABS	Emissions from process water sump is sent to the gas collection system and then to the thermal incinerator.
Facility AM: ABS, SAN, & PS	Aqueous waste is transferred by truck to wastewater treatment facility.
Facility L: PS	Uses a carbon filter to treat wastewater.
Facility AB: PS	Uses a carbon filter to treat wastewater.
Facility AT: PS & ASA/AMSAN	Uses two packed towers on decanter. Uses two packed towers on all streams from ASA/AMSAN.
Facility AS: SAN	Collects wastewater and send off-site for disposal.
Facility T: MBS	Has covered pits and the wastewater is sent to an industrial wastewater complex for treatment.
Facility W: Nitrile	Has two wastewater stripper columns that can each process wastewater from either process line.
Facility AK: SAC	Uses a steam stripper after their adjustment tanks in their wastewater treatment system.
Facility BD: PET	Dioxane recovery project to reduce emissions from wastewater.

WASTE

Facility AM: ABS, SAN, & PS	Incinerates emissions from waste.
Facility AN: PS & ABS	Some waste is treated on-site by burning in a boiler. All other waste streams are packaged and shipped off-site for incineration.
Facility AS: SAN	Has some RCRA waste but stored in tanks with any emissions being incinerated.
Facility T: MBS	Collected waste monomer is sent off-site for disposal.
Facility U: SAC	Uses a condenser on a liquid waste stream.
Facility BE: PET	Uses wall fans in the wasted handling area.

Equipment Leaks

Facility AA: PS, ABS, & SAN	Upgraded equipment maintenance to reduce fugitive leaks in production area.
Facility AL: ABS & PS	Uses some sealless pumps and closed sample systems.
Facility AN: PS & ABS	Uses some sealless pumps.
Facility AQ: PS & ABS	Uses some sealless pumps.

ATTACHMENT B

SUMMARY OF LDAR PROGRAMS AT STYRENE-BASED RESIN FACILITIES

ABS - EQUIPMENT LEAKS : 12/29/93

FACILITY	CONTROLS?	
X	Monthly LDAR - AN only	Valves, Gas
	Monthly LDAR - AN only	Valves, LL
	--	Valves, HL
	Weekly vis, monthly LDAR - AN	Pumps, LL
	--	Pumps, HL
	No detectable emissions	PRDs
	Caps, etc.	OELs
	Barrier fluids, etc	Compressors
	Closed purge/vent	Sam. Conns.
	--	Flanges
	TOTALS	
Y	Monthly LDAR at 10000 ppm	Valves, Gas
	Monthly LDAR at 10000 ppm	Valves, LL
	--	Valves, HL
	Weekly vis, monthly LDAR at 10	Pumps, LL
	--	Pumps, HL
	No detectable emissions	PRDs
	Caps. etc	OELs
	Barrier fluids	Compressors
	Closed purge/vent	Sam. Conns.
	inspect as suspect	Flanges
	TOTALS	
Y	Monthly LDAR at 10000 ppm	Valves, Gas
	Monthly LDAR at 10000 ppm	Valves, LL
	--	Valves, HL
	Weekly vis, monthly LDAR	Pumps, LL
	--	Pumps, HL
	No detectable emissions; CVS	PRDs
	Caps. etc	OELs
	Barrier fluids	Compressors
	Closed purge/vent	Sam. Conns.
	inspect as suspect	Flanges
	None TOTALS	
AA	Monthly LDAR @1000 ppm LD	Valves, Gas
	Month/quart LDAR @1000 ppm LD	Valves, LL
	--	Valves, HL
	Month/quart. LDAR @ 1000 ppm L	Pumps, LL
	--	Pumps, HL
	No detectable emissions	PRDs
	Caps, etc.	OELs
	Barrier fluids, etc	Compressors
	Closed purge/vent	Sam. Conns.
	Annual at 10000 ppm LD	Flanges

		TOTALS
AA	Monthly LDAR @1000 ppm LD	Valves, Gas
	Month/quart LDAR @1000 ppm LD	Valves, LL
	--	Valves, HL
	Month/quart. LDAR @ 1000 ppm L	Pumps, LL
	--	Pumps, HL
	No detectable emissions	PRDs
	Caps, etc.	OELs
	Barrier fluids, etc	Compressors
	Closed purge/vent	Sam. Conns.
	Annual at 10000 ppm LD	Flanges
		TOTALS
AA	--	Valves, Gas
	Month/quart. LDAR @ 1000 ppm L	Valves, LL
	--	Valves, HL
	Month/quart. LDAR @ 1000 ppm L	Pumps, LL
	--	Pumps, HL
	No detectable emissions	PRDs
	Caps, etc.	OELs
	Barrier fluids, etc	Compressors
	Closed purge/vent	Sam. Conns.
	Annualy at 10000 ppm LD	Flanges
		TOTALS
AL	Quarterly LDAR at 10000	Valves, Gas
	Quarterly LDAR at 10000	Valves, LL
	--	Valves, HL
	Q LDAR at 10000; 12 sealless	Pumps, LL
	--	Pumps, HL
	6 RDI/RD; Q LDAR at 10000; aft	PRDs
	OLBs	OELs
	Quarterly LDAR at 10000	Compressors
	1 w/CSS; none	Sam. Conns.
	Sight, smell, sound	Flanges
		TOTALS
AM	--	Valves, Gas
	Q LDAR at 10000 ppm	Valves, LL
	--	Valves, HL
	Q LDAR at 10000 ppm	Pumps, LL
	--	Pumps, HL
	6 w/RDI; Q at 10000	PRDs
	OLBs etc	OELs
	--	Compressors
	--	Sam. Conns.
	Q LDAR at 10000 ppm	Flanges
		TOTALS

ABS - EQUIPMENT LEAKS : 12/29/93

AN	Quarterly LDAR at 1000 ppm	Valves, Gas
	Quarterly LDAR at 1000 ppm	Valves, LL
	--	Valves, HL
	19 sealless; quarterly LDAR at	Pumps, LL
	--	Pumps, HL
	6 with RDs; Quart LDAR at 200	PRDs
	OLBS; Q LDAR at 1000	OELs
	Under vacuum	Compressors
	OLBS; Q LDAR at 1000	Sam. Conns.
	Quarterly LDAR at 1000 ppm	Flanges
	TOTALS	
AQ	Quarterly LDAR at 10000	Valves, Gas
	Quarterly LDAR at 10000	Valves, LL
	--	Valves, HL
	5 sealless; wkly vis., Q LDAR	Pumps, LL
	--	Pumps, HL
	6 w/RDs; quarterly LDAR	PRDs
	OLBs	OELs
	--	Compressors
	Quarterly LDAR at 10000	Sam. Conns.
	--	Flanges
	TOTALS	
AU	--	Valves, Gas
	Quarterly LDAR at 10000, 12 se	Valves, LL
	--	Valves, HL
	Wkly inspcs; mnth LDAR -10000	Pumps, LL
	--	Pumps, HL
	RDIs, 19 to controls (98%)	PRDs
	All OLBs	OELs
	Weekly inspections	Compressors
	--	Sam. Conns.
	Annual inspections at 500	Flanges
	TOTALS	
AR	Monthly LDAR at 500 ppm (HON)	Valves, Gas
	Monthly LDAR at 500 ppm (HON)	Valves, LL
	--	Valves, HL
	Monthly LDAR at 500 ppm (HON)	Pumps, LL
	--	Pumps, HL
	--	PRDs
	Caps, etc.	OELs
	Closed purge (2 of the four)	Compressors
	--	Sam. Conns.
	Annual LDAR - at 500 ppm	Flanges
	TOTALS	
AM	40 LOT	Valves, Gas
	18 sealless	Valves, LL

--		Valves, HL
8 - DMS; 6 sealless		Pumps, LL
--		Pumps, HL
--		PRDs
OLBs		OELs
8 - DMS		Compressors
CVS for 3		Sam. Conns.
Eliminated about 5000		Flanges
	TOTALS	

FACILITY	CONTROLS?	
T	Wk vis., quart. LDAR at 10000	Valves, Gas
	Wk vis., quart. LDAR at 10000	Valves, LL
	--	Valves, HL
	Wk vis., quart. LDAR at 10000	Pumps, LL
	--	Pumps, HL
	RDIs	PRDs
	Caps, etc.	OELs
		Compressors
	DBVs	Sam. Conns.
	--	Flanges
	TOTALS	
G	Monthly LDAR at 100 ppm	Valves, Gas
	Monthly LDAR at 100 ppm	Valves, LL
	--	Valves, HL
	Monthly at 100 ppm	Pumps, LL
	--	Pumps, HL
	RDIs	PRDs
	caps etc	OELs
	Q LDAR at 100 ppm; barrier flu	Compressors
	Purge	Sam. Conns.
	Annual at 100 ppm	Flanges
	TOTALS	
AC	--	Valves, Gas
	--	Valves, LL
	--	Valves, HL
	--	Pumps, LL
	--	Pumps, HL
	RDIs on 6	PRDs
	--	OELs
	--	Compressors
	--	Sam. Conns.
	--	Flanges
	TOTALS	

NITRILE EQUIPMENT LEAKS - 12/29/93

CONTROLS?

--	Valves, Gas
Quarterly LDAR at 10000	Valves, LL
--	Valves, HL
Quarterly LDAR at 500	Pumps, LL
--	Pumps, HL
--	PRDs
--	OELs
--	Compressors
--	Sam. Conns.
Quarterly LDAR at 10000	Flanges
	TOTALS

POLYSTYRENE EQUIPMENT LEAKS - CONTINUOUS PLANTS

FACILITY	LDAR PROGRAM ?	COMPONENT
A	Quarterly LDAR at 10000	Valves, Gas
	Quarterly LDAR at 10000	Valves, LL
	--	Valves, HL
	Weekly vis, quarterly LDAR at 10000	Pumps, LL
	--	Pumps, HL
	Quarterly LDAR at 10000	PRDs
	Seal all	OELs
	If see leaking, fix	Compressors
	If see leaking, fix	Sam. Conns.
	If see leaking, fix	Flanges
A	Quarterly LDAR at 10000	Valves, Gas
	Quarterly LDAR at 10000	Valves, LL
	--	Valves, HL
	Weekly vis, quarterly LDAR at 10000	Pumps, LL
	--	Pumps, HL
	Quarterly LDAR at 10000	PRDs
	Seal all	OELs
	If see leaking, fix	Compressors
	If see leaking, fix	Sam. Conns.
	If see leaking, fix	Flanges
B	"no evidence of leaks"	Valves, Gas
	"no evidence of leaks"	Valves, LL
	--	Valves, HL
	"no evidence of leaks"	Pumps, LL
	--	Pumps, HL
	"no evidence of leaks"	PRDs
	Seal all	OELs
	If see leaking, fix	Compressors
	If see leaking, fix	Sam. Conns.
	"no evidence of leaks"	Flanges
D		Valves, Gas
		Valves, LL
		Valves, HL
		Pumps, LL
		Pumps, HL
		PRDs
		OELs
		Compressors
		Sam. Conns.
		Flanges

POLYSTYRENE EQUIPMENT LEAKS - CONTINUOUS PLANTS

FACILITY	LDAR PROGRAM ?	COMPONENT
I	Quarterly at 1,000 ppm	Valves, Gas
	Quarterly at 1,000 ppm	Valves, LL
	--	Valves, HL
	Weekly visual; monthly at 10000	Pumps, LL
	--	Pumps, HL
	quarterly at 1000 and per sight/smell/sound	PRDs
	OLBs	OELs
	barriers to emissions	Compressors
	--	Sam. Conns.
	fix if evidence of leaks	Flanges
P	Quarterly at 10,000 ppm	Valves, Gas
	Quarterly at 10,000 ppm	Valves, LL
	--	Valves, HL
	Weekly vis, monthly LDAR at 10000	Pumps, LL
	--	Pumps, HL
	no detectable emissions	PRDs
	OLBs	OELs
	barriers to emissions	Compressors
	closed purge/vent	Sam. Conns.
	annual at 10000	Flanges
R	Quarterly LDAR - 10000 ppm LD	Valves, Gas
	Quarterly LDAR - 10000 ppm LD	Valves, LL
	--	Valves, HL
	Monthly LDAR - 10000 ppm	Pumps, LL
	--	Pumps, HL
	Annual LDAR - 10000 ppm LD	PRDs
	Capped	OELs
	Annual LDAR - 10000 ppm LD	Compressors
	--	Sam. Conns.
	Annual LDAR - 10000 ppm LD	Flanges
S	Uncontrolled facility	Valves, Gas
		Valves, LL
		Valves, HL
		Pumps, LL
		Pumps, HL
		PRDs
		OELs
		Compressors
		Sam. Conns.
		Flanges

POLYSTYRENE EQUIPMENT LEAKS - CONTINUOUS PLANTS

FACILITY	LDAR PROGRAM ?	COMPONENT
L	--	Valves, Gas
	Monthly at 100 ppm	Valves, LL
	--	Valves, HL
	Monthly at 500 ppm	Pumps, LL
	--	Pumps, HL
	--	PRDs
	--	OELs
	--	Compressors
	--	Sam. Conns.
	Quarterly at 100 ppm	Flanges
L	--	Valves, Gas
	Monthly at 100 ppm	Valves, LL
	--	Valves, HL
	Monthly at 500 ppm	Pumps, LL
	--	Pumps, HL
	--	PRDs
	--	OELs
	--	Compressors
	--	Sam. Conns.
	Quarterly at 100 ppm	Flanges
K	--	Valves, Gas
	Monthly LDAR at 100 ppm	Valves, LL
	--	Valves, HL
	Monthly - pumps; quart. agitators at 100 pp	Pumps, LL
	--	Pumps, HL
	Quarterly LDAR at 10000	PRDs
	Seal all	OELs
	If see leaking, fix	Compressors
	If see leaking, fix	Sam. Conns.
	quarterly at 100 ppm	Flanges
K	Quarterly LDAR at 10000	Valves, Gas
	Quarterly LDAR at 10000	Valves, LL
	--	Valves, HL
	Weekly vis, quarterly LDAR at 10000	Pumps, LL
	--	Pumps, HL
	Quarterly LDAR at 10000	PRDs
	Seal all	OELs
	If see leaking, fix	Compressors
	If see leaking, fix	Sam. Conns.

POLYSTYRENE EQUIPMENT LEAKS - CONTINUOUS PLANTS

FACILITY	LDAR PROGRAM ?	COMPONENT
	quarterly at 100 ppm	Flanges
AA	--	Valves, Gas
	Monthly LDAR at 1000 ppm	Valves, LL
	--	Valves, HL
	Weekly vis, monthly LDAR at 1000	Pumps, LL
	--	Pumps, HL
	--	PRDs
	capped etc	OELs
	--	Compressors
	--	Sam. Conns.
	Annual at 10000 ppm	Flanges
AB	Quarterly LDAR at 10000	Valves, Gas
	Quarterly LDAR at 10000	Valves, LL
	--	Valves, HL
	Quarterly LDAR at 10000	Pumps, LL
	--	Pumps, HL
	Quarterly LDAR at 10000	PRDs
	OLBs	OELs
	Quarterly LDAR at 10000	Compressors
	--	Sam. Conns.
	--	Flanges
AD	Maintain less than 0.5% at 10000 ppm	Valves, Gas
	Maintain less than 0.5% at 10000 ppm	Valves, LL
	--	Valves, HL
	Maintain less than 1% at 10000 ppm	Pumps, LL
	--	Pumps, HL
	Maintain less than 1% at 10000 ppm	PRDs
	Capped etc.	OELs
	Maintain less than 1% at 10000 ppm	Compressors
	Maintain less than 1% at 10000 ppm	Sam. Conns.
	Maintain less than 1% at 10000 ppm	Flanges
AH	Q LDAR at 10000	Valves, Gas
	Q LDAR at 10000	Valves, LL
	--	Valves, HL
	Q LDAR at 10000; wkly vis.	Pumps, LL
	--	Pumps, HL
	Q LDAR at 10000	PRDs
	Caps, etc.	OELs
	Q LDAR at 10000	Compressors

POLYSTYRENE EQUIPMENT LEAKS - CONTINUOUS PLANTS

FACILITY	LDAR PROGRAM ?	COMPONENT
	--	Sam. Conns.
	--	Flanges
AJ	Q LDAR and M LDAR at 10000	Valves, Gas
	Q LDAR and M LDAR at 10000	Valves, LL
	--	Valves, HL
	Q LDAR and M LDAR at 10000	Pumps, LL
	--	Pumps, HL
	Many with rupture disks	PRDs
	--	OELs
	--	Compressors
	--	Sam. Conns.
	None/Annual at 10,000 ppm	Flanges
AL	Q LDAR at 10,000	Valves, Gas
	Q LDAR at 10,000	Valves, LL
	--	Valves, HL
	Weekly vis, Q LDAR at 10000	Pumps, LL
	--	Pumps, HL
	RDIs on 6	PRDs
	OLBs	OELs
	Q LDAR at 10,000	Compressors
	CCS for one	Sam. Conns.
	--	Flanges
AN	Quarterly LDAR at 1000	Valves, Gas
	Quarterly LDAR at 1000	Valves, LL
	--	Valves, HL
	Quarterly LDAR at 1000	Pumps, LL
	--	Pumps, HL
	6 w/RDIs; Q LDAR at 200	PRDs
	OLBs	OELs
	Under vacuum	Compressors
	OLBs	Sam. Conns.
	Q LDAR at 1000	Flanges
AQ	Quarterly LDAR at 10000	Valves, Gas
	Quarterly LDAR at 10000	Valves, LL
	--	Valves, HL
	weekly vis, Q LDAR at 10000; 7 sealless	Pumps, LL
	--	Pumps, HL
	7 w/RDIs	PRDs
	OLBs	OELs

FACILITY	LDAR PROGRAM ?	COMPONENT
	--	Compressors
	Q LDAR at 10000	Sam. Conns.
	--	Flanges
AM	Q LDAR at 10000	Valves, Gas
	Q LDAR at 10000	Valves, LL
	--	Valves, HL
	Q LDAR at 10000; 2 with DMS	Pumps, LL
	--	Pumps, HL
	2 with RDIs, annual LDAR at 10000	PRDs
	all capped	OELs
	--	Compressors
	Q LDAR at 10000	Sam. Conns.
	Q LDAR at 10000	Flanges
AO	--	Valves, Gas
	Monthly at 10000 ppm	Valves, LL
	--	Valves, HL
	Monthly at 10000 ppm	Pumps, LL
	--	Pumps, HL
	3 with RDIs; annual at 10000	PRDs
	all capped	OELs
	--	Compressors
	annual survey at 10000	Sam. Conns.
	annual survey at 10000	Flanges
AP	--	Valves, Gas
	Maintain less than 2% leakers at 10000	Valves, LL
	--	Valves, HL
	Q LDAR at 10000; 17 w/DMS	Pumps, LL
	--	Pumps, HL
	RDIs	PRDs
	all plugged	OELs
	--	Compressors
	annual survey at 10000	Sam. Conns.
	--	Flanges
AT	quarterly at 10000 ppm	Valves, Gas
	quarterly at 10000 ppm	Valves, LL
	--	Valves, HL
	quarterly at 10000 ppm	Pumps, LL
	--	Pumps, HL
	RDIs, quarterly at 10000	PRDs

POLYSTYRENE EQUIPMENT LEAKS - CONTINUOUS PLANTS

FACILITY	LDAR PROGRAM ?	COMPONENT
capped		OELs
	--	Compressors
	--	Sam. Conns.
	--	Flanges

POLYSTYRENE EQUIPMENT LEAKS - EPS PLANTS

FACILITY	LDAR PROGRAM ?	COMPONENT
C	Quarterly LDAR at 10000	Valves, Gas
	Quarterly LDAR at 10000	Valves, LL
	--	Valves, HL
	Weekly vis, quarterly LDAR at 10000	Pumps, LL
	--	Pumps, HL
	Quarterly LDAR at 10000	PRDs
	--	OELs
	Quarterly LDAR at 10000	Compressors
	--	Sam. Conns.
	--	Flanges
AG	--	Valves, Gas
	--	Valves, LL
	--	Valves, HL
	--	Pumps, LL
	--	Pumps, HL
	--	PRDs
	--	OELs
	--	Compressors
	--	Sam. Conns.
	--	Flanges
Q	--	Valves, Gas
	Monthly at 10000 ppm	Valves, LL
	--	Valves, HL
	Monthly at 10000 ppm	Pumps, LL
	--	Pumps, HL
	--	PRDs
	--	OELs
	--	Compressors
	--	Sam. Conns.
	Monthly at 10000 ppm	Flanges
S	Uncontrolled facility	Valves, Gas
		Valves, LL
		Valves, HL
		Pumps, LL
		Pumps, HL
		PRDs
		OELs
		Compressors
		Sam. Conns.
		Flanges

POLYSTYRENE EQUIPMENT LEAKS - EPS PLANTS

FACILITY	LDAR PROGRAM ?	COMPONENT
M	Q LDAR at 10000	Valves, Gas
	Q LDAR at 10000	Valves, LL
	--	Valves, HL
	Q LDAR at 10000; wkly vis.	Pumps, LL
	--	Pumps, HL
	Q LDAR at 10000	PRDs
	capped etc.	OELs
	Q LDAR at 10000	Compressors
	--	Sam. Conns.
	--	Flanges
N	Q LDAR at 10000	Valves, Gas
	Q LDAR at 10000	Valves, LL
	--	Valves, HL
	Q LDAR at 10000; wkly vis.	Pumps, LL
	--	Pumps, HL
	Q LDAR at 10000	PRDs
	capped etc.	OELs
	Q LDAR at 10000	Compressors
	--	Sam. Conns.
	--	Flanges
AF	Quarterly LDAR at 10000	Valves, Gas
	Quarterly LDAR at 10000	Valves, LL
	--	Valves, HL
	Quarterly LDAR at 10000	Pumps, LL
	--	Pumps, HL
	Quarterly LDAR at 10000	PRDs
	--	OELs
	--	Compressors
	--	Sam. Conns.
	--	Flanges

POLYSTYRENE EQUIPMENT LEAKS - BATCH PLANTS

FACILITY	LDAR PROGRAM ?	COMPONENT
E	Quarterly LDAR at 10000	Valves, Gas
	Quarterly LDAR at 10000	Valves, LL
	--	Valves, HL
	Quarterly LDAR at 10000	Pumps, LL
	--	Pumps, HL
	Quarterly LDAR at 10000	PRDs
	OLBs	OELs
	Quarterly LDAR at 10000	Compressors
	--	Sam. Conns.
	--	Flanges
F	--	Valves, Gas
	--	Valves, LL
	--	Valves, HL
	--	Pumps, LL
	--	Pumps, HL
	--	PRDs
	--	OELs
	--	Compressors
	--	Sam. Conns.
	--	Flanges
P	Quarterly at 10,000 ppm	Valves, Gas
	Quarterly at 10,000 ppm	Valves, LL
	--	Valves, HL
	Weekly vis, monthly LDAR at 10000	Pumps, LL
	--	Pumps, HL
	no detectable emissions	PRDs
	OLBs	OELs
	barriers to emissions	Compressors
	closed purge/vent	Sam. Conns.
	annual at 10000	Flanges
S	Uncontrolled facility	Valves, Gas
		Valves, LL
		Valves, HL
		Pumps, LL
		Pumps, HL
		PRDs
		OELs
		Compressors
		Sam. Conns.
		Flanges

POLYSTYRENE EQUIPMENT LEAKS - BATCH PLANTS

FACILITY	LDAR PROGRAM ?	COMPONENT
M	Q LDAR at 10000	Valves, Gas
	Q LDAR at 10000	Valves, LL
	--	Valves, HL
	Q LDAR at 10000; wkly vis.	Pumps, LL
	--	Pumps, HL
	Q LDAR at 10000	PRDs
	capped etc.	OELs
	Q LDAR at 10000	Compressors
	--	Sam. Conns.
	--	Flanges
N	Q LDAR at 10000	Valves, Gas
	Q LDAR at 10000	Valves, LL
	--	Valves, HL
	Q LDAR at 10000; wkly vis.	Pumps, LL
	--	Pumps, HL
	Q LDAR at 10000	PRDs
	capped etc.	OELs
	Q LDAR at 10000	Compressors
	--	Sam. Conns.
	--	Flanges
Z	--	Valves, Gas
	--	Valves, LL
	--	Valves, HL
	--	Pumps, LL
	--	Pumps, HL
	--	PRDs
	--	OELs
	--	Compressors
	--	Sam. Conns.
	--	Flanges
AE	Maintain less than 0.5% at 10000 ppm	Valves, Gas
	Maintain less than 0.5% at 10000 ppm	Valves, LL
	--	Valves, HL
	Maintain less than 1% at 10000 ppm	Pumps, LL
	--	Pumps, HL
	Maintain less than 1% at 10000 ppm	PRDs
	Capped etc.	OELs
	Maintain less than 1% at 10000 ppm	Compressors
	Maintain less than 1% at 10000 ppm	Sam. Conns.
	Maintain less than 1% at 10000 ppm	Flanges

POLYSTYRENE EQUIPMENT LEAKS - BATCH PLANTS

FACILITY	LDAR PROGRAM ?	COMPONENT
AI	Q LDAR at 10000	Valves, Gas
	Q LDAR at 10000	Valves, LL
	--	Valves, HL
	Q LDAR at 10000; wkly vis.	Pumps, LL
	--	Pumps, HL
	Q LDAR at 10000	PRDs
	Caps, etc.	OELs
	Q LDAR at 10000	Compressors
	--	Sam. Conns.
	--	Flanges
AF	--	Valves, Gas
	--	Valves, LL
	--	Valves, HL
	--	Pumps, LL
	--	Pumps, HL
	--	PRDs
	--	OELs
	--	Compressors
	--	Sam. Conns.
	--	Flanges

SAC EQUIPMENT LEAKS : 12/29/93

FACILITY	CONTROLS?		
AK	--	Valves, Gas	
	--	Valves, LL	
	--	Valves, HL	
	--	Pumps, LL	
	--	Pumps, HL	
	--	PRDs	
	--	OELs	
	--	Compressors	
	--	Sam. Conns.	
	--	Flanges	
			TOTALS
V	Monthly LDAR at 10000	Valves, Gas	
	Monthly LDAR at 10000	Valves, LL	
	--	Valves, HL	
	Monthly LDAR at 10000	Pumps, LL	
	--	Pumps, HL	
	Rupture disks	PRDs	
	Caps, etc.	OELs	
	--	Compressors	
	--	Sam. Conns.	
	--	Flanges	
			TOTALS
U	--	Valves, Gas	
	--	Valves, LL	
	--	Valves, HL	
	--	Pumps, LL	
	--	Pumps, HL	
	--	PRDs	
	--	OELs	
	--	Compressors	
	--	Sam. Conns.	
	--	Flanges	
			TOTALS

SAN AND AM/SAN/ASA EQUIPMENT LEAKS : 12/29/93

FACILITY	PROCESS TYPE	CONTROLS?	
AS	SAN - Continuous	Quarterly LDAR at 1000 ppm	Valves, Gas
		Quart/Annual LDAR at 1000 ppm	Valves, LL
		--	Valves, HL
		DMS, quarterly LDAR at 1000 pp	Pumps, LL
		--	Pumps, HL
		20 to closed vent system/devic	PRDs
		Caps, etc.	OELs
			Compressors
			Sam. Conns.
		Quart/annual LDAR at 1000 ppm	Flanges
		TOTALS	
Y	SAN - Batch	Monthly LDAR at 10000 ppm	Valves, Gas
		Monthly LDAR at 10000 ppm	Valves, LL
		--	Valves, HL
		Weekly vis, monthly LDAR	Pumps, LL
		--	Pumps, HL
		No detectable emissions	PRDs
		Caps, etc.	OELs
		Barrier fluids, etc	Compressors
		Closed purge/vent	Sam. Conns.
		Inspect as suspect	Flanges
		TOTALS	
AM	SAN - Continuous	--	Valves, Gas
		Q LDAR at 500 ppm	Valves, LL
		--	Valves, HL
		Q LDAR at 500; 2 DMS	Pumps, LL
		--	Pumps, HL
		RDIs on 6; Q LDAR at 500	PRDs
	Number of OELs nAll capped		OELs
		--	Compressors
		Isolok	Sam. Conns.
		Q LDAR at 500	Flanges
		TOTALS	
AA	SAN - batch	Monthly LDAR at 10000	Valves, Gas
		Month/quart. LDAR @1000 ppm LD	Valves, LL
		--	Valves, HL
		Weekly vis, monthly LDAR @ 100	Pumps, LL
		--	Pumps, HL
		No detectable emissions	PRDs
		Caps, etc.	OELs
		Barrier fluids, etc	Compressors
		Closed purge/vent	Sam. Conns.
		Annual at 1000 ppm LD	Flanges

SAN AND AM/SAN/ASA EQUIPMENT LEAKS : 12/29/93

				TOTALS
AA	SAN - continuous	--	Valves, Gas	
		Month/quart LDAR at 1000 ppm	Valves, LL	
		--	Valves, HL	
		Month/quart. LDAR at 1000 ppm	Pumps, LL	
		--	Pumps, HL	
		No detectable emissions	PRDs	
		Caps, etc.	OELs	
		Barrier fluids, etc	Compressors	
		Closed purge/vent	Sam. Conns.	
		Annual at 1000 ppm LD	Flanges	
				TOTALS
AT	ASA/AM/SAN	the entire facility is equipped with 24 continuous area monitors for acrylonitrile and styrene with a detection level of 2 ppm	Valves, Gas	
			Valves, LL	
			Valves, HL	
			Pumps, LL	
			Pumps, HL	
			PRDs	
			OELs	
			Compressors	
			Sam. Conns.	
			Flanges	
				TOTALS

II-B-16

PACIFIC ENVIRONMENTAL SERVICES, INC.

Central Park West
5001 South Miami Boulevard
PO Box 12077
Research Triangle Park, NC 27709-2077
(919) 941-0333 FAX (919) 941-0234

MEMORANDUM

TO: Les Evans
US Environmental Protection Agency

FROM: Ken Meardon
Pacific Environmental Services

DATE: July 21, 1994

SUBJECT: Collocation of Group IV Resins Facilities

Per your request, I have assembled information on the collocation of the production of the resins that comprise the Group IV resins project. Table 1 summarizes the results of this effort. Attached is a table that details the collocation.

As seen in Table 1, most of the PET (15 out of 23) and PS (24 out of 35) facilities are <u>not</u> collocated. The three MBS facilities and the one NITRILE facility are <u>not</u> collocated. Seven of 9 ABS facilities are collocated, 4 of the 5 SAN facilities are collocated, and the one MABS facility is collocated. There is only one instance where there is a collocation between PET and a styrene-based resin. For PET plants, all other cases of collocation are between different processes for producing PET. For the styrene-based resins, collocations occur between source categories as well as among processes within a source category.

Please call me if you have any questions.

TABLE 1. SUMMARY OF COLLOCATIONS - GROUP IV RESINS

SOURCE CATEGORY	SUBCATEGORY[a]	TOTAL NUMBER OF FACILITIES	NUMBER OF COLLOCATED FACILITIES	NUMBER OF NON-COLLOCATED FACILITIES
PET	All processes	23	8	15
	TPA, C	12	7	5
	TPA, B	1	1	0
	DMT, C	10	6	4
	DMT, B	10	4[b]	6
PS	All processes	35	11	24
	C	22	8	14
	B	11	5[c]	6
	EPS	7	3	4
MBS		3	0	3
SAN	All processes	5	4	1
	C	2	2	0
	B	3	2	1
ASA/AMSAN		1	1	0
ABS	All processes	9	7	2
	Cm	5	5	0
	Ce	2	1	1
	Be	4	4	0
	Bs	2	2	0
	Latex	1	0	1
MABS		1	1	0
Nitrile		1	0	1

a TPA = terephthalic acid; DMT = dimethyl terephthalate; Cm = continuous mass
Ce = continuous emulsion; Be = batch emulsion; Bs = batch suspension
C = continuous; B = batch; EPS = expandable polystyrene.

b One facility is collocated with a polystyrene batch process.

c One facility is collocated with a PET, DMT-B process.

SUMMARY OF COMPANY AND POLYMERS PRODUCED
AT EACH FACILITY LOCATION

COMPANY	LOCATION	POLYMER(S) PRODUCED[a]
Allied Signal	Moncure	PET-TPA,C
DuPont	Cooper River	PET-TPA,C and DMT,C
	Kinston	PET-TPA,C and DMT,C
	Cape Fear	PET-TPA,C and DMT,C
	Circleville	PET-DMT,C
	Florence	PET-DMT,C
	Old Hickory	PET-DMT,C
	Brevard	PET-DMT,C
Hoechst Cleanese	Spartanburg	PET-TPA,C, DMT,C, and DMT-B
	Salisbury	PET-TPA,C[b]
	Greer	PET-TPA,C
	Shelby	PET-DMT,B
ICI Films	Fayetteville	PET-DMT,B[b]
	Hopewell	PET-DMT,B
Shell	Pt. Pleasant	PET-TPA,C; TPA,B; and DMT-B[b]
Tennessee Eastman	Kingsport	PET-TPA,C; DMT,C; and DMT-B
Carolina Eastman	Columbia	PET-TPA,C and DMT,C[b]
Eastman Kodak	Rochester	PET-DMT,B[b]
Wellman	Palmetto	PET-TPA,C
YKK	Macon	PET-TPA,C
3M	Decatur	PET-DMT, B and PS,B
	Greenville	PET-DMT,B
American Polymers	Oxford	PS,C and semi-continuous
Amoco Chemical Corp.	Joilet	PS,C
	Torrance	PS,Bs
	Willow Springs	PS,Bs
Arco Chemical Corp.	Painesville	EPS,Insitu
	Monaca	EPS,PI and PS,Bs
BASF Corp.	Holyoke	PS,C
	Santa Ana	PS,C

SUMMARY OF COMPANY AND POLYMERS PRODUCED
AT EACH FACILITY LOCATION

BASF Corp cont.	Joilet	PS,C
	South Brunswick	EPS-Insitu
	Lowland	PET-DMT,B
BF Goodrich	Akron	ABS-latex, batch
BP Chemicals	Lima	Nitrile
Chevron Chemical	Marietta	PS,C
Dart Container Corp.	Leola	PS,Bs
	Ownesboro	PS,Bs
Dow Chemical	Midland	ABS,Be; ABS,Cm; SAN,C; and PS,C
	Allyn's Point	ABS,Cm and PS,C
	Torrance	ABS,Cm and PS,C
	Hanging Rock	ABS,Cm and PS,C
	Joilet	PS,C
	Riverside	PS,C
Elf Atochem		MBS
Fina Oil & CHemical Co.	Carville	PS,C
GE Plastics	Washington, WV	ABS,Be; ABS,Ce; and MABS
	Ottawa	ABS,Ce
	Bay St. Louis	SAN,C
	Selkirk	ASA/AMSAN and PS,C
Hunstman Chemical	Chesapeake	PS,C and PS,B
	Belpre	PS,C
	Peru	PS,C; PS,B; and EPS, insitu and PI
	Rome	EPS, insitu
Kama	Hazelton	PS,C
Kaneka Texas Corp.		MBS
Monsanto Corp.	Muscatine	ABS,Be; ABS,Bs; and SAN,B
	Addyston	ABS,Be; ABS,Bs; ABS,Cm; SAN,B; SAN,C; and PS,C
Novacor Chemicals	Decatur - 1	PS,C
	Decatur - 2	PS,C
	Indian Orchard	PS,C

SUMMARY OF COMPANY AND POLYMERS PRODUCED
AT EACH FACILITY LOCATION

Rohm and Hass	Kentucky	MBS
	Philadelphia	PS,Bs
Scott Polymers	Saginaw - 1	EPS, PI and PS,B
	Saginaw - 2	PS,Bs
	Fort Worth	EPS,PI

a KEY: PET = polyethylene terephthalate
TPA = terephthalic acid
DMT = dimethyl terephthalate
C = continuous
B = batch
PS = polystryene
Bs = batch, suspension
EPS = expandable polystyrene
PI = post-impregnation
Be = batch, emulsion
Ce = continuous, emulsion
Cm = continuous, mass

b These facilities also use a solid state process.

II-8-19

PACIFIC ENVIRONMENTAL SERVICES, INC.

Central Park West
5001 South Miami Boulevard
PO Box 12077
Research Triangle Park, NC 27709-2077
(919) 941-0333 FAX (919) 941-0234

MEMORANDUM

TO: Group IV Resins Docket No. A-92-45

FROM: Ken Meardon
Pacific Environmental Services

DATE: December 21, 1994

SUBJECT: Estimated New Growth for Group IV Resins Sources

The purpose of this memo is to describe how new growth capacities for each source category were estimated and which existing facilities were selected to represent that new growth. PES reviewed the last 12 months of the Chemical Marketing Reporter in an effort to quantify expected growth for each of the seven source categories that comprise the Group IV resins. Information was found on ABS, polystyrene, and bottle-grade PET. Attached are the pages from the CMR that were relevant.

Table 1 summarizes the results of the estimated new growth capacities. Table 2 summarizes those plants selected to reflect new plants that make up the estimated new growth capacity. The following paragraphs discuss the estimated new growth and the selection of existing facilities.

Table 1. Estimated New Growth

POLYMER	CURRENT INDUSTRY CAPACITY (million pounds)	AVERAGE ANNUAL GROWTH RATE (%)	TOTAL NEW CAPACITY OVER FIVE YEARS (million pounds)
ABS	1785	4	386
SAN	530	4	115
PS	6480	3	1032
PET	15823	3-5, 10	4194
MBS	64	3	14
MABS	--	3	--
NITRILE	--	3	--

ABS Resins

The CMR (3/21/94) projects new growth for ABS at between 3 and 5 percent per year through 1998. The CMR shows a capacity of 1,785 millions pounds, which is very close to your estimate of 1,850 million pounds (839 million kilograms). Using the CMR capacity of 1,785 million pounds, a growth rate of 4 percent (the mid-point), and assuming 4 percent per year through 1999, additional capacity of 386 million pounds would be added over the next five years.

There are four basic processes for producing ABS -- batch, emulsion; batch, suspension; continuous, emulsion; and continuous, mass. The batch processes comprise about 30 percent of total capacity and the continuous process the about 70 percent. Assuming the new growth mirrored the current distribution, about 115 million pounds of batch capacity and 270 million pounds of continuous capacity are projected.

Based on current distribution of capacity among the four basic process types and the size of individual facilities, the projected batch capacity could be reasonably represented as two new facilities, one of each of the two basic batch processes and the projected continuous capacity could also be represented as two new facilities, also one each of the two basic continuous facilities. There are three dominant producers of ABS -- Dow, GE, and Monsanto. At least one facility from each of these producers was be selected for the new growth analysis.

SAN Resins

No information specific to SAN growth was found. However, many facilities that produce ABS also produce SAN since much of the SAN produced is used as a feedstock in the production of ABS. Because of this, it may not be unreasonable to assume a similar growth rate for SAN as above for ABS (i.e., 4 percent per year through 1999). If this is done, the total expected increase in capacity is estimated to be about 115 million pounds, given an initial total capacity of about 530 million pounds.

As for ABS, about 30 of the current capacity is in batch production and about 70 percent in continuous production facilities. Given current facility size, the projected new growth could be reasonable represented as one larger new plant using a continuous process (Option 1) or two smaller plants, one using a continuous process and one using a batch process (Option 2).

There are three facilities that produce SAN using a continuous process, each owned by a different company. Two of the three facilities are collocated with ABS production. Since specific information was found for growth in ABS resins and SAN is used as a feedstock to ABS resins, a preference was made that new growth would occur with a collocated facility. Of the two collocated continuous facilities, one has a much smaller capacity than the other.

Therefore, the larger facility was selected to represent new growth Option 1. This facility is the Monsanto facility in Addyston, Ohio.

For Option 2, it was assumed that one smaller batch and one smaller continuous process facility would be selected. Based on relative capacities and the preference for collocated facilities, the two plants selected were Monsanto, Muscatine (batch) and Dow, Midland (continuous).

Polystyrene

The CMR (4/25/94) projects new growth for PS at between 2 and 4 percent per year through 1998. The CMR shows a US capacity of 6,480 millions pounds, which is nearly identical to your estimate of 6,400 million pounds (2,904 million kilograms). Using the CMR capacity of 6,480 million pounds, a growth rate of 3 percent (the mid-point), and assuming 3 percent per year through 1999, additional capacity of 1,032 million pounds would be added over the next five years.

Basic processes used for producing general purpose and high impact PS are batch, suspension; batch, bulk; and continuous. In addition, expandable PS (EPS) is produced using a batch, in-situ process or a batch process followed by a post-impregnation step. Based on past information, it is very unlikely that new batch facilities will be built for the production of general purpose or high impact PS. Thus, it is not unreasonable to assume no growth through this production process. On the other hand, there may be some growth for EPS, but no information is available to suggest what a split between EPS and new continuous PS processes might be. I think it reasonable to assume that all new growth will be in the continuous processes.

Based on the above assumptions (1,032 million pounds of new growth all by continuous processes) and based on current plant size distributions, the new projected growth would be equivalent to about four new facilities, which could be distributed as one smaller size facility, two medium size facilities, and one larger size facility. Based on the producers of PS using continuous processes, the BASF Holyoke facility was selected to represent a new smaller facility, the Dow Midland and Novacor Decatur facilities to represent the two new medium sized facilities, and the Chevron Marietta facility to represent the larger facility.

PET

The CMR (9/3/93) projects new growth for solid-state bottle-grade PET resin at about 10 percent through 1997. The CMR shows a capacity for this type resin of 1,000,000 megagrams, which is very close to your estimate of 927,000 Mg (927 million kg). The CMR does not report any growth information for the other portion of the PET industry.

For the solid-state, bottle-grade resins, assuming a 10 percent growth over the next five years would add 991 million lbs of capacity, which is essentially a doubling of the current capacity. Thus, we could use all of the current facilities that produce solid state resins as representative of new facilities being built over the next five years. This would cover six facilities that use a TPA, continuous process, three that use a DMT, continuous process, one that uses a TPA, batch process, and four that use a DMT, batch process.

For the other PET resin types, I have arbitrarily assumed a 3 to 5 percent per year growth rate. At 3 percent, this would add about 2,260 million pounds of capacity over the next five years, which is about 15 percent of current capacity. At 5 percent, this would add about 3,900 million lbs of capacity over the next five years, which is about 25 percent of the current capacity. New facilities are likely to be continuous, and would favor the TPA process over the DMT process. I think a reasonable assumption would again be a 30/70 split between DMT/continuous and TPA/continuous, respectively. If this is acceptable, new DMT/continuous capacity is projected to be about 675 to 1,200 million lbs and new TPA/continuous capacity at about 1,600 to 2,700 million lbs.

Based on current plant size, the 675 to 1,200 million lbs of DMT/continuous capacity would be equivalent to about 3 to 5 new plants, and the 1,600 to 2,700 million lbs of TPA/continuous capacity, about 6 to 10 new plants. For DMT/continuous processes, 3 for the 10 facilities are already represented due to the new growth of solid state resins. The remaining 7 facilities are all owned by DuPont. Six of the seven Dow facilities were selected to approximate the total projected capacity growth. For TPA/continuous, 6 of the 12 facilities are already represented due to the new growth of solid state resins. All six of the remaining facilities were selected to represent the projected capacity growth.

MBS, MABS, and Nitrile

No growth information was found on these three polymers. MBS is produced by three facilities, with a total capacity of about 64,000 Mg. The uses of MBS are similar to those for PS, which was estimated to have an average growth rate of about 3 percent per year through 1999. We could assume the same for MBS, which would result in an additional 10,000 Mg of capacity over the next five years. All three MBS facilities have capacities greater than this estimated growth in capacity. Rather than assuming incremental growth at an existing facility, which would be difficult to do based on the available information, we assumed that the new growth would be represented by one new additional plant. The one facility selected was the one with a capacity closest to the estimated new growth, which is the Elf Atochem facility.

Based on our information, only one plant produces MABS and only one plant produces nitrile resins. Since the growth rate is so small, no new facilities were projected. Furthermore, since MACT for these sources is likely to be identical for both the existing plant and any new plant, the costs and impact estimates would be the same.

TABLE 2.

EXISTING FACILITIES SELECTED TO REPRESENT NEW GROWTH

SOURCE CATEGORY	FACILITY
MBS	Elf Atochem
SAN - Option 1	Monsanto, Addyston
SAN - Option 2	Monsanto, Muscatine Dow, Midland
PET	Allied, Moncure DuPont, Cooper River DuPont, Kinston DuPont, Cape Fear DuPont, Circleville DuPont, Florence DuPont, Old Hickory DuPont, Brevard Hoechst-Celanese, Spartanburg Hoechst-Celanese, Salisbury Hoechst-Celanese, Greer ICI, Fayetteville Shell, Pt. Pleasant Tennessee Eastman, Kingsport Columbia Eastman, Columbia Wellman, Palmetto YKK, Macon
ABS, BE	Dow, Midland
ABS, BS	Monsanto, Muscatine
ABS, CM	Dow, Hanging Rock
ABS, CE	GE, Ottawa
PS (continuous only)	BASF, Holyoke Chevron, Marietta Dow, Midland Novacor, Decatur

CHEMICAL PROFILE

ABS RESINS

March 21, 1994

PRODUCER	CAPACITY*
Diamond Polymers, Akron, Ohio	35
Dow, Allyn's Point, Conn.	60
Dow, Hanging Rock, Ohio	90
Dow, Midland, Mich.	140
Dow, Torrance, Calif.	40
GE, Ottawa, Ill.	345
GE, Port Bienville, Miss.	200
GE, Washington, W.Va.	265
Monsanto, Addyston, Ohio	450
Monsanto, Muscatine, Iowa	160
Total	1,785

***Millions of pounds per year of effective acrylonitrile-butadiene-styrene resin capacity. Diamond Polymers added a third production line in February, raising its capacity by 15 million pounds. Diamond was founded in 1989, as a joint venture between Mitsubishi Rayon Company and Network Polymers Inc. GE's Mexican subsidiary, GE Plastics Mexico, acquired the customer base and Epolan trademark of Industrias Resistol. Profile last published 4/22/91; this revision, 3/21/94.**

DEMAND

1993: 1.4 billion pounds; **1994:** 1.5 billion pounds; **1998:** 1.8 billion pounds. (Includes exports, which grew from 275 million pounds in 1992 to 315 million in 1993; but not imports, which have grown to 175 million to 180 million pounds per year, after being only 75 million pounds per year at the start of the decade.)

GROWTH

Historical (1984-1993): 2 to 3 percent per year; **future:** 3 to 5 percent per year through 1998.

PRICE

Historical (1981-1994): High, $1.49 per pound, list, high-impact molding grade; low, 74c. per pound, same basis. **Current:** 95c. to $1 per pound, list, same basis.

USES

Automotive, 25 percent; appliances (including refrigerators), 20 percent; construction, 20 percent; electronics (including business machines and telecommunications), 12 percent; custom sheet (including luggage, recreation and leisure goods), 8 percent; other (including furniture, toys and housewares), 15 percent.

STRENGTH

Producers are bullish on virtually all ABS markets in North America. The product enjoyed 5 to 7 percent annualized growth in the fourth quarter of 1993, and this should continue throughout the first half of 1994. High yen values could help US exports.

WEAKNESS

ABS markets in Europe and the Far East are in a recession, and companies in those regions are exporting low-cost material to the US, keeping prices down. Demand is cyclical, and ABS is vulnerable to downturns in the housing and automotive markets.

OUTLOOK

Demand for ABS fell dramatically in 1991, following a recession in the housing and automotive industries, but it surged in 1992 and 1993. Producers expect a return to normal growth in 1994 and 1995.

Report Fr

By DON

NGL HEADACHE: CEO George Mitc
Corporation, The Woodlands, says earni
1994, but were held back by poor natural
natural gasoline) prices. Mitchell can pro
but throughput during the last three mon
Industry observers say the biggest curr
price of crude oil.
Because of the ability of several olefins
appropriate price levels, demand for etha
Another squeeze on pricing: when NGLs
must be replaced by higher-priced spot n
To avoid this double-edged problem n
gas streams until the pricing situation imp
Mitchell spokesman Tony Lentini says th
120,000 barrels daily of lighter ends as Fo
Comfort olefins plant and Dow starts up u
says of the weak NGL market, "The bigge

HUNTER PROJECT DENIAL UPHE
deny an application by Hunter Industrial
in salt dome caverns near Dayton was uph
District Judge W. Jeanne Meurer ruled "T
things."
The ruling was in response to an appeal
Natural Resource Conservation Commissi
January, 1993 (CMR, 1/11/93, pg. 41).
Following the decision last week, Hunte
the possibility of further appeals. The firm'
pollution of Lake Houston, ten miles away.

CLEAN FUELS PROJECT: Serv-Tech
construction and management of a $40-mil
Torrance, Calif., refinery, to meet Federal
Board standards for cleaner fuels. Work is s
completed in mid-1995.

DOW FREEPORT NPDES PERMIT: E
formulated National Pollutant Discharge E
TX0006483 for the Freeport chemical com
Operations.
Changes from the current permit include
previously discharged under another permi
exceed Texas Natural Resource Conservati
Human Health standards.
Also, the permit addresses construction of
system and requires twice-a-year chronic bi
EPA and TNRCC requirements.

CHANNEL DREDGING: The US Army
and Port of Houston Authority have comple
responsibility for maintenance dredging of B
Bayou Channel, both connected to Houston
industry transportation.

BUSINESS BRIEFS

Amoco Appoints Kolon

Valley clients Reter a national environmen

CHEMICAL PROFILE

POLYSTYRENE

April 25, 1994

PRODUCER	CAPACITY*
American Polymers, Oxford, Mass.	[redacted]
American Polystyrene, Torrance, Calif.	30
Amoco, Joliet, Ill.	[redacted]
Amoco, Willow Springs, Ill.	75
Arco, Beaver Valley, Pa.	545
Arco, Painesville, Ohio	70
BASF, Holyoke, Mass.	[redacted]
BASF, Joliet, Ill.	[redacted]
BASF, Santa Ana, Calif.	[redacted]
BASF, South Brunswick, N.J.	175
Chevron, Marietta, Ohio	[redacted]
Dart Polymers, Owensboro, Ky.	70
Deltech, Troy, Ohio	150
Dow, Allyn's Point, Conn.	[redacted]
Dow, Hanging Rock, Ohio	[redacted]
Dow, Joliet, Ill.	[redacted]
Dow, Midland, Mich.	[redacted]
Dow, Pevely, Mo.	[redacted]
Dow, Sarnia, Ont., Canada	230
Dow, Torrance, Calif.	[redacted]
Fina, Carville, La.	[redacted]
G.E.-Huntsman, Selkirk, N.Y.	[redacted]
Huntsman, Belpre, Ohio	[redacted]
Huntsman, Chesapeake, Va.	[redacted]
Huntsman, Peru, Ill.	260
Huntsman, Rome, Ga.	45
IRSA, Coadzazoalcos, Mexico	100
IRSA, Tlaxcala, Mexico	70
Kama, Hazleton, Pa.	[redacted]
Novacor, Addyston, Ohio	[redacted]
Novacor, Decatur, Ala.	[redacted]
Novacor, Montreal, Que., Canada	85
Novacor, Springfield, Mass.	[redacted]
Packaging Corp. of America, City of Industry, Calif.	65
Scott Polymers, Fort Worth, Tex.	120
Total	6,965

*Millions of pounds of polystyrene (PS) resins. Mobil left the business in 1992, selling its plants to BASF, which is expanding its Joliet, Ill., facility by 40 million pounds. Dow took down 200 million pounds at Midland, Mich., in December 1991. Novacor will raise its Springfield site to 220 million pounds and its Decatur plant to 355 million pounds by the end of this year's second quarter. All of the PS at the company's Addyston, Ohio, plant is produced for Monsanto under a tolling agreement; that facility's capacity fell from 210 million pounds after Monsanto converted one of its lines to ABS. Huntsman is adding 220 million pounds to its Belpre, Ohio, plant, and the company plans to add another 45 million pounds through debottlenecking at another site. Profile last published 6/24/91; this revision, 4/25/94.

DEMAND

1993: 5.4 billion pounds; 1994: 5.5 billion pounds; 1998: 6 billion pounds. (US demand is roughly 5 billion pounds per year. The total includes Canada and Mexico, as well as exports of 250 million to 350 million pounds per year, but not imports of 60 million to 120 million pounds per year.)

Continued on Page 17

Report From

By DON RICHAR

GCF FRACTIONATOR BLAST: Explosions anc facility of Gulf Coast Fractionators shortly before 9:0 personnel on-site were hospitalized. Late last week, r nor the extent of the damage could be determined, al restricted to the plant site. The unit is down and an ir

GCF has a design capacity to separate 80,000 barre ethane, propane, butanes and natural gasoline. The fr currently undergoing a 40,000 barrel-a-day expansion

GCF is a partnership of Trident NGL Inc., a subsic Inc. (38.75 percent); Liquid Energy Corporation, a sul Development Corporation (38.75 percent); and Cono

In 1993 the partnership had revenues of $28.5 millic Trident also owns 100 percent of an 82,000-barrel-a-d which was not damaged and continues to operate.

UNION TEXAS OLEFINS: Average net daily prod La., rose to 1,312,000 pounds in 1993 from 1,278,000 pc company's annual report. Output of ethylene and prop million gross pounds daily.

Union Texas has a 42 percent interest in and operate pounds a year of ethylene and 72 million pounds a year new furnace will boost the olefin plant's capacity by 4 p natural gas liquids fractionator at Rayne, La., and outpu percent last year. The unit was upgraded with electroni computer controls.

FORMOSA SHIPS CAUSTIC: On March 10, 30,000 made by Formosa Plastics Texas at Point Comfort was e Calhoun County Navigation District docks to Latin Am its total incoming and outgoing traffic for 1994 will reach totaling 384,000 tons overseas and 1.2 million barrels of p service.

TNRCC LEVIES FINES: Texas Natural Resource Co fined Phillips Petroleum Company $537,742 for violation regulations that occurred between 1985 and 1991 at the S petrochemical complex. Mobil Oil Corporation has been at the Beaumont refinery between 1989 and 1992.

Also penalized were Firestone Synthetic Rubber & La Unocal at Nederland ($8,000), Allwaste Recovery System Solutions Inc., Deer Park ($82,840), American Plating Cor Chem Grind Chemical Corporation, Houston ($45,600) a Corporation, Houston ($42,400).

SUPERFUND SITE SAGA: Texas Natural Resource C Environmental Protection Agency are treating groundwat remediation of the Industrial Transformer (Sol Lynn) Sup Astrodome.

Soil cleanup was completed in March, 1993 and ground placed under direction of Radian Corporation and Southw (CMR, 3/14/93, pg. 45). The $2.87 million contract involv 175 million gallons of water over the next 10 years.

BUSINESS BRIEFS

CHEMICAL PROFILE

Continued from Page 41

GROWTH

Historical (1984-1993): 2 to 3 percent per year; **future:** 2 to 4 percent per year through 1998.

PRICE

Historical (1981-1994): High, 80c. per pound, bulk crystal, hopper cars f.o.b.; low, 40c. per pound, same basis. **Current:** bulk crystal, hopper cars, frt. alld., 45c. per pound list; impact-grade, hopper cars, frt. alld., 47c. per pound, list; expandable beads, packaging grade, 1,000-lb. lots, 53c. to 55c. per pound, list.

USES

Packaging and one-time use, 40 percent; expandable polystyrene beads, 15 percent; electronics, 13 percent; resellers and compounding, 13 percent; consumer and institutional products, 11 percent; furniture, building and construction, 5 percent; other, 3 percent.

STRENGTH

Polystyrene is used heavily in consumer products, and should do well as the economy improves. The supply-demand balance is moving in favor of producers, and pricing is firming. Packaging uses of PS grew by more than 12 percent in 1993, and engineered formulations of PS are finding new opportunities in appliances, home entertainment electronics, packaging and construction. Improved resin grades are also making PS more competitive against other plastics, particularly ABS.

WEAKNESS

Polystyrene is a mature product, and manufacturers are under fire to lower their production costs and develop higher-performance resins. Benzene prices are rising, putting upward pressure on styrene.

OUTLOOK

Polystyrene is recovering as consumer goods pick up and the plastic makes inroads against more-expensive polymers. The market is no longer overcapacitated, and pricing is recovering. Growth should continue at GDP, but PS could falter if the economy weakens or the product comes under renewed environmental attack.

Third World Nations Tops In Carbon Dioxide Emissions

Third world nations are now the largest producers of carbon dioxide as they fuel their economic development with increased use of coal, oil and gas. Energy-related carbon dioxide emissions are growing much more slowly in industrialized nations.

The 24 major industrialized countries now produce 48 percent of the world's energy-related carbon emissions, down from 57 percent in 1970, says Energy Department in a new report. That means that the poorer developing nations are now the majority producers of energy-related carbon at 52 percent, up from 43 percent in 1970.

Between 1970 and 1992, carbon emissions grew 82 percent in developing countries, compared with a 28 percent increase in the industrial nations, according to the Energy Information Administration study. Overall, world emissions of energy-related carbon dioxide grew from 4 billion metric tons in 1970 to 6 billion in 1992.

Increased levels of carbon dioxide in the atmosphere, due mainly to the burning of fossil fuels have sparked concern among en- and the potential exists for large increases as developing nations continue to demand more modern lifestyles.

If the developing nations had used energy and produced carbon at the same per capita rates as the industrial countries in 1990, worldwide carbon emissions would have been triple the reported rate.

FDA Registered, C
Backed by Napp
Napp Technol
INC. 199 MAIN ST., BOX 90C
(201) 773-3900 FA

Your Bridge to the Resources
X-GAL •Enzyme
X-Glu, IP
CUSTOM SYNTHESIS A
CHEMBRIDGE CORPORATION (70
One Northbrook Place, 5 Revere Drive, S

ERREGIERRE
ERREGIERRE
INDUSTRIA CHIMICA S.p.A.
BERGAMO, ITALY
Amrinone
Anistotropine Methylbromide

CHEMICAL PROFILE

PET

May 3, 1993

PRODUCER	CAPACITY*
Eastman Chemical (3 Sites)	570
Hoechst Celanese (3 Sites)	160
ICI Americas, Fayetteville, N.C	65
Shell Chemical, Point Pleasant, W. Va.	205
Total	1,000

*Thousands of metric tons per year of [redacted] Eastman produces material at Columbia, S.C.; Kingsport, Tenn.; and Toronto, Canada. It will add 60,000 metric tons at Nuevo Leon, Mexico, in the second quarter of 1995. Eastman also plans overseas expansions, and it will increase its North American capacity through debottlenecking, particularly at Columbia. Hoechst produces at Greer, S.C.; Salisbury, N.C.; and Spartanburg, S.C. The company also has 25,000 annual metric tons at Ocotlan, Mexico. It plans to raise its North American capacity by over 200,000 metric tons over the next three years. Shell purchased its business from Goodyear. Nan Ya Plastics will open a 100,000-metric-ton plant in Lake City, S.C., in 1995. Wellman Inc. should join the market at the end of 1993, with an 88,500-metric-ton facility in Palmetto, S.C.

DEMAND

1992: 710,000 metric tons; 1993: 780,000 metric tons; 1997: 1.15 million metric tons. (Excludes exports, roughly 160,000 tons in 1992. Imports are negligible.)

GROWTH

Historical (1983-1992): 10 to 15 percent per year; future: 10 percent per year through 1997.

PRICE

Historical (1977-1993): High, 70c. per pound, bulk material, container-grade; low, 60c. per pound, same basis. Current, 65c. per pound, same basis.

USES

Bottles for carbonated soft drinks, 60 percent; custom containers for products other than soft drinks, 30 percent; amorphous and crystalized PET, 10 percent.

STRENGTH

PET continues to post enormous growth, and producers are highly optimistic about the coming decade. High recycling rates—40 percent for soda bottles and 25 percent for all PET applications—give the product an advantage over competing plastics and make it environmentally competitive with glass and aluminum.

WEAKNESS

Plastics are perceived as bad for the environment, and this could favor paper, aluminum and glass. PET is a poor barrier to oxygen and carbon dioxide, limiting its use as a beer container.

OUTLOOK

PET is one of the hot products for the 1990s. Two new producers are entering the US market, and most current manufacturers plan sizeable expansions.

Report From

By DON RICHA

GNI EXPANDING CHEMICAL RECYCLIN recycled chemicals processing capacity in Deer Pa million pounds annually by year's end. Current po

The plant, capable of recovering glycols, amines chemicals from side streams, started up in 1990 wit process off-materials from chemical and other indu 54).

A wiped-film evaporator and two batch reactor u stainless steel, have been added since "changing the puts it. GNI is currently eyeing specialty chemicals

FORMOSA PERMIT FROM TWC: Formosa P amended permit by Texas Water Commission to n gallons daily of treated industrial water into Upper process of lining up permits to operate the firm's ne glycol-plastics-ethylene dichloride complex at Poi

The company, which promised to work with the settle pending solid waste disposal cases, to become Clean Texas 2000 program, and abide by other stri biggest hurdle: an NPDES permit from Environme Environmental Impact Statement prepared by US I 3/15/93, pg. 41).

DIAMOND SHAMROCK RESULTS: The San $4.3 million vs. a loss of $28.5 million in 1Q 1992. T changes in accounting mandated by Financial Acco margins from refining and pipeline projects were al

Sales and operating revenues in the year 1992 for $2,602.6 million from $2,575.9 million in 1991. But r from $37.1 million the previous year. The firm is a j export facility completed last August at Bayport.

Diamond Shamrock also owns and operates an u storage facility at Mont Belvieu, with 25 storage wel 62 pipeline connections. This represents nearly 1? p hydrocarbon storage.

PERMITS SOUGHT: Environmental Protection draft National Pollutant Discharge Elimination Sys Chemicals Inc.'s Green Lake acrylonitrile and aceto new limits for copper, zinc, cyanide, arsenic and thal for the latter two metals. A permit also has been form Company refinery at Corpus Christi. A 30-day com

Lyondell Petrochemical Company has applied to renewal of Permit No. 3130A for its barge terminal f are listed as nitrogen oxides, carbon monoxide, parti hydrocarbons including but not limited to MTBE, s and acetophenone.

BAYOU CITY BULLETS: Petrochemical and pe Setpoint Inc. of Houston has opened has opened an Warrington, England, headed by Alan Dunkerley… Performance Chemicals, a Baker Hughes subsidiary, treat carbon dioxide corrosion in refinery overhead

BUSINESS BRIEFS

Compaction Improvement

distributes fluorspar and strontium carbonate use to reduce the amount of material used

PACIFIC ENVIRONMENTAL SERVICES, INC.

Central Park West
5001 South Miami Boulevard
PO Box 12077
Research Triangle Park, NC 27709-2077
(919) 941-0333 FAX (919) 941-0234

MEMORANDUM

TO: Leslie Evans
U. S. Environmental Protection Agency

FROM: Bennett King
Pacific Environmental Services

DATE: March 22, 1995

SUBJECT: Process Vents Level of Control For Methyl Methacrylate Butadiene Styrene (MBS) Sources - New Level of Control More Stringent Than Existing Level of Control

Purpose

This memorandum presents the analyses done to examine whether the level of control for new MBS sources is more stringent than for existing MBS sources. Since the control requirement (i.e., reduce emissions by 98 percent) is the same for new and existing sources, the analysis focuses on a comparison of applicability criteria.

Methodology & Results

Three analyses were done as part of examining this issue. The first analysis examined the percent emission reduction achieved by each facility under the new and existing applicability criteria. The second analysis examined the total allowed emissions for each facility for three situations: 1) under the existing controls, 2) under the new applicability criteria, and 3) under the existing applicability criteria. Finally, the third analysis entailed a vent-by-vent comparison across the three facilities between the new and existing criteria.

Based on the results of the three analyses, the new applicability criteria are at least as stringent as the existing criteria.

Analysis 1

Under the first analysis, the percent reduction achieved by the new and existing applicability criteria is compared for the three known facilities. For two out of the three facilities, this analysis demonstrates that the new applicability criteria are more stringent than the existing applicability criteria (Table 1).

Table 1. Percent Reduction For Each Facility

Facility	Existing Control	Existing Criteria	New Criteria
AQ	89%	92%	89%
AE	72%	72%	86%
L	17%	66%	97%

Analysis 2

Under the second analysis, the allowed emissions under the existing and new applicability criteria are compared. Under the existing criteria, emissions are approximately 77,400 lb/yr, and under the new criteria, emissions are approximately 72,400 lb/yr. For this analysis, the new applicability criteria are more stringent.

Analysis 3

Under the third and final analysis, the number of process vents and the emissions associated with each were categorized under one of three possible scenarios: 1) controlled by both the existing and new applicability criteria, 2) controlled by only the new applicability criteria and not by the existing criteria, and 3) controlled by only the existing applicability criteria, but not the new. Table 2 presents the results of this analysis.

Table 2. Vent-by-Vent Comparison

	Controlled by Both New & Existing	Controlled by New Only	Controlled by Existing Only
Number of Vents	26	2	9
Percent of Emissions	92%	3.5%	4.5%

Several observations can be made concerning the data. First, the percent of emissions controlled by only the existing criteria is a small amount of the total (less than 5 percent). Second, the delta between emissions controlled by only the existing criteria and those controlled by only the new criteria is even smaller (less than 1 percent). Given the approximate nature of the emission estimating techniques, this analysis demonstrates that the control achieved under the existing applicability criteria and that achieved under the new criteria are, for all practical purposes, equivalent.

Summary

In summary, one of the analyses clearly indicates that the new applicability criteria are more stringent, and for two of the analyses, the results indicate that the new criteria are at least as stringent as the existing. Therefore, on an overall basis, the new applicability criteria can be judged to be at least as stringent as the existing criteria.

l:\n301\docu\mbsnew

cc: Ken Meardon, PES
Valeria Everette, PES

II-B-21

PACIFIC ENVIRONMENTAL SERVICES, INC.

Central Park West
5001 South Miami Boulevard
PO Box 12077
Research Triangle Park, NC 27709-2077
(919) 941-0333 FAX (919) 941-0234

MEMORANDUM

TO: Group IV Resins Docket A-92-45

FROM: Bennett King
Pacific Environmental Services, Inc.

DATE: March 22, 1995

SUBJECT: Process Vent MACT Floors Considered More Stringent than the Hazardous Organic NESHAP (HON) and Batch Processes Alternative Control Techniques (ACT)

Purpose

This memo presents the options considered for defining the MACT floor for process vents for various subcategories and identifies the option selected by the EPA that appears in the proposed rule. The subcategories for which MACT floors were defined in regulatory terms are: existing sources producing methyl methacrylate butadiene styrene (MBS); existing and new sources producing acrylonitrile styrene acrylate/alpha methyl styrene acrylonitrile (ASA/AMSAN); and new sources producing styrene acrylonitrile (SAN) using a batch process. Defining the MACT floor for certain subcategories was necessary because it was determined that the MACT floors, as reflected in the existing level of control, for these subcategories are more stringent than the appropriate HON process vent requirements or Batch Processes ACT. Chapter 6 of the Basis and Purpose Document discusses the relationship between the MACT floor, the HON and Batch Processes ACT, and regulatory alternatives in more detail.

This memo discusses each subcategory (e.g., MBS) separately, identifying (1) why the MACT floors were considered more stringent than the HON requirements, (2) the options for defining the MACT floors, and (3) the advantages and disadvantages of each option. Finally, the option selected by the EPA as the basis of the proposed standards for each subcategory is identified.

MBS

Background. There are three facilities that produce MBS. Based on the available information, two of the facilities are controlling process vents that the HON for existing sources would not require to be controlled. (Note: all three facilities ar equivalent to the HON for new sources.) For each facility, each process vent was evaluated against the HON applicability criteria of total resource effectiveness (TRE). In addition, the emissions allowed under the HON were compared to the existing emissions. The finding that two facilities were more stringent than the HON was based on the fact that either (1) process vents were being controlled that the HON did not require to be controlled or (2) emissions allowed after applying the HON applicability and level of control to each process vent were greater than emissions under existing control.

Options for Defining the MACT Floor. The MACT floor can be defined as an overall percent reduction for process vents (determined using a weighted average percent reduction for the three MBS facilities) or as an overall emission factor for process vents. Defining the MACT floor as an overall percent reduction yields a value of 83 percent (see table below). Defining the MACT floor as an overall emission factor for process vents yields a value of 0.000590 pound emissions per pound of product (lb/lb). The estimation of the overall emission factor uses data which are considered to be confidential business information (CBI), and the derivation of this value is not shown.

DATA USED TO DETERMINE OVERALL PERCENT REDUCTION

Facility	Uncontrolled Emissions (lb/yr)	Existing Emissions (lb/yr)	Percent Emission Reduction
A	531,250	58,440	89%
B	95,610	26,770	72%
C	32,810	27,230	17%
Totals	659,660	112,440	83%

Options for Expressing the MACT Floor in the Regulation. Under either of the two options for defining the MACT floor, it is possible to determine a TRE value that achieves the emission reduction equivalent to the MACT floor (hereafter referred to as the equivalent TRE). Further, it is possible to determine an emission factor that achieves emission reduction equivalent to the MACT floor when it is expressed as an overall percent reduction. As a result, there are at least three possible formats for expressing the MACT floor in the rule: 1) TRE, 2) percent reduction, and 3) emission factor. Combinations of these formats are also possible.

TRE Determination. Determining the equivalent TRE value for either definition of the MACT floor followed the same process. The first step in determining the equivalent TRE value associated with the percent reduction definition of the MACT floor was to compare the percent reduction achieved by each facility on its process vents to the MACT floor level of 83 percent (or, when the MACT floor is defined as an emission factor, the emission factor achieved by each facility is compared to the MACT floor of 0.000590 lb/lb). For those facilities below the MACT floor level, the process vents that needed to be controlled in order to meet or exceed the MACT floor level were identified based on their stream characteristics; priority was given to those vents likely to be most cost effective to control. Once this was done for each facility. The TRE values for the selected process vents were examined and a TRE value representative of the individual process vent was determined (hereafter referred to as the representative TRE). Specific data are not available for all process vents. As a result, a range of likely stream characteristics that correspond to the known emissions for each process vent were developed, and a range of TRE values were determined based on the developed data.

The following criteria were used in selecting the representative TRE value for each process vent requiring control:

- if stream characteristics are known, the lower of the three calculated TRE values, one for each control device option (flare, thermal incinerator with 0% heat recovery, and thermal incinerator with 70% heat recovery), was selected as the representative TRE value
- if stream characteristics are not known, a two-step process was followed.

First, the TRE value or range of values representing year-round (8760 hr/yr) operation was selected for each control device option. This set of TRE values was selected to be conservative. Second, the highest TRE value for the control device option with the lowest range of values was selected.

Once the representative TRE value for each process vent required to be controlled was determined, the highest representative TRE value for the set of process vents requiring control was selected as the equivalent TRE.

For example, given the data in the table presented below, the representative TRE value for stream 1 would be 3.2 and the representative TRE value for stream 2 would be 5. The equivalent TRE value would be the highest value for the two streams requiring control -- 5.

EXAMPLE DATA FOR TRE DETERMINATION

Facility & Stream ID		TRE or Range of TREs for Control Device Options			
		Flare	Thermal Incinerator (0% heat recovery)	Thermal Incinerator (70% heat recovery)	Representative TRE
Str 1, Facility A	TRE[a]	9.3	3.2	3.8	3.2
Str 2, Facility B	TRE Range[b]	4.8 to 16.5	3 to 5	4.7 to 6	5[c]

[a] Stream characteristics are known.
[b] Stream characteristics are not known and the range of TRE values represent year-round operation.
[c] Highest TRE value for the year-round range with the lowest range of values.

A different equivalent TRE value was determined for the two different options of defining the MACT floor and different facilities were required to apply additional control. Using percent reduction for defining the MACT floor results in an equivalent TRE value of

5.0 and was based on facilities B and C applying additional control. Using the emission factor definition, an equivalent TRE value of 3.7 was calculated and facilities A and C would be required to apply additional control.

Determination of an equivalent TRE value under a third approach was considered. This approach would entail evaluating the TRE values of the process vents currently being controlled by each facility. Determining the equivalent TRE would define the MACT floor. After an initial review of the data, it was determined that too many process vents were represented by a wide range of TRE values due to missing stream data to utilize this approach.

Determining an Emission Factor Equivalent to the MACT Floor of 83% Emission Reduction. Another option for expressing the MACT floor in the regulation is to calculate an equivalent emission factor; that is, an emission factor that achieves the same emission reduction required by the MACT floor when defined as an overall percent reduction. To do this, the streams requiring control in order to bring each facility up to the MACT floor level of 83 percent emission reduction were determined. In most cases, the process vent population did not allow a facility to precisely achieve 83 percent emission reduction, and a facility achieved an emission reduction higher than 83 percent. The remaining emissions (existing emissions less the emission reduction required to achieve at least 83 percent emission reduction) and the production capacity were used to determine an overall emission factor. The calculated emission factor was 0.000654 lb/lb.

Expressing the MACT Floor in the Regulation. Five options for expressing the MACT floor in the regulation were developed. The first three options are based on defining the MACT floor as an overall percent reduction for process vents and the next two are based on defining the MACT floor as an overall emission factor. The options are:

1) require facilities to control each process vent with a TRE less than or equal to 5;
2) allow facilities to either (1) control each process vent with a TRE less than or equal to 5 or (2) achieve an overall process vents emission reduction equal to the MACT floor -- 83 percent;

3) require facilities to achieve an overall process vents emission factor equivalent to the percent reduction MACT floor of 83 percent emission reduction -- 0.000654 lb emissions per lb product.

4) require facilities to control each process vent with a TRE less than or equal to 3.7;

5) allow facilities to either (1) control each process vent with a TRE less than or equal to 3.7 or (2) achieve an overall process vents emission factor equal to the MACT floor (i.e., 0.000590 lb/lb).

These options all have slightly different emission reductions, annual costs, and cost-effectiveness values as presented in Table 1.

Table 1. OPTIONS FOR EXPRESSING THE MACT FLOOR

Option/Best Controlled Facility	Description	Facilities Requiring Control	Emission Reductions Achieved (Mg/yr)	Rough Order Annual Cost ($/yr)	Overall Cost Effectiveness ($/Mg)	Percent Reduction Relative to Uncontrolled Emissions
1[a] / A	TRE of 5	A, B, & C	25.88	203,250	7,850	91.5%
2 / A	TRE of 5 <u>or</u> 83% reduction	B & C	18.2	141,060	7,750	89%
3 / A	EF of 0.000654	A & C	20.14	299,420	14,870	89%
4[a] / B	TRE of 3.7	A, B, & C	21.17	151,530	7,160	90%
5 / B	TRE of 3.7 <u>or</u> EF of 0.000590	A & C	15.03	114,060	7,590	88%

[a] This option is more stringent than the MACT floor.
EF = emission factor

Cost effectiveness values for Options 1, 2, 4 and 5 are comparable. However, the options that apply a TRE value alone without considering a facility's performance relative to the MACT floor (options 1 and 4) are more stringent than the MACT floor and would need to be justified on a cost effectiveness basis. These options are more stringent because with either option, the facility that is the "best controlled" (e.g., the highest emission reduction) is required to apply control. Option 3 does not appear to be a favorable option due to the significantly higher cost effectiveness value when compared to the other options.

Option Selected by EPA. There is very little difference between Options 2 and 5 from an impacts perspective. However, Option 2 requires the facility with the lowest emissions per quantity of product (emission factor) at the existing level of control to apply additional control; Option 5 does not. For this reason, the EPA selected Option 5 as the basis for the proposed standards for this subcategory.

ASA/AMSAN

Background. Only one facility was identified as producing ASA/AMSAN, and all the known process vents at this facility were controlled. Based on the calculated TRE's for these process vents and/or application of the Batch Processes ACT applicability criteria, none of these process vents required control. Based on this comparison, this facility was considered to be controlling process vents more stringently than required by the HON/ACT for both existing and new sources. Therefore, the MACT floor for both existing and new sources needs to be based on the existing control level achieved at this facility. In addition, since only one facility exists that produces this resin, the MACT floors will be the same for existing and new sources and must ensure that this facility maintains its level of control.

Options & Selected Option. No options were developed for this subcategory. Because of the limited data, need to maintain the current level of control at the one known facility, and desire for simplicity, the EPA selected control of all process vents as the basis for the proposed standards for this subcategory.

SAN, Batch

Background. There are two facilities that produce SAN using a batch process. Based on the available information, one facility is controlling process vents as would be required by the HON/ACT, and one facility is controlling process vents to a level more stringent than the HON/ACT. The MACT floor for new sources needs to be based on this "best" facility.

Options. The process vents found at facilities producing SAN using a batch process are a mixture of batch and continuous process vents. As a result, defining the MACT floor based on the TRE was not an option. Two options were identified that could account for the mix of batch and continuous process vents. They are a percent reduction and an emission factor. The percent emission reduction achieved by the "best" facility is 84 percent. An emission factor could be estimated, but would have to be based on confidential production capacity data.

Option Selected by EPA. The option selected by EPA as the basis of the proposed standards for this subcategory is percent reduction. The confidential business information concerns associated with an emission factor weighed against considering this option for the proposed rule.

A-92-45
II-B-22

PACIFIC ENVIRONMENTAL SERVICES, INC.

Central Park West
5001 South Miami Boulevard
PO Box 12077
Research Triangle Park, NC 27709-2077
(919) 941-0333 FAX (919) 941-0234

MEMORANDUM

TO: Leslie Evans
U. S. Environmental Protection Agency

FROM: Bennett King
Pacific Environmental Services

DATE: March 22, 1995

SUBJECT: Methodology for Estimation of Preliminary Monitoring, Recordkeeping, and Reporting Costs for the Economic Impact Analysis for the Polymers and Resins IV NESHAP

The purpose of this memorandum is to document the basis used to estimate monitoring, recordkeeping, and reporting costs provided to the EPA for use in the Economic Impact Analysis for the Group IV polymers and resins national emission standards for hazardous air pollutants (NESHAP). The estimates for the Group IV NESHAP are based on a preliminary cost analysis done for the Group I NESHAP (i.e. the NESHAP affecting elastomer polymers and resin processes).

In estimating the preliminary monitoring, recordkeeping, and reporting costs used in the Economic Impact Analysis, it was assumed that the total monitoring, recordkeeping, and reporting costs would be similar to those estimated for the Group I NESHAP. In the memorandum entitled "Preliminary Monitoring, Recordkeeping, and Reporting Costs for Polymers and Resins I," it was determined that, in general, the total costs for monitoring, recordkeeping, and reporting for the Group I NESHAP were approximately 30 percent of the total annualized control costs. Many of the control requirements, as well as monitoring, recordkeeping and reporting requirements for the Group IV NESHAP are quite similar to those in the Group I NESHAP. Therefore, it was determined that an estimate of 30 percent of the total annualized control costs is a reasonable estimate for Group IV and was used. The memorandum documenting the preliminary cost analysis for the Group I NESHAP is included as Attachment 1.

1:\n301\docu\mrr30%

cc: Ken Meardon, PES
Valerie Everette, PES

ATTACHMENT 1

MEMORANDUM

Date: August 9, 1994

Subject: Preliminary Monitoring, Recordkeeping, and Reporting Costs for Polymers and Resins I

From: Phil Norwood, EC/R

To: Leslie Evans, EPA/OAQPS/ESD/CPB

This memorandum presents estimated monitoring, recordkeeping, and reporting (MRR) costs for the Polymers and Resins I project. These estimates are based on the MRR cost estimates for the Hazardous Organic NESHAP (HON), and are intended to be a preliminary estimate. A more detailed analysis, specific to the requirements of the selected regulatory alternative for Polymers and Resins I, will be necessary at a later date.

This estimation was made using the methodology from the HON SF-83 analysis. Copies of the HON SF-83 and supporting statement are included as Attachment 1. In the HON analysis, the average technical hours per monitoring, reporting, and recordkeeping activity were estimated for a representative facility. These numbers were multiplied by the number of activities per year to obtain an estimated number of technical hours per year for the representative facility (source). The estimated technical hours needed per source are shown in Table 1.

Warren Johnson of EPA, the author of the HON SF-83 and supporting statement, indicated that the HON estimates include costs for monitoring equipment. He said that monitoring equipment costs were converted to technical labor hours, and that these were included in the "gather information, monitor, and inspect" activity. However, the SF-83 supporting information does not provide details on this conversion.

For the Polymers and Resins I MRR cost estimate, EC/R used the technical hours per source estimates shown in Table 1, and the other information shown in Table 2. Since it is expected that many of the control requirements (as well as monitoring, recordkeeping, and reporting requirements) for the Polymers and Resins I regulation will be identical to those in the HON, this should provide a reasonable preliminary estimate for this project. However, a future analysis should take into account the actual monitoring, reporting, and recordkeeping requirements of the Polymers and Resins I regulation. Also, the assumptions for the HON representative plant should be examined and modified to reflect a representative Polymers and Resins I facility.

University Tower, Suite 404 • 3101 Petty Road, Box 37 • Durham, North Carolina 27707
Telephone: (919) 493-6099 • Fax: (919) 493-6393

TABLE 1. TECHNICAL HOURS NEEDED TO COMPLY WITH MONITORING, REPORTING, AND RECORDKEEPING REQUIREMENTS

Activity	Tech hrs/yr per source Overall[a]	Eq Leaks
Read rule and instructions	167	18
Plan activities	276	12
Training	111	10
Create, Test, Research and Development	2499	1220
Gather Info., Monitor/Inspect[b]	1250	750
Process/Compile and Review	20	4
Complete Reports	151	125
Record/Disclose	35	21
Store/File	27	1

[b] Overall includes equipment leaks.
[b] This estimate incorporates costs of monitoring equipment.

TABLE 2. OTHER INFORMATION USED TO CALCULATE MONITORING, REPORTING, AND RECORDKEEPING COSTS

Other Labor	
Managerial Hours	5% of technical labor hours
Clerical Hours	10% of technical laborhours
Labor Rates	
Technical	$33 per hour
Managerial	$49 per hour
Clerical	$15 per hour

For each subcategory, the overall technical labor hours per event per source (shown in Table 1) were multiplied by the number of facilities, to obtain the total estimated technical labor hours per year for the subcategory. The managerial and clerical hours were then calculated using the percentages in Table 2. Each type of labor hour was then multiplied by the appropriate labor rate in Table 2 to obtain the annual cost for each event. The sum of the individual event annual costs represent the total MRR costs for the subcategory.

Several subcategories (Hypalon™, Styrene-Butadiene Latex, Styrene-Butadiene Rubber by Emulsion, and Polybutadiene Rubber/Styrene-Butadiene Rubber by Solution) are already subject to the HON equipment leaks provisions. For these subcategories, the total technical labor hours needed per event per facility were calculated by subtracting the equipment leak technical labor hours from the overall. For instance, the technical hours per year per source for training would be 111 - 10 = 101.

Table 3 shows the total estimated costs for monitoring, reporting, and recordkeeping for Polymers and Resins I. The total MRR cost for the project is around $5.3 million per year, which is approximately 31 percent of the total control costs.

TABLE 3. ESTIMATED MONITORING, REPORTING, AND RECORDKEEPING COSTS

Subcategory	MRR[a] Costs 1000$/yr
Butyl Rubber	$168
Halobutyl Rubber	$168
Epichlorohydrin Elastomers	$168
Ethylene–Propylene Rubber	$838
Hypalon	$88
Neoprene	$503
Nitrile–Butadiene Latex	$503
Nitrile–Butadiene Rubber by Emulsion	$670
Styrene–Butadiene Latex	$1,404
Styrene–Butadiene Rubber by Emulsion	$351
Poly–/Styrene–Butadiene Rubber by Soln	$439
TOTAL P&R I MRR COSTS ($/yr)	$5,299
Total Control Costs ($/yr)	$16,982
%MRR to total	31%

[a] Monitoring, recordkeeping, and reporting

ATTACHMENT 1

HON SF-83 AND SUPPORTING STATEMENT

A-90-19
IV-B-9

Form 83 (…ember 1983)

Request for OMB Review

…ortant

…ad instructions before completing form. Do not use the same SF 83 …quest both an Executive Order 12291 review and approval under …Paperwork Reduction Act.

…swer all questions in Part I. If this request is for review under E.O. …91, complete Part II and sign the regulatory certification. If this …est is for approval under the Paperwork Reduction Act and 5 CFR …0, skip Part II, complete Part III and sign the paperwork certification.

Send three copies of this form, the material to be reviewed, and for paperwork—three copies of the supporting statement, to:

Office of Information and Regulatory Affairs
Office of Management and Budget
Attention: Docket Library, Room 3201
Washington, DC 20503

…T I.—Complete This Part for All Requests.

…partment/agency and Bureau/office originating request
…nited States Environmental Protection Agency
…ffice of Air and Radiation

2. Agency code: 2 0 6 0

…ame of person who can best answer questions regarding this request
…anet S. Meyer, MD-13; Warren R. Johnson, MD-13

Telephone number: (919) 541-5254/51…

…tle of information collection or rulemaking
…ecordkeeping and Reporting for the Hazardous Organic NESHAP (HON) for the Synthetic Organic …hemical Manufacturing Industry (SOCMI) and Other Processes Subject to the Negotiated …egulation for Equipment Leaks

…egal authority for information collection or rule (cite United States Code, Public Law, or Executive Order)
42 USC 7412 or 7414

…ffected public (check all that apply)

- ☐ Individuals or households
- ☐ State or local governments
- 3 ☐ Farms
- 4 ☒ Businesses or other for-profit
- 5 ☐ Federal agencies or employees
- 6 ☐ Non-profit institutions
- 7 ☒ Small businesses or organizations

…RT II.—Complete This Part Only If the Request Is for OMB Review Under Executive Order 12291

…egulation Identifier Number (RIN)
__ __ __ __ – __ __ __ __, or, None assigned ☐

…ype of submission (check one in each category)

…lassification
- … ☐ Major
- … ☐ Nonmajor

Stage of development
- 1 ☐ Proposed or draft
- 2 ☐ Final or interim final, with prior proposal
- 3 ☐ Final or interim final, without prior proposal

Type of review requested
- 1 ☐ Standard
- 2 ☐ Pending
- 3 ☐ Emergency
- 4 ☐ Statutory or judicial deadline

…CFR section affected
______ CFR ______

Does this regulation contain reporting or recordkeeping requirements that require OMB approval under the Paperwork Reduction Act and 5 CFR 1320? . . . . . ☐ Yes ☐ N…

… If a major rule, is there a regulatory impact analysis attached? . . . . . 1 ☐ Yes 2 ☐ N…
If "No," did OMB waive the analysis? . . . . . 3 ☐ Yes 4 ☐ N…

…rtification for Regulatory Submissions

…n submitting this request for OMB review, the authorized regulatory contact and the program official certify that the requirements of E.O. 12291 and any applicable …cy directives have been complied with.

…gnature of program official | Date

…gnature of authorized regulatory contact | Date

… (OMB use only)

III.—Complete This Part Only If the Request is for Approval of a Collection of Information Under the Paperwork Reduction Act and 5 CFR 1320.

:tract—Describe needs, uses and affected public in 50 words or less

:omulgated standard will require control of emissions of 110 hazardous air pollutants from :oduction of about 400 synthetic organic chemicals. Affected chemical plants would maintain :s and submit initial and sometimes semiannual or quarterly reports of emission measurements :lated information.

:e of information collection (check only one)

:ormation collections not contained in rules

☐ Regular submission 2 ☐ Emergency submission (certification attached)

:ormation collections contained in rules

☐ Existing regulation (no change proposed)
☐ Notice of proposed rulemaking (NPRM)
☒ Final, NPRM was previously published

6 Final or interim final without prior NPRM
A ☐ Regular submission
B ☐ Emergency submission (certification attached)

7. Enter date of expected or actual Federal Register publication at this stage of rulemak: (month, day, year): Feb. 28, 1994

:pe of review requested (check only one)

☒ New collection
☐ Revision of a currently approved collection
☐ Extension of the expiration date of a currently approved collection without any change in the substance or in the method of collection
4 ☐ Reinstatement of a previously approved collection for which approval has expired
5 ☐ Existing collection in use without an OMB control number

:gency report form number(s) (include standard/optional form number(s))

1414.02

:nnual reporting or disclosure burden

Number of respondents	389
Number of responses per respondent	4
Total annual responses (line 1 times line 2)	1,556
Hours per response	1341.18
Total hours (line 3 times line 4)	2,086,870

:nnual recordkeeping burden

Number of recordkeepers	389
Annual hours per recordkeeper	105
Total recordkeeping hours (line 1 times line 2)	40,840
Recordkeeping retention period	5 years

:tal annual burden

Requested (line 17-5 plus line 18-3)	2,127,710
In current OMB inventory	-0-
Difference (line 1 less line 2)	2,127,710
Explanation of difference	
Program change	2,127,710
Adjustment	-0-

:urrent (most recent) OMB control number or comment number

:equested expiration date

:years from promulgation (or approval if later)

22. Purpose of information collection (check as many as apply)

1 ☐ Application for benefits
2 ☐ Program evaluation
3 ☐ General purpose statistics
4 ☒ Regulatory or compliance
5 ☐ Program planning or management
6 ☐ Research
7 ☐ Audit

23. Frequency of recordkeeping or reporting (check all that apply)

1 ☒ Recordkeeping
Reporting
2 ☐ On occasion
3 ☐ Weekly
4 ☐ Monthly
5 ☒ Quarterly
6 ☒ Semi-annually
7 ☐ Annually
8 ☐ Biennially
9 ☒ Other (describe): Initial

24. Respondents' obligation to comply (check the strongest obligation that app:

1 ☐ Voluntary
2 ☐ Required to obtain or retain a benefit
3 ☒ Mandatory

:re the respondents primarily educational agencies or institutions or is the primary purpose of the collection related to Federal education programs? ☐ Yes ☒

:oes the agency use sampling to select respondents or does the agency recommend or prescribe the use of sampling or statistical analysis :y respondents? ☐ Yes ☒

:egulatory authority for the information collection

40 CFR 63 ; or ______ FR ______ ; or, Other (specify): ______

:erwork Certification

:ubmitting this request for OMB approval, the agency head, the senior official or an authorized representative, certifies that the requirements of 5 CFR 1320 :acy Act, statistical standards or directives, and any other applicable information policy directives have been complied with.

:ature of program official | Date

:rector, Office of Air Quality Planning and Standards

:ature of agency head, the senior official or an authorized representative | Date

PART A OF THE SUPPORTING STATEMENT

1. Identification of the Information Collection

(a) Title and Number of the Information Collection.

"Reporting and Recordkeeping Requirements for the Hazardous Organic NESHAP (HON) for the Synthetic Organic Chemical Manufacturing Industry (SOCMI) and Other Processes Subject to the Negotiated Regulation for Equipment Leaks."

(b) Short Characterization.

Respondents are owners or operators of processes in SOCMI industires, styrene-butadiene rubber production, polybutadiene production, chloride production, pesticide production, chlorinated hydrocarbon use in production of chemicals, pharmaceutical production, and miscellaneous butadiene use. It is estimated that about 370 existing plants will be subject to the standards. All sources must be in compliance with the requirements of the standard for equipment leaks within 18 months of the effective date of that rule. In addition, new sources must be in compliance with the standard for process vents, storage, transfer, and wastewater emissions (Subpart G) at startup. Existing sources are not required to comply with Subpart G until three years after the effective date of the rule.

Generally, respondents are required by law to submit onetime reports of start of construction, anticipated and actual start-up dates, and physical or operational changes to existing facilities. In addition, Subpart G requires respondents to submit five types of reports: (1) Initial Notification, (2) Implementation Plan, (3) Notification of Compliance Status, (4) Periodic Reports, and (5) several event triggered reports. The Initial Notification report identifies sources subject to the rule and the provisions which apply to these sources. In the Implementation Plan, an owner or operator details how the source will comply with the provisions of Subpart G. The Notification of Compliance Status is submitted to provide the information necessary to demonstrate that compliance has been achieved. The Periodic Reports provide the parameter monitoring data for the control devices, results of any performance tests conducted during the period, and information on instances where inspections revealed problems. Subparts H and I require the source to submit an initial report detailing the equipment and process units subject to, and schedule for implementing each phase of, the standard. Owners and operators also have to submit semiannual reports of the monitoring results from the leak detection and repair program in the equipment leak standard, and quarterly reports for all points included in an emissions average. All records are to be maintained by the source for a period of at least 5 years.

All reports are submitted to the respondent's State agency, if it has an approved Title V permit program implementation authority, or the appropriate Environmental Protection Agency (EPA) Regional Office. The reports required by Subparts G, H and I are used to determine that sources subject to the rule are in compliance with the rule.

2. Need for and use of the Collection.

(a) Need/Authority for the collection.

Section 112 of the Clean Air Act, as amended in 1990, requires that EPA establish standards to limit emissions of hazardous air pollutants (HAP) from stationary sources. The sources subject to the proposed rule can potentially emit 149 of the 189 HAP's listed in Section 112. Section 114 of the Act gives the EPA authority to collect data and information necessary to enforce standards established under Section 112.

Certain records and reports are necessary to enable the Administrator to (1) identify sources subject to the standards and (2) ensure that the standards, which are based on "MACT", maximum achievable control technology, are being achieved.

(b) Use/Users of the Data.

The information will be used by Agency enforcement personnel to: (1) identify sources subject to the standards; (2) identify the control methodology being applied; and (3) ensure that the emission control devices are being properly operated and maintained on a continuous basis.

In addition, records and reports are necessary to enable EPA to identify plants that may not be in compliance with the standards. Based on reported information, EPA can decide which plants should be inspected and what records or processes should be inspected at the plants. The records that plants maintain would indicate to EPA whether plant personnel are operating and maintaining control equipment properly.

3. The Respondents and the Information Requested.

(a) Respondents/SIC Codes.

Respondents are owners or operators of HAP-emitting chemical production processes that are used to produce any of the approximately 400 listed SOCMI chemicals. Most of the processes are classified in the four-digit Standard Industrial Classification (SIC) Codes 2869 for Industrial Organic Chemicals and 2865 for Cyclic Organic Crudes and Intermediates. However, not all processes classified in these two SIC codes would be regulated by this proposal.

(b) Information Requested.

(i) Data items. Attachment 1, Source Data and Information Requirements, summarizes the recordkeeping and reporting requirements.

(ii) Respondent Activities. The respondent activities required by the standards are shown in the first column of Tables 1a and 1b, which are introduced in Section 6(a).

4. The Information Collected--Agency Activities, Collection Methodology, and Information Management.

(a) Agency Activities.

A list of Agency activities is provided in Table 2, introduced in Section 6(c).

(b) Collection Methodology and Management.

Information contained in the one-time-only reports will be entered into the Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS) maintained and operated by EPA's Office of Air Quality Planning and Standards (OAQPS). Data obtained during periodic visits by Agency personnel from records maintained by the respondents will be tabulated and published for internal EPA use in compliance and enforcement programs.

(c) Small Entity Flexibility.

Minimizing the information collection burden for all sizes of organizations is a continuing effort on EPA's part. The EPA has reduced the recordkeeping and reporting requirements to include only the information needed by EPA to determine compliance with the standards.

The burden to respondents has been minimized by requiring the collection and reporting of information which is clearly essential to ensure that sources comply with the standards.

(d) Collection Schedule.

Collection of data will begin after promulgation of the rule, scheduled for February 1994.

The schedule for the submission of the five types of reports required by Subpart G, (1) Initial Notification, (2) Implementation Plan, (3) Notification of Compliance Status, (4) Periodic Reports, and (5) other reports, is detailed below.

The Initial Notification is due 120 days after the date of promulgation for existing sources. For new sources, it is due 180 days before commencement of construction or reconstruction, or 90 days after promulgation of Subpart G, whichever is later.

Existing sources must submit the Implementation Plan at different times for emission points included in averages and emission points not included in averages. The Implementation Plan for emission points included in the average would be due 18 months prior to the date of compliance. The Implementation Plan for emission points not included in an emissions average would be due 12 months prior to the date of compliance. For new sources, Implementation Plans would be submitted with the Notification of Compliance Status. An Implementation Plan would be required only for sources that have not yet submitted an operating permit application.

The Notification of Compliance Status would be submitted 150 days after the source's compliance date for both new and existing sources.

Generally, periodic Reports would be submitted semiannually. However, there are two exceptions. Quarterly reports must be submitted for all points included in an emissions average. In addition, if monitoring results show that the parameter values for an emission point are outside the established range for more than 1 percent of the operating time in a reporting period, or the monitoring system is out of service for more than 5 percent of the time, the regulatory authority may request that the owner or operator submit quarterly reports for that emission point. After 1 year, semiannual reporting can be resumed, unless the regulatory authority requests continuation of quarterly reports.

Other reports would be submitted as required by the provisions for each kind of emission point. The due date for these kinds of reports is tied to the event that precipitated the report itself. Examples of these special reports include requests for extensions of repair, notification of scheduled inspections for storage vessel and wastewater management units, process changes, and startup, shutdown, and malfunctions.

Subparts H and I, the equipment leak standards, would require the submittal of an initial report and semiannual reports of leak detection and repair experiences and any changes to the processes, monitoring frequency and/or initiation of a quality improvement program. The schedule for submission of these reports is detailed below.

For existing sources, the owner or operator would be required to submit the initial report within 90 days after the applicability date of the standard. The standard establishes a staggered implementation scheme with 5 groups of applicability dates. The standard would apply to the first group of processes 6 months after promulgation. Thereafter, the standard would apply to another group every 3 months until all processes are implementing the program. For new sources, the initial report shall be submitted with the application for construction, as under Subpart G.

Every 6 months after the initial report, a report must be submitted that summarizes the monitoring results from the leak detection and repair program and provides a notification of initiation of monthly monitoring or implementation of a quality improvement program, if applicable.

5. Nonduplication, Consultations, and Other Collection Criteria.

(a) Nonduplication.

A search of EPA's existing standards and ongoing ICR's revealed no duplication of information-gathering efforts. However, certain reports required by State or local agencies may duplicate information required by the standards. In such cases, a copy of the report submitted to the State or local agency can be provided to the Administrator in lieu of the report required by the standards.

(b) Consultations.

Consultations with numerous representatives of the chemical industry, environmental organizations, and state/local air pollution control agencies were conducted throughout the rule development. Table 3 provides a list of some of the persons consulted. The standard was also discussed at meetings of the National Air Pollution Control Techniques Advisory Committee (NAPCTAC) held in January and November of 1991. A 90-day public comment period was provided after proposal, during which all affected parties were given the opportunity to comment on the proposed rule. In addition, a 30-day public comment period was provided after supplemental notice on the proposed General Provisions impacts on the HON, and certain Emissions Averaging policy considerations. All received comments were considered and some reflected in the development of the final rule.

(c) Effects of Less Frequent Collection.

If the relevant information were collected less frequently, the EPA would not be reasonably assured that a source is in compliance with the standards. In addition, EPA's authority to take administrative action would be significantly reduced; Section 113(d) of the CAA limits the assessment of administrative penalties to violations which occur no more than 12 months before initiation of the administrative proceeding. Since administrative proceedings are less costly and require use of fewer resources than judicial proceedings, both EPA and the regulated community benefit from preservation of EPA's administrative powers.

(d) General Guidelines.

Except for some equipment leaks provisions (Subparts H and I) which only require 2-year retention, this rule requires that facility owners or operators retain records for a period of 5 years, which exceeds the 3-year retention period contained in the guidelines in 5 CFR 1320.6. The 5-year records retention period is consistent with the provisions of the soon-to-be final General Provisions of 40 CFR Part 63, and with the 5-year records retention requirement in the operating permit program under Title V of the Clean Air Act.

(e) Confidentiality and Sensitive Questions.

(i) Confidentiality. Information obtained by EPA is safeguarded according to the Agency policies set forth in Title 40, Chapter 1, Part 2, Subpart B, Confidentiality of Business Information. See 40 CFR 2; 41 FR 36902, September 1, 1976; amended by 43 FR 3999, September 8, 1978; 43 FR 42251, September 28, 1978; 44 FR 17674, March 23, 1979. Even where the Agency has determined that information received from a "person" in response to an Information Collection Request (ICR) is eligible for confidential treatment under 40 CFR Part 2, Subpart B, the Agency may nonetheless disclose the information if it is "relevant in any proceeding" under the statute [42 U.S.C. Section 7414 (C); 40 CFR 2.301 (g)]. The information collection complies with the Privacy Act of 1974 and Office of Management and Budget (OMB) Circular 108.

(ii) Sensitive Questions. Information to be reported consists of emission data and other information that are not of a sensitive nature. No sensitive personal or proprietary data are being collected.

6. Estimating Burden and Cost of the Collection.

(a) Estimating Respondent Burden.

The existing source annual burden estimates for reporting and recordkeeping are presented in Table 1a. The new source annual burden estimates for reporting and recordkeeping are presented in Table 1b. These estimates are shown separately since the technical hours for new sources must include compliance at startup and periodic records burdens in addition to pre-compliance requirements. Generally, with the exceptions of new sources and some equipment leaks provisions, periodic reports and recordkeeping requirements begin after the compliance date, which is three years from promulgation.

In addition to Tables 1a and 1b, an extract of the equipment leaks standards (Subparts H and I) contribution to the overall existing source annual burden estimates for reporting and recordkeeping is presented in Table 4. This is to highlight the burden which can be directly attributed to the equipment leaks standards (Subparts H and I) during the first three years after promulgation. The equipment leaks standards were developed through regulatory negotiation.

Information collection requirements include one-time-only reports and periodic reports. The burden estimates for the one-time only reports are treated/considered as average annual burdens by dividing the cumulative three year total technical hour estimate by three before including it in column (c), "technical hours per year per source."

The estimates of total technical-hours per year per source and the number of activities per respondent per year listed in each table are based upon experience with similar information collection requirements in SOCMI NSPS and the number of emission points in each source.

(b) Estimating Respondent Costs.

The information collection activities for the first three years for sources subject to the standards are presented in Tables 1a and 1b. To stay consistent with the control cost estimates, labor rates and associated costs are based on the 1989 Comprehensive Assessment and Information Rule (CAIR) economic analysis, and estimated hourly rates are as follows: Technical at $33, management at $49, and clerical at $15. The total burden costs may be converted to 1992 CAIR rates by multiply the technical hours by $49.0/hour (this includes assumed managerial and clerical cost considerations). However, any conversions to 1992 CAIR rates should not be used to compare with control costs, which are estimated in 1989 dollars.

It is important to note that an average was taken of costs covering a period of three years for reporting and recordkeeping to a typical source. Therefore, total recurrent annual burden hours would be as indicated in Table 1a for existing sources and Table 1b for new sources.

(c) Estimating Agency Burden and Cost.

Because the information collection requirements were developed as an incidental part of standards development, no costs can be attributed to the development of the information collection requirements.

Because reporting and recordkeeping requirements on the part of the respondents are required under Section 112 of the Clean Air Act, no operational costs will be incurred by the Federal Government. Publication and distribution of the information are part of the AFS operated and maintained by OAQPS, with the result that no Federal costs can be directly attributed to the ICR.

Examination of records to be maintained by the respondents will occur incidentally as part of the periodic inspection of sources that is part of EPA's overall compliance and enforcement program and, therefore, is not attributable to the ICR. The only costs that the Federal Government will incur are user costs associated with the analysis of the reported information, as presented in Table 2. Labor rates and associated costs are based on the CAIR economic analysis, and estimated hourly rates are as follows: technical at $33, management at $49, and clerical at $15.

(d) Bottom Line Burden Hours and Costs/Master Tables.

(i) The simple collection. The bottom line respondent burden hours and costs, presented in Tables 1a and 1b, are calculated by adding person-hours per year down each column for technical, managerial, and clerical staff, and by adding down the cost column. The estimated total nationwide burden in the first 3 years of the rule is an estimated 2,127,710 hours per year (1,850,180 technical, 92,510 managerial and 185,020 clerical hours) at a cost of 68,364.37 thousand dollars per year.

(ii) The Agency Tally. The bottom line Agency burden hours and costs, presented in Table 2, are calculated as in the respondent table, by adding person-hours per year down each column for technical, managerial, and clerical staff, and by adding down the cost column. In this case, the total cost is the sum of the total salary cost and the total travel expenses for tests attended. The estimated total hours and costs in the first 3 years of the rule are 23,188 hours per year (20,162 technical, 1,009 managerial, and 2,017 clerical hours) at a cost of 760.37 thousand dollars per year.

(iii) The complex collection. This section does not apply since this is a simple collection.

(e) Reasons for Change in Burden.

This section does not apply because this is a new collection.

Table 1a. Existing Source Annual Respondent Burden and Cost of Reporting and Recordkeeping Requirements of the HON Provisions

Burden Item	Average Hours per Activity (a)	Number of Activities per year per source (b)	Technical Hours per year per source (c)	Est'd. Number Existing Sources (d)	Estimated Technical Hours per year (e)	Estimated Managerial Hours per year (f)	Estimated Clerical Hours per year (g)	Annual Cost in $Thousands per year (h)
1) Read Rule and Instructions	3.6	47	167	371	61,957	3,098	6,196	2,289.32
2) Plan Activities	5.9	47	276	371	102,396	5,120	10,240	3,783.55
3) Training	5.8	19	111	371	41,181	2,059	4,118	1,521.63
4) Create, Test, Research & Development	17.9	140	2,499	371	927,129	46,356	92,713	34,257.40
5) Gather Info., Monitor/Inspect	2.5	500	1,250	371	463,750	23,188	46,375	17,135.59
6) Process/Compile & Review	20.0	1	20	371	7,420	371	742	274.17
7) Complete Rep'ts	75.5	2	151	371	56,021	2,801	5,602	2,069.97
8) Record/Disclose	17.5	2	35	371	12,985	649	1,299	479.79
9) Store/File	6.8	4	27	371	10,017	501	1,002	370.14
TOTAL BURDEN AND COST					1,682,856	84,143	168,287	62,181.56

See attachment 2 for assumptions and further description of activities.

Table 1b. New Source Annual Respondent Burden and Cost of Reporting and Recordkeeping Requirements of the HON Provisions

Burden Item	Average Hours per Activity (a)	Number of Activities per year per source (b)	Technical Hours per year per source (c)	Est'd. Number of New Sources (d)	Estimated Technical Hours per year (e)	Estimated Managerial Hours per year (f)	Estimated Clerical Hours per year (g)	Annual Cost in $Thousands per year (h)
1) Read Rule and Instructions	2.7	94	250	18	4,500	225	450	166.28
2) Plan Activities	3.8	94	355	18	6,390	320	639	236.14
3) Training	3.5	38	132	18	2,376	119	238	87.81
4) Create, Test, Research & Development	2.4	1,780	4,266	18	76,788	3,839	7,679	2,837.30
5) Gather Info., Monitor/Inspect	1.4	2,047	2,943	18	52,974	2,649	5,297	1,957.40
6) Process/Compile & Review	0.8	48	40	18	720	36	72	26.60
7) Complete Rep'ts	11.4	49	557	18	10,026	501	1,003	370.45
8) Record/Disclose	10.0	49	489	18	8,802	440	880	325.23
9) Store/File	5.2	51	264	18	4,752	238	475	175.60
TOTAL BURDEN AND COST					167,328	8,367	16,733	6,182.81

See attachment 2 for assumptions and further description of activities.

Table 2. Annual Burden and Cost for the Federal Government

Burden Item	Average Hours per Activity (a)	Number of Activities per year (b)	Estimated Technical Hours per year (c)	Estimated Managerial Hours per year (d)	Estimated Clerical Hours per year (e)	Annual Cost in $Thousands per year (f)
PERFORMANCE TESTS:						
1) Initial	40	14	560	28	56	20.69
2) Repeat	40	3	120	6	12	4.43
LITIGATION:	2,080	3	6,240	312	624	230.57
REPORTS REVIEW:						
1) Initial	2	124	248	12	25	9.15
2) Implementation Plan or Permit	20	124	2,480	124	248	91.64
3) Compl. status	40	124	4,960	248	496	183.27
4) Review equip. leak monitoring	7	742	5,194	260	519	191.93
5) Notification of const./recon.	6	6	36	2	4	1.35
6) Notification of anticipated startup	6	6	36	2	4	1.35
7) Notification of actual startup	6	6	36	2	4	1.35
8) Notif. of performance test	6	6	36	2	4	1.35
9) Review of test results	24	6	144	7	14	5.31
10) Review periodic reports	4	18	72	4	7	2.68
TOTAL BURDEN AND COST (Salary)			20,162	1,009	2,017	745.07
TRAVEL EXPENSES						15.30
TOTAL ANNUAL COST						760.37

See attachment 3 for assumptions and further description of activities.

Table 3. Persons Consulted on the Reporting and Recordkeeping Requirements in the Rule Development

David Driessen	Natural Resources Defense Council	(202) 783-7800
Larry Goodheart	Chevron Corp.	(510) 242-4145
David Gustafson	DOW Chemical USA	(517) 636-2953
Joe Hovious	Union Carbide	(203) 794-5183
Ali Khan	Indiana Air Pollution Control	(219) 391-8297
Karen Olsen	Texas Air Pollution Control Board	(512) 451-5711
Gus Von Bodungen	Louisiana Department of Environmental Quality	(504) 394-5374

Table 4. Existing Source Annual Respondent Burden and Cost of Reporting and Recordkeeping Requirements of the HON Equipment Leaks Provisions (Subparts H and I) Alone

Burden Item	Average Hours per Activity (a)	Number of Activities per year per source (b)	Technical Hours per year per source (c)	Est'd. Number Existing Sources (d)	Estimated Technical Hours per year (e)	Estimated Managerial Hours per year (f)	Estimated Clerical Hours per year (g)	Annual Cost in $Thousands per year (h)
1) Read Rule and Instructions	4.5	4	18	371	6,678	334	668	246.76
2) Plan Activities	3.0	4	12	371	4,452	223	445	164.52
3) Training	2.5	4	10	371	3,710	186	371	137.11
4) Create, Test, Research & Development	0.8	1,500	1,220	371	452,620	22,631	45,262	16,724.31
5) Gather Info., Monitor/Inspect	0.5	1,500	750	371	278,250	13,913	27,825	10,281.36
6) Process/Compile & Review	1.0	4	4	371	1,484	74	148	54.82
7) Complete Rep'ts	0.1	1,500	125	371	46,375	2,319	4,638	1,713.58
8) Record/Disclose	5.0	4	20	371	7,420	371	742	274.17
9) Store/File	0.3	4	1	371	371	19	37	13.73
TOTAL BURDEN AND COST					801,360	40,070	80,136	29,610.36

These burdens are the equipment leaks regulatory negotiation contribution to the overall existing source burden in Table 1a.
See attachment 2 for assumptions and further description of activities.

Attachment 1

SOURCE DATA AND INFORMATION REQUIREMENTS

Information Requirements	Citation
NOTIFICATION	
Notification of construction or reconstruction	63.151, 63.182
Notification of anticipated date of initial startup	63.151, 63.182
Notification of actual date of initial startup	63.151, 63.182
Notification of modification	63.118, 63.122, 63.130, 63.146, 63.151, 63.152, 63.182
REPORTING - INITIAL	
Initial report requirements	63.117, 63.122, 63.129, 63.146, 63.151, 63.182
Reporting of operating parameter levels	63.118, 63.122, 63.129, 63.146, 63.151, 63.182
Statement of compliance or noncompliance	63.151, 63.152, 63.182
REPORTING - SEMIANNUAL & QUARTERLY	
Exceedances of parameter boundaries established during the most recent performance test	63.105, 63.118, 63.122, 63.130, 63.146, 63.148, 63.151, 63.152, 63.182
Any change in equipment or process operation that increases emission levels above requirements of the standard	63.118, 63.122, 63.130, 63.146, 63.151, 63.152, 63.182
Written report of performance tests	63.117, 63.122, 63.129, 63.146, 63.151, 63.152, 63.182
RECORDKEEPING	
Record of data measured during each performance test	63.117, 63.118, 63.123, 63.129, 63.130, 63.147, 63.148, 63.151, 63.152, 63.181
Record of periods of operation during which the performance boundaries esdtablished during the most recent performance tests are exceeded	63.118, 63.123, 63.130, 63.147, 63.148, 63.151, 63.152
Records of Monthly visual inspections	63.118, 63.147, 63.147, 63.181
Records of Annual visual inspections	63.123, 63.147, 63.148, 63.181

Attachment 2
Assumptions and Item Descriptions for Tables 1a, 1b and 4

Assumptions are:

(A) that there are 371 existing sources with a 5% increase (new sources) in the first three years after promulgation. The 5% increase (new sources) is expected to be new expansion at existing facilities, as opposed to new facilities altogether, but given to possibility that this growth could all occur as new facilities, this table assumes the startup of 18 new facility startups in the first three years. Since new facilities must be in compliance at startup, the general periodic recordkeeping and reporting burdens are included, which accounts for the difference in the technical hours per source.

(B) that the average representative source, new and existing, will consist of the following points of burden:

- 20 parameters to monitor at control devices throughout the facility
- 10 affected storage tanks of various capacities
- 3 affected major wastewater streams
- 4 affected transfer rack operations
- 1 overall leak detection and repair program for 2,000 points
- 1 emissions averaging program that involves 10 emission points
- 1 facility wide inventory of emission points, Group 1 and Group 2

(C) that there are 5% (.05) managerial and 10% (.10) clerical hours required for every technical hour.

(D) that some activities necessary to generate reports involve creating records in the process, and that these activities are assumed to be reports activities alone, to avoid double counting these as records activities as well. Therefore, only items 8 and 9 are considered records burdens directly.

Item Descriptions:

(a) Average Hours per Activity is back calculated by dividing (b) into (c). Since the activities within each burden category can vary significantly, it is too inaccurate to assume an average to use to calculate (c). Estimated activity technical hours are summarized to obtain (c) first, then back calculate for (a) with an estimated (b).

(b) Estimated Number of Activities per year per source represents the assumed typical number of separate activities a source may encounter during one year. This number may vary from facility to facility depending on consolidation of activities, collocated readings, etc. Since so much variability exists, it important to note that this is our best guess at an average facility experience. This number was only used to back calculate (a).

(c) Technical Hours per year per source is the actual best estimate of the burden for each burden item. The three year separate activity burdens were divided by three, where appropriate, and then summarized to include in this column. The technical hours for new sources is higher because some periodic compliance reports and records are required at startup. Existing sources do not encounter these reports and record burdens for three years after promulgation.

(d) Estimated Number of Existing and New Sources reflect the number given in assumption (A), above.

(e) Estimated Technical Hours per year is the product of (c) and (d).

(f) Estimated Managerial Hours per year is 5% of (e).

(g) Estimated Clerical Hours per year is 10% of (e).

Attachment 2 (continued)
Assumptions and Item Descriptions for Tables 1a and 2b

(h) Estimated Annual Cost in $Thousands per year is the total cost of technical, managerial and clerical hours and overhead using 1989 CAIR rates using this formula:

$$\frac{(H^t \times \$33/hour) + (H^m \times \$49/hour) + (H^c \times \$15/hour)}{1{,}000} = (h)$$

Where:

H^t is (e), or technical hours
H^m is (f), or managerial hours, and
H^c is (g), clerical hours

1) Read Rule and Instructions are the activities, less training, which involve comprehending the provisions in the standard and understanding how they apply to the respective points at a facility.

2) Plan Activities represents such burdens as design, redesign, scheduling as well as drafting the implementation plan, and selecting methods of compliance.

3) Training represents the portion (assumed 40%) of activities from 1) Read Rule and Instruction which an average facility would elect to provide class room instruction for. The standard does not require specific training itself.

4) Create, Test, Research & Development are the activities involving testing, retesting, establishing operating range for parameters and analyzing point by point applicability. Monitor related refit, calibration and maintenance activities are also included under this heading.

5) Gather Information, Monitor and Inspect are the activities involving physical inspections of equipment, collection of monitored data and other related activities.

6) Process/Compile & Review are the activities that involve analysis of the information collected for accuracy, compliance and appropriate reports and records required as a result.

7) Complete Reports represents the activities normally associated with filling out forms. Since the standard requires no standard forms, these activities relate to the preparing of formal reports and cover letters as appropriate.

8) Record/Disclose are activities which are solely recordkeeping which occur once the appropriate report information has been extracted (see assumption (D)) above. These activities involve software translation, duplication or archival processes normally associated with data management and storage common to this industry.

9) Store/File are again activities which are solely recordkeeping which occur once the appropriate report information has been extracted (see assumption (D) above). These activities involve the management life cycle of records, from the time they are filed and boxed up, to the time they are disposed.

TOTAL BURDEN AND COST is the sum of each of the columns (e), (f), (g) and (h).

Attachment 3
Assumptions and Item Descriptions for Table 2

Assumptions are the same as attachment 2, and:

(A) that EPA personnel would attend 10% of the performance tests. Performance tests are required only for new sources in the first 3 years after promulgation. If the 18 new source equivalents are considered to have 20 parameters each from 8 control devices (2.5 parameters per control), this would mean the equivalent of 144 tests (8 x 18), approximately. Its important to note, however, that EPA attendance is dependent upon EPA available resources, and not the number of tests.

(B) that 20% of the initial tests must be repeated due to failure of initial test.

(C) that all existing and new sources must submit an initial report within 120 of promulgation and an implementation plan or permit application within 12 or 18 months of the compliance date. There are about 370 plant sites. The new sources are most likely to be collocated within existing plants and be included in those existing source reports.

(D) that semiannual reports of results from equipment leak detection and repair program are required by the equipment leak standard. Sources are required to comply with the equipment leak standard by 6 months after promulgation.

(E) that travel expenses equal:

(2 people/trip)(17 trips)($400 travel/trip + $50 per diem/trip)

Item Descriptions:

(a) <u>Average Hours per Activity</u> are estimates of the specific activities and are the basis for estimating the overall burden (unlike tables 1a, 1b and 4).

(b) <u>Number of Activities per year</u> represents the number of reports expected to be reviewed and other related activities during the course of the year. Under the performance test headings, these numbers are based upon assumptions (A) and (B), above. For one time reports, the total number of reports expected over the three year period was divided by three to get an annual average incorporating assumption (C), above.

(c) <u>Estimated Technical Hours per year</u> is the product of (a) and (b).

(d) <u>Estimated Managerial Hours per year</u> is 5% of (c).

(e) <u>Estimated Clerical Hours per year</u> is 10% of (c).

(f) <u>Estimated Annual Cost in $Thousands per year</u> is the total cost of technical, managerial and clerical hours and overhead using 1989 CAIR rates using this formula:

$$\frac{(H^t \times \$33/hour) + (H^m \times \$49/hour) + (H^c \times \$15/hour)}{1{,}000} = (h)$$

Where:

H^t is (e), or technical hours
H^m is (f), or managerial hours, and
H^c is (g), clerical hours

PERFORMANCE TESTS:

1) <u>Initial</u> represents the activities during EPA attendance at an initial performance test.

2) <u>Repeat</u> represents the same activities as 1) Initial, except for a repeat performance test.

LITIGATION: Represents the cost of litigating an average of three case per year.

Attachment 3 (continued)
Assumptions and Item Descriptions for Table 2

REPORTS REVIEW:

1) Initial represents the EPA review of all initial reports received.

2) Implementation Plan or Permit Applications represents the EPA review of all implementation plans, or permit applications if submitted in lieu of an implementation plan.

3) Compliance Status represents compliance status verification by the EPA for the portions of the standard which a source must comply with before the compliance date (see assumption (D) above).

4) Review equipment leak monitoring represents the review and screening of periodic reports received as a result of the equipment leaks standard.

5) Notification of construction/reconstruction represents the EPA review of this notification from new sources.

6) Notification of anticipated startup represents the EPA review of this notification from new sources.

7) Notification of actual startup represents the EPA review of this notification from new sources.

8) Notification of performance test represents the EPA review of this notification from new sources.

9) Review of test results represents the EPA review of performance test results for new sources.

10) Review periodic reports represents the EPA review of periodic reports for new sources, only. Generally, periodic reports are not required from existing sources until after the compliance date, which is 3 years after promulgation, except for equipment leaks which is included under 4), above.

TOTAL BURDEN AND COST is the sum of each of the columns (e), (f), (g) and (h).

A-92-45
II-B-23

PACIFIC ENVIRONMENTAL SERVICES, INC.

Central Park West
5001 South Miami Boulevard
PO Box 12077
Research Triangle Park, NC 27709-2077
(919) 941-0333 FAX (919) 941-0234

MEMORANDUM

TO: Group IV Resins Docket No. A-92-45

FROM: Bennett King
Pacific Environmental Services, INC.

DATE: March 24, 1995

SUBJECT: Storage Vessel MACT Floors Considered More Stringent than the Hazardous Organic NESHAP (HON)

Purpose

This memo presents the options considered for defining the MACT floors for storage vessels for various subcategories and identifies the option selected by the EPA as the basis for the proposed standards. The subcategories for which the MACT floor was defined in regulatory terms are: new sources producing styrene acrylonitrile (SAN) using a continuous process; existing and new sources producing acrylonitrile styrene acrylate/alpha methyl styrene acrylonitrile (ASA/AMSAN); existing and new sources producing nitrile; new sources producing acrylonitrile butadiene styrene (ABS) using a continuous mass process; and existing and new sources producing polystyrene using a continuous process. Defining the MACT floor for certain subcategories was necessary because it was determined that the MACT floors, as reflected in the existing level of control, for these subcategories are more stringent than the appropriate HON storage vessel requirements.

This memo discusses each subcategory (e.g., SAN, continuous) separately, identifying (1) why the MACT floors were considered more stringent than the HON requirements, (2) the options for defining the MACT floors, and (3) the advantages and disadvantages of each option. Finally, the option selected by the EPA as the basis of the proposed standards for each subcategory is identified.

SAN, Continuous

Background. There are three facilities that produce SAN using a continuous process. Based on the available information, two of the facilities are controlling storage vessels as would be required by the HON and, thus, were considered to be equivalent to the HON. The third facility has five storage vessels, and the existing control at this facility was considered to be more stringent than the HON requirements for new sources. Based on these findings, the existing source MACT floor was determined to be equivalent to the HON, and the new source MACT floor was determined to be more stringent than the HON. As described in the general MACT floor memorandum (Docket No. A-92-45 Category II-B-28), existing controls were compared to the HON requirements within the vapor pressure ranges defined by the HON applicability criteria. For the analysis of new source MACT floor, these vapor pressure ranges were: less than 0.1 psia, from 0.1 to 1.9 psia, and greater than 1.9 psia. Two of the five storage vessels are in the less than 0.1 psia vapor pressure range; the other three vessels are in the 0.1 to 1.9 psia vapor pressure range. The existing level of control for the less than 0.1 psia vapor pressure range was considered to be more stringent than or equivalent to the HON. The existing level of control for the 0.1 to 1.9 psia vapor pressure range was also considered to be more stringent than or equivalent to the HON. Overall, the existing control for this facility was considered more stringent than the HON, and, as the "best" facility, it serves as the basis for setting the MACT floor for new sources. Figure 1 illustrates the relationship of the five storage vessels at this facility to the HON applicability criteria for storage vessels at new sources. In addition to controlling more storage vessels than the HON would require, this facility controls some storage vessels to different levels of control than required by the HON. This facility controls one vessel through incineration, and since the new source MACT floor must be based on the "best" performing facility, a control level equivalent to incineration (i.e., 98 percent emission reduction) would be included as part of the MACT floor definition. These differences played a part in determining that the existing control for this facility is more stringent than the HON and in defining the MACT floor.

Options. Three options were identified for defining the MACT floor for new sources. The first option was to define the MACT floor using the same applicability

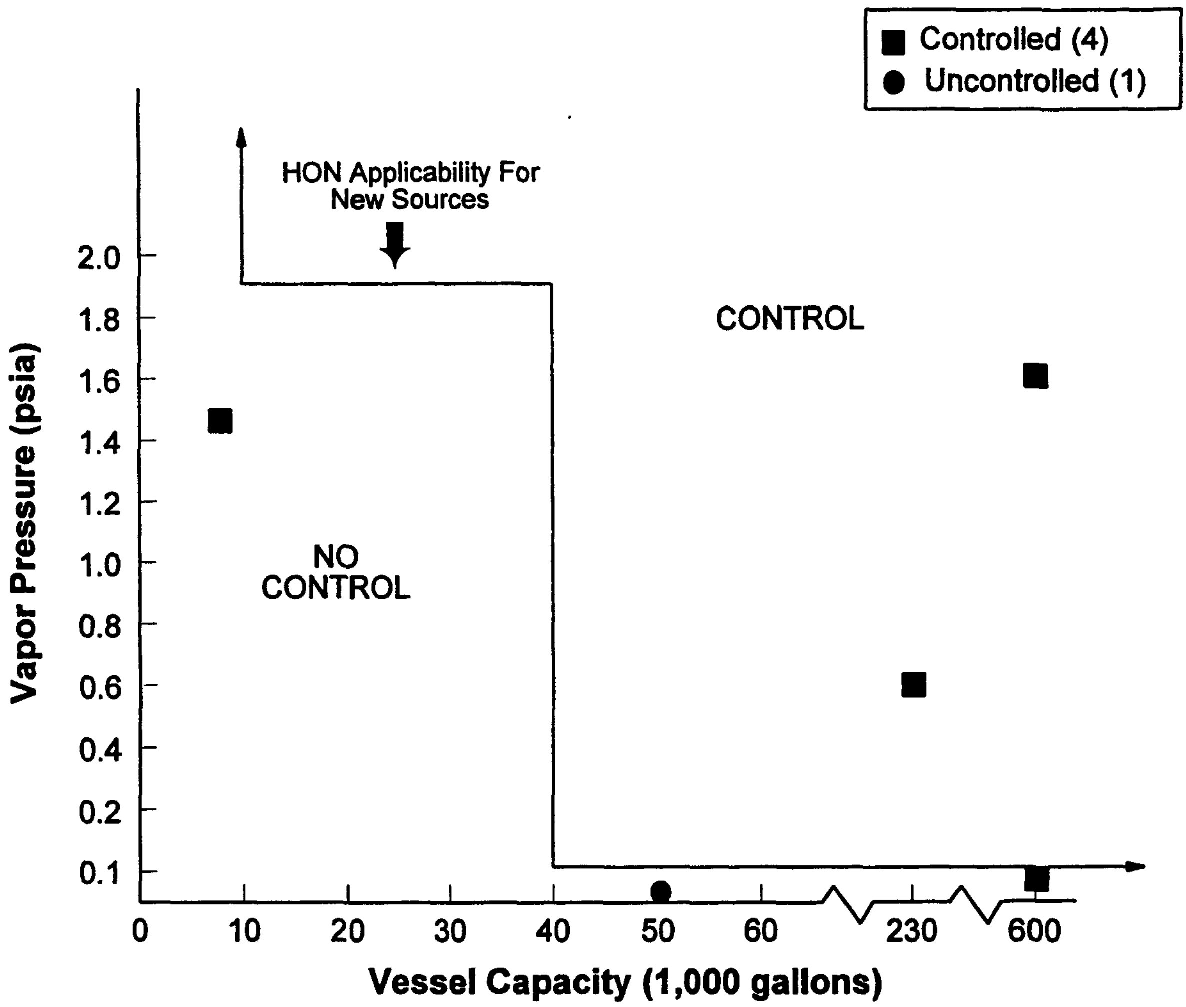

Figure 1. Comparison of Storage Vessel for "Best" SAN, Continuous Facility to the HON Applicability Criteria for New Sources

criteria as found in the HON (i.e., define vapor pressure and storage vessel capacities). The second option was to define chemical-specific storage vessels and storage vessel capacities. The third option was a combination of Option 2 and requiring the HON for chemicals not specifically identified. These options are presented in Table 1.

TABLE 1. STORAGE VESSEL MACT FLOOR OPTIONS FOR NEW SAN, CONTINUOUS FACILITIES

Option	Proposed Rule		
1	Vapor Pressure (psia)	Capacity (gallons)	Control Level
	0.0735 to <0.1	≥600,000	≥90%
	0.1 to <1.45	≥40,000	HON
	≥1.45	≥8,000 to 40,000	≥98%
	≥1.45	≥40,000	HON
2	Compound	Capacity (gallons)	Control Level
	Styrene	≥600,000	≥90%
	Maleic Anhydride	any size	HON
	MMA	≥40,000	HON
	Acrylonitrile	≥40,000	HON
	MEK	≥8,000	≥98%
3	Compound	Capacity (gallons)	Control Level
	Styrene	≥600,000	≥90%
	Maleic Anhydride	any size	HON
	MMA	≥40,000	HON
	Acrylonitrile	≥40,000	HON
	MEK	≥8,000	≥98%
	Any chemical not listed above: HON applicability and control level		

KEY: MMA = methyl methacrylate; MEK = methyl ethyl ketone

Option 1 has the following advantages: (1) it creates a rule that is similar to the HON and, thus, may be more familiar to industry and the EPA and (2) it is more generic than Option 2 in that it would be applicable to all chemicals, not just those known to be at the "best" facility. Disadvantages of Option 1 are: (1) the vapor pressures proposed may not actually reflect the maximum actual vapor pressure of the chemical and (2) the format of the rule becomes more complicated (i.e., more levels are involved).

Option 2's advantages are: (1) by being chemical-specific, a facility avoids the need to measure/calculate "maximum actual vapor pressure" and, thus, costs for determining compliance are reduced and (2) the rule is much simpler to enforce and understand. A disadvantage in being chemical-specific is that the applicability criteria may "miss" a chemical used at a new facility that is not known to be used at the "best" facility. Based on available information, one of the other two existing facilities has chemicals (ethyl benzene) and other materials (recycle, tar and recycle) that are not found in the best controlled facility. Second, without regarding the actual conditions at which a chemical is stored, this option operates on a different premise for determining control/no control than the HON. The HON premise considered that environmental conditions (i.e., storage vessel temperature) should be considered at the specific facilities when determining whether or not a storage vessel should be controlled. This option ignores the environmental conditions of a storage vessel and requires control based solely on the contents of the storage vessel.

Option 3 is an attempt to combine the advantages of Options 1 and 2 and avoid Option 2's first disadvantage (i.e., miss a chemical at a facility).

Option Selected by EPA. While Option 2 has some strong advantages to it, its disadvantages were considered too much to overcome. Option 3 deals with Option 2's first disadvantage by applying the HON to other chemicals, but it does not resolve Option 2's second disadvantage. Further, while Option 2 will decrease compliance costs by removing applicability determinations (i.e., vapor pressure determinations), these savings may be offset by requiring control of vessels that under Option 1 would not require control. Therefore, the EPA rejected Option 3. Based on these considerations, the EPA selected Option 1 as the basis for the proposed standards. Figure 2 illustrates the applicability criteria of Option 1 compared to the HON applicability criteria for storage vessels at new sources.

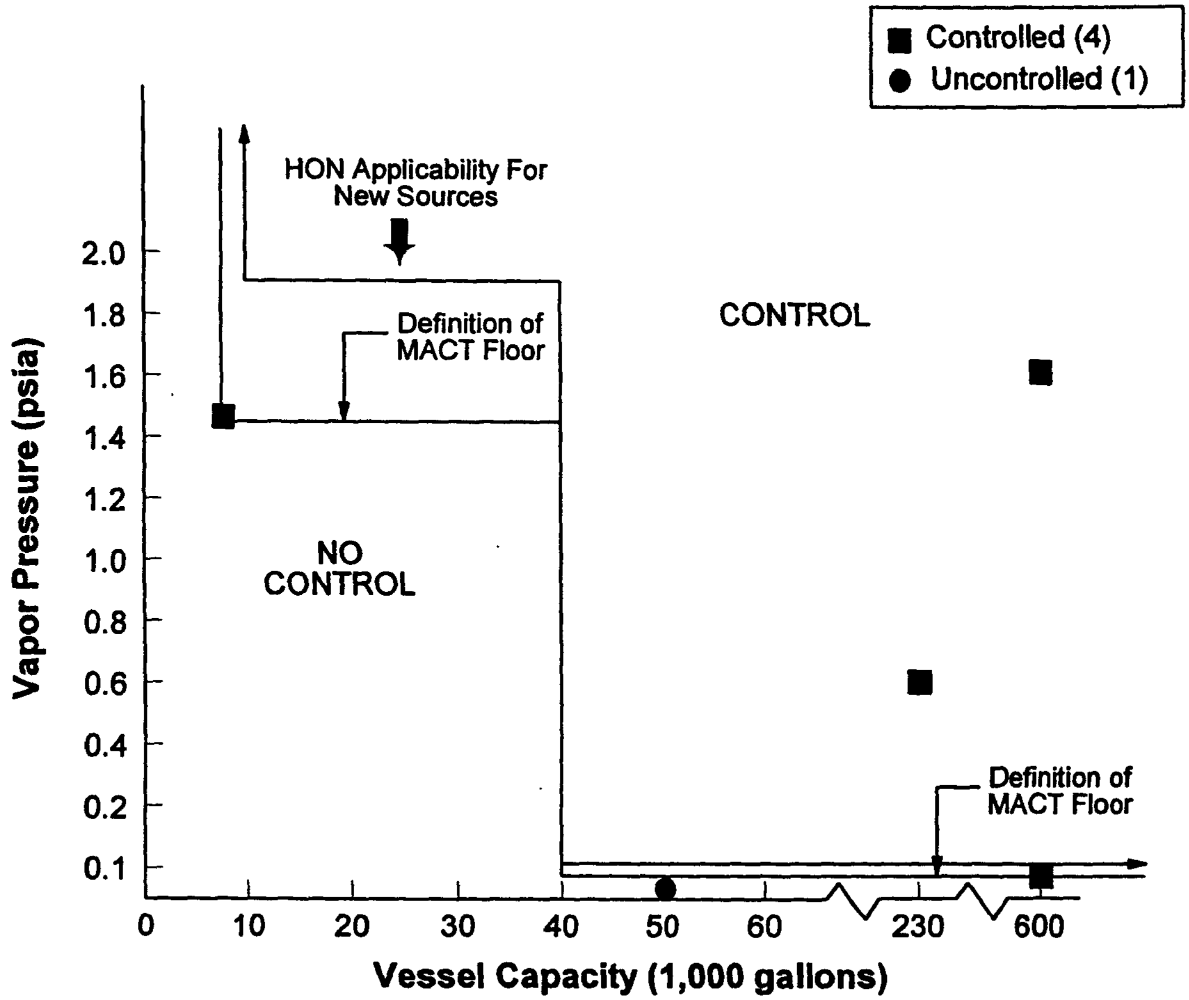

Figure 2. MACT Floor Applicability Criteria for New SAN, Continuous Sources vs. HON Applicability Criteria

ASA/AMSAN

Background. Only one facility was identified as producing ASA/AMSAN and all the known storage vessels are controlled to achieve an emission reduction of 98 percent through incineration. In a manner similar to new source MACT floor for SAN continuous processes, the MACT floor must be based on the "best" performing facility for new sources or the average of five "best" performing facilities for existing sources. Therefore, a control level equivalent to incineration (i.e., 98 percent emission reduction) would be included as part of the MACT floor definition since it is part of the "best" facility. Based on their capacities and vapor pressures, only one of the storage vessels would require control under the HON (See Figure 3). Based upon this comparison, this facility was considered to be controlling storage vessels more stringently than the HON for both existing and new facilities. Therefore, the MACT floor for both existing and new sources needs to be based on the level of control being achieved at this facility. In addition, since only one facility exists that produces this resin, the MACT floor will be the same for existing and new sources and must ensure that this facility maintains its level of control.

Options. Four options were identified. The first three options are structured the same as for SAN, continuous facilities, (i.e., vapor pressure and storage vessel capacity, chemical-specific and storage vessel capacity, and a combination of Option 2 and the HON). A fourth option considered was to simply require control of all storage vessels, regardless of vapor pressure, chemical, or storage vessel capacity. Table 2 shows these options.

The advantages and disadvantages of Options 1 through 3 are the same as discussed previously for SAN, continuous facilities, although the degree of importance changes somewhat. It seems, for example, that when dealing with only one known facility it becomes more critical to set a correct vapor pressure (a disadvantage associated with Option 1), that unknown chemicals are less likely to occur, and that deviating from the HON's premise is less important (both disadvantages associated with Option 2). Option 3 becomes more attractive because of this shift in importance.

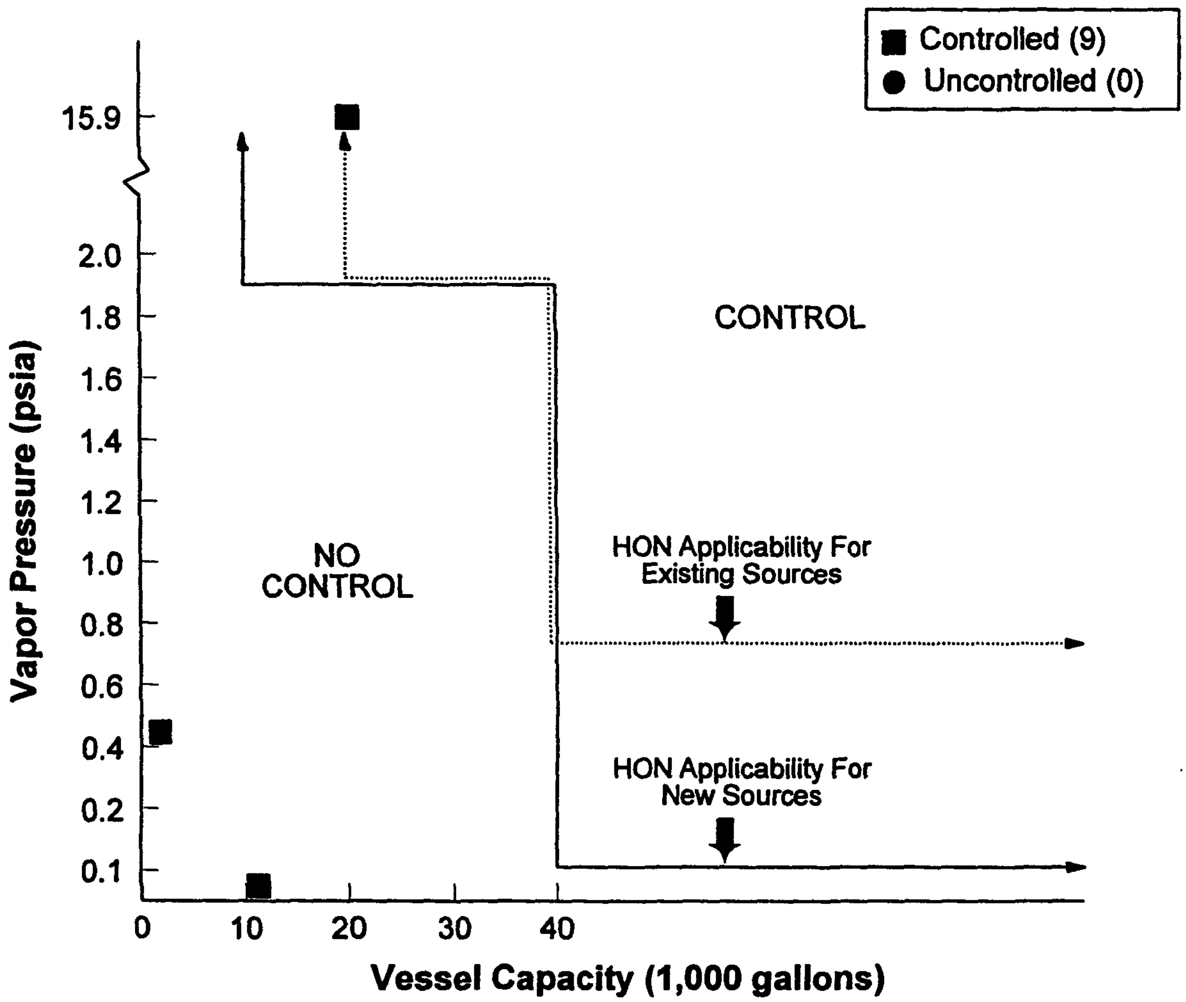

Figure 3. Comparison of Storage Vessel Controls for the Only ASA/AMSAN Facility to the HON Applicability Criteria for Exisitng and New Sources

TABLE 2. STORAGE VESSEL MACT FLOOR OPTIONS FOR EXISTING AND NEW ASA/AMSAN FACILITIES

Option	Proposed Rule		
	Vapor Pressure (psia)	Capacity (gallons)	Control Level
1	0.077 to <0.47 ≥0.47	≥10,200 ≥1,000	≥98% ≥98%
	Compound	Capacity (gallons)	Control Level
2	AMST ST/AN mix* Acrylonitrile	≥10,200 ≥1,000 ≥20,000	≥98% ≥98% ≥98%
	Compound	Capacity (gallons)	Control Level
3	AMST ST/AN mix* Acrylonitrile	≥10,200 ≥1,000 ≥20,000	≥98% ≥98% ≥98%
	Any chemical not listed above: HON		
4	Control all storage vessels by at least 98%		

KEY: * Styrene and acrylonitrile mixtures; AMST = alpha methyl styrene

Option 4 is the most simple to apply and covers the current situation directly. On the other hand, it has the potential to cover storage vessels at new facilities that are not represented by the existing facility.

Option Selected by EPA. Given that there is only one existing facility and no new growth is projected for this subcategory, the EPA determined that it was most reasonable to set the simplest rule that will maintain the current control scenario, which would be achieved by either Option 2 or 4. Concern over setting the correct vapor pressure makes

Option 1 less attractive. Between Option 2 and 4, the EPA favored Option 2 partly because Option 4 may regulate storage vessels at the existing facility that are not currently represented. On the other hand, Option 2 by itself would leave unidentified storage vessels at the existing facility unregulated. Option 3 would avoid this last outcome. Therefore, the EPA selected Option 3 for defining both the existing and new MACT floor for storage vessels at ASA/AMSAN facilities.

ABS, Continuous Mass

Background. There are five facilities that produce ABS using a continuous mass process. Based on the available information, two of the facilities are controlling storage vessels as would be required by the HON, one facility is controlling storage vessels to a level less stringent than the HON, and two facilities are controlling storage vessels to a level more stringent than the HON. Since the majority of facilities (3 out of 5) control storage vessels to a level less than or equivalent to the HON, the existing MACT floor was considered to be equivalent to the HON. However, the new MACT floor must be based on either of the two facilities controlling storage vessels to a level more stringent than the HON.

Of the two facilities considered more stringent than the HON, one facility controlled 40% of the total storage capacity that would not be required to be controlled by the HON, and the other facility controlled 10% of the total storage capacity. The first facility was selected as the "best" facility and serves as the basis for setting the MACT floor for new sources. Figure 4 illustrates the relationship of the storage vessels at this facility to the HON applicability criteria.

Options. Four options were identified. The first three options are structured the same as for SAN, continuous and ASA/AMSAN facilities (i.e., vapor pressure and storage vessel capacity, chemical-specific and storage vessel capacity, and a combination of Option 2 and the HON). Option 4 is a combination of Option 1 with one set of chemical-specific and capacity and storage vessel criteria for styrene. These options are presented in Table 3.

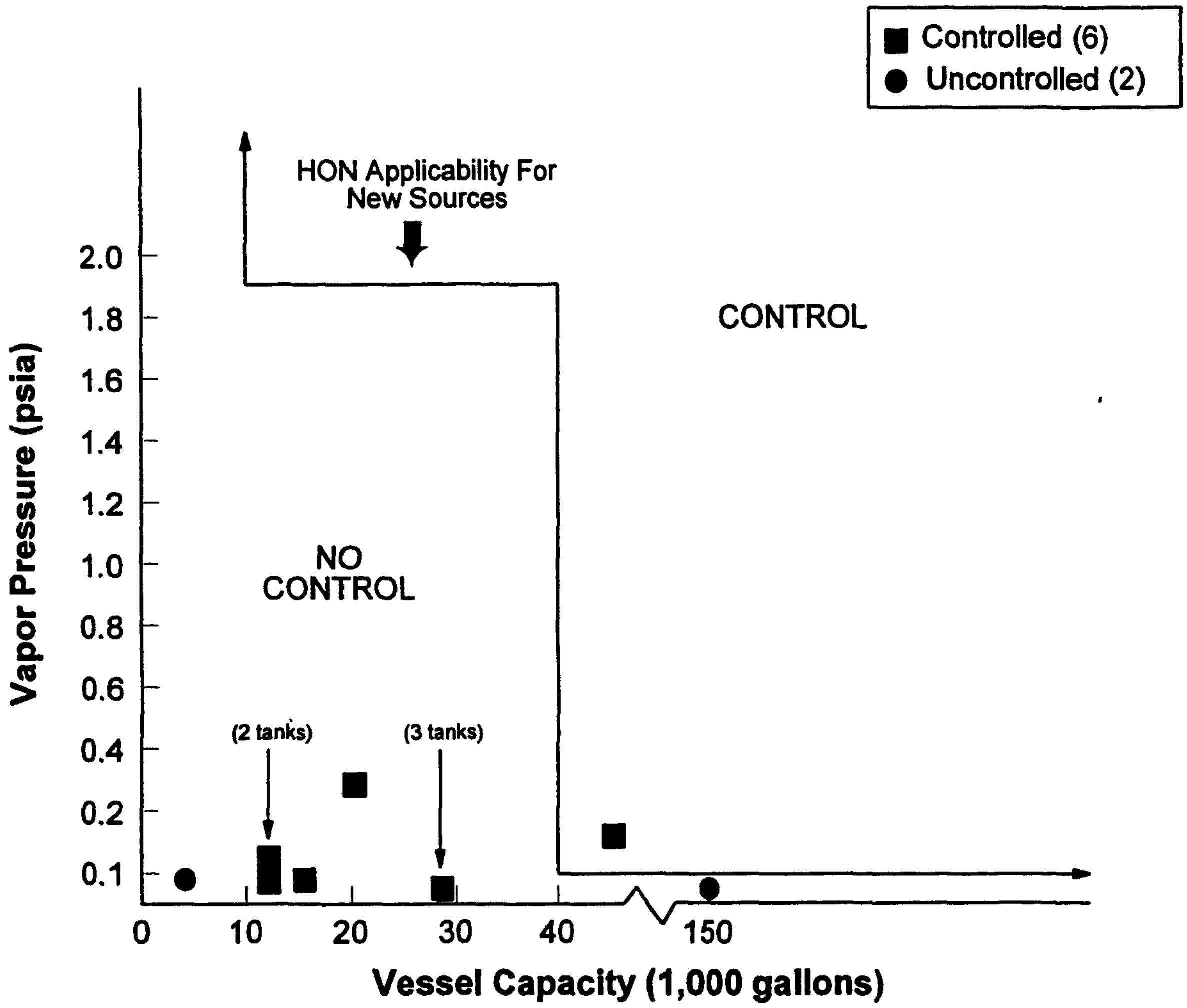

Figure 4. Comparison of Storage Vessel Controls for "Best" ABS, Continuous Emulsion Facility to the HON Applicability Criteria for New Sources

TABLE 3. STORAGE VESSEL MACT FLOOR OPTIONS FOR NEW ABS, CONTINUOUS EMULSION FACILITIES

Option	Proposed Rule		
1	Vapor Pressure (psia)	Capacity (gallons)	Control Level
	0.0782 to <1.9	≥12,000	Same as HON
	≥1.9	≥10,000	Same as HON
2	Compound	Capacity (gallons)	Control Level
	Styrene	≥12,000	Same as HON
	Ethyl Benzene	≥12,000	Same as HON
	Acrylonitrile	≥49,000	Same as HON
	ST/EB/CU mix*	≥15,000	Same as HON
3	Compound	Capacity (gallons)	Control Level
	Styrene	≥12,000	Same as HON
	Ethyl Benzene	≥12,000	Same as HON
	Acrylonitrile	≥49,000	Same as HON
	ST/EB/CU mix*	≥15,000	Same as HON
	Any chemical not listed above: HON		
4	Vapor Pressure (psia)	Capacity (gallons)	Control Level
	0.0782 to <1.9	≥12,000	Same as HON
	≥1.9	≥10,000	Same as HON
	All styrene vessels ≥12,000		Same as HON

The advantages and disadvantages discussed for SAN, continuous facilities concerning the first three options are applicable here. The advantages of the fourth option are that it 1) carries with it the advantages of the first option and 2) ensures that styrene storage vessels are controlled whereas they may not necessarily be controlled under Option 1. The disadvantages of the fourth option are the same as for the first option.

Option Selected by EPA. For the same reasons that Option 1 was selected for SAN, continuous facilities, the EPA considered Option 1 a strong choice for this subcategory. However, styrene storage vessels are a specific concern for this subcategory because a large amount of styrene is stored and the reported vapor pressure of styrene varies significantly within the gathered data. Option 4 addresses this concern by specifically requiring that all styrene vessels above a certain capacity (i.e., 12,000 gallons) be controlled. For this reason, the EPA selected Option 4 as the basis for the proposed standards.

Selection of the Regulatory Alternative Beyond the MACT Floor. As shown on Figure 3, the "best" facility controls some of their styrene vessels and not others. In fact, of the four styrene vessels, the three small vessels (i.e., 30,000 gallons) are controlled and the one large vessel (i.e., 150,000 gallons) is not controlled. It is generally more cost effective to control a larger vessel than a smaller one. Therefore, the EPA developed a regulatory alternative to go beyond the MACT floor and require control of the larger styrene vessel. The cost effectiveness of controlling this vessel was estimated to be approximately $6,000 per ton of organic hazardous air pollutant (HAP) removed and no adverse nonair environmental or energy impacts were expected to result from this option. Considering this, the EPA judged these impacts to be reasonable and selected this regulatory alternative as the basis of the proposed standards.

Nitrile

Background. Only one facility was identified as producing nitrile resin and all the known storage vessels are controlled. Based on their capacities and vapor pressures, none of the storage vessels would require control under the HON, and this facility was considered to be controlling storage vessels more stringently than the HON for both existing and new facilities. Like ASA/AMSAN facilities, only one facility exists that produces this resin, therefore the MACT floors will be the same for existing and new sources and must ensure that this facility maintains its level of control.

Options. Because of the limited data for nitrile resin production (i.e., one facility and one chemical stored), only one option was developed for defining the MACT floor.

Option Selected by EPA. The option selected by the EPA as the basis for the proposed standards for this subcategory is a combination of the chemical-specific and capacity criteria, similar to Option 2 for the other subcategories, and the HON. For acrylonitrile storage vessels with capacities of 3,500 gallons or greater, control to the HON level of control is required. All other chemicals must meet the HON requirements.

Polystyrene, Continuous

Background. There are 16 facilities that produce polystyrene using a continuous process. Based on the available information, there are several facilities that are controlling a majority of vessels that would not be required to be controlled by the HON for existing sources or the HON for new sources. Therefore, the MACT floor was considered to be more stringent than the HON for both existing and new sources.

The available data were used to determine the average of the best performing five sources to define the existing source MACT floor. While there were several sources that were more stringent than the HON requirements for new sources, there was only one source with complete data. The new source MACT floor was based on data for this facility.

Option Selected by EPA. Formal options were not developed for this subcategory. Based on experience gained in defining the MACT floor for the previous four subcategories, the following option was developed and selected as the basis for the proposed standards. The MACT floor for both existing and new polystyrene continuous sources is defined using the same criteria as in the HON (i.e., vapor pressure and vessel capacity). Different criteria were developed for existing and new and are presented in Table 4.

TABLE 4. STORAGE VESSEL APPLICABILITY CRITERIA FOR EXISTING AND NEW POLYSTYRENE CONTINUOUS SOURCES

Existing/New Sources	Vapor Pressure (psia)	Capacity (gallons)	Control Level
Existing	≥ 0.28 to < 2.08 ≥ 2.08	≥ 20,000 ≥ 10,000	same as the HON same as the HON
New	≥ 0.078 to < 0.09 ≥ 0.09 to < 1.1 ≥ 1.1	≥ 29,500 ≥ 12,000 ≥ 5,170	same as the HON same as the HON same as the HON

A-92-45
II-B-24

PACIFIC ENVIRONMENTAL SERVICES, INC.

Central Park West
5001 South Miami Boulevard
PO Box 12077
Research Triangle Park, NC 27709-2077
(919) 941-0333 FAX (919) 941-0234

MEMORANDUM

TO: Leslie Evans
U. S. Environmental Protection Agency

FROM: Bennett King
Pacific Environmental Services

DATE: March 24, 1995

SUBJECT: Methodology for Estimation of Secondary Environmental Impacts

The purpose of this memorandum is to describe the methodology used to estimate the secondary environmental impacts associated with the Group IV thermoplastics national emission standards for hazardous air pollutants (NESHAP). This memoranda describes how the secondary environmental impacts were estimated for those facilities for which there were adequate data. For those facilities without adequate data, an estimate was extrapolated from the estimates made for facilities with adequate data. This extrapolation procedure is described in a separate memorandum (March 24, 1995, Methodology for Extrapolation of Impacts).

The proposed standards are not expected to generate any adverse water impacts. Depending on the methods selected to comply with the proposed prohibition of cooling tower water in contact condensers, the amount of wastewater generated at poly(ethylene terephthalate) (PET) facilities could decrease. The proposed standards are not expected to increase the generation of solid waste at any Group IV thermoplastic facility. On the other hand, the EPA judged that there would be energy impacts and associated secondary air impacts as a result of the proposed rule, and these impacts were estimated and are presented in this memorandum.

The estimation of energy impacts required to operate control devices is part of the control cost and emission reduction estimation procedures associated with each control device. The estimation procedures for control costs and emission reductions, as well as the associated energy estimates, are described in a separate memorandum (March 24, 1995, Summary of Cost, Emission Reduction, and Energy Impacts for Group IV Resins Sources). Energy credits have been attributed to the control of equipment leaks. The estimation of these energy credits is described in this memorandum. While this memorandum presents both the energy and secondary air impacts, it only describes 1) the estimation of the secondary air impacts of particulate, sulfur dioxide (SO_x), and nitrogen oxide (NO_x) associated with the energy impacts from the operation of control devices and 2) the estimation of the energy credit associated with equipment leaks.

Results

Energy impacts include increased energy use (fuel) for the operation of control equipment, energy credits attributable to the prevention of organic hazardous air pollutant (HAP) emissions from equipment leaks, and secondary air impacts include the emissions of particulates, SO_x, and NO_x associated with increased energy use. Under the proposed rule, energy use is expected to increase by approximately 30,000 barrels of oil equivalent per year (BOE/yr) for existing sources and 44,000 BOE/yr for new sources. At the same time, energy credits attributable to the prevention of organic HAP emissions from equipment leaks are approximately 17,000 BOE/yr for existing sources and 8,000 BOE/yr for new sources. This results in a net increase of approximately 13,000 BOE/yr for existing sources and 36,000 BOE/yr for new sources. The emissions of secondary air pollutants associated with this energy increase are 70 megagrams per year (Mg/yr) of all three pollutants for existing sources and 80 Mg/yr for new sources.

These figures are related to the control of process vents, wastewater operations, and equipment leaks. The impacts analysis for storage vessels was based on the use of internal floating roofs which do not have any associated energy impacts. Further, the estimates above do not include the projected energy savings associated with control of vacuum system air emissions from the manufacture of PET. The majority of existing vacuum systems at PET facilities are operated with steam jets, which are very energy intensive. The precise affect of the proposed rule on the use of steam jets cannot be predicted with accuracy. However, it is anticipated by the EPA that compliance with the proposed rule will, in almost all cases, decrease the energy demand of the vacuum systems.

Tables 1 provides the secondary environmental impacts for each subcategory for existing and new sources. The process total column contains the total estimated energy requirement for the given subcategory. This number is comprised of steam, natural gas, and electricity components. The fugitive energy credit column provides the total estimated energy credit attributable to the control of organic HAP emissions from equipment leaks in each subcategory. The total energy column contains the sum of the total estimated energy requirements and energy credits. The three remaining columns provide the secondary air impacts of particulates, SO_x, and NO_x.

For existing sources, five of the eighteen subcategories are estimated to require more than 1000 additional BOE/yr of energy use and one of these is expected to require more than 10,000 additional BOE/yr. For both new and existing sources, energy savings are projected for several subcategories.

Table 1. Group IV Resins Secondary Impacts Summary Table

	*************** EXISTING IMPACTS ***********************					
	Energy Impacts			Secondary Air Impacts		
Subcategory	Process Total (BOE/yr)	Fugitive Energy Credit (BOE/yr)	Total Energy (BOE/yr)	Particulate (Mg/yr)	SOx (Mg/yr)	NOx (Mg/yr)
ABS, Cm	173	-931	-757	0.01	0.00	0.10
ABS, Ce	13585	-274	13311	0.72	12.85	9.07
ABS, Be	4077	-204	3873	0.28	7.83	3.10
ABS, Bs	272	-28	245	0.02	0.52	0.21
ABS, Bl	0	-11	-11	0.00	0.00	0.00
MABS	22	-14	9	0.00	0.13	0.03
MBS	1944	-703	1241	0.12	2.61	1.37
Nitrile	2	-23	-22	0.00	0.01	0.00
PET, TPA, C	2351	-1567	784	0.29	12.74	2.56
PET, TPA, B	0	-9	-9	0.00	0.00	0.00
PET, DMT, C	192	-3426	-3234	0.01	0.00	0.11
PET, DMT, B	6317	-2162	4155	0.31	4.78	4.10
PS, C	81	-5538	-5458	0.01	0.48	0.09
PS, B	14	-574	-560	0.00	0.08	0.02
PS, EPS	0	-566	-566	0.00	0.00	0.00
SAN, C	511	-228	283	0.07	3.06	0.58
SAN, B	226	-38	188	0.03	1.35	0.26
ASA/AMSAN	0	-426	-426	0.00	0.00	0.00
GRAND TOTALS	29767	-16719	13047	1.87	46.46	21.60

Table 1. Group IV Resins Secondary Impacts Summary Table

	************** NEW IMPACTS **********************					
		Energy Impacts		Secondary Air Impacts		
Subcategory	Process Total (BOE/yr)	Fugitive Energ Credit (BOE/yr	Total Energy (BOE/yr)	Particulate (Mg/yr)	SOx (Mg/yr)	NOx (Mg/yr)
ABS, Cm	0	-452	-452	0.00	0.00	0.00
ABS, Ce	29219	-194	29026	1.48	23.90	19.15
ABS, Be	0	-81	-81	0.00	0.00	0.00
ABS, Bs	272	-26	247	0.02	0.52	0.21
ABS, Bl		NO NEW GROWTH PROJECTED FOR THIS SUBCATEGORY				
MABS		NO NEW GROWTH PROJECTED FOR THIS SUBCATEGORY				
MBS	3124	-44	3080	0.16	2.74	2.06
Nitrile		NO NEW GROWTH PROJECTED FOR THIS SUBCATEGORY				
PET, TPA, C	3083	-1567	1516	0.32	12.74	2.99
PET, TPA, B	0	-9	-9	0.00	0.00	0.00
PET, DMT, C	399	-2624	-2225	0.02	0.00	0.23
PET, DMT, B	6760	-1342	5418	0.33	4.78	4.36
PS, C	4	-1476	-1473	0.00	0.02	0.00
PS, B		NO NEW GROWTH PROJECTED FOR THIS SUBCATEGORY				
PS, EPS		NO NEW GROWTH PROJECTED FOR THIS SUBCATEGORY				
SAN, C	511	-128	383	0.07	3.06	0.58
SAN, B	226	-33	193	0.03	1.35	0.26
ASA/AMSAN		NO NEW GROWTH PROJECTED FOR THIS SUBCATEGORY				
GRAND TOTALS	43598	-7975	35623	2.43	49.11	29.85

Methodology

The estimated energy impacts reflect the energy associated with the application of controls required to take a facility from existing control levels to the control levels of the proposed rule. Once again, this memo describes 1) the estimation of the secondary air impacts associated with the energy required to operate control devices and 2) the estimation of the energy credits attributable to the control of organic HAP emissions from equipment leaks.

Estimation of Energy Requirements and Secondary Air Impacts

As mentioned previously, estimates of energy requirements were made as part of estimating emission reductions and costs associated with the application of controls and are documented in a separate memorandum. Estimates of particulate, NO_x, and SO_x emissions are based on procedures documented in Chapter 7 of the background information document (BID) for the Polymers Manufacturing New Source Performance Standards (NSPS) and are directly related to the estimated energy requirements (i.e., natural gas, electricity, and steam). In brief, emission factors for particulate, NO_x, and SO_x emissions associated with each form of energy (e.g., steam) and the estimated energy requirement are used to estimate secondary air impacts. Table 2 presents the emission factors associated with each form of energy.

Table 2. Secondary Air Emission Factors[a]

Form of Energy	Particulates	NO_x	SO_x
Steam	0.0729 lb/1,000 lb steam	0.6256 lb/1,000 lb steam	3.274 lb/1,000 lb steam
Natural Gas	0.01428 lb/10^6Btu	0.2190 lb/10^6Btu	0.0005714 lb/10^6Btu
Electricity	0.0004535 lb/kWh	0.003887 lb/kWh	0.02034 lb/kWh

[a]Polymer Manufacturing Industry - Background Information for Proposed Standards, Chapter 7. U. S. Environmental Protection Agency. EPA 450/3-83-019a. October 1984.

Estimation of Energy Credits Attributable to the Control of Equipment Leaks

Energy credits were estimated to serve as a means of representing the benefit of preventing the loss (i.e., emissions) of valuable organic HAP through the control of equipment leaks. Energy credit estimates, as presented in Table 3, were determined by multiplying the emission reductions (i.e., organic HAP not "lost") by the heating value for individual organic HAP or by the average heating value for the set of organic HAP and then converting to barrels of oil equivalents (BOE). Since emissions and emission reductions of organic HAP were not speciated, emission reductions were represented by the predominant HAP emitted by each process (i.e., subcategory). This assumption is indicated on Table 3. Table 3.

Table 3. Equipment Leak Energy Credits

Subcategory	HAP Emitted	Existing Source Credits (BOE/yr)	New Source Credits (BOE/yr)
PS,C	Styrene	5538	1476
PS,Bs	Styrene	574	0
EPS	Styrene	566	0
ABS,Ce	Styrene	274	194
	Butadiene		
	Acrylonitrile		
ABS,Cm	Styrene	931	452
	Butadiene		
	Acrylonitrile		
ABS,Be	Styrene	204	81
	Butadiene		
	Acrylonitrile		
ABS,Bs	Styrene	28	26
	Butadiene		
	Acrylonitrile		
ABS,Bl	Styrene	11	0
	Butadiene		
	Acrylonitrile		
MABS	Styrene	14	0
	Butadiene		
	Acrylonitrile		
Nitrile	Acrylonitrile	23	0
MBS	Styrene	703	44
	Butadiene		
SAN, C	Styrene	228	128
	Acrylonitrile		
SAN, B	Styrene	38	33
	Acrylonitrile		
AMSAN/ASA	Styrene	426	0
	Acrylonitrile		
PET, TPA,C	Ethylene Glycol	1567	1567
PET, TPA,B	Ethylene Glycol	9	9
PET, DMT,C	Ethylene Glycol	3426	2624
PET, DMT,B	Ethylene Glycol	2162	1342

Notes:

a - *The following heating values were taken from the HON database - styrene: 17606 Btu/lb, butadiene: 19165 Btu/lb, and acrylonitrile: 9786 Btu/lb.*

b - Heating value of 15519 Btu/lb is average of styrene, butadiene, and acrylonitrile.

c - Assumed 149,700 BTU/gal oil (reference: Energy Reference Handbook, 1977) and 42 gal/barrel of oil.

d - Heating value of 18385.5 Btu/lb is average of styrene and butadiene.

e - Heating value of 13696 Btu/lb is average of styrene and acrylonitrile.A19

f - The following heating value for ethylene glycol was taken from Chapter 7 of the Polymers NSPS BID - 7,810 Btu/lb.

A-92-45
II-B-25

PACIFIC ENVIRONMENTAL SERVICES, INC.

Central Park West
5001 South Miami Boulevard
PO Box 12077
Research Triangle Park, NC 27709-2077
(919) 941-0333 FAX (919) 941-0234

MEMORANDUM

TO: Group IV Resins Docket No. A-92-45

FROM: Bennett King
Pacific Environmental Services, Inc.

DATE: March 24, 1995

SUBJECT: Baseline Emissions Estimates for the Group IV Thermoplastics

Purpose

This memorandum presents baseline emissions estimates of organic hazardous air pollutants (HAP) for existing and new sources in the thermoplastic industry and provides the methodology used to determine these emissions. The baseline emissions estimates are estimates of the amount of organic HAP emitted from the industry prior to the application of controls required by the proposed rule. The organic HAP emitted from the thermoplastic industry includes styrene, butadiene, acrylonitrile, acetaldehyde, dioxane, methanol, and ethylene glycol. The quantity of emissions for each individual organic HAP was not determined, but acrylonitrile and styrene are estimated to comprise the largest quantity of emissions. The organic HAP emitted by each subcategory are identified in Table 1. These organic HAP are emitted from storage vessels, process vents, wastewater operations, equipment leaks, and process contact cooling towers.

In general, emissions for storage vessels, process vents, wastewater operations, and process contact cooling towers were taken directly from information submitted by each facility when available. Exceptions to this are discussed in subsequent paragraphs. Industry estimates of emissions were used because data were not provided to allow the EPA to make independent estimates of emissions in all cases. However, in all cases, the baseline emissions from equipment leaks were calculated by using component counts provided by facilities and emission factors from EPA's Protocol document for equipment

TABLE 1. MAJOR HAZARDOUS AIR POLLUTANTS EMITTED BY SUBCATEGORY

Subcategory	Major Organic HAP Emitted
ABS	acrylonitrile, butadiene, styrene
SAN	acrylonitrile, styrene
MABS	acrylonitrile, butadiene, styrene
MBS	butadiene, styrene
Polystyrene	styrene
PET	ethylene glycol, methanol, acetaldehyde, dioxane
Nitrile	acrylonitrile

ABS = acrylonitrile butadiene styrene
SAN = styrene acrylonitrile
MABS = methyl methacrylate acrylonitrile butadiene styrene
MBS = methyl methacrylate butadiene styrene
PET = poly(ethylene terephthalate)
HAP = hazardous air pollutant

leaks.[1] The level of equipment leak control assumed for each facility was based on the submitted information or was determined using other available information.[2]

Results

Baseline organic HAP emissions for each thermoplastic subcategory are presented in Tables 2 and 3. As shown in the tables, the total nationwide estimated organic HAP emissions are approximately 24,790 megagrams per year (Mg/yr) for existing sources and 14,930 Mg/year for new sources. Equipment leaks and process contact cooling tower emissions comprise more than two thirds of the total baseline emissions for existing and new sources. Of the remaining emissions, for both existing and new sources, approximately 17 to 20 percent are from process vents, 1 percent are from storage vessels,

---

[1] U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. EPA-453/R-92-026, June 1993.

[2] Memorandum to Group IV Resins Docket No. A-92-45 from Ken Meardon. Determination of MACT Floors for Equipment Leaks. December 22, 1994.

TABLE 2. BASELINE ORGANIC HAP EMISSIONS FOR EXISTING SOURCES

Subcategory	Baseline Organic HAP Emissions for Existing Sources (Mg/yr)					
	Process Vents	Storage Vessels	Equipment Leaks[a]	Wastewater	Cooling Towers	Total
ABS, Be	430	6	50	20	0	500
ABS, Bl	1	0	2	0	0	3
ABS, Bs	4	1	9	1	0	15
ABS, Ce	630	15	80	390	0	1,110
ABS, Cm	20	6	220	0	0	240
MABS	80	2	3	3	0	90
Nitrile	20	0	10	0	0	30
SAN, B	8	3	10	10	0	40
SAN, C	7	4	70	30	0	110
ASA/AMSAN	0	0	90	5	0	100
MBS	50	3	130	10	0	190
EPS	15	3	430	0	0	450
PS, B	70	10	110	0	0	190
PS, C	260	60	1,120	5	0	1,440
PET TPA, C	1,090	3	2,030	1,310	1,660	6,090
PET TPA, B	570	1	90	35	620	1,320
PET DMT, C	535	80	2,150	580	1,140	4,480
PET DMT, B	1,290	100	1,190	110	5,690	8,390
TOTALS	5,060	310	7,790	2,510	9,110	24,790

Footnotes to Table 2

[a] These values were determined by estimating equipment counts and applying SOCMI factors taken from the EPA's Protocol document for equipment leaks which were adjusted according to leak detection and repair (LDAR) programs.

Be	=	batch emulsion
Bl	=	batch latex
Bs	=	batch suspension
Ce	=	continuous emulsion
Cm	=	continuous mass
B	=	batch
C	=	continuous
PS	=	polystyrene
ASA	=	acrylonitrile styrene acrylate
AMSAN	=	alpha methyl styrene acrylonitrile

TABLE 3. BASELINE ORGANIC HAP EMISSIONS FOR NEW SOURCES

	Baseline Organic HAP Emissions For New Sources (Mg/yr)					
Subcategory[a]	Process Vents	Storage Vessels	Equipment Leaks[b]	Wastewater	Cooling Towers	TOTAL
ABS, B	10	0	20	1	0	30
ABS, Bl	0	0	0	0	0	0
ABS, Bs	5	1	6	1	0	10
ABS, Ce	120	1	40	240	0	400
ABS, Cm	0	2	90	0	0	90
MABS	0	0	0	0	0	0
Nitrile	0	0	0	0	0	0
SAN, B	5	3	10	3	0	20
SAN, C	0	1	40	0	0	40
ASA/AMSAN	0	0	0	0	0	0
MBS	15	0	4	1	0	20
EPS	0	0	0	0	0	0
PS, B	0	0	0	0	0	0
PS, C	30	15	280	0	0	330
PET TPA, C	1,090	3	2,030	1,310	1,660	6,090
PET TPA, B	570	1	90	35	620	1,315
PET DMT, C	300	80	1,690	270	850	3,190
PET DMT, B	360	40	690	20	2,270	3,380
TOTALS	2,510	150	5,000	1,880	5,400	14,930

Footnotes to Table 3

[a] See abbreviations from Table 5-1.

[b] These values were determined by estimating equipment counts and applying SOCMI factors taken from the EPA's Protocol document for equipment leaks which were adjusted according to leak detection and repair (LDAR) programs.

and 10 to 12 percent are from wastewater operations. Based on the submitted data, process contact cooling tower emissions are only present at poly(ethylene terephthalate) (PET) facilities. The least amount of emissions are from the nitrile subcategory which only contains one facility.

Methodology

This section describes 1) the estimation of emissions from equipment leaks, and 2) why and when emissions data provided by industry were not used and independent estimates were developed for storage vessels, process vents, wastewater operations, and process contact cooling towers. In most instances, the emissions data provided by industry were used; the development of independent emission estimates were the exception.

Equipment Leak Emissions Estimates

Emissions data provided by industry for equipment leaks were not used. Instead, emissions were estimated by determining the equipment component counts at each facility (e.g. valves in gas service, pumps in light liquid service) and applying the appropriate emission factors for each component category. Emission factors reported in the EPA's Protocol document for equipment leaks were used. This approach to estimating emissions for equipment leaks was taken to provide a consistent baseline for estimating the impacts of various leak detection and repair (LDAR) programs in use for various subcategories and to compensate for the fact that equipment leaks data provided by industry was not complete. For the several facilities that provided specific and clear information, the estimate of emissions were adjusted to account for low organic HAP concentrations and reduced hours of operations. More information is available in the memorandum "Determination of MACT Floors for Equipment Leaks"[2] under the section titled "Estimating Uncontrolled Emissions."

Exceptions to Industry Provided Data

As described earlier, the emissions estimates provided by industry for storage vessels, process vents, wastewater operations, and process contact cooling towers were used in the majority of cases. The exceptions to this are described in the paragraphs below.

The first exception made is related to process vents, storage vessels, and wastewater operations. Emissions and emission reductions were estimated based on individual stream or tank characteristics as part of evaluating the application of controls. Often these estimates did not correlate with the emissions data provided by industry. When this situation occurred, the independent emissions estimates were used.

When emissions estimates were required under the first exception, emissions were estimated using the methodologies found in the Background Information Document (BID) to the Hazardous Organic NESHAP (HON). In brief, storage vessel emissions were estimated based on vessel capacity and the vapor pressure of the stored material. Both breathing and working losses were estimated. Process vent and wastewater stream emissions were estimated based on flowrate and organic HAP concentration. The HON BID contains more detail, including example calculations. The appropriate chapters of the HON BID have been placed in the docket (Docket No.A-92-45, Category II-A).

The second exception made is related to process contact cooling towers used in the production of poly(ethylene terephthalate) (PET). As part of analyzing the regulatory alternative for this emission point, the emissions data provided by industry were manipulated through several assumptions. Independent emissions estimates were not made as part of this manipulation.

Under the first assumption, average default emissions were assigned when a process contact cooling tower was present and emissions data had not been provided by industry. This assumption was made in an effort to verify the cost effectiveness of the evaluated regulatory alternative across the entire industry. Second, emissions were adjusted to reflect operations at full production capacity. This assumption was made to provide a conservative evaluation of the regulatory alternative. Third, emissions associated with some vacuum system condensate wastewater streams were assigned to the process contact cooling tower to accurately reflect the emission reductions achieved by the second regulatory alternative. In brief, the first regulatory alternative required control of some vacuum system condensate wastewater streams but did not controlled the process contact cooling tower emissions. The second regulatory alternative controlled these wastewater streams and the process contact cooling tower emissions. Therefore, to accurately reflect the emission reduction associated with the second regulatory alternative, the emissions from these few wastewater streams were added to the process contact cooling tower emissions; they were not included as wastewater emissions. Fourth, emissions from process contact cooling towers associated with solid state PET processes were assigned to the PET process or processes present at the facility where the solid state PET process was located.

I:\n301\docu\baseline.val

cc: Ken Meardon, PES
Valerie Everette, PES

A-92-45
II-B-26

PACIFIC ENVIRONMENTAL SERVICES, INC.

Central Park West
5001 South Miami Boulevard
PO Box 12077
Research Triangle Park, NC 27709-2077
(919) 941-0333 FAX (919) 941-0234

MEMORANDUM

TO: Leslie Evans
U. S. Environmental Protection Agency

FROM: Bennett King
Pacific Environmental Services

DATE: March 24, 1995

SUBJECT: Methodology for Extrapolation of Impacts

Purpose

This memorandum presents the methodology used to develop impacts (i.e., costs and energy) for emission points for which sufficient data were not available upon which to make individual estimates of impacts. For most facilities, data are sufficient to evaluate individual emission points. However, for some emission points at facilities within certain subcategories, data are not sufficient, and estimates of impacts for emission points within these facilities were developed by extrapolating from the known impacts. Extrapolated impacts were developed to support the economic impacts analysis.

Results

The extrapolation procedure was applied to process vents and storage vessels in the polystyrene and acrylonitrile butadiene styrene (ABS) subcategories. For all other subcategories, data were available to make individual estimates of impacts for all emission points. For the other types of emission points (i.e., wastewater operations and equipment leaks) at polystyrene and ABS facilities, it was not necessary to develop extrapolated impacts for several reasons. For wastewater operations, analysis showed that no impacts were expected as a result of the proposed rule. For equipment leaks, data required to develop an individual estimate of impacts are available for all facilities.

Table 1 presents the data related to extrapolating total annual costs (dollars per year ($/yr)) to illustrate the methodology. Table 1 presents the individual emission point cost estimates used as the basis for the extrapolated impacts and the extrapolated cost impacts for process vents. For each of the facilities within a given subcategory, the estimated impacts are provided. The last column on each table identifies whether the estimated impacts were made based on available data for the individual facility or based on the extrapolation procedure. In all cases, the extrapolated impacts for storage vessels were zero, and these results are not presented on Table 1.

Methodology

The two source categories for which extrapolation was done represent 9 subcategories. Typically, one or more facility within each subcategory had individual emission point estimates upon which to base the extrapolation. In one case, a subcategory (ABS using a batch suspension process) did not have any facilities with individual emission point estimates and it was assumed that a facility from a similar subcategory (ABS using a batch emulsion process) could be used as the basis for extrapolation.

As mentioned earlier, in all cases the extrapolated impacts for storage vessels were zero. Because there were no impacts associated with the proposed rule for those emission points for which sufficient data were available, it follows that the extrapolated impacts would also be zero. The remainder of the methodology discussion concerns process vents only.

For those facilities that required extrapolation, the following steps were followed to develop an estimate of impacts. When extrapolating for existing source impacts, the process vent baseline emissions for each facility were evaluated against a predetermined cutoff (2.2 tons per year (tpy)). The derivation of this emissions cutoff is discussed in a later paragraph. When baseline emissions were greater than the emissions cutoff, a non-zero extrapolated value was determined. When baseline emissions were equal to or less than the emissions cutoff, the extrapolated value assigned was zero. When extrapolating for new source impacts, the same procedure was followed with one exception. The first step for extrapolating for new source impacts was to determine if a facility had been selected to represent the projected new growth. If so, the extrapolation procedure continued, and if not, an extrapolated value was not determined. (See the memorandum titled "Estimated New

Growth for Group IV Resins Sources," dated December 21, 1994, for more details on the projected new growth.)

Once a facility passed this initial "criteria," impacts were extrapolated using two different methods. For the extrapolation of impacts associated with the application of controls required by process vent provisions modeled after the Hazardous Organic NESHAP (HON), impacts were extrapolated using the 6/10th rule. Impacts were extrapolated by dividing the emissions for the "extrapolating facility" by the emissions for the "basis facility," then this quotient was raised to the 0.6 power, and finally this product was multiplied by the known impact. For the extrapolation of impacts associated with the application of controls required by process vent provisions modeled after the Polymers Manufacturing New Source Performance Standards (NSPS), impacts were based on an average dollar (or energy amount) per megagram of emissions (e.g., $/Mg baseline emissions). Impacts were extrapolated by multiplying the "impact factor" by the baseline emissions of the "extrapolating facility." The decision criteria used to determine which of the two methods described above should be used was based on the amount of data available. If only one or two data sets were available for a subcategory, as was the case for impacts associated with the application of controls required the HON, the 6/10th rule was used. If three or more data sets were available for a subcategory, the "impact factor" technique was used.

The emissions cutoff referred to earlier, a value of 2.2 tpy, was determined to be the minimum "size" emission point for which extrapolated impacts should be assigned. This assumption was made to avoid extrapolating impacts to emission points that would not require controls due to their small "size" (e.g., flowrates or hazardous air pollutant (HAP) concentrations below applicability criteria). The value of 2.2 tpy was determined by inspecting the group of process vents with the least amount of emissions that had to apply controls as a result of the proposed rule.

l:\n301\docu\extrpol

cc: Ken Meardon, PES
Valerie Everette, PES

Table 1. Summary of Extrapolated Costs

SUBCATEGORY[a]	FACILITY	TOTAL ANNUALIZED COSTS[b]	COMMENTS
ABS-Batch emulsion	Monsanto-Muscatine[c]	$218,133	Based on known process vent data; no extrapolation required.
	Monsanto-Addyston	$0	Based on known process vent data; no extrapolation required.
	Dow-Midland	$0	Based on known process vent data; no extrapolation required.
	GE-Washington	$0	Based on known process vent data; no extrapolation required.
ABS-Batch suspension	Monsanto-Muscatine	$14,572	Extrapolated value, based on Monsanto, Muscatine ABS-batch emulsion facility.
	Monsanto-Addyston	$0	Extrapolated value, based on Monsanto, Muscatine ABS-batch emulsion facility.
ABS-Batch latex	BF-Goodrich-Akron	$0	Based on known process vent data; no extrapolation required.

Table 1. Summary of Extrapolated Costs
(continued)

SUBCATEGORY[a]	FACILITY	TOTAL ANNUALIZED COSTS[b]	COMMENTS
ABS-Continuous emulsion	GE-Ottawa	$0	Based on known process vent data; no extrapolation required.
	GE-Washington	$8	Based on known process vent data; no extrapolation required.
ABS-Continuous mass	Monsanto-Addyston[c]	$25	Based on known process vent data; no extrapolation required.
	Dow-Midland	$0	Based on known process vent data; no extrapolation required.
	Dow-Allyn's Point	$0	Extrapolated value; below emissions cutoff.
	Dow-Torrance	$0	Based on known process vent data; no extrapolation required.
	Dow-Hanging Rock	$0	Extrapolated value; below emissions cutoff.

Table 1. Summary of Extrapolated Costs
(continued)

SUBCATEGORY[a]	FACILITY	TOTAL ANNUALIZED COSTS[b]	COMMENTS
PS, Batch	Amoco-Willow Springs[c]	$6,085	Based on known process vent data; no extrapolation required.
	Huntsman-Chesapeake	$11,202	Extrapolated value.
	Scott Polymers-Saginaw #2	$0	Extrapolated value; below emissions cutoff.
	Scott Polymers-Saginaw #1	$0	Extrapolated value; below emissions cutoff.
	Dart-Leola	$0	Extrapolated value; below emissions cutoff.
	Rohm & Haas-Philadelphia	$3,962	Extrapolated value.
	Dart-Owensboro	$0	Extrapolated value; below emissions cutoff.
	Huntsman-Peru	$8,967	Extrapolated value.
	Amoco-Torrance	$0	Extrapolated value; below emissions cutoff.
	Arco-Monaca	$5,516	Extrapolated value.

Table 1. Summary of Extrapolated Costs
(continued)

SUBCATEGORY[a]	FACILITY	TOTAL ANNUALIZED COSTS[b]	COMMENTS
PS, Continuous	Huntsman-Chesapeake	$0	Based on known process vent data; no extrapolation required.
	Chevron-Marietta	$0	Based on known process vent data; no extrapolation required.
	Huntsman-Belpre[c]	($26)[d]	Based on known process vent data; no extrapolation required.
	Dow-Midland	$0	Based on known process vent data; no extrapolation required.
	American Polymers-Oxford	$0	Based on known process vent data; no extrapolation required.
	BASF-Holyoke	$0	Based on known process vent data; no extrapolation required.
	Novacor-Indian Orchard	$0	Based on known process vent data; no extrapolation required.
	Novacor-Decatur #1	$0	Based on known process vent data; no extrapolation required.

Table 1. Summary of Extrapolated Costs (continued)

SUBCATEGORY[a]	FACILITY	TOTAL ANNUALIZED COSTS[b]	COMMENTS
PS, Continuous (continued)	Dow-Joilet	$0	Based on known process vent data; no extrapolation required.
	Amoco-Joilet[c]	$43	Based on known process vent data; no extrapolation required.
	Dow-Allyn's Point[c]	$1	Based on known process vent data; no extrapolation required.
	Dow-Torrance	$0	Based on known process vent data; no extrapolation required.
	Dow-Hanging Rock	$0	Based on known process vent data; no extrapolation required.
	Dow-Riverside	$0	Based on known process vent data; no extrapolation required.
	GE-Selkirk	$0	Based on known process vent data; no extrapolation required.
	Kama-Hazelwood	($22,723)	Extrapolated value.
	Monsanto-Addyston	$0	Extrapolated value, below emissions cutoff.

Table 1. Summary of Extrapolated Costs
(concluded)

SUBCATEGORY[a]	FACILITY	TOTAL ANNUALIZED COSTS[b]	COMMENTS
PS, Continuous (continued)	Fina Oil-Carville	($11,502)	Extrapolated value.
	BASF-Joilet	($5,693)	Extrapolated value.
	Huntsman-Peru	($6,064)	Extrapolated value.
	BASF-Santa Ana	($1,994)	Extrapolated value.
PS, Expandable	Arco-Monaca[c]	$0	Based on known process vent data; no extrapolation required.
	Scott Polymers-Saginaw #1	$0	Extrapolated value, below emissions cutoff.
	Scott Polymers-Fort Worth	$0	Extrapolated value, below emissions cutoff.
	Arco-Painesville	$0	Extrapolated value, below emissions cutoff.
	BASF-South Brunswick	$0	Extrapolated value.
	Huntsman-Peru	$0	Extrapolated value.
	Huntsman-Rome	$0	Extrapolated value.

Table 1. Summary of Extrapolated Costs
(Footnotes)

a ABS = Acrylonitrile butadiene styrene
PS = Polystyrene

b Does not include recordkeeping and reporting costs, which are estimated to be on average 30 percent of total annualized control costs. Numbers in parenthesis () represent savings and are the result of recovery credits achieved through the use of condensers as a control device.

c Identifies the "basis facility," meaning that facility used as the basis for extrapolation.

l:\n301\docu\extapo$.tbl

A-92-45
II-B-29

PACIFIC ENVIRONMENTAL SERVICES, INC.

Central Park West
5001 South Miami Boulevard
PO Box 12077
Research Triangle Park, NC 27709-2077
(919) 941-0333 FAX (919) 941-0234

MEMORANDUM

TO: Group IV Resins Docket No. A-92-45

FROM: Bennett King and Kenneth R. Meardon
Pacific Environmental Services

DATE: March 24, 1995

SUBJECT: Summary of Cost, Emission Reduction, and Energy Impacts for Group IV Resin Sources

The purpose of this memo is to document the procedures used to estimate cost, emission reduction, and energy impacts associated with the application of controls associated with the proposed rule. The following paragraphs describe briefly the procedures used for each type of emission point and refer the reader to specific docket items that contain more detail.

Attachment 1 presents the cost and emission reduction impacts that were estimated using the procedures described in this memorandum. Although energy impacts were estimated based on the procedures discussed in this memorandum, energy impacts are presented in a separate memorandum titled "Methodology for Estimation of Secondary Environmental Impacts," dated March 24, 1995. Attachment 1 also includes some impacts data associated with process vents at polystyrene and acrylonitrile butadiene styrene (ABS) facilities that were developed by extrapolating from the data estimated using the subject procedures. The memorandum titled "Methodology for Extrapolation of Impacts," dated March 24, 1995, contains more detail on the extrapolation procedure and identifies which facilities have "extrapolated" impacts.

Attachment 1 presents the costs and emission reductions for each facility. The facilities are arranged alphabetically. In addition, summary tables for each subcategory are included. The impacts data associated with the production of poly(ethylene terephthalate) (PET) are considered to be confidential business information (CBI). Such information has been deleted from the attached table, and is located in the U.S. Environmental Protection Agency's CBI files. This confidential data is presented in a memorandum titled "Final Cost Impacts for Poly(ethylene terephthalate) Facilities," dated October 28, 1994.

Storage Vessels

Storage vessels requiring control were assumed to be controlled through tank improvements (i.e., installation of internal floating roofs) for the purposes of the impacts analysis. A calculational spreadsheet for estimating impacts associated with tank improvements was developed based on the procedures presented in the HON Background Information Document (BID) and was used to estimate wastewater impacts for the Group IV project. Storage vessel characteristics required to use the spreadsheet are storage vessel capacity, storage vessel diameter, and annual emission reductions. Because the storage vessel impacts were expected to be a minimal portion of the total impacts, it was decided that only tank improvements would be considered for developing impacts.

Detailed information on the storage vessel impacts procedure is presented in Volume 1B: Control Technologies of the HON BID (EPA-453/D-92-016b). Pertinent chapters of the HON BID are available in the Group IV docket (Docket No. A-92-45, Item II-A-11).

Process Vents

Two impact estimation procedures were used for process vents. One procedure for process vents requiring control using a combustion device, and one procedure for process vents requiring control using a condenser. Impacts for most continuous process vents were estimated using the combustion device procedure, while impacts for all batch process vents were estimated using the condenser procedure.

Process vents requiring control by a combustion device were those that were subject to control under the provisions modeled after the Hazardous Organic NESHAP (HON) process vent provisions. Process vents with a total resource effectiveness (TRE) value less than or equal to 1.0 were required to be controlled. For purposes of the analysis, control was achieved through the use of a combustion device and impacts for these process vents were determined using the procedure developed and used for the HON. The process vent stream characteristics used in the combustion device procedure are flowrate, hazardous organic pollutant (HAP) concentration, molecular weight, heat content, emission rate, and hours of operation. These data were either provided by industry as part of responding to Section 114 questionnaires or were estimated based on available data. The procedure assumes a fixed emission reduction of 98 percent and costs are estimated in 1989 dollars. Energy impacts vary depending on the type of combustion device selected as optimal by the procedure. This procedure is in a computer program format and is commonly referred to as VENTCOST. Detailed information on the combustion device procedure is presented in Volume 1B: Control Technologies of the HON Background Information Document (BID)

(EPA-453/D-92-016b). Pertinent chapters of the HON BID are available in the Group IV docket (Docket No. A-92-45, Item II-A-11).

Process vents requiring control by a condenser were those that were subject to control under the provisions modeled after the Batch Processes Alternative Control Techniques (ACT) document or after the Polymers Manufacturing New Source Performance Standards (NSPS). In other words, the condenser procedure was used to estimate impacts for all batch process vents and certain continuous process vents from polystyrene and PET processes that required control. The condenser procedure was developed under the Polymers Manufacturing NSPS rulemaking. Only one process vent stream characteristic is required to use the procedure: emissions per mass of product produced. Like the combustion procedure, this procedure is in a computer program format. The computer program version of this procedure was available to PES through earlier EPA work. Costs are estimated in 1980 dollars and were then escalated to 1989 dollars using the chemical engineering fabricated equipment cost indices as follows:

Year	Cost Index
1980	291.3
1989	392

Detailed information on the condenser procedure is available in the Group IV docket (Docket No. A-92-45, Item II-B-30).

Wastewater

Wastewater streams requiring control were assumed to be controlled through the use of a steam stripper for the purposes of the impacts analysis. A calculational spreadsheet for estimating impacts associated with steam strippers was developed under the HON and was used to estimate wastewater impacts for the Group IV project.

The only wastewater stream characteristic required to use the spreadsheet is the flowrate, expressed in gallons per minute (gpm). One change was made to the HON wastewater impacts spreadsheet -- the annualized capital cost factor was revised to reflect a 7% (rather than a 10%) interest rate over 15 years. Costs are estimated in 1989 dollars.

Detailed information on the wastewater impacts procedure is presented in Volume 1B: Control Technologies of the HON Background Information Document (BID) (EPA-453/D-92-

016b). Pertinent chapters of the HON BID are available in the Group IV docket (Docket No. A-92-45, Item II-A-11).

Equipment Leaks

For equipment leaks, costing was based on the cost algorithm used in the HON. All costs were estimated in 1989 dollars. In brief, costs were estimated for the purchase of an analyzer; the labor costs associated with each leak detection and repair program, which varied depending on the frequency of the inspections and the leak definition; and the costs for various equipment used in complying with the standards (e.g., caps for open-ended lines).

Where available, actual equipment counts and leak detection repair programs at each facility were used. The costs were originally estimated in 1992 dollars, and were de-escalated to 1989 dollars using chemical engineering plant cost indices as follows:

Year	Cost Index
1992	358.2
1989	355.4

Material recovery credits were assumed for PET facilities using the dimethyl terephthalate (DMT) process only. A recovery credit was estimated based on recovery of methanol using a price of $0.068 per lb of methanol.

Detailed information on the equipment leaks impacts procedure is presented in Volume 1B: Control Technologies of the HON Background Information Document (BID) (EPA-453/D-92-016b). Pertinent chapters of the HON BID are available in the Group IV docket (Docket No. A-92-45) at docket item II-A-11. Additional Group IV docket items documenting the cost procedures are located at docket items II-B-11, II-B-12, and II-B-30.

Ethylene Glycol Jet Costing

As discussed in the Basis & Purpose Document and preamble to the proposed rule, the impacts analysis for the proposed prohibition on the use of process contact cooling towers for vacuum systems used in the production of PET is based on the use of ethylene glycol vacuum jet systems as a replacement for the steam jet vacuum systems. Cost data for ethylene glycol jets were available from a single source (Company XXX), and the cost data are declared to be confidential business information (CBI) by Company XXX. The costs provided were for a retrofit application of ethylene glycol jets, however, the retrofit related capital costs were not provided and had to be approximated.

Costs were estimated for other PET facilities through the following procedure. First, the capital, variable annual, and fixed annual costs for Company XXX were determined. Recovery credits for ethylene glycol emission reductions were not estimated. Individual cost components were extrapolated to other facilities using two techniques, both dependent on production capacity.

The first technique was to use a 6/10th scaling factor based on the ratio of the "extrapolated facility's" production and Company XXX's production. For these types of calculations, the ratio of the extrapolated facility's production rate (or capacity) to Company XXX's production rate (or capacity) was determined and raised to the 0.6 power. This quotient

was multiplied by the appropriate cost component to determine the extrapolated cost. See the equation below for an illustration of this technique.

Extrapolated Cost = (Extrapolated Facility Production Rate/Company XXX Production Rate)^0.6 * Cost Component

The second technique uses a direct ratio of the production rates (or capacities) between the "extrapolated facility" and Company XXX. The production rate (or capacity) ratio is multiplied by the cost component to determine the extrapolated cost. See the equation below for an illustration of this technique.

Extrapolated Cost = (Extrapolated Facility Production Rate/Company XXX Production Rate) * Cost Component

Table 1 presents which extrapolation technique was used on each cost component. The decision criteria for when to apply the 6/10th scaling factor and when to ratio directly based on capacity reflects the sensitivity of a given cost component to production capacity. Variable annual costs are directly related to the time of operation and/or amount of product produced, therefore, these costs were extrapolated based directly on production capacity. Other cost components are not as strongly related to production capacity, and these costs were extrapolated using the 6/10th scaling factor.

Table 1. Application of Ethylene Glycol Jet Costs to Other Facilities

Cost Category	Retrofit Application	New Application
Capital Costs	6/10th scaling factor	Incremental costs assumed to be zero
Variable Annual: ~~semi-variable costs~~.	6/10th scaling factor	6/10th scaling factor
~~Variable Annual:~~ variable costs	~~Capacity ratio~~	~~Capacity ratio~~
Fixed Annual	6/10th scaling factor	Incremental costs assumed to be zero

Table 1 also presents the differences between applying the known cost data to existing or new facilities. The primary differences between a new or retrofit application are capital costs and fixed annual costs (i.e., annualized capital costs). As mentioned previously, the cost data provided by Company XXX were for a retrofit application, however, the retrofit related capital costs were not provided. Retrofit capital costs were approximated by doubling the direct capital costs and using the provided indirect capital costs without modification. The capital costs for a new steam jet system were determined to be comparable to the costs for a new ethylene glycol jet system. An estimate for a new steam jet system was made by using the purchased equipment costs for a steam jet system, as provided by Company XXX, and using the standard EPA factors for direct and indirect capital costs as shown in Table 2. Direct installation costs include: foundation and supports; handling and erection; electrical; piping; insulation and ductwork; painting; and site preparation. Indirect costs include: engineering; construction and field expenses; contractor fees; start-up; performance test; and contingencies. Based on the determination that capital costs were comparable, it was assumed that the incremental costs between a new steam jet system and a new ethylene glycol jet system were zero.

Table 2. EPA Direct and Indirect Capital Cost Factors

Capital Cost Component	EPA Factor
Direct Installation Costs	30% of PEC
Indirect Costs	31% of PEC

PEC = purchased equipment cost

Other assumptions that were made as part of extrapolating costs to other facilities are related to emissions and emission reductions; these assumptions directly affect the evaluation of the cost effectiveness of applying ethylene glycol jets. Emissions data on process contact cooling towers were not available for all facilities. In order to develop emissions for all facilities and as part of analyzing the impact of applying ethylene glycol jets for all facilities, the emissions data provided by industry were manipulated through several assumptions. Independent emissions estimates were not made as part of this manipulation.

Under the first assumption, average default emissions were assigned when a process contact cooling tower was present and emissions data had not been provided by industry. Second, emissions were adjusted to reflect operations at full production capacity. This assumption was made to provide a conservative evaluation of the regulatory alternative. Third, emissions associated with some vacuum system condensate wastewater streams were assigned to the process contact cooling tower to accurately reflect the emission reductions achieved by the use of ethylene glycol jets. Emissions were only included for "some" of the vacuum system condensate wastewater streams because data were not available to estimate emissions for all of these streams. The omission of emission reductions associated with these streams for some facilities makes the impacts analysis of applying ethylene glycol jets more conservative. Fourth, emissions from process contact cooling towers associated with solid state PET processes were assigned to the PET process or processes present at the facility where the solid state PET process was located. Finally, it was assumed that ethylene glycol jets achieved a 98 percent emission reduction.

I:\n301\docu\cost&er.mem

cc: Valerie Everette, PES

ATTACHMENT 1

SUMMARY TABLES

Impacts Summary
By Sub-category

MBS | All Facilities | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents	$93,204	$101,898	$76,831		$178,729	18.19	$9,826
Equipment Leaks	$174,426	$68,140	$66,534	($90,895)	$43,779	109.32	$400
Wastewater	$279,051	$53,976	$83,655		$137,631	5.00	$27,526
TOTALS	$546,681	$224,013	$227,020	($90,895)	$360,139	132.51	$2,718

Impacts Summary
By Sub-category

MBS | **Kaneka - Pasadena** | New

(Option 1)

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks	$18,083	$6,183	($3,367)		$2,816	1.65	$1,707
Process Vents	$405,446	$136,592	$94,900		$231,492	7.68	$30,142
Equipment Leaks	$17,252	$4,264	$1,580	($5,954)	($111)	7.16	($15)
Wastewater		$0	$0		$0		
TOTALS	$440,781	$147,039	$93,113	($5,954)	$234,198	16.49	$14,202

MBS | **Rohm & Haas - Louisville** | New

(Option 2)

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents	$106,394	$138,150	$95,992		$234,142	6.14	$38,134
Equipment Leaks	$157,174	$63,876	$64,955	($84,941)	$43,889	102.16	$430
Wastewater	$279,051	$53,976	$83,655		$137,631	5.00	$27,526
TOTALS	$542,619	$256,001	$244,602	($84,941)	$415,662	113.30	$3,669

MBS | **Elf Atochem - Mobile** | New

(Option 3)

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents	$142,730	$131,816	$91,572		$223,388	12.04	$18,554
Equipment Leaks		$0	$0		$0		
Wastewater		$0	$0		$0		
TOTALS	$142,730	$131,816	$91,572	$0	$223,388	12.04	$18,554

Impacts Summary
By Sub-category

SAN,C | All Facilities | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$194,786	$56,976	$25,033	($27,407)	$54,602	45.54	$1,199
Wastewater	$259,217	$40,899	$67,062		$107,961	19.00	$5,682
TOTALS	$454,003	$97,876	$92,095	($27,407)	$162,563	64.54	$2,519

Impacts Summary
By Sub-category

SAN,C | **Monsanto - Addyston** | New

(Option 1)

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$0	$889	$607	($1,276)	$220	2.10	$105
Wastewater	$259,217	$40,899	$67,062		$107,961	19.00	$5,682
TOTALS	$259,217	$41,789	$67,669	($1,276)	$108,181	21.10	$5,127

SAN,C | **Dow - Midland** | New

(Option 2)

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$178,188	$44,270	$8,470	($15,159)	$37,581	25.20	$1,491
Wastewater		$0	$0		$0		
TOTALS	$178,188	$44,270	$8,470	($15,159)	$37,581	25.20	$1,491

Impacts Summary
By Sub-category

SAN,B | All Facilities | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$1,223	$1,255	$1,733	($4,223)	($1,236)	7.02	($176)
Wastewater	$81,858	$12,916	$21,177		$34,093	6.00	$5,682
TOTALS	$83,081	$14,170	$22,910	($4,223)	$32,857	13.02	$2,524

Impacts Summary
By Sub-category

SAN,B

No Facilities
(Option 1)

New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks		$0	$0		$0		
Wastewater		$0	$0		$0		
TOTALS	$0	$0	$0	$0	$0	0.00	

SAN,B

Monsanto - Muscatine
(Option 2)

New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$1,223	$963	$1,544	($3,820)	($1,312)	6.35	($207)
Wastewater		$0	$0		$0		
TOTALS	$1,223	$963	$1,544	($3,820)	($1,312)	6.35	($207)

Impacts Summary
By Sub-category

ASA/AMSAN | **All Facilities** | **Existing**

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$308,781	$84,097	$42,801	($53,302)	$73,596	88.61	$831
Wastewater	$238,177	$51,636	$75,686		$127,322	5.00	$25,464
TOTALS	$546,958	$135,733	$118,487	($53,302)	$200,918	93.61	$2,146

Impacts Summary
By Sub-category

PS,C | All Facilities | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$32,700	$10,777	$8,579	($154,311)	($134,955)	162.14	($832)
Equipment Leaks	$733,149	$577,060	$424,939	($588,346)	$413,652	897.10	$461
Wastewater							
TOTALS	$765,849	$587,837	$433,518	($742,657)	$278,697	1059.24	$263

Impacts Summary
By Sub-category

PS,C | All Facilities | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$2,045	$1,204	$538	($3,277)	($1,535)	3.44	($446)
Equipment Leaks	$199,010	$142,502	$101,495	($156,809)	$87,188	239.10	$365
Wastewater							
TOTALS	$201,055	$143,706	$102,033	($160,086)	$85,653	242.54	$353

Impacts Summary
By Sub-category

PS,Bs | All Facilities | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$210,827	$26,040	$55,559	($26,437)	$55,163	33.21	$1,661
Equipment Leaks	$87,128	$104,528	$60,958	($60,928)	$104,558	92.90	$1,125
Wastewater							
TOTALS	$297,955	$130,568	$116,518	($87,365)	$159,721	126.11	$1,267

Impacts Summary
By Sub-category

EPS | All Facilities | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$112,917	$61,390	$47,915	($60,140)	$49,165	91.70	$536
TOTALS	$112,917	$61,390	$47,915	($60,140)	$49,165	91.70	$536

Impacts Summary
By Sub-category

ABS,Ce | All Facilities | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$3,537,793	$427,671	$880,164	($11,098)	$1,296,737	181.16	$7,158
Equipment Leaks	$3,229	$64,390	$29,987	($27,498)	$66,879	50.30	$1,330
Wastewater							
TOTALS	$3,541,022	$492,062	$910,151	($38,596)	$1,363,617	231.46	$5,891

Impacts Summary
By Sub-category

ABS,Ce | All Facilities | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks	$99,858	($339)	$34,141		$33,801	0.78	$43,335
Process Vents	$3,391,735	$836,198	$856,077		$1,692,275	114.53	$14,776
Equipment Leaks	$3,229	$39,034	$18,558	($19,462)	$38,129	35.60	$1,071
Wastewater							
TOTALS	$3,494,822	$874,892	$908,775	($19,462)	$1,764,206	150.91	$11,690

Impacts Summary
By Sub-category

ABS,Cm | All Facilities | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$29,647	$17,858	$14,790		$32,648	15.47	$2,110
Equipment Leaks	$176,822	$88,648	$74,746	($93,485)	$69,909	171.00	$409
Wastewater							
TOTALS	$206,469	$106,506	$89,536	($93,485)	$102,558	186.47	$550

Impacts Summary
By Sub-category

ABS,Cm | All Facilities | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks	$72,418	($2,964)	$24,760		$21,796	3.44	$6,336
Process Vents							
Equipment Leaks	$76,198	$32,499	$28,699	($45,430)	$15,768	83.10	$190
Wastewater							
TOTALS	$148,616	$29,535	$53,459	($45,430)	$37,563	86.54	$434

Impacts Summary
By Sub-category

ABS,Be — All Facilities — Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$409,420	$161,442	$122,131		$283,573	18.71	$15,156
Equipment Leaks	$20,388	$30,003	$18,191	($20,446)	$27,748	37.40	$742
Wastewater							
TOTALS	$429,808	$191,445	$140,322	($20,446)	$311,321	56.11	$5,548

Impacts Summary
By Sub-category

ABS,Be | All Facilities | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$17,848	$13,088	$9,211	($8,091)	$14,208	14.80	$960
TOTALS	$17,848	$13,088	$9,211	($8,091)	$14,208	14.80	$960

Impacts Summary
By Sub-category

ABS,Bs | All Facilities | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$27,351	$10,785	$8,159		$18,944	0.21	$90,208
Equipment Leaks	$886	$1,534	$1,243	($2,788)	($11)	5.10	($2)
Wastewater							
TOTALS	$28,237	$12,319	$9,402	($2,788)	$18,932	5.31	$3,565

Impacts Summary
By Sub-category

ABS,Bs — All Facilities — New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$27,351	$10,785	$8,159		$18,944	0.21	$90,208
Equipment Leaks	$886	$1,154	$944	($2,569)	($471)	4.70	($100)
Wastewater							
TOTALS	$28,237	$11,939	$9,103	($2,569)	$18,473	4.91	$3,762

Impacts Summary
By Sub-category

ABS,BI | All Facilities | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$221	$372	$233	($1,093)	($489)	2.00	($244)
TOTALS	$221	$372	$233	($1,093)	($489)	2.00	($244)

Impacts Summary
By Sub-category

MABS | All Facilities | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$89,673	$10,603	$23,629	($36,113)	($1,881)	37.97	($50)
Equipment Leaks		$4,230	$1,933	($1,366)	$4,797	2.50	$1,919
Wastewater							
TOTALS	$89,673	$14,833	$25,562	($37,479)	$2,916	40.47	$72

Impacts Summary
By Sub-category

Nitrile | All Facilities | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$8,770	$1,547	$2,311	($3,267)	$591	3.43	$172
Equipment Leaks		$7,125	$3,498	($4,460)	$6,164	6.80	$906
Wastewater							
TOTALS	$8,770	$8,672	$5,810	($7,727)	$6,755	10.23	$660

FACILITY SPECIFIC TABLES

Impacts Summary by Facility

PS,C | American Polymers-Oxford | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$163	$1,529	$944	($984)	$1,489	1.50	$992
TOTALS	$163	$1,529	$944	($984)	$1,489	1.50	$992

Impacts Summary
by Facility

PS,C

Amoco Chemical-Joilet

Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$10,622	$3,325	$2,799	($62,696)	($56,572)	65.82	($859)
Equipment Leaks	$53,984	$35,074	$25,901	($45,843)	$15,132	69.90	$216
Wastewater							
TOTALS	$64,606	$38,399	$28,700	($108,539)	($41,440)	135.72	($305)

Impacts Summary
by Facility

PS,Bs | Amoco Chemical-Willow Springs | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$35,902	$4,302	$9,461	($4,502)	$9,261	4.73	$1,958
Equipment Leaks	$12,087	$19,869	$11,645	($19,675)	$11,840	30.00	$395
Wastewater							
TOTALS	$47,989	$24,171	$21,107	($24,177)	$21,101	34.73	$608

Impacts Summary
by Facility

PS,Bs; EPS | Arco Chemical-Monaca | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$32,547	$4,680	$8,577	($4,081)	$9,176	4.02	$2,283
Equipment Leaks	$11,074	$11,496	$7,014	($11,411)	$7,098	17.40	$408
Wastewater							
TOTALS	$43,621	$16,176	$15,591	($15,492)	$16,275	21.42	$760

Impacts Summary
by Facility

PS,Bs — Arco Chemical-Monaca — Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$32,547	$4,680	$8,577	($4,081)	$9,176	4.02	$2,283
Equipment Leaks[a]	$11,074	$11,496	$7,014	($11,411)	$7,098	17.40	$408
Wastewater							
TOTALS	$43,621	$16,176	$15,591	($15,492)	$16,275	21.42	$760

[a]These impacts are for both EPS and PS,B production. Data were not provided to allow distinction between the two processes.

Impacts Summary
by Facility

EPS | Arco Chemical-Monaca | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks[a] Wastewater	$11,074	$11,496	$7,014	($11,411)	$7,098	17.40	$408
TOTALS	$11,074	$11,496	$7,014	($11,411)	$7,098	17.40	$408

[a]These impacts are for both EPS and PS,B production. Data were not provided to allow distinction between the two processes.

Impacts Summary
by Facility

EPS | Arco Chemical-Painesville | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$16,467	$11,694	$7,076	($4,919)	$13,850	7.50	$1,847
TOTALS	$16,467	$11,694	$7,076	($4,919)	$13,850	7.50	$1,847

Impacts Summary
by Facility

PS,C | BASF-Holyoke | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$26,065	$2,428	$6,536	($4,853)	$4,112	7.40	$556
TOTALS	$26,065	$2,428	$6,536	($4,853)	$4,112	7.40	$556

Impacts Summary
by Facility

PS,C

BASF-Holyoke

New

Regulatory Alternative #1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$26,065	$2,428	$6,536	($4,853)	$4,112	7.40	$556
TOTALS	$26,065	$2,428	$6,536	($4,853)	$4,112	7.40	$556

Impacts Summary
by Facility

PS,C | BASF-Joilet | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$1,337	$441	$347	($6,308)	($5,520)	6.65	($830)
Equipment Leaks	$6,476	$72,999	$38,453	($52,795)	$58,657	80.50	$729
Wastewater							
TOTALS	$7,813	$73,440	$38,800	($59,103)	$53,136	87.15	$610

Impacts Summary
by Facility

PS,C | BASF-Santa Ana | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$468	$155	$122	($2,209)	($1,932)	2.33	($829)
Equipment Leaks	$23,480	$1,827	$5,719	($12,526)	($4,981)	19.10	($261)
Wastewater							
TOTALS	$23,948	$1,981	$5,841	($14,735)	($6,913)	21.43	($323)

Impacts Summary
by Facility

EPS | BASF-South Brunswick | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$21,343	$11,716	$9,870	($13,510)	$8,075	20.60	$392
TOTALS	$21,343	$11,716	$9,870	($13,510)	$8,075	20.60	$392

Impacts Summary
by Facility

ABS,BI | BF Goodrich | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$221	$372	$233	($1,093)	($489)	2.00	($244)
TOTALS	$221	$372	$233	($1,093)	($489)	2.00	($244)

Impacts Summary
by Facility

Nitrile | BP Chemicals-Lima | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$8,770	$1,547	$2,311	($3,267)	$591	3.43	$172
Equipment Leaks	$0	$7,125	$3,498	($4,460)	$6,164	6.80	$906
Wastewater							
TOTALS	$8,770	$8,672	$5,810	($7,727)	$6,755	10.23	$660

Impacts Summary
by Facility

PS,C | Chevron Chemical-Marietta | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$83,685	$140,036	$74,706	($135,823)	$78,919	207.10	$381
TOTALS	$83,685	$140,036	$74,706	($135,823)	$78,919	207.10	$381

Impacts Summary
by Facility

PS,C | Chevron Chemical-Marietta | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$83,685	$140,036	$74,706	($135,823)	$78,919	207.10	$381
TOTALS	$83,685	$140,036	$74,706	($135,823)	$78,919	207.10	$381

Impacts Summary
by Facility

PS,Bs | Dart-Leola | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$102	$1,895	$892	($525)	$2,262	0.80	$2,828
TOTALS	$102	$1,895	$892	($525)	$2,262	0.80	$2,828

Impacts Summary by Facility

PS,Bs | Dart-Owensboro | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$6,816	$22,890	$11,093	($4,001)	$29,982	6.10	$4,915
TOTALS	$6,816	$22,890	$11,093	($4,001)	$29,982	6.10	$4,915

Impacts Summary
by Facility

PS,C; ABS,Cm — Dow-Allyn's Point — Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$2,045	$1,130	$538	($252)	$1,416	0.26	$5,446
Equipment Leaks	$98,517	$56,653	$43,963	($54,869)	$45,747	92.20	$496
Wastewater							
TOTALS	$100,562	$57,782	$44,502	($55,121)	$47,163	92.46	$510

Impacts Summary
by Facility

PS,C

Dow-Allyn's Point

Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$2,045	$1,130	$538	($252)	$1,416	0.26	$5,446
Equipment Leaks	$68,855	$30,970	$28,055	($26,823)	$32,202	40.90	$787
Wastewater							
TOTALS	$70,900	$32,100	$28,594	($27,075)	$33,618	41.16	$817

Impacts Summary
by Facility

ABS,Cm | Dow-Allyn's Point | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$29,662	$25,683	$15,908	($28,046)	$13,545	51.30	$264
TOTALS	$29,662	$25,683	$15,908	($28,046)	$13,545	51.30	$264

Impacts Summary
by Facility

PS,C; ABS,Cm | Dow-Hanging Rock | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$238,632	$68,232	$78,763	($97,372)	$49,623	162.30	$306
TOTALS	**$238,632**	**$68,232**	**$78,763**	**($97,372)**	**$49,623**	**162.30**	**$306**

Impacts Summary
by Facility

PS,C | Dow-Hanging Rock | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$162,434	$35,733	$50,064	($51,942)	$33,855	79.20	$427
TOTALS	$162,434	$35,733	$50,064	($51,942)	$33,855	79.20	$427

Impacts Summary
by Facility

ABS,Cm | Dow-Hanging Rock | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$76,198	$32,499	$28,699	($45,430)	$15,768	83.10	$190
TOTALS	$76,198	$32,499	$28,699	($45,430)	$15,768	83.10	$190

Impacts Summary
by Facility

ABS,Cm — Dow-Hanging Rock — New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks	$72,418	($2,964)	$24,760		$21,796	3.44	$6,336
Process Vents							
Equipment Leaks	$76,198	$32,499	$28,699	($45,430)	$15,768	83.10	$190
Wastewater							
TOTALS	$148,616	$29,535	$53,459	($45,430)	$37,563	86.54	$434

Impacts Summary
by Facility

PS,C

Dow-Joilet

Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$5,115	$2,024	$5,626	($7,280)	$371	11.10	$33
TOTALS	$5,115	$2,024	$5,626	($7,280)	$371	11.10	$33

Impacts Summary
by Facility

PS,C; ABS,Be; ABS,Cm; SAN,C | Dow-Midland | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$263,583	$57,905	$34,536	($37,930)	$54,510	63.00	$865
TOTALS	$263,583	$57,905	$34,536	($37,930)	$54,510	63.00	$865

Impacts Summary
by Facility

PS,C | *Dow-Midland* | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$63,258	$4,638	$16,881	($12,657)	$8,862	19.30	$459
TOTALS	$63,258	$4,638	$16,881	($12,657)	$8,862	19.30	$459

Impacts Summary
by Facility

ABS,Be | Dow-Midland | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$17,848	$13,088	$9,211	($8,091)	$14,208	14.80	$960
TOTALS	$17,848	$13,088	$9,211	($8,091)	$14,208	14.80	$960

Impacts Summary
by Facility

ABS,Cm — Dow-Midland — Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$4,289	($4,092)	($25)	($2,023)	($6,140)	3.70	($1,659)
TOTALS	$4,289	($4,092)	($25)	($2,023)	($6,140)	3.70	($1,659)

Impacts Summary
by Facility

SAN,C | Dow - Midland | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$178,188	$44,270	$8,470	($15,159)	$37,581	25.20	$1,491
TOTALS	$178,188	$44,270	$8,470	($15,159)	$37,581	25.20	$1,491

Impacts Summary
by Facility

SAN,C | Dow - Midland | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$178,188	$44,270	$8,470	($15,159)	$37,581	25.20	$1,491
Wastewater		$0	$0		$0		
TOTALS	$178,188	$44,270	$8,470	($15,159)	$37,581	25.20	$1,491

Impacts Summary
by Facility

SAN,C | Dow - Midland | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$178,188	$44,270	$8,470	($15,159)	$37,581	25.20	$1,491
Wastewater		$0	$0		$0		
TOTALS	$178,188	$44,270	$8,470	($15,159)	$37,581	25.20	$1,491

Impacts Summary
by Facility

PS,C; ABS,Be; SAN,C — Dow-Midland — New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$2,045	$1,204	$538	($3,277)	($1,535)	3.44	($446)
Equipment Leaks	$259,294	$61,997	$34,561	($35,907)	$60,651	59.30	$1,023
Wastewater							
TOTALS	$261,339	$63,201	$35,099	($39,184)	$59,116	62.74	$942

Impacts Summary
by Facility

PS,C | Dow-Midland | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$2,045	$1,204	$538	($3,277)	($1,535)	3.44	($446)
Equipment Leaks	$63,258	$4,638	$16,881	($12,657)	$8,862	19.30	$459
Wastewater							
TOTALS	$65,303	$5,842	$17,419	($15,934)	$7,327	22.74	$322

Impacts Summary
by Facility

ABS,Be | Dow-Midland | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$17,848	$13,088	$9,211	($8,091)	$14,208	14.80	$960
TOTALS	$17,848	$13,088	$9,211	($8,091)	$14,208	14.80	$960

Impacts Summary
by Facility

SAN,C Dow - Midland New

Regulatory Alternative # 2	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$178,188	$44,270	$8,470	($15,159)	$37,581	25.20	$1,491
TOTALS	$178,188	$44,270	$8,470	($15,159)	$37,581	25.20	$1,491

Impacts Summary
by Facility

PS,C | Dow-Riverside | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$2,077	$14,886	$6,637	($7,804)	$13,719	11.90	$1,153
TOTALS	$2,077	$14,886	$6,637	($7,804)	$13,719	11.90	$1,153

Impacts Summary
by Facility

PS,C; ABS,Cm | Dow-Torrance | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$92,016	$52,867	$43,117	($23,603)	$72,381	40.50	$1,787
TOTALS	$92,016	$52,867	$43,117	($23,603)	$72,381	40.50	$1,787

Impacts Summary
by Facility

PS,C | Dow-Torrance | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$25,343	$21,674	$14,946	($8,788)	$27,832	13.40	$2,077
TOTALS	$25,343	$21,674	$14,946	($8,788)	$27,832	13.40	$2,077

Impacts Summary
by Facility

ABS,Cm | Dow-Torrance | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$66,673	$31,194	$28,171	($14,815)	$44,550	27.10	$1,644
TOTALS	$66,673	$31,194	$28,171	($14,815)	$44,550	27.10	$1,644

Impacts Summary
by Facility

MBS | Elf Atochem - Mobile | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents	$64,093	$70,071	$52,387		$122,459	12.05	$10,163
Equipment Leaks		$0	$0		$0		
Wastewater		$0	$0		$0		
TOTALS	$64,093	$70,071	$52,387	$0	$122,459	12.05	$10,163

Impacts Summary
by Facility

MBS | Elf Atochem - Mobile | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents	$142,730	$131,816	$91,572		$223,388	12.04	$18,554
Equipment Leaks		$0	$0		$0		
Wastewater		$0	$0		$0		
TOTALS	$142,730	$131,816	$91,572	$0	$223,388	12.04	$18,554

Impacts Summary
by Facility

PS,C | Fina-Carville | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$2,700	$889	$702	($12,744)	($11,153)	13.40	($832)
Equipment Leaks	$56,079	$72,587	$41,527	($110,508)	$3,606	168.50	$21
Wastewater							
TOTALS	$58,779	$73,476	$42,229	($123,252)	($7,547)	181.90	($41)

Impacts Summary
by Facility

ABS CE | GE Ottawa | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$3,229	$39,034	$18,558	($19,462)	$38,129	35.60	$1,071
TOTALS	$3,229	$39,034	$18,558	($19,462)	$38,129	35.60	$1,071

Impacts Summary
by Facility

ABS CE | GE Ottawa | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks	$99,858	($339)	$34,141		$33,801	0.78	$43,335
Process Vents	$3,391,735	$836,198	$856,077		$1,692,275	114.53	$14,776
Equipment Leaks	$3,229	$39,034	$18,558	($19,462)	$38,129	35.60	$1,071
Wastewater							
TOTALS	$3,494,822	$874,892	$908,775	($19,462)	$1,764,206	150.91	$11,690

Impacts Summary
by Facility

PS,C; ASA/AMSAN | GE Plastics-Selkirk | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents							
Equipment Leaks	$324,437	$119,804	$60,129	($86,094)	$93,839	138.61	$677
Wastewater	$238,177	$51,636	$75,686		$127,322	5.00	$25,464
TOTALS	$562,614	$171,440	$135,815	($86,094)	$221,161	143.61	$1,540

Impacts Summary
by Facility

PS,C | GE Plastics-Selkirk | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$15,656	$35,707	$17,328	($32,792)	$20,243	50.00	$405
TOTALS	$15,656	$35,707	$17,328	($32,792)	$20,243	50.00	$405

Impacts Summary
by Facility

ASA/AMSAN — **GE Plastics-Selkirk** — Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents							
Equipment Leaks	$308,781	$84,097	$42,801	($53,302)	$73,596	88.61	$831
Wastewater	$238,177	$51,636	$75,686		$127,322	5.00	$25,464
TOTALS	$546,958	$135,733	$118,487	($53,302)	$200,918	93.61	$2,146

Impacts Summary
by Facility

ABS,Be; ABS,Ce; MABS — GE Plastics-Washington — Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$3,627,466	$438,274	$903,793	($47,211)	$1,294,856	219.13	$5,909
Equipment Leaks	$0	$42,254	$19,074	($13,557)	$47,771	24.80	$1,926
Wastewater							
TOTALS	$3,627,466	$480,528	$922,866	($60,768)	$1,342,626	243.93	$5,504

Impacts Summary
by Facility

ABS,Be | GE Plastics-Washington | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$0	$12,667	$5,711	($4,155)	$14,223	7.60	$1,871
TOTALS	$0	$12,667	$5,711	($4,155)	$14,223	7.60	$1,871

Impacts Summary
by Facility

ABS,Ce | GE Plastics-Washington | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$3,537,793	$427,671	$880,164	($11,098)	$1,296,737	181.16	$7,158
Equipment Leaks	$0	$25,357	$11,430	($8,036)	$28,750	14.70	$1,956
Wastewater							
TOTALS	$3,537,793	$453,028	$891,593	($19,134)	$1,325,487	195.86	$6,768

Impacts Summary
by Facility

MABS | GE Plastics-Washington | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$89,673	$10,603	$23,629	($36,113)	($1,881)	37.97	($50)
Equipment Leaks	$0	$4,230	$1,933	($1,366)	$4,797	2.50	$1,919
Wastewater							
TOTALS	$89,673	$14,833	$25,562	($37,479)	$2,916	40.47	$72

Impacts Summary
by Facility

SAN,C — General Electric - Bay St. Louis — Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$16,598	$11,817	$15,956	($10,972)	$16,801	18.24	$921
Wastewater		$0	$0		$0		
TOTALS	**$16,598**	**$11,817**	**$15,956**	**($10,972)**	**$16,801**	**18.24**	**$921**

Impacts Summary
by Facility

ASA/AMSAN | General Electric - Selkirk | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$308,781	$84,097	$42,801	($53,302)	$73,596	88.61	$831
Wastewater	$238,177	$51,636	$75,686		$127,322	5.00	$25,464
TOTALS	$546,958	$135,733	$118,487	($53,302)	$200,918	93.61	$2,146

Impacts Summary
by Facility

ASA/AMSAN | *General Electric - Selkirk* | *New*

No new growth projected

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks		$0	$0		$0		
Wastewater		$0	$0		$0		
TOTALS	$0	$0	$0	$0	$0	0.00	

Impacts Summary
by Facility

PS,C | Huntsman Chemical-Belpre | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$8,770	$2,612	$2,309	($38,207)	($33,287)	40.11	($830)
Equipment Leaks	$46,670	$50,852	$44,708	($28,987)	$66,573	44.20	$1,506
Wastewater							
TOTALS	$55,440	$53,464	$47,017	($67,194)	$33,287	84.31	$395

Impacts Summary
by Facility

PS,C; PS,Bs | Huntsman Chemical-Chesapeake | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$66,091	$7,918	$17,417	($8,288)	$17,048	13.10	$1,301
Equipment Leaks	$0	$19,093	$13,749	($8,985)	$23,857	13.70	$1,741
Wastewater							
TOTALS	$66,091	$27,011	$31,166	($17,273)	$40,905	26.80	$1,526

Impacts Summary
by Facility

PS,C — **Huntsman Chemical-Chesapeake** — Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$0	$14,122	$11,197	($6,624)	$18,695	10.10	$1,851
TOTALS	$0	$14,122	$11,197	($6,624)	$18,695	10.10	$1,851

Impacts Summary
by Facility

PS,Bs | Huntsman Chemical-Chesapeake | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$66,091	$7,918	$17,417	($8,288)	$17,048	13.10	$1,301
Equipment Leaks	$0	$4,971	$2,552	($2,361)	$5,162	3.60	$1,434
Wastewater							
TOTALS	$66,091	$12,890	$19,969	($10,649)	$22,210	16.70	$1,330

Impacts Summary
by Facility

PS,C; PS,Bs; EPS | Huntsman Chemical-Peru | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$54,332	$6,808	$14,317	($13,353)	$7,772	16.11	$482
Equipment Leaks	$86,038	$77,518	$47,702	($50,499)	$74,721	77.00	$970
Wastewater							
TOTALS	$140,370	$84,326	$62,019	($63,852)	$82,493	93.11	$886

Impacts Summary
by Facility

PS,C | Huntsman Chemical-Peru | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$1,424	$469	$374	($6,719)	($5,875)	7.07	($831)
Equipment Leaks	$46,905	$44,207	$27,763	($33,316)	$38,653	50.80	$761
Wastewater							
TOTALS	$48,329	$44,676	$28,137	($40,035)	$32,778	57.87	$566

Impacts Summary
by Facility

PS,Bs | Huntsman Chemical-Peru | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$52,908	$6,339	$13,943	($6,634)	$13,647	9.04	$1,510
Equipment Leaks	$12,144	$14,084	$7,219	($6,034)	$15,269	9.20	$1,660
Wastewater							
TOTALS	$65,052	$20,423	$21,161	($12,668)	$28,916	18.24	$1,585

Impacts Summary
by Facility

EPS | Huntsman Chemical-Peru | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$26,989	$19,227	$12,721	($11,149)	$20,799	17.00	$1,223
TOTALS	$26,989	$19,227	$12,721	($11,149)	$20,799	17.00	$1,223

Impacts Summary
by Facility

EPS | Huntsman Chemical-Rome | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$5,008	($6,266)	($1,169)	($722)	($8,157)	1.10	($7,415)
TOTALS	$5,008	($6,266)	($1,169)	($722)	($8,157)	1.10	($7,415)

Impacts Summary
by Facility

PS,C | Kama-Hazelton | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$5,334	$1,756	$1,387	($25,176)	($22,033)	26.50	($831)
Equipment Leaks	$0	$0	$0	$0	$0	$0	NA
Wastewater							
TOTALS	$5,334	$1,756	$1,387	($25,176)	($22,033)	26.50	($831)

Impacts Summary
by Facility

MBS | Kaneka - Pasadena | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$17,252	$4,264	$1,580	($5,954)	($111)	7.16	($15)
Wastewater		$0	$0		$0		
TOTALS	$17,252	$4,264	$1,580	($5,954)	($111)	7.16	($15)

Impacts Summary
by Facility

MBS | Kaneka - Pasadena | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks	$18,083	$6,183	($3,367)		$2,816	1.65	$1,707
Process Vents	$405,446	$136,592	$94,900		$231,492	7.68	$30,142
Equipment Leaks	$17,252	$4,264	$1,580	($5,954)	($111)	7.16	($15)
Wastewater		$0	$0		$0		
TOTALS	$440,781	$147,039	$93,113	($5,954)	$234,198	16.49	$14,202

Impacts Summary
by Facility

PS,C; ABS,Be; ABS,Bs; ABS,Cm;SAN,B;SAN,C — Monsanto-Addyston — Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$29,647	$17,858	$14,790		$32,648	15.47	$2,110
Equipment Leaks	$7,816	$6,445	$5,707	($8,250)	$3,902	14.07	$277
Wastewater	$341,075	$53,815	$88,239		$142,054	25.00	$5,682
TOTALS	$378,538	$78,118	$108,736	($8,250)	$178,604	54.54	$3,275

Impacts Summary
by Facility

SAN,B;SAN,C | **Monsanto - Addyston** | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$0	$1,180	$796	($1,679)	$297	2.77	$107
Wastewater	$341,075	$53,815	$88,239		$142,054	25.00	$5,682
TOTALS	$341,075	$54,995	$89,034	($1,679)	$142,351	27.77	$5,126

Impacts Summary
by Facility

PS,C | Monsanto-Addyston | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$7,816	$727	$1,937	($2,361)	$303	3.60	$84
TOTALS	$7,816	$727	$1,937	($2,361)	$303	3.60	$84

Impacts Summary
by Facility

ABS,Be | Monsanto-Addyston | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$0	$793	$683	($820)	$656	1.50	$437
TOTALS	$0	$793	$683	($820)	$656	1.50	$437

Impacts Summary
by Facility

ABS,Bs | *Monsanto-Addyston* | *Existing*

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$0	$380	$299	($219)	$460	0.40	$1,149
TOTALS	$0	$380	$299	($219)	$460	0.40	$1,149

Impacts Summary
by Facility

SAN,B | Monsanto - Addyston | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$0	$291	$189	($403)	$77	0.67	$114
Wastewater	$81,858	$12,916	$21,177		$34,093	6.00	$5,682
TOTALS	$81,858	$13,207	$21,366	($403)	$34,169	6.67	$5,123

Impacts Summary
by Facility

ABS,Cm | Monsanto-Addyston | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$29,647	$17,858	$14,790		$32,648	15.47	$2,110
Equipment Leaks	$0	$3,366	$1,993	($3,171)	$2,188	5.80	$377
Wastewater							
TOTALS	$29,647	$21,224	$16,783	($3,171)	$34,836	21.27	$1,638

Impacts Summary
by Facility

SAN,B | Monsanto-Addyston | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents							
Equipment Leaks	$0	$291	$189	($403)	$77	0.67	$114
Wastewater	$81,858	$12,916	$21,177		$34,093	6.00	$5,682
TOTALS	$81,858	$13,207	$21,366	($403)	$34,169	6.67	$5,123

Impacts Summary
by Facility

SAN,C | Monsanto-Addyston | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents							
Equipment Leaks	$0	$889	$607	($1,276)	$220	2.10	$105
Wastewater	$259,217	$40,899	$67,062		$107,961	19.00	$5,682
TOTALS	$259,217	$41,789	$67,669	($1,276)	$108,181	21.10	$5,127

Impacts Summary
by Facility

SAN,C | Monsanto - Addyston | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$0	$889	$607	($1,276)	$220	2.10	$105
Wastewater	$259,217	$40,899	$67,062		$107,961	19.00	$5,682
TOTALS	$259,217	$41,789	$67,669	($1,276)	$108,181	21.10	$5,127

Impacts Summary
by Facility

SAN,B | Monsanto - Addyston | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$0	$291	$189	($403)	$77	0.67	$114
Wastewater	$81,858	$12,916	$21,177		$34,093	6.00	$5,682
TOTALS	$81,858	$13,207	$21,366	($403)	$34,169	6.67	$5,123

Impacts Summary
by Facility

SAN,B;SAN,C | **Monsanto - Addyston** | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$0	$1,180	$796	($1,679)	$297	2.77	$107
Wastewater	$341,075	$53,815	$88,239		$142,054	25.00	$5,682
TOTALS	$341,075	$54,995	$89,034	($1,679)	$142,351	27.77	$5,126

Impacts Summary
by Facility

SAN,C | Monsanto - Addyston | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$0	$889	$607	($1,276)	$220	2.10	$105
Wastewater	$259,217	$40,899	$67,062		$107,961	19.00	$5,682
TOTALS	$259,217	$41,789	$67,669	($1,276)	$108,181	21.10	$5,127

Impacts Summary
by Facility

ABS,Be; ABS,Bs; SAN,B — Monsanto-Muscatine — Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$436,771	$172,227	$130,290		$302,517	18.92	$15,989
Equipment Leaks	$4,649	$5,572	$5,075	($13,769)	($3,122)	24.55	($127)
Wastewater							
TOTALS	$441,420	$177,798	$135,365	($13,769)	$299,395	43.47	$6,887

Impacts Summary
by Facility

SAN,B | Monsanto - Muscatine | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$1,223	$963	$1,544	($3,820)	($1,312)	6.35	($207)
Wastewater		$0	$0		$0		
TOTALS	$1,223	$963	$1,544	($3,820)	($1,312)	6.35	($207)

Impacts Summary
by Facility

ABS,Be | Monsanto-Muscatine | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$409,420	$161,442	$122,131		$283,573	18.71	$15,156
Equipment Leaks	$2,540	$3,454	$2,587	($7,380)	($1,339)	13.50	($99)
Wastewater							
TOTALS	$411,960	$164,896	$124,718	($7,380)	$282,234	32.21	$8,762

Impacts Summary
by Facility

ABS,Bs | Monsanto-Muscatine | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$27,351	$10,785	$8,159		$18,944	0.21	$90,208
Equipment Leaks	$886	$1,154	$944	($2,569)	($471)	4.70	($100)
Wastewater							
TOTALS	$28,237	$11,939	$9,103	($2,569)	$18,473	4.91	$3,762

Impacts Summary
by Facility

SAN,B — Monsanto-Muscatine — Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storgae Tanks Process Vents Equipment Leaks Wastewater	$1,223	$963	$1,544	($3,820)	($1,312)	6.35	($207)
TOTALS	$1,223	$963	$1,544	($3,820)	($1,312)	6.35	($207)

Impacts Summary
by Facility

ABS,Bs; SAN,B | Monsanto-Muscatine | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$27,351	$10,785	$8,159		$18,944	0.21	$90,208
Equipment Leaks	$2,109	$2,118	$2,488	($6,389)	($1,783)	11.05	($161)
Wastewater							
TOTALS	$29,460	$12,903	$10,647	($6,389)	$17,161	11.26	$1,524

Impacts Summary
by Facility

ABS,Bs | Monsanto-Muscatine | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$27,351	$10,785	$8,159		$18,944	0.21	$90,208
Equipment Leaks	$886	$1,154	$944	($2,569)	($471)	4.70	($100)
Wastewater							
TOTALS	$28,237	$11,939	$9,103	($2,569)	$18,473	4.91	$3,762

Impacts Summary
by Facility

SAN,B — Monsanto-Muscatine — New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$1,223	$963	$1,544	($3,820)	($1,312)	6.35	($207)
TOTALS	$1,223	$963	$1,544	($3,820)	($1,312)	6.35	($207)

Impacts Summary
by Facility

SAN,B | Monsanto - Muscatine | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents		$0	$0		$0		
Equipment Leaks	$1,223	$963	$1,544	($3,820)	($1,312)	6.35	($207)
Wastewater		$0	$0		$0		
TOTALS	$1,223	$963	$1,544	($3,820)	($1,312)	6.35	($207)

Impacts Summary
by Facility

PS,C | Novacor Chemicals-Decatur | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$26,002	($4,601)	$3,372	($3,476)	($4,705)	5.30	($888)
TOTALS	$26,002	($4,601)	$3,372	($3,476)	($4,705)	5.30	($888)

Impacts Summary
by Facility

PS,C — Novacor Chemicals-Decatur — New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$26,002	($4,601)	$3,372	($3,476)	($4,705)	5.30	($888)
TOTALS	$26,002	($4,601)	$3,372	($3,476)	($4,705)	5.30	($888)

Impacts Summary
by Facility

PS,C | Novacor-Indian Orchard | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$13,086	($359)	$2,639	($2,164)	$116	3.30	$35
TOTALS	$13,086	($359)	$2,639	($2,164)	$116	3.30	$35

Impacts Summary
by Facility

MBS | Rohm & Haas - Louisville | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		$0	$0		$0		
Process Vents	$29,111	$31,827	$24,444		$56,271	6.14	$9,165
Equipment Leaks	$157,174	$63,876	$64,955	($84,941)	$43,889	102.16	$430
Wastewater	$279,051	$53,976	$83,655		$137,631	5.00	$27,526
TOTALS	$465,336	$149,678	$173,053	($84,941)	$237,791	113.30	$2,099

Impacts Summary
by Facility

MBS | Rohm & Haas - Louisville | New

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks		0	0		0		
Process Vents	$106,394	138149.7	95992		234141.7	6.14	$38,134
Equipment Leaks	$157,174	63875.5	64954.5	($84,941)	43889	102.16	$430
Wastewater	$279,051	53976	83655		137631	5.00	$27,526
TOTALS	$542,619	$256,001	$244,602	($84,941)	$415,662	113.30	$3,669

Impacts Summary
by Facility

PS,Bs | Rohm and Hass-Philadelphia | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks							
Process Vents	$23,379	$2,802	$6,161	($2,932)	$6,030	2.32	$2,599
Equipment Leaks	$21,179	$24,445	$13,156	($10,297)	$27,304	15.70	$1,739
Wastewater							
TOTALS	$44,558	$27,247	$19,317	($13,229)	$33,334	18.02	$1,850

Impacts Summary
by Facility

EPS | Scott Polymers-Fort Worth | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$12,332	$4,993	$4,696	($6,755)	$2,934	10.30	$285
TOTALS	$12,332	$4,993	$4,696	($6,755)	$2,934	10.30	$285

Impacts Summary
by Facility

PS,Bs; EPS | **Scott Polymer- Saginaw-1** | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$22,585	$10,247	$9,097	($13,313)	$6,031	20.30	$297
TOTALS	$22,585	$10,247	$9,097	($13,313)	$6,031	20.30	$297

Impacts Summary
by Facility

PS,Bs | Scott Polymers-Saginaw 1 | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$2,881	$1,716	$1,388	($1,639)	$1,465	2.50	$586
TOTALS	$2,881	$1,716	$1,388	($1,639)	$1,465	2.50	$586

Impacts Summary
by Facility

EPS | Scott Polymers-Saginaw 1 | Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$19,704	$8,531	$7,709	($11,674)	$4,566	17.80	$256
TOTALS	$19,704	$8,531	$7,709	($11,674)	$4,566	17.80	$256

Impacts Summary
by Facility

PS,Bs — Scott Polymers-Saginaw 2 — Existing

Regulatory Alternative # 1	Total Capital ($)	Variable Annual ($/yr)	Fixed Annual ($/yr)	Recovery Credit ($/yr)	Total Annual ($/yr)	Emission Reduction (Mg/yr)	Cost Effectiveness ($/Mg)
Storage Tanks Process Vents Equipment Leaks Wastewater	$2,909	$1,990	$1,564	($1,771)	$1,783	2.70	$660
TOTALS	$2,909	$1,990	$1,564	($1,771)	$1,783	2.70	$660

II-B-28

PACIFIC ENVIRONMENTAL SERVICES, INC.

Central Park West
5001 South Miami Boulevard
PO Box 12077
Research Triangle Park, NC 27709-2077
(919) 941-0333 FAX (919) 941-0234

MEMORANDUM

TO: Group IV Resins Docket No. A-92-45

FROM: Bennett King and Kenneth R. Meardon
Pacific Environmental Services

DATE: March 24, 1995

SUBJECT: MACT Floor Analysis & Development of Regulatory Alternatives For Wastewater Operations, Storage Vessels, Process Vents, and Process Contact Cooling Towers

Purpose

This memo presents the results of the MACT floor analysis, identifies the selected regulatory alternatives, describes the general approach of the analysis, and presents the data used to conduct the analysis. This memorandum addresses wastewater operations, storage vessels, process vents, and process contact cooling towers. The determination of the MACT floor for equipment leaks is discussed in a separate memorandum.

The basic approach taken for determining the MACT floors and developing regulatory alternatives was to 1) select a set of existing federal rules and guidance documents which would serve as a starting point for determining regulatory alternatives, and 2) compare the existing controls at the resin facilities for a given subcategory to the set of rules/guidances. This comparison determined whether or not the MACT floor, as expressed in terms of the existing levels of control for a subcategory, was more stringent than, equivalent to, or less stringent than the selected set of rules/guidances.

When the MACT floor was found to be equivalent to or less stringent than the selected set of rules/guidances, the requirements of the rules/guidances were accepted as the regulatory alternative. When the MACT floor was found to be more stringent than the selected set of rules/guidances, the MACT floor was defined in regulatory terms (i.e., applicability criteria and level of control) and accepted as the regulatory alternative. The exception to both of these statements is that regulatory alternatives that were more stringent than the MACT floor and the selected set of rules/guidances and were still reasonable considering cost, emission reduction, nonair environmental, and energy impacts were also considered as regulatory alternatives.

Those instances where (1) the MACT floor was found to be more stringent than the selected set of rules/guidances or 2) a regulatory alternative was found to be more stringent than the selected set of rules/guidances and the MACT floor are identified in this memorandum, but are not discussed. The technical analyses required to define MACT floors that are more stringent than the selected set of rules/guidances are described in separate memoranda. These memoranda are located in the Group IV docket as items II-B-21 and II-B-23. Item II-B-21 discusses MACT floors related to process vents, and Item II-B-23 discusses MACT floors related to storage vessels. Policy decisions to go beyond the MACT floor are discussed in the Basis and Purpose Document.

This memorandum presents a summary of the data used in the analyses in the body of the memorandum. The raw data considered in comparing the existing control level to the selected set of rules/guidances are presented in appendices. Appendix A presents data related to storage vessels, and Appendix B presents data related to process vents.

<u>Results</u>

Tables 1 (existing sources) and 2 (new sources) present the results of the MACT floor analysis and identify the selected regulatory alternatives for storage vessels, process vents, and wastewater operations. (Note: tables are presented at the end of the text.) The "MACT Floor Stringency" column in Tables 1 and 2 reflect the comparison of the MACT floor to the selected set of rules/guidances. If this column indicates "<", this means that the MACT floor, as reflected in the existing level of control, is less stringent than the selected set of rules/guidances. If this column indicates "=", this means that the MACT floor is equivalent to the selected set of rules/guidances, and a ">" means the MACT floor is more stringent than the selected set of rules/guidances.

Table 3 shows the distribution of subcategories in the relationship of existing and new source MACT floors to the set of rules/guidance for storage vessels, process vents, and wastewater operations. For example, for existing storage vessels, the analysis found that for 15 out of the 18 subcategories the MACT floor was less stringent than or equivalent to the selected set of rules/guidances. In three cases, the MACT floor was determined to be more stringent than the selected set of rules/guidances.

The MACT floor analysis for process contact cooling towers associated with PET production followed the general approach. A cost effective regulatory alternative more stringent than the MACT floor or selected set of rules/guidances was identified for both existing and new sources, and was selected as the basis for the proposed standards.

Description of the Approach

As described above, the approach taken for determining the MACT floor and developing regulatory alternatives entailed selecting a set of rules/guidances to serve as a starting point and comparing the existing controls for each facility in a given subcategory to the selected set of rules/guidances. This process was done for each type of emission point.

The set of rules/guidances selected as the starting point for determining regulatory alternatives were the Hazardous Organic NESHAP (HON), the Polymers NSPS (subpart DDD of 40 CFR part 60), and the Batch Processes Alternative Control Techniques (ACT) document. The HON was selected because the characteristics of the emissions from storage vessels, continuous process vents, equipment leaks, and wastewater streams at Group IV resin facilities are similar or identical to those addressed by the HON.

The Polymers NSPS, which covers certain process emissions at polystyrene and PET facilities using a continuous process and cooling tower emissions at PET facilities, was selected for the same basic reasons as the HON. Although the Polymers NSPS was developed under section 111 of the Clean Air Act and was targeted to control volatile organic compound (VOC) emissions, the requirements for setting standards under section 111 are similar to the requirements under section 112 of the 1990 Amendments. Further, all of the hazardous air pollutant (HAP) identified from polystyrene and PET facilities are also VOC.

Finally, the Batch Processes ACT was selected so that batch process vents, which are not addressed by either the HON or the Polymers NSPS, could be covered. As with the Polymers NSPS, the Batch Processes ACT covers VOC emissions. Again, all of the HAP identified from Group IV resin facilities are also VOC. Unlike the HON and Polymers NSPS, the Batch Processes ACT is not a regulation and, therefore, does not specify a level of control that must be met. For the MACT floor analysis, the applicability criteria associate with the 90 percent control level was used.

For all three of these rules/guidances, the levels of control required (or recommended) were already determined through extensive analyses to be reasonable from a cost and impact perspective. Therefore, they represent "ready made" regulatory alternatives.

For existing sources, the MACT floor was based on the five best controlled facilities, and for new sources, the MACT floor was based on the single best controlled facility.

For existing sources in subcategories with five or fewer facilities, all of the facilities were included in determining the existing source MACT floor. However, for those subcategories with more than five facilities, the five best controlled facilities had to be identified. This was done by examining the types of control and the level of emission reductions being achieved (e.g., emission factors, percent reductions). For storage vessels, the level of control, vapor pressure, and tank capacity were used to determine which facilities were best controlled. For process vents, percent emission reduction was used as the primary indicator of the best controlled facilities. For equipment leaks, percent reduction based on the actual leak, detection, and repair (LDAR) programs was used to identify the best controlled facilities. For wastewater and process contact cooling towers, the controls being applied at each facility were examined; very few wastewater streams were controlled and none of the process contact cooling towers were controlled.

After the facilities that comprised the MACT floor were identified, a three step evaluation process was used to compare the existing controls at the facilities for a given subcategory to the set of rules/guidances and determine whether or not the MACT floor, as expressed in terms of the existing levels of control for a subcategory, was more stringent than, equivalent to, or less stringent than the selected set of rules/guidances. The first step evaluated the stringency status of individual emission points; the next step evaluated the stringency status of individual facilities; and the last step evaluated the stringency status of the subcategory. Stringency status means the relationship of the existing levels of control to the selected set of rules/guidances (i.e., more stringent than, equivalent to, or less stringent than).

For the first step, the control/no control criteria of the applicable rule/guidance was applied to the corresponding emission point to determine whether or not control would be required. The result was then compared to whether or not the emission point was actually being controlled or not. Where the emission point was uncontrolled, but the criteria being applied indicated control, the level of control was considered for that emission point to be less stringent than the rule/guidance. Similarly, if the emission point was being controlled, but the criteria indicated no control, the level of control was considered to be more stringent than the rule/guidance.

If the emission point was not being controlled and the criteria indicated no control, the level of control was considered for that emission point equivalent to the rule/guidance. If the emission point was being controlled and the criteria indicated control, the level of control (e.g., percent reduction) was then compared to the level of control required by the rule/guidance. If the level of control was less stringent than the rule/guidance (e.g., 90 percent reduction was being achieved, but the rule requires 98 percent reduction), the level of control was considered less stringent than the rule/guidance. Similarly, if the level of control being achieved was equivalent to (or greater than) that required by the rule/guidance, the level of control was considered equivalent to (or more stringent than) the rule/guidance.

For existing sources, this process was done for each emission point within each of the five best controlled facilities within each subcategory. For new sources, this was done for each emission point within the best controlled facility within each subcategory.

For the next step, within each facility, a determination was then made as to whether the emission source type (e.g., storage vessels) overall was being controlled less stringently, equivalently, or more stringently than the rule/guidance. In making this determination, the stringency status decisions for individual emission points were evaluated to determine the most frequent answer (i.e., mode). When a "mode" was not evident within the data, the stringency status was defaulted to be equivalent to the selected set of rules/guidances. In other words, the analysis looked for a "preponderance" of evidence before determining that the MACT floor was less stringent than or more stringent than the set of rules/guidances. For example, if eight out of 10 storage vessels at a facility were determined to be controlled less stringently and the remaining two more stringently than the rule/guidance, a "preponderance" of evidence was deemed to exist and the facility was considered to be controlled less stringently overall for storage vessels. However, using another example, if three of five storage vessels at a facility were controlled less stringently than the rule/guidance and two of the five storage vessels were controlled more stringently, then a "preponderance" of evidence was deemed not to exist, and the facility was considered to be controlled equivalently to the rule/guidance. This was done for each type of emission point at each facility.

In the third step, the stringency status for an individual subcategory was determined. The same type of decision rule was applied to the set of individual facility stringency status decisions as described in the above paragraph. For example, if a subcategory has five facilities and the overall level of control for storage vessels at three of the facilities was determined to be less stringent than the rule/guidance and more stringent at the other two facilities, a "preponderance" of evidence was deemed not to exist, and the facility was considered to be controlled equivalently to the rule/guidance.

Discussion of Specific Analyses for Each Type of Emission Point

The specific analyses for each type of emission point are described below.

Wastewater Operations

Very little data were received on wastewater operations from the industry. Typically, data are not available for more than a single stream at a facility, and there is typically only one facility with data per subcategory. However, data are available for 15 of the 18 subcategories and all 7 of the listed source categories are represented.

Based on the information received, only one of the facilities were controlling wastewater streams. (This one facility is an acrylonitrile butadiene styrene (ABS) latex facility, which is the only facility in its subcategory.) Thus, the MACT floor for both existing and new facilities (except for the ABS latex facility) was determined to be no control. A comparison was then made to determine the relationship of the HON requirements to the MACT floors. This was done by applying the control/no control applicability criteria (i.e., concentration and flow rate) from the HON to each individual wastewater stream for which data were available. The data used to make these decisions are presented in Appendix A, Table A-1. The wastewater stream applicability criteria for the HON are available in 40 CFR Part 63, Subpart F and G. The results of this comparison of existing control and HON-required control and their relationship are summarized on Table 4 for each facility within each subcategory.

Next, all the wastewater streams at a facility were examined to determine the overall relationship of the HON to all of the wastewater streams at a facility. As seen in Table 4, the overall level of control for all but four facilities was determined to be equivalent to the HON. For these other four facilities, the overall level of control was determined to be less stringent than the HON.

The last step was to determine the overall relationship of the HON to the MACT floor for each subcategory. Table 5 summarizes this determination. As seen in Table 5, for all subcategories except acrylonitrile styrene acrylate/alpha methyl styrene acrylonitrile (ASA/AMSAN), the HON was determined to be equivalent to the MACT floor. For ASA/AMSAN, the HON was determined to be more stringent than the MACT floor.

Because the MACT floor was equivalent to the HON for the majority of subcategories, it was assumed that the MACT floor was equivalent to the HON for the three subcategories not represented by the data -- ABS by batch suspension, polystyrene by batch suspension, and expandable polystyrene.

Storage Vessels

Storage vessel data are available for most Group IV thermoplastic facilities. For the majority of subcategories, data are available for at least 50 percent of the facilities within the subcategory. All seven listed source categories are represented by the data, and 17 of the 18 subcategories are represented. The only subcategory not represented is poly(ethylene terephthalate) (PET) produced using a batch terephthalic acid (TPA) process.

Many storage vessels are controlled. A comparison was made to determine whether or not the HON requirements for storage vessels were more stringent than the level of control being achieved. This was done by applying the control/no control applicability criteria (i.e., storage vessel size and vapor pressure of the stored material) to each storage vessel within a facility. The data used to make these decisions are presented in Appendix A, Tables A-2 through A-x. The storage vessel applicability criteria for the HON are available in 40 CFR Part 63, Subpart G.

As summarized in Table 6, the current level of control at each facility was generally equivalent to that required by the HON. There were several facilities, however, for which existing control was determined to be more stringent than the HON (i.e., storage vessels were being controlled whereas the HON applicability criteria would indicate no control required).

Next, the overall relationship of the HON to the level of control at all of the facilities within a subcategory was determined. As seen in Table 6, for each subcategory except ASA/AMSAN, the HON was determined to be equivalent to the MACT floor. For ASA/AMSAN existing and new facilities, the MACT floor was determined to be more stringent than the HON requirements.

A different technique was used to determine the MACT floor for the PS,C subcategory. Unlike the other subcategories, when the individual storage tank determinations were made within each of the vapor pressure ranges, it was unclear as to which were the best five controlled facilities and which was the best controlled facility. Since it was not possible to identify the five best performing facilities (for the existing analysis) or the single best performing facility (for the new analysis) based on controls across all storage vessels, the best performers were picked within each vapor pressure range. This means that a given facility might be considered the single best performer for the low vapor pressure range and another facility would be the single best performer for the high vapor pressure range. Using this approach, the new source MACT floor for the PS,C subcategory is based on the existing controls from two different facilities across the vapor pressure ranges.

The data used in the analysis are presented in Tables 7 through 9. Table 7 presents the storage vessel data by vapor pressure range on a facility basis considering the HON requirements for existing sources. There were 8 facilities in the "less than 0.75 psia" vapor pressure range where the MACT floor was more stringent than the HON. In the "0.75 to 1.9 psia" vapor pressure range, there were 4 facilities that were less stringent than the HON and 1 facility that was more stringent than the HON. In the "greater than 1.9 psia" range, there were 2 facilities that were more stringent than the HON and 1 facility that was less stringent than the HON. This collection of data was judged to show the existing source MACT floor to be more stringent than the HON.

Table 8 presents the storage vessel data by vapor pressure range on an individual storage vessel basis for the best performing facilities (based only the storage vessels in that range) considering the HON requirements for existing sources. In the "less than 0.75 psia" range, the 8 best performing facilities were considered. In the other two ranges there are five or fewer facilities with data, and all available data were considered. This collection of data was also judged to show the existing source MACT floor to be more stringent than the HON.

Table 9 presents the storage vessel data by vapor pressure range on a facility basis considering the HON requirements for new sources. This data indicates that there is at least one facility in each vapor pressure range that is more stringent than the HON. This collection of data was judged to show the new source MACT floor to be more stringent than the HON.

Process Vents

Process vent data are available for most Group IV thermoplastic facilities. For the majority of subcategories, data are available for at least 50 percent of the facilities within the subcategory. Six of the seven listed source categories are represented by the data, and 16 of the 18 subcategories are represented. The two subcategories not represented are PET TPA,B and methyl methacrylate acrylonitrile butadiene styrene (MABS).

As for storage vessels, many process vents are being controlled. A comparison was made to determine whether or not the HON requirements, the Batch Processes ACT criteria, or the Polymer Manufacturing NSPS requirements for process vents were more stringent than the MACT floor. This was done by applying the applicable control/no control criteria from the HON, Batch Processes ACT, and Polymer Manufacturing NSPS to each process vent for which data were available. The criteria and their use are discussed more completely below.

HON Criteria. To determine control/no control decisions for the HON, the total resource effectiveness (TRE) value for each process vent for which data are available was calculated. When a process vent has a TRE value less than or equal to one, it is required to apply controls under the HON requirements. The criteria for estimating TRE values for process vents from new and existing sources are different. The estimation of the TRE is described in detail in the HON (40 CFR part 63, subpart G). Tables A-x through A-x present the TRE values and the data used to make the calculations. In some cases, a range of potential vent stream characteristics was developed based on the available data and multiple, theoretical TRE values were calculated. In other cases, all the data required to calculate the TRE are available and a single, definitive TRE value was calculated. The process vent applicability criteria for the HON are available in 40 CFR part 63, subpart G.

Batch Processes ACT Criteria. To determine the control/no control decisions for the Batch Processes ACT, the applicability criteria for this guidance document was evaluated for each process vent for which data are available and which appeared to be a batch process vent. In many cases, it is not possible to know definitively whether a process vent is a batch or continuous process vent. For this reason, the analyses of the HON and Batch Processes ACT overlap in many instances. There is no distinction in the Batch Processes ACT between process vents at new or existing sources. The data required for evaluating the Batch Processes ACT applicability criteria are annual emissions, actual flowrate, and a calculated flowrate. The results of these evaluations are included in Tables 11 through 14. The columns on Tables 11 through 14 are generically labeled as "HON/ACT Control Required." When the Batch Processes ACT applicability criteria were specifically analyzed, it is indicated in the body of the column (e.g., ACT-N, ACT-Y, or ACT/H-N). The Batch Processes ACT describes the applicability criteria in detail and is available in section II-B of the docket (A-92-45).

Polymer Manufacturing NSPS. Threshold emission rates (i.e., applicability criteria) were developed under the Polymers NSPS to set a point at which it was not cost effective to require an existing source (i.e., modified or reconstructed) to meet the emission limits. Therefore, to determine the control/no control decisions for the Polymers NSPS, the emissions for each subject process area (e.g., material recovery for continuous PET dimethyl terephthalate (DMT) processes) for which data are available was compared to the Polymers NSPS emission limits. The raw data comparing each facility's emissions to the Polymers NSPS emission limits is considered confidential business information since it reveals the production capacity of individual facilities. These data are contained in the EPA's confidential files.

As seen in Tables 1 and 2, there are a few subcategories where the MACT floor for process vents is more stringent than the HON, but in the majority of cases the MACT floor is equivalent to or less stringent than the HON.

Table 10 presents the existing level of control stringency result for each individual facility for which data were available and also presents the MACT floor decision for each subcategory. The MACT floor for both existing and new sources is more stringent than the HON/ACT for two subcategories. The remaining MACT floors are either equivalent to or less stringent than the HON/ACT/NSPS.

The results of this analysis for the PET subcategories are summarized on Table 11. On Table 11, each facility for which data were available is listed and the relationship between the existing control level and the HON/ACT is indicated.

The next step in this type of analysis was to utilize the results of each individual facility to determine the result for the subcategory. For determining existing source MACT floor, the results of the best performing five sources were considered; for new source MACT floor, the single best performing source was considered. As noted above, these subcategory decisions are also presented on Table 10.

For facilities where control is required for a different set of process vents than is being controlled, a more involved analysis was required to determine the overall relationship of the applicable rules/guidances to the facility. For these facilities, the emissions being vented to the atmosphere under the existing control level and the emissions that would be vented under the HON/ACT were compared. For purposes of comparison, these two levels of emissions are expressed in terms of a percent reduction, and the larger percent reduction reflects the more stringent control scenario. The results of comparing emissions was used to complement the simpler comparison of the number of process vents. This type of analysis was used for the remaining 14 subcategories, and the results are presented on Table 12 for methyl methacrylate butadiene styrene (MBS), Table 13 for SAN and ASA/AMSAN, and Table 14 for polystyrene, ABS, MABS, and Nitrile.

Once the existing level of control stringency of each individual facility was determined, the MACT floor stringency for the subcategory was determined. For facilities with less than five sources, all sources were included in the MACT floor determination and its relationship to the HON/ACT/NSPS. Where the same relationship existed, the relationship of the MACT floor to the HON/ACT/NSPS was self-evident. Where different relationships existed among facilities within a subcategory, the majority ruled or, if this is still not clear, the same analysis done for individual facilities is done for the five best performing facilities (i.e., a percent reduction is determined for the existing control level and for the HON/ACT control level). For new source MACT floor, the single best performing facility is determined based on percent reduction, and it is the basis for new source MACT floor.

As discussed earlier, the HON and Batch Processes ACT were evaluated simultaneously to determine the stringency of the MACT floor against these two rules/guidances. After this analysis, the impact of the Polymers NSPS on the determined MACT floor/regulatory alternative was considered. The Polymers NSPS affects some process emissions from new polystyrene facilities using a continuous process and some process emissions from new PET facilities using a continuous process. (Note: Section II of the proposed preamble discusses the Polymers NSPS in more detail.) These requirements were considered in developing regulatory alternatives for both existing and new polystyrene and PET facilities using a continuous process.

For PET facilities, the analysis of process vents at existing sources considered the threshold emission rates found in the Polymer Manufacturing NSPS. With one exception, the analysis showed that emissions from the facilities included in the analysis were below the various emission limits in the Polymers NSPS. For those situations where the emissions from the facilities are below the Polymers NSPS emission limits, the emission limits became part of the existing source MACT floor for that subcategory. For those situations where the emissions from the facilities are not greater than the Polymers NSPS emission limits (i.e., process vents associated with material recovery at PET facilities using a continuous DMT process), the emission limits and the corresponding threshold emission rate were included as part of the regulatory alternative.

The analysis of new facilities entailed comparing the appropriate process vent emissions against the emission limits; threshold emission rates did not need to be considered since new sources are required to meet the emission limits. In all cases, the best performing facility was meeting the Polymers NSPS emission limits and the emission limits were made part of the MACT floor for new sources.

Process Contact Cooling Towers

The MACT floor for process contact cooling towers at existing sources, as reflected in the existing control level, was determined to be no control for all PET subcategories as none of the facilities with process contact cooling towers were controlling the emissions from process contact cooling tower water. Since none of the facilities that had process contact cooling towers controlled emissions from the cooling towers, it was qualitatively judged that the MACT floor was less stringent or equivalent to the Polymers NSPS requirements. (A facility that does not control cooling tower emissions could be considered equivalent to the Polymers NSPS if no control is required by the Polymers NSPS.)

As mentioned previously, a cost effective regulatory alternative that is more stringent than the MACT floor or selected set of rules/guidances was available for this emission point at existing sources. The basis for selecting this regulatory alternative is discussed in detail in the Basis and Purpose document (see Docket A-92-45, section II-A-10).

For new sources, the MACT floor was based on a facility that used ethylene glycol jets, as opposed to steam jets, and did not have a cooling tower. In addition to eliminating the need for a cooling tower, the use of ethylene glycol jets prevents the generation of the vacuum system wastewater streams. This level of control was compared to the Polymers NSPS cooling tower provisions and found to be more stringent. Therefore, the MACT floor for new sources was described as "no process contact cooling tower" and "no vacuum system wastewater." This option was then considered as a regulatory alternative for existing sources and was found to be reasonable considering cost, emission reduction, nonair environmental, and energy impacts.

l:\n301\docu\mactflr2.ken

cc: Valerie Everette, PES

TABLES

Note: Alphabetical codes are used to identify facilities in some of the tables. Table A, presented first, provides the facility codes and names. On the tables with facility codes, there are typically two codes; one in parenthesis and one not. The code not in parenthesis matches the codes presented in Table A. Facility codes are also used in the appendices, but are not done so consistently.

TABLE A. FACILITY CODES AND FACILITY IDENTIFICATION

CODE	COMPANY	LOCATION
A (S) OR (19)	Allied Signal	Moncure
B (J)	DuPont	Cooper River
C (L)		Kinston
D (Q)		Cape Fear
E (I)		Circleville
F (K)		Florence
G (M) or (25)		Old Hickory
H (P)		Brevard
I (E) or (28)	Hoechst Cleanese	Spartanburg
J (N) or (23)		Salisbury
K (R) or (21)		Greer
L (O) or (22)		Shelby
M (F)	ICI Films	Fayetteville
N (G) or (15)		Hopewell
O (V)	Shell	Pt. Pleasant
P (A)	Tennessee Eastman	Kingsport
Q (H)	Carolina Eastman	Columbia
R (W)	Eastman Kodak	Rochester
S (B) or (29)	Wellman	Palmetto
T (C)	YKK	Macon
U (T)	3M	Decatur
V (U)		Greenville
W (A)	American Polymers	Oxford
X (U)	Amoco Chemical Corp.	Joilet
Y (V)		Torrance
Z (W)		Willow Springs
AA (T)	Arco Chemical Corp.	Painesville
AB (S)		Monaca

TABLE A. FACILITY CODES AND FACILITY IDENTIFICATION (CONTINUED)

CODE	COMPANY	LOCATION
AC (B)	BASF Corp.	Holyoke
AD (Y)		Santa Ana
AE (X)		Joilet
AF (C)		South Brunswick
AG (D)		Lowland
AH (Z)	BF Goodrich	Akron
AI (AA)	BP Chemicals	Lima
AJ (D)	Chevron Chemical	Marietta
AK (E)	Dart Container Corp.	Leola
AL (F)		Ownesboro
AM (AJ)	Dow Chemical	Midland
AN (AL)		Allyn's Point
AO (AG)		Torrance
AP (AH)		Hanging Rock
AQ (AI)		Joilet
AR (AK)		Riverside
AS (L)	Elf Atochem	
AT (G)	Fina Oil & Chemical Co.	Carville
AU (AO)	GE Plastics	Washington, WV
AV (AP)		Ottawa
AW (AN)		Bay St. Louis
AX (AM)		Selkirk
AY (I)	Hunstman Chemical	Chesapeake
AZ (H)		Belpre
BA (J)		Peru
BB (K)		Rome
BC (AB)	Kama	Hazelton

TABLE A. FACILITY CODES AND FACILITY IDENTIFICATION (CONCLUDED)

CODE	COMPANY	LOCATION
BD (AQ)	Kaneka Texas Corp.	
BE (AC)	Monsanto Corp.	Muscatine
BF (AD)		Addyston
BG (AU)	Novacor Chemicals	Decatur - 1
BH		Decatur - 2
BI (N)		Indian Orchard
BJ (AE)	Rohm and Hass	Kentucky
BK (AF)		Philadelphia
BL (O)	Scott Polymers	Saginaw - 1
BM (P)		Saginaw - 2
BN (Q)		Fort Worth

TABLE 1. MACT FLOOR ANALYSIS FOR EXISTING SOURCES[a]

Subcategory	Storage Vessels: MACT Floor Stringency[b]	Storage Vessels: Regulatory Alternative	Process Vents: MACT Floor Stringency[b]	Process Vents: Regulatory Alternative	Wastewater Streams: MACT Floor Stringency[b]	Wastewater Streams: Regulatory Alternative
ABS, Ce	=	HON	=	HON/Batch ACT	=	HON
ABS, Cm	=	HON	=	HON/Batch ACT	=	HON
ABS, Be	=	HON	=	HON/Batch ACT	=	HON
ABS, Bs	=	HON	=	HON/Batch ACT	=	HON
ABS, Bl	=	HON	=	HON/Batch ACT	=	HON
MABS	=	HON	=	HON/Batch ACT	=	HON
MBS	=	HON	>	MACT Floor	=	HON
SAN, C	=	HON	=	HON/Batch ACT	=	HON
SAN, B	=	HON	=	HON/Batch ACT	=	HON
ASA/AMSAN	>	MACT Floor	>	MACT Floor	<	No control[c]
PS, C	>	MACT Floor	=	HON/NSPS/ Batch ACT	=	HON

TABLE 1. MACT FLOOR ANALYSIS FOR EXISTING SOURCES[a] (CONCLUDED)

	Storage Vessels		Process Vents		Wastewater Streams	
Subcategory	MACT Floor Stringency[b]	Regulatory Alternative	MACT Floor Stringency[b]	Regulatory Alternative	MACT Floor Stringency[b]	Regulatory Alternative
PS, B	=	HON	<	HON/Batch ACT	=	HON
EPS	=	HON	=	HON/Batch ACT	=	HON
PET, TPA, C	=	HON	=	HON/NSPS/ Batch ACT	=	HON
PET, TPA, B	=	HON	=	HON/Batch ACT	=	HON
PET, DMT, C	=	HON	=	HON/NSPS/ Batch ACT	=	HON
PET, DMT, B	=	HON	=	HON/Batch ACT	=	HON
Nitrile	>	MACT Floor	<	HON/Batch ACT	=	HON

[a] In all cases, the MACT floor for equipment leaks was less stringent than the HON.

[b] As compared to the selected set of rules/guidances.

[c] A policy decision was made not to accept the control level from the selected set of rules/guidances. The reasons for this decision are discussed in Chapter 8.0 of the Basis and Purpose Document.

TABLE 2. MACT FLOOR ANALYSIS FOR NEW SOURCES[a]

Subcategory	Storage Vessels: MACT Floor Stringency[b]	Storage Vessels: Regulatory Alternative	Process Vents: MACT Floor Stringency[b]	Process Vents: Regulatory Alternative	Wastewater Streams: MACT Floor Stringency[b]	Wastewater Streams: Regulatory Alternative
ABS, Ce	=	HON	=	HON/Batch ACT	=	HON
ABS, Cm	>	Regulatory Alternative 2[c]	=	HON/Batch ACT	=	HON
ABS, Be	=	HON	=	HON/Batch ACT	=	HON
ABS, Bs	=	HON	=	HON/Batch ACT	=	HON
ABS, Bl	=	HON	=	HON/Batch ACT	=	HON
MABS	=	HON	=	HON/Batch ACT	=	HON
MBS	=	HON	=	HON/Batch ACT	=	HON
SAN, C	>	MACT Floor	=	HON/Batch ACT	=	HON
SAN, B	=	HON	>	MACT Floor	=	HON
ASA/AMSAN	>	MACT Floor	>	MACT Floor	<	No control[c]
PS, C	>	MACT Floor	=	HON/NSPS/ Batch ACT	=	HON

TABLE 2. MACT FLOOR ANALYSIS FOR NEW SOURCES[a] (CONCLUDED)

Subcategory	Storage Vessels: MACT Floor Stringency[b]	Storage Vessels: Regulatory Alternative	Process Vents: MACT Floor Stringency[b]	Process Vents: Regulatory Alternative	Wastewater Streams: MACT Floor Stringency[b]	Wastewater Streams: Regulatory Alternative
PS, B	=	HON	<	HON/Batch ACT	=	HON
EPS	=	HON	=	HON/Batch ACT	=	HON
PET, TPA, C	=	HON	=	HON/NSPS/ Batch ACT	=	HON
PET, TPA, B	=	HON	=	HON/Batch ACT	=	HON
PET, DMT, C	=	HON	=	HON/NSPS/ Batch ACT	=	HON
PET, DMT, B	=	HON	=	HON/Batch ACT	=	HON
Nitrile	>	MACT Floor	<	HON/Batch ACT	=	HON

[a] In all cases, the MACT floor for equipment leaks was less stringent than the HON.

[b] As compared to the selected set of rules/guidances.

[c] A policy decision was made not to accept the control level from the selected set of rules/guidances; a decision was made to go beyond the MACT floor. The reasons for this decision are discussed in Chapter 8.0 of the Basis and Purpose Document.

TABLE 3. DISTRIBUTION OF SUBCATEGORIES BY RELATIVE MACT FLOOR STRINGENCY[a]

	Existing Source MACT Floor			New Source MACT Floor		
	<	=	>	<	=	>
Storage Vessels	0	15	3	0	13	5
Process Vents	2	14	2	2	14	2
Wastewater Streams	1	17	0	1	17	0

[a] Number of subcategories where MACT floor is less stringent than (<), equivalent to (=), or more stringent (>) than selected set of rules/guidances

Table 4. Wastewater Stream Data Summary

Subcategory	Facility	Number of Steams Currently Being Controlled	Number of Streams that would be controlled by the HON	Relative Stringency of Existing Control to HON [<,=,>]
MBS	BD (AQ)	None	None	=
	BJ (AE)	None	1 of 3	=
	AS (L)	None	None	=
SAN, B & C	BF (AO)	None	1 of 3	=
SAN,B	BE (AC)	None	None	=
SAN,C	AM (AJ)	None	None	=
ASA/AMSAN	AX (AM)	None	3 of 6	<[a]
PET TPA,C	Footnote b	None	None	=
PET TPA,C	S (B)	None	2 of 3	<
PET TPA,C	Q (H)	None	1 of 5	=
PET TPA,B	O (V)	None	None	=
PET DMT,C	Footnote c	None	None	=
PET DMT,C	P (A)	None	1 of 6	=
PET DMT,B	Footnote d	None	None	=
PET DMT,B	AG (D)	None	1 of 4	=
PET DMT,B	M (F)	None	1 of 1	<
PET DMT,B	L (O)	None	1 of 1	<
PET DMT,B	R (W)	None	1 of 2	=[e]
ABS, Latex	AH (Z)	1 of 1[f]	0 of 1	=[f]
Nitrile	AI (AA)	None	1 of 2	=[e]
PS,C	AQ (AI)	No WW generated		=
PS,C	AR (AK)	None	None	=
PS,C	AP (AH)	None	None	=
PS,C	AO (AG)	None	None	=
PS,C	AN (AL)	None	None	=
PS,C	AX (AM)	None	None	=
PS,C	BI (N)	None	None	=
ABS, Cm	AN (AL)	None	None	=

Table 4. Wastewater Stream Data Summary

ABS, Cm	AO (AG)	None	None	=
ABS, Ce	AV (AP)	None	None	=
ABS, Ce	AU (AO)	None	None	=
ABS, Be	AU (AO)	None	None	=
MABS	AU (AO)	None	None	=

[a] Controlled streams represent majority of wastewater volume at facility.
[b] There are 9 facilities that meet this scenario.
[c] There are 8 facilities that meet this scenario.
[d] There are 5 facilities that meet this scenario.
[e] One of two streams meeting the HON. Judged not to be clearly more stringent than the HON.
[f] Partial control of stream only. Judged not to be clearly more stringent than the HON.

Table 5. Relative Stringency of Existing Controls and MACT Floor to HON Requirements for Wastewater Streams

Subcategory	Facility[a]	Relative Stringency of Existing Control to Existing Source HON Requirements [<,=,>]	Relative Stringency of Existing Control to New Source HON Requirements [<,=,>]
MBS	BJ (AE)	=	=
	AS (L)	=	=
	BD (AQ)	=	=
Overall Stringency of MACT Floor to HON		=	=
SAN, C	BF (AD)	=	=
	AM (AJ)	=	=
Overall Stringency of MACT Floor to HON		=	=
SAN, B	BF (AD)	=	=
	BE (AC)	=	=
Overall Stringency of MACT Floor to HON		=	=
ASA/AMSAN	AX (AM)	<	<
PET TPA, C	9 Others	=	=
	Q (H)	=	=
	S (B)	<	<
Overall Stringency of MACT Floor to HON		=	=
PET DMT, C	8 Others	=	=
	P (A)	=	=
Overall Stringency of MACT Floor to HON		=	=
PET DMT, B	5 Others	=	=
	AG (D)	=	=

Table 5. Relative Stringency of Existing Controls and MACT Floors to HON Requirements for Wastewater Streams (Continued)

Subcategory	Facility[a]	Relative Stringency of Existing Control to Existing Source HON Requirements [<,=,>]	Relative Stringency of Existing Control to New Source HON Requirements [<,=,>]
	M (F)	<	<
	L (O)	<	<
	R (W)	=	=
Overall Stringency of MACT Floor to HON		=	=
PET TPA, B	O (V)	=	=
EPS		ND[b]	ND[b]
PS, B		ND[b]	ND[b]
PS, C	AQ (AJ)	=	=
	AR (AK)	=	=
	AP (AH)	=	=
	AO (AG)	=	=
	AN (AL)	=	=
	AX (AM)	=	=
	BI (N)	=	=
Overall Stringency of MACT Floor to HON		=	=
MABS	AU (AO)	=	=
Nitrile	AI (AA)	=	=
ABS, Be	AU (AO)	=	=

Table 5. Relative Stringency of Existing Controls and MACT Floor to HON Requirements for Wastewater Streams (Concluded)

Subcategory	Facility[a]	Relative Stringency of Existing Control to Existing Source HON Requirements [<,=,>]	Relative Stringency of Existing Control to New Source HON Requirements [<,=,>]
ABS, Cm	AN (AL)	=	=
	AO (AG)	=	=
Overall Stringency of MACT Floor to HON		=	=
ABS, Bs		ND[b]	ND[b]
ABS, Ce	AV (AP)	=	=
	AU (AO)	=	=
Overall Stringency of MACT Floor to HON		=	=
ABS,Latex	AH (Z)	=	=

a Only facilities with data are included. Facilities without data are assumed to be equivalent.

b No data for subcategory. Assumed equivalent to the HON.

Table 6. Storage Vessel Data Summary
For All Subcategories Except PS, C

Subcategory	Facility	Relative Stringency of Existing Control to Existing Source HON Requirements [<,=,>]	Relative Stringency of Existing Control to New Source HON Requirements [<,=,>]
MBS	BJ (AE)	=	=
	AS (L)	>	=
	BD (AQ)	=	=
Overall Stringency of MACT Floor to HON		=	=
SAN, C	BF (AD)	=	=
	AW (AN)	>	>
	AM (AJ)	=	=
Overall Stringency of MACT Floor to HON		=	>
SAN, B	BF (AD)	=	=
	BE (AC)	=	=
Overall Stringency of MACT Floor to HON		=	=
ASA/AMSAN	AX (AM)	>	>
PET TPA, C	A (19)	=	=
	I (28)	=	=
	J (23)	=	=
	K (21)	=	=
	S (29)	=	=
Overall Stringency of MACT Floor to HON		=	=
PET DMT, C	G (25)	=	=
	I (28)	=	=
Overall Stringency of MACT Floor to HON		=	=

Table 6. Storage Vessel Data Summary
For All Subcategories Except PS, C

PET DMT, B	L (22)	=	=
	I (28)	=	=
	N (15)	=	=
Overall Stringency of MACT Floor to HON		=	=
PET TPA, B		=[a]	=[a]
EPS	AF (C)	=	=
	BA (J)	>	>[b]
	AB (S)	=	=
Overall Stringency of MACT Floor to HON		=	=[b]
MABS	AU (AO)	=	=
ABS, Be	BF (AD)	=	=
	BE (AC)	=	=
	AM (AJ)	=	=
	AU (AO)	=	=
Overall Stringency of MACT Floor to HON		=	=
ABS, Cm	AN (AL)	=	=
	BF (AD)	=	=
	AO (AG)	>	>
	AM (AJ)	=	=
	AP (AH)	>	>
Overall Stringency of MACT Floor to HON		=	>

Table 6. Storage Vessel Data Summary
For All Subcategories Except PS, C

ABS, Bs	BF (AD)	=	=
	BE (AC)	=	=
Overall Stringency of MACT Floor to HON		=	=
ABS, Ce	AV (AP)	=	=
	AU (AO)	=	=
Overall Stringency of MACT Floor to HON		=	=
ABS, Latex	AH (Z)	=	=
Nitrile	AI (AA)	>	>
PS, B	Y (V)	>	>[c]
	AY (I)	>	>[c]
	BA (J)	>	>[c]
	AK (E)	=	=
	AL (F)	=	=
	AB (S)	=	=
Overall Stringency of MACT Floor to HON		=	=[c]

[a]No data. MACT floor assumed to be equivalent to the HON based on existing control levels for other 3 PET subcategories.

[b]Cannot define new source MACT floor based on this facility due to missing storage vessel size data. Defaulted to HON as regulatory alternative.

[c]Cannot define new source MACT four on these facilities due to missing storage vessel size data and "unknown" control efficiency. Defaulted to HON as regulatory alternative.

Table 7. Existing PS,C Storage Vessel Data Summary

		Vapor pressure (psia)	
Facility	<0.75	≥ 0.75 < 1.9	≥ 1.9
AJ (D)	=HON	NA	NA
W (A)	>HON	NA	NA
AC (B)	>HON	NA	NA
X (U)	>HON	NA	NA
BF (AD)	=HON	≤HON	NA
AZ (H)	>HON	NA	NA
AY (I)	>HON	NA	NA
BA (J)	>HON	NA	NA
AO (AG)	>HON	=HON	NA
AQ (AI)	=HON	NA	NA
AM (AJ)	=HON	>HON	>HON
AP (AH)	>HON	<HON	NA
AR (AK)	=HON	NA	NA
AN (AL)	=HON	=HON	>HON
AX (AM)	=HON	NA	<HON
AD (Y)	=HON	NA	NA
Summary[a]	8 >HON	4 ≤HON	2 >HON
		1 >HON	1 <HON
	>HON	≤HON	≥HON
Overall Summary	>HON		

[a] Summary of 5 best performing sources.

Table 8. Existing PS,C Storage Vessel Analysis - Number of Storage Vessels Per Vapor Pressure Range

	Vapor Pressure Range (psia)		
Existing Control <,=,> the HON (No. storage vessels)	< 0.75[a]	≥ 0.75 and < 1.9	≥ 1.9
<	1	0	0
=	7	8	3
>	37	4	5
Summary	> HON	= HON	> HON
Overall Summary	> HON		

a These numbers represent the storage vessels at the 8 best performing facilities.

Table 9. New PS,C Storage Vessel Data Summary

		Vapor pressure (psia)		
Facility	<0.1	≥ 0.1 < 1.9	≥ 1.9	Facility
AJ (D)	=HON	=HON	NA	=HON
AD (Y)	=HON	NA	NA	=HON
W (A)	>HON	≥HON	NA	≥HON
AC (B)	>HON	NA	NA	>HON
X (U)	>HON	NA	NA	>HON
BF (AD)	=HON	≤HON	NA	≤HON
AZ (H)	>HON	≥HON	NA	≥HON
AY (I)	>HON	NA	NA	>HON
BA (J)	>HON	NA	NA	>HON
AO (AG)	>HON	>HON	NA	>HON
AQ (AI)	=HON	NA	NA	=HON
AM (AJ)	=HON	=HON	=HON	=HON
AP (AH)	=HON	>HON	NA	=HON
AR (AK)	=HON	>HON	NA	=HON
AN (AL)	=HON	>HON	>HON	>HON
AX (AM)	=HON	=HON	<HON	=HON
Summary	>HON	>HON	>HON	>HON
Overall Summary	>HON			

Next, all the wastewater streams at a facility were examined to determine the overall relationship of the HON to all of the wastewater streams at a facility. As seen in Table 4, the overall level of control for all but four facilities was determined to be equivalent to the HON. For these other four facilities, the overall level of control was determined to be less stringent than the HON.

The last step was to determine the overall relationship of the HON to the MACT floor for each subcategory. Table 5 summarizes this determination. As seen in Table 5, for all subcategories except acrylonitrile styrene acrylate/alpha methyl styrene acrylonitrile (ASA/AMSAN), the HON was determined to be equivalent to the MACT floor. For ASA/AMSAN, the HON was determined to be more stringent than the MACT floor.

Because the MACT floor was equivalent to the HON for the majority of subcategories, it was assumed that the MACT floor was equivalent to the HON for the three subcategories not represented by the data -- ABS by batch suspension, polystyrene by batch suspension, and expandable polystyrene.

Storage Vessels

Storage vessel data are available for most Group IV thermoplastic facilities. For the majority of subcategories, data are available for at least 50 percent of the facilities within the subcategory. All seven listed source categories are represented by the data, and 17 of the 18 subcategories are represented. The only subcategory not represented is poly(ethylene terephthalate) (PET) produced using a batch terephthalic acid (TPA) process.

Many storage vessels are controlled. A comparison was made to determine whether or not the HON requirements for storage vessels were more stringent than the level of control being achieved. This was done by applying the control/no control applicability criteria (i.e., storage vessel size and vapor pressure of the stored material) to each storage vessel within a facility. The data used to make these decisions are presented in Appendix A, Tables A-2 through A-x. The storage vessel applicability criteria for the HON are available in 40 CFR Part 63, Subpart G.

As summarized in Table 6, the current level of control at each facility was generally equivalent to that required by the HON. There were several facilities, however, for which existing control was determined to be more stringent than the HON (i.e., storage vessels were being controlled whereas the HON applicability criteria would indicate no control required).

Next, the overall relationship of the HON to the level of control at all of the facilities within a subcategory was determined. As seen in Table 6, for each subcategory except ASA/AMSAN, the HON was determined to be equivalent to the MACT floor. For ASA/AMSAN existing and new facilities, the MACT floor was determined to be more stringent than the HON requirements.

A different technique was used to determine the MACT floor for the PS,C subcategory. Unlike the other subcategories, when the individual storage tank determinations were made within each of the vapor pressure ranges, it was unclear as to which were the best five controlled facilities and which was the best controlled facility. Since it was not possible to identify the five best performing facilities (for the existing analysis) or the single best performing facility (for the new analysis) based on controls across all storage vessels, the best performers were picked within each vapor pressure range. This means that a given facility might be considered the single best performer for the low vapor pressure range and another facility would be the single best performer for the high vapor pressure range. Using this approach, the new source MACT floor for the PS,C subcategory is based on the existing controls from two different facilities across the vapor pressure ranges.

The data used in the analysis are presented in Tables 7 through 9. Table 7 presents the storage vessel data by vapor pressure range on a facility basis considering the HON requirements for existing sources. There were 8 facilities in the "less than 0.75 psia" vapor pressure range where the MACT floor was more stringent than the HON. In the "0.75 to 1.9 psia" vapor pressure range, there were 4 facilities that were less stringent than the HON and 1 facility that was more stringent than the HON. In the "greater than 1.9 psia" range, there were 2 facilities that were more stringent than the HON and 1 facility that was less stringent than the HON. This collection of data was judged to show the existing source MACT floor to be more stringent than the HON.

Table 8 presents the storage vessel data by vapor pressure range on an individual storage vessel basis for the best performing facilities (based only the storage vessels in that range) considering the HON requirements for existing sources. In the "less than 0.75 psia" range, the 8 best performing facilities were considered. In the other two ranges there are five or fewer facilities with data, and all available data were considered. This collection of data was also judged to show the existing source MACT floor to be more stringent than the HON.

Table 9 presents the storage vessel data by vapor pressure range on a facility basis considering the HON requirements for new sources. This data indicates that there is at least one facility in each vapor pressure range that is more stringent than the HON. This collection of data was judged to show the new source MACT floor to be more stringent than the HON.

Process Vents

Process vent data are available for most Group IV thermoplastic facilities. For the majority of subcategories, data are available for at least 50 percent of the facilities within the subcategory. Six of the seven listed source categories are represented by the data, and 16 of the 18 subcategories are represented. The two subcategories not represented are PET TPA,B and methyl methacrylate acrylonitrile butadiene styrene (MABS).

As for storage vessels, many process vents are being controlled. A comparison was made to determine whether or not the HON requirements, the Batch Processes ACT criteria, or the Polymer Manufacturing NSPS requirements for process vents were more stringent than the MACT floor. This was done by applying the applicable control/no control criteria from the HON, Batch Processes ACT, and Polymer Manufacturing NSPS to each process vent for which data were available. The criteria and their use are discussed more completely below.

HON Criteria. To determine control/no control decisions for the HON, the total resource effectiveness (TRE) value for each process vent for which data are available was calculated. When a process vent has a TRE value less than or equal to one, it is required to apply controls under the HON requirements. The criteria for estimating TRE values for process vents from new and existing sources are different. The estimation of the TRE is described in detail in the HON (40 CFR part 63, subpart G). Tables A-x through A-x present the TRE values and the data used to make the calculations. In some cases, a range of potential vent stream characteristics was developed based on the available data and multiple, theoretical TRE values were calculated. In other cases, all the data required to calculate the TRE are available and a single, definitive TRE value was calculated. The process vent applicability criteria for the HON are available in 40 CFR part 63, subpart G.

Batch Processes ACT Criteria. To determine the control/no control decisions for the Batch Processes ACT, the applicability criteria for this guidance document was evaluated for each process vent for which data are available and which appeared to be a batch process vent. In many cases, it is not possible to know definitively whether a process vent is a batch or continuous process vent. For this reason, the analyses of the HON and Batch Processes ACT overlap in many instances. There is no distinction in the Batch Processes ACT between process vents at new or existing sources. The data required for evaluating the Batch Processes ACT applicability criteria are annual emissions, actual flowrate, and a calculated flowrate. The results of these evaluations are included in Tables 11 through 14. The columns on Tables 11 through 14 are generically labeled as "HON/ACT Control Required." When the Batch Processes ACT applicability criteria were specifically analyzed, it is indicated in the body of the column (e.g., ACT-N, ACT-Y, or ACT/H-N). The Batch Processes ACT describes the applicability criteria in detail and is available in section II-B of the docket (A-92-45).

Polymer Manufacturing NSPS. Threshold emission rates (i.e., applicability criteria) were developed under the Polymers NSPS to set a point at which it was not cost effective to require an existing source (i.e., modified or reconstructed) to meet the emission limits. Therefore, to determine the control/no control decisions for the Polymers NSPS, the emissions for each subject process area (e.g., material recovery for continuous PET dimethyl terephthalate (DMT) processes) for which data are available was compared to the Polymers NSPS emission limits. The raw data comparing each facility's emissions to the Polymers NSPS emission limits is considered confidential business information since it reveals the production capacity of individual facilities. These data are contained in the EPA's confidential files.

As seen in Tables 1 and 2, there are a few subcategories where the MACT floor for process vents is more stringent than the HON, but in the majority of cases the MACT floor is equivalent to or less stringent than the HON.

Table 10 presents the existing level of control stringency result for each individual facility for which data were available and also presents the MACT floor decision for each subcategory. The MACT floor for both existing and new sources is more stringent than the HON/ACT for two subcategories. The remaining MACT floors are either equivalent to or less stringent than the HON/ACT/NSPS.

The results of this analysis for the PET subcategories are summarized on Table 11. On Table 11, each facility for which data were available is listed and the relationship between the existing control level and the HON/ACT is indicated.

The next step in this type of analysis was to utilize the results of each individual facility to determine the result for the subcategory. For determining existing source MACT floor, the results of the best performing five sources were considered; for new source MACT floor, the single best performing source was considered. As noted above, these subcategory decisions are also presented on Table 10.

For facilities where control is required for a different set of process vents than is being controlled, a more involved analysis was required to determine the overall relationship of the applicable rules/guidances to the facility. For these facilities, the emissions being vented to the atmosphere under the existing control level and the emissions that would be vented under the HON/ACT were compared. For purposes of comparison, these two levels of emissions are expressed in terms of a percent reduction, and the larger percent reduction reflects the more stringent control scenario. The results of comparing emissions was used to complement the simpler comparison of the number of process vents. This type of analysis was used for the remaining 14 subcategories, and the results are presented on Table 12 for methyl methacrylate butadiene styrene (MBS), Table 13 for SAN and ASA/AMSAN, and Table 14 for polystyrene, ABS, MABS, and Nitrile.

Once the existing level of control stringency of each individual facility was determined, the MACT floor stringency for the subcategory was determined. For facilities with less than five sources, all sources were included in the MACT floor determination and its relationship to the HON/ACT/NSPS. Where the same relationship existed, the relationship of the MACT floor to the HON/ACT/NSPS was self-evident. Where different relationships existed among facilities within a subcategory, the majority ruled or, if this is still not clear, the same analysis done for individual facilities is done for the five best performing facilities (i.e., a percent reduction is determined for the existing control level and for the HON/ACT control level). For new source MACT floor, the single best performing facility is determined based on percent reduction, and it is the basis for new source MACT floor.

As discussed earlier, the HON and Batch Processes ACT were evaluated simultaneously to determine the stringency of the MACT floor against these two rules/guidances. After this analysis, the impact of the Polymers NSPS on the determined MACT floor/regulatory alternative was considered. The Polymers NSPS affects some process emissions from new polystyrene facilities using a continuous process and some process emissions from new PET facilities using a continuous process. (Note: Section II of the proposed preamble discusses the Polymers NSPS in more detail.) These requirements were considered in developing regulatory alternatives for both existing and new polystyrene and PET facilities using a continuous process.

For PET facilities, the analysis of process vents at existing sources considered the threshold emission rates found in the Polymer Manufacturing NSPS. With one exception, the analysis showed that emissions from the facilities included in the analysis were below the various emission limits in the Polymers NSPS. For those situations where the emissions from the facilities are below the Polymers NSPS emission limits, the emission limits became part of the existing source MACT floor for that subcategory. For those situations where the emissions from the facilities are not greater than the Polymers NSPS emission limits (i.e., process vents associated with material recovery at PET facilities using a continuous DMT process), the emission limits and the corresponding threshold emission rate were included as part of the regulatory alternative.

The analysis of new facilities entailed comparing the appropriate process vent emissions against the emission limits; threshold emission rates did not need to be considered since new sources are required to meet the emission limits. In all cases, the best performing facility was meeting the Polymers NSPS emission limits and the emission limits were made part of the MACT floor for new sources.

Process Contact Cooling Towers

The MACT floor for process contact cooling towers at existing sources, as reflected in the existing control level, was determined to be no control for all PET subcategories as none of the facilities with process contact cooling towers were controlling the emissions from process contact cooling tower water. Since none of the facilities that had process contact cooling towers controlled emissions from the cooling towers, it was qualitatively judged that the MACT floor was less stringent or equivalent to the Polymers NSPS requirements. (A facility that does not control cooling tower emissions could be considered equivalent to the Polymers NSPS if no control is required by the Polymers NSPS.)

As mentioned previously, a cost effective regulatory alternative that is more stringent than the MACT floor or selected set of rules/guidances was available for this emission point at existing sources. The basis for selecting this regulatory alternative is discussed in detail in the Basis and Purpose document (see Docket A-92-45, section II-A-10).

For new sources, the MACT floor was based on a facility that used ethylene glycol jets, as opposed to steam jets, and did not have a cooling tower. In addition to eliminating the need for a cooling tower, the use of ethylene glycol jets prevents the generation of the vacuum system wastewater streams. This level of control was compared to the Polymers NSPS cooling tower provisions and found to be more stringent. Therefore, the MACT floor for new sources was described as "no process contact cooling tower" and "no vacuum system wastewater." This option was then considered as a regulatory alternative for existing sources and was found to be reasonable considering cost, emission reduction, nonair environmental, and energy impacts.

l:\n301\docu\mactflr2.ken

cc: Valerie Everette, PES

TABLES

Note: Alphabetical codes are used to identify facilities in some of the tables. Table A, presented first, provides the facility codes and names. On the tables with facility codes, there are typically two codes; one in parenthesis and one not. The code not in parenthesis matches the codes presented in Table A. Facility codes are also used in the appendices, but are not done so consistently.

TABLE A. FACILITY CODES AND FACILITY IDENTIFICATION

CODE	COMPANY	LOCATION
A (S) OR (19)	Allied Signal	Moncure
B (J)	DuPont	Cooper River
C (L)		Kinston
D (Q)		Cape Fear
E (I)		Circleville
F (K)		Florence
G (M) or (25)		Old Hickory
H (P)		Brevard
I (E) or (28)	Hoechst Cleanese	Spartanburg
J (N) or (23)		Salisbury
K (R) or (21)		Greer
L (O) or (22)		Shelby
M (F)	ICI Films	Fayetteville
N (G) or (15)		Hopewell
O (V)	Shell	Pt. Pleasant
P (A)	Tennessee Eastman	Kingsport
Q (H)	Carolina Eastman	Columbia
R (W)	Eastman Kodak	Rochester
S (B) or (29)	Wellman	Palmetto
T (C)	YKK	Macon
U (T)	3M	Decatur
V (U)		Greenville
W (A)	American Polymers	Oxford
X (U)	Amoco Chemical Corp.	Joilet
Y (V)		Torrance
Z (W)		Willow Springs
AA (T)	Arco Chemical Corp.	Painesville
AB (S)		Monaca

TABLE A. FACILITY CODES AND FACILITY IDENTIFICATION (CONTINUED)

CODE	COMPANY	LOCATION
AC (B)	BASF Corp.	Holyoke
AD (Y)		Santa Ana
AE (X)		Joilet
AF (C)		South Brunswick
AG (D)		Lowland
AH (Z)	BF Goodrich	Akron
AI (AA)	BP Chemicals	Lima
AJ (D)	Chevron Chemical	Marietta
AK (E)	Dart Container Corp.	Leola
AL (F)		Ownesboro
AM (AJ)	Dow Chemical	Midland
AN (AL)		Allyn's Point
AO (AG)		Torrance
AP (AH)		Hanging Rock
AQ (AI)		Joilet
AR (AK)		Riverside
AS (L)	Elf Atochem	
AT (G)	Fina Oil & Chemical Co.	Carville
AU (AO)	GE Plastics	Washington, WV
AV (AP)		Ottawa
AW (AN)		Bay St. Louis
AX (AM)		Selkirk
AY (I)	Hunstman Chemical	Chesapeake
AZ (H)		Belpre
BA (J)		Peru
BB (K)		Rome
BC (AB)	Kama	Hazelton

TABLE A. FACILITY CODES AND FACILITY IDENTIFICATION (CONCLUDED)

CODE	COMPANY	LOCATION
BD (AQ)	Kaneka Texas Corp.	
BE (AC)	Monsanto Corp.	Muscatine
BF (AD)		Addyston
BG (AU)	Novacor Chemicals	Decatur - 1
BH		Decatur - 2
BI (N)		Indian Orchard
BJ (AE)	Rohm and Hass	Kentucky
BK (AF)		Philadelphia
BL (O)	Scott Polymers	Saginaw - 1
BM (P)		Saginaw - 2
BN (Q)		Fort Worth

TABLE 1. MACT FLOOR ANALYSIS FOR EXISTING SOURCES[a]

Subcategory	Storage Vessels		Process Vents		Wastewater Streams	
	MACT Floor Stringency[b]	Regulatory Alternative	MACT Floor Stringency[b]	Regulatory Alternative	MACT Floor Stringency[b]	Regulatory Alternative
ABS, Ce	=	HON	=	HON/Batch ACT	=	HON
ABS, Cm	=	HON	=	HON/Batch ACT	=	HON
ABS, Be	=	HON	=	HON/Batch ACT	=	HON
ABS, Bs	=	HON	=	HON/Batch ACT	=	HON
ABS, Bl	=	HON	=	HON/Batch ACT	=	HON
MABS	=	HON	=	HON/Batch ACT	=	HON
MBS	=	HON	>	MACT Floor	=	HON
SAN, C	=	HON	=	HON/Batch ACT	=	HON
SAN, B	=	HON	=	HON/Batch ACT	=	HON
ASA/AMSAN	>	MACT Floor	>	MACT Floor	<	No control[c]
PS, C	>	MACT Floor	=	HON/NSPS/ Batch ACT	=	HON

TABLE 1. MACT FLOOR ANALYSIS FOR EXISTING SOURCES[a] (CONCLUDED)

Subcategory	Storage Vessels: MACT Floor Stringency[b]	Storage Vessels: Regulatory Alternative	Process Vents: MACT Floor Stringency[b]	Process Vents: Regulatory Alternative	Wastewater Streams: MACT Floor Stringency[b]	Wastewater Streams: Regulatory Alternative
PS, B	=	HON	<	HON/Batch ACT	=	HON
EPS	=	HON	=	HON/Batch ACT	=	HON
PET, TPA, C	=	HON	=	HON/NSPS/ Batch ACT	=	HON
PET, TPA, B	=	HON	=	HON/Batch ACT	=	HON
PET, DMT, C	=	HON	=	HON/NSPS/ Batch ACT	=	HON
PET, DMT, B	=	HON	=	HON/Batch ACT	=	HON
Nitrile	>	MACT Floor	<	HON/Batch ACT	=	HON

[a] In all cases, the MACT floor for equipment leaks was less stringent than the HON.

[b] As compared to the selected set of rules/guidances.

[c] A policy decision was made not to accept the control level from the selected set of rules/guidances. The reasons for this decision are discussed in Chapter 8.0 of the Basis and Purpose Document.

TABLE 2. MACT FLOOR ANALYSIS FOR NEW SOURCES[a]

Subcategory	Storage Vessels: MACT Floor Stringency[b]	Storage Vessels: Regulatory Alternative	Process Vents: MACT Floor Stringency[b]	Process Vents: Regulatory Alternative	Wastewater Streams: MACT Floor Stringency[b]	Wastewater Streams: Regulatory Alternative
ABS, Ce	=	HON	=	HON/Batch ACT	=	HON
ABS, Cm	>	Regulatory Alternative 2[c]	=	HON/Batch ACT	=	HON
ABS, Be	=	HON	=	HON/Batch ACT	=	HON
ABS, Bs	=	HON	=	HON/Batch ACT	=	HON
ABS, Bl	=	HON	=	HON/Batch ACT	=	HON
MABS	=	HON	=	HON/Batch ACT	=	HON
MBS	=	HON	=	HON/Batch ACT	=	HON
SAN, C	>	MACT Floor	=	HON/Batch ACT	=	HON
SAN, B	=	HON	>	MACT Floor	=	HON
ASA/AMSAN	>	MACT Floor	>	MACT Floor	<	No control[c]
PS, C	>	MACT Floor	=	HON/NSPS/ Batch ACT	=	HON

TABLE 2. MACT FLOOR ANALYSIS FOR NEW SOURCES[a] (CONCLUDED)

Subcategory	Storage Vessels: MACT Floor Stringency[b]	Storage Vessels: Regulatory Alternative	Process Vents: MACT Floor Stringency[b]	Process Vents: Regulatory Alternative	Wastewater Streams: MACT Floor Stringency[b]	Wastewater Streams: Regulatory Alternative
PS, B	=	HON	<	HON/Batch ACT	=	HON
EPS	=	HON	=	HON/Batch ACT	=	HON
PET, TPA, C	=	HON	=	HON/NSPS/ Batch ACT	=	HON
PET, TPA, B	=	HON	=	HON/Batch ACT	=	HON
PET, DMT, C	=	HON	=	HON/NSPS/ Batch ACT	=	HON
PET, DMT, B	=	HON	=	HON/Batch ACT	=	HON
Nitrile	>	MACT Floor	<	HON/Batch ACT	=	HON

[a] In all cases, the MACT floor for equipment leaks was less stringent than the HON.

[b] As compared to the selected set of rules/guidances.

[c] A policy decision was made not to accept the control level from the selected set of rules/guidances; a decision was made to go beyond the MACT floor. The reasons for this decision are discussed in Chapter 8.0 of the Basis and Purpose Document.

TABLE 3. DISTRIBUTION OF SUBCATEGORIES BY RELATIVE MACT FLOOR STRINGENCY[a]

	Existing Source MACT Floor			New Source MACT Floor		
	<	=	>	<	=	>
Storage Vessels	0	15	3	0	13	5
Process Vents	2	14	2	2	14	2
Wastewater Streams	1	17	0	1	17	0

[a] Number of subcategories where MACT floor is less stringent than (<), equivalent to (=), or more stringent (>) than selected set of rules/guidances

Table 4. Wastewater Stream Data Summary

Subcategory	Facility	Number of Steams Currently Being Controlled	Number of Streams that would be controlled by the HON	Relative Stringency of Existing Control to HON [<,=,>]
MBS	BD (AQ)	None	None	=
	BJ (AE)	None	1 of 3	=
	AS (L)	None	None	=
SAN, B & C	BF (AO)	None	1 of 3	=
SAN,B	BE (AC)	None	None	=
SAN,C	AM (AJ)	None	None	=
ASA/AMSAN	AX (AM)	None	3 of 6	<[a]
PET TPA,C	Footnote b	None	None	=
PET TPA,C	S (B)	None	2 of 3	<
PET TPA,C	Q (H)	None	1 of 5	=
PET TPA,B	O (V)	None	None	=
PET DMT,C	Footnote c	None	None	=
PET DMT,C	P (A)	None	1 of 6	=
PET DMT,B	Footnote d	None	None	=
PET DMT,B	AG (D)	None	1 of 4	=
PET DMT,B	M (F)	None	1 of 1	<
PET DMT,B	L (O)	None	1 of 1	<
PET DMT,B	R (W)	None	1 of 2	=[e]
ABS, Latex	AH (Z)	1 of 1[f]	0 of 1	=[f]
Nitrile	AI (AA)	None	1 of 2	=[e]
PS,C	AQ (AI)	No WW generated		=
PS,C	AR (AK)	None	None	=
PS,C	AP (AH)	None	None	=
PS,C	AO (AG)	None	None	=
PS,C	AN (AL)	None	None	=
PS,C	AX (AM)	None	None	=
PS,C	BI (N)	None	None	=
ABS, Cm	AN (AL)	None	None	=

Table 4. Wastewater Stream Data Summary

ABS, Cm	AO (AG)	None	None	=
ABS, Ce	AV (AP)	None	None	=
ABS, Ce	AU (AO)	None	None	=
ABS, Be	AU (AO)	None	None	=
MABS	AU (AO)	None	None	=

[a] Controlled streams represent majority of wastewater volume at facility.
[b] There are 9 facilities that meet this scenario.
[c] There are 8 facilities that meet this scenario.
[d] There are 5 facilities that meet this scenario.
[e] One of two streams meeting the HON. Judged not to be clearly more stringent than the HON.
[f] Partial control of stream only. Judged not to be clearly more stringent than the HON.

Table 5. Relative Stringency of Existing Controls and MACT Floor to HON Requirements for Wastewater Streams

Subcategory	Facility[a]	Relative Stringency of Existing Control to Existing Source HON Requirements [<,=,>]	Relative Stringency of Existing Control to New Source HON Requirements [<,=,>]
MBS	BJ (AE)	=	=
	AS (L)	=	=
	BD (AQ)	=	=
Overall Stringency of MACT Floor to HON		=	=
SAN, C	BF (AD)	=	=
	AM (AJ)	=	=
Overall Stringency of MACT Floor to HON		=	=
SAN, B	BF (AD)	=	=
	BE (AC)	=	=
Overall Stringency of MACT Floor to HON		=	=
ASA/AMSAN	AX (AM)	<	<
PET TPA, C	9 Others	=	=
	Q (H)	=	=
	S (B)	<	<
Overall Stringency of MACT Floor to HON		=	=
PET DMT, C	8 Others	=	=
	P (A)	=	=
Overall Stringency of MACT Floor to HON		=	=
PET DMT, B	5 Others	=	=
	AG (D)	=	=

Table 5. Relative Stringency of Existing Controls and MACT Floors to HON Requirements for Wastewater Streams (Continued)

Subcategory	Facility[a]	Relative Stringency of Existing Control to Existing Source HON Requirements [<,=,>]	Relative Stringency of Existing Control to New Source HON Requirements [<,=,>]
	M (F)	<	<
	L (O)	<	<
	R (W)	=	=
Overall Stringency of MACT Floor to HON		=	=
PET TPA, B	O (V)	=	=
EPS		ND[b]	ND[b]
PS, B		ND[b]	ND[b]
PS, C	AQ (AJ)	=	=
	AR (AK)	=	=
	AP (AH)	=	=
	AO (AG)	=	=
	AN (AL)	=	=
	AX (AM)	=	=
	BI (N)	=	=
Overall Stringency of MACT Floor to HON		=	=
MABS	AU (AO)	=	=
Nitrile	AI (AA)	=	=
ABS, Be	AU (AO)	=	=

Table 5. Relative Stringency of Existing Controls and MACT Floor to HON Requirements for Wastewater Streams (Concluded)

Subcategory	Facility[a]	Relative Stringency of Existing Control to Existing Source HON Requirements [<,=,>]	Relative Stringency of Existing Control to New Source HON Requirements [<,=,>]
ABS, Cm	AN (AL)	=	=
	AO (AG)	=	=
Overall Stringency of MACT Floor to HON		=	=
ABS, Bs		ND[b]	ND[b]
ABS, Ce	AV (AP)	=	=
	AU (AO)	=	=
Overall Stringency of MACT Floor to HON		=	=
ABS,Latex	AH (Z)	=	=

a Only facilities with data are included. Facilities without data are assumed to be equivalent.

b No data for subcategory. Assumed equivalent to the HON.

Table 6. Storage Vessel Data Summary
For All Subcategories Except PS, C

Subcategory	Facility	Relative Stringency of Existing Control to Existing Source HON Requirements [<,=,>]	Relative Stringency of Existing Control to New Source HON Requirements [<,=,>]
MBS	BJ (AE)	=	=
	AS (L)	>	=
	BD (AQ)	=	=
Overall Stringency of MACT Floor to HON		=	=
SAN, C	BF (AD)	=	=
	AW (AN)	>	>
	AM (AJ)	=	=
Overall Stringency of MACT Floor to HON		=	>
SAN, B	BF (AD)	=	=
	BE (AC)	=	=
Overall Stringency of MACT Floor to HON		=	=
ASA/AMSAN	AX (AM)	>	>
PET TPA, C	A (19)	=	=
	I (28)	=	=
	J (23)	=	=
	K (21)	=	=
	S (29)	=	=
Overall Stringency of MACT Floor to HON		=	=
PET DMT, C	G (25)	=	=
	I (28)	=	=
Overall Stringency of MACT Floor to HON		=	=

Table 6. Storage Vessel Data Summary
For All Subcategories Except PS, C

PET DMT, B	L (22)	=	=
	I (28)	=	=
	N (15)	=	=
Overall Stringency of MACT Floor to HON		=	=
PET TPA, B		=[a]	=[a]
EPS	AF (C)	=	=
	BA (J)	>	>[b]
	AB (S)	=	=
Overall Stringency of MACT Floor to HON		=	=[b]
MABS	AU (AO)	=	=
ABS, Be	BF (AD)	=	=
	BE (AC)	=	=
	AM (AJ)	=	=
	AU (AO)	=	=
Overall Stringency of MACT Floor to HON		=	=
ABS, Cm	AN (AL)	=	=
	BF (AD)	=	=
	AO (AG)	>	>
	AM (AJ)	=	=
	AP (AH)	>	>
Overall Stringency of MACT Floor to HON		=	>

Table 6. Storage Vessel Data Summary
For All Subcategories Except PS, C

ABS, Bs	BF (AD)	=	=
	BE (AC)	=	=
Overall Stringency of MACT Floor to HON		=	=
ABS, Ce	AV (AP)	=	=
	AU (AO)	=	=
Overall Stringency of MACT Floor to HON		=	=
ABS, Latex	AH (Z)	=	=
Nitrile	AI (AA)	>	>
PS, B	Y (V)	>	>[c]
	AY (I)	>	>[c]
	BA (J)	>	>[c]
	AK (E)	=	=
	AL (F)	=	=
	AB (S)	=	=
Overall Stringency of MACT Floor to HON		=	=[c]

[a]No data. MACT floor assumed to be equivalent to the HON based on existing control levels for other 3 PET subcategories.

[b]Cannot define new source MACT floor based on this facility due to missing storage vessel size data. Defaulted to HON as regulatory alternative.

[c]Cannot define new source MACT four on these facilities due to missing storage vessel size data and "unknown" control efficiency. Defaulted to HON as regulatory alternative.

Table 7. Existing PS,C Storage Vessel Data Summary

	[illegible]	Vapor pressure (psia)	
Facility	<0.75	≥ 0.75 < 1.9	≥ 1.9
AJ (D)	=HON	NA	NA
W (A)	>HON	NA	NA
AC (B)	>HON	NA	NA
X (U)	>HON	NA	NA
BF (AD)	=HON	≤HON	NA
AZ (H)	>HON	NA	NA
AY (I)	>HON	NA	NA
BA (J)	>HON	NA	NA
AO (AG)	>HON	=HON	NA
AQ (AI)	=HON	NA	NA
AM (AJ)	=HON	>HON	>HON
AP (AH)	>HON	<HON	NA
AR (AK)	=HON	NA	NA
AN (AL)	=HON	=HON	>HON
AX (AM)	=HON	NA	<HON
AD (Y)	=HON	NA	NA
Summary[a]	8 >HON	4 ≤HON	2 >HON
		1 >HON	1 <HON
	>HON	≤HON	≥HON
Overall Summary	>HON		

[a] Summary of 5 best performing sources.

Table 8. Existing PS,C Storage Vessel Analysis - Number of Storage Vessels Per Vapor Pressure Range

	Vapor Pressure Range (psia)		
Existing Control <,=,> the HON (No. storage vessels)	< 0.75[a]	≥ 0.75 and < 1.9	≥ 1.9
<	1	0	0
=	7	8	3
>	37	4	5
Summary	> HON	= HON	> HON
Overall Summary	> HON		

[a] These numbers represent the storage vessels at the 8 best performing facilities.

Table 9. New PS,C Storage Vessel Data Summary

		Vapor pressure (psia)		
Facility	<0.1	≥ 0.1 < 1.9	≥ 1.9	Facility
AJ (D)	=HON	=HON	NA	=HON
AD (Y)	=HON	NA	NA	=HON
W (A)	>HON	≥HON	NA	≥HON
AC (B)	>HON	NA	NA	>HON
X (U)	>HON	NA	NA	>HON
BF (AD)	=HON	≤HON	NA	≤HON
AZ (H)	>HON	≥HON	NA	≥HON
AY (I)	>HON	NA	NA	>HON
BA (J)	>HON	NA	NA	>HON
AO (AG)	>HON	>HON	NA	>HON
AQ (AI)	=HON	NA	NA	=HON
AM (AJ)	=HON	=HON	=HON	=HON
AP (AH)	=HON	>HON	NA	=HON
AR (AK)	=HON	>HON	NA	=HON
AN (AL)	=HON	>HON	>HON	>HON
AX (AM)	=HON	=HON	<HON	=HON
Summary	>HON	>HON	>HON	>HON
Overall Summary	>HON			

Table 10. Process Vents Data Summary For All Subcategories

PET DMT, C	P (A)	=	≈
	I (E)	=	≈
	Q (H)	=	≈
	B (J)	=	≈
	C (L)	=	<
	G (M))	=	≈
Overall Stringency of MACT Floor to HON		=	≈
PET TPA, C	P (A)	=	≈
	S (B)	=	≈
	I (E)	=	≈
	Q (H)	=	≈
	C (L)	=	≈
	J (N)	=	=
	K (R)	=	=
	A (S)	=	=
Overall Stringency of MACT Floor to HON		=	=
PET TPA, B		=[a]	≈[a]
PS, B	Z (W)	<	<
PS, C	W (A)	=	=
	BF (AD)	=	=
	AO (AG)	=	=
	AP (AH)	=	=
	AQ (AI)	=	<
	AR (AK)	=	=
	AN (AL)	=	=

Table 10. Process Vents Data Summary For All Subcategories

	AX (AM)	=	=
	AC (B)	=	=
	BI (N)	=	<
Overall Stringency of MACT Floor to HON		=	=

[a] No data. Assumed to be equivalent to the HON.

Table 11. PET Process Vent Data Summary

						*** Existing Analysis ***		*** New Analysis ***	
						HON/ACT	Existing MACT	HON/ACT	New MACT
Facility	Subcategory	Stream Number	Stream Name	Emissions (tpy)	Existing Control	Control Required (Y/N)	Floor Stringency [<,=,> the HON]	Control Required (Y/N)	Floor Stringency [<,=,> the HON]
P (A)	DMT-B	1	additive tank	0.91	N	N	=	N	=
P (A)	DMT-B	2	MeOH dist system	0.04	N	N	=	N	=
P (A)	DMT-B	3	regen scrubber	0.0012	N	N	=	N	=
P (A)	DMT-B	5	condenser	0.02	N	N	=	N	=
P (A)	DMT-B	6	EG rec/dist scrubber	4.23	N	N	=	N	=
P (A)	DMT-B	11	Refining sys	0.2	N	N	=	N	=
P (A)	DMT-B	12	sludge proc tk	0.13	N	not evaluated	unknown	not evaluated	unknown
Summary							=		=
AG (D)	DMT-B	11	head tank	0.01	N	N	=	N	=
AG (D)	DMT-B	12	catalyst mix tank	0.01	N	N	=	N	=
AG (D)	DMT-B	13	catalyst mix tank	0.33	N	N	=	N	=
AG (D)	DMT-B	14	recovery mix tank	0.02	N	N	=	N	=
AG (D)	DMT-B	10	purification vac jet	1.5	N	N	=	N	=
Summary							=		=
I (E)	DMT-B	1-15	autoclave vac jets (15)	33.65	N	N	=	N	=
I (E)	DMT-B	16	catch tank vent	0.625	N	not evaluated	unknown	not evaluated	unknown
I (E)	DMT-B		MeOH/glycol rec	2.502	N	not evaluated	unknown	not evaluated	unknown
Summary							=		=
M (F)	DMT-B	E6	MeOH day tank	7.43	N	Y	<	Y	<
M (F)	DMT-B	E10	EG day tank	1.32	N	N	=	N	=
M (F)	DMT-B	E3	crude EG dist vent	1.66	N	N	=	N	=
M (F)	DMT-B	E4	vacuum jet	0.52	N	N	=	N	=
M (F)	DMT-B	E1	monomer prep	40.74	N	N	=	N	=
M (F)	DMT-B	E2	polymerization vent	250.07	N	Y	<	Y	<
Summary							< or =		< or =

Table 11. PET Process Vent Data Summary

						*** Existing Analysis ***		*** New Analysis ***	
						HON/ACT	Existing MACT	HON/ACT	New MACT
Facility	Subcategory	Stream Number	Stream Name	Emissions (tpy)	Existing Control	Control Required (Y/N)	Floor Stringency [<,=,> the HON]	Control Required (Y/N)	Floor Stringency [<,=,> the HON]
N (G)	DMT-B	9	Line 1 Rxt	5.3	N	N	=	N	=
N (G)	DMT-B	10	Line 2 Rxt	6.7	N	N	=	N	=
N (G)	DMT-B	11	Line 3 Rxt	12	N	Y	<	Y	<
N (G)	DMT-B	69	Line 4 Rxt	12.5	N	Y	<	Y	<
Summary							< or =		< or =
L (O)	DMT-B	4	MeOH vent tank	0.37	N	N	=	N	=
L (O)	DMT-B	6	MeOH reflux tank	0.123	N	N	=	N	=
L (O)	DMT-B	11	crude glycol receiver	4.56	N	N	=	N	=
L (O)	DMT-B		missing emissions	1.907	N	not evaluated	unknown	not evaluated	unknown
Summary							=		=
U (T)	DMT-B	1	vent tank	77.27	N	Y	<	Y	<
U (T)	DMT-B	2	vent tank	89.6	N	Y	<	Y	<
U (T)	DMT-B	3	vent tank	138.2	N	Y	<	Y	<
Summary							<		<
V (U)	DMT-B	1	vent tank	50.34	N	Y	<	Y	<
Summary									
R (W)	DMT-B	E4	Ester exchange	4.9	N	N	=	N	=
R (W)	DMT-B	E6	Prepoly Rxt	0.25	N	N	=	N	=
R (W)	DMT-B	E11	Casting belt	1.75	N	N	=	N	=
Summary							=		=

Table 11. PET Process Vent Data Summary

Facility	Subcategory	Stream Number	Stream Name	Emissions (tpy)	Existing Control	*** Existing Analysis *** HON/ACT Control Required (Y/N)	Existing MACT Floor Stringency [<,=,> the HON]	*** New Analysis *** HON/ACT Control Required (Y/N)	New MACT Floor Stringency [<,=,> the HON]
P (A)	DMT-C	4	MeOH rec scrubber	0.1	N	N	=	N	=
P (A)	DMT-C	9	EG refining	3.1	N	N	=	N	=
Summary							=		=
I (E)	DMT-C	1	vac.jet	0.351	N	N	=	N	=
I (E)	DMT-C	3	vac.jet	0.455	N	N	=	N	=
I (E)	DMT-C	14	vac.pump	3.027	N	N	=	N	=
I (E)	DMT-C	20	scrubber	0.9085	N	N	=	N	=
I (E)	DMT-C	22	GTO sealpot	0.0185	N	N	=	N	=
I (E)	DMT-C	23	Rxt sealpot	0.004	N	N	=	N	=
I (E)	DMT-C	32	run/feed tank	0.312	N	N	=	N	=
I (E)	DMT-C	33	hold tank	0.156	N	N	=	N	=
I (E)	DMT-C	5	vac.jet	0.3515	N	N	=	N	=
I (E)	DMT-C	6	vac.jet	0.455	N	N	=	N	=
I (E)	DMT-C	8	vac.jet	0.205	N	N	=	N	=
I (E)	DMT-C	25	scrubber	1.816	N	N	=	N	=
I (E)	DMT-C	39	mix tank	0.312	N	N	=	N	=
I (E)	DMT-C	81	sealpot	0.0185	N	N	=	N	=
I (E)	DMT-C	89	work tank	0.85	N	N	=	N	=
I (E)	DMT-C	134	crystalize	0.92	N	N	=	N	=
I (E)	DMT-C	44	MeOH condenser vent	0.089	N	N	=	N	=
I (E)	DMT-C	69	work tank	2.041	N	N	=	N	=
I (E)	DMT-C	1	MeOH vac.pump	0.4915	N	N	=	N	=
Summary							=		=
Q (H)	DMT-C	11	refining cond vent	0.8	N	N	=	N	=
Q (H)	DMT-C	16	mix tank (18)	0.23	N	N	=	N	=
Q (H)	DMT-C	23	vac system	0.04	N	N	=	N	=
Q (H)	DMT-C	24	vac system	0.2	N	N	=	N	=
Q (H)	DMT-C	25	vac system	0.2	N	N	=	N	=

Table 11. PET Process Vent Data Summary

						*** Existing Analysis ***		*** New Analysis ***	
						HON/ACT	Existing MACT	HON/ACT	New MACT
Facility	Subcategory	Stream Number	Stream Name	Emissions (tpy)	Existing Control	Control Required (Y/N)	Floor Stringency [<,=,> the HON]	Control Required (Y/N)	Floor Stringency [<,=,> the HON]
Q (H)	DMT-C	26	refining system	1.2	N	N	=	N	=
Q (H)	DMT-C	27	vac system	0.04	N	N	=	N	=
Q (H)	DMT-C	29	mix tank	0.04	N	N	=	N	=
Summary							=		=
B (J)	DMT-C	2	EG mix tank	0.98	N	N	=	N	=
B (J)	DMT-C	3	MeOH recovery	1.206	N	N	=	N	=
Summary							=		=
C (L)	DMT-C	3	mix tank	0.2242	N	N	=	N	=
C (L)	DMT-C	4	MeOH recovery	6.62	N	N	=	Y	<
C (L)	DMT-C	11	proc.tank	0.8955	N	N	=	N	=
C (L)	poly.recy.	3	reactor	16.1605	N	Y	<	Y	<
C (L)	poly.recy.	2	Rxt charging	8.14	N	N	=	Y	<
Summary							=		<
G (M)	DMT-C	4	column	2.7228	N	N	=	N	=
Summary									
P (A)	Solid State[a]	1	reactor scrubber (E8)	4.2	N	N	=	N	=
P (A)	Solid State	2	rxt tank vent (E11)	0.2	N	N	=	N	=
Summary							=		=
I (E)	Solid State[a]	1	vac. pump (2)	0.588	N	N	=	N	=
I (E)	Solid State	3	1/2 hot air vent	0.882	N	N	=	N	=
I (E)	Solid State	5	3 hot air vent	4.693	N	N	=	Y	<
I (E)	Solid State	7	4 hot air vent	3.822	N	N	=	Y	<

Table 11. PET Process Vent Data Summary

Facility	Subcategory	Stream Number	Stream Name	Emissions (tpy)	Existing Control	*** Existing Analysis *** HON/ACT Control Required (Y/N)	*** Existing Analysis *** Existing MACT Floor Stringency [<,=,> the HON]	*** New Analysis *** HON/ACT Control Required (Y/N)	*** New Analysis *** New MACT Floor Stringency [<,=,> the HON]
I (E)	Solid State	9	zurn discharge	2.814	N	N	=	N	=
I (E)	Solid State	21	4 combined vents	19.11	N	Y	<	Y	<
Summary							=		< or =
Q (H)	Solid State[a]	1	Rxt/dryer scrubber	0.003	N	N	=	N	=
Q (H)	Solid State	2	Rxt/dryer scrubber	0.003	N	N	=	N	=
Q (H)	Solid State	3	Rxt/dryer bleed	1.32	N	N	=	N	=
Q (H)	Solid State	4	Rxt/dryer bleed	1.32	N	N	=	N	=
Q (H)	Solid State	6	Rxt/dryer bleed	0.013	N	N	=	N	=
Q (H)	Solid State	8	Rxt/drying cat convt vt	49.1	98% incin	not evaluated	unknown	not evaluated	unknown
Q (H)	Solid State	9	Rxt/dryer scrub vent	0.81	N	N	=	N	=
Summary							=		=
J (N)	Solid State[a]	1	crystallizer	0.12	98% incin	N	>	N	>
J (N)	Solid State	2	reactors	0.081	98% incin	N	>	N	>
J (N)	Solid State	3	glycol rec. vac.pump	1.968	98% incin	N	>	N	>
J (N)	Solid State	9	extrude/dry	0.01	N	N	=	N	=
Summary							>		>
R (W)	Solid State[a]	E8	adsorber	9.6	N	N	=	Y	<
	TPA-B Summary						=[b]		=[b]
P (A)	TPA-C	5	vac pump vent	3.5	N	N	=	N	=
P (A)	TPA-C	6	Est dist vent	1.5	N	N	=	N	=
Summary							=		=

Table 11. PET Process Vent Data Summary

						*** Existing Analysis ***		*** New Analysis ***	
						HON/ACT	Existing MACT	HON/ACT	New MACT
Facility	Subcategory	Stream	Stream	Emissions	Existing	Control Required	Floor Stringency	Control Required	Floor Stringency
		Number	Name	(tpy)	Control	(Y/N)	[<,=,> the HON]	(Y/N)	[<,=,> the HON]
S (B)	TPA-C	1	1* Est receiver	3.11	N	N	=	N	=
S (B)	TPA-C	5	2* Est receiver	0.23	N	N	=	N	=
S (B)	TPA-C	6	2* Est condenser	0.238	N	N	=	N	=
S (B)	TPA-C	7	glycol receiver	0.5	N	N	=	N	=
S (B)	TPA-C	9	steam jet vent	7.75	N	N	=	Y	<
S (B)	TPA-C	10	steam jet vent	44.32	N	Y	<	Y	<
S (B)	TPA-C	12	glycol receiver	0.11	N	N	=	N	=
S (B)	TPA-C	13	glycol receiver	0.13	N	N	=	N	=
S (B)	TPA-C	14	glycol receiver	0.08	N	N	=	N	=
S (B)	TPA-C	15	glycol receiver	0.03	N	N	=	N	=
S (B)	TPA-C	16	vac.pump	0.01	N	N	=	N	=
S (B)	TPA-C	17	vac.pump	0.01	N	N	=	N	=
S (B)	TPA-C	18	vac.pump	0.01	N	N	=	N	=
S (B)	TPA-C	23	glycol seal tank	0.91	N	N	=	N	=
Summary							=		=
I (E)	TPA-C	9	Prim Est vent	10.234	N	N	=	Y	<
I (E)	TPA-C		2 like 9	20.46	N	N	=	N	=
I (E)	TPA-C	34	SV(ent?)	0.0075	N	N	=	N	=
I (E)	TPA-C		2 like 34	0.015	N	N	=	N	=
I (E)	TPA-C	37	vac.pump	2.297	N	N	=	N	=
I (E)	TPA-C		2 like 37	4.59	N	N	=	N	=
I (E)	TPA-C	17	mix tank scrubber vt	0.2125	N	N	=	N	=
I (E)	TPA-C	18	mix tank scrub mani	0.021	N	N	=	N	=
Summary							=		=
Q (H)	TPA-C	15	mix tank	0.055	N	N	=	N	=
Q (H)	TPA-C	16	feed tank	0.055	N	N	=	N	=
Summary							=		=

Table 11. PET Process Vent Data Summary

						*** Existing Analysis ***		*** New Analysis ***	
						HON/ACT	Existing MACT	HON/ACT	New MACT
Facility	Subcategory	Stream	Stream	Emissions	Existing	Control Required	Floor Stringency	Control Required	Floor Stringency
		Number	Name	(tpy)	Control	(Y/N)	[<,=,> the HON]	(Y/N)	[<,=,> the HON]
C (L)	TPA-C	3	seal tank	2.6188	N	N	=	N	=
C (L)	TPA-C	6	mix tank	0.3797	N	N	=	N	=
C (L)	TPA-C	9	EG proc. tank	0.0035	N	N	=	N	=
Summary							=		=
J (N)	TPA-C	2	1° Est cond/receiver	8.35	N	N	=	Y	<
J (N)	TPA-C	3	2° Est cond/receiver	3.91	N	N	=	Y	<
J (N)	TPA-C	4	poly cond/receiver	8.18	N	N	=	Y	<
J (N)	TPA-C	5	extrude/dry	9.77	N	N	=	Y	<
J (N)	TPA-C	11	1° Est cond/receiver	2.87	N	N	=	N	=
J (N)	TPA-C	12	2° Est cond/receiver	0.91	N	N	=	N	=
J (N)	TPA-C	13	poly cond/receiver	2.83	N	N	=	N	=
J (N)	TPA-C	14	extrude/dry	1.23	N	N	=	N	=
J (N)	TPA-C	20	1° Est cond/receiver	0.488	N	N	=	N	=
J (N)	TPA-C	21	2° Est cond/receiver	0.158	N	N	=	N	=
J (N)	TPA-C	22	poly cond/receiver	0.48	N	N	=	N	=
J (N)	TPA-C	23	extrude/dry	0.21	N	N	=	N	=
J (N)	TPA-C	29	1° Est cond/receiver	0.974	N	N	=	N	=
J (N)	TPA-C	30	2° Est cond/receiver	0.305	N	N	=	N	=
J (N)	TPA-C	31	poly cond/receiver	0.95	N	N	=	N	=
J (N)	TPA-C	32	extrude/dry	0.42	N	N	=	N	=
J (N)	TPA-C	38	1° Est cond/receiver	1.644	N	N	=	N	=
J (N)	TPA-C	39	2° Est cond/receiver	0.264	N	N	=	N	=
J (N)	TPA-C	40	poly cond/receiver	1.63	N	N	=	N	=
J (N)	TPA-C	41	vac.pump	3.65	N	N	=	N	=
J (N)	TPA-C	42	extrude/dry	0.36	N	N	=	N	=
Summary							=		=

Table 11. PET Process Vent Data Summary

Facility	Subcategory	Stream Number	Stream Name	Emissions (tpy)	Existing Control	*** Existing Analysis *** HON/ACT Control Required (Y/N)	Existing MACT Floor Stringency [<,=,> the HON]	*** New Analysis *** HON/ACT Control Required (Y/N)	New MACT Floor Stringency [<,=,> the HON]
K (R)	TPA-C	41	2* Est condenser	0.00016	N	N	=	N	=
K (R)	TPA-C	42	2* Est condenser	0.00009	N	N	=	N	=
K (R)	TPA-C	51	2* Est condenser	0.00017	N	N	=	N	=
K (R)	TPA-C	52	2* Est condenser	0.00009	N	N	=	N	=
Summary							=		=
A (S)	TPA-C	1	Est condenser	0.02	N	N	=	N	=
A (S)	TPA-C	3	vac. pump	3.5	N	N	=	N	=
Summary							=		=

[a] Solid state data combined with collocated PET process to make MACT floor decisions.

[b] No data available. Floor assumed to be equivalent to the HON.

Table 12. MBS Process Vent Data Summary

Facility	Stream ID	Uncontrolled Emissions Rate (lb/yr)	Existing Control (Y/N)	Emissions Under Existing Control (lb/yr)	Existing Analysis: HON/ACT Control Required (Y/N)	Existing Analysis: Emissions Under HON/ACT Control	New Analysis: HON/ACT Control Required (Y/N)	New Analysis: Emissions Under HON/ACT Control
BD (AQ)	MA-1 SIFTER	2670	N	2670	N	2670	N	2670
BD (AQ)	MA-1 TREATER	17246	N	17246	N	17246	Y	345
BD (AQ)	MA-1 FILTER	4352	N	4352	N	4352	N	4352
BD (AQ)	MA-1 DRYER	11474	N	11474	N	11474	N	11474
BD (AQ)	MA-1 MM TANK	4056	Boiler	81	ACT - N	4056	ACT - N	4056
BD (AQ)	MA1 REACTOR VENT	202171	Boiler	4043	ACT - Y	4043	H/ACT - Y	404
BD (AQ)	MA-1 LATEX TANKS	1794	Boiler	36	N	1794	N	179
BD (AQ)	MA-1 COAGULATOR	21863	Boiler	437	N	21863	Y	437
BD (AQ)	MA-2 DRYER	11474	N	11474	N	11474	N	1147
BD (AQ)	MA-2 MM TANK	4056	Boiler	81	ACT - N	4056	ACT - N	405
BD (AQ)	MA-2 REACTOR VENT	202171	Boiler	4043	ACT - Y	4043	H/ACT - Y	404
BD (AQ)	MA-2 LATEX TANKS	1794	Boiler	36	N	1794	N	179
BD (AQ)	MA-2 SIFTER	2670	Boiler	53	N	2670	N	267
BD (AQ)	MA-2 COAGULATOR	21863	Boiler	437	N	21863	Y	43
BD (AQ)	MA-2 TREATER	17246	Boiler	345	N	17246	Y	34
BD (AQ)	MA-2 FILTER	4352	Boiler	87	N	4352	N	435
Summary	Percent Reduction			89%		75%		89%
	Floor <, =, > the HON					>		
BJ (AE)	MIX TANKS	1	N	1	ACT - N	1	ACT - N	
BJ (AE)	MONOMER SAMPLING (E3) (100%)	200	Flare	4	ACT - N	200	ACT - N	20
BJ (AE)	REACTOR 1 TANK (E5)	5204	Scrubber	104	ACT - Y	104	ACT - Y	10
BJ (AE)	REACTOR 2 TANK (E6)	12110	Flare	242	ACT - Y	242	ACT - Y	24
BJ (AE)	MIX FEED TANKS (E5)	1941	Scrubber	39	ACT - Y	39	ACT - Y	3
BJ (AE)	MIX FEED TANKS 2 (a)	93	Scrubber	2	ACT - N	93	ACT - N	9
BJ (AE)	EMULSION STORAGE 1 (E10)	68	N	68	ACT/H -N	68	H/ACT-N	6
BJ (AE)	EMULSTION STORAGE 2 (E 20)	68	N	68	ACT/H -N	68	H/ACT-N	6
BJ (AE)	FILTERING (E17)	3206	N	3206	N	3206	N	320
BJ (AE)	PRODUCT/AIR SEPARATION 1(E12)	5100	N	5100	N	5100	N	510
BJ (AE)	PRODUCT/AIR SEPARATION 2 (E13)	2660	N	2660	N	2660	N	266
BJ (AE)	PRO/AIR SEPARATION 3 (E14/15)	94	N	94	N	94	N	9
BJ (AE)	DRYER TO BOILER (E21)	37860	Boiler	757	Y (1)	757	Y	75
BJ (AE)	DRYER BYPASS (E22)	13800	N	13800	N	13800	Y	27
BJ (AE)	DRYER TO FURNACE (E23)	13200	Furnace	264	N	13200	Y	26
Summary	Percent Reduction			72%		59%		86
	Floor <, =, > the HON					>		
AS (L)	COAGULATION	16497	N	16497	N (2)	16497	Y	33
AS (L)	GRAFT REACTOR	4420	Flare	88	ACT/H -N (3)	4420	Y	8
AS (L)	Purification-Stripping	196	Flare	4	N	196	N	19
AS (L)	Dryer-Flash & Fluid Bed Dryer	10555	N	10555	N (4)	10555	Y	21
AS (L)	Rubber Reactor	1138	Flare	23	ACT/H -N	1138	Y	2
AS (L)	Monomer Mixing - not evaluated since trace emission	trace	N	trace	N	trace		trac
Summary	Percent Reduction			17%		0%		97
	Floor <, =, > the HON					>		

Table 13. SAN Process Vent Data Summary

Facility	Subcategory	Stream ID	Uncontrolled Emission Rate (lb/yr)	Existing Control (Y/N)	Emissions Under Exisitng Control (lb/yr)	Existing Analysis: HON/ACT Control Required (Y/N)	Existing Analysis: Emissions Under HON/ACT Control	New Analysis: HON/ACT Control Required (Y/N)	New Analysis: Emissions Under HON/ACT Control
BE (AC)		Product Drying-Rotary Dryer	5124	N	5124	N	5124	N	5124
BE (AC)		Product Transfer Slurry Tan	308	N	308	N	308	N	308
BE (AC)		Product Transfer Slurry Tan	308	N	308	N	308	N	308
BE (AC)		Reactor Charge Purge	6408	N	6408	ACT - N	6408	ACT - N	6408
BE (AC)		Vapor Recovery-Distillate Re	14	N	14	N	14	N	14
Summary	Emissions		12162		12162		12162		12162
	Percent Reduction				0%		0%		0%
	Floor <,=,> the HON						= HON		= HON
BF (AD)-B		Feedstock Premixing Tank	2020	Boiler	40	ACT - Y	40	H/ACT - Y	40
BF (AD)-B		Feedstock Recovery Tank	21000	Boiler	420	H/ACT - Y	420	H/ACT - Y	420
BF (AD)-B		Product Drying Rotary Dryer	4800	N	4800	N	4800	N	4800
BF (AD)-B		Product Storage-Hold Tank	1760	Boiler	35	H/ACT - Y	35	N	35
BF (AD)-B		Reactor-Condenser Seal Pot	3964	Boiler	79	ACT - N	3964	ACT - N	3964
BF (AD)-B		Reactor-Condenser Seal Pot	36	Boiler	1	ACT - N	36	ACT - N	36
Summary	Emissions		33580		5376		9296		9296
	Percent Reduction				84%		72%		72%
	Floor <,=,> the HON						> HON		> HON
BF(AD)-C		Product Stranding Extruders	836	N	836	H/ACT - N	836	H/ACT - N	836
BF(AD)-C		Reactor Process Equipment	12	Boiler	0	H/ACT - N	12	H/ACT - N	12
BF(AD)-C		Reactor Fugitive Vent	5464	N	5464	H/ACT - N	5464	H/ACT - N	5464
Summary	Emissions		6312		6300		6312		6312
	Percent Reduction				0%		0%		0%
	Floor <,=,> the HON						= HON		= HON
AM(AJ)		Die Exhaust Control	802	N	802	N	802	N	802
AM(AJ)		Pelletizing	68	N	68	N	68	N	68
AM(AJ)		Finishing	36	N	36	N	36	N	36
AM(AJ)		Initiator Mixing	16	N	16	ACT - N	16	ACT - N	16
AM(AJ)		Devolatilization-Vacuum System	83	97% scrubber *	56	N	83	N	83
Summary	Emissions		1005		977		1005		1005
	Percent Reduction				3%		0%		0%
	Floor <,=,> the HON						= HON		= HON
AW(AN)		Line 1 & 2 Exhaust	394080	Incinerator	7882	Y	7882	Y	7882
AW(AN)		Line 3 Exhaust	420760	Incinerator	8415	Y	8415	Y	8415
AW(AN)		Line 3 Cyclone Dust Collect	640	N	640	N	640	N	640
AW(AN)		Die Head	1640	N	1640	N	1640	N	1640
Summary	Emissions		817120		18577		18577		18577
	Percent Reduction				98%		98%		98%
	Floor <,=,> the HON						= HON		= HON

Table 13. SAN Process Vent Data Summary

Facility	Subcategory	Stream ID	Uncontrolled Emission Rate (lb/yr)	Existing Control (Y/N)	Emissions Under Exisitng Control (lb/yr)	Existing Analysis: HON/ACT Control Required (Y/N)	Existing Analysis: Emissions Under HON/ACT Control	New Analysis: HON/ACT Control Required (Y/N)	New Analysis: Emissions Under HON/ACT Control
AX(AM)		201 Mix Tank	1.84	Scr/burner	0.04	H/ACT - N	1.84	H/ACT - N	1.84
AX(AM)		201 ASA Reactor	5.92	Scr/burner	0.12	H/ACT - N	5.92	H/ACT - N	5.92
AX(AM)		210 AMSAN Reactor	82	Scr/burner	1.64	H/ACT - N	82	H/ACT - N	82
AX(AM)		301 Water Recovery	9.87	Scr/burner	0.20	H/ACT - N	9.87	H/ACT - N	9.87
AX(AM)		302 Water Suspension Rea	4.07	Scr/burner	0.08	H/ACT - N	4.07	H/ACT - N	4.07
AX(AM)		306 Water Recovery	0.0057	Scr/burner	0.00	H/ACT - N	0.0057	H/ACT - N	0.0057
AX(AM)		403 Water Recovery	0.001	Scr/burner	0.00	N	0.001	N	0.001
AX(AM)		304 Recovered Scrubber Ma	0.185	Scr/burner	0.00	N	0.185	N	0.185
AX(AM)		404 Dewatering & Separation	0.145	Scr/burner	0.00	N	0.145	N	0.145
AX(AM)		Extruder MeOH & Styrene	162	Car Adsorber	3.24	N	162	N	162
AX(AM)		Dryer MeOH & Styrene	4514	Car Adsorber	90.28	N	4514	N	4514
Summary	Emissions		4780		96		4780		4780
	Percent Reduction				98%		0%		0%
	Floor <,=,> the HON						> HON		> HON

* Scrubber controls EB and AN only, scrubbing liquid is ST, ST not controlled. Controlled emissions are 56 lb/yr.

Table 14. Process Vent Data Summary for PS, ABS, Nitrile, and MABS

Facility	Subcategory	Process Vent	Uncontrolled Emissions (lb/yr)	Existing Control (Y/N)	Emissions Under Existing Control (lb/yr)	Existing Analysis: HON/ACT Control Required (Y/N)	Existing Analysis: Emissions Under HON/ACT Control	New Analysis: HON/ACT Control Required (Y/N)	New Analysis: Emissions Under HON/ACT Control
BE (AC)	ABS,Be	A24 Product Drying-Rotary Dryer	107276.00	N	107,276.00	Y	2,145.52	Y	2,145.52
BE (AC)	ABS,Be	A2 Reactor Charge/Purge	388000.00	Y	7,760.00	Y	7,760.00	Y	7,760.00
BE (AC)	ABS,Be	A3 Reactor Charge/Purge-Strip Tank	6960.00	Y	139.20	Y	139.20	Y	139.20
Summary	Percent Reduction				77%		98%		98%
	Floor <, =, > the HON						= HON		= HON
BF (AD)	ABS,Be	B16 Product Drying-Syneresis Tanks	42980.00	Y	859.60	Y	859.60	Y	859.60
BF (AD)	ABS,Be	B18-B19 Product Drying-High Vacuum Tank	6984.00	Y	139.68	N	6,984.00	Y	139.68
BF (AD)	ABS,Be	A3 Cooling-Cooler	9880.00	Y	197.60	Y	197.60	Y	197.60
BF (AD)	ABS,Be	A8 Cooling-Cooler	5360.00	Y	107.20	Y	107.20	Y	107.20
BF (AD)	ABS,Be	A1 Feedstock Premixing-Tank	1160.00	Y	23.20	Y	23.20	Y	23.20
BF (AD)	ABS,Be	A6 Feedstock Premixing-Tank	1648.00	Y	32.96	Y	32.96	Y	32.96
BF (AD)	ABS,Be	A11 Product Drying-Syneresis Tank	376640.00	Y	7,532.80	Y	7,532.80	Y	7,532.80
BF (AD)	ABS,Be	A12 Product Drying-Centrifuge	9130.00	Y	182.60	N	9,130.00	Y	182.60
BF (AD)	ABS,Be	A13 Product Drying-High Vacuum Vent	9880.00	Y	197.60	N	9,880.00	Y	9,880.00
BF (AD)	ABS,Be	A14 Product Drying-Low Vacuum Vent	15480.00	Y	309.60	Y	309.60	Y	309.60
BF (AD)	ABS,Be	A4 Intermediate Storage-Tank	3840.00	Y	76.80	Y	76.80	Y	76.80
BF (AD)	ABS,Be	A5 Intermediate Storage-Tank	1854.00	Y	37.08	Y	37.08	Y	37.08
Summary	Percent Reduction				98%		93%		96%
	Floor <, =, > the HON						= HON[a]		= HON[a]
AU (AO)	ABS,Be	Reactors	--	N	--	Y	--	Y	--
							< HON		< HON
AH (Z)	ABS,Bl	S8 2-Stage Vacuum Jet-Steam Condenser St	11009.15	Y	220.18	Y	220.18	Y	220.18
AH (Z)	ABS,Bl	S6 Blowdown-Foam Tk Vent	25883.95	Y	517.68	Y	517.68	Y	517.68
AH (Z)	ABS,Bl	S5 Vacuum Sys-Steam Condenser	597.10	Y	11.94	Y	11.94	Y	11.94
Summary	Percent Reduction				98%		98%		98%
	Floor <, =, > the HON						= HON		= HON

Table 14. Process Vent Data Summary for PS, ABS, Nitrile, and MABS

Facility	Subcategory	Process Vent	Uncontrolled Emissions (lb/yr)	Existing Control (Y/N)	Emissions Under Existing Control (lb/yr)	Existing Analysis: HON/ACT Control Required (Y/N)	Existing Analysis: Emissions Under HON/ACT Control	New Analysis: HON/ACT Control Required (Y/N)	New Analysis: Emissions Under HON/ACT Control
BE(AC)	ABS,Bs	B9 Product Drying-Rotary Dryer	660.00	N	660.00	N	660.00	N	660.00
Summary	Percent Reduction				0%		0%		0%
	Floor <, =, > the HON						= HON		= HON
BF (AD)	ABS,Bs	D6 Feedstock Recovery-Distillate Tank	702.00	Y	14.04	N	702.00	N	702.00
BF (AD)	ABS,Bs	D1 Feedstock Charging-Rubber Dissolver	222.00	Y	4.44	N	222.00	N	222.00
BF (AD)	ABS,Bs	D3 Feedstock Charging-Reactor	6782.00	Y	135.64	Y	135.64	Y	135.64
BF (AD)	ABS,Bs	D2 Feedstock Charging-Reactor	2664.00	Y	53.28	Y	53.28	Y	53.28
BF (AD)	ABS,Bs	D5 Feedstock Charging-Reactor	2832.00	Y	56.64	Y	56.64	Y	56.64
BF (AD)	ABS,Bs	D9 Product Drying-Rotary Dryer	2702.00	Y	54.04	N	2,702.00	N	2,702.00
BF (AD)	ABS,Bs	D3 Reactor	7368.00	Y	147.36	Y	147.36	Y	147.36
Summary	Percent Reduction				98%		83%		83%
	Floor <, =, > the HON						= HON[a]		= HON[a]
AU (AO)	ABS,Ce	Predryer	1,356.00	N	1,356.00	N	1,356.00	N	1,356.00
AU (AO)	ABS,Ce	Dryer	1,393.00	N	1,393.00	N	1,393.00	N	1,393.00
AU (AO)	ABS,Ce	Reactor Coagulation Vacuum	109,358.00	Y	2,187.16	Y	2,187.16	Y	2,187.16
AU (AO)	ABS,Ce	Chip Maker	31,498.00	N	31,498.00	Y	629.96	Y	629.96
AU (AO)	ABS,Ce	Reactor Coagulation Vacuum	131,522.00	Y	2,630.44	Y	2,630.44	Y	2,630.44
AU (AO)	ABS,Ce	Dryer	32,647.00	N	32,647.00	N	32,647.00	Y	652.94
AU (AO)	ABS,Ce	Dryer	30,352.00	N	30,352.00	N	30,352.00	N	30,352.00
AU (AO)	ABS,Ce	Reactor Coagulation Vacuum	615,558.00	Y	12,311.16	Y	12,311.16	Y	12,311.16
AU (AO)	ABS,Ce	Reactor Coagulation Vacuum	557,722.00	Y	11,154.44	Y	11,154.44	Y	11,154.44
AU (AO)	ABS,Ce	Dryer	146,197.00	N	146,197.00	Y	2,923.94	Y	2,923.94
AU (AO)	ABS,Ce	Reactor Coagulation Vacuum	177,749.00	Y	3,554.98	Y	3,554.98	Y	3,554.98
AU (AO)	ABS,Ce	Dryer	94,733.00	N	94,733.00	Y	1,894.66	Y	1,894.66
AU (AO)	ABS,Ce	Reactor Coagulation Vacuum	165,687.00	Y	3,313.74	Y	3,313.74	Y	3,313.74
AU (AO)	ABS,Ce	Dryer	108,208.00	N	108,208.00	Y	2,164.16	Y	2,164.16
Summary	Percent Reduction				78%		95%		97%
	Floor <, =, > the HON						< HON		< HON

Table 14. Process Vent Data Summary for PS, ABS, Nitrile, and MABS

Facility	Subcategory	Process Vent	Uncontrolled Emissions (lb/yr)	Existing Control (Y/N)	Emissions Under Existing Control (lb/yr)	Existing Analysis: HON/ACT Control Required (Y/N)	Existing Analysis: Emissions Under HON/ACT Control	New Analysis: HON/ACT Control Required (Y/N)	New Analysis: Emissions Under HON/ACT Control
AV (AP)	ABS,Ce	Reactor system outlet, after stripper flasher (F	1,050,200.00	Y	21,004.00	Y	21,004.00	Y	21,004.00
AV (AP)	ABS,Ce	Butadiene recovery system outlet (feed to flar	105,020.00	Y	2,100.40	Y	2,100.40	Y	2,100.40
AV (AP)	ABS,Ce	Combined AN Absorber Outlet (Reactor Syste	245,078.00	Y	4,901.56	Y	4,901.56	Y	4,901.56
AV (AP)	ABS,Ce	Pre-Dryer Outlet	38,758.00	N	38,758.00	N	38,758.00	Y	775.16
AV (AP)	ABS,Ce	Rotary Dryer Outlet	107,136.00	N	107,136.00	N	107,136.00	Y	2,142.72
AV (AP)	ABS,Ce	Combined AN Absorber Outlet (Reactor Syste	322,651.00	Y	6,453.02	Y	6,453.02	Y	6,453.02
AV (AP)	ABS,Ce	Rotary Dryer Outlet	8,329.00	N	8,329.00	N	8,329.00	N	8,329.00
AV (AP)	ABS,Ce	Combined AN Absorber Outlet (Reactor Syste	244,316.00	Y	4,886.32	Y	4,886.32	Y	4,886.32
AV (AP)	ABS,Ce	Rotary Dryer Outlet	111,273.00	N	111,273.00	N	111,273.00	Y	2,225.4
Summary	Percent Reduction				86%		86%		98%
	Floor <, =, > the HON						= HON		= HON
BF (AD)	ABS,Cm	F7 Product Stranding-Extruder	26800.00	N	26,800.00	N	26,800.00	Y	536.0(
BF (AD)	ABS,Cm	F1 Reactor	101800.00	Y	2,036.00	N	101,800.00	Y	2036
BF (AD)	ABS,Cm	F2 Reactor	30600.00	Y	612.00	N	30,600.00	N	30600.00
BF (AD)	ABS,Cm	F4 Feedstock Storage-Press Tank	2800.00	Y	56.00	N	2,800.00	N	2800.0(
BF (AD)	ABS,Cm	F5 Feedstock Storage-Tank	4620.00	Y	92.40	Y	92.40	Y	92.4
BF (AD)	ABS,Cm	F6 Feedstock Storage-Tank	34626.00	N	34,626.00	Y	692.52	Y	692.52
Summary	Percent Reduction				68%		19%		82%
	Floor <, =, > the HON						= HON[b]		= HON
AO (AG)	ABS,Cm	Before Burner (99.9%)	2,103.00	Y	42.06	N	2,103.00	N	2,103.0(
AO (AG)	ABS,Cm	Before Demister Filter	1251.00	N	1,251.00	N	1,251.00	N	1251.00
Summary	Percent Reduction				61%		0%		0%
	Floor <, =, > the HON						= HON[b]		= HON[b]
AP (AH)	ABS,Cm	ABS Condenser	910.00	N	910.00	N	910.00	N	910.00
AP (AH)	ABS,Cm	ABS Feed Preparation	134,770.00	Y	2,695.40	Y	2,695.40	Y	2695.4
Summary	Percent Reduction				97%		97%		97%
	Floor <, =, > the HON						= HON		= HON

Table 14. *Process Vent Data Summary for PS, ABS, Nitrile, and MABS*

						Existing Analysis		New Analysis	
Facility	Subcategory	Process Vent	Uncontrolled Emissions (lb/yr)	Existing Control (Y/N)	Emissions Under Existing Control (lb/yr)	HON/ACT Control Required (Y/N)	Emissions Under HON/ACT Control	HON/ACT Control Required (Y/N)	Emissions Under HON/ACT Control
AM (AJ)	ABS,Cm	Absorber	950.00	N	950.00	N	950.00	N	950.00
AM (AJ)	ABS,Cm	Demister Filter	1,850.00	N	1,850.00	N	1,850.00	N	1,850.00
AM (AJ)	ABS,Cm	Devolatilization & Pelletizing (Before Filter)	1,850.00	N	1,850.00	N	1,850.00	N	1,850.00
Summary	Percent Reduction				0%		0%		0%
	Floor <, =, > the HON						= HON		= HON
AN (AL)	ABS,Cm	Devolatilization & Pelletizing	307.00	N	307.00	N	307.00	N	307.00
AN (AL)	ABS,Cm	Feed Preparation (Before boiler)	360.00	Y	7.20	N	360.00	N	360.00
AN (AL)	ABS,Cm	Condensers (Before boiler)	365.00	N	365.00	N	365.00	N	365.00
Summary	Percent Reduction				34%		0%		0%
	Floor <, =, > the HON						= HON[b]		= HON[b]
AU (AO)	MABS	Predryer	20,386.00	N	20,386.00	Y	407.72	Y	407.72
AU (AO)	MABS	Dryer	72,475.00	N	72,475.00	Y	1,449.50	Y	1,449.50
AU (AO)	MABS	Reactor Coagulation Vacuum	21,977.00	Y	439.54	Y	439.54	Y	439.54
AU (AO)	MABS	Reactor Coagulation Vacuum	107,013.00	Y	2,140.26	Y	2,140.26	Y	2,140.26
Summary	Percent Reduction				57%		98%		98%
	Floor <, =, > the HON						= HON[b]		= HON[b]
AI (AA)	Nitrile	P06 Paste Line-Screens #1	8400.00	N	8,400.00	Y	168.00	Y	168
Summary	Percent Reduction				0%		98%		98%
	Floor <, =, > the HON						< HON		< HON
Z (W)	PS,Bs	E6-E9 Reactor	4744.00	N	4,744.00	Y	94.88	Y	94.88
Z (W)	PS,Bs	E10-E13 Devolatilizer Vac Sys	6855.20	N	6,855.20	Y	137.10	Y	137.104
Z (W)	PS,Bs	E14-E19(-E16) Die Head -Extruder Quench S	6962.60	N	6,962.60	N	6,962.60	N	6962.60
Summary	Percent Reduction				0%		61%		61%
	Floor <, =, > the HON						< HON		< HON
W (A)	PS,C	E6 Process Purge	700.00	N	700.00	N	700.00	N	700.00
Summary	Percent Reduction				0%		0%		0%
	Floor <, =, > the HON						= HON		= HON

Table 14. Process Vent Data Summary for PS, ABS, Nitrile, and MABS

Facility	Subcategory	Process Vent	Uncontrolled Emissions (lb/yr)	Existing Control (Y/N)	Emissions Under Existing Control (lb/yr)	Existing Analysis: HON/ACT Control Required (Y/N)	Existing Analysis: Emissions Under HON/ACT Control	New Analysis: HON/ACT Control Required (Y/N)	New Analysis: Emissions Under HON/ACT Control
BF (AD)	PS,C	K1 Reactor	6300.00	Y	126.00	Y	126.00	Y	126
BF (AD)	PS,C	K2 'Spent Feedstock Storage-Tank	2800.00	Y	56.00	N	2,800.00	N	2800.00
Summary	Percent Reduction				98%		68%		68%
	Floor <, =, > the HON						= HON[a]		= HON[a]
AO (AG)	PS,C	Before Burner (99.9%)	1,823.00	Y	36.46	N	1,823.00	N	1,823.00
AO (AG)	PS,C	Before Demister Filter	2,152.00	N	2,152.00	N	2,152.00	N	2,152.00
Summary	Percent Reduction				45%		0%		0%
	Floor <, =, > the HON						= HON[b]		= HON[b]
AP (AH)	PS,C	Die Demister	395.00	N	395.00	N	395.00	N	395.00
AP (AH)	PS,C	PS Raw Material Storage	3,960.00	N	3,960.00	N	3,960.00	N	3,960.00
Summary	Percent Reduction				0%		0%		0%
	Floor <, =, > the HON						= HON		= HON
AQ (AI)	PS,C	Before Eliminator (Die Exhaust Hoods,99%)	62,000.00	N	62,000.00	N	62,000.00	Y	1,240.0[illegible]
AQ (AI)	PS,C	Monomer Recovery Vent	2,716.00	N	2,716.00	N	2,716.00	N	2,716.0[illegible]
Summary	Percent Reduction				0%		0%		94%
	Floor <, =, > the HON						= HON		< HON
AR (AK)	PS,C	PS Die Vent	350.00	N	350.00	N	350.00	N	350.00
AR (AK)	PS,C	Demister (after die vent)	370.00	N	370.00	N	370.00	N	370.00
AR (AK)	PS,C	PS Vacuum Pumps	2,548.00	N	2,548.00	N	2,548.00	N	2,548.0[illegible]
Summary	Percent Reduction				0%		0%		0%
	Floor <, =, > the HON						= HON		= HON
AN (AL)	PS,C	Devolatilization & Pelletizing	323.00	N	323.00	N	323.00	N	323.00
AN (AL)	PS,C	Condenser (before boiler)	26.00	N	26.00	N	26.00	N	26.00
AN (AL)	PS,C	Condensers (before boiler)	1,174.00	N	1,174.00	N	1,174.00	N	1,174.00
Summary	Percent Reduction				0%		0%		0%
	Floor <, =, > the HON						= HON		= HON

Table 14. Process Vent Data Summary for PS, ABS, Nitrile, and MABS

Facility	Subcategory	Process Vent	Uncontrolled Emissions (lb/yr)	Existing Control (Y/N)	Emissions Under Existing Control (lb/yr)	Existing Analysis: HON/ACT Control Required (Y/N)	Existing Analysis: Emissions Under HON/ACT Control	New Analysis: HON/ACT Control Required (Y/N)	New Analysis: Emissions Under HON/ACT Control
AX (AM)	PS,C	Carbon Adsorption Canister (95%)	418.02	N	418.02	N	418.02	N	418.02
AX (AM)	PS,C	Carbon Adsorber - 132	235.10	N	235.10	N	235.10	N	235.10
AX (AM)	PS,C	Carbon Adsorber - 136	484.60	N	484.60	N	484.60	N	484.60
AX (AM)	PS,C	Carbon Adsorber - 139	378.00	N	378.00	N	378.00	N	378.00
AX (AM)	PS,C	Carbon Adsorber - 101	14.36	N	14.36	N	14.36	N	14.36
AX (AM)	PS,C	Carbon Adsorber - 131	26.10	N	26.10	N	26.10	N	26.10
AX (AM)	PS,C	Carbon Adsorber	0.06	N	0.06	N	0.06	N	0.06
AX (AM)	PS,C	Refrigerated Condenser & Carbon Adsorber -	39.70	N	39.70	N	39.70	N	39.70
AX (AM)	PS,C	Refrigerated Condenser and Carbon Adsorber	39.70	N	39.70	N	39.70	N	39.70
AX (AM)	PS,C	3013-01(before control)	14,700.00	N	14,700.00	N	14,700.00	N	14,700.00
AX (AM)	PS,C	Condenser & Carbon Adsorption Cannister	51.17	N	51.17	N	51.17	Y	1.02
AX (AM)	PS,C	Condenser & Carbon Adsorption System - 1	39.70	N	39.70	N	39.70	N	39.70
AX (AM)	PS,C	Condenser & Carbon Adsorption System - 2	39.70	N	39.70	N	39.70	N	39.70
Summary	Percent Reduction				0%		0%		0%
	Floor <, =, > the HON						= HON		= HON
AC (B)	PS,C	E11 Vapor Recovery	3860.00	N	3,860.00	N	3,860.00	N	3860.00
Summary	Percent Reduction				0%		0%		0%
	Floor <, =, > the HON						= HON		= HON
BI (N)	PS,C	E7 Die Heads-Extrusion Bath	410.00	N	410.00	N	410.00	N	410.00
BI (N)	PS,C	E2 Die Heads-Extrusion Bath	560.00	N	560.00	N	560.00	N	560.00
BI (N)	PS,C	E1 Organic Trap	9300.00	N	9,300.00	N	9,300.00	Y	186
Summary	Percent Reduction				0%		0%		89%
	Floor <, =, > the HON						= HON		< HON

[a] Majority of process vents or uncontrolled emissions meet the HON requirements. Judged equivalent to the HON.

[b] Not clearly more stringent or less stringent than the HON, judged to be equivalent.

APPENDIX A

RAW DATA TABLES FOR STORAGE VESSELS

Table A-1. Storage Vessel Raw Data For MBS, SAN, ASA/AMSAN and PET

				Existing Analysis		New Analysis	
Facility	Capacity (gal)	Vapor Pressure (psia)	Current Control (Y/N)	HON Control Required (Y/N)	MACT Floor <,=,> the HON	HON Control Required (Y/N)	MACT Floor <,=,> the HON
BJ(AE)	--	0.0029	N	N	=	N	=
(MBS)	--	0.09	N	N	=	N	=
	--	0.55	N	N	=	Y	<
	--	0.586	N	N	=	Y	<
	--	34.8	Y	Y	=	Y	=
Summary					=		=
AS(L)	--	0.09	Y	N	>	N	>
(MBS)	--	0.55	Y	N	>	Y	=
	--	0.586	Y	N	>	Y	=
	--	34.8	Y	Y	=	Y	=
Summary					>		=
BD (AQ)	28,600	0.09	N	N	=	N	=
(MBS)	28,600	0.09	N	N	=	N	=
	2,500	0.38	Y	N	>	N	>
	28,600	0.55	N	N	=	N	=
	118,800	0.55	N	N	=	Y	<
	16,900	1.47	Y	N	>	N	>

				Existing Analysis		New Analysis	
Facility	Capacity (gal)	Vapor Pressure (psia)	Current Control (Y/N)	HON Control Required (Y/N)	MACT Floor <,=,> the HON	HON Control Required (Y/N)	MACT Floor <,=,> the HON
	16,900	1.47	Y	N	>	N	>
	52,900	34.8	Y	Y	=	Y	=
	52,900	34.8	Y	Y	=	Y	=
Summary					=		=
AX (AM)	10,200	0.077	Y	N	>	N	>
ASA/AMSAN	1,000	0.47	Y	N	>	N	>
	20,000	15.9	Y	Y	=	Y	=
Summary					>		>
BF (AD)	--	0.00395	N	N	=	N	=
(SAN,B & SAN,C)	--	0.529	N	N	=	UNK	UNK
	--	1.42	N	UNK	UNK	UNK	UNK
	--	1.42	Y	UNK	UNK	UNK	UNK
	--	1.62	Y	UNK	UNK	UNK	UNK
	--	1.62	Y	UNK	UNK	UNK	UNK
	--	1.62	Y	UNK	UNK	UNK	UNK
Summary					=		=
BE (AC)	--	0.09	N	N	=	N	=
(SAN, B)	--	0.09	N	N	=	N	=

				Existing Analysis		New Analysis	
Facility	Capacity (gal)	Vapor Pressure (psia)	Current Control (Y/N)	HON Control Required (Y/N)	MACT Floor <,=,> the HON	HON Control Required (Y/N)	MACT Floor <,=,> the HON
	--	1.62	Y	UNK	UNK	UNK	UNK
	--	34.8	Y	Y	=	Y	=
Summary					=		=
AW (AN)	50,000	.00395	N	N	=	N	=
(SAN, C)	600,000	.0735	Y	N	>	N	>
	230,000	.5996	Y	N	>	Y	=
	8,000	1.45	Y	N	>	N	>
	600,000	1.62	Y	Y	=	Y	=
Summary					>		>
AM (AJ)	20,000	0.09	N	N	=	N	=
(SAN, C)	20,000	0.09	N	N	=	N	=
	30,000	0.09	N	N	=	N	=
	30,000	0.09	N	N	=	N	=
	4,000	0.137	N	N	=	N	=
	15,000	0.137	N	N	=	N	=
	4,000	0.711	N	N	=	N	=
	20,000	0.711	N	N	=	N	=

				Existing Analysis		New Analysis	
Facility	Capacity (gal)	Vapor Pressure (psia)	Current Control (Y/N)	HON Control Required (Y/N)	MACT Floor <,=,> the HON	HON Control Required (Y/N)	MACT Floor <,=,> the HON
	1,500	1.5	N	N	=	N	=
	20,000*	1.62	N	N	=	N	=
Summary					=		=
L(22)	29,800	0.00244	N	N	=	N	=
(PET DMT,B)	100,000	0.00244	N	N	=	N	=
	27,800	0.00244	N	N	=	N	=
	29,800	0.00244	N	N	=	N	=
	29,800	0.00244	N	N	=	N	=
	32,700	0.073	N	N	=	N	=
	36,000	0.29	N	N	=	N	=
	36,000	0.29	N	N	=	N	=
	32,700	2.21	Y	Y	=	Y	=
	32,700	2.21	Y	Y	=	Y	=
	32,700	2.21	Y	Y	=	Y	=
Summary					=		=
AG (16)	132,182	0.00116	N	N	=	N	=
(PET DMT,B)	107,234	0.0188	N	N	=	N	=
	107,234	0.0188	N	N	=	N	=

				Existing Analysis		New Analysis	
Facility	Capacity (gal)	Vapor Pressure (psia)	Current Control (Y/N)	HON Control Required (Y/N)	MACT Floor <,=,> the HON	HON Control Required (Y/N)	MACT Floor <,=,> the HON
	107,231	1.827	N	Y	<	Y	<
	107,231	1.827	N	Y	<	Y	<
Summary					=		=
N (15)	993,504	0.00232	N	N	=	N	=
(PET DMT,B)	993,504	0.00232	N	N	=	N	=
	1,521,470	3.809	N	Y	<	Y	<
	1,521,470	3.809	N	Y	<	Y	<
Summary					=		=
I (28)	97,000*	0.00224	N	N	=	N	=
(PET TPA,C;	8,000*	0.0024	N	N	=	N	=
DMT,C; &	10,000*	0.00243	N	N	=	N	=
DMT,B)	52,000*	0.00243	N	N	=	N	=
	97,000	0.00243	N	N	=	N	=
	100,000*	0.00243	N	N	=	N	=
	97,000*	0.00244	N	N	=	N	=
	71,500*	0.174	N	N	=	Y	<
	80,000	0.174	N	N	=	Y	<
	254,500*	0.174	N	N	=	Y	<

				Existing Analysis		New Analysis	
Facility	Capacity (gal)	Vapor Pressure (psia)	Current Control (Y/N)	HON Control Required (Y/N)	MACT Floor <,=,> the HON	HON Control Required (Y/N)	MACT Floor <,=,> the HON
	254,500*	2.126	N	Y	<	Y	<
Summary					=		=
G (25)	2,350*	0.03	N	N	=	N	=
(PET DMT,C)	3,670*	0.03	N	N	=	N	=
	1,151	3.5	N	N	=	N	=
Summary					=		=
K (21)	30,000*	0.0024	N	N	=	N	=
(PET TPA,C)	30,000*	0.17	N	N	=	N	=
Summary					=		=
J (23)	35,500*	0.0024	N	N	=	N	=
(PET, TPA,C)	150,000	0.0024	N	N	=	N	=
	35,500	0.00244	N	N	=	N	=
	130,000	0.00244	N	N	=	N	=
	140,000	0.00244	N	N	=	N	=
	35,500*	0.1695	N	N	=	N	=
	159,800	0.1695	N	N	=	Y	<

				Existing Analysis		New Analysis	
Facility	Capacity (gal)	Vapor Pressure (psia)	Current Control (Y/N)	HON Control Required (Y/N)	MACT Floor <,=,> the HON	HON Control Required (Y/N)	MACT Floor <,=,> the HON
	35,500	0.1754	N	N	=	N	=
Summary					=		=
S (29)	38,000*	0.0024	N	N	=	N	=
(PET TPA,C)	150,000*	0.0024	N	N	=	N	=
	300,000*	0.0024	N	N	=	N	=
	150,000*	0.17	N	N	=	Y	<
Summary					=		=
A (19)	200,000*	0.0024	N	N	=	N	=
(PET TPA,C)	25,000	0.17	N	N	=	N	=
	200,000	0.17	N	N	=	Y	<
Summary					=		=

* Multiple Tanks

Table A-2. Storage Vessel Raw Data from Generic ICR'S for PS AND ABS

					Existing Analysis		New Analysis	
		Vapor	Calculated	Existing	HON Control		HON Control	
		Pressure	Capacity	Control	Required	MACT Floor	Required	MACT Floor
Facility	Subcategory	(psia)	(gal)	(Y/N)	(Y/N)	<,=,> the HON	(Y/N)	<,=,> the HON
AF(C)	EPS	0.2	3,200	N	N	=	N	=
AJ(D)	PS,C	0.068	1,176,297	N	N	=	N	=
AJ(D)	PS,C	0.071	1,176,297	N	N	=	N	=
AJ(D)	PS,C	0.071	54,414	N	N	=	N	=
AJ(D)	PS,C	0.071	54,414	N	N	=	N	=
AJ(D)	PS,C	0.068	649,790	N	N	=	N	=
AJ(D)	PS,C	0.068	649,790	N	N	=	N	=
AJ(D)	PS,C	0.125	28,867	N	N	=	N	=
AJ(D)	PS,C	0.071	91,806	N	N	=	N	=
AJ(D)	PS,C	0.071	2,015	N	N	=	N	=
AJ(D)	PS,C	0.071	2,015	N	N	=	N	=
AJ(D)	PS,C	0.071	10,153	N	N	=	N	=
AJ(D)	PS,C	0.071	10,153	N	N	=	N	=
AJ(D)	PS,C	0.071	6,802	N	N	=	N	=
AJ(D)	PS,C	0.071	3,008	N	N	=	N	=
AJ(D)	PS,C	0.071	3,008,289	N	N	=	N	=
AJ(D)	PS,C	0.071	3,008,289	N	N	=	N	=
AJ(D)	PS,C	0.071	3,008,289	N	N	=	N	=
AJ(D)	PS,C	0.071	2,015	N	N	=	N	=
AJ(D)	PS,C	0.089	6,686	N	N	=	N	=
AJ(D)	PS,C	0.291	6,802	N	N	=	N	=
AJ(D)	PS,C	0.291	2,952	N	N	=	N	=
AJ(D)	PS,C	0.084	1,614	N	N	=	N	=
AJ(D)	PS,C	0.084	1,614	N	N	=	N	=
AJ(D)	PS,C	0.096	6,686	N	N	=	N	=
AJ(D)	PS,C	0.121	6,686	N	N	=	N	=
AJ(D)	PS,C	0.0845	734	N	N	=	N	=
AJ(D)	PS,C	0.0845	734	N	N	=	N	=
AJ(D)	PS,C	0.0845	734	N	N	=	N	=
AJ(D)	PS,C	0.125	376	N	N	=	N	=
AJ(D)	PS,C	0.125	1,269	N	N	=	N	=
AJ(D)	PS,C	0.071	1,614	N	N	=	N	=
AJ(D)	PS,C	0.071	734	N	N	=	N	=

Table A-2. Storage Vessel Raw Data from Generic ICR'S for PS AND ABS

Facility	Subcategory	Vapor Pressure (psia)	Calculated Capacity (gal)	Existing Control (Y/N)	HON Control Required (Y/N)	MACT Floor <,=,> the HON	HON Control Required (Y/N)	MACT Floor <,=,> the HON
AJ(D)	PS,C	0.071	1,614	N	N	=	N	=
AJ(D)	PS,C	0.071	734	N	N	=	N	=
AJ(D)	PS,C	0.071	5,038	N	N	=	N	=
AJ(D)	PS,C	0.071	5,038	N	N	=	N	=
AJ(D)	PS,C	0.331	734	N	N	=	N	=
AJ(D)	PS,C	0.331	376	N	N	=	N	=
AJ(D)	PS,C	0.331	376	N	N	=	N	=
AJ(D)	PS,C	0.331	376	N	N	=	N	=
AJ(D)	PS,C	0.331	376	N	N	=	N	=
AJ(D)	PS,C	0.331	159	N	N	=	N	=
AJ(D)	PS,C	0.331	159	N	N	=	N	=
AJ(D)	PS,C	0.071	159	N	N	=	N	=
AJ(D)	PS,C	0.071	159	N	N	=	N	=
AK(E)	PS,B	0.0657	30,000	N	N	=	N	=
AK(E)	PS,B	0.0657	30,000	N	N	=	N	=
AK(E)	PS,B	0.0657	30,000	N	N	=	N	=
AL(F)	PS,B	0.0657	300,000	N	N	=	N	=
AL(F)	PS,B	0.0657	300,000	N	N	=	N	=
AL(F)	PS,B	0.0657	700,000	N	N	=	N	=
AL(F)	PS,B	0.0657	51,500	N	N	=	N	=
AL(F)	PS,B	0.0657	51,500	N	N	=	N	=
AL(F)	PS,B	0.0657	46,500	N	N	=	N	=
AL(F)	PS,B	0.0657	16,900	N	N	=	N	=
AL(F)	PS,B	0.0657	2,260	N	N	=	N	=
AL(F)	PS,B	0.0657	6,000	N	N	=	N	=
AL(F)	PS,B	0.1042	6,000	N	N	=	N	=
AL(F)	PS,B	0.1042	5,580	N	N	=	N	=
AL(F)	PS,B	0.1042	10,245	N	N	=	N	=
AL(F)	PS,B		200	N	N	=	N	=
AL(F)	PS,B	0.0657	700,000	N	N	=	N	=
AL(F)	PS,B	0.0657	98,000	N	N	=	N	=
AL(F)	PS,B	0.0657	13,000	N	N	=	N	=
AD(Y)	PS,C	0.095	10,153	N	N	=	N	=
AD(Y)	PS,C	0.095	10,153	N	N	=	N	=

Table A-2. Storage Vessel Raw Data from Generic ICR'S for PS AND ABS

Facility	Subcategory	Vapor Pressure (psia)	Calculated Capacity (gal)	Existing Control (Y/N)	HON Control Required (Y/N)	MACT Floor <,=,> the HON	HON Control Required (Y/N)	MACT Floor <,=,> the HON
AD(Y)	PS,C	0.0665	5,876	N	N	=	N	=
AD(Y)	PS,C	0.0665	10,153	N	N	=	N	=
AD(Y)	PS,C	0.0665	10,153	N	N	=	N	=
W(A)	PS,C	0.087		Y	N	>	N	>
W(A)	PS,C	0.134		Y	?	?	?	?
AC(B)	PS,C	0.045		??	N	?	N	?
AC(B)	PS,C	0.045		??	N	?	N	?
AC(B)	PS,C	0.045		??	N	?	N	?
AC(B)	PS,C	0.045		??	N	?	N	?
AB(S)	EPS,PS,B	0.086		N	N	=	N	=
AB(S)	EPS,PS,B	0.086		N	N	=	N	=
AB(S)	EPS,PS,B	0.086		N	N	=	N	=
AB(S)	EPS,PS,B			Y	?	?	?	?
AB(S)	EPS,PS,B			Y	?	?	?	?
AB(S)	EPS,PS,B	0.086		N	N	=	N	=
AB(S)	EPS,PS,B			Y	?	?	?	?
X(U)	PS,C	0.086		Y	N	>	N	>
X(U)	PS,C	0.086		Y	N	>	N	>
X(U)	PS,C	0.086		Y	N	>	N	>
Y(V)	PS,B	0.086		Y	N	>	N	>
BF (AD)	PS,C & ABS	0.086		N	N	=	N	=
BF (AD)	PS,C & ABS	0.086		N	N	=	N	=
BF (AD)	PS,C & ABS	1.62		Y	?	?	?	?
BF (AD)	PS,C & ABS			Y	Y	=	Y	=
BF (AD)	PS,C & ABS	1.62		N	?	?	?	?
BF (AD)	PS,C & ABS	1.62		N	?	?	?	?
BF (AD)	PS,C & ABS	1.62		N	?	?	?	?
BE (AC)	ABS	1.62		Y	?	?	?	?
BE (AC)	ABS	1.62		Y	?	?	?	?

Table A-2. Storage Vessel Raw Data from Generic ICR'S for PS AND ABS

Facility	Subcategory	Vapor Pressure (psia)	Calculated Capacity (gal)	Existing Control (Y/N)	HON Control Required (Y/N)	MACT Floor <,=,> the HON	HON Control Required (Y/N)	MACT Floor <,=,> the HON
BE (AC)	ABS	1.62		Y	?	?	?	?
BE (AC)	ABS	0.004		N	N	=	N	=
BE (AC)	ABS	0.529		N	N	=	?	=
BE (AC)	ABS	1.42		Y	?	?	?	?
BE (AC)	ABS	1.42		N	?	?	?	?
BE (AC)	ABS	0.086		N	N	=	N	=
BE (AC)	ABS	0.086		N	N	=	N	=
BE (AC)	ABS	0.086		N	N	=	N	=
BE (AC)	ABS	0.086		N	N	=	N	=
BE (AC)	ABS	0.086		N	N	=	N	=
BE (AC)	ABS	Pressure Tank		Y	Y	=	Y	=
BE (AC)	ABS	Pressure Tank		Y	Y	=	Y	=
AZ(H)	PS,C	0.41		Y	N	>	?	?
AZ(H)	PS,C	0.086		Y	N	>	N	>
AZ(H)	PS,C	0.086		Y	N	>	N	>
AZ(H)	PS,C	0.086		Y	N	>	N	>
AY(I)	PS,C & PS,B	0.086		Y	N	>	N	>
AY(I)	PS,C & PS,B	0.086		Y	N	>	N	>
BA(J)	EPS,PS,C & PS,B	0.086		Y	N	>	N	>
BA(J)	EPS,PS,C & PS,B	0.086		Y	N	>	N	>
BA(J)	EPS,PS,C & PS,B	0.086		Y	N	>	N	>
BA(J)	EPS,PS,C & PS,B	0.086		Y	N	>	N	>

Table A-3. Storage Vessel Raw Data from Section 114 Responses for PS, ABS, AND MABS

					Existing Analysis		New Analysis	
Facility	Subcategory	Vapor Pressure (psia)	Tank Capacity (gal)	Existing Control (Y/N)	HON Control Required (Y/N)	MACT Floor <,=,> the HON	HON Control Required (Y/N)	MACT Floor <,=,> the HON
AO(AG)	ABS/PS,C	0.0782	150000	N	N	=	N	=
AO(AG)	ABS/PS,C	0.0923	12000	Y	N	>	N	>
AO(AG)	ABS/PS,C	0.126	12000	Y	N	>	N	>
AO(AG)	ABS/PS,C	0.0928	4300	N	N	=	N	=
AO(AG)	ABS/PS,C	1.55	49000	Y	Y	=	Y	=
AO(AG)	ABS/PS,C	1.55	49000	Y	Y	=	Y	=
AO(AG)	ABS/PS,C	0.0928	15000	Y	N	>	N	>
AO(AG)	ABS/PS,C	0.101	15000	Y	N	>	N	>
AO(AG)	ABS/PS,C	0.283	20000	Y	N	>	N	>
AO(AG)	ABS/PS,C	0.0782	29500	Y	N	>	N	>
AO(AG)	ABS/PS,C	0.0782	29500	Y	N	>	N	>
AO(AG)	ABS/PS,C	0.0782	29500	Y	N	>	N	>
AQ(AI)	PS,C	0.068	15000	N	N	=	N	=
AQ(AI)	PS,C	0.068	10000	N	N	=	N	=
AQ(AI)	PS,C	0.049	1000	N	N	=	N	=
AQ(AI)	PS,C	0.048	840000	Y	N	>	N	>
AQ(AI)	PS,C	0.068	8750	N	N	=	N	=
AQ(AI)	PS,C	0.048	110000	Y	N	>	N	>
AQ(AI)	PS,C	0.049	47000	N	N	=	N	=
AQ(AI)	PS,C	0.049	47000	N	N	=	N	=
AQ(AI)	PS,C	0.049	67000	N	N	=	N	=
AQ(AI)	PS,C	0.049	1000	N	N	=	N	=
AM(AJ)	ABS/PS,C	0.14	10000	N	N	=	N	=
AM(AJ)	ABS/PS,C	0.14	8500	Y	N	>	N	>
AM(AJ)	ABS/PS,C	0.09	10000	Y	N	>	N	>
AM(AJ)	ABS/PS,C	0.09	20000	N	N	=	N	=
AM(AJ)	ABS/PS,C	0.09	20000	N	N	=	N	=
AM(AJ)	ABS/PS,C	0.09	30000	N	N	=	N	=
AM(AJ)	ABS/PS,C	0.09	30000	N	N	=	N	=
AM(AJ)	ABS/PS,C	0.137	4000	Y	N	>	N	>
AM(AJ)	ABS/PS,C	0.137	15000	N	N	=	N	=
AM(AJ)	ABS/PS,C	1.62	20000	Y	N	>	N	>
AM(AJ)	ABS/PS,C	1.62	20000	Y	N	>	N	>
AM(AJ)	ABS/PS,C	1.62	20000	Y	N	>	N	>
AM(AJ)	ABS/PS,C	0.711	20000	N	N	=	N	=
AM(AJ)	ABS/PS,C	0.711	4000	N	N	=	N	=
AM(AJ)	ABS/PS,C	1.5	1500	N	N	=	N	=
AM(AJ)	ABS/PS,C	2.08	10000	Y	N	>	Y	=
AM(AJ)	ABS/PS,C	2.08	10000	Y	N	>	Y	=
AM(AJ)	ABS/PS,C	2.08	10000	Y	N	>	Y	=

Table A-3. Storage Vessel Raw Data from Section 114 Responses for PS, ABS, AND MABS

					Existing Analysis		New Analysis	
Facility	Subcategory	Vapor Pressure (psia)	Tank Capacity (gal)	Existing Control (Y/N)	HON Control Required (Y/N)	MACT Floor <,=,> the HON	HON Control Required (Y/N)	MACT Floor <,=,> the HON
AM(AJ)	ABS/PS,C	0.0773	25105	N	N	=	N	=
AM(AJ)	ABS/PS,C	17.6	420000	Y	Y	=	Y	=
AM(AJ)	ABS/PS,C	0.09	17000	NA	NA	NA	NA	NA
AM(AJ)	ABS/PS,C	0.09	17000	NA	NA	NA	NA	NA
AP(AH)	ABS/PS,C	0.07	846000	N	N	=	N	=
AP(AH)	ABS/PS,C	0.07	846000	N	N	=	N	=
AP(AH)	ABS/PS,C	0.07	47000	Y	N	>	N	>
AP(AH)	ABS/PS,C	0.1	25000	Y	N	>	N	>
AP(AH)	ABS/PS,C	0.35	32000	Y	N	>	N	>
AP(AH)	ABS/PS,C	0.35	47000	Y	N	>	Y	=
AP(AH)	ABS/PS,C	0.11	8000	N	N	=	N	=
AP(AH)	ABS/PS,C	1.3	110000	N	Y	<	Y	<
AP(AH)	ABS/PS,C	0.1	22000	Y	N	>	N	>
AP(AH)	ABS/PS,C	0.1	22000	Y	N	>	N	>
AP(AH)	ABS/PS,C	0.13	11000	Y	N	>	N	>
AP(AH)	ABS/PS,C	0.11	11000	Y	N	>	N	>
AP(AH)	ABS/PS,C	0.29	22000	Y	N	>	N	>
AP(AH)	ABS/PS,C	0.29	22000	Y	N	>	N	>
AR(AK)	PS,C	0.087	250000	N	N	=	N	=
AR(AK)	PS,C	0.087	100000	N	N	=	N	=
AR(AK)	PS,C	0.087	30000	N	N	=	N	=
AR(AK)	PS,C	0.087	10000	N	N	=	N	=
AR(AK)	PS,C	0.137	10000	Y	N	>	N	>
AN(AL)	ABS/PS,C	0.066	368000	N	N	=	N	=
AN(AL)	ABS/PS,C	0.066	368000	N	N	=	N	=
AN(AL)	ABS/PS,C	0.066	368000	N	N	=	N	=
AN(AL)	ABS/PS,C	0.066	1000000	N	N	=	N	=
AN(AL)	ABS/PS,C	0.066	1000000	N	N	=	N	=
AN(AL)	ABS/PS,C	0.066	1000000	N	N	=	N	=
AN(AL)	ABS/PS,C	1.3	68500	Y	Y	=	Y	=
AN(AL)	ABS/PS,C	29	210000	Y	Y	=	Y	=
AN(AL)	ABS/PS,C	0.04	15150	N	N	=	N	=
AN(AL)	ABS/PS,C	0.11	11620	N	N	=	N	=
AN(AL)	ABS/PS,C	0.11	12850	Y	N	>	N	>
AN(AL)	ABS/PS,C	0.11	5170	Y	N	>	N	>
AN(AL)	ABS/PS,C	0.29	19000	Y	N	>	N	>
AN(AL)	ABS/PS,C	0.29	19000	Y	N	>	N	>
AN(AL)	ABS/PS,C	0.29	12800	Y	N	>	N	>
AN(AL)	ABS/PS,C	0.1	16250	Y	N	>	N	>
AN(AL)	ABS/PS,C	2.2	6424	Y	N	>	N	>
AN(AL)	ABS/PS,C	2.2	6424	Y	N	>	N	>

Table A-3. Storage Vessel Raw Data from Section 114 Responses for PS, ABS, AND MABS

					Existing Analysis		New Analysis	
Facility	Subcategory	Vapor Pressure (psia)	Tank Capacity (gal)	Existing Control (Y/N)	HON Control Required (Y/N)	MACT Floor <,=,> the HON	HON Control Required (Y/N)	MACT Floor <,=,> the HON
AV(AP)	ABS	2	543000	Y	Y	=	Y	=
AV(AP)	ABS	2	543000	Y	Y	=	Y	=
AV(AP)	ABS	2	432000	Y	Y	=	Y	=
AV(AP)	ABS	2	634000	Y	Y	=	Y	=
AV(AP)	ABS	0.2	543000	N	N	=	Y	<
AV(AP)	ABS	0.2	543000	N	N	=	Y	<
AV(AP)	ABS	0.2	543000	N	N	=	Y	<
AU(AO)	ABS/MABS	1.9	464213	Y	Y	=	Y	=
AU(AO)	ABS/MABS	1.9	454243	N	Y	<	Y	<
AU(AO)	ABS/MABS	17.6	178500	Y	Y	=	Y	=
AU(AO)	ABS/MABS	17.6	389700	Y	Y	=	Y	=
AU(AO)	ABS/MABS	17.6	389700	Y	Y	=	Y	=
AU(AO)	ABS/MABS	17.6	389700	Y	Y	=	Y	=
AU(AO)	ABS/MABS	0.1	455820	N	N	=	Y	<
AU(AO)	ABS/MABS	0.1	455820	N	N	=	Y	<
AU(AO)	ABS/MABS	0.1	455820	N	N	=	Y	<
AU(AO)	ABS/MABS	0.1	545300	N	N	=	Y	<
AU(AO)	ABS/MABS	0.11	24480	N	N	=	N	=
AU(AO)	ABS/MABS	0.6	80660	N	N	=	Y	<
AX(AM)	PS,C	15.9	20000	N	Y	<	Y	<
AX(AM)	PS,C	0.077	10200	N	N	=	N	=
AX(AM)	PS,C	0.47	1000	N	N	=	N	=
AI(AA)	NITRILE	unknown	22000	Y	N	>	N	>
AI(AA)	NITRILE	unknown	6132	Y	N	>	N	>
AI(AA)	NITRILE	unknown	6132	Y	N	>	N	>
AI(AA)	NITRILE	unknown	3500	Y	N	>	N	>

APPENDIX B

RAW DATA TABLES FOR PROCESS VENTS

Process Vent Raw Data For MBS - Application of HON Existing TRE Criteria

		Emission		Emission				Flow	BTU							TI 0%	TI 70%
Facility	Stream	Rate		Rate	Conc	Conc	MW	Rate	Content	Emissions	Conc	EHAP	QS	HT	Flare	REC	REC
ID	ID	(lbs/yr)	hrs/yr	(lbs/hr)	(ppmv)	(ppmw)	Stream	(scfm)	(Btu/scf)	(Mg/yr)	WT %	(kg/hr)	m^3/min	MJ/m^3	TRE	TRE	TRE
BD	MA-1 SIFTER	2670	8000	0.33	30	100	29.00	739.46	0.14	1.21	0.01	0.151369	20.94	0.005	63.41	18.52	18.32
BD	MA-1 TREATER	17246	8000	2.16	51	150	29.00	3,088.86	0.21	7.82	0.015	0.9778482	87.48	0.008	34.72	7.13	3.68
BD	MA-1 FILTER	4352	8000	0.54	15	40	29.00	3,013.38	0.05	1.97	0.004	0.2467584	85.34	0.002	134.42	27.72	14.35
BD	MA-1 DRYER	11474	8000	1.43	98	335	29.01	948.41	0.46	5.20	0.0335	0.6505758	26.86	0.017	18.08	4.88	4.41
BD	MA-1 DRYER	11474	8000	1.43	4	12	29.00	26,212.77	0.02	5.20	0.001212	0.6505758	742.35	0.001	420.60	73.80	17.42
BD	MA-1 MM TANK	4056	1000	4.08	68	156	29.00	5,736.95	0.20	1.84	0.0156	1.8398016	162.47	0.008	33.37	6.34	2.46
BD	MA1 REACTOR VENT	202171	1200	168.48	3412	7820	29.13	4,772.70	10.19	91.70	0.782	76.420636	135.16	0.360	0.67	0.13	0.10
BD	MA-1 LATEX TANKS	1794	8000	0.22	89	310	29.01	160.61	0.42	0.81	0.031	0.1017198	4.55	0.016	35.39	17.47	25.34
BD	MA-1 COAGULATOR	21863	8000	2.73	469	975	29.01	621.84	1.38	9.92	0.0975	1.2396321	17.61	0.051	6.76	2.09	2.25
BD	MA-2 DRYER	11474	8000	1.43	98	335	29.01	948.41	0.46	5.20	0.0335	0.6505758	26.86	0.017	18.08	4.88	4.41
BD	MA-2 DRYER	11474	8000	1.43	5	15	29.00	20,595.74	0.02	5.20	0.001543	0.6505758	583.27	0.001	331.11	58.48	14.53
BD	MA-2 MM TANK	4056	1000	4.08	68	156	29.00	5,736.95	0.20	1.84	0.0156	1.8398016	162.47	0.008	33.37	6.34	2.46
BD	MA-2 REACTOR VENT	202171	1200	168.48	3412	7820	29.13	4,772.70	10.19	91.70	0.782	76.420636	135.16	0.360	0.67	0.13	0.10
BD	MA-2 LATEX TANKS	1794	8000	0.22	89	310	29.01	160.61	0.42	0.81	0.031	0.1017198	4.55	0.016	35.39	17.47	25.34
BD	MA-2 SIFTER	2670	8000	0.33	30	100	29.00	739.46	0.14	1.21	0.01	0.151369	20.94	0.005	63.41	18.52	18.32
BD	MA-2 COAGULATOR	21863	8000	2.73	469	975	29.01	621.84	1.36	9.92	0.0975	1.2396321	17.61	0.051	6.76	2.09	2.25
BD	MA-2 TREATER	17246	8000	2.16	51	150	29.00	3,088.86	0.21	7.82	0.015	0.9778482	87.48	0.008	34.72	7.13	3.68
BD	MA-2 FILTER	4352	8000	0.54	15	40	29.00	3,013.38	0.05	1.97	0.004	0.2467584	85.34	0.002	134.42	27.72	14.35
BJ	MIX FEED TANKS	1	1000	0.00100	1000	4132	29.09	0.05	5.62	0.00	0.413184	0.0004536	0.00	0.208	4,263.61	3303.86	5559.33
BJ		1	2000	0.00050	1000	4132	29.09	0.03	5.62	0.00	0.413184	0.0002268	0.00	0.208	8,526.00	6607.50	11118.56
BJ		1	4000	0.00025	1000	4132	29.09	0.01	5.62	0.00	0.413184	0.0001134	0.00	0.208	17,050.77	13214.80	22237.07
BJ		1	6000	0.00017	1000	4132	29.09	0.01	5.52	0.00	0.413184	0.0000756	0.00	0.208	25,575.54	19822.10	33355.56
BJ		1	8000	0.00013	1000	4132	29.09	0.01	5.52	0.00	0.413184	0.0000567	0.00	0.208	34100	26429	44474.05
BJ		1	8760	0.00011	1000	4132	29.09	0.01	5.52	0.00	0.413184	5.1781E-05	0.00	0.208	37340	28940.16	48699
BJ	MONOMER SAMPLING	200	1000	0.20	1000000	1000000	54.09	0.02	2,688.79	0.09	100	0.09072	0.00	100.165	12.84	51.52	42.17
BJ		200	2000	0.10	1000000	1000000	54.09	0.01	2,688.79	0.09	100	0.04536	0.00	100.165	25.69	103.05	84.29
BJ		200	4000	0.05						0.09	0	0.02268	0.00	0.000	85.32	65.78	111.11
BJ		200	6000	0.03	1000000	1000000	54.09	0.00	2,688.79	0.09	100	0.01512	0.00	100.165	77.05	309.14	252.77
BJ		200	8000	0.03						0.09	0	0.01134	0.00	0.000	170.63	131.57	222.18
BJ		200	8760	0.02	1000000	1000000	54.09	0.00	2,688.79	0.09	100	0.01035616	0.00	100.165	112.50	451.35	369.02
BJ	MONOMER SAMPLING	200	1000	0.20	500000	650981	41.55	0.04	1,333.36	0.09	65.09609	0.09072	0.00	49.671	17.12	33.84	34.93
BJ		200	2000	0.10	500000	650981	41.55	0.02	1,333.36	0.09	65.09609	0.04536	0.00	49.671	34.24	67.68	69.82
BJ		200	4000	0.05	500000	650981	41.55	0.01	1,333.36	0.09	65.09609	0.02268	0.00	49.671	68.49	135.36	139.59
BJ		200	6000	0.03	500000	650981	41.55	0.01	1,333.36	0.09	65.09609	0.01512	0.00	49.671	102.73	203.05	209.36
BJ		200	8000	0.03	500000	650981	41.55	0.00	1,333.36	0.09	65.09609	0.01134	0.00	49.671	136.97	270.73	279.12
BJ		200	8760	0.02	500000	650981	41.55	0.00	1,333.36	0.09	65.09609	0.01035616	0.00	49.671	149.98	296.45	305.64
BJ	REACTOR 1 TANK	5204	1000	5.20	646738	864092	75.38	0.51	2,105.45	2.36	86.40924	2.3605344	0.01	78.434	0.57	1.69	1.55

Process Vent Raw Data For MBS - Application of HON Existing TRE Criteria

Facility ID	Stream ID	Emission Rate (lbs/yr)	hrs/yr	Emission Rate (lbs/hr)	Conc (ppmv)	Conc (ppmw)	MW Stream	Flow Rate (scfm)	BTU Content (Btu/scf)	Emissions (Mg/yr)	Conc WT %	EHAP (kg/hr)	QS m^3/min	HT MJ/m^3	Flare TRE	TI 0% REC TRE	TI 70% REC TRE
BJ		5204	2000	2.60	646738	864092	75.38	0.26	2,105.45	2.36	86.40924	1.1802672	0.01	78.434	1.13	3.37	3.05
BJ		5204	4000	1.30	646738	864092	75.38	0.13	2,105.45	2.36	86.40924	0.5901336	0.00	78.434	2.26	6.75	6.04
BJ		5204	6000	0.87	646738	864092	75.38	0.09	2,105.45	2.36	86.40924	0.3934224	0.00	78.434	3.39	10.13	9.04
BJ		5204	8000	0.65	646738	864092	75.38	0.06	2,105.45	2.36	86.40924	0.2950668	0.00	78.434	4.52	13.50	12.04
BJ		5204	8760	0.59	646738	864092	75.38	0.06	2,105.45	2.36	86.40924	0.2694674	0.00	78.434	4.94	14.78	13.18
BJ	REACTOR 2 TANK	12110	1000	12.11	994730	997180	54.19	1.44	2,662.27	5.49	99.71798	5.493096	0.04	99.922	0.21	0.85	0.74
BJ		12110	2000	6.06	994730	997180	54.19	0.72	2,662.31	5.49	99.71798	2.746548	0.02	99.179	0.43	1.69	1.43
BJ		12110	4000	3.03	994730	997180	54.19	0.36	2,662.31	5.49	99.71798	1.373274	0.01	99.179	0.86	3.38	2.82
BJ		12110	6000	2.02	994730	997180	54.19	0.24	2,662.31	5.49	99.71798	0.915516	0.01	99.179	1.28	5.07	4.21
BJ		12110	8000	1.51	994730	997180	54.19	0.18	2,662.31	5.49	99.71798	0.686637	0.01	99.179	1.71	6.76	5.59
BJ		12110	8760	1.38	994730	997180	54.19	0.16	2,662.31	5.49	99.71798	0.62706575	0.00	99.179	1.87	7.40	6.12
BJ	MIX FEED TANKS	1941	1000	1.94	120615	322687	37.64	1.03	361.91	0.88	32.26868	0.8804376	0.03	14.227	2.08	2.21	3.12
BJ		1941	2000	0.97	120615	322687	37.64	0.51	361.91	0.88	32.26868	0.4402188	0.01	14.227	4.16	4.42	6.19
BJ		1941	4000	0.49	120615	322687	37.64	0.26	361.91	0.88	32.26868	0.2201094	0.01	14.227	8.31	8.83	12.33
BJ		1941	6000	0.32	120615	322687	37.64	0.17	361.91	0.88	32.26868	0.1467396	0.00	14.227	12.45	13.25	18.48
BJ		1941	8000	0.24	120615	322687	37.64	0.13	361.91	0.88	32.26868	0.1100547	0.00	14.227	16.60	17.66	24.62
BJ		1941	8760	0.22	120615	322687	37.64	0.12	361.91	0.88	32.26868	0.10050658	0.00	14.227	18.18	19.34	26.95
BJ	EMULSION STORAGE 1	68	1000	0.07	340	1173	29.02	12.83	1.25	0.03	0.117296	0.0308448	0.36	0.046	67.03	49.16	81.87
BJ		68	2000	0.03	340	1173	29.02	6.42	1.25	0.03	0.117296	0.0154224	0.18	0.046	129.76	97.58	163.56
BJ		68	4000	0.02	340	1173	29.02	3.21	1.25	0.03	0.117296	0.0077112	0.09	0.046	255.20	194.41	326.93
BJ		68	6000	0.01	340	1173	29.02	2.14	1.25	0.03	0.117296	0.0051408	0.06	0.046	380.64	291.25	490.31
BJ		68	8000	0.01	340	1173	29.02	1.60	1.25	0.03	0.117296	0.0038556	0.05	0.046	506.09	388.09	653.68
BJ		68	8760	0.01	340	1173	29.02	1.47	1.25	0.03	0.117296	0.0035211	0.04	0.046	553.76	424.89	715.76
BJ	EMULSTION STORAGE 2	68	1000	0.07	345	1173	29.02	12.83	1.24	0.03	0.117297	0.0308448	0.36	0.046	67.03	49.16	81.87
BJ		68	2000	0.03	345	1173	29.02	6.42	1.24	0.03	0.11732	0.0154224	0.18	0.046	129.76	97.57	163.56
BJ		68	4000	0.02	345	1173	29.02	3.21	1.24	0.03	0.11732	0.0077112	0.09	0.046	255.20	194.41	326.93
BJ		68	6000	0.01	345	1173	29.02	2.14	1.24	0.03	0.11732	0.0051408	0.06	0.046	380.64	291.25	490.31
BJ		68	8000	0.01	345	1173	29.02	1.60	1.24	0.03	0.11732	0.0038556	0.05	0.046	506.09	388.09	653.68
BJ		68	8760	0.01	345	1173	29.02	1.47	1.24	0.03	0.11732	0.0035211	0.04	0.046	553.76	424.88	715.76
BJ	FILTERING	3206	1000	3.21	62	136	29.00	5,227.09	0.18	1.45	0.013589	1.4542416	148.03	0.007	38.59	7.40	2.98
BJ		3206	2000	1.60	62	136	29.00	2,613.55	0.18	1.45	0.013589	0.7271208	74.02	0.007	39.92	8.43	4.72
BJ		3206	4000	0.80	62	136	29.00	1,306.77	0.18	1.45	0.013589	0.3635604	37.01	0.007	42.58	10.48	8.18
BJ		3206	6000	0.53	62	136	29.00	871.18	0.18	1.45	0.013589	0.2423736	24.67	0.007	45.24	12.53	11.65
BJ		3206	8000	0.40	62	136	29.00	653.39	0.18	1.45	0.013589	0.1817802	18.50	0.007	47.90	14.59	15.11
BJ		3206	8760	0.37	62	136	29.00	596.70	0.18	1.45	0.013589	0.16600932	16.90	0.007	48.91	15.37	16.43
BJ	PRODUCT/AIR SEPARATION 1	5100	1000	5.10	19	61	29.00	18,507.37	0.08	2.31	0.006106	2.31336	524.13	0.003	83.76	14.84	3.82
BJ		5100	2000	2.55	19	61	29.00	9,253.69	0.08	2.31	0.006106	1.15668	262.06	0.003	84.60	15.49	4.91

Process Vent Raw Data For MBS - Application of HON Existing TRE Criteria

		Emission		Emission				Flow	BTU							TI 0%	TI 70%
Facility	Stream	Rate		Rate	Conc	Conc	MW	Rate	Content	Emissions	Conc	EHAP	QS	HT	Flare	REC	REC
ID	ID	(lbs/yr)	hrs/yr	(lbs/hr)	(ppmv)	(ppmw)	Stream	(scfm)	(Btu/scf)	(Mg/yr)	WT %	(kg/hr)	m^3/min	MJ/m^3	TRE	TRE	TRE
BJ		5100	4000	1.28	19	61	29.00	4,626.84	0.06	2.31	0.006106	0.57834	131.03	0.003	86.27	16.78	7.06
BJ		5100	6000	0.85	19	61	29.00	3,084.56	0.06	2.31	0.006106	0.38556	87.35	0.003	87.94	18.07	9.26
BJ		5100	8000	0.64	19	61	29.00	2,313.42	0.06	2.31	0.006106	0.28917	65.52	0.003	89.61	19.36	11.44
BJ		5100	8760	0.58	19	61	29.00	2,112.71	0.06	2.31	0.006106	0.26408219	59.83	0.003	90.25	19.85	12.27
BJ	PRODUCT/AIR SEPARATION 2	2660	1000	2.66	2	7	29.00	86,367.74	0.01	1.21	0.000682	1.206576	2,445.93	0.000	743.55	128.26	26.12
BJ		2660	2000	1.33	2	7	29.00	43,183.87	0.01	1.21	0.000682	0.603288	1,222.97	0.000	745.15	129.51	28.20
BJ		2660	4000	0.67	2	7	29.00	21,591.94	0.01	1.21	0.000682	0.301644	611.48	0.000	748.36	131.99	32.36
BJ		2660	6000	0.44	2	7	29.00	14,394.62	0.01	1.21	0.000682	0.201096	407.66	0.000	751.57	134.46	36.56
BJ		2660	8000	0.33	2	7	29.00	10,795.97	0.01	1.21	0.000682	0.150822	305.74	0.000	754.77	136.93	40.73
BJ		2660	8760	0.30	2	7	29.00	9,859.33	0.01	1.21	0.000682	0.13773699	279.22	0.000	755.99	137.87	42.32
BJ	PRODUCT/AIR SEPARATION 3	94	1000	0.09	2	6	29.00	3,701.47	0.01	0.04	0.000563	0.0426384	104.83	0.000	945.19	189.06	88.21
BJ		94	2000	0.05	2	6	29.00	1,850.74	0.01	0.04	0.000563	0.0213192	52.41	0.000	990.57	224.06	147.29
BJ		94	4000	0.02	2	6	29.00	925.37	0.01	0.04	0.000563	0.0106596	26.21	0.000	1,061.33	294.04	265.44
BJ		94	6000	0.02	2	6	29.00	616.91	0.01	0.04	0.000563	0.0071064	17.47	0.000	1,172.09	364.02	383.60
BJ		94	8000	0.01	2	6	29.00	462.68	0.01	0.04	0.000563	0.0053298	13.10	0.000	1,262.86	434.01	501.76
BJ		94	8760	0.01	2	6	29.00	422.54	0.01	0.04	0.000563	0.0048674	11.97	0.000	1,297.35	460.60	546.66
BJ	DRYER TO BOILER	37860	1000	37.86	255	726	29.01	11,551.35	0.82	17.17	0.072589	17.173296	327.13	0.030	7.08	1.28	0.42
BJ		37860	2000	18.93	255	726	29.01	5,775.68	0.82	17.17	0.072589	8.586648	163.57	0.030	7.20	1.37	0.57
BJ		37860	4000	9.47	255	726	29.01	2,887.84	0.82	17.17	0.072589	4.293324	81.78	0.030	7.42	1.54	0.86
BJ		37860	6000	6.31	255	726	29.01	1,925.23	0.82	17.17	0.072589	2.862216	54.52	0.030	7.65	1.71	1.15
BJ		37860	8000	4.73	255	726	29.01	1,443.92	0.82	17.17	0.072589	2.146662	40.89	0.030	7.87	1.89	1.45
BJ		37860	8760	4.32	255	726	29.01	1,318.65	0.82	17.17	0.072589	1.96042192	37.34	0.030	7.96	1.95	1.56
BJ	DRYER BYPASS	13800	1000	13.80	275	768	29.01	3,978.80	0.87	6.26	0.076814	6.25968	112.68	0.033	6.90	1.37	0.66
BJ		13800	2000	6.90	275	768	29.01	1,989.40	0.87	6.26	0.076814	3.12984	56.34	0.033	7.21	1.60	1.07
BJ		13800	4000	3.45	275	768	29.01	994.70	0.87	6.26	0.076814	1.56492	28.17	0.033	7.82	2.08	1.87
BJ		13800	6000	2.30	275	768	29.01	663.13	0.87	6.26	0.076814	1.04328	18.78	0.033	8.44	2.56	2.68
BJ		13800	8000	1.73	275	768	29.01	497.35	0.87	6.26	0.076814	0.78246	14.08	0.033	9.06	3.04	3.48
BJ		13800	8760	1.58	275	768	29.01	454.20	0.87	6.26	0.076814	0.71457534	12.86	0.033	9.30	3.22	3.79
BJ	DRYER TO FURNACE	13200	1000	13.20	268	759	29.01	3,850.45	0.86	5.99	0.075923	5.98752	109.04	0.032	6.99	1.39	0.66
BJ		13200	2000	6.60	268	759	29.01	1,925.23	0.86	5.99	0.075923	2.99376	54.52	0.032	7.31	1.64	1.10
BJ		13200	4000	3.30	268	759	29.01	962.61	0.86	5.99	0.075923	1.49688	27.26	0.032	7.96	2.14	1.95
BJ		13200	6000	2.20	268	759	29.01	641.74	0.86	5.99	0.075923	0.99792	18.17	0.032	8.60	2.64	2.79
BJ		13200	8000	1.65	268	759	29.01	481.31	0.86	5.99	0.075923	0.74844	13.63	0.032	9.25	3.14	3.63
BJ		13200	8760	1.51	268	759	29.01	439.56	0.86	5.99	0.075923	0.68350685	12.45	0.032	9.50	3.32	3.95
AS	COAGULATION	16497	1000	16.50	223	782	29.02	4,669.31	0.85	7.48	0.078241	7.4830392	132.23	0.032	6.73	1.31	0.59
AS		16497	1000	16.50	1114	3903	29.08	933.86	4.25	7.48	0.390332	7.4830392	26.45	0.158	1.55	0.42	0.43
AS		16497	2000	8.25	223	782	29.02	2,334.66	0.85	7.48	0.078241	3.7415196	66.12	0.032	6.96	1.51	0.93

Process Vent Raw Data For MBS - Application of HON Existing TRE Criteria

Facility ID	Stream ID	Emission Rate (lbs/yr)	hrs/yr	Emission Rate (lbs/hr)	Conc (ppmv)	Conc (ppmw)	MW Stream	Flow Rate (scfm)	BTU Content (Btu/scf)	Emissions (Mg/yr)	Conc WT %	EHAP (kg/hr)	QS m^3/min	HT MJ/m^3	Flare TRE	TI 0% REC TRE	TI 70% REC TRE
AS		16497	2000	8.25	1114	3903	29.06	466.93	4.25	7.48	0.390332	3.7415196	13.22	0.158	1.81	0.62	0.76
AS		16497	4000	4.12	223	782	29.02	1,167.33	0.85	7.48	0.078241	1.8707598	33.06	0.032	7.50	1.90	1.60
AS		16497	4000	4.12	1114	3903	29.06	233.47	4.25	7.48	0.390332	1.8707598	6.61	0.158	2.33	1.02	1.44
AS		16497	6000	2.75	223	782	29.02	778.22	0.85	7.48	0.078241	1.2471732	22.04	0.032	8.02	2.30	2.28
AS		16497	6000	2.75	1114	3903	29.06	155.64	4.25	7.48	0.390332	1.2471732	4.41	0.158	2.84	1.42	2.11
AS		16497	8000	2.06	223	782	29.02	583.66	0.85	7.48	0.078241	0.9353799	16.53	0.032	8.54	2.70	2.95
AS		16497	8000	2.06	1114	3903	29.06	116.73	4.25	7.48	0.390332	0.9353799	3.31	0.158	3.36	1.82	2.78
AS		16497	8760	1.88	223	782	29.02	533.03	0.85	7.48	0.078241	0.85422822	15.10	0.032	8.73	2.85	3.21
AS		16497	8760	1.88	1114	3903	29.06	106.61	4.25	7.48	0.390332	0.85422822	3.02	0.158	3.56	1.97	3.04
AS	GRAFT REACTOR, RUBBER REAC, BD PURIFICATION	15164	1000	15.16	0			668.00	6.827	6.88	0	6.8783904	18.92	0.254	1.29	0.39	0.45
AS		15164	2600	5.83	0			668.00	2.626	6.88	0	2.64553477	18.92	0.098	3.35	1.01	1.09
AS	GRAFT REACTOR	4420	1000	4.42	582	1217	29.02	804.50	1.602	2.00	0.12166	2.004912	22.78	0.060	5.12	1.46	1.44
AS		4420	1000	4.42	1164	2432	29.04	402.25	3.204	2.00	0.243166	2.004912	11.39	0.119	3.04	1.10	1.37
AS		4420	1000	4.42	5820	12097	29.18	80.45	16.019	2.00	1.209688	2.004912	2.28	0.597	1.38	0.82	1.32
AS		4420	2000	2.21	582	1217	29.02	402.25	1.602	2.00	0.12166	1.002456	11.39	0.060	6.09	2.20	2.70
AS		4420	2000	2.21	1164	2432	29.04	201.12	3.204	2.00	0.243166	1.002456	5.70	0.119	4.01	1.65	2.63
AS		4420	2000	2.21	5820	12097	29.18	40.22	16.019	2.00	1.209688	1.002456	1.14	0.597	2.34	1.56	2.58
AS		4420	4000	1.11	582	1217	29.02	201.12	1.602	2.00	0.12166	0.501228	5.70	0.060	8.02	3.69	5.21
AS		4420	4000	1.11	1164	2432	29.04	100.56	3.204	2.00	0.243166	0.501228	2.85	0.119	5.94	3.34	5.14
AS		4420	4000	1.11	5820	12097	29.18	20.11	16.019	2.00	1.209688	0.501228	0.57	0.597	4.27	3.08	5.10
AS		4420	6000	0.74	582	1217	29.02	134.08	1.602	2.00	0.12166	0.334152	3.80	0.060	9.95	5.18	7.72
AS		4420	6000	0.74	1164	2432	29.04	67.04	3.204	2.00	0.243166	0.334152	1.90	0.119	7.67	4.83	7.66
AS		4420	6000	0.74	5820	12097	29.18	13.41	16.019	2.00	1.209688	0.334152	0.38	0.597	6.19	4.59	7.62
AS		4420	8000	0.55	582	1217	29.02	100.56	1.602	2.00	0.12166	0.250614	2.85	0.060	11.88	6.67	10.24
AS		4420	8000	0.55	1164	2432	29.04	50.28	3.204	2.00	0.243166	0.250614	1.42	0.119	9.80	6.32	10.17
AS		4420	8000	0.55	5820	12097	29.18	10.06	16.019	2.00	1.209688	0.250614	0.28	0.597	8.12	6.10	10.14
AS		4420	8760	0.50	582	1217	29.02	91.84	1.602	2.00	0.12166	0.22887123	2.60	0.060	12.61	7.24	11.19
AS		4420	8760	0.50	1164	2432	29.04	45.92	3.204	2.00	0.243166	0.22887123	1.30	0.119	10.53	6.89	11.13
AS		4420	8760	0.50	5820	12097	29.18	9.18	16.019	2.00	1.209688	0.22887123	0.26	0.597	8.85	6.67	11.10
AS	PURIFICATION-STRIPPING	196	1000	0.20	500	932	29.01	46.57	1.333	0.09	0.093218	0.0889056	1.32	0.050	27.19	17.73	28.56
AS		196	1000	0.20	5000	9286	29.13	4.66	13.334	0.09	0.928569	0.0889056	0.13	0.497	22.26	17.05	28.47
AS		196	1000	0.20	50000	89392	30.25	0.47	133.336	0.09	8.939166	0.0889056	0.01	4.967	21.39	18.56	29.11
AS		196	1000	0.20	100000	171665	31.51	0.23	266.672	0.09	17.16652	0.0889056	0.01	9.934	20.93	20.34	29.83
AS		196	1000	0.20	500000	650961	41.55	0.05	1,333.361	0.09	65.09609	0.0889056	0.00	49.671	17.47	34.53	35.64
AS		196	2000	0.10	500	932	29.01	23.28	1.333	0.09	0.093218	0.0444528	0.66	0.050	46.95	34.53	56.90
AS		196	2000	0.10	5000	9286	29.13	2.33	13.334	0.09	0.928569	0.0444528	0.07	0.497	43.99	34.01	56.88
AS		196	2000	0.10	50000	89392	30.25	0.23	133.336	0.09	8.939166	0.0444528	0.01	4.967	42.72	37.12	56.17

Process Vent Raw Data For MBS - Application of HON Existing TRE Criteria

		Emission		Emission				Flow	BTU							TI 0%	TI 70%
Facility	Stream	Rate		Rate	Conc	Conc	MW	Rate	Content	Emissions	Conc	EHAP	QS	HT	Flare	REC	REC
ID	ID	(lbs/yr)	hrs/yr	(lbs/hr)	(ppmv)	(ppmw)	Stream	(scfm)	(Btu/scf)	(Mg/yr)	WT %	(kg/hr)	m^3/min	MJ/m^3	TRE	TRE	TRE
AS		196	2000	0.10	100000	171665	31.51	0.12	266.672	0.09	17.16652	0.0444528	0.00	9.934	41.64	40.67	59.62
AS		196	2000	0.10	500000	650981	41.55	0.02	1,333.361	0.09	65.09809	0.0444528	0.00	49.671	34.94	69.06	71.24
AS		196	4000	0.05	500	932	29.01	11.64	1.333	0.09	0.093218	0.0222264	0.33	0.050	92.47	68.13	113.59
AS		196	4000	0.05	5000	9286	29.13	1.16	13.334	0.09	0.928569	0.0222264	0.03	0.497	87.43	67.93	113.69
AS		196	4000	0.05	50000	89392	30.25	0.12	133.336	0.09	8.939166	0.0222264	0.00	4.967	85.39	74.24	116.29
AS		196	4000	0.05	100000	171665	31.51	0.06	266.672	0.09	17.16652	0.0222264	0.00	9.934	83.65	81.33	119.19
AS		196	4000	0.05	500000	650981	41.55	0.01	1,333.361	0.09	65.09809	0.0222264	0.00	49.671	69.88	138.13	142.43
AS		196	6000	0.03	500	932	29.01	7.76	1.333	0.09	0.093218	0.0148176	0.22	0.050	135.99	101.73	170.27
AS		196	6000	0.03	5000	9286	29.13	0.78	13.334	0.09	0.928569	0.0148176	0.02	0.497	130.87	101.85	170.50
AS		196	6000	0.03	50000	89392	30.25	0.08	133.336	0.09	8.939166	0.0148176	0.00	4.967	128.06	111.35	174.41
AS		196	6000	0.03	100000	171665	31.51	0.04	266.672	0.09	17.16652	0.0148176	0.00	9.934	125.46	121.99	178.77
AS		196	6000	0.03	500000	650981	41.55	0.01	1,333.361	0.09	65.09809	0.0148176	0.00	49.671	104.82	207.19	213.63
AS		196	8000	0.02	500	932	29.01	5.82	1.333	0.09	0.093218	0.0111132	0.16	0.050	179.51	135.33	226.95
AS		196	8000	0.02	5000	9286	29.13	0.58	13.334	0.09	0.928569	0.0111132	0.02	0.497	174.32	135.77	227.31
AS		196	8000	0.02	50000	89392	30.25	0.06	133.336	0.09	8.939166	0.0111132	0.00	4.967	170.74	148.46	232.53
AS		196	8000	0.02	100000	171665	31.51	0.03	266.672	0.09	17.16652	0.0111132	0.00	9.934	167.27	162.66	238.34
AS		196	8000	0.02	500000	650981	41.55	0.01	1,333.361	0.09	65.09809	0.0111132	0.00	49.671	139.76	276.25	284.82
AS		196	8760	0.02	500	932	29.01	5.32	1.333	0.09	0.093218	0.01014904	0.15	0.050	196.05	148.09	248.49
AS		196	8760	0.02	5000	9286	29.13	0.53	13.334	0.09	0.928569	0.01014904	0.02	0.497	190.82	148.66	248.90
AS		196	8760	0.02	50000	89392	30.25	0.05	133.336	0.09	8.939166	0.01014904	0.00	4.967	186.95	162.57	254.61
AS		196	8760	0.02	100000	171665	31.51	0.03	266.672	0.09	17.16652	0.01014904	0.00	9.934	183.16	178.11	260.97
AS		196	8760	0.02	500000	650981	41.55	0.01	1,333.361	0.09	65.09809	0.01014904	0.00	49.671	153.04	302.50	311.87
AS	DRYER-FLASH & FLUID BED DRYER	10555	1000	10.56	111	391	29.01	5,986.52	0.43	4.79	0.039056	4.787748	169.54	0.016	13.36	2.53	0.99
AS		10555	1000	10.56	222	781	29.02	2,993.26	0.85	4.79	0.07809	4.787748	84.77	0.032	6.88	1.42	0.78
AS		10555	1000	10.56	1111	3896	29.08	598.65	4.27	4.79	0.389561	4.787748	16.95	0.159	1.70	0.53	0.62
AS		10555	2000	5.28	111	391	29.01	2,993.26	0.43	4.79	0.039056	2.393874	84.77	0.016	13.77	2.84	1.52
AS		10555	2000	5.28	222	781	29.02	1,496.63	0.85	4.79	0.07809	2.393874	42.38	0.032	7.29	1.73	1.31
AS		10555	2000	5.28	1111	3896	29.08	299.33	4.27	4.79	0.389561	2.393874	8.48	0.159	2.10	0.85	1.14
AS		10555	4000	2.64	111	391	29.01	1,496.63	0.43	4.79	0.039056	1.196937	42.38	0.016	14.58	3.46	2.57
AS		10555	4000	2.64	222	781	29.02	748.31	0.85	4.79	0.07809	1.196937	21.19	0.032	8.10	2.36	2.36
AS		10555	4000	2.64	1111	3896	29.08	149.66	4.27	4.79	0.389561	1.196937	4.24	0.159	2.91	1.47	2.20
AS		10555	6000	1.76	111	391	29.01	997.75	0.43	4.79	0.039056	0.797958	28.26	0.016	15.36	4.09	3.62
AS		10555	6000	1.76	222	781	29.02	498.88	0.85	4.79	0.07809	0.797958	14.13	0.032	8.90	2.98	3.41
AS		10555	6000	1.76	1111	3896	29.08	99.78	4.27	4.79	0.389561	0.797958	2.83	0.159	3.72	2.10	3.25
AS		10555	8000	1.32	111	391	29.01	748.31	0.43	4.79	0.039056	0.5984685	21.19	0.016	16.19	4.71	4.68
AS		10555	8000	1.32	222	781	29.02	374.16	0.85	4.79	0.07809	0.5984685	10.60	0.032	9.71	3.60	4.47
AS		10555	8000	1.32	1111	3896	29.08	74.83	4.27	4.79	0.389561	0.5984685	2.12	0.159	4.53	2.72	4.30

Process Vent Raw Data For MBS - Application of HON Existing TRE Criteria

Facility	Stream	Emission Rate		Emission Rate	Conc	Conc	MW	Flow Rate	BTU Content	Emissions	Conc	EHAP	QS	HT	Flare	TI 0% REC	TI 70% REC
ID	ID	(lbs/yr)	hrs/yr	(lbs/hr)	(ppmv)	(ppmw)	Stream	(scfm)	(Btu/scf)	(Mg/yr)	WT %	(kg/hr)	m^3/min	MJ/m^3	TRE	TRE	TRE
AS		10555	8760	1.20	111	391	29.01	683.39	0.43	4.79	0.039056	0.54654658	19.35	0.016	16.50	4.95	5.08
AS		10555	8760	1.20	222	781	29.02	341.70	0.85	4.79	0.07809	0.54654658	9.68	0.032	10.02	3.84	4.87
AS		10555	8760	1.20	1111	3896	29.06	68.34	4.27	4.79	0.389561	0.54654658	1.94	0.159	4.83	2.96	4.70
AS	RUBBER REACTOR	1138	1000	1.14	51	96	29.00	2,632.55	0.14	0.52	0.009578	0.5161968	74.55	0.005	56.61	11.94	6.64
AS		1138	1000	1.14	507	957	29.01	263.26	1.37	0.52	0.095741	0.5161968	7.46	0.051	9.03	3.80	5.10
AS		1138	1000	1.14	1014	1914	29.03	131.63	2.67	0.52	0.191395	0.5161968	3.73	0.099	6.39	3.35	5.02
AS		1138	1000	1.14	50703	91652	30.31	2.63	136.77	0.52	9.165194	0.5161968	0.07	5.095	3.72	3.21	5.06
AS		1138	1000	1.14	101406	175724	31.61	1.32	273.54	0.52	17.57239	0.5161968	0.04	10.190	3.62	3.52	5.19
AS		1138	2000	0.57	51	96	29.00	1,316.28	0.14	0.52	0.009578	0.2580984	37.28	0.005	60.36	14.83	11.52
AS		1138	2000	0.57	507	957	29.01	131.63	1.37	0.52	0.095741	0.2580984	3.73	0.051	12.78	6.69	9.98
AS		1138	2000	0.57	1014	1914	29.03	65.81	2.67	0.52	0.191395	0.2580984	1.86	0.099	10.14	6.24	9.90
AS		1138	2000	0.57	50703	91652	30.31	1.32	136.77	0.52	9.165194	0.2580984	0.04	5.095	7.40	6.42	10.07
AS		1138	2000	0.57	101406	175724	31.61	0.66	273.54	0.52	17.57239	0.2580984	0.02	10.190	7.22	7.04	10.32
AS		1138	4000	0.28	51	96	29.00	658.14	0.14	0.52	0.009578	0.1290492	18.64	0.005	67.65	20.61	21.28
AS		1138	4000	0.28	507	957	29.01	65.81	1.37	0.52	0.095741	0.1290492	1.86	0.051	20.28	12.48	19.74
AS		1138	4000	0.28	1014	1914	29.03	32.91	2.67	0.52	0.191395	0.1290492	0.93	0.099	17.63	12.04	19.66
AS		1138	4000	0.28	50703	91652	30.31	0.66	136.77	0.52	9.165194	0.1290492	0.02	5.095	14.74	12.82	20.06
AS		1138	4000	0.28	101406	175724	31.61	0.33	273.54	0.52	17.57239	0.1290492	0.01	10.190	14.41	14.07	20.59
AS		1138	6000	0.19	51	96	29.00	438.76	0.14	0.52	0.009578	0.0860328	12.43	0.005	75.36	26.39	31.04
AS		1138	6000	0.19	507	957	29.01	43.88	1.37	0.52	0.095741	0.0860328	1.24	0.051	27.77	18.27	29.51
AS		1138	6000	0.19	1014	1914	29.03	21.94	2.67	0.52	0.191395	0.0860328	0.62	0.099	25.12	17.83	29.43
AS		1138	6000	0.19	50703	91652	30.31	0.44	136.77	0.52	9.165194	0.0860328	0.01	5.095	22.09	19.23	30.10
AS		1138	6000	0.19	101406	175724	31.61	0.22	273.54	0.52	17.57239	0.0860328	0.01	10.190	21.61	21.11	30.87
AS		1138	8000	0.14	51	96	29.00	329.07	0.14	0.52	0.009578	0.0645246	9.32	0.005	82.85	32.18	40.80
AS		1138	8000	0.14	507	957	29.01	32.91	1.37	0.52	0.095741	0.0645246	0.93	0.051	35.27	24.05	39.27
AS		1138	8000	0.14	1014	1914	29.03	16.45	2.67	0.52	0.191395	0.0645246	0.47	0.099	32.62	23.62	39.19
AS		1138	8000	0.14	50703	91652	30.31	0.33	136.77	0.52	9.165194	0.0645246	0.01	5.095	29.43	25.64	40.12
AS		1138	8000	0.14	101406	175724	31.61	0.16	273.54	0.52	17.57239	0.0645246	0.00	10.190	28.80	28.14	41.14
AS		1138	8760	0.13	51	96	29.00	300.52	0.14	0.52	0.009578	0.05892858	8.51	0.005	86.70	34.37	44.51
AS		1138	8760	0.13	507	957	29.01	30.05	1.37	0.52	0.095741	0.05892858	0.85	0.051	38.12	26.25	42.96
AS		1138	8760	0.13	1014	1914	29.03	15.03	2.67	0.52	0.191395	0.05892858	0.43	0.099	35.47	25.82	42.90
AS		1138	8760	0.13	50703	91652	30.31	0.30	136.77	0.52	9.165194	0.05892858	0.01	5.095	32.22	28.07	43.92
AS		1138	8760	0.13	101406	175724	31.61	0.15	273.54	0.52	17.57239	0.05892858	0.00	10.190	31.53	30.82	45.04

Process Vent Raw Data For MBS - Application of HON New TRE Criteria

Facility ID	Stream ID	Emission Rate (lbs/yr)	hrs/yr	Emission Rate (lbs/hr)	Conc (ppmv)	Conc (ppmw)	MW Stream	Flow Rate (scfm)	BTU Content (Btu/scf)	Emissions (Mg/yr)	Conc WT %	EHAP (kg/hr)	QS m^3/min	HT MJ/m^3	Flare TRE	TI 0% REC TRE	TI 70% REC TRE
BD	MA-1 SIFTER	2670	8000	0.33	30	100	29.00	739.46	0.14	1.21	0.01	0.151369	20.94	0.005	17.29	5.05	4.99
BD	MA-1 TREATER	17246	8000	2.16	51	150	29.00	3,068.86	0.21	7.82	0.015	0.9778482	87.48	0.008	9.47	1.95	1.00
BD	MA-1 FILTER	4352	8000	0.54	15	40	29.00	3,013.36	0.05	1.97	0.004	0.2467584	85.34	0.002	36.65	7.56	3.91
BD	MA-1 DRYER	11474	8000	1.43	98	335	29.01	948.41	0.46	5.20	0.0335	0.6505758	26.86	0.017	4.93	1.33	1.20
BD	MA-1 DRYER	11474	8000	1.43	4	12	29.00	26,212.77	0.02	5.20	0.0012	0.6505758	742.35	0.001	114.69	20.14	4.73
BD	MA-1 MM TANK	4056	1000	4.06	68	156	29.00	5,736.95	0.20	1.84	0.0156	1.8398016	162.47	0.008	9.10	1.73	0.67
BD	MA1 REACTOR VENT	202171	1200	168.48	3412	7820	29.13	4,772.70	10.19	91.70	0.782	76.420638	135.16	0.380	0.18	0.04	0.03
BD	MA-1 LATEX TANKS	1794	8000	0.22	89	310	29.01	160.61	0.42	0.81	0.031	0.1017198	4.55	0.016	9.65	4.76	6.91
BD	MA-1 COAGULATOR	21863	8000	2.73	469	975	29.01	621.84	1.38	9.92	0.0975	1.2396321	17.61	0.051	1.84	0.57	0.61
BD	MA-2 DRYER	11474	8000	1.43	98	335	29.01	948.41	0.46	5.20	0.0335	0.6505758	26.86	0.017	4.93	1.33	1.20
BD	MA-2 DRYER	11474	8000	1.43	5	15	29.00	20,595.74	0.02	5.20	0.0015	0.6505758	583.27	0.001	90.29	15.96	3.95
BD	MA-2 MM TANK	4056	1000	4.06	68	156	29.00	5,736.95	0.20	1.84	0.0156	1.8398016	162.47	0.008	9.10	1.73	0.67
BD	MA-2 REACTOR VENT	202171	1200	168.48	3412	7820	29.13	4,772.70	10.19	91.70	0.782	76.420638	135.16	0.380	0.18	0.04	0.03
BD	MA-2 LATEX TANKS	1794	8000	0.22	89	310	29.01	160.61	0.42	0.81	0.031	0.1017198	4.55	0.016	9.65	4.76	6.91
BD	MA-2 SIFTER	2670	8000	0.33	30	100	29.00	739.46	0.14	1.21	0.01	0.151369	20.94	0.005	17.29	5.05	4.99
BD	MA-2 COAGULATOR	21863	8000	2.73	469	975	29.01	621.84	1.38	9.92	0.0975	1.2396321	17.61	0.051	1.84	0.57	0.61
BD	MA-2 TREATER	17246	8000	2.16	51	150	29.00	3,068.86	0.21	7.82	0.015	0.97785	87.48	0.008	9.47	1.95	1.00
BD	MA-2 FILTER	4352	8000	0.54	15	40	29.00	3,013.36	0.05	1.97	0.004	0.24676	85.34	0.002	36.65	7.56	3.91
BJ	MIX FEED TANKS	1	1000	0.00100	1000	4132	29.09	0.05	5.52	0.00	0.4132	0.00045	0.00	0.206	1,162.52	900.61	1515.74
BJ		1	2000	0.00050	1000	4132	29.09	0.03	5.52	0.00	0.4132	0.00023	0.00	0.206	2,324.71	1801.57	3031.46
BJ		1	4000	0.00025	1000	4132	29.09	0.01	5.52	0.00	0.4132	0.00011	0.00	0.206	4,649.09	3603.07	6062.89
BJ		1	6000	0.00017	1000	4132	29.09	0.01	5.52	0.00	0.4132	0.00008	0.00	0.206	6,973.47	5404.58	9094.33
BJ		1	8000	0.00013	1000	4132	29.09	0.01	5.52	0.00	0.4132	0.00006	0.00	0.206	9,297.84	7206.09	12125.76
BJ		1	8760	0.00011	1000	4132	29.09	0.01	5.52	0.00	0.4132	0.0001	0.00	0.206	10,181.11	7890.66	13277.71
BJ	MONOMER SAMPLING	200	1000	0.20	1000000	1000000	54.09	0.02	2,688.79	0.09	100	0.09072	0.00	100.165	3.50	14.05	11.50
BJ		200	2000	0.10	1000000	1000000	54.09	0.01	2,688.79	0.09	100	0.04536	0.00	100.165	7.00	28.10	22.98
BJ		200	4000	0.05						0.09	0	0.02268	0.00	0.000	23.26	17.94	30.30
BJ		200	6000	0.03	1000000	1000000	54.09	0.00	2,688.79	0.09	100	0.01512	0.00	100.165	21.01	84.30	68.93
BJ		200	8000	0.03						0.09	0	0.01134	0.00	0.000	46.53	35.87	60.58
BJ		200	8760	0.02	1000000	1000000	54.09	0.00	2,688.79	0.09	100	0.01036	0.00	100.165	30.67	123.06	100.63
BJ	MONOMER SAMPLING	200	1000	0.20	500000	650961	41.55	0.04	1,333.36	0.09	65.10	0.09072	0.00	49.671	4.67	9.23	9.53
BJ		200	2000	0.10	500000	650961	41.55	0.02	1,333.36	0.09	65.10	0.04536	0.00	49.671	9.34	18.46	19.04
BJ		200	4000	0.05	500000	650961	41.55	0.01	1,333.36	0.09	65.10	0.02268	0.00	49.671	18.67	36.91	38.06
BJ		200	6000	0.03	500000	650961	41.55	0.01	1,333.36	0.09	65.10	0.01512	0.00	49.671	28.01	55.37	57.09
BJ		200	8000	0.03	500000	650961	41.55	0.00	1,333.36	0.09	65.10	0.01134	0.00	49.671	37.35	73.82	76.11
BJ		200	8760	0.02	500000	650961	41.55	0.00	1,333.36	0.09	65.10	0.01036	0.00	49.671	40.89	80.84	83.34
BJ	REACTOR 1 TANK	5204	1000	5.20	646738	864092	75.38	0.51	2,105.45	2.36	86.41	2.3605344	0.01	78.434	0.15	0.46	0.42

Process Vent Raw Data For MBS - Application of HON New TRE Criteria

Facility	Stream	Rate		Rate	Conc	Conc	MW	Rate	Content	Emissions	Conc	EHAP	Q8	HT	Flare	REC	REC
ID	ID	(lbs/yr)	hrs/yr	(lbs/hr)	(ppmv)	(ppmw)	Stream	(scfm)	(Btu/scf)	(Mg/yr)	WT %	(kg/hr)	m^3/min	MJ/m^3	TRE	TRE	TRE
BJ		5204	2000	2.60	646738	864092	75.38	0.26	2,105.45	2.36	86.41	1.1802672	0.01	78.434	0.31	0.92	0.83
BJ		5204	4000	1.30	646738	864092	75.38	0.13	2,105.45	2.36	86.41	0.5901336	0.00	78.434	0.62	1.84	1.65
BJ		5204	6000	0.87	646738	864092	75.38	0.09	2,105.45	2.36	86.41	0.3934224	0.00	78.434	0.92	2.76	2.47
BJ		5204	8000	0.65	646738	864092	75.38	0.06	2,105.45	2.36	86.41	0.2950668	0.00	78.434	1.23	3.68	3.28
BJ		5204	8760	0.59	646738	864092	75.38	0.06	2,105.45	2.36	86.41	0.2694674	0.00	78.434	1.35	4.03	3.59
BJ	REACTOR 2 TANK	12110	1000	12.11	994730	997180	54.19	1.44	2,662.27	5.49	99.72	5.493096	0.04	99.922	0.06	0.23	0.20
BJ		12110	2000	6.06	994730	997180	54.19	0.72	2,662.31	5.49	99.72	2.746548	0.02	99.179	0.12	0.46	0.39
BJ		12110	4000	3.03	994730	997180	54.19	0.36	2,662.31	5.49	99.72	1.373274	0.01	99.179	0.23	0.92	0.77
BJ		12110	6000	2.02	994730	997180	54.19	0.24	2,662.31	5.49	99.72	0.915516	0.01	99.179	0.35	1.38	1.15
BJ		12110	8000	1.51	994730	997180	54.19	0.18	2,662.31	5.49	99.72	0.686637	0.01	99.179	0.47	1.84	1.53
BJ		12110	8760	1.38	994730	997180	54.19	0.16	2,662.31	5.49	99.72	0.6270658	0.00	99.179	0.51	2.02	1.67
BJ	MIX FEED TANKS	1941	1000	1.94	120615	322687	37.64	1.03	381.91	0.88	32.27	0.8804376	0.03	14.227	0.57	0.60	0.85
BJ		1941	2000	0.97	120615	322687	37.64	0.51	381.91	0.88	32.27	0.4402188	0.01	14.227	1.13	1.20	1.69
BJ		1941	4000	0.49	120615	322687	37.64	0.26	381.91	0.88	32.27	0.2201094	0.01	14.227	2.26	2.41	3.36
BJ		1941	6000	0.32	120615	322687	37.64	0.17	381.91	0.88	32.27	0.1467396	0.00	14.227	3.40	3.61	5.04
BJ		1941	8000	0.24	120615	322687	37.64	0.13	381.91	0.88	32.27	0.1100547	0.00	14.227	4.53	4.82	6.71
BJ		1941	8760	0.22	120615	322687	37.64	0.12	381.91	0.88	32.27	0.10050658	0.00	14.227	4.96	5.27	7.35
BJ	EMULSION STORAGE 1	68	1000	0.07	340	1173	29.02	12.83	1.25	0.03	0.1173	0.0308448	0.36	0.046	18.28	13.40	22.32
BJ		68	2000	0.03	340	1173	29.02	6.42	1.25	0.03	0.1173	0.0154224	0.18	0.046	35.38	26.60	44.59
BJ		68	4000	0.02	340	1173	29.02	3.21	1.25	0.03	0.1173	0.0077112	0.09	0.046	69.58	53.01	89.14
BJ		68	6000	0.01	340	1173	29.02	2.14	1.25	0.03	0.1173	0.0051408	0.06	0.046	103.79	79.41	133.68
BJ		68	8000	0.01	340	1173	29.02	1.60	1.25	0.03	0.1173	0.0038556	0.05	0.046	137.99	105.81	178.22
BJ		68	8760	0.01	340	1173	29.02	1.47	1.25	0.03	0.1173	0.0035211	0.04	0.046	150.99	115.85	195.15
BJ	EMULSTION STORAGE 2	68	1000	0.07	345	1173	29.02	12.83	1.24	0.03	0.1173	0.0308448	0.36	0.046	18.28	13.40	22.32
BJ		68	2000	0.03	345	1173	29.02	6.42	1.24	0.03	0.1173	0.0154224	0.18	0.046	35.38	26.60	44.59
BJ		68	4000	0.02	345	1173	29.02	3.21	1.24	0.03	0.1173	0.0077112	0.09	0.046	69.58	53.01	89.14
BJ		68	6000	0.01	345	1173	29.02	2.14	1.24	0.03	0.1173	0.0051408	0.06	0.046	103.79	79.41	133.68
BJ		68	8000	0.01	345	1173	29.02	1.60	1.24	0.03	0.1173	0.0038556	0.05	0.046	137.99	105.81	178.22
BJ		68	8760	0.01	345	1173	29.02	1.47	1.24	0.03	0.1173	0.0035211	0.04	0.046	150.99	115.85	195.15
BJ	FILTERING	3206	1000	3.21	62	136	29.00	5,227.09	0.18	1.45	0.0136	1.4542416	148.03	0.007	10.52	2.02	0.81
BJ		3206	2000	1.60	62	136	29.00	2,613.55	0.18	1.45	0.0136	0.7271208	74.02	0.007	10.88	2.30	1.28
BJ		3206	4000	0.80	62	136	29.00	1,306.77	0.18	1.45	0.0136	0.3635604	37.01	0.007	11.61	2.86	2.23
BJ		3206	6000	0.53	62	136	29.00	871.18	0.18	1.45	0.0136	0.2423736	24.67	0.007	12.34	3.42	3.17
BJ		3206	8000	0.40	62	136	29.00	653.39	0.18	1.45	0.0136	0.1817802	18.50	0.007	13.06	3.98	4.12
BJ		3206	8760	0.37	62	136	29.00	596.70	0.18	1.45	0.0136	0.16600932	16.90	0.007	13.34	4.19	4.46
BJ	PRODUCT/AIR SEPARATION 1	5100	1000	5.10	19	61	29.00	18,507.37	0.08	2.31	0.0061	2.31336	524.13	0.003	22.84	4.05	1.04
BJ		5100	2000	2.55	19	61	29.00	9,253.69	0.08	2.31	0.0061	1.15668	262.06	0.003	23.07	4.23	1.33
BJ		5100	4000	1.28	19	61	29.00	4,626.84	0.08	2.31	0.0061	0.57834	131.03	0.003	23.52	4.58	1.93

Process Vent Raw Data For MBS - Application of HON New TRE Criteria

Facility	Stream	Rate		Rate	Conc	Conc	MW	Rate	Content	Emissions	Conc	EHAP	QS	HT	Flare	REC	REC
ID	ID	(lbs/yr)	hrs/yr	(lbs/hr)	(ppmv)	(ppmw)	Stream	(scfm)	(Btu/scf)	(Mg/yr)	WT %	(kg/hr)	m^3/min	MJ/m^3	TRE	TRE	TRE
BJ		5100	6000	0.85	19	61	29.00	3,084.56	0.08	2.31	0.0061	0.38556	87.35	0.003	23.98	4.93	2.52
BJ		5100	8000	0.64	19	61	29.00	2,313.42	0.08	2.31	0.0061	0.28917	65.52	0.003	24.44	5.28	3.12
BJ		5100	8760	0.58	19	61	29.00	2,112.71	0.08	2.31	0.0061	0.26408219	59.83	0.003	24.61	5.41	3.34
BJ	PRODUCT/AIR SEPARATION 2	2660	1000	2.66	2	7	29.00	86,367.74	0.01	1.21	0.0007	1.208576	2,445.93	0.000	202.75	35.00	7.09
BJ		2660	2000	1.33	2	7	29.00	43,183.87	0.01	1.21	0.0007	0.603288	1,222.97	0.000	203.19	35.34	7.66
BJ		2660	4000	0.67	2	7	29.00	21,591.94	0.01	1.21	0.0007	0.301644	611.48	0.000	204.06	36.01	8.80
BJ		2660	6000	0.44	2	7	29.00	14,394.62	0.01	1.21	0.0007	0.201096	407.66	0.000	204.93	36.69	9.93
BJ		2660	8000	0.33	2	7	29.00	10,795.97	0.01	1.21	0.0007	0.150822	305.74	0.000	205.81	37.36	11.07
BJ		2660	8760	0.30	2	7	29.00	9,859.33	0.01	1.21	0.0007	0.13773699	279.22	0.000	206.14	37.62	11.50
BJ	PRODUCT/AIR SEPARATION 3	94	1000	0.09	2	6	29.00	3,701.47	0.01	0.04	0.0006	0.0426384	104.83	0.000	257.73	51.58	24.01
BJ		94	2000	0.05	2	6	29.00	1,850.74	0.01	0.04	0.0006	0.0213192	52.41	0.000	270.10	61.12	40.12
BJ		94	4000	0.02	2	6	29.00	925.37	0.01	0.04	0.0006	0.0106596	26.21	0.000	294.85	80.20	72.33
BJ		94	6000	0.02	2	6	29.00	616.91	0.01	0.04	0.0006	0.0071064	17.47	0.000	319.60	99.26	104.55
BJ		94	8000	0.01	2	6	29.00	462.68	0.01	0.04	0.0006	0.0053298	13.10	0.000	344.35	118.37	136.76
BJ		94	8760	0.01	2	6	29.00	422.54	0.01	0.04	0.0006	0.0048674	11.97	0.000	353.75	125.62	149.00
BJ	DRYER TO BOILER	37860	1000	37.86	255	726	29.01	11,551.35	0.82	17.17	0.0726	17.173296	327.13	0.030	1.93	0.35	0.11
BJ		37860	2000	18.93	255	726	29.01	5,775.68	0.82	17.17	0.0726	8.586648	163.57	0.030	1.96	0.37	0.15
BJ		37860	4000	9.47	255	726	29.01	2,887.84	0.82	17.17	0.0726	4.293324	81.78	0.030	2.02	0.42	0.23
BJ		37860	6000	6.31	255	726	29.01	1,925.23	0.82	17.17	0.0726	2.862216	54.52	0.030	2.09	0.47	0.31
BJ		37860	8000	4.73	255	726	29.01	1,443.92	0.82	17.17	0.0726	2.146662	40.89	0.030	2.15	0.52	0.39
BJ		37860	8760	4.32	255	726	29.01	1,318.65	0.82	17.17	0.0726	1.96042192	37.34	0.030	2.17	0.53	0.42
BJ	DRYER BYPASS	13800	1000	13.80	275	768	29.01	3,978.80	0.87	6.26	0.0768	6.25968	112.68	0.033	1.88	0.37	0.18
BJ		13800	2000	6.90	275	768	29.01	1,989.40	0.87	6.26	0.0768	3.12984	56.34	0.033	1.96	0.44	0.29
BJ		13800	4000	3.45	275	768	29.01	994.70	0.87	6.26	0.0768	1.56492	28.17	0.033	2.13	0.57	0.51
BJ		13800	6000	2.30	275	768	29.01	663.13	0.87	6.26	0.0768	1.04328	18.78	0.033	2.30	0.70	0.73
BJ		13800	8000	1.73	275	768	29.01	497.35	0.87	6.26	0.0768	0.78246	14.08	0.033	2.47	0.83	0.95
BJ		13800	8760	1.58	275	768	29.01	454.20	0.87	6.26	0.0768	0.71457534	12.86	0.033	2.53	0.88	1.03
BJ	DRYER TO FURNACE	13200	1000	13.20	268	759	29.01	3,850.45	0.86	5.99	0.0759	5.98752	109.04	0.032	1.91	0.38	0.19
BJ		13200	2000	6.60	268	759	29.01	1,925.23	0.86	5.99	0.0759	2.99376	54.52	0.032	1.99	0.45	0.30
BJ		13200	4000	3.30	268	759	29.01	962.61	0.86	5.99	0.0759	1.49688	27.26	0.032	2.17	0.58	0.53
BJ		13200	6000	2.20	268	759	29.01	641.74	0.86	5.99	0.0759	0.99792	18.17	0.032	2.35	0.72	0.76
BJ		13200	8000	1.65	268	759	29.01	481.31	0.86	5.99	0.0759	0.74844	13.63	0.032	2.52	0.86	0.99
BJ		13200	8760	1.51	268	759	29.01	439.55	0.86	5.99	0.0759	0.68350686	12.45	0.032	2.59	0.91	1.08
AS	COAGULATION	16497	1000	16.50	223	782	29.02	4,669.31	0.85	7.48	0.0782	7.4830392	132.23	0.032	1.83	0.36	0.16
AS		16497	1000	16.50	1114	3903	29.08	933.86	4.25	7.48	0.3903	7.4830392	26.45	0.158	0.42	0.11	0.12
AS		16497	2000	8.25	223	782	29.02	2,334.66	0.85	7.48	0.0782	3.7415196	66.12	0.032	1.90	0.41	0.25
AS		16497	2000	8.25	1114	3903	29.08	466.93	4.25	7.48	0.3903	3.7415196	13.22	0.158	0.49	0.17	0.21
AS		16497	4000	4.12	223	782	29.02	1,167.33	0.85	7.48	0.0782	1.8707598	33.06	0.032	2.05	0.52	0.44

Process Vent Raw Data For MBS - Application of HON New TRE Criteria

Facility	Stream	Rate		Rate	Conc	Conc	MW	Rate	Content	Emissions	Conc	EHAP	QS	HT	Flare	REC	REC
ID	ID	(lbs/yr)	hrs/yr	(lbs/hr)	(ppmv)	(ppmw)	Stream	(acfm)	(Btu/scf)	(Mg/yr)	WT %	(kg/hr)	m^3/min	MJ/m^3	TRE	TRE	TRE
AS		16497	4000	4.12	1114	3903	29.06	233.47	4.25	7.48	0.3903	1.8707598	6.61	0.158	0.63	0.28	0.39
AS		16497	6000	2.75	223	782	29.02	778.22	0.85	7.48	0.0782	1.2471732	22.04	0.032	2.19	0.63	0.62
AS		16497	6000	2.75	1114	3903	29.06	155.64	4.25	7.48	0.3903	1.2471732	4.41	0.158	0.78	0.39	0.58
AS		16497	8000	2.06	223	782	29.02	583.66	0.85	7.48	0.0782	0.9353799	16.53	0.032	2.33	0.74	0.80
AS		16497	8000	2.06	1114	3903	29.06	116.73	4.25	7.48	0.3903	0.9353799	3.31	0.158	0.92	0.50	0.76
AS		16497	8760	1.88	223	782	29.02	533.03	0.85	7.48	0.0782	0.85422822	15.10	0.032	2.38	0.78	0.87
AS		16497	8760	1.88	1114	3903	29.06	106.61	4.25	7.48	0.3903	0.85422822	3.02	0.158	0.97	0.54	0.83
AS	GRAFT REACTOR, RUBBER REAC, BD PURIFICATION	15164	1000	15.16	0			668.00	6.827	6.88	0.0000	6.8783904	18.92	0.254	0.35	0.11	0.12
AS		15164	2600	5.83	0			668.00	2.626	6.88	0.0000	2.64553477	18.92	0.098	0.91	0.28	0.30
AS	GRAFT REACTOR	4420	1000	4.42	582	1217	29.02	804.50	1.602	2.00	0.1217	2.004912	22.78	0.060	1.40	0.40	0.39
AS		4420	1000	4.42	1164	2432	29.04	402.25	3.204	2.00	0.2432	2.004912	11.39	0.119	0.83	0.30	0.37
AS		4420	1000	4.42	5820	12097	29.18	80.45	16.019	2.00	1.2097	2.004912	2.28	0.597	0.38	0.22	0.36
AS		4420	2000	2.21	582	1217	29.02	402.25	1.602	2.00	0.1217	1.002456	11.39	0.060	1.66	0.60	0.73
AS		4420	2000	2.21	1164	2432	29.04	201.12	3.204	2.00	0.2432	1.002456	5.70	0.119	1.09	0.50	0.72
AS		4420	2000	2.21	5820	12097	29.18	40.22	16.019	2.00	1.2097	1.002456	1.14	0.597	0.64	0.43	0.70
AS		4420	4000	1.11	582	1217	29.02	201.12	1.602	2.00	0.1217	0.501228	5.70	0.060	2.19	1.01	1.42
AS		4420	4000	1.11	1164	2432	29.04	100.56	3.204	2.00	0.2432	0.501228	2.85	0.119	1.62	0.91	1.40
AS		4420	4000	1.11	5820	12097	29.18	20.11	16.019	2.00	1.2097	0.501228	0.57	0.597	1.16	0.84	1.39
AS		4420	6000	0.74	582	1217	29.02	134.06	1.602	2.00	0.1217	0.334152	3.80	0.060	2.71	1.41	2.11
AS		4420	6000	0.74	1164	2432	29.04	67.04	3.204	2.00	0.2432	0.334152	1.90	0.119	2.15	1.32	2.09
AS		4420	6000	0.74	5820	12097	29.18	13.41	16.019	2.00	1.2097	0.334152	0.38	0.597	1.69	1.25	2.06
AS		4420	8000	0.55	582	1217	29.02	100.56	1.602	2.00	0.1217	0.250614	2.85	0.060	3.24	1.82	2.79
AS		4420	8000	0.55	1164	2432	29.04	50.28	3.204	2.00	0.2432	0.250614	1.42	0.119	2.67	1.72	2.77
AS		4420	8000	0.55	5820	12097	29.18	10.06	16.019	2.00	1.2097	0.250614	0.28	0.597	2.21	1.66	2.77
AS		4420	8760	0.50	582	1217	29.02	91.84	1.602	2.00	0.1217	0.22887123	2.60	0.060	3.44	1.97	3.05
AS		4420	8760	0.50	1164	2432	29.04	45.92	3.204	2.00	0.2432	0.22887123	1.30	0.119	2.87	1.88	3.03
AS		4420	8760	0.50	5820	12097	29.18	9.18	16.019	2.00	1.21	0.22887123	0.26	0.597	2.41	1.82	3.03
AS	PURIFICATION-STRIPPING	196	1000	0.20	500	932	29.01	46.57	1.333	0.09	0.0932	0.0889056	1.32	0.050	7.41	4.83	7.79
AS		196	1000	0.20	5000	9286	29.13	4.66	13.334	0.09	0.9286	0.0889056	0.13	0.497	6.07	4.65	7.76
AS		196	1000	0.20	50000	89392	30.25	0.47	133.336	0.09	8.94	0.0889056	0.01	4.967	5.83	5.06	7.94
AS		196	1000	0.20	100000	171665	31.51	0.23	266.672	0.09	17.17	0.0889056	0.01	9.934	5.71	5.54	8.13
AS		196	1000	0.20	500000	650961	41.55	0.05	1,333.361	0.09	65.10	0.0889056	0.00	49.671	4.76	9.42	9.72
AS		196	2000	0.10	500	932	29.01	23.28	1.333	0.09	0.0932	0.0444528	0.66	0.050	13.35	9.41	15.51
AS		196	2000	0.10	5000	9286	29.13	2.33	13.334	0.09	0.9286	0.0444528	0.07	0.497	11.99	9.27	15.51
AS		196	2000	0.10	50000	89392	30.25	0.23	133.336	0.09	8.94	0.0444528	0.01	4.967	11.65	10.12	15.86
AS		196	2000	0.10	100000	171665	31.51	0.12	266.672	0.09	17.17	0.0444528	0.00	9.934	11.41	11.09	16.26
AS		196	2000	0.10	500000	650961	41.55	0.02	1,333.361	0.09	65.10	0.0444528	0.00	49.671	9.53	18.83	19.43
AS		196	4000	0.05	500	932	29.01	11.64	1.333	0.09	0.0932	0.0222264	0.33	0.050	25.21	18.56	30.97

Process Vent Raw Data For MBS - Application of HON New TRE Criteria

Facility	Stream	Rate		Rate	Conc	Conc	MW	Rate	Content	Emissions	Conc	EHAP	QS	HT	Flare	REC	REC
ID	ID	(lbs/yr)	hrs/yr	(lbs/hr)	(ppmv)	(ppmw)	Stream	(scfm)	(Btu/scf)	(Mg/yr)	WT %	(kg/hr)	m^3/min	MJ/m^3	TRE	TRE	TRE
AS		196	4000	0.05	5000	9286	29.13	1.16	13.334	0.09	0.9286	0.0222264	0.03	0.497	23.84	18.52	31.00
AS		196	4000	0.05	50000	89392	30.25	0.12	133.336	0.09	8.94	0.0222264	0.00	4.967	23.28	20.24	31.71
AS		196	4000	0.05	100000	171665	31.51	0.06	266.672	0.09	17.17	0.0222264	0.00	9.934	22.81	22.18	32.50
AS		196	4000	0.05	500000	650981	41.55	0.01	1,333.361	0.09	65.10	0.0222264	0.00	49.671	19.05	37.66	38.64
AS		196	6000	0.03	500	932	29.01	7.76	1.333	0.09	0.0932	0.0148176	0.22	0.050	37.08	27.74	46.42
AS		196	6000	0.03	5000	9286	29.13	0.78	13.334	0.09	0.9286	0.0148176	0.02	0.497	35.68	27.77	46.49
AS		196	6000	0.03	50000	89392	30.25	0.08	133.336	0.09	8.94	0.0148176	0.00	4.967	34.92	30.36	47.55
AS		196	6000	0.03	100000	171665	31.51	0.04	266.672	0.09	17.17	0.0148176	0.00	9.934	34.21	33.26	48.74
AS		196	6000	0.03	500000	650981	41.55	0.01	1,333.361	0.09	65.10	0.0148176	0.00	49.671	28.58	56.50	58.25
AS		196	8000	0.02	500	932	29.01	5.82	1.333	0.09	0.0932	0.0111132	0.16	0.050	48.95	36.90	61.88
AS		196	8000	0.02	5000	9286	29.13	0.58	13.334	0.09	0.9286	0.0111132	0.02	0.497	47.53	37.02	61.98
AS		196	8000	0.02	50000	89392	30.25	0.06	133.336	0.09	8.94	0.0111132	0.00	4.967	46.55	40.48	63.40
AS		196	8000	0.02	100000	171665	31.51	0.03	266.672	0.09	17.17	0.0111132	0.00	9.934	45.61	44.35	64.98
AS		196	8000	0.02	500000	650981	41.55	0.01	1,333.361	0.09	65.10	0.0111132	0.00	49.671	38.11	75.33	77.66
AS		196	8760	0.02	500	932	29.01	5.32	1.333	0.09	0.0932	0.01014904	0.15	0.050	53.46	40.38	67.75
AS		196	8760	0.02	5000	9286	29.13	0.53	13.334	0.09	0.9286	0.01014904	0.02	0.497	52.03	40.53	67.86
AS		196	8760	0.02	50000	89392	30.25	0.05	133.336	0.09	8.94	0.01014904	0.00	4.967	50.97	44.33	69.42
AS		196	8760	0.02	100000	171665	31.51	0.03	266.672	0.09	17.17	0.01014904	0.00	9.934	49.94	48.56	71.16
AS		196	8760	0.02	500000	650981	41.55	0.01	1,333.361	0.09	65.10	0.01014904	0.00	49.671	41.73	82.49	85.04
AS	DRYER-FLASH & FLUID BED DRYER	10555	1000	10.56	111	391	29.01	5,986.52	0.43	4.79	0.0391	4.787748	169.54	0.016	3.64	0.69	0.27
AS		10555	1000	10.56	222	781	29.02	. 2,993.26	0.85	4.79	0.0781	4.787748	84.77	0.032	1.88	0.39	0.21
AS		10555	1000	10.56	1111	3896	29.06	598.65	4.27	4.79	0.3896	4.787748	16.95	0.159	0.46	0.15	0.17
AS		10555	2000	5.28	111	391	29.01	2,993.26	0.43	4.79	0.0391	2.393874	84.77	0.016	3.75	0.78	0.41
AS		10555	2000	5.28	222	781	29.02	1,496.63	0.85	4.79	0.0781	2.393874	42.38	0.032	1.99	0.47	0.36
AS		10555	2000	5.28	1111	3896	29.06	299.33	4.27	4.79	0.3896	2.393874	8.48	0.159	0.57	0.23	0.31
AS		10555	4000	2.64	111	391	29.01	1,496.63	0.43	4.79	0.0391	1.196937	42.38	0.016	3.97	0.95	0.70
AS		10555	4000	2.64	222	781	29.02	748.31	0.85	4.79	0.0781	1.196937	21.19	0.032	2.21	0.64	0.64
AS		10555	4000	2.64	1111	3896	29.06	149.66	4.27	4.79	0.3896	1.196937	4.24	0.159	0.79	0.40	0.60
AS		10555	6000	1.76	111	391	29.01	997.75	0.43	4.79	0.0391	0.797958	28.26	0.016	4.19	1.12	0.99
AS		10555	6000	1.76	222	781	29.02	498.88	0.85	4.79	0.0781	0.797958	14.13	0.032	2.43	0.81	0.93
AS		10555	6000	1.76	1111	3896	29.06	99.78	4.27	4.79	0.3896	0.797958	2.83	0.159	1.01	0.57	0.89
AS		10555	8000	1.32	111	391	29.01	748.31	0.43	4.79	0.0391	0.5984685	21.19	0.016	4.42	1.29	1.27
AS		10555	8000	1.32	222	781	29.02	374.16	0.85	4.79	0.0781	0.5984685	10.60	0.032	2.65	0.98	1.22
AS		10555	8000	1.32	1111	3896	29.06	74.83	4.27	4.79	0.3896	0.5984685	2.12	0.159	1.23	0.74	1.17
AS		10555	8760	1.20	111	391	29.01	683.39	0.43	4.79	0.0391	0.54654658	19.35	0.016	4.50	1.35	1.38
AS		10555	8760	1.20	222	781	29.02	341.70	0.85	4.79	0.0781	0.54654658	9.68	0.032	2.73	1.05	1.33
AS		10555	8760	1.20	1111	3896	29.06	68.34	4.27	4.79	0.3896	0.54654658	1.94	0.159	1.32	0.81	1.28
AS	RUBBER REACTOR	1138	1000	1.14	51	98	29.00	2,632.55	0.14	0.52	0.0096	0.5161968	74.55	0.005	15.44	3.26	1.61

Process Vent Raw Data For MBS - Application of HON New TRE Criteria

Facility	Stream	Rate		Rate	Conc	Conc	MW	Rate	Content	Emissions	Conc	EHAP	QS	HT	Flare	REC	REC
ID	ID	(lbs/yr)	hrs/yr	(lbs/hr)	(ppmv)	(ppmw)	Stream	(scfm)	(Btu/scf)	(Mg/yr)	WT %	(kg/hr)	m^3/min	MJ/m^3	TRE	TRE	TRE
AS		1136	1000	1.14	507	957	29.01	263.26	1.37	0.52	0.0957	0.5161968	7.46	0.051	2.46	1.04	1.39
AS		1136	1000	1.14	1014	1914	29.03	131.63	2.67	0.52	0.1914	0.5161968	3.73	0.099	1.74	0.91	1.37
AS		1136	1000	1.14	50703	91652	30.31	2.63	136.77	0.52	9.17	0.5161968	0.07	5.095	1.02	0.88	1.38
AS		1136	1000	1.14	101406	175724	31.61	1.32	273.54	0.52	17.57	0.5161968	0.04	10.190	0.99	0.96	1.41
AS		1136	2000	0.57	51	96	29.00	1,316.28	0.14	0.52	0.0096	0.2580984	37.28	0.005	16.46	4.05	3.14
AS		1136	2000	0.57	507	957	29.01	131.63	1.37	0.52	0.0957	0.2580984	3.73	0.051	3.48	1.82	2.72
AS		1136	2000	0.57	1014	1914	29.03	65.81	2.67	0.52	0.1914	0.2580984	1.86	0.099	2.76	1.70	2.70
AS		1136	2000	0.57	50703	91652	30.31	1.32	136.77	0.52	9.17	0.2580984	0.04	5.095	2.02	1.75	2.74
AS		1136	2000	0.57	101406	175724	31.61	0.66	273.54	0.52	17.57	0.2580984	0.02	10.190	1.97	1.92	2.81
AS		1136	4000	0.28	51	96	29.00	658.14	0.14	0.52	0.0096	0.1290492	18.64	0.005	18.50	5.62	5.80
AS		1136	4000	0.28	507	957	29.01	65.81	1.37	0.52	0.0957	0.1290492	1.86	0.051	5.53	3.40	5.38
AS		1136	4000	0.28	1014	1914	29.03	32.91	2.67	0.52	0.1914	0.1290492	0.93	0.099	4.81	3.26	5.36
AS		1136	4000	0.28	50703	91652	30.31	0.66	136.77	0.52	9.17	0.1290492	0.02	5.095	4.02	3.50	5.48
AS		1136	4000	0.28	101406	175724	31.61	0.33	273.54	0.52	17.57	0.1290492	0.01	10.190	3.93	3.84	5.62
AS		1136	6000	0.19	51	96	29.00	438.76	0.14	0.52	0.0096	0.0860328	12.43	0.005	20.55	7.20	8.46
AS		1136	6000	0.19	507	957	29.01	43.88	1.37	0.52	0.0957	0.0860328	1.24	0.051	7.57	4.98	8.04
AS		1136	6000	0.19	1014	1914	29.03	21.94	2.67	0.52	0.1914	0.0860328	0.62	0.099	6.85	4.86	8.02
AS		1136	6000	0.19	50703	91652	30.31	0.44	136.77	0.52	9.17	0.0860328	0.01	5.095	6.02	5.24	8.21
AS		1136	6000	0.19	101406	175724	31.61	0.22	273.54	0.52	17.57	0.0860328	0.01	10.190	5.89	5.76	8.42
AS		1136	8000	0.14	51	96	29.00	329.07	0.14	0.52	0.0096	0.0645246	9.32	0.005	22.59	8.77	11.12
AS		1136	8000	0.14	507	957	29.01	32.91	1.37	0.52	0.0957	0.0645246	0.93	0.051	9.62	6.56	10.71
AS		1136	8000	0.14	1014	1914	29.03	16.45	2.67	0.52	0.1914	0.0645246	0.47	0.099	8.89	6.44	10.69
AS		1136	8000	0.14	50703	91652	30.31	0.33	136.77	0.52	9.17	0.0645246	0.01	5.095	8.03	6.99	10.94
AS		1136	8000	0.14	101406	175724	31.61	0.16	273.54	0.52	17.57	0.0645246	0.00	10.190	7.85	7.67	11.22
AS		1136	8760	0.13	51	96	29.00	300.52	0.14	0.52	0.0096	0.05892658	8.51	0.005	23.37	9.37	12.13
AS		1136	8760	0.13	507	957	29.01	30.05	1.37	0.52	0.0957	0.05892658	0.85	0.051	10.39	7.16	11.72
AS		1136	8760	0.13	1014	1914	29.03	15.03	2.67	0.52	0.1914	0.05892658	0.43	0.099	9.67	7.04	11.70
AS		1136	8760	0.13	50703	91652	30.31	0.30	136.77	0.52	9.17	0.05892658	0.01	5.095	8.79	7.65	11.98
AS		1136	8760	0.13	101406	175724	31.61	0.15	273.54	0.52	17.57	0.05892658	0.00	10.190	8.60	8.40	12.28

Process Vent Raw Data For PET - Application of HON Existing and New TRE Criteria

Facility	Process	Strm #	Stream Name	EG vol%	MeOH vol	HAc vol%	1,4-Diox v	Eth.Ox.vol	Emissions (tpy)	E(HAP)kg/hr	Qs(scfm)	Qs(scmm)
U(T)	DMT-B	1	vent tank	0.002	0.38	0.01	0.002		77.27	8.1040776	1740	49.242
U(T)	DMT-B	2	vent tank	0.02	0.3	0.01	0.002		89.6	9.397248	2600	73.58
U(T)	DMT-B	3	vent tank	0.01	0.06	0.02	0.004		138.2	14.494416	2000	56.6
V(U)	DMT-B	1	vent tank	0.0065	0.027	0.0005	0.000055		50.34	5.2796592	4250	120.275
P(A)	DMT-C	4	MeOH rec scrubber	0	18				0.1	0.010488	0.5	0.01415
P(A)	DMT-C	9	EG refining	0.14	15.8				3.1	0.325128	830	23.489
I(E)	DMT-C	1	vac.jet	0.012	0.003	0.05	0.0003	0.015	0.351	0.03681288	0.01673	0.0004735
I(E)	DMT-C	3	vac.jet	0.007	0.003	0.09	0.0004	0.0035	0.455	0.0477204	0.02169	0.0006137
I(E)	DMT-C	14	vac.pump	0.05	0.62	0.005	0.015	0.004	3.027	0.31747176	0.14413	0.0040789
I(E)	DMT-C	20	scrubber	0.2	0.0016	0.001	0.004	0.0005	0.9085	0.09528348	0.04322	0.0012232
I(E)	DMT-C	22	GTO sealpot	0.0008	0.003	0.0002	0.00002	0.00008	0.0185	0.00194028	0.00088	2.497E-05
I(E)	DMT-C	23	Rxt sealpot			0.0009			0.004	0.00041952	0.00019	5.398E-06
I(E)	DMT-C	32	run/feed tank	0.04	0.031	0.0005			0.312	0.03272256	0.01487	0.0004209
I(E)	DMT-C	33	hold tank	0.02	0.016	0.0003			0.156	0.01636128	0.00744	0.0002105
I(E)	DMT-C	5	vac.jet	0.012	0.003	0.05	0.0003	0.015	0.3515	0.03686532	0.01675	0.0004742
I(E)	DMT-C	6	vac.jet	0.007	0.003	0.09	0.0004	0.0035	0.455	0.0477204	0.02169	0.0006137
I(E)	DMT-C	8	vac.jet	0.008	0.031	0.007	0.0003	0.0007	0.205	0.0215004	0.00977	0.0002766
I(E)	DMT-C	25	scrubber	0.4	0.0035	0.002	0.008	0.001	1.816	0.19046208	0.0862	0.0024393
I(E)	DMT-C	39	mix tank	0.04	0.031	0.0005			0.312	0.03272256	0.01487	0.0004209
I(E)	DMT-C	81	sealpot	0.0008	0.0003	0.0002	0.00002	0.00008	0.0185	0.00194028	0.00088	2.497E-05
I(E)	DMT-C	89	work tank	0.007	0.187	0.0003	0.0002		0.85	0.089148	0.04052	0.0011469
I(E)	DMT-C	134	crystalize	0.05		0.16			0.92	0.0964896	0.04381	0.0012399
I(E)	DMT-C	44	MeOH condenser vent	0.00001	0.018	0.002	7E-07		0.089	0.00933432	0.00424	0.0001201
I(E)	DMT-C	69	work tank	0.0007	0.43	0.03	0.002		2.041	0.21406008	0.09727	0.0027528
I(E)	DMT-C	1	MeOH vac.pump	0.05	0.01	0.05	0.0003	0.003	0.4915	0.05154852	0.02342	0.0006628
Q(H)	DMT-C	11	refining cond vent		0.001338				0.8	0.083904	1	0.0283
Q(H)	DMT-C	16	mix tank (18)	0.01					0.23	0.0241224	3	0.0849
Q(H)	DMT-C	23	vac system			3.35E-05			0.04	0.0041952	2	0.0566
Q(H)	DMT-C	24	vac system	3.72E-05					0.2	0.020976	9	0.2547
Q(H)	DMT-C	25	vac system	1.34E-05					0.2	0.020976	25	0.7075

Process Vent Raw Data For PET - Application of HON Existing and New TRE Criteria

						***************** Existing Analysis ***********			************ New Analysis *************		
Facility	Process	Strm #	Ht(stream)MJ/scm	E(TOC)kg/hr	Existing Control	TRE(flare)	TRE(TI,0%)	TRE(TI,70%)	TRE (flare)	TRE (TI,0%)	TRE (TI,70%)
U(T)	DMT-B	1	0.135	8.1040776		2.5	0.6	0.4	0.7	0.2	0.1
U(T)	DMT-B	2	0.119	9.397248		3.1	0.6	0.4	0.8	0.2	0.1
U(T)	DMT-B	3	0.040	14.494416		1.6	0.3	0.3	0.4	0.1	0.1
V(U)	DMT-B	1	0.013	5.2796592		8.7	1.7	0.8	2.4	0.5	0.2
P(A)	DMT-C	4	5.993	0.010488		180.6	160.5	247.7	2.7	2.4	3.8
P(A)	DMT-C	9	5.347	0.325128		32.3	9.6	8.9	N	N	N
I(E)	DMT-C	1	0.041	0.03681288		52.6	40.6	68.5	14.3	11.1	18.7
I(E)	DMT-C	3	0.054	0.0477204		40.5	31.3	52.8	11.1	8.5	14.4
I(E)	DMT-C	14	0.256	0.31747176		6.1	4.7	8.0	1.7	1.3	2.2
I(E)	DMT-C	20	0.128	0.09528348		20.3	15.7	26.5	5.5	4.3	7.2
I(E)	DMT-C	22	0.002	0.00194028		997.3	769.0	1298.3	271.9	209.7	354
I(E)	DMT-C	23	0.00047	0.00041952		4612.4	3556.5	6004.5	1257.6	969.7	1637.1
I(E)	DMT-C	32	0.035	0.03272256		59.1	45.6	77.0	16.1	12.4	21
I(E)	DMT-C	33	0.018	0.01636128		118.3	91.2	154.0	32.2	24.9	42
I(E)	DMT-C	5	0.041	0.03686532		52.5	40.5	68.4	14.3	11	18.6
I(E)	DMT-C	6	0.054	0.0477204		40.5	31.3	52.8	11.1	8.5	14.4
I(E)	DMT-C	8	0.019	0.0215004		90.0	69.4	117.2	24.5	18.9	32
I(E)	DMT-C	25	0.256	0.19046208		10.2	7.9	13.3	2.8	2.1	3.6
I(E)	DMT-C	39	0.035	0.03272256		59.1	45.6	77.0	16.1	12.4	21
I(E)	DMT-C	81	0.001	0.00194028		997.3	769.0	1298.3	271.9	209.7	354
I(E)	DMT-C	89	0.067	0.089148		21.7	16.8	28.3	5.9	4.6	7.7
I(E)	DMT-C	134	0.114	0.0964896		20.0	15.5	26.2	5.5	4.2	7.1
I(E)	DMT-C	44	0.007	0.00933432		207.3	159.9	269.9	56.5	43.6	73.6
I(E)	DMT-C	69	0.161	0.21406008		9.0	7.0	11.8	2.5	1.9	3.2
I(E)	DMT-C	1	0.062	0.05154852		37.5	29.0	48.9	10.2	7.9	13.3
Q(H)	DMT-C	11	0.00045	0.083904		23.2	17.8	30.1	6.3	4.9	8.2
Q(H)	DMT-C	16	0.006	0.0241224		81.5	62.1	104.5	399.9	304.6	512.6
Q(H)	DMT-C	23	0.000017	0.0041952		466.2	356.5	600.7	127.1	97.2	163.8
Q(H)	DMT-C	24	0.000023	0.020976		96.7	71.9	120.3	26.4	19.6	32.8
Q(H)	DMT-C	25	0.000008	0.020976		104.6	73.2	120.5	28.5	20	32.9

Process Vent Raw Data For PET - Application of HON Existing and New TRE Criteria

Facility	Process	Strm #	Stream Name	EG vol%	MeOH vol	HAc vol%	1,4-Diox v	Eth.Ox.vol	Emissions (tpy)	E(HAP)kg/hr	Qs(scfm)	Qs(scmm)
Q(H)	DMT-C	26	refining system	0.000335					1.2	0.125856	6	0.1698
Q(H)	DMT-C	27	vac system			3.35E-05			0.04	0.0041952	2	0.0566
Q(H)	DMT-C	29	mix tank	0.000335					0.04	0.0041952	0.2	0.00566
B(J)	DMT-C	2	EG mix tank						0.98			
B(J)	DMT-C	3	MeOH recovery		33	0.06	0.0007		1.206	0.12648528	0.05557	0.0015727
C(L)	DMT-C	3	mix tank	0.1	0.21	0.026	0.016		0.2242	0.023514096	0.01067	0.000302
C(L)	DMT-C	4	MeOH recovery		33.27	0.0598	0.00078		6.62	0.6943056	0.30496	0.0086305
C(L)	DMT-C	11	proc.tank	0.0587	0.1952	0.6196	0.0022		0.8955	0.09392004	0.04253	0.0012036
C(L)	DMT-C	3	reactor	0.0277	0.0016	0.000061	0.00205		16.1605	1.69491324	0.77041	0.0218026
C(L)	DMT-C	2	Rxt charging						8.14	0.8537232		
G(M)	DMT-C	4	column		20.3	0.11	0.0019		2.7226	0.285546288	0.12706	0.0035957
P(A)	solid state	1	reactor scrubber (E8)	0.4		3.4			4.2	0.440496	500	14.15
P(A)	solid state	2	rxt tank vent (E11)	2.42E-07		2.42E-07			0.2	0.020976	1382	39.1106
I(E)	solid state	1	vac. pump (2)	0.024		0.046			0.588	0.06166944	0.02803	0.0007932
I(E)	solid state	3	1/2 hot air vent	0.072		0.138			0.882	0.09250416	0.042	0.0011885
I(E)	solid state	5	3 hot air vent	0.34		0.78			4.693	0.49220184	0.22205	0.0062839
I(E)	solid state	7	4 hot air vent	0.32		0.59			3.822	0.40085136	0.18105	0.0051238
I(E)	solid state	9	zum discharge	0.56		0.11			2.814	0.29513232	0.13327	0.0037716
I(E)	solid state	21	4 combined vents	1.14		3.41			19.11	2.0042568	0.8842	0.025023
Q(H)	solid state	1	Rxt/dryer scrubber	0.5	0.5	22			0.003	0.00031464	35	0.9905
Q(H)	solid state	2	Rxt/dryer scrubber	0.06	0.02	0.02			0.003	0.00031464	4342	122.8786
Q(H)	solid state	3	Rxt/dryer bleed	0.0001	0.0001	0.0001			1.32	0.1384416	216	6.1128
Q(H)	solid state	4	Rxt/dryer bleed	0.0001	0.0001	0.0001			1.32	0.1384416	216	6.1128
Q(H)	solid state	6	Rxt/dryer bleed		0.00007	0.00002			0.013	0.00136344	300	8.49
Q(H)	solid state	8	Rxt/drying cat convt vt						49.1			
Q(H)	solid state	9	Rxt/dryer scrub vent	0.00014		0.000138			0.81	0.0849528	0.03863	0.0010932
J(N)	solid state	1	crystallizer			0.008			0.12	0.0125856	680	19.244
J(N)	solid state	2	reactors	0.0027		0.0252			0.081	0.00849528	29	0.8207
J(N)	solid state	3	glycol rec. vac.pump	0.0019	0.002	0.0252		0.0037	1.968	0.20640384	630	17.829
J(N)	solid state	9	extrude/dry			100			0.01	0.0010488	0.00031	8.884E-06
R(W)	solid state	E8	adsorber	0.004	0.02	0.03			9.6	1.006848	8.1	0.22923

						***************** Existing Analysis ***********			************ New Analysis **************		
Facility	Process	Strm #	Ht(stream)MJ/scm	E(TOC)kg/hr	Existing Control	TRE(flare)	TRE(TI,0%)	TRE(TI,70%)	TRE (flare)	TRE (TI,0%)	TRE (TI,70%)
Q(H)	DMT-C	26	0.00021	0.125856		15.9	11.9	20.1	4.3	3.3	5.5
Q(H)	DMT-C	27	0.000017	0.0041952		466.2	356.5	600.7	127.1	97.2	163.8
Q(H)	DMT-C	29	0.00021	0.0041952		461.7	355.7	600.5	125.9	97	163.7
B(J)	DMT-C	2									
B(J)	DMT-C	3	11.020	0.12648528		14.6	14.6	21.1	4	4	5.8
C(L)	DMT-C	3	0.160	0.023514096		82.2	63.7	107.3	22.4	17.4	29.2
C(L)	DMT-C	4	11.109	0.6943056		2.7	2.7	3.9	0.7	0.7	1.1
C(L)	DMT-C	11	0.425	0.09392004		20.6	16.0	26.9	5.6	4.4	7.3
C(L)	DMT-C	3	0.020	1.69491324		1.1	0.9	1.5	0.3	0.2	0.4
C(L)	DMT-C	2				2.3	1.7	3.0	0.6	0.5	0.8
G(M)	DMT-C	4	6.818	0.285546288		6.6	6.0	9.2	1.8	1.6	2.5
P(A)	solid state	1	2.013	0.440496		16.1	5.5	6.2	1.1	0.4	0.4
P(A)	solid state	2	0.00000027	0.020976		774.7	188.0	142.2	211.2	51.3	38.7
I(E)	solid state	1	0.039	0.06166944		31.4	24.2	40.9	17.1	13.2	22.3
I(E)	solid state	3	0.116	0.09250416		20.9	16.2	27.3	5.7	4.4	7.4
I(E)	solid state	5	0.615	0.49220184		3.9	3.1	5.2	1.1	0.8	1.4
I(E)	solid state	7	0.503	0.40085136		4.8	3.8	6.3	1.3	1	1.7
I(E)	solid state	9	0.402	0.29513232		6.5	5.1	8.6	1.8	1.4	2.3
I(E)	solid state	21	2.473	2.0042568		1.0	0.8	1.3	0.3	0.2	0.4
Q(H)	solid state	1	11.909	0.00031464		7011.1	6141.7	8535.3	N	N	N
Q(H)	solid state	2	0.054	0.00031464		149085.2	29222.3	12628.3	N	N	N
Q(H)	solid state	3	0.00015	0.1384416		30.1	13.5	18.8	8.6	3.9	5.4
Q(H)	solid state	4	0.00015	0.1384416		30.1	13.5	18.8	8.6	3.9	5.4
Q(H)	solid state	6	0.000034	0.00136344		3698.2	1484.5	1921.2	1092.4	438.6	567.4
Q(H)	solid state	8			98% incin	ND	ND	ND	ND	ND	ND
Q(H)	solid state	9	0.00016	0.0849528		22.8	17.6	29.7	1	0.7	1.3
J(N)	solid state	1	0.004	0.0125856	98% incin	713.4	214.4	218.3	194.5	58.5	59.5
J(N)	solid state	2	0.015	0.00849528	98% incin	263.1	181.7	297.7	71.7	49.6	81.2
J(N)	solid state	3	0.017	0.20640384	98% incin	41.0	12.6	13.3	11.2	3.4	3.6
J(N)	solid state	9	51.976	0.0010488		1464.0	2997.0	3046.1	399.2	817.2	830.6
R(W)	solid state	E8	0.025	1.006848		2.0	1.5	2.6	0.5	0.4	0.7

Process Vent Raw Data For PET - Application of HON Existing and New TRE Criteria

Facility	Process	Strm #	Stream Name		EG vol%	MeOH vol	HAc vol%	1,4-Diox v	Eth.Ox.vol	Emissions (tpy)	E(HAP)kg/hr	Qs(scfm)	Qs(scmm)
P(A)	TPA-C	5	vac pump vent		0.02		35.9			3.5	0.36708	1	0.0283
P(A)	TPA-C	6	Est dist vent		0.001255		0.001255			1.5	0.15732	2	0.0566
S(B)	TPA-C	1	1* Est receiver				5	0.06		3.11	0.3261768	0.14439	0.0040863
S(B)	TPA-C	5	2* Est receiver				2			0.23	0.0241224	0.01086	0.0003072
S(B)	TPA-C	6	2* Est condenser		0.008		0.6			0.238	0.02496144	0.01131	0.0003202
S(B)	TPA-C	7	glycol receiver				0.03			0.5	0.05244	0.02384	0.0006747
S(B)	TPA-C	9	steam jet vent		0.01		0.03			7.75	0.81282	0.3695	0.0104567
S(B)	TPA-C	10	steam jet vent		0.01		0.21	0.01		44.32	4.6482816	2.11063	0.0597309
S(B)	TPA-C	12	glycol receiver				0.01			0.11	0.0115368	0.00525	0.0001485
S(B)	TPA-C	13	glycol receiver				0.03			0.13	0.0136344	0.0062	0.0001754
S(B)	TPA-C	14	glycol receiver				0.01			0.08	0.0083904	0.00381	0.000108
S(B)	TPA-C	15	glycol receiver				0.01			0.03	0.0031464	0.00143	4.049E-05
S(B)	TPA-C	16	vac.pump				0.02			0.01	0.0010488	0.00048	1.349E-05
S(B)	TPA-C	17	vac.pump							0.01	0.0010488	0.00048	1.35E-05
S(B)	TPA-C	18	vac.pump				0.04			0.01	0.0010488	0.00048	1.349E-05
S(B)	TPA-C	23	glycol seal tank				0.1	0.002		0.91	0.0954408	0.04337	0.0012275
I(E)	TPA-C	9	Prim Est vent		0.032	0.064	2	0.226	0.0014	10.234	1.07334192	0.48064	0.0136021
I(E)	TPA-C	34	SV(ent?)		0.0006		0.001			0.0075	0.0007866	0.00036	1.012E-05
I(E)	TPA-C	37	vac.pump		0.022	0.019	0.48	0.0004	0.0006	2.297	0.24090936	0.10924	0.0030915
I(E)	TPA-C	17	mix tank scrubber vt		0.001		0.044	0.0003	0.003	0.2125	0.022287	0.01013	0.0002867
I(E)	TPA-C	18	mix tank scrub mani		0.00005		0.004		0.0003	0.021	0.00220248	0.001	2.834E-05
Q(H)	TPA-C	15	mix tank		0.09					0.055	0.0057684	0.00262	7.415E-05
Q(H)	TPA-C	16	feed tank							0.055			
C(L)	TPA-C	3	seal tank				0.22	0.00018		2.6188	0.274659744	0.12475	0.0035303
C(L)	TPA-C	6	mix tank		2.775					0.3797	0.039822936	0.01755	0.0004967
C(L)	TPA-C	9	EG proc. tank				0.2758			0.0035	0.00036708	0.00017	4.717E-06
J(N)	TPA-C	2	1* Est cond/receiver			3	2.6	0.02		8.35	0.875748	0.39153	0.0110804
J(N)	TPA-C	3	2* Est cond/receiver		1.1	0.06	1.4	0.05		3.91	0.4100808	0.18265	0.005169
J(N)	TPA-C	4	poly cond/receiver				100			8.18	0.8579184	0.2568	0.0072674
J(N)	TPA-C	5	extrude/dry				100			9.77	1.0246776	0.30671	0.00868
J(N)	TPA-C	11	1* Est cond/receiver			0.05	4.5	0.02		2.87	0.3010056	0.13368	0.0037833
J(N)	TPA-C	12	2* Est cond/receiver		1.7	0.2	2.7	0.05		0.91	0.0954408	0.04195	0.001187
J(N)	TPA-C	13	poly cond/receiver				100			2.83	0.2968104	0.08884	0.0025143
J(N)	TPA-C	14	extrude/dry				100			1.23	0.1290024	0.03861	0.0010928

						****************** Existing Analysis ***********			************ New Analysis *************		
Facility	Process	Strm #	Ht(stream)MJ/scm	E(TOC)kg/hr	Existing Control	TRE(flare)	TRE(TI,0%)	TRE(TI,70%)	TRE (flare)	TRE (TI,0%)	TRE (TI,70%)
P(A)	TPA-C	5	18.672	0.36708		4.9	5.7	7.6	0.1	0.1	0.1
P(A)	TPA-C	6	0.001	0.15732		12.4	9.5	16.1	3.4	2.6	4.4
S(B)	TPA-C	1	2.657	0.3261768		5.9	4.8	7.9	1.6	1.3	2.1
S(B)	TPA-C	5	1.040	0.0241224		79.9	63.2	105.0	21.8	17.2	28.6
S(B)	TPA-C	6	0.317	0.02496144		77.4	60.2	101.1	21.1	16.4	27.6
S(B)	TPA-C	7	0.016	0.05244		36.9	28.5	48.1	10.1	7.8	13.1
S(B)	TPA-C	9	0.022	0.81282		2.4	1.8	3.1	0.7	0.5	0.9
S(B)	TPA-C	10	0.125	4.6482816		0.4	0.3	0.6	0.1	0.1	0.2
S(B)	TPA-C	12	0.005	0.0115368		167.7	129.3	218.4	45.7	35.3	59.5
S(B)	TPA-C	13	0.016	0.0136344		141.9	109.5	184.8	38.7	29.8	50.4
S(B)	TPA-C	14	0.005	0.0083904		230.6	177.8	300.3	62.9	48.5	81.9
S(B)	TPA-C	15	0.005	0.0031464		615.0	474.2	800.7	167.7	129.3	218.3
S(B)	TPA-C	16	0.010	0.0010488		1844.9	1422.9	2402.0	503	388	654.9
S(B)	TPA-C	17	0.000	0.0010488		1845.0	1422.6	2401.8	503	388	654.9
S(B)	TPA-C	18	0.021	0.0010488		1844.8	1423.2	2402.1	503	388	654.9
S(B)	TPA-C	23	0.054	0.0954408		20.3	15.7	26.4	5.5	4.3	7.2
I(E)	TPA-C	9	1.300	1.07334192		1.8	1.4	2.4	0.5	0.4	0.7
I(E)	TPA-C	34	0.001	0.0007866		2459.9	1896.8	3202.5	670.7	517.2	873.1
I(E)	TPA-C	37	0.270	0.24090936		8.0	6.2	10.5	2.2	1.7	2.9
I(E)	TPA-C	17	0.025	0.022287		86.8	67.0	113.1	23.7	18.3	30.8
I(E)	TPA-C	18	0.002	0.00220248		878.6	677.5	1143.8	239.5	184.7	311.8
Q(H)	TPA-C	15	0.055	0.0057684		335.4	259.0	436.9	91.4	70.6	119.1
Q(H)	TPA-C	16				N	N	N	N	N	N
C(L)	TPA-C	3	0.115	0.274659744		7.0	5.4	9.2	1.9	1.5	2.5
C(L)	TPA-C	6	1.707	0.039822936		48.3	38.8	63.9	13.2	10.6	17.4
C(L)	TPA-C	9	0.143	0.00036708		5268.3	4076.9	6867.4	1436.5	1111.6	1872.4
J(N)	TPA-C	2	2.370	0.875748		2.2	1.8	3.0	0.6	0.5	0.8
J(N)	TPA-C	3	1.473	0.4100808		4.7	3.8	6.2	1.3	1	1.7
J(N)	TPA-C	4	51.976	0.8579184		1.8	3.7	3.8	0.5	1	1
J(N)	TPA-C	5	51.976	1.0246776		1.5	3.1	3.2	0.4	0.8	0.9
J(N)	TPA-C	11	2.375	0.3010056		6.4	5.2	8.5	1.7	1.4	2.3
J(N)	TPA-C	12	2.564	0.0954408		20.1	16.5	26.8	5.5	4.5	7.3
J(N)	TPA-C	13	51.976	0.2968104		5.2	10.6	10.8	1.4	2.9	2.9
J(N)	TPA-C	14	51.976	0.1290024		11.9	24.4	24.8	3.2	6.6	6.8

Facility	Process	Strm #	Stream Name		EG vol%	MeOH vol	HAc vol%	1,4-Diox v	Eth.Ox.vol	Emissions (tpy)	E(HAP)kg/hr	Qs(scfm)	Qs(scmm)
J(N)	TPA-C	20	1* Est cond/receiver			0.05	4.5	0.02		0.488	0.05118144	0.02273	0.0006433
J(N)	TPA-C	21	2* Est cond/receiver		1.7	0.2	2.7	0.05		0.158	0.01657104	0.00728	0.0002061
J(N)	TPA-C	22	poly cond/receiver				100			0.48	0.0503424	0.01507	0.0004264
J(N)	TPA-C	23	extrude/dry				100			0.21	0.0220248	0.00659	0.0001866
J(N)	TPA-C	29	1* Est cond/receiver			0.05	4.5	0.02		0.974	0.10215312	0.04537	0.0012839
J(N)	TPA-C	30	2* Est cond/receiver		1.7	0.2	2.7	0.05		0.305	0.0319884	0.01406	0.0003979
J(N)	TPA-C	31	poly cond/receiver				100			0.95	0.099636	0.02982	0.000844
J(N)	TPA-C	32	extrude/dry				100			0.42	0.0440496	0.01319	0.0003731
J(N)	TPA-C	38	1* Est cond/receiver			0.05	4.5	0.02		1.644	0.17242272	0.07658	0.0021671
J(N)	TPA-C	39	2* Est cond/receiver		1.7	0.2	2.7	0.05		0.264	0.02768832	0.01217	0.0003444
J(N)	TPA-C	40	poly cond/receiver				100			1.63	0.1709544	0.05117	0.0014481
J(N)	TPA-C	41	vac.pump		81.5	0.6	8.7		9.2	3.65	0.382812	0.08605	0.0024351
J(N)	TPA-C	42	extrude/dry				100			0.36	0.0377568	0.0113	0.0003198
K(R)	TPA-C	41	2* Est condenser		70					0.00016	1.67808E-05	4.2E-06	1.201E-07
K(R)	TPA-C	42	2* Est condenser		70					0.00009	9.4392E-06	2.4E-06	6.755E-08
K(R)	TPA-C	51	2* Est condenser		70					0.00017	1.78296E-05	4.5E-06	1.276E-07
K(R)	TPA-C	52	2* Est condenser		70					0.00009	9.4392E-06	2.4E-06	6.755E-08
A(S)	TPA-C	1	Est condenser		35		35			0.02	0.0020976	0.0006	1.708E-05
A(S)	TPA-C	3	vac. pump		2					3.5	0.36708	0.16319	0.0046183

Note - An "N" in TRE columns means TRE judged to be >1.0, actual value could not be calculated.
An "ND" in TRE column means no data was available.

Process Vent Raw Data For PET - Application of HON Existing and New TRE Criteria

						***************** Existing Analysis ***********			************ New Analysis *************		
Facility	Process	Strm #	Ht(stream)MJ/scm	E(TOC)kg/hr	Existing Control	TRE(flare)	TRE(TI,0%)	TRE(TI,70%)	TRE (flare)	TRE (TI,0%)	TRE (TI,70%)
J(N)	TPA-C	20	2.375	0.05118144		37.5	30.6	49.9	10.2	8.4	13.6
J(N)	TPA-C	21	2.564	0.01657104		115.6	95.0	154.1	31.5	25.9	42
J(N)	TPA-C	22	51.976	0.0503424		30.5	62.4	63.5	8.3	17	17.3
J(N)	TPA-C	23	51.976	0.0220248		69.7	142.7	145.1	19	38.9	39.6
J(N)	TPA-C	29	2.375	0.10215312		18.8	15.3	25.0	5.1	4.2	6.8
J(N)	TPA-C	30	2.564	0.0319884		59.9	49.2	79.8	16.3	13.4	21.8
J(N)	TPA-C	31	51.976	0.099636		15.4	31.5	32.1	4.2	8.6	8.8
J(N)	TPA-C	32	51.976	0.0440496		34.9	71.4	72.6	9.5	19.5	19.8
J(N)	TPA-C	38	2.375	0.17242272		11.1	9.1	14.8	3	2.5	4
J(N)	TPA-C	39	2.564	0.02768832		69.2	56.8	92.2	18.9	15.5	25.1
J(N)	TPA-C	40	51.976	0.1709544		9.0	18.4	18.7	2.4	5	5.1
J(N)	TPA-C	41	59.020	0.382812		3.9	8.8	8.6	1.1	2.4	2.4
J(N)	TPA-C	42	51.976	0.0377568		40.7	83.3	84.7	11.1	22.7	23.1
K(R)	TPA-C	41	43.050	1.67808E-05		95589.8	170415.2	183462.8	59573.8	106214.8	114342.4
K(R)	TPA-C	42	43.050	9.4392E-06		169937.5	302960.3	326156.1	83403.3	148700.7	160079.3
K(R)	TPA-C	51	43.050	1.78296E-05		89966.9	160390.7	172670.9	139005.5	247834.5	266798.8
K(R)	TPA-C	52	43.050	9.4392E-06		169937.5	302960.3	326156.1	139005.5	247834.5	266798.8
A(S)	TPA-C	1	39.717	0.0020976		776.9	1312.8	1447.1	211.8	358	394.6
A(S)	TPA-C	3	1.230	0.36708		5.2	4.2	7.0	1.4	1.1	1.9

Note - An "N" in TRE colum

An "ND" in TRE column m

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility ID	Subcategory	Stream ID	Stream Name	AN PPMV	EB PPMV	STY PPMV	MA PPMV	MEK ppmv	MMA ppmv	Flow Rate (scfm)	Emissions (lbs/yr) AN	EB	STY	MA	MEK	MMA	F AN
BE	SAN,B	1	Product Drying-Rota	5	0.004	2				16073	3080	4	2040				4641.367735
				5.601709669	0.00376557	1.957499759				16073	3080	4	2040				4000
				2.76271669	0.001763128	0.932142742				16073	3080	4	2040				8400
BE	SAN,B	2	Product Transfer SI	416		239				363	154		154				122.9136245
				446.7643047		227.58558				363	154		154				115
				6.116416077		3.115754964				363	154		154				8400
BE	SAN,B	3	Product Transfer-SI	416		239				363	154		154				122.9136245
				446.7643047		227.58558				363	154		154				115
				6.116416077		3.115754964				363	154		154				8400
BE	SAN,B	4	Reactor Charge Pur	14000	30	100				137	6160	28	220				388.950488
				14000	30	100				20	6160	28	220				2664.310643
				13613.26708	30.92467275	247.6684055				137	6160	28	220				400
				93250.67951	211.8340084	1696.528578				20	6160	28	220				400
				648.2508134	1.472603464	11.7937336				137	6160	28	220				8400
				4440.516072	10.08733373	80.78707513				20	6160	28	220				8400
BE	SAN,B	5	Vapor Recovery-Dis	30		14				11.8	8		6				2736.637024
				34.2104628		13.07032603				11.8	8		6				2400
				9.774417944		3.734379436				11.8	8		6				8400
BF	SAN,B & C	6	Feedstock Premixin	29800	55	920				29	1800	20	200				252.2437734
				16704.14322	92.75709178	945.4704718				29	1800	20	200				450
				894.8648152	4.969129917	50.65020385				29	1800	20	200				8400
				23100	55	920				29	1800	20	200				325.4053873
				16704.14322	92.75709178	945.4704718				29	1800	20	200				450
				894.8648152	4.969129917	50.65020385				29	1800	20	200				8400
				29800	55	920				20	1800	20	200				365.7534714
				21798.9069	121.0480048	1233.838966				20	1800	20	200				500
				1297.553982	7.205238379	73.44279558				20	1800	20	200				8400
				23100	55	920				20	1800	20	200				471.6378116
				14532.6046	80.69866985	822.5593105				20	1800	20	200				750
				1297.553982	7.205238379	73.44279558				20	1800	20	200				8400
				29800	0	920				29	1800	20	200				252.2437734
				20880.17902	115.9463647	1181.83809				29	1800	20	200				360
				894.8648152	4.969129917	50.65020385				29	1800	20	200				8400
				23100	0	920				29	1800	20	200				325.4053873
				19030.03658	105.6726362	1077.118259				29	1800	20	200				395
				894.8648152	4.969129917	50.65020385				29	1800	20	200				8400
				29800	0	920				20	1800	20	200				365.7534714
				20960.4874	116.3923123	1186.383621				20	1800	20	200				520
				1297.553982	7.205238379	73.44279558				20	1800	20	200				8400
				23100	0	920				20	1800	20	200				471.6378116
				19121.84616	106.1824603	1082.314682				20	1800	20	200				570
				1297.553982	7.205238379	73.44279558				20	1800	20	200				8400
BF	SAN,B & C	7	Feedstock Recovery	45400	127	2230				22	19400	100	1500				2352.260456
				50853.63081	131.0043342	2002.985334				22	19400	100	1500				2100
				12713.4077	32.75108354	500.7463335				22	19400	100	1500				8400
				45400	80	2230				22	19400	100	1500				2352.260456
				41715.86902	107.4644929	1643.073907				22	19400	100	1500				2560
				12713.4077	32.75108354	500.7463335				22	19400	100	1500				8400
				45400	127	845				22	19400	100	1500				2352.260456
				33741.74556	86.92230703	1328.995008				22	19400	100	1500				3165
				12713.4077	32.75108354	500.7463335				22	19400	100	1500				8400
				45400	80	845				22	19400	100	1500				2352.260456
				29747.24922	76.63208177	1171.66273				22	19400	100	1500				3590
				12713.4077	32.75108354	500.7463335				22	19400	100	1500				8400
				10500	127	2230				22	19400	100	1500				10170.72616
				22530.0696	58.03969489	887.3965657				22	19400	100	1500				4740
				12713.4077	32.75108354	500.7463335				22	19400	100	1500				8400

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	quency (HRS/YR) BASED ON EACH COMPOUND					Btu Content	Qs	EHAP (KG/HR) BASED ON COMPONENT					
ID		ID	Name	EB	STY	MA	MEK	MMA	BTU/SCF	m^3/min	AN	EB	STY	MA	MEK	MMA
BE	SAN,B	1	Product Drying-Rota	3765.569737	3914.999518				0.019654278	455.18736	0.50076756	0.617236318	0.593677314			
				4000	4000				0.021024593	455.18736	0.5810616	0.5810616	0.5810616			
				8400	8400				0.010011711	455.18736	0.276696	0.276696	0.276696			
BE	SAN,B	2	Product Transfer SI		109.5077058				1.992724056	10.28016	1.1368421		1.275789671			
					115				1.993547941	10.28016	1.21485913		1.21485913			
					8400				0.027292621	10.28016	0.016632		0.016632			
BE	SAN,B	3	Product Transfer-SI		109.5077058				1.992724056	10.28016	1.1368421		1.275789671			
					115				1.993547941	10.28016	1.21485913		1.21485913			
					8400				0.027292621	10.28016	0.016632		0.016632			
BE	SAN,B	4	Reactor Charge Pur	412.32897	990.6736221				28.21660267	3.87984	7.47310748	7.049392624	2.934032698			
				2824.453445	6786.114311				28.21660267	0.5664	1.0909646	1.029108412	0.428325941			
				400	400				28.18169604	3.87984	7.266672	7.266672	7.266672			
				400	400				193.0446179	0.5664	7.266672	7.266672	7.266672			
				8400	8400				1.341965526	3.87984	0.346032	0.346032	0.346032			
				8400	8400				9.192600852	0.5664	0.346032	0.346032	0.346032			
BE	SAN,B	5	Vapor Recovery-Dis		2240.627662				0.127592589	0.334176	0.00232034		0.002834206			
					2400				0.131339091	0.334176	0.002646		0.002646			
					8400				0.037525454	0.334176	0.000756		0.000756			
BF	SAN,B & C	6	Feedstock Premixin	758.92166	462.4583829				63.47718155	0.82128	3.6324861	1.207334101	1.981308932			
				450	450				37.98769028	0.82128	2.03616	2.03616	2.03616			
				8400	8400				2.035054837	0.82128	0.10908	0.10908	0.10908			
				758.92166	462.4583829				50.27801931	0.82128	2.8157862	1.207334101	1.981308932			
				450	450				37.98769028	0.82128	2.03616	2.03616	2.03616			
				8400	8400				2.035054837	0.82128	0.10908	0.10908	0.10908			
					670.5646553				63.47718155	0.5664	2.50516283		1.368418574			
				500	500				49.57393582	0.5664	1.832544	1.832544	1.832544			
				8400	8400				2.950829513	0.5664	0.10908	0.10908	0.10908			
				1100.436407	670.5646553				50.27801931	0.5664	1.94192152	0.832644207	1.368418574			
				750	750				33.04929055	0.5664	1.221696	1.221696	1.221696			
				8400	8400				2.950829513	0.5664	0.10908	0.10908	0.10908			
					462.4583829				63.20761542	0.82128	3.6324861		1.981308932			
				360	360				47.48461285	0.82128	2.5452	2.5452	2.5452			
				8400	8400				2.035054837	0.82128	0.10908	0.10908	0.10908			
					462.4583829				50.00845318	0.82128	2.8157862		1.981308932			
				395	395				43.27711551	0.82128	2.31967595	2.319675949	2.319675949			
				8400	8400				2.035054837	0.82128	0.10908	0.10908	0.10908			
					670.5646553				63.20761542	0.5664	2.50516283		1.368418574			
				520	520				47.66724598	0.5664	1.76206154	1.762061538	1.762061538			
				8400	8400				2.950829513	0.5664	0.10908	0.10908	0.10908			
					670.5646553				50.00845318	0.5664	1.94192152		1.368418574			
				570	570				43.48590861	0.5664	1.60749474	1.607494737	1.607494737			
				8400	8400				2.950829513	0.5664	0.10908	0.10908	0.10908			
BF	SAN,B & C	7	Feedstock Recovery	2166.2134	1886.219373				100.9713273	0.62304	4.04955156	4.397350696	5.05010188			
				2100	2100				110.6241197	0.62304	4.536	4.536	4.536			
				8400	8400				27.65602993	0.62304	1.134	1.134	1.134			
				3438.863772	1886.219373				100.7409706	0.62304	4.04955156	2.76996469	5.05010188			
				2560	2560				90.7463482	0.62304	3.7209375	3.7209375	3.7209375			
				8400	8400				27.65602993	0.62304	1.134	1.134	1.134			
				2166.2134	4977.833374				94.19552518	0.62304	4.04955156	4.397350696	1.913603627			
				3165	3165				73.39968965	0.62304	3.00966825	3.009668246	3.009668246			
				8400	8400				27.65602993	0.62304	1.134	1.134	1.134			
				3438.863772	4977.833374				93.96516868	0.62304	4.04955156	2.76996469	1.913603627			
				3590	3590				64.71048785	0.62304	2.65337047	2.653370474	2.653370474			
				8400	8400				27.65602993	0.62304	1.134	1.134	1.134			
				2166.2134	1886.219373				32.21748215	0.62304	0.93657029	4.397350696	5.05010188			
				4740	4740				49.01068595	0.62304	2.00962025	2.009620253	2.009620253			
				8400	8400				27.65602993	0.62304	1.134	1.134	1.134			

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility ID	Subcategory	Stream ID	Stream Name	FLARE TRE BASED ON DIFFERENT HRS/YR: AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	TI 0% BASED ON DIFFERENT HRS/YR: AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR
BE	SAN,B	1	Product Drying-Rota	336.549757	273.0447166	283.8800282				59.944048	48.63275028	50.56269845			
				290.0435025	290.0435025	290.0435025				51.66051804	51.66051804	51.66051804			
				609.0921733	609.0921733	609.0921733				108.4883157	108.4883157	108.4883157			
BE	SAN,B	2	Product Transfer SI	5.011370565		4.464711421				1.880360865		1.675147632			
				4.688672963		4.688672963				1.759222601		1.759222601			
				342.5636455		342.5636455				128.4434003		128.4434003			
BE	SAN,B	3	Product Transfer-SI	5.011370565		4.464711421				1.880360865		1.675147632			
				4.688672963		4.688672963				1.759222601		1.759222601			
				342.5636455		342.5636455				128.4434003		128.4434003			
BE	SAN,B	4	Reactor Charge Pur	0.44713206	0.474061713	1.139999035				0.235492902	0.249717237	0.601603573			
				1.955541853	2.073126854	4.981963657				1.429567369	1.515563431	3.642962597			
				0.459856632	0.459856632	0.459856632				0.242210153	0.242210153	0.242210153			
				0.286475737	0.286475737	0.286475737				0.240469604	0.240469604	0.240469604			
				9.693853818	9.693853818	9.693853818				5.017847674	5.017847674	5.017847674			
				6.182716547	6.182716547	6.182716547				4.444584742	4.444584742	4.444584742			
BE	SAN,B	5	Vapor Recovery-Dis	886.6234012		725.871704				652.0980699		533.8675213			
				777.501469		777.501469				571.8424397		571.8424397			
				2721.292489		2721.292489				2001.304858		2001.304858			
BF	SAN,B & C	6	Feedstock Premixin	0.609708564	1.835893019	1.118437864				0.444418071	1.339441347	0.815752549			
				1.091870703	1.091870703	1.091870703				0.778938196	0.778938196	0.778938196			
				20.48887117	20.48887117	20.48887117				14.17079505	14.17079505	14.17079505			
				0.78810469	1.839021849	1.120344456				0.568110112	1.326510044	0.807872698			
				1.091870703	1.091870703	1.091870703				0.778938196	0.778938196	0.778938196			
				20.48887117	20.48887117	20.48887117				14.17079505	14.17079505	14.17079505			
				0.847169672		1.553794387				0.638551568		1.171672822			
				1.160556445	1.160556445	1.160556445				0.864377636	0.864377636	0.864377636			
				19.63126052	19.63126052	19.63126052				14.03428862	14.03428862	14.03428862			
				1.095043758	2.554875722	1.556558945				0.816055665	1.904777255	1.160247038			
				1.745072397	1.745072397	1.745072397				1.281146971	1.281146971	1.281146971			
				19.63126052	19.63126052	19.63126052				14.03428862	14.03428862	14.03428862			
				0.609729603		1.118476802				0.444330293		0.815591619			
				0.872282019	0.872282019	0.872282019				0.627332269	0.627332269	0.627332269			
				20.48887117	20.48887117	20.48887117				14.17079505	14.17079505	14.17079505			
				0.788132089		1.120383394				0.567996875		0.807711768			
				0.957677618	0.957677618	0.957677618				0.68629013	0.68629013	0.68629013			
				20.48887117	20.48887117	20.48887117				14.17079505	14.17079505	14.17079505			
				0.847200668		1.553850848				0.638424311		1.171439473			
				1.207317721	1.207317721	1.207317721				0.897719183	0.897719183	0.897719183			
				19.63126052	19.63126052	19.63126052				14.03428862	14.03428862	14.03428862			
				1.095083486		1.556615406				0.815891491		1.16001369			
				1.324220911	1.324220911	1.324220911				0.98107305	0.98107305	0.98107305			
				19.63126052	19.63126052	19.63126052				14.03428862	14.03428862	14.03428862			
BF	SAN,B & C	7	Feedstock Recovery	0.526271967	0.484589621	0.421859181				0.406411591	0.374175659	0.325661758			
				0.469145998	0.469145998	0.469145998				0.365220136	0.365220136	0.365220136			
				1.899723141	1.899723141	1.899723141				1.377816642	1.377816642	1.377816642			
				0.526288267	0.769740637	0.421872236				0.406344306	0.594586404	0.325607604			
				0.573600837	0.573600837	0.573600837				0.439155754	0.439155754	0.439155754			
				1.899723141	1.899723141	1.899723141				1.377816642	1.377816642	1.377816642			
				0.526750656	0.485030615	1.115524142				0.404432448	0.372353052	0.857150139			
				0.710981658	0.710981658	0.710981658				0.536397165	0.536397165	0.536397165			
				1.899723141	1.899723141	1.899723141				1.377816642	1.377816642	1.377816642			
				0.526767137	0.770440715	1.115558593				0.404365163	0.591693016	0.857007751			
				0.807488846	0.807488846	0.807488846				0.604707246	0.604707246	0.604707246			
				1.899723141	1.899723141	1.899723141				1.377816642	1.377816642	1.377816642			
				2.298946872	0.489064373	0.425755549				1.674266563	0.355681726	0.309558259			
				1.068625944	1.068625944	1.068625944				0.789546291	0.789546291	0.789546291			
				1.899723141	1.899723141	1.899723141				1.377816642	1.377816642	1.377816642			

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility ID	Subcategory	Stream ID	Stream Name	TI 70% TRE BASED ON DIFFERENT HRS/YR: AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	TOTAL HAP FLOW RATE (LBS/HR) BASED ON COMPONENT: AN	EB	STY	MA	MEK	MMA
BE	SAN,B	1	Product Drying-Rota	15.83142233	12.85316721	13.36132093				1.104192472	1.361006081	1.309058478	0	0	0
				13.6503763	13.6503763	13.6503763				1.281240828	1.281240828	1.281240828	0	0	0
				28.61308097	28.61308097	28.61308097				0.61011468	0.61011468	0.61011468	0	0	0
BE	SAN,B	2	Product Transfer Si	2.371919835		2.118444104				2.506295825	0	2.813116224	0	0	0
				2.222291346		2.222291346				2.678764383	0	2.678764383	0	0	0
				158.8157874		158.8157874				0.03667356	0	0.03667356	0	0	0
BE	SAN,B	3	Product Transfer-Si	2.371919835		2.118444104				2.506295825	0	2.813116224	0	0	0
				2.222291346		2.222291346				2.678764383	0	2.678764383	0	0	0
				158.8157874		158.8157874				0.03667356	0	0.03667356	0	0	0
BE	SAN,B	4	Reactor Charge Pur	0.392944613	0.413684083	0.926743469				16.47820198	15.54391074	6.469542099	0	0	0
				2.375525929	2.515431553	5.976463353				2.405576932	2.269184049	0.944458701	0	0	0
				0.402744498	0.402744498	0.402744498				16.02301176	16.02301176	16.02301176	0	0	0
				0.406331158	0.406331158	0.406331158				16.02301176	16.02301176	16.02301176	0	0	0
				7.462093006	7.462093006	7.462093006				0.76300056	0.76300056	0.76300056	0	0	0
				7.359795355	7.359795355	7.359795355				0.76300056	0.76300056	0.76300056	0	0	0
BE	SAN,B	5	Vapor Recovery-Dis	1087.39374		890.2496713				0.005116356	0	0.006249424	0	0	0
				953.5690152		953.5690152				0.00583443	0	0.00583443	0	0	0
				3337.311742		3337.311742				0.00166696	0	0.00166696	0	0	0
BF	SAN,B & C	6	Feedstock Premixin	0.752497051	2.167609469	1.339693266				8.009831844	2.662171692	4.368781786	0	0	0
				1.298834092	1.298834092	1.298834092				4.4897328	4.4897328	4.4897328	0	0	0
				23.23914238	23.23914238	23.23914238				0.2405214	0.2405214	0.2405214	0	0	0
				0.954591898	2.162518098	1.336468922				6.206806577	2.662171692	4.368781786	0	0	0
				1.298834092	1.298834092	1.298834092				4.4897328	4.4897328	4.4897328	0	0	0
				23.23914238	23.23914238	23.23914238				0.2405214	0.2405214	0.2405214	0	0	0
				1.068362118		1.918793598				5.523884031	0	3.012952956	0	0	0
				1.439241505	1.439241505	1.439241505				4.04075952	4.04075952	4.04075952	0	0	0
				23.21556343	23.21556343	23.21556343				0.2405214	0.2405214	0.2405214	0	0	0
				1.361050548	3.110474967	1.91411827				4.28193695	1.835960477	3.012952956	0	0	0
				2.128365617	2.128365617	2.128365617				2.69383968	2.69383968	2.69383968	0	0	0
				23.21556343	23.21556343	23.21556343				0.2405214	0.2405214	0.2405214	0	0	0
				0.752461133		1.339627435				8.009831844	0	4.368781786	0	0	0
				1.050453243	1.050453243	1.050453243				5.612166	5.612166	5.612166	0	0	0
				23.23914238	23.23914238	23.23914238				0.2405214	0.2405214	0.2405214	0	0	0
				0.954545562		1.33640307				6.206806577	0	4.368781786	0	0	0
				1.147045796	1.147045796	1.147045796				5.114885468	5.114885468	5.114885468	0	0	0
				23.23914238	23.23914238	23.23914238				0.2405214	0.2405214	0.2405214	0	0	0
				1.068310037		1.918698114				5.523884031	0	3.012952956	0	0	0
				1.494371434	1.494371434	1.494371434				3.885345692	3.885345692	3.885345692	0	0	0
				23.21556343	23.21556343	23.21556343				0.2405214	0.2405214	0.2405214	0	0	0
				1.360983361		1.914022785				4.28193695	0	3.012952956	0	0	0
				1.632196256	1.632196256	1.632196256				3.544525695	3.544525695	3.544525695	0	0	
				23.21556343	23.21556343	23.21556343				0.2405214	0.2405214	0.2405214	0	0	0
BF	SAN,B & C	7	Feedstock Recovery	0.663632427	0.6335347	0.557638456				8.929261191	9.698158284	11.13547464	0	0	0
				0.616663922	0.616663922	0.616663922				10.00188	10.00188	10.00188	0	0	0
				2.287543924	2.287543924	2.287543924				2.50047	2.50047	2.50047	0	0	0
				0.663604695	0.977564635	0.557816376				8.929261191	6.107816242	11.13547464	0	0	0
				0.736664684	0.736664684	0.736664684				8.204667186	8.204667186	8.204667186	0	0	0
				2.287543924	2.287543924	2.287543924				2.50047	2.50047	2.50047	0	0	0
				0.66302268	0.632768905	1.391940949				8.929261191	9.698158284	4.219495998	0	0	0
				0.899122208	0.899122208	0.899122208				6.636318483	6.636318483	6.636318483	0	0	0
				2.287543924	2.287543924	2.287543924				2.50047	2.50047	2.50047	0	0	0
				0.662995048	0.976370686	1.391862685				8.929261191	6.107816242	4.219495998	0	0	0
				1.011840303	1.011840303	1.011840303				5.850681894	5.850681894	5.850681894	0	0	0
				2.287543924	2.287543924	2.287543924				2.50047	2.50047	2.50047	0	0	0
				2.762019792	0.625967148	0.551249048				2.0651375	9.698158284	11.13547464	0	0	0
				1.316842209	1.316842209	1.316842209				4.431212658	4.431212658	4.431212658	0	0	0
				2.287543924	2.287543924	2.287543924				2.50047	2.50047	2.50047	0	0	

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility ID	Subcategory	Stream ID	Stream Name	AN PPMV	EB PPMV	STY PPMV	MA PPMV	MEK ppmv	MMA ppmv	Flow Rate (scfm)	Emissions (lbs/yr) AN	EB	STY	MA	MEK	MMA	F AN
				10500	80	2230				22	19400	100	1500				10170.72616
				20676.21001	53.26410489	814.3793226				22	19400	100	1500				5165
				12713.4077	32.75108354	500.7463335				22	19400	100	1500				8400
				10500	127	845				22	19400	100	1500				10170.72616
				18508.25385	47.67922041	728.989463				22	19400	100	1500				5770
				12713.4077	32.75108354	500.7463335				22	19400	100	1500				8400
				10500	80	845				22	19400	100	1500				10170.72616
				17238.51692	44.40624687	678.9780793				22	19400	100	1500				6195
				12713.4077	32.75108354	500.7463335				22	19400	100	1500				8400
				45400	127	2230				17	19400	100	1500				3044.101767
				50073.26819	128.9940375	1972.248986				17	19400	100	1500				2760
				16452.64526	42.38375517	648.0246669				17	19400	100	1500				8400
				45400	80	2230				17	19400	100	1500				3044.101767
				41762.93662	107.5599829	1644.533898				17	19400	100	1500				3310
				16452.64526	42.38375517	648.0246669				17	19400	100	1500				8400
				45400	127	845				17	19400	100	1500				3044.101767
				33749.01592	86.94103625	1329.281368				17	19400	100	1500				4095
				16452.64526	42.38375517	648.0246669				17	19400	100	1500				8400
				45400	80	845				17	19400	100	1500				3044.101767
				29752.89994	76.64661861	1171.885296				17	19400	100	1500				4645
				16452.64526	42.38375517	648.0246669				17	19400	100	1500				8400
				10500	127	2230				17	19400	100	1500				13162.11621
				22526.84926	58.03154742	887.2709375				17	19400	100	1500				6135
				16452.64526	42.38375517	648.0246669				17	19400	100	1500				8400
				10500	80	2230				17	19400	100	1500				13162.11621
				20673.48096	53.25707456	814.2718327				17	19400	100	1500				6685
				16452.64526	42.38375517	648.0246669				17	19400	100	1500				8400
				10500	127	845				17	19400	100	1500				13162.11621
				18500.98656	47.66044758	728.7024366				17	19400	100	1500				7470
				16452.64526	42.38375517	648.0246669				17	19400	100	1500				8400
				10500	80	845				17	19400	100	1500				13162.11621
				17232.19703	44.39196302	678.7290775				17	19400	100	1500				8020
				16452.64526	42.38375517	648.0246669				17	19400	100	1500				8400
BF	SAN,B & C	8	Product Drying Rota	28	3	58				1181	1420	300	3080				5200.470377
				33.35626015	3.522205669	38.85912801				1181	1420	300	3080				4365
				17.33490126	1.830289173	19.15358259				1181	1420	300	3080				8400
				28		58				1181	1420	300	3080				5200.470377
				36.54031683	3.858075046	40.37392566				1181	1420	300	3080				3985
				17.33490126	1.830289173	19.15358259				1181	1420	300	3080				8400
				28	3	6				1181	1420	300	3080				5200.470377
				28.2196067	2.979640515	31.18025073				1181	1420	300	3080				5160
				17.33490126	1.830289173	19.15358259				1181	1420	300	3080				8400
				28		6				1181	1420	300	3080				5200.470377
				28.0026328	2.956620972	30.94040264				1181	1420	300	3080				5200
				17.33490126	1.830289173	19.15358259				1181	1420	300	3080				8400
				2	3	58				1181	1420	300	3080				72806.58527
				36.86409381	3.892260521	40.7316693				1181	1420	300	3080				3950
				17.33490126	1.830289173	19.15358259				1181	1420	300	3080				8400
				2		58				1181	1420	300	3080				72806.58527
				52.47321461	5.540334795	57.97841216				1181	1420	300	3080				2775
				17.33490126	1.830289173	19.15358259				1181	1420	300	3080				8400
				2	3	6				1181	1420	300	3080				72806.58527
				28.41232596	2.999868596	31.39318902				1181	1420	300	3080				5125
				17.33490126	1.830289173	19.15358259				1181	1420	300	3080				8400
				2		6				1181	1420	300	3080				72806.58527
				16.62250805	1.75507181	18.36644906				1181	1420	300	3080				8760
				17.33490126	1.830289173	19.15358259				1181	1420	300	3080				8400

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	quency (HRS/YR) BASED ON EACH COMPOUND					Btu Content	Qs	EHAP (KG/HR) BASED ON COMPONENT					
ID		ID	Name	EB	STY	MA	MEK	MMA	BTU/SCF	m^3/min	AN	EB	STY	MA	MEK	MMA
				3438.863772	1886.219373				31.98712564	0.62304	0.93657029	2.76998469	5.05010188			
				5165	5165				44.97786067	0.62304	1.84425944	1.844259439	1.844259439			
				8400	8400				27.65602993	0.62304	1.134	1.134	1.134			
				2166.2134	4977.833374				25.44168006	0.62304	0.93657029	4.397350696	1.913603627			
				5770	5770				40.26181133	0.62304	1.65068388	1.650683882	1.650683882			
				8400	8400				27.65602993	0.62304	1.134	1.134	1.134			
				3438.863772	4977.833374				25.21132356	0.62304	0.93657029	2.76998469	1.913603627			
				6195	6195				37.4997016	0.62304	1.53762712	1.537627119	1.537627119			
				8400	8400				27.65602993	0.62304	1.134	1.134	1.134			
				2803.334988	2440.989776				100.9713273	0.48144	3.12919893	3.39795281	3.902351453			
				2760	2760				108.9265629	0.48144	3.45130435	3.451304348	3.451304348			
				8400	8400				35.79015638	0.48144	1.134	1.134	1.134			
				4450.294293	2440.989776				100.7409708	0.48144	3.12919893	2.140442715	3.902351453			
				3310	3310				90.82698295	0.48144	2.87762477	2.877624773	2.877624773			
				8400	8400				35.79015638	0.48144	1.134	1.134	1.134			
				2803.334988	6441.902014				94.19552518	0.48144	3.12919893	3.39795281	1.478693712			
				4095	4095				73.41570539	0.48144	2.32615385	2.326153846	2.326153846			
				8400	8400				35.79015638	0.48144	1.134	1.134	1.134			
				4450.294293	6441.902014				93.98516868	0.48144	3.12919893	2.140442715	1.478693712			
				4645	4645				64.7227801	0.48144	2.05072121	2.050721206	2.050721206			
				8400	8400				35.79015638	0.48144	1.134	1.134	1.134			
				2803.334988	2440.989776				32.21748215	0.48144	0.72371341	3.39795281	3.902351453			
				6135	6135				49.00363709	0.48144	1.55266504	1.552665037	1.552665037			
				8400	8400				35.79015638	0.48144	1.134	1.134	1.134			
				4450.294293	2440.989776				31.98712564	0.48144	0.72371341	2.140442715	3.902351453			
				6685	6685				44.97192424	0.48144	1.42492147	1.424921466	1.424921466			
				8400	8400				35.79015638	0.48144	1.134	1.134	1.134			
				2803.334988	6441.902014				25.44168006	0.48144	0.72371341	3.39795281	1.478693712			
				7470	7470				40.24595898	0.48144	1.27518072	1.275180723	1.275180723			
				8400	8400				35.79015638	0.48144	1.134	1.134	1.134			
				4450.294293	6441.902014				25.21132356	0.48144	0.72371341	2.140442715	1.478693712			
				8020	8020				37.48594932	0.48144	1.18773067	1.187730673	1.187730673			
				8400	8400				35.79015638	0.48144	1.134	1.134	1.134			
BF	SAN,B & C	8	Product Drying Rota	5124.809686	2773.987134				0.353616286	33.44592	0.41866962	0.424850699	0.784897547			
				4365	4365				0.263306617	33.44592	0.49880412	0.498804124	0.498804124			
				8400	8400				0.136825403	33.44592	0.2592	0.2592	0.2592			
					2773.987134				0.338912679	33.44592	0.41866962		0.784897547			
				3985	3985				0.288414902	33.44592	0.54636888	0.546368883	0.546368883			
				8400	8400				0.136825403	33.44592	0.2592	0.2592	0.2592			
				5124.809686	26815.01562				0.09921794	33.44592	0.41866962	0.424850699	0.081196296			
				5160	5160				0.222739028	33.44592	0.42195349	0.421953488	0.421953488			
				8400	8400				0.136825403	33.44592	0.2592	0.2592	0.2592			
					26815.01562				0.084514333	33.44592	0.41866962		0.081196296			
				5200	5200				0.221026661	33.44592	0.41870769	0.418707692	0.418707692			
				8400	8400				0.136825403	33.44592	0.2592	0.2592	0.2592			
				5124.809686	2773.987134				0.302396656	33.44592	0.02990499	0.424850699	0.784897547			
				3950	3950				0.290970477	33.44592	0.55121013	0.551210127	0.551210127			
				8400	8400				0.136825403	33.44592	0.2592	0.2592	0.2592			
					2773.987134				0.287692049	33.44592	0.02990499		0.784897547			
				2775	2775				0.414174192	33.44592	0.78460541	0.784605405	0.784605405			
				8400	8400				0.136825403	33.44592	0.2592	0.2592	0.2592			
				5124.809686	26815.01562				0.04799731	33.44592	0.02990499	0.424850699	0.081196296			
				5125	5125				0.224260172	33.44592	0.42483512	0.424835122	0.424835122			
				8400	8400				0.136825403	33.44592	0.2592	0.2592	0.2592			
					26815.01562				0.033293704	33.44592	0.02990499		0.081196296			
				8760	8760				0.131202441	33.44592	0.24854795	0.248547945	0.248547945			
				8400	8400				0.136825403	33.44592	0.2592	0.2592	0.2592			

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility ID	Subcategory	Stream ID	Stream Name	FLARE TRE BASED ON DIFFERENT HRS/YR AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	TI 0% BASED ON DIFFERENT HRS/YR AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR
				2.299017264	0.776844306	0.425768603				1.673975637	0.565227286	0.309504306			
				1.165133132	1.165133132	1.165133132				0.857856373	0.857856373	0.857856373			
				1.899723141	1.899723141	1.899723141				1.377816642	1.377816642	1.377816642			
				2.30101741	0.469505367	1.125806863				1.665709126	0.353859119	0.814652148			
				1.302513953	1.302513953	1.302513953				0.955097783	0.955097783	0.955097783			
				1.899723141	1.899723141	1.899723141				1.377816642	1.377816642	1.377816642			
				2.301087802	0.777544384	1.125841314				1.6654182	0.562333898	0.814509761			
				1.399021141	1.399021141	1.399021141				1.023407665	1.023407665	1.023407665			
				1.899723141	1.899723141	1.899723141				1.377816642	1.377816642	1.377816642			
				0.664711604	0.612079649	0.532670479				0.523449402	0.481956612	0.419511478			
				0.601946881	0.601946881	0.601946881				0.477214855	0.477214855	0.477214855			
				1.851968686	1.851968686	1.851968686				1.378475584	1.378475584	1.378475584			
				0.664732672	0.972138058	0.532887374				0.523362327	0.765659736	0.419441655			
				0.723846171	0.723846171	0.723846171				0.565103756	0.565103756	0.565103756			
				1.851968686	1.851968686	1.851968686				1.378475584	1.378475584	1.378475584			
				0.665331317	0.612650348	1.408786922				0.520888158	0.479597944	1.103592711			
				0.897829702	0.897829702	0.897829702				0.690545187	0.690545187	0.690545187			
				1.851968686	1.851968686	1.851968686				1.378475584	1.378475584	1.378475584			
				0.665352385	0.973044041	1.408831507				0.520801083	0.761915351	1.103408445			
				1.019728992	1.019728992	1.019728992				0.778434088	0.778434088	0.778434088			
				1.851968686	1.851968686	1.851968686				1.378475584	1.378475584	1.378475584			
				2.903712726	0.617870505	0.537912837				2.154776929	0.458023287	0.398671656			
				1.349965249	1.349965249	1.349965249				1.01653311	1.01653311	1.01653311			
				1.851968686	1.851968686	1.851968686				1.378475584	1.378475584	1.378475584			
				2.903803621	0.96133104	0.537929731				2.154400435	0.727665583	0.398601833			
				1.471864538	1.471864538	1.471864538				1.104422011	1.104422011	1.104422011			
				1.851968686	1.851968686	1.851968686				1.378475584	1.378475584	1.378475584			
				2.906392246	0.618441203	1.422093973				2.143702596	0.455664619	1.048595312			
				1.645848069	1.645848069	1.645848069				1.229863443	1.229863443	1.229863443			
				1.851968686	1.851968686	1.851968686				1.378475584	1.378475584	1.378475584			
				2.906483342	0.962237024	1.422138558				2.143326105	0.723921196	1.048411048			
				1.767747359	1.767747359	1.767747359				1.317752344	1.317752344	1.317752344			
				1.851968686	1.851968686	1.851968686				1.378475584	1.378475584	1.378475584			
BF	SAN,B & C	8	Product Drying Rota	33.85913626	33.36651522	18.06035704				8.56997247	8.445272648	4.570742246			
				28.4195036	28.4195036	28.4195036				7.192781634	7.192781634	7.192781634			
				54.69127118	54.69127118	54.69127118				13.84227328	13.84227328	13.84227328			
				33.85914631		18.06036241				8.569930929		4.570720068			
				25.94533466	25.94533466	25.94533466				6.566559372	6.566559372	6.566559372			
				54.69127118	54.69127118	54.69127118				13.84227328	13.84227328	13.84227328			
				33.85931016	33.36668659	174.5907034				8.569253739	8.444564374	44.19016041			
				33.59572547	33.59572547	33.59572547				8.502904524	8.502904524	8.502904524			
				54.69127118	54.69127118	54.69127118				13.84227328	13.84227328	13.84227328			
				33.85932021		174.5907552				8.569212198		44.18996622			
				33.8561643	33.8561643	33.8561643				8.568822657	8.568822657	8.568822657			
				54.69127118	54.69127118	54.69127118				13.84227328	13.84227328	13.84227328			
				474.0379307	33.36654972	18.06037572				119.9926556	8.445130044	4.570665057			
				25.71745068	25.71745068	25.71745068				6.508881006	6.508881006	6.508881006			
				54.69127118	54.69127118	54.69127118				13.84227328	13.84227328	13.84227328			
				474.0380714		18.06038108				119.9920741		4.570642899			
				18.06705987	18.06705987	18.06705987				4.572535854	4.572535854	4.572535854			
				54.69127118	54.69127118	54.69127118				13.84227328	13.84227328	13.84227328			
				474.0403654	33.3667211	174.5906839				119.9825934	8.44442177	44.18943425			
				33.36784148	33.36784148	33.36784148				8.445226158	8.445226158	8.445226158			
				54.69127118	54.69127118	54.69127118				13.84227328	13.84227328	13.84227328			
				474.0405061		174.5909357				119.9820118		44.18922006			
				57.0352207	57.0352207	57.0352207				14.43553648	14.43553648	14.43553648			
				54.69127118	54.69127118	54.69127118				13.84227328	13.84227328	13.84227328			

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	TI 70% TRE BASED ON DIFFERENT HRS/YR						TOTAL HAP FLOW RATE (LBS/HR) BASED ON COMPONENT					
ID		ID	Name	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN	EB	STY	MA	MEK	MMA
				2.761900748	0.965541346	0.551226971				2.0651375	6.107816242	11.13547464	0	0	
				1.429560304	1.429560304	1.429560304				4.066592062	4.066592062	4.066592062	0	0	
				2.287543924	2.287543924	2.287543924				2.50047	2.50047	2.50047	0	0	
				2.758518166	0.625221353	1.374551151				2.0651375	9.696156284	4.219495996	0	0	
				1.590017828	1.590017828	1.590017828				3.64019896	3.64019896	3.64019896	0	0	
				2.287543924	2.287543924	2.287543924				2.50047	2.50047	2.50047	0	0	
				2.758399121	0.984357396	1.374492687				2.0651375	6.107816242	4.219495996	0	0	
				1.702735923	1.702735923	1.702735923				3.390467797	3.390467797	3.390467797	0	0	
				2.287543924	2.287543924	2.287543924				2.50047	2.50047	2.50047	0	0	
				0.870336056	0.805287218	0.707391093				6.899883647	7.492485947	8.604684953	0	0	
				0.794694874	0.794694874	0.794694874				7.610126067	7.610126067	7.610126067	0	0	
				2.289538481	2.289538481	2.289538481				2.50047	2.50047	2.50047	0	0	
				0.870300425	1.25020012	0.707362522				6.899883647	4.719676187	8.604684953	0	0	
				0.94046863	0.94046863	0.94046863				6.345603625	6.345603625	6.345603625	0	0	
				2.289538481	2.289538481	2.289538481				2.50047	2.50047	2.50047	0	0	
				0.869288017	0.804322072	1.786114267				6.899883647	7.492485947	3.260519635	0	0	
				1.148527536	1.148527536	1.148527536				5.129169231	6.129169231	5.129169231	0	0	
				2.289538481	2.289538481	2.289538481				2.50047	2.50047	2.50047	0	0	
				0.869252367	1.248667951	1.786036867				6.899883647	4.719676187	3.260519635	0	0	
				1.294301292	1.294301292	1.294301292				4.521840258	4.521840258	4.521840258	0	0	
				2.289538481	2.289538481	2.289538481				2.50047	2.50047	2.50047	0	0	
				3.557975691	0.795493915	0.698863625				1.595766066	7.492485947	8.604684953	0	0	
				1.689215649	1.689215649	1.689215649				3.423626406	3.423626406	3.423626406	0	0	
				2.289538481	2.289538481	2.289538481				2.50047	2.50047	2.50047	0	0	
				3.557821633	1.234653252	0.698835054				1.595766066	4.719676187	8.604684953	0	0	
				1.834989405	1.834989405	1.834989405				3.141951832	3.141951832	3.141951832	0	0	
				2.289538481	2.289538481	2.289538481				2.50047	2.50047	2.50047	0	0	
				3.553444173	0.79452877	1.763609623				1.595766066	7.492485947	3.260519635	0	0	
				2.043048311	2.043048311	2.043048311				2.811773494	2.811773494	2.811773494	0	0	
				2.289538481	2.289538481	2.289538481				2.50047	2.50047	2.50047	0	0	
				3.553290116	1.233121063	1.763534423				1.595766066	4.719676187	3.260519635	0	0	
				2.188822067	2.188822067	2.188822067				2.618946135	2.618946135	2.618946135	0	0	
				2.289538481	2.289538481	2.289538481				2.50047	2.50047	2.50047	0	0	
BF	SAN,B & C	8	Product Drying Rota	7.01003637	6.908745523	3.761552049				0.923166955	0.936796231	1.730699092	0	0	
				5.891461704	5.891461704	5.891461704				1.099863093	1.099863093	1.099863093	0	0	
				11.29300593	11.29300593	11.29300593				0.571536	0.571536	0.571536	0	0	
				7.010019372		3.761542982				0.923166955	0	1.730699092	0	0	
				5.382766089	5.382766089	5.382766089				1.204743388	1.204743388	1.204743388	0	0	
				11.29300593	11.29300593	11.29300593				0.571536	0.571536	0.571536	0	0	
				7.009742272	6.908455704	35.94502003				0.923166955	0.936796231	0.179037837	0	0	
				6.955706476	6.955706476	6.955706476				0.930407442	0.930407442	0.930407442	0	0	
				11.29300593	11.29300593	11.29300593				0.571536	0.571536	0.571536	0	0	
				7.009725274		35.94493238				0.923166955	0	0.179037837	0	0	
				7.009253385	7.009253385	7.009253385				0.923250462	0.923250462	0.923250462	0	0	
				11.29300593	11.29300593	11.29300593				0.571536	0.571536	0.571536	0	0	
				97.51698019	6.908687171	3.761520464				0.065940497	0.936796231	1.730699092	0	0	
				5.335912546	5.335912546	5.335912546				1.215418329	1.215418329	1.215418329	0	0	
				11.29300593	11.29300593	11.29300593				0.571536	0.571536	0.571536	0	0	
				97.51674221		3.761511397				0.065940497	0	1.730699092	0	0	
				3.762972157	3.762972157	3.762972157				1.730054919	1.730054919	1.730054919	0	0	
				11.29300593	11.29300593	11.29300593				0.571536	0.571536	0.571536	0	0	
				97.51266262	6.908397351	35.9447147				0.065940497	0.936796231	0.179037837	0	0	
				6.908852934	6.908852934	6.908852934				0.936761444	0.936761444	0.936761444	0	0	
				11.29300593	11.29300593	11.29300593				0.571536	0.571536	0.571536	0	0	
				97.51262484		35.94462706				0.065940497	0	0.179037837	0	0	
				11.77492809	11.77492809	11.77492809				0.548048219	0.548048219	0.548048219	0	0	
				11.29300593	11.29300593	11.29300593				0.571536	0.571536	0.571536	0	0	

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility ID	Subcategory	Stream ID	Stream Name	AN PPMV	EB PPMV	STY PPMV	MA PPMV	MEK ppmv	MMA ppmv	Flow Rate (acfm)	Emissions (lbs/yr) AN	EB	STY	MA	MEK	MMA	F AN
BF	SAN,B & C	9	Product Storage-Hol	587	237	1250				333	300	280	1180				185.8665045
				574.2296744	267.8476477	1150.568974				333	300	280	1180				190
				12.98852835	6.058458697	26.02477441				333	300	280	1180				8400
				587	108	1250				333	300	280	1180				185.8665045
				396.7405023	185.0583748	794.9385638				333	300	280	1180				275
				12.98852835	6.058458697	26.02477441				333	300	280	1180				8400
				587	237	223				333	300	280	1180				185.8665045
				237.181822	110.632724	475.2350109				333	300	280	1180				460
				12.98852835	6.058458697	26.02477441				333	300	280	1180				8400
				587	108	223				333	300	280	1180				185.8665045
				200.1901617	93.378079	401.1157891				333	300	280	1180				545
				12.98852835	6.058458697	26.02477441				333	300	280	1180				8400
				256	237	1250				333	300	280	1180				426.1860864
				404.0675486	188.4853817	809.6596483				333	300	280	1180				270
				12.98852835	6.058458697	26.02477441				333	300	280	1180				8400
				256	108	1250				333	300	280	1180				426.1860864
				307.3341919	143.355079	615.797479				333	300	280	1180				355
				12.98852835	6.058458697	26.02477441				333	300	280	1180				8400
				256	237	223				333	300	280	1180				426.1860864
				202.0437743	94.24269085	404.8298241				333	300	280	1180				540
				12.98852835	6.058458697	26.02477441				333	300	280	1180				8400
				256	108	223				333	300	280	1180				426.1860864
				174.585821	81.42568489	349.7729681				333	300	280	1180				625
				12.98852835	6.058458697	26.02477441				333	300	280	1180				8400
BF	SAN,B & C	10	Reactor-Condenser	16800	176	358				137	3760	44	160				197.8427807
				19551.52186	114.3433278	423.8175923				137	3760	44	160				170
				395.6855614	2.314091158	8.577260797				137	3760	44	160				8400
				16800	25	358				137	3760	44	160				197.8427807
				8522.458246	49.84196341	184.7410018				137	3760	44	160				390
				395.6855614	2.314091158	8.577260797				137	3760	44	160				8400
				16800	176	208				137	3760	44	160				197.8427807
				15107.99416	88.35620786	327.4954123				137	3760	44	160				220
				395.6855614	2.314091158	8.577260797				137	3760	44	160				8400
				16800	25	208				137	3760	44	160				197.8427807
				7553.997062	44.17810393	163.7477061				137	3760	44	160				440
				395.6855614	2.314091158	8.577260797				137	3760	44	160				8400
				965	176	358				137	3760	44	160				3444.30955
				2659.008973	15.55069256	57.63919256				137	3760	44	160				1250
				395.6855614	2.314091158	8.577260797				137	3760	44	160				8400
				965	25	358				137	3760	44	160				3444.30955
				2253.39574	13.17856304	48.84677335				137	3760	44	160				1475
				395.6855614	2.314091158	8.577260797				137	3760	44	160				8400
				965	176	208				137	3760	44	160				3444.30955
				2556.737474	14.95258902	55.42230054				137	3760	44	160				1300
				395.6855614	2.314091158	8.577260797				137	3760	44	160				8400
				965	25	208				137	3760	44	160				3444.30955
				2186.683366	12.78839851	47.40065177				137	3760	44	160				1520
				395.6855614	2.314091158	8.577260797				137	3760	44	160				8400
				16800	176	358				10	3760	44	160				2710.446096
				19585.15889	114.5400475	424.5467409				10	3760	44	160				2325
				5420.892192	31.70304887	117.5084729				10	3760	44	160				8400
				16800	25	358				10	3760	44	160				2710.446096
				8471.71989	49.54522986	183.6411484				10	3760	44	160				5375
				5420.892192	31.70304887	117.5084729				10	3760	44	160				8400
				16800	176	208				10	3760	44	160				2710.446096
				15229.26234	89.06542157	330.124138				10	3760	44	160				2990
				5420.892192	31.70304887	117.5084729				10	3760	44	160				8400

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	quency (HRS/YR) BASED ON EACH COMPOUND					Btu Content	Qs	EHAP (KG/HR) BASED ON COMPONENT					
ID		ID	Name	EB	STY	MA	MEK	MMA	BTU/SCF	m^3/min	AN	EB	STY	MA	MEK	MMA
BF	SAN,B & C	9	Product Storage-Hol	214.7301817	174.886484				8.433333998	9.43056	4.29521178	3.717856492	4.564881068			
				190	190				8.072922698	9.43056	4.20176842	4.201768421	4.201768421			
				8400	8400				0.182601823	9.43056	0.09504	0.09504	0.09504			
				471.2134542	174.886484				7.801078902	9.43056	4.29521178	1.694213085	4.564881068			
				275	275				5.577655681	9.43056	2.90304	2.90304	2.90304			
				8400	8400				0.182601823	9.43056	0.09504	0.09504	0.09504			
				214.7301817	980.3054037				3.408966674	9.43056	4.29521178	3.717856492	0.814374783			
				460	460				3.33446807	9.43056	1.73551304	1.735513043	1.735513043			
				8400	8400				0.182601823	9.43056	0.09504	0.09504	0.09504			
				471.2134542	980.3054037				2.77671158	9.43056	4.29521178	1.694213085	0.814374783			
				545	545				2.814413417	9.43056	1.4648367	1.464836697	1.464836697			
				8400	8400				0.182601823	9.43056	0.09504	0.09504	0.09504			
				214.7301817	174.886484				7.78125598	9.43056	1.87320991	3.717856492	4.564881068			
				270	270				5.680945601	9.43056	2.9568	2.9568	2.9568			
				8400	8400				0.182601823	9.43056	0.09504	0.09504	0.09504			
				471.2134542	174.886484				7.149000887	9.43056	1.87320991	1.694213085	4.564881068			
				355	355				4.320719189	9.43056	2.2488338	2.248833803	2.248833803			
				8400	8400				0.182601823	9.43056	0.09504	0.09504	0.09504			
				214.7301817	980.3054037				2.756888658	9.43056	1.87320991	3.717856492	0.814374783			
				540	540				2.8404728	9.43056	1.4784	1.4784	1.4784			
				8400	8400				0.182601823	9.43056	0.09504	0.09504	0.09504			
				471.2134542	980.3054037				2.124633565	9.43056	1.87320991	1.694213085	0.814374783			
				625	625				2.454168499	9.43056	1.2773376	1.2773376	1.2773376			
				8400	8400				0.182601823	9.43056	0.09504	0.09504	0.09504			
BF	SAN,B & C	10	Reactor-Condenser	110.4452598	201.254164				35.71045318	3.87984	9.08838014	16.2801953	8.934326449			
				170	170				41.15082387	3.87984	10.5768847	10.57688471	10.57688471			
				8400	8400				0.832814293	3.87984	0.214056	0.214056	0.214056			
				777.5346292	201.254164				34.97037164	3.87984	9.08838014	2.312527742	8.934326449			
				390	390				17.93753861	3.87984	4.61043692	4.610436923	4.610436923			
				8400	8400				0.832814293	3.87984	0.214056	0.214056	0.214056			
				110.4452598	346.3893784				34.9766118	3.87984	9.08838014	16.2801953	5.190693579			
				220	220				31.7983639	3.87984	8.17304727	8.173047273	8.173047273			
				8400	8400				0.832814293	3.87984	0.214056	0.214056	0.214056			
				777.5346292	346.3893784				34.23653026	3.87984	9.08838014	2.312527742	5.190693579			
				440	440				15.69918195	3.87984	4.08652364	4.086523636	4.086523636			
				8400	8400				0.832814293	3.87984	0.214056	0.214056	0.214056			
				110.4452598	201.254164				4.515119731	3.87984	0.52204088	16.2801953	8.934326449			
				1250	1250				5.596512046	3.87984	1.43845632	1.43845632	1.43845632			
				8400	8400				0.832814293	3.87984	0.214056	0.214056	0.214056			
				777.5346292	201.254164				3.775038188	3.87984	0.52204088	2.312527742	8.934326449			
				1475	1475				4.742806819	3.87984	1.21903078	1.21903078	1.21903078			
				8400	8400				0.832814293	3.87984	0.214056	0.214056	0.214056			
				110.4452598	346.3893784				3.78127835	3.87984	0.52204088	16.2801953	5.190693579			
				1300	1300				5.381261583	3.87984	1.38313108	1.383131077	1.383131077			
				8400	8400				0.832814293	3.87984	0.214056	0.214056	0.214056			
				777.5346292	346.3893784				3.041196807	3.87984	0.52204088	2.312527742	5.190693579			
				1520	1520				4.602394775	3.87984	1.18294105	1.182941053	1.182941053			
				8400	8400				0.832814293	3.87984	0.214056	0.214056	0.214056			
				1513.10008	2757.182046				35.71045318	0.2832	0.66338541	1.188335423	0.652140617			
				2325	2325				41.22162099	0.2832	0.77336361	0.773363613	0.773363613			
				8400	8400				11.40955581	0.2832	0.214056	0.214056	0.214056			
				10852.22442	2757.182046				34.97037164	0.2832	0.66338541	0.168797645	0.652140617			
				5375	5375				17.83074768	0.2832	0.33452473	0.334524726	0.334524726			
				8400	8400				11.40955581	0.2832	0.214056	0.214056	0.214056			
				1513.10008	4745.534483				34.9766118	0.2832	0.66338541	1.188335423	0.378897342			
				2990	2990				32.0536016	0.2832	0.60136134	0.601361338	0.601361338			
				8400	8400				11.40955581	0.2832	0.214056	0.214056	0.214056			

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	FLARE TRE BASED ON DIFFERENT HRS/YR						TI 0% BASED ON DIFFERENT HRS/YR					
ID		ID	Name	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR
BF	SAN,B & C	9	Product Storage-Hol	1.252795431	1.447459082	1.178743514				0.486125103	0.561796677	0.457338908			
				1.280697275	1.280697275	1.280697275				0.496860382	0.496860382	0.496860382			
				56.67574713	56.67574713	56.67574713				21.91833998	21.91833998	21.91833998			
				1.252837559	3.177351188	1.178783153				0.48595099	1.233774543	0.457175081			
				1.854214844	1.854214844	1.854214844				0.71864184	0.71864184	0.71864184			
				56.67574713	56.67574713	56.67574713				21.91833998	21.91833998	21.91833998			
				1.253130212	1.447845832	6.612449529				0.484741472	0.560198179	2.561598931			
				3.102458963	3.102458963	3.102458963				1.201342659	1.201342659	1.201342659			
				56.67574713	56.67574713	56.67574713				21.91833998	21.91833998	21.91833998			
				1.25317234	3.178199931	6.612671723				0.484567359	1.230266728	2.560680617			
				3.675976532	3.675976532	3.675976532				1.423124116	1.423124116	1.423124116			
				56.67574713	56.67574713	56.67574713				21.91833998	21.91833998	21.91833998			
				2.873668535	1.447509258	1.178784396				1.115756467	0.561589219	0.457169944			
				1.820478516	1.820478516	1.820478516				0.705595872	0.705595872	0.705595872			
				56.67574713	56.67574713	56.67574713				21.91833998	21.91833998	21.91833998			
				2.873765133	3.177461341	1.178824035				1.115357232	1.233319288	0.457006117			
				2.393996085	2.393996085	2.393996085				0.927377329	0.927377329	0.927377329			
				56.67574713	56.67574713	56.67574713				21.91833998	21.91833998	21.91833998			
				2.874436176	1.447896028	6.612678689				1.112563845	0.559990721	2.560651825			
				3.642240204	3.642240204	3.642240204				1.410078148	1.410078148	1.410078148			
				56.67574713	56.67574713	56.67574713				21.91833998	21.91833998	21.91833998			
				2.874532774	3.178310084	6.612900882				1.11218461	1.229811472	2.559733611			
				4.215757773	4.215757773	4.215757773				1.631859606	1.631859606	1.631859606			
				56.67574713	56.67574713	56.67574713				21.91833998	21.91833998	21.91833998			
BF	SAN,B & C	10	Reactor-Condenser	0.367297219	0.204718858	0.373643133				0.194408201	0.108015923	0.197780347			
				0.315356394	0.315356394	0.315356394				0.167494074	0.167494074	0.167494074			
				15.671722	15.671722	15.671722				8.109497337	8.109497337	8.109497337			
				0.367320525	1.445741487	0.37366684				0.194311881	0.767053915	0.197682366			
				0.725854624	0.725854624	0.725854624				0.379795498	0.379795498	0.379795498			
				15.671722	15.671722	15.671722				8.109497337	8.109497337	8.109497337			
				0.367320328	0.204731759	0.643668597				0.194312694	0.107962606	0.341079004			
				0.408651447	0.408651447	0.408651447				0.215744398	0.215744398	0.215744398			
				15.671722	15.671722	15.671722				8.109497337	8.109497337	8.109497337			
				0.367343633	1.445832306	0.6437074				0.194216374	0.768678563	0.340910364			
				0.819149677	0.819149677	0.819149677				0.428045822	0.428045822	0.428045822			
				15.671722	15.671722	15.671722				8.109497337	8.109497337	8.109497337			
				6.423532192	0.206267253	0.374642421				3.332852302	0.105749435	0.193650336			
				2.330629524	2.330529524	2.330629524				1.209701064	1.209701064	1.209701064			
				15.671722	15.671722	15.671722				8.109497337	8.109497337	8.109497337			
				6.423937923	1.449602184	0.374666128				3.331175435	0.75109784	0.193552355			
				2.750357259	2.750357259	2.750357259				1.42682752	1.42682752	1.42682752			
				15.671722	15.671722	15.671722				8.109497337	8.109497337	8.109497337			
				6.423934502	0.205280153	0.645388526				3.331189574	0.105696118	0.33397082			
				2.423824576	2.423824576	2.423824576				1.257951387	1.257951387	1.257951387			
				15.671722	15.671722	15.671722				8.109497337	8.109497337	8.109497337			
				6.424340233	1.449693003	0.645427329				3.329512708	0.750722488	0.33380198			
				2.834322806	2.834322806	2.834322806				1.470252811	1.470252811	1.470252811			
				15.671722	15.671722	15.671722				8.109497337	8.109497337	8.109497337			
				3.056962854	1.706218275	3.109686403				2.338337187	1.304859159	2.378676886			
				2.620095657	2.620095657	2.620095657				2.014072136	2.014072136	2.014072136			
				9.507927212	9.507927212	9.507927212				7.114940253	7.114940253	7.114940253			
				3.057282138	12.0174606	3.110011192				2.337017603	9.188022792	2.377334548			
				6.078183927	6.078183927	6.078183927				4.575001808	4.575001808	4.575001808			
				9.507927212	9.507927212	9.507927212				7.114940253	7.114940253	7.114940253			
				3.057279446	1.706395012	5.353331833				2.33702873	1.304128716	4.092613799			
				3.37407228	3.37407228	3.37407228				2.57243877	2.57243877	2.57243877			
				9.507927212	9.507927212	9.507927212				7.114940253	7.114940253	7.114940253			

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	Ti 70% TRE BASED ON DIFFERENT HRS/YR						TOTAL HAP FLOW RATE (LBS/HR) BASED ON COMPONENT					
ID		ID	Name	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN	EB	STY	MA	MEK	MMA
BF	SAN,B & C	9	Product Storage-Hol	0.661291244	0.756546314	0.625055299				9.47094198	8.197873565	10.06556276	0	0	0
				0.67489097	0.67489097	0.67489097				9.264899368	9.264899368	9.264899368	0	0	0
				27.72731819	27.72731819	27.72731819				0.2095632	0.2095632	0.2095632	0	0	0
				0.661219998	1.602804343	0.624986262				9.47094198	3.735739852	10.06556276	0	0	0
				0.954970911	0.954970911	0.954970911				6.4012032	6.4012032	6.4012032	0	0	0
				27.72731819	27.72731819	27.72731819				0.2095632	0.2095632	0.2095632	0	0	
				0.660725074	0.755692222	3.280089327				9.47094198	8.197873565	1.795696396	0	0	
				1.564556664	1.564556664	1.564556664				3.826806261	3.826806261	3.826806261	0	0	0
				27.72731819	27.72731819	27.72731819				0.2095632	0.2095632	0.2095632	0	0	0
				0.660653829	1.601368976	3.279713561				9.47094198	3.735739852	1.795696396	0	0	0
				1.844636605	1.844636605	1.844636605				3.229964917	3.229964917	3.229964917	0	0	0
				27.72731819	27.72731819	27.72731819				0.2095632	0.2095632	0.2095632	0	0	0
				1.454218468	0.756461424	0.624986161				4.130427848	8.197873565	10.06556276	0	0	0
				0.93849562	0.93849562	0.93849562				6.519744	6.519744	6.519744	0	0	0
				27.72731819	27.72731819	27.72731819				0.2095632	0.2095632	0.2095632	0	0	0
				1.454055104	1.602618056	0.624919124				4.130427848	3.735739852	10.06556276	0	0	0
				1.218575561	1.218575561	1.218575561				4.958678535	4.958678535	4.958678535	0	0	0
				27.72731819	27.72731819	27.72731819				0.2095632	0.2095632	0.2095632	0	0	0
				1.452920259	0.755807332	3.27970178				4.130427848	8.197873565	1.795696396	0	0	0
				1.828161314	1.828161314	1.828161314				3.259872	3.259872	3.259872	0	0	0
				27.72731819	27.72731819	27.72731819				0.2095632	0.2095632	0.2095632	0	0	0
				1.452756896	1.60116269	3.279328014				4.130427848	3.735739852	1.795696396	0	0	0
				2.108241255	2.108241255	2.108241255				2.816529408	2.816529408	2.816529408	0	0	
				27.72731819	27.72731819	27.72731819				0.2095632	0.2095632	0.2095632	0	0	
BF	SAN,B & C	10	Reactor-Condenser	0.332019116	0.206506818	0.336918153				20.03987822	35.89783064	19.70018982	0	0	
				0.292283462	0.292283462	0.292283462				23.32203078	23.32203078	23.32203078	0	0	
				12.03215456	12.03215456	12.03215456				0.47199348	0.47199348	0.47199348	0	0	
				0.331979703	1.164351182	0.336878061				20.03987822	5.09912367	19.70018982	0	0	
				0.606107476	0.606107476	0.606107476				10.16601342	10.16601342	10.16601342	0	0	
				12.03215456	12.03215456	12.03215456				0.47199348	0.47199348	0.47199348	0	0	
				0.331960035	0.206467001	0.545276282				20.03987822	35.89783064	11.44592034	0	0	
				0.363607101	0.363607101	0.363607101				18.02156924	18.02156924	18.02156924	0	0	
				12.03215456	12.03215456	12.03215456				0.47199348	0.47199348	0.47199348	0	0	
				0.331940622	1.164197591	0.545207276				20.03987822	5.09912367	11.44592034	0	0	
				0.677431116	0.677431116	0.677431116				9.010784618	9.010784618	9.010784618	0	0	
				12.03215456	12.03215456	12.03215456				0.47199348	0.47199348	0.47199348	0	0	
				4.965300012	0.205581391	0.33522819				1.151100148	35.89783064	19.70018982	0	0	
				1.632674079	1.632674079	1.632674079				3.171796186	3.171796186	3.171796186	0	0	
				12.03215456	12.03215456	12.03215456				0.47199348	0.47199348	0.47199348	0	0	
				4.964613654	1.157822098	0.335188097				1.151100148	5.09912367	19.70018982	0	0	0
				2.153830458	2.153830458	2.153830458				2.687962869	2.687962869	2.687962869	0	0	
				12.03215456	12.03215456	12.03215456				0.47199348	0.47199348	0.47199348	0	0	
				4.964619639	0.205569674	0.542367595				1.151100148	35.89783064	11.44592034	0	0	
				1.904197719	1.904197719	1.904197719				3.049804025	3.049804025	3.049804025	0	0	
				12.03215456	12.03215456	12.03215456				0.47199348	0.47199348	0.47199348	0	0	
				4.963933481	1.157668508	0.542298589				1.151100148	5.09912367	11.44592034	0	0	
				2.218021733	2.218021733	2.218021733				2.608385021	2.608385021	2.608385021	0	0	
				12.03215456	12.03215456	12.03215456				0.47199348	0.47199348	0.47199348	0	0	
				3.876193832	2.185035889	3.942204719				1.462764834	2.620279609	1.43797006	0	0	0
				3.335230396	3.335230396	3.335230396				1.705266766	1.705266766	1.705266766	0	0	
				11.85729817	11.85729817	11.85729817				0.47199348	0.47199348	0.47199348	0	0	0
				3.87565367	15.09121457	3.941655446				1.462764834	0.372198608	1.43797006	0	0	0
				7.6137994	7.6137994	7.6137994				0.73762702	0.73762702	0.73762702	0	0	0
				11.85729817	11.85729817	11.85729817				0.47199348	0.47199348	0.47199348	0	0	0
				3.875658423	2.184736998	6.749660134				1.462764834	2.620279609	0.835468636	0	0	
				4.26609672	4.26609672	4.26609672				1.32600175	1.32600175	1.32600175	0	0	0
				11.85729817	11.85729817	11.85729817				0.47199348	0.47199348	0.47199348	0	0	

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	AN	EB	STY	MA	MEK	MMA	Flow Rate	Emissions (lbs/yr)						F
ID		ID	Name	PPMV	PPMV	PPMV	PPMV	ppmv	ppmv	(scfm)	AN	EB	STY	MA	MEK	MMA	AN
				16800	25	208				10	3760	44	160				2710.446096
				7545.235196	44.12686172	163.5577751				10	3760	44	160				6035
				5420.892192	31.70304887	117.5084729				10	3760	44	160				8400
				965	176	358				10	3760	44	160				47187.04084
				21328.10043	124.733307	462.3284181				10	3760	44	160				2135
				5420.892192	31.70304887	117.5084729				10	3760	44	160				8400
				965	25	358				10	3760	44	160				47187.04084
				6791.274334	39.71746614	147.2141943				10	3760	44	160				6705
				5420.892192	31.70304887	117.5084729				10	3760	44	160				8400
				965	176	208				10	3760	44	160				47187.04084
				14548.08128	85.0816847	315.3582021				10	3760	44	160				3130
				5420.892192	31.70304887	117.5084729				10	3760	44	160				8400
				965	25	208				10	3760	44	160				47187.04084
				5913.700573	34.58514422	128.1910814				10	3760	44	160				7700
				5420.892192	31.70304887	117.5084729				10	3760	44	160				8400
BF	SAN,B & C	11	Reactor Condenser	1078	3	55				11	14	2	20				142.981155
				79.04291545	5.643263626	57.5216301				11	14	2	20				1950
				18.34924823	1.310043342	13.35323556				11	14	2	20				8400
				1078	0	55				11	14	2	20				142.981155
				141.4070506	10.09574685	102.9056685				11	14	2	20				1090
				18.34924823	1.310043342	13.35323556				11	14	2	20				8400
				1078	3	4				11	14	2	20				142.981155
				80.91007094	5.776569066	58.88040877				11	14	2	20				1905
				18.34924823	1.310043342	13.35323556				11	14	2	20				8400
				1078	0	4				11	14	2	20				142.981155
				1082.990932	75.892166	773.5867497				11	14	2	20				145
				18.34924823	1.310043342	13.35323556				11	14	2	20				8400
				618	3	55				5	14	2	20				548.6959665
				77.59590556	5.539954452	56.46860255				5	14	2	20				4370
				40.36834611	2.882095352	29.37711823				5	14	2	20				8400
				618	0	55				5	14	2	20				548.6959665
				134.5611537	9.606984506	97.92372744				5	14	2	20				2520
				40.36834611	2.882095352	29.37711823				5	14	2	20				8400
				618	3	4				5	14	2	20				548.6959665
				78.67612898	5.617076788	57.25470838				5	14	2	20				4310
				40.36834611	2.882095352	29.37711823				5	14	2	20				8400
				618	0	4				5	14	2	20				548.6959665
				616.5347405	44.01745628	448.6687148				5	14	2	20				550
				40.36834611	2.882095352	29.37711823				5	14	2	20				8400
BF	SAN,B & C	12	Product Stranding E	2	21	12	0.078039971			641	34	500	300	2			3211.83409
				2.451781748	18.0193169	11.02022394	0.078039971			641	34	500	300	2			2820
				0.764722402	5.620310748	3.437260323	0.024341039			641	34	500	300	2			8400
				2	8	12	0.053246022			641	34	500	300	2			3211.83409
				1.672830255	12.29442976	7.519008957	0.053246022			641	34	500	300	2			3840
				0.764722402	5.620310748	3.437260323	0.024341039			641	34	500	300	2			8400
				2	21	6	0.05969773			641	34	500	300	2			3211.83409
				1.875523558	13.78411979	8.430069114	0.05969773			641	34	500	300	2			3425
				0.764722402	5.620310748	3.437260323	0.024341039			641	34	500	300	2			8400
				2	8	6	0.044065673			641	34	500	300	2			3211.83409
				1.384411246	10.17470049	6.222626448	0.044065673			641	34	500	300	2			4640
				0.764722402	5.620310748	3.437260323	0.024341039			641	34	500	300	2			8400
				0	21	12	0.087941817			641	34	500	300	2			
				2.762866034	20.30563883	12.41848891	0.087941817			641	34	500	300	2			2325
				0.764722402	5.620310748	3.437260323	0.024341039			641	34	500	300	2			8400
				0	8	12	0.04920932			641	34	500	300	2			
				1.546009189	11.36236108	6.948973939	0.04920932			641	34	500	300	2			4155

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	quency (HRS/YR) BASED ON EACH COMPOUND					Btu Content	Qs	EHAP (KG/HR) BASED ON COMPONENT					
ID		ID	Name	EB	STY	MA	MEK	MMA	BTU/SCF	m^3/min	AN	EB	STY	MA	MEK	MMA
				10652.22442	4745.534483				34.23653026	0.2832	0.66338541	0.168797645	0.378897342			
				6035	6035				15.88074048	0.2832	0.29794041	0.297940414	0.297940414			
				8400	8400				11.40955581	0.2832	0.214056	0.214056	0.214056			
				1513.10006	2757.182046				4.515119731	0.2832	0.03810517	1.168335423	0.652140617			
				2135	2135				44.89005564	0.2832	0.84218754	0.842187541	0.842187541			
				8400	8400				11.40955581	0.2832	0.214056	0.214056	0.214056			
				10652.22442	2757.182046				3.775038188	0.2832	0.03810517	0.168797645	0.652140617			
				6705	6705				14.29385068	0.2832	0.26816859	0.268168591	0.268168591			
				8400	8400				11.40955581	0.2832	0.214056	0.214056	0.214056			
				1513.10006	4745.534483				3.78127835	0.2832	0.03810517	1.168335423	0.378897342			
				3130	3130				30.61989418	0.2832	0.57446339	0.574463387	0.574463387			
				8400	8400				11.40955581	0.2832	0.214056	0.214056	0.214056			
				10652.22442	4745.534483				3.041196807	0.2832	0.03810517	0.168797645	0.378897342			
				7700	7700				12.44678816	0.2832	0.23351564	0.233515636	0.233515636			
				8400	8400				11.40955581	0.2832	0.214056	0.214056	0.214056			
BF	SAN,B & C	11	Reactor Condenser	3668.121357	2039.403249				2.407464884	0.31152	0.11420606	0.004451761	0.008007048			
				1950	1950				0.464786917	0.31152	0.00837415	0.008374154	0.008374154			
				8400	8400				0.107896963	0.31152	0.001944	0.001944	0.001944			
					2039.403249				2.392761277	0.31152	0.11420606		0.008007048			
				1090	1090				0.831499531	0.31152	0.01498128	0.014981284	0.014981284			
				8400	8400				0.107896963	0.31152	0.001944	0.001944	0.001944			
				3668.121357	28041.79467				2.157958815	0.31152	0.11420606	0.004451761	0.000582331			
				1905	1905				0.475766136	0.31152	0.00857197	0.008571969	0.008571969			
				8400	8400				0.107896963	0.31152	0.001944	0.001944	0.001944			
					28041.79467				2.143255208	0.31152	0.11420606		0.000582331			
				145	145				6.250582679	0.31152	0.11261793	0.112617931	0.112617931			
				8400	8400				0.107896963	0.31152	0.001944	0.001944	0.001944			
				8069.866965	4486.687148				1.501253745	0.1416	0.02976074	0.002023528	0.003639567			
				4370	4370				0.456278232	0.1416	0.00373675	0.003736751	0.003736751			
				8400	8400				0.237373318	0.1416	0.001944	0.001944	0.001944			
					4486.687148				1.486550138	0.1416	0.02976074		0.003639567			
				2520	2520				0.791244395	0.1416	0.00648	0.00648	0.00648			
				8400	8400				0.237373318	0.1416	0.001944	0.001944	0.001944			
				8069.866965	61691.94828				1.251747675	0.1416	0.02976074	0.002023528	0.000264696			
				4310	4310				0.462630133	0.1416	0.00378877	0.00378877	0.00378877			
				8400	8400				0.237373318	0.1416	0.001944	0.001944	0.001944			
					61691.94828				1.237044069	0.1416	0.02976074		0.000264696			
				550	550				3.625337954	0.1416	0.02969018	0.029690182	0.029690182			
				8400	8400				0.237373318	0.1416	0.001944	0.001944	0.001944			
									0							
BF	SAN,B & C	12	Product Stranding E	2248.124299	2408.082226	2620			0.165690546	18.15312	0.11808837	0.168878218	0.157604589	0.144738489		
				2620	2620	2620			0.147178302	18.15312	0.14473849	0.144738489	0.144738489	0.144738489		
				8400	8400	8400			0.045905613	18.15312	0.045144	0.045144	0.045144	0.045144		
				5901.326286	2408.082226	3840			0.101937446	18.15312	0.11808837	0.064258369	0.157604589	0.0987525		
				3840	3840	3840			0.100418629	18.15312	0.0987525	0.0987525	0.0987525	0.0987525		
				8400	8400	8400			0.045905613	18.15312	0.045144	0.045144	0.045144	0.045144		
				2248.124299	4812.164453	3425			0.136309171	18.15312	0.11808837	0.168878218	0.078802294	0.110718131		
				3425	3425	3425			0.112586029	18.15312	0.11071813	0.110718131	0.110718131	0.110718131		
				8400	8400	8400			0.045905613	18.15312	0.045144	0.045144	0.045144	0.045144		
				5901.326286	4812.164453	4640			0.072569917	18.15312	0.11808837	0.064258369	0.078802294	0.081726207		
				4640	4640	4640			0.083104989	18.15312	0.08172621	0.081726207	0.081726207	0.081726207		
				8400	8400	8400			0.045905613	18.15312	0.045144	0.045144	0.045144	0.045144		
				2248.124299	2408.082226	2325			0.161765462	18.15312	#DIV/0!	0.168878218	0.157604589	0.163100903		
				2325	2325	2325			0.165852538	18.15312	0.1631009	0.163100903	0.163100903	0.163100903		
				8400	8400	8400			0.045905613	18.15312	0.045144	0.045144	0.045144	0.045144		
				5901.326286	2408.082226	4155			0.097991297	18.15312	#DIV/0!	0.064258369	0.157604589	0.091265848		
				4155	4155	4155			0.092805572	18.15312	0.09126585	0.091265848	0.091265848	0.091265848		

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	FLARE TRE BASED ON DIFFERENT HRS/YR						Ti 0% BASED ON DIFFERENT HRS/YR					
ID		ID	Name	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR
				3.057598729	12.01870482	5.353890845				2.335709146	9.18268047	4.090303429			
				6.826491553	6.826491553	6.826491553				5.129170196	5.129170196	5.129170196			
				9.507927212	9.507927212	9.507927212				7.114940253	7.114940253	7.114940253			
				53.46599524	1.71373128	3.123376654				39.75955112	1.273808275	2.322095736			
				2.404673764	2.404673764	2.404673764				1.654538813	1.654538813	1.654538813			
				9.507927212	9.507927212	9.507927212				7.114940253	7.114940253	7.114940253			
				53.47155375	12.07035215	3.123701443				39.73657805	8.969424565	2.320753398			
				7.586137173	7.586137173	7.586137173				5.691735075	5.691735075	5.691735075			
				9.507927212	9.507927212	9.507927212				7.114940253	7.114940253	7.114940253			
				53.47150689	1.713908016	5.376894862				39.73677175	1.273077631	3.995228635			
				3.5328042	3.5328042	3.5328042				2.68998964	2.68998964	2.68998964			
				9.507927212	9.507927212	9.507927212				7.114940253	7.114940253	7.114940253			
				53.4770654	12.07159637	5.377453874				39.71379668	8.964262243	3.992918566			
				8.714267609	8.714267609	8.714267609				6.527185902	6.527185902	6.527185902			
				9.507927212	9.507927212	9.507927212				7.114940253	7.114940253	7.114940253			
BF	SAN,B & C	11	Reactor Condenser	17.93431748	460.1154463	255.8148029				13.25859356	340.1722128	189.1285377			
				244.6667684	244.6667684	244.6667684				180.5630809	180.5630809	180.5630809			
				1054.004123	1054.004123	1054.004123				777.5968773	777.5968773	777.5968773			
				17.93435433		255.8153284				13.2584413		189.1263656			
				136.7551211	136.7551211	136.7551211				100.9585747	100.9585747	100.9585747			
				1054.004123	1054.004123	1054.004123				777.5968773	777.5968773	777.5968773			
				17.93494272	460.1314866	3517.585513				13.25600949	340.105919	2600.025373			
				239.0202287	239.0202287	239.0202287				176.3977288	176.3977288	176.3977288			
				1054.004123	1054.004123	1054.004123				777.5968773	777.5968773	777.5968773			
				17.93497957		3517.592739				13.2558572		2599.995507			
				18.17778775	18.17778775	18.17778775				13.48618124	13.48618124	13.48618124			
				1054.004123	1054.004123	1054.004123				777.5968773	777.5968773	777.5968773			
				66.74477451	981.64922	545.777312				50.48984425	742.588007	412.8637957			
				531.6630684	531.6630684	531.6630684				401.7954672	401.7954672	401.7954672			
				1021.99395	1021.99395	1021.99395				772.1978353	772.1978353	772.1978353			
				66.74491591		545.7784683				50.48925986		412.8590172			
				306.5732095	306.5732095	306.5732095				231.7596407	231.7596407	231.7596407			
				1021.99395	1021.99395	1021.99395				772.1978353	772.1978353	772.1978353			
				66.7471739	981.6845086	7504.717162				50.4799277	742.4421607	5675.777013			
				524.3628568	524.3628568	524.3628568				396.2807918	396.2807918	396.2807918			
				1021.99395	1021.99395	1021.99395				772.1978353	772.1978353	772.1978353			
				66.7473153		7504.73306				50.47934331		5675.711308			
				66.8829273	66.8829273	66.8829273				50.69446321	50.69446321	50.69446321			
				1021.99395	1021.99395	1021.99395				772.1978353	772.1978353	772.1978353			
BF	SAN,B & C	12	Product Stranding E	72.66173683	50.85938733	54.43282805	59.2724644			22.27319363	15.58978125	16.68523341	18.16877203		
				59.272501	59.272501	59.272501	59.272501			18.16882074	18.16882074	18.16882074	18.16882074		
				190.0362325	190.0362325	190.0362325	190.0362325			58.25044319	58.25044319	58.25044319	58.25044319		
				72.66169337	133.5073873	54.43304182	86.8731458			22.27255493	40.92388564	16.68475494	26.62881599		
				86.8731502	86.8731502	86.8731502	86.8731502			26.6287978	26.6287978	26.6287978	26.6287976		
				190.0362325	190.0362325	190.0362325	190.0362325			58.25044319	58.25044319	58.25044319	58.25044319		
				72.66181005	50.85943718	108.8688921	77.48434346			22.27289928	15.58957522	33.3711848	23.75120413		
				77.48440478	77.48440478	77.48440478	77.48440478			23.75095069	23.75095069	23.75095069	23.75095069		
				190.0362325	190.0362325	190.0362325	190.0362325			58.25044319	58.25044319	58.25044319	58.25044319		
				72.66196455	133.5074981	108.8689236	104.9719735			22.27228071	40.92334506	33.37022806	32.17630241		
				104.9719366	104.9719366	104.9719366	104.9719366			32.17645488	32.17645488	32.17645488	32.17645488		
				190.0362325	190.0362325	190.0362325	190.0362325			58.25044319	58.25044319	58.25044319	58.25044319		
					50.85939399	54.43293317	52.59858071				15.58975373	16.68520395	16.12269255		
				52.59857353	52.59857353	52.59857353	52.59857353			16.12292219	16.12292219	16.12292219	16.12292219		
				190.0362325	190.0362325	190.0362325	190.0362325			58.25044319	58.25044319	58.25044319	58.25044319		
					133.5073849	54.43304898	93.99953107				40.923813	16.68472532	28.81325498		
				93.99954733	93.99954733	93.99954733	93.99954733			28.81318778	28.81318778	28.81318778	28.81318778		

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	Ti 70% TRE BASED ON DIFFERENT HRS/YR						TOTAL HAP FLOW RATE (LBS/HR) BASED ON COMPONENT					
ID		ID	Name	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN	EB	STY	MA	MEK	MMA
				3.875118461	15.08911038	6.748714751				1.462764834	0.372198808	0.835468638	0	0	
				8.539653676	8.539653676	8.539653676				0.658958613	0.658958613	0.658958613	0	0	
				11.85729817	11.85729817	11.85729817				0.47199348	0.47199348	0.47199348	0	0	
				66.2996798	2.172330144	3.919052218				0.084021909	2.620279609	1.43797006	0	0	
				3.088698589	3.088698589	3.088698589				1.857023528	1.857023528	1.857023528	0	0	
				11.85729817	11.85729817	11.85729817				0.47199348	0.47199348	0.47199348	0	0	
				66.29027943	15.00176613	3.918502946				0.084021909	0.372198808	1.43797006	0	0	
				9.479536048	9.479536048	9.479536048				0.591311742	0.591311742	0.591311742	0	0	
				11.85729817	11.85729817	11.85729817				0.47199348	0.47199348	0.47199348	0	0	
				66.29035869	2.172031253	6.709811118				0.084021909	2.620279609	0.835468638	0	0	
				4.464492051	4.464492051	4.464492051				1.266691767	1.266691767	1.266691767	0	0	
				11.85729817	11.85729817	11.85729817				0.47199348	0.47199348	0.47199348	0	0	
				66.28095832	14.99966194	6.708865736				0.084021909	0.372198808	0.835468638	0	0	
				10.87533151	10.87533151	10.87533151				0.514901978	0.514901978	0.514901978	0	0	
				11.85729817	11.85729817	11.85729817				0.47199348	0.47199348	0.47199348	0	0	
BF	SAN,B & C	11	Reactor Condenser	22.1466079	566.9609505	315.2515132				0.251828767	0.009816133	0.017655541	0	0	
				301.3213525	301.3213525	301.3213525				0.018465009	0.018465009	0.018465009	0	0	
				1297.752377	1297.752377	1297.752377				0.00428652	0.00428652	0.00428652	0	0	
				22.14654558		315.2506244				0.251828767	0	0.017655541	0	0	
				168.4638825	168.4638825	168.4638825				0.033033732	0.033033732	0.033033732	0	0	
				1297.752377	1297.752377	1297.752377				0.00428652	0.00428652	0.00428652	0	0	
				22.14555061	566.9538237	4333.890204				0.251828767	0.009816133	0.001284039	0	0	
				294.3695081	294.3695081	294.3695081				0.018901191	0.018901191	0.018901191	0	0	
				1297.752377	1297.752377	1297.752377				0.00428652	0.00428652	0.00428652	0	0	
				22.1454882		4333.877983				0.251828767	0	0.001284039	0	0	
				22.47515088	22.47515088	22.47515088				0.248322538	0.248322538	0.248322538	0	0	
				1297.752377	1297.752377	1297.752377				0.00428652	0.00428652	0.00428652	0	0	
				84.77030383	1246.090465	692.8230316				0.06562244	0.004461879	0.008025246	0	0	
				674.6703882	674.6703882	674.6703882				0.008239535	0.008239535	0.008239535	0	0	
				1296.750584	1296.750584	1296.750584				0.00428652	0.00428652	0.00428652	0	0	
				84.77006471		692.8210783				0.06562244	0	0.008025246	0	0	
				389.100075	389.100075	389.100075				0.0142884	0.0142884	0.0142884	0	0	
				1296.750584	1296.750584	1296.750584				0.00428652	0.00428652	0.00428652	0	0	
				84.76624607	1246.030786	9525.24973				0.06562244	0.004461879	0.000583654	0	0	
				665.4086483	665.4086483	665.4086483				0.008354239	0.008354239	0.008354239	0	0	
				1296.750584	1296.750584	1296.750584				0.00428652	0.00428652	0.00428652	0	0	
				84.76600894		9525.222844				0.06562244	0	0.000583654	0	0	
				86.00628199	86.00628199	86.00628199				0.065466851	0.065466851	0.065466851	0	0	
				1296.750584	1296.750584	1296.750584				0.00428652	0.00428652	0.00428652	0	0	
										0	0	0	0	0	
BF	SAN,B & C	12	Product Stranding E	23.20294023	16.25527782	17.39404217	18.93623723			0.260336351	0.37193547	0.347518118	0.319143957	0	
				18.93617532	18.93617532	18.93617532	18.93617532			0.319143957	0.319143957	0.319143957	0.319143957	0	
				60.60464349	60.60464349	60.60464349	60.60464349			0.09954252	0.09954252	0.09954252	0.09954252	0	
				23.20267888	42.59178858	17.39384638	27.73125738			0.260336351	0.141689703	0.347518118	0.217749263	0	
				27.73124992	27.73124992	27.73124992	27.73124992			0.217749263	0.217749263	0.217749263	0.217749263	0	
				60.60464349	60.60464349	60.60464349	60.60464349			0.09954252	0.09954252	0.09954252	0.09954252	0	
				23.20281978	16.25519351	34.74000388	24.73958844			0.260336351	0.37193547	0.173759059	0.24413348	0	
				24.73948274	24.73948274	24.73948274	24.73948274			0.24413348	0.24413348	0.24413348	0.24413348	0	
				60.60464349	60.60464349	60.60464349	60.60464349			0.09954252	0.09954252	0.09954252	0.09954252	0	
				23.20255849	42.59156538	34.73961239	33.49844956			0.260336351	0.141689703	0.173759059	0.180208288	0	
				33.49851195	33.49851195	33.49851195	33.49851195			0.180208288	0.180208288	0.180208288	0.180208288	0	
				60.60464349	60.60464349	60.60464349	60.60464349			0.09954252	0.09954252	0.09954252	0.09954252	0	
					16.25528858	17.39403012	16.80948532			#DIV/0!	0.37193547	0.347518118	0.359837492	0	
				16.80949745	16.80949745	16.80949745	16.80949745			0.359837492	0.359837492	0.359837492	0.359837492	0	
				60.60464349	60.60464349	60.60464349	60.60464349			0.09954252	0.09954252	0.09954252	0.09954252	0	
					42.59175888	17.39383427	30.00213884			#DIV/0!	0.141689703	0.347518118	0.201241198	0	
				30.00210934	30.00210934	30.00210934	30.00210934			0.201241198	0.201241198	0.201241198	0.201241198	0	

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	AN	EB	STY	MA	MEK	MMA	Flow Rate	Emissions (lbs/yr)						F
ID		ID	Name	PPMV	PPMV	PPMV	PPMV	ppmv	ppmv	(scfm)	AN	EB	STY	MA	MEK	MMA	AN
				0.764722402	5.620310748	3.437260323	0.024341039			641	34	500	300	2			8400
				0	21	6	0.057922018			641	34	500	300	2			
				1.819736028	13.37411058	8.17931635	0.057922018			641	34	500	300	2			3530
				0.764722402	5.620310748	3.437260323	0.024341039			641	34	500	300	2			8400
				0	8	6	0.036182021			641	34	500	300	2			
				1.199584553	8.816173723	5.391780899	0.036182021			641	34	500	300	2			5355
				0.764722402	5.620310748	3.437260323	0.024341039			641	34	500	300	2			8400
BF	SAN,B & C	13	Reactor Process Eq	80	3	14	43.2904669	14.71763006	10.59866325	0.5	2	2	2	2	2	2	6055.251916
				60.00332837	39.98282569	40.75438367	43.2904669	14.71763006	10.59866325	0.5	2	2	2	2	2	2	6055
				57.66906587	28.82095352	29.37711823	31.20521156	10.60895834	7.639869757	0.5	2	2	2	2	2	2	8400
				80	0	14	43.2904669	14.71763006	10.59866325	0.5	2	2	2	2	2	2	6055.251916
				60.00332837	39.98282569	40.75438367	43.2904669	14.71763006	10.59866325	0.5	2	2	2	2	2	2	6055
				57.66906587	28.82095352	29.37711823	31.20521156	10.60895834	7.639869757	0.5	2	2	2	2	2	2	8400
				80	3	0	43.2904669	14.71763006	10.59866325	0.5	2	2	2	2	2	2	6055.251916
				60.00332837	39.98282569	40.75438367	43.2904669	14.71763006	10.59866325	0.5	2	2	2	2	2	2	6055
				57.66906587	28.82095352	29.37711823	31.20521156	10.60895834	7.639869757	0.5	2	2	2	2	2	2	8400
				80	0	0	43.2904669	14.71763006	10.59866325	0.5	2	2	2	2	2	2	6055.251916
				60.00332837	39.98282569	40.75438367	43.2904669	14.71763006	10.59866325	0.5	2	2	2	2	2	2	6055
				57.66906587	28.82095352	29.37711823	31.20521156	10.60895834	7.639869757	0.5	2	2	2	2	2	2	8400
				5	3	14	29.9228056	10.17297375	7.325902506	0.5	2	2	2	2	2	2	96884.03066
				57.66906587	28.82095352	29.37711823	31.20521156	10.60895834	7.639869757	0.5	2	2	2	2	2	2	8400
				55.29910426	27.63653077	28.1698394	29.9228056	10.17297375	7.325902506	0.5	2	2	2	2	2	2	8760
				5	0	14	29.9228056	10.17297375	7.325902506	0.5	2	2	2	2	2	2	96884.03066
				57.66906587	28.82095352	29.37711823	31.20521156	10.60895834	7.639869757	0.5	2	2	2	2	2	2	8400
				55.29910426	27.63653077	28.1698394	29.9228056	10.17297375	7.325902506	0.5	2	2	2	2	2	2	8760
				5	3	0	29.9228056	10.17297375	7.325902506	0.5	2	2	2	2	2	2	96884.03066
				57.66906587	28.82095352	29.37711823	31.20521156	10.60895834	7.639869757	0.5	2	2	2	2	2	2	8400
				55.29910426	27.63653077	28.1698394	29.9228056	10.17297375	7.325902506	0.5	2	2	2	2	2	2	8760
				5	0	0	29.9228056	10.17297375	7.325902506	0.5	2	2	2	2	2	2	96884.03068
				57.66906587	28.82095352	29.37711823	31.20521156	10.60895834	7.639869757	0.5	2	2	2	2	2	2	8400
				55.29910426	27.63653077	28.1698394	29.9228056	10.17297375	7.325902506	0.5	2	2	2	2	2	2	8760
BF	SAN,B & C	14	Reactor Fugitive Ve	204	10	187	1	0.075665364	80.63862528	793	2460	100	2780	2	2	120	1841.594307
				393.3676845	7.991919134	226.4627219	0.173061261	0.075665364	80.63862528	793	2460	100	2780	2	2	120	955
				44.72443318	0.908605092	25.74665469	0.019675417	0.008625169	9.167843708	793	2460	100	2780	2	2	120	8400
				204	5	187	1	0.063276352	67.25754336	793	2460	100	2780	2	2	120	1841.594307
				328.1093788	6.665749146	188.8837549	0.144343671	0.063276352	67.25754336	793	2460	100	2780	2	2	120	1145
				44.72443318	0.908605092	25.74665469	0.019675417	0.008625169	9.167843708	793	2460	100	2780	2	2	120	8400
				204	10	136	1	0.068350399	72.65083693	793	2460	100	2780	2	2	120	1841.594307
				354.4200365	7.200266767	204.0300938	0.1559184	0.068350399	72.65083693	793	2460	100	2780	2	2	120	1060
				44.72443318	0.908605092	25.74665469	0.019675417	0.008625169	9.167843708	793	2460	100	2780	2	2	120	8400
				204	5	136	1	0.057961138	61.60790972	793	2460	100	2780	2	2	120	1841.594307
				300.5481909	6.105826218	173.0175195	0.132218803	0.057961138	61.60790972	793	2460	100	2780	2	2	120	1250
				44.72443318	0.908605092	25.74665469	0.019675417	0.008625169	9.167843708	793	2460	100	2780	2	2	120	8400
				204	10	187	0	0.057776254	61.41139326	793	2460	100	2780	2	2	120	1841.594307
				299.5895045	6.086349898	172.4656295	0.131797053	0.057776254	61.41139326	793	2460	100	2780	2	2	120	1254
				44.72443318	0.908605092	25.74665469	0.019675417	0.008625169	9.167843708	793	2460	100	2780	2	2	120	8400
				204	5	187	0	0.047981075	50.99992526	793	2460	100	2780	2	2	120	1841.594307
				248.7981713	5.054491902	143.2264234	0.109452652	0.047981075	50.99992526	793	2460	100	2780	2	2	120	1510
				44.72443318	0.908605092	25.74665469	0.019675417	0.008625169	9.167843708	793	2460	100	2780	2	2	120	8400
				204	10	136	0	0.051751016	55.00706225	793	2460	100	2780	2	2	120	1841.594307
				268.3465991	5.451630552	154.4799281	0.118052503	0.051751016	55.00706225	793	2460	100	2780	2	2	120	1400
				44.72443318	0.908605092	25.74665469	0.019675417	0.008625169	9.167843708	793	2460	100	2780	2	2	120	8400
				204	5	136	0	0.043777295	46.53165387	793	2460	100	2780	2	2	120	1841.594307
				227.0001442	4.611851222	130.6778848	0.099863144	0.043777295	46.53165387	793	2460	100	2780	2	2	120	1655
				44.72443318	0.908605092	25.74665469	0.019675417	0.008625169	9.167843708	793	2460	100	2780	2	2	120	8400
				151	10	187	1	0.064978855	69.06716336	793	2460	100	2780	2	2	120	2487.981713
				336.9374336	6.845096657	193.9658291	0.148227358	0.064978855	69.06716336	793	2460	100	2780	2	2	120	1115

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	quencey (HRS/YR) BASED ON EACH COMPOUND					Btu Content	Qs	EHAP (KG/HR) BASED ON COMPONENT					
ID		ID	Name	EB	STY	MA	MEK	MMA	BTU/SCF	m^3/min	AN	EB	STY	MA	MEK	MMA
				8400	8400	8400			0.045905613	18.15312	0.045144	0.045144	0.045144	0.045144		
				2248.124299	4812.164453	3530			0.132368439	18.15312	#DIV/0!	0.168678218	0.078802294	0.107424816		
				3530	3530	3530			0.109237153	18.15312	0.10742482	0.107424816	0.107424816	0.107424816		
				8400	8400	8400			0.045905613	18.15312	0.045144	0.045144	0.045144	0.045144		
				5901.326288	4812.164453	5355			0.068620977	18.15312	#DIV/0!	0.064258369	0.078802294	0.070814118		
				5355	5355	5355			0.072008805	18.15312	0.07081412	0.070814118	0.070814118	0.070814118		
				8400	8400	8400			0.045905613	18.15312	0.045144	0.045144	0.045144	0.045144		
BF	SAN,B & C	13	Reactor Process Eq	80698.66985	17626.27094	6055	6055	6055	0.374775722	0.01416	0.00069692	6.74509E-05	0.000308812	0.00069696	0.00069696	0.00069696
				6055	6055	6055	6055	6055	0.686932415	0.01416	0.00069696	0.00069696	0.00069696	0.00069696	0.00069696	0.00069696
				8400	8400	8400	8400	8400	0.495163782	0.01416	0.000648	0.000648	0.000648	0.000648	0.000648	0.000648
					17626.27094	6055	6055	6055	0.360072116	0.01416	0.00069692		0.000308812	0.00069696	0.00069696	0.00069696
				6055	6055	6055	6055	6055	0.686932415	0.01416	0.00069696		0.00069696	0.00069696	0.00069696	0.00069696
				8400	8400	8400	8400	8400	0.495163782	0.01416	0.000648		0.000648	0.000648	0.000648	0.000648
				80698.66985		6055	6055	6055	0.30628386	0.01416	0.00069692	6.74509E-05	#DIV/0!	0.00069696	0.00069696	0.00069696
				6055	6055	6055	6055	6055	0.686932415	0.01416	0.00069696	0.00069696	0.00069696	0.00069696	0.00069696	0.00069696
				8400	8400	8400	8400	8400	0.495163782	0.01416	0.000648	0.000648	0.000648	0.000648	0.000648	0.000648
						6055	6055	6055	0.291580253	0.01416	0.00069692	#DIV/0!	#DIV/0!	0.00069696	0.00069696	0.00069696
				6055	6055	6055	6055	6055	0.686932415	0.01416	0.00069696	0.00069696	0.00069696	0.00069696	0.00069696	0.00069696
				8400	8400	8400	8400	8400	0.495163782	0.01416	0.000648	0.000648	0.000648	0.000648	0.000648	0.000648
				80698.66985	17626.27094	8760	8760	8760	0.185652748	0.01416	5.6183E-05	6.74509E-05	0.000308812	0.00062137	0.00062137	0.00062137
				8400	8400	8400	8400	8400	0.495163782	0.01416	0.000648	0.000648	0.000648	0.000648	0.000648	0.000648
				8760	8760	8760	8760	8760	0.474814586	0.01416	0.00062137	0.00062137	0.00062137	0.00062137	0.00062137	0.00062137
					17626.27094	8760	8760	8760	0.170949141	0.01416	5.6183E-05	#DIV/0!	0.000308812	0.00062137	0.00062137	0.00062137
				8400	8400	8400	8400	8400	0.495163782	0.01416	0.000648	0.000648	0.000648	0.000648	0.000648	0.000648
				8760	8760	8760	8760	8760	0.474814586	0.01416	0.00062137	0.00062137	0.00062137	0.00062137	0.00062137	0.00062137
				80698.66985		8760	8760	8760	0.117160886	0.01416	5.6183E-05	6.74509E-05	#DIV/0!	0.00062137	0.00062137	0.00062137
				8400	8400	8400	8400	8400	0.495163782	0.01416	0.000648	0.000648	0.000648	0.000648	0.000648	0.000648
				8760	8760	8760	8760	8760	0.474814586	0.01416	0.00062137	0.00062137	0.00062137	0.00062137	0.00062137	0.00062137
						8760	8760	8760	0.102457279	0.01416	5.6183E-05	#DIV/0!	#DIV/0!	0.00062137	0.00062137	0.00062137
				8400	8400	8400	8400	8400	0.495163782	0.01416	0.000648	0.000648	0.000648	0.000648	0.000648	0.000648
				8760	8760	8760	8760	8760	0.474814586	0.01416	0.00062137	0.00062137	0.00062137	0.00062137	0.00062137	0.00062137
BF	SAN,B & C	14	Reactor Fugitive Ve	763.2282773	1156.534221	50.1561	955	955	1.606448205	22.45776	1.34582866	3.247351381	2.143015186	49.41517778	2.595256963	2.595256963
				955	955	955	955	955	2.161517312	22.45776	2.59525696	2.595256963	2.595256963	2.595256963	2.595256963	2.595256963
				8400	8400	8400	8400	8400	0.245743932	22.45776	0.295056	0.295056	0.295056	0.295056	0.295056	0.295056
				1526.456555	1156.534221	50.1561	1145	1145	1.542252209	22.45776	1.34582866	1.62367569	2.143015186	49.41517778	2.164602969	2.164602969
				1145	1145	1145	1145	1145	1.802837583	22.45776	2.16460297	2.164602969	2.164602969	2.164602969	2.164602969	2.164602969
				8400	8400	8400	8400	8400	0.245743932	22.45776	0.295056	0.295056	0.295056	0.295056	0.295056	0.295056
				763.2282773	1590.234554	50.1561	1060	1060	1.333249343	22.45776	1.34582866	3.247351381	1.558556499	49.41517778	2.338179623	2.338179623
				1060	1060	1060	1060	1060	1.947404748	22.45776	2.33817962	2.338179623	2.338179623	2.338179623	2.338179623	2.338179623
				8400	8400	8400	8400	8400	0.245743932	22.45776	0.295056	0.295056	0.295056	0.295056	0.295056	0.295056
				1526.456555	1590.234554	50.1561	1250	1250	1.27598861	22.45776	1.34582866	1.62367569	1.558556499	49.41517778	1.98277632	1.98277632
				1250	1250	1250	1250	1250	1.651399226	22.45776	1.98277632	1.98277632	1.98277632	1.98277632	1.98277632	1.98277632
				8400	8400	8400	8400	8400	0.245743932	22.45776	0.295056	0.295056	0.295056	0.295056	0.295056	0.295056
				763.2282773	1156.534221	#DIV/0!	1254	1254	1.547906526	22.45776	1.34582866	3.247351381	2.143015186	#DIV/0!	1.976451675	1.976451675
				1254	1254	1254	1254	1254	1.646131605	22.45776	1.97645167	1.976451675	1.976451675	1.976451675	1.976451675	1.976451675
				8400	8400	8400	8400	8400	0.245743932	22.45776	0.295056	0.295056	0.295056	0.295056	0.295056	0.295056
				1526.456555	1156.534221	#DIV/0!	1510	1510	1.492518781	22.45776	1.34582866	1.62367569	2.143015186	#DIV/0!	1.641371126	1.641371126
				1510	1510	1510	1510	1510	1.36705234	22.45776	1.64137113	1.641371126	1.641371126	1.641371126	1.641371126	1.641371126
				8400	8400	8400	8400	8400	0.245743932	22.45776	0.295056	0.295056	0.295056	0.295056	0.295056	0.295056
				763.2282773	1590.234554	#DIV/0!	1400	1400	1.279404399	22.45776	1.34582866	3.247351381	1.558556499	#DIV/0!	1.770336	1.770336
				1400	1400	1400	1400	1400	1.474463595	22.45776	1.770336	1.770336	1.770336	1.770336	1.770336	1.770336
				8400	8400	8400	8400	8400	0.245743932	22.45776	0.295056	0.295056	0.295056	0.295056	0.295056	0.295056
				1526.456555	1590.234554	#DIV/0!	1655	1655	1.229759252	22.45776	1.34582866	1.62367569	1.558556499	#DIV/0!	1.497565196	1.497565196
				1655	1655	1655	1655	1655	1.247260382	22.45776	1.4975652	1.497565196	1.497565196	1.497565196	1.497565196	1.497565196
				8400	8400	8400	8400	8400	0.245743932	22.45776	0.295056	0.295056	0.295056	0.295056	0.295056	0.295056
				763.2282773	1156.534221	50.1561	1115	1115	1.467714499	22.45776	0.9961771	3.247351381	2.143015186	49.41517778	2.222843408	2.222843408
				1115	1115	1115	1115	1115	1.651344424	22.45776	2.22284341	2.222843408	2.222843408	2.222843408	2.222843408	2.222843408

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility ID	Subcategory	Stream ID	Stream Name	FLARE TRE BASED ON DIFFERENT HRS/YR						TI 0% BASED ON DIFFERENT HRS/YR					
				AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR
				190.0362325	190.0362325	190.0362325	190.0362325			58.25044319	58.25044319	58.25044319	58.25044319		
					50.85944387	108.8887064	79.85980887				15.58954757	33.37112562	24.47933535		
				79.85987049	79.85987049	79.85987049	79.85987049			24.47908068	24.47908068	24.47908068	24.47908068		
				190.0362325	190.0362325	190.0362325	190.0362325			58.25044319	58.25044319	58.25044319	58.25044319		
					133.5075157	108.8669379	121.1477406				40.92327237	33.37016879	37.13481682		
				121.1477269	121.1477269	121.1477269	121.1477269			37.1346734	37.1346734	37.1346734	37.1346734		
				190.0362325	190.0362325	190.0362325	190.0362325			58.25044319	58.25044319	58.25044319	58.25044319		
BF	SAN,B & C	13	Reactor Process Eq	2158.223231	28762.76679	6282.386997	2158.133443	2158.133443	2158.133443	1661.244727	22139.51263	4835.729954	1661.175615	1661.175615	1661.175615
				2158.034063	2158.034063	2158.034063	2158.034063	2158.034063	2158.034063	1661.586344	1661.586344	1661.586344	1661.586344	1661.586344	1661.586344
				2993.889462	2993.889462	2993.889462	2993.889462	2993.889462	2993.889462	2304.741284	2304.741284	2304.741284	2304.741284	2304.741284	2304.741284
				2158.227912		6282.400824	2158.138124	2158.138124	2158.138124	1661.22538	#DIV/0!	4835.673635	1661.156268	1661.156268	1661.156268
				2158.034063		2158.034063	2158.034063	2158.034063	2158.034063	1661.586344	#DIV/0!	1661.586344	1661.586344	1661.586344	1661.586344
				2993.889462		2993.889462	2993.889462	2993.889462	2993.889462	2304.741284	#DIV/0!	2304.741284	2304.741284	2304.741284	2304.741284
				2158.245037	28763.0574	#DIV/0!	2158.155248	2158.155248	2158.155248	1661.154603	22138.31155	#DIV/0!	1661.085494	1661.085494	1661.085494
				2158.034063	2158.034063	2158.034063	2158.034063	2158.034063	2158.034063	1661.586344	1661.586344	1661.586344	1661.586344	1661.586344	1661.586344
				2993.889462	2993.889462	2993.889462	2993.889462	2993.889462	2993.889462	2304.741284	2304.741284	2304.741284	2304.741284	2304.741284	2304.741284
				2158.249718	#DIV/0!	#DIV/0!	2158.159929	2158.159929	2158.159929	1661.135256	#DIV/0!	#DIV/0!	1661.066148	1661.066148	1661.066148
				2158.034063	2158.034063	2158.034063	2158.034063	2158.034063	2158.034063	1661.586344	1661.586344	1661.586344	1661.586344	1661.586344	1661.586344
				2993.889462	2993.889462	2993.889462	2993.889462	2993.889462	2993.889462	2304.741284	2304.741284	2304.741284	2304.741284	2304.741284	2304.741284
				34532.54609	28763.56924	6282.582269	3122.341598	3122.341598	3122.341598	26575.95135	22136.19614	4835.005662	2402.926779	2402.926779	2402.926779
				2993.889462	2993.889462	2993.889462	2993.889462	2993.889462	2993.889462	2304.741284	2304.741284	2304.741284	2304.741284	2304.741284	2304.741284
				3122.208414	3122.208414	3122.208414	3122.208414	3122.208414	3122.208414	2403.477224	2403.477224	2403.477224	2403.477224	2403.477224	2403.477224
				34532.62099	#DIV/0!	6282.575896	3122.348371	3122.348371	3122.348371	26575.64179	#DIV/0!	4834.949243	2402.898789	2402.898789	2402.898789
				2993.889462	2993.889462	2993.889462	2993.889462	2993.889462	2993.889462	2304.741284	2304.741284	2304.741284	2304.741284	2304.741284	2304.741284
				3122.208414	3122.208414	3122.208414	3122.208414	3122.208414	3122.208414	2403.477224	2403.477224	2403.477224	2403.477224	2403.477224	2403.477224
				34532.89499	28763.85965	#DIV/0!	3122.373145	3122.373145	3122.373145	26574.50937	22134.99505	#DIV/0!	2402.796398	2402.796398	2402.796398
				2993.889462	2993.889462	2993.889462	2993.889462	2993.889462	2993.889462	2304.741284	2304.741284	2304.741284	2304.741284	2304.741284	2304.741284
				3122.208414	3122.208414	3122.208414	3122.208414	3122.208414	3122.208414	2403.477224	2403.477224	2403.477224	2403.477224	2403.477224	2403.477224
				34532.96989	#DIV/0!	#DIV/0!	3122.379917	3122.379917	3122.379917	26574.1998	#DIV/0!	#DIV/0!	2402.768409	2402.768409	2402.768409
				2993.889462	2993.889462	2993.889462	2993.889462	2993.889462	2993.889462	2304.741284	2304.741284	2304.741284	2304.741284	2304.741284	2304.741284
				3122.208414	3122.208414	3122.208414	3122.208414	3122.208414	3122.208414	2403.477224	2403.477224	2403.477224	2403.477224	2403.477224	2403.477224
BF	SAN,B & C	14	Reactor Fugitive Ve	7.544120438	3.126147413	4.737488093	0.204751753	3.911819694	3.911819694	2.15463398	0.892285422	1.352694205	0.057564296	1.116775763	1.116775763
				3.911758483	3.911758483	3.911758483	3.911758483	3.911758483	3.911758483	1.117028746	1.117028746	1.117028746	1.117028746	1.117028746	1.117028746
				34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619
				7.54413409	6.253039442	4.737498666	0.204752124	4.690241866	4.690241866	2.154577559	1.785683079	1.352658772	0.05755276	1.339157024	1.339157024
				4.690207412	4.690207412	4.690207412	4.690207412	4.690207412	4.690207412	1.339299419	1.339299419	1.339299419	1.339299419	1.339299419	1.339299419
				34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619
				7.544178535	3.126171491	6.514371283	0.204753335	4.342029117	4.342029117	2.154393869	0.892165911	1.860181619	0.057547757	1.239551851	1.239551851
				4.341953944	4.341953944	4.341953944	4.341953944	4.341953944	4.341953944	1.239862539	1.239862539	1.239862539	1.239862539	1.239862539	1.239862539
				34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619
				7.544190712	6.253086374	6.514381797	0.204753666	5.120457061	5.120457061	2.154343543	1.785489108	1.860138362	0.057546386	1.46190926	1.46190926
				5.120402874	5.120402874	5.120402874	5.120402874	5.120402874	5.120402874	1.462133213	1.462133213	1.462133213	1.462133213	1.462133213	1.462133213
				34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619
				7.544132887	3.126152573	4.737495911	#DIV/0!	5.136805495	5.136805495	2.154582526	0.892264099	1.352661693	#DIV/0!	1.466753811	1.466753811
				5.136791272	5.136791272	5.136791272	5.136791272	5.136791272	5.136791272	1.466812595	1.466812595	1.466812595	1.466812595	1.466812595	1.466812595
				34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619
				7.544144666	6.253048208	4.737503308	#DIV/0!	6.185626901	6.185626901	2.154533849	1.785646848	1.352631322	#DIV/0!	1.766383498	1.766383498
				6.185648778	6.185648778	6.185648778	6.185648778	6.185648778	6.185648778	1.766293082	1.766293082	1.766293082	1.766293082	1.766293082	1.766293082
				34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619
				7.544189985	3.126176236	6.51438117	#DIV/0!	5.734999352	5.734999352	2.154346545	0.892166296	1.860140954	#DIV/0!	1.637479733	1.637479733
				5.734967818	5.734967818	5.734967818	5.734967818	5.734967818	5.734967818	1.63761006	1.63761006	1.63761006	1.63761006	1.63761006	1.63761006
				34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619
				7.544200543	6.253094623	6.514390286	#DIV/0!	6.779731572	6.779731572	2.154302913	1.78545543	1.860103277	#DIV/0!	1.935906863	1.935906863
				6.779728224	6.779728224	6.779728224	6.779728224	6.779728224	6.779728224	1.935920701	1.935920701	1.935920701	1.935920701	1.935920701	1.935920701
				34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619
				10.19235399	3.12615964	4.737506621	0.204752556	4.567343817	4.567343817	2.911138311	0.892234889	1.352617632	0.057550976	1.30399991	1.30399991
				4.567294424	4.567294424	4.567294424	4.567294424	4.567294424	4.567294424	1.30420405	1.30420405	1.30420405	1.30420405	1.30420405	1.30420405

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility ID	Subcategory	Stream ID	Stream Name	TI 70% TRE BASED ON DIFFERENT HRS/YR AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	TOTAL HAP FLOW RATE (LBS/HR) BASED ON COMPONENT AN	EB	STY	MA	MEK	MMA
				60.60464349	60.60464349	60.60464349	60.60464349			0.09954252	0.09954252	0.09954252	0.09954252	0	
					18.2551822	34.73997958	25.49854009			#DIV/0!	0.37193547	0.173759059	0.236871719	0	
				25.49643588	25.49643588	25.49643588	25.49643588			0.236871719	0.236871719	0.236871719	0.236871719	0	
				60.60464349	60.60464349	60.60464349	60.60464349			0.09954252	0.09954252	0.09954252	0.09954252	0	
					42.59153564	34.73958814	38.85297923			#DIV/0!	0.141669703	0.173759059	0.156145129	0	
				38.65300239	38.65300239	38.65300239	38.65300239			0.156145129	0.156145129	0.156145129	0.156145129	0	
				60.60464349	60.60464349	60.60464349	60.60464349			0.09954252	0.09954252	0.09954252	0.09954252	0	
BF	SAN,B & C	13	Reactor Process Eq	2802.680983	37350.89035	8158.250135	2802.564366	2802.564366	2802.564366	0.001982123	0.000148729	0.00068093	0.001982206	0.001982206	0.00198
				2802.732432	2802.732432	2802.732432	2802.732432	2802.732432	2802.732432	0.001982206	0.001982206	0.001982206	0.001982206	0.001982206	0.001982
				3888.021935	3888.021935	3888.021935	3888.021935	3888.021935	3888.021935	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884	0.0014
				2802.673046		8158.22709	2802.556449	2802.556449	2802.556449	0.001982123	0	0.00068093	0.001982206	0.001982206	0.00198
				2802.732432		2802.732432	2802.732432	2802.732432	2802.732432	0.001982206	0	0.001982206	0.001982206	0.001982206	0.00198
				3888.021935		3888.021935	3888.021935	3888.021935	3888.021935	0.00142884	0	0.00142884	0.00142884	0.00142884	0.00142
				2802.644065	37350.39687	#DIV/0!	2802.527489	2802.527489	2802.527489	0.001982123	0.000148729	#DIV/0!	0.001982206	0.001982206	0.00198
				2802.732432	2802.732432	2802.732432	2802.732432	2802.732432	2802.732432	0.001982206	0.001982206	0.001982206	0.001982206	0.001982206	0.00198
				3888.021935	3888.021935	3888.021935	3888.021935	3888.021935	3888.021935	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884	0.0014
				2802.636169	#DIV/0!	#DIV/0!	2802.519573	2802.519573	2802.519573	0.001982123	#DIV/0!	#DIV/0!	0.001982206	0.001982206	0.00198
				2802.732432	2802.732432	2802.732432	2802.732432	2802.732432	2802.732432	0.001982206	0.001982206	0.001982206	0.001982206	0.001982206	0.00198
				3888.021935	3888.021935	3888.021935	3888.021935	3888.021935	3888.021935	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884	0.0014
				44840.54765	37349.53326	8157.95372	4054.408305	4054.408305	4054.408305	0.000123883	0.000148729	0.00068093	0.001370121	0.001370121	0.00137
				3888.021935	3888.021935	3888.021935	3888.021935	3888.021935	3888.021935	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884	0.0014
				4054.633543	4054.633543	4054.633543	4054.633543	4054.633543	4054.633543	0.001370121	0.001370121	0.001370121	0.001370121	0.001370121	0.001370
				44840.42098	#DIV/0!	8157.930675	4054.396852	4054.396852	4054.396852	0.000123883	#DIV/0!	0.00068093	0.001370121	0.001370121	0.001370
				3888.021935	3888.021935	3888.021935	3888.021935	3888.021935	3888.021935	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884	0.00142
				4054.633543	4054.633543	4054.633543	4054.633543	4054.633543	4054.633543	0.001370121	0.001370121	0.001370121	0.001370121	0.001370121	0.00137
				44839.9576	37349.04179	#DIV/0!	4054.354955	4054.354955	4054.354955	0.000123883	0.000148729	#DIV/0!	0.001370121	0.001370121	0.001370
				3888.021935	3888.021935	3888.021935	3888.021935	3888.021935	3888.021935	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884	0.00142
				4054.633543	4054.633543	4054.633543	4054.633543	4054.633543	4054.633543	0.001370121	0.001370121	0.001370121	0.001370121	0.001370121	0.001370
				44839.83093	#DIV/0!	#DIV/0!	4054.343502	4054.343502	4054.343502	0.000123883	#DIV/0!	#DIV/0!	0.001370121	0.001370121	0.00137
				3888.021935	3888.021935	3888.021935	3888.021935	3888.021935	3888.021935	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884	0.00142
				4054.633543	4054.633543	4054.633543	4054.633543	4054.633543	4054.633543	0.001370121	0.001370121	0.001370121	0.001370121	0.001370121	0.00137
BF	SAN,B & C	14	Reactor Fugitive Ve	2.117593499	0.90586145	1.347682123	0.104268366	1.121165948	1.121165948	2.967552197	7.160409795	4.725348486	108.960467	5.722541604	5.722541
				1.121289466	1.121289466	1.121289466	1.121289466	1.121289466	1.121289466	5.722541604	5.722541604	5.722541604	5.722541604	5.722541604	5.722541
				9.486068825	9.486068825	9.486068825	9.486068825	9.486068825	9.486068825	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.650
				2.117570412	1.763403764	1.347667625	0.104267737	1.334704923	1.334704923	2.967552197	3.580204897	4.725348486	108.960467	4.772949548	4.77294
				1.33476319	1.33476319	1.33476319	1.33476319	1.33476319	1.33476319	4.772949548	4.772949548	4.772949548	4.772949548	4.772949548	4.7729
				9.486068825	9.486068825	9.486068825	9.486068825	9.486068825	9.486068825	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.650
				2.117495247	0.905620731	1.835015579	0.10426569	1.239134657	1.239134657	2.967552197	7.160409795	3.436817081	108.960467	5.155686068	5.1
				1.239261787	1.239261787	1.239261787	1.239261787	1.239261787	1.239261787	5.155686068	5.155686068	5.155686068	5.155686068	5.155686068	5.15568
				9.486068825	9.486068825	9.486068825	9.486068825	9.486068825	9.486068825	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65
				2.117474654	1.763324393	1.834997796	0.104265129	1.452643872	1.452643872	2.967552197	3.580204897	3.436817081	108.960467	4.372021786	4.372021
				1.452735511	1.452735511	1.452735511	1.452735511	1.452735511	1.452735511	4.372021786	4.372021786	4.372021786	4.372021786	4.372021786	4.372021
				9.486068825	9.486068825	9.486068825	9.486068825	9.486068825	9.486068825	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.650
				2.117572445	0.905652725	1.347668902	#DIV/0!	1.457205641	1.457205641	2.967552197	7.160409795	4.725348486	#DIV/0!	4.358075943	4.35807
				1.457229695	1.457229695	1.457229695	1.457229695	1.457229695	1.457229695	4.358075943	4.358075943	4.358075943	4.358075943	4.358075943	4.35807
				9.486068825	9.486068825	9.486068825	9.486068825	9.486068825	9.486068825	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.650
				2.117552526	1.763388939	1.347656392	#DIV/0!	1.744894447	1.744894447	2.967552197	3.580204897	4.725348486	#DIV/0!	3.619223332	3.61922
				1.74485745	1.74485745	1.74485745	1.74485745	1.74485745	1.74485745	3.619223332	3.619223332	3.619223332	3.619223332	3.619223332	3.61922
				9.486068825	9.486068825	9.486068825	9.486068825	9.486068825	9.486068825	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.6505
				2.117475663	0.905612705	1.834996857	#DIV/0!	1.621214071	1.621214071	2.967552197	7.160409795	3.436817081	#DIV/0!	3.90359088	3.903
				1.621267399	1.621267399	1.621267399	1.621267399	1.621267399	1.621267399	3.90359088	3.90359088	3.90359088	3.90359088	3.90359088	3.9035
				9.486068825	9.486068825	9.486068825	9.486068825	9.486068825	9.486068825	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.6505
				2.117458029	1.763310612	1.83498344	#DIV/0!	1.907765946	1.907765946	2.967552197	3.580204897	3.436817081	#DIV/0!	3.302131258	3.302131
				1.907771608	1.907771608	1.907771608	1.907771608	1.907771608	1.907771608	3.302131258	3.302131258	3.302131258	3.302131258	3.302131258	3.302131
				9.486068825	9.486068825	9.486068825	9.486068825	9.486068825	9.486068825	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.650
				2.843974805	0.905640772	1.34765079	0.104267007	1.300973281	1.300973281	2.196570499	7.160409795	4.725348486	108.960467	4.901369715	4.901369
				1.301056813	1.301056813	1.301056813	1.301056813	1.301056813	1.301056813	4.901369715	4.901369715	4.901369715	4.901369715	4.901369715	4.901369

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	AN	EB	STY	MA	MEK	MMA	Flow Rate	Emissions (lbs/yr)						F
ID		ID	Name	PPMV	PPMV	PPMV	PPMV	ppmv	ppmv	(scfm)	AN	EB	STY	MA	MEK	MMA	AN
				44.72443318	0.908605092	25.74665469	0.019675417	0.008625169	9.167843708	793	2460	100	2780	2	2	120	8400
				151	5	187	1	0.055518332	59.01140778	793	2460	100	2780	2	2	120	2487.981713
				287.8814089	5.848492546	165.7255934	0.126646363	0.055518332	59.01140778	793	2460	100	2780	2	2	120	1305
				44.72443318	0.908605092	25.74665469	0.019675417	0.008625169	9.167843708	793	2460	100	2780	2	2	120	8400
				151	10	136	1	0.059144019	62.865214	793	2460	100	2780	2	2	120	2487.981713
				306.6818275	6.230434916	176.5484893	0.134917146	0.059144019	62.865214	793	2460	100	2780	2	2	120	1225
				44.72443318	0.908605092	25.74665469	0.019675417	0.008625169	9.167843708	793	2460	100	2780	2	2	120	8400
				151	5	136	1	0.051202419	54.42394851	793	2460	100	2780	2	2	120	2487.981713
				265.5019355	5.393839415	152.8423317	0.116801083	0.051202419	54.42394851	793	2460	100	2780	2	2	120	1415
				44.72443318	0.908605092	25.74665469	0.019675417	0.008625169	9.167843708	793	2460	100	2780	2	2	120	8400
				151	10	187	0	0.049286682	52.38767833	793	2460	100	2780	2	2	120	2487.981713
				255.5681896	5.192029097	147.1237411	0.112430955	0.049286682	52.38767833	793	2460	100	2780	2	2	120	1470
				44.72443318	0.908605092	25.74665469	0.019675417	0.008625169	9.167843708	793	2460	100	2780	2	2	120	8400
				151	5	187	0	0.042000825	44.64341284	793	2460	100	2780	2	2	120	2487.981713
				217.7885442	4.424511752	125.3750142	0.095810727	0.042000825	44.64341284	793	2460	100	2780	2	2	120	1725
				44.72443318	0.908605092	25.74665469	0.019675417	0.008625169	9.167843708	793	2460	100	2780	2	2	120	8400
				151	10	136	0	0.044861562	47.68414065	793	2460	100	2780	2	2	120	2487.981713
				232.6224388	4.725671688	133.9144888	0.102336535	0.044861562	47.68414065	793	2460	100	2780	2	2	120	1615
				44.72443318	0.908605092	25.74665469	0.019675417	0.008625169	9.167843708	793	2460	100	2780	2	2	120	8400
				151	5	136	0	0.036744076	41.16175783	793	2460	100	2780	2	2	120	2487.981713
				200.9011972	4.081434638	115.6534221	0.088381583	0.036744076	41.16175783	793	2460	100	2780	2	2	120	1870
				44.72443318	0.908605092	25.74665469	0.019675417	0.008625169	9.167843708	793	2460	100	2780	2	2	120	8400
AJ	SAN,C	15	Die Exhaust Control	0.098640809	0.822458008	1.16648249				3686.22222	19.6	327	455				6528
				0.098640809	0.822458008	1.16648249				3686.22222	19.6	327	455				6528
AJ	SAN,C	16	Pelletizing	0.097721061	0.100638215	0.099559898				2534.4	13.35	27.51	26.7				6528
				0.097721061	0.100638215	0.099559898				2534.4	13.35	27.51	26.7				6528
AJ	SAN,C	17	Finishing	0.1	0.1	0.1				1167.57736	11.7	12.5	12.26				6528
				0.1	0.1	0.1				1167.57736	11.7	12.5	12.26				6528
				0.18590123	0.099259445	0.09923232				1167.57736	11.7	12.5	12.26				6528
AJ	SAN,C	18	Initiator Mixing		224.3049819					1.36888889		15.6					
					224.3049819					1.36888889		15.6					
AJ	SAN,C	19	Devolatilization-Vac	12400	190	6000				0.89955556	26	1.36	56.1				6528
				12400	190	6000				0.89955556	26	1.36	56.1				6528
				536.200758	14.01710777	589.3634665				0.89955556	26	1.36	56.1				6528
				12400	190	6000				0.89955556	26	1.36	56.1				282.2837539
				12400	190	6000				0.89955556	26	1.36	56.1				460
				7609.388149	198.9210424	8363.836325				0.89955556	26	1.36	56.1				460
				12.4	9.5	6000				0.89955556	0.026	0.068	56.1				6528
				12.4	9.5	6000				0.89955556	0.026	0.068	56.1				6528
				0.536200758	0.700855388	589.3634665				0.89955556	0.026	0.068	56.1				6528
				12.4	9.5	6000				0.89955556	0.026	0.068	56.1				282.2837539
				12.4	9.5	6000				0.89955556	0.026	0.068	56.1				470
				7.447486273	9.734433989	8185.882361				0.89955556	0.026	0.068	56.1				470
AX	ASA/AMSAN	20	201 mix tank	290000		710000				2.5184E-05	1.65		0.19				222.5
AX	ASA/AMSAN	21	201 asa reactor	250000		420000				8.8117E-05	2.2		3.72				8010
AX	ASA/AMSAN	22	210 amsan reactor	750000		250000				0.00103863	61.7		20.3				8010
AX	ASA/AMSAN	23	301 water recovery	660000		340000				0.00011882	6.55		3.32				2670
AX	ASA/AMSAN	24	302 Water Suspensi	960000		30000				5.8557E-05	3.97		0.1				2670
AX	ASA/AMSAN	25	306 Water Recover	1000000						8.2178E-08	0.0057						222.5
AX	ASA/AMSAN	26	403 Water Recovery			1000000				7.3443E-09			0.001				

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	quency (HRS/YR) BASED ON EACH COMPOUND					Btu Content	Qs	EHAP (KG/HR) BASED ON COMPONENT					
ID		ID	Name	EB	STY	MA	MEK	MMA	BTU/SCF	m^3/min	AN	EB	STY	MA	MEK	MMA
				8400	8400	8400	8400	8400	0.245743932	22.45776	0.295056	0.295056	0.295056	0.295056	0.295056	0.295056
				1526.456555	1156.534221	50.1561	1305	1305	1.413381843	22.45776	0.9961771	1.62367569	2.143015186	49.41517778	1.899211034	1.899211034
				1305	1305	1305	1305	1305	1.581800025	22.45776	1.89921103	1.899211034	1.899211034	1.899211034	1.899211034	1.899211034
				8400	8400	8400	8400	8400	0.245743932	22.45776	0.295056	0.295056	0.295056	0.295056	0.295056	0.295056
				763.2282773	1590.234554	50.1561	1225	1225	1.199812662	22.45776	0.9961771	3.247351381	1.558556499	49.41517778	2.023241143	2.023241143
				1225	1225	1225	1225	1225	1.685101251	22.45776	2.02324114	2.023241143	2.023241143	2.023241143	2.023241143	2.023241143
				8400	8400	8400	8400	8400	0.245743932	22.45776	0.295056	0.295056	0.295056	0.295056	0.295056	0.295056
				1526.456555	1590.234554	50.1561	1415	1415	1.150268788	22.45776	0.9961771	1.62367569	1.558556499	49.41517778	1.751569187	1.751569187
				1415	1415	1415	1415	1415	1.458833239	22.45776	1.75156919	1.751569187	1.751569187	1.751569187	1.751569187	1.751569187
				8400	8400	8400	8400	8400	0.245743932	22.45776	0.295056	0.295056	0.295056	0.295056	0.295056	0.295056
				763.2282773	1156.534221	#DIV/0!	1470	1470	1.41672976	22.45776	0.9961771	3.247351381	2.143015186	#DIV/0!	1.686034286	1.686034286
				1470	1470	1470	1470	1470	1.404251043	22.45776	1.68603429	1.686034286	1.686034286	1.686034286	1.686034286	1.686034286
				8400	8400	8400	8400	8400	0.245743932	22.45776	0.295056	0.295056	0.295056	0.295056	0.295056	0.295056
				1526.456555	1156.534221	#DIV/0!	1725	1725	1.369253276	22.45776	0.9961771	1.62367569	2.143015186	#DIV/0!	1.436794435	1.436794435
				1725	1725	1725	1725	1725	1.196666106	22.45776	1.43679443	1.436794435	1.436794435	1.436794435	1.436794435	1.436794435
				8400	8400	8400	8400	8400	0.245743932	22.45776	0.295056	0.295056	0.295056	0.295056	0.295056	0.295056
				763.2282773	1590.234554	#DIV/0!	1615	1615	1.153272402	22.45776	0.9961771	3.247351381	1.558556499	#DIV/0!	1.534656594	1.534656594
				1615	1615	1615	1615	1615	1.278172776	22.45776	1.53465659	1.534656594	1.534656594	1.534656594	1.534656594	1.534656594
				8400	8400	8400	8400	8400	0.245743932	22.45776	0.295056	0.295056	0.295056	0.295056	0.295056	0.295056
				1526.456555	1590.234554	#DIV/0!	1870	1870	1.109479499	22.45776	0.9961771	1.62367569	1.558556499	#DIV/0!	1.325385241	1.325385241
				1870	1870	1870	1870	1870	1.103876488	22.45776	1.32538524	1.325385241	1.325385241	1.325385241	1.325385241	1.325385241
				8400	8400	8400	8400	8400	0.245743932	22.45776	0.295056	0.295056	0.295056	0.295056	0.295056	0.295056
AJ	SAN,C	15	Die Exhaust Control	6528	6528				8.82739E-06	104.3938133	0.05569941	0.055699412	0.055699412			
				6528	6528				0.009932112	104.3938133	0.05569941	0.055699412	0.055699412			
AJ	SAN,C	16	Pelletizing	6528	6528				8.0249E-07	71.774208	0.00469443	0.004694426	0.004694426			
				6528	6528				0.001172836	71.774208	0.00469443	0.004694426	0.004694426			
AJ	SAN,C	17	Finishing	6528	6528				4.81494E-08	33.06579079	0.00253343	0.002533434	0.002533434			
				6528	6528				0.00117635	33.06579079	0.00253343	0.002533434	0.002533434			
				6528	6528				0.001338192	33.06579079	0.00253343	0.002533434	0.002533434			
AJ	SAN,C	18	Initiator Mixing	3075					0.005818051	0.038766933	#DIV/0!	0.00230119	#DIV/0!			
				3075					1.099364068	0.038766933	#DIV/0!	0.00230119	#DIV/0!			
AJ	SAN,C	19	Devolatilization-Vac	6528	6528				2.499755815	0.025475413	0.00579924	0.005799243	0.005799243			
				6528	6528				54.71316395	0.025475413	0.00579924	0.005799243	0.005799243			
				6528	6528				4.008357826	0.025475413	0.00579924	0.005799243	0.005799243			
				481.5963131	641.2274516				54.71316395	0.025475413	0.13411135	0.07860795	0.059039044			
				460	460				54.71316395	0.025475413	0.08229882	0.082298817	0.082298817			
				460	460				56.88382585	0.025475413	0.08229882	0.082298817	0.082298817			
				6528	6528				0.002499756	0.025475413	0.00390466	0.003904657	0.003904657			
				6528	6528				29.42464496	0.025475413	0.00390466	0.003904657	0.003904657			
				6528	6528				2.887820031	0.025475413	0.00390466	0.003904657	0.003904657			
				481.5963131	641.2274516				29.42464496	0.025475413	0.09029779	0.052927092	0.039751259			
				470	470				29.42464496	0.025475413	0.05423319	0.054233188	0.054233188			
				470	470				40.10997694	0.025475413	0.05423319	0.054233188	0.054233188			
									0							
AX	ASA/AMSAN	20	201 mix tank		222.5				4044.822893	7.13208E-07	0.00375112	#DIV/0!	0.003751119			
									0							
AX	ASA/AMSAN	21	201 asa reactor		8010				2547.261921	2.49549E-06	0.00033524	#DIV/0!	0.000336245			
									0							
AX	ASA/AMSAN	22	210 amsan reactor		8010				2700.58713	2.94141E-05	0.0046436	#DIV/0!	0.004643598			
									0							
AX	ASA/AMSAN	23	301 water recovery		2670				2963.589779	3.36487E-06	0.00167679	#DIV/0!	0.001676791			
									0							
AX	ASA/AMSAN	24	302 Water Suspensi		2670				2037.991523	1.65832E-06	0.00069144	#DIV/0!	0.000691443			
									0							
AX	ASA/AMSAN	25	306 Water Recover						1970.024215	2.32729E-09	1.162E-05	#DIV/0!	#DIV/0!			
									0							
AX	ASA/AMSAN	26	403 Water Recovery		8400				4692.275874	2.0799E-10			0.000000064			

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility ID	Subcategory	Stream ID	Stream Name	FLARE TRE BASED ON DIFFERENT HRS/YR: AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	TI 0% BASED ON DIFFERENT HRS/YR: AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR
				34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619
				10.1923696	6.253062157	4.737513877	0.204752871	5.345768733	5.345768733	2.911073798	1.785589198	1.352587643	0.057549675	1.526369832	1.526369832
				5.345743353	5.345743353	5.345743353	5.345743353	5.345743353	5.345743353	1.526474723	1.526474723	1.526474723	1.526474723	1.526474723	1.526474723
				34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619
				10.19243096	3.126183251	6.514395786	0.204754108	5.018044029	5.018044029	2.910820212	0.892137307	1.86008055	0.057544563	1.432603361	1.432603361
				5.017975383	5.017975383	5.017975383	5.017975383	5.017975383	5.017975383	1.432887071	1.432887071	1.432887071	1.432887071	1.432887071	1.432887071
				34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619
				10.19244519	6.253106534	6.514404883	0.204754395	5.79647473	5.79647473	2.910761385	1.785397522	1.86004295	0.057543377	1.654949372	1.654949372
				5.796424313	5.796424313	5.796424313	5.796424313	5.796424313	5.796424313	1.655157745	1.655157745	1.655157745	1.655157745	1.655157745	1.655157745
				34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619
				10.19236864	3.126164133	4.73751343	#DIV/0!	6.021762674	6.021762674	2.911077773	0.892216318	1.352589491	#DIV/0!	1.71950601	1.71950601
				6.021764792	6.021764792	6.021764792	6.021764792	6.021764792	6.021764792	1.719499256	1.719499256	1.719499256	1.719499256	1.719499256	1.719499256
				34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619
				10.19236228	6.253069935	4.73751977	#DIV/0!	7.06649062	7.06649062	2.911021401	1.785557051	1.352563286	#DIV/0!	2.017951978	2.017951978
				7.066525196	7.066525196	7.066525196	7.066525196	7.066525196	7.066525196	2.017809897	2.017809897	2.017809897	2.017809897	2.017809897	2.017809897
				34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619
				10.19244433	3.126187352	6.514404332	#DIV/0!	6.615867531	6.615867531	2.910764951	0.892120355	1.860045229	#DIV/0!	1.889030609	1.889030609
				6.615844239	6.615844239	6.615844239	6.615844239	6.615844239	6.615844239	1.889126875	1.889126875	1.889126875	1.889126875	1.889126875	1.889126875
				34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619
				10.19245691	6.253115724	6.514412373	#DIV/0!	7.660603435	7.660603435	2.910712952	1.785367806	1.860011994	#DIV/0!	2.187442517	2.187442517
				7.660604645	7.660604645	7.660604645	7.660604645	7.660604645	7.660604645	2.187437516	2.187437516	2.187437516	2.187437516	2.187437516	2.187437516
				34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	34.41466523	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619	9.826529619
AJ	SAN,C	15	Die Exhaust Control	720.7094934	720.7094934	720.7094934				144.2438166	144.2438166	144.2438166			
				720.7094424	720.7094424	720.7094424				144.2440274	144.2440274	144.2440274			
AJ	SAN,C	16	Pelletizing	6008.051646	6008.051646	6008.051646				1275.999148	1275.999148	1275.999148			
				6008.051575	6008.051575	6008.051575				1275.999443	1275.999443	1275.999443			
AJ	SAN,C	17	Finishing	5540.731887	5540.731887	5540.731887				1406.877158	1406.877158	1406.877158			
				5540.731755	5540.731755	5540.731755				1406.877705	1406.877705	1406.877705			
				5540.731737	5540.731737	5540.731737				1406.877781	1406.877781	1406.877781			
AJ	SAN,C	18	Initiator Mixing	#DIV/0!	847.0335515	#DIV/0!				#DIV/0!	649.4177274	#DIV/0!			
				#DIV/0!	846.8975488	#DIV/0!				#DIV/0!	649.97962	#DIV/0!			
AJ	SAN,C	19	Devolatilization-Vac	335.1479577	335.1479577	335.1479577				258.0589755	258.0589755	258.0589755			
				332.5711976	332.5711976	332.5711976				268.7086005	268.7086005	268.7086005			
				335.0735074	335.0735074	335.0735074				258.366675	258.366675	258.366675			
				14.38034101	24.53451194	32.86689105				11.61838751	19.82270235	26.39346022			
				23.43417605	23.43417605	23.43417605				18.93365861	18.93365861	18.93365861			
				23.4266276	23.4266276	23.4266276				18.96485598	18.96485598	18.96485598			
				497.9491446	497.9491446	497.9491446				382.5163444	382.5163444	382.5163444			
				495.7926193	495.7926193	495.7926193				391.429159	391.429159	391.429159			
				497.7376622	497.7376622	497.7376622				383.3903909	383.3903909	383.3903909			
				21.43636118	36.57605014	48.69968153				16.92506949	28.87631969	38.44796252			
				35.69517291	35.69517291	35.69517291				28.18066451	28.18066451	28.18066451			
				35.63878501	35.63878501	35.63878501				28.41391299	28.41391299	28.41391299			
AX	ASA/AMSAN	20	201 mix tank	207.2412809	#DIV/0!	207.2412809				1673.192726	#DIV/0!	1673.192726			
AX	ASA/AMSAN	21	201 asa reactor	3597.325976	#DIV/0!	3597.325976				13437.8907	#DIV/0!	13437.8907			
AX	ASA/AMSAN	22	210 amsan reactor	250.2610371	#DIV/0!	250.2610371				1009.204979	#DIV/0!	1009.204979			
AX	ASA/AMSAN	23	301 water recovery	648.1627364	#DIV/0!	648.1627364				2960.35334	#DIV/0!	2960.35334			
AX	ASA/AMSAN	24	302 Water Suspensi	1954.949795	#DIV/0!	1954.949795				5644.144767	#DIV/0!	5644.144767			
AX	ASA/AMSAN	25	306 Water Recover	117999.1804	#DIV/0!	#DIV/0!				328924.7775	#DIV/0!	#DIV/0!			
AX	ASA/AMSAN	26	403 Water Recovery			9904683.82						134791569.3			

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility ID	Subcategory	Stream ID	Stream Name	TI 70% TRE BASED ON DIFFERENT HRS/YR						TOTAL HAP FLOW RATE (LBS/HR) BASED ON COMPONENT					
				AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN	EB	STY	MA	MEK	MMA
				9.486088825	9.486088825	9.486088825	9.486088825	9.486088825	9.486088825	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
				2.843948408	1.763365349	1.347638519	0.104268475	1.514487616	1.514487616	2.196570499	3.580204897	4.725348486	108.960467	4.187760331	4.187760331
				1.514530537	1.514530537	1.514530537	1.514530537	1.514530537	1.514530537	4.187760331	4.187760331	4.187760331	4.187760331	4.187760331	4.187760331
				9.486088825	9.486088825	9.486088825	9.486088825	9.486088825	9.486088825	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
				2.843844641	0.905600643	1.83497414	0.104264383	1.424530772	1.424530772	2.196570499	7.160409795	3.436617081	108.960467	4.46124672	4.46124672
				1.424646864	1.424646864	1.424646864	1.424646864	1.424646864	1.424646864	4.46124672	4.46124672	4.46124672	4.46124672	4.46124672	4.46124672
				9.486088825	9.486088825	9.486088825	9.486088825	9.486088825	9.486088825	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
				2.84362057	1.763286917	1.634958755	0.104263898	1.638035323	1.638035323	2.196570499	3.580204897	3.436617081	108.960467	3.862210058	3.862210058
				1.638120568	1.638120568	1.638120568	1.638120568	1.638120568	1.638120568	3.862210058	3.862210058	3.862210058	3.862210058	3.862210058	3.862210058
				9.486088825	9.486088825	9.486088825	9.486088825	9.486088825	9.486088825	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
				2.843950033	0.905633173	1.347639275	#DIV/0!	1.699919196	1.699919196	2.196570499	7.160409795	4.725348486	#DIV/0!	3.7177056	3.7177056
				1.699915613	1.699915613	1.699915613	1.699915613	1.699915613	1.699915613	3.7177056	3.7177056	3.7177056	3.7177056	3.7177056	3.7177056
				9.486088825	9.486088825	9.486088825	9.486088825	9.486088825	9.486088825	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
				2.843926966	1.763352194	1.347628552	#DIV/0!	1.986477961	1.986477961	2.196570499	3.580204897	4.725348486	#DIV/0!	3.168131729	3.168131729
				1.986419823	1.986419823	1.986419823	1.986419823	1.986419823	1.986419823	3.168131729	3.168131729	3.168131729	3.168131729	3.168131729	3.168131729
				9.486088825	9.486088825	9.486088825	9.486088825	9.486088825	9.486088825	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
				2.843822029	0.905593906	1.834959687	#DIV/0!	1.86279038	1.86279038	2.196570499	7.160409795	3.436617081	#DIV/0!	3.383917791	3.383917791
				1.862829772	1.862829772	1.862829772	1.862829772	1.862829772	1.862829772	3.383917791	3.383917791	3.383917791	3.383917791	3.383917791	3.383917791
				9.486088825	9.486088825	9.486088825	9.486088825	9.486088825	9.486088825	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
				2.843800752	1.763274758	1.834946088	#DIV/0!	2.149336027	2.149336027	2.196570499	3.580204897	3.436617081	#DIV/0!	2.922474456	2.922474456
				2.149333981	2.149333981	2.149333981	2.149333981	2.149333981	2.149333981	2.922474456	2.922474456	2.922474456	2.922474456	2.922474456	2.922474456
				9.486088825	9.486088825	9.486088825	9.486088825	9.486088825	9.486088825	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
AJ	SAN,C	15	Die Exhaust Control	67.44499984	67.44499984	67.44499984				0.122817203	0.122817203	0.122817203	0	0	0
				67.44508607	67.44508607	67.44508607				0.122817203	0.122817203	0.122817203	0	0	0
AJ	SAN,C	16	Pelletizing	717.5133672	717.5133672	717.5133672				0.01035121	0.01035121	0.01035121	0	0	0
				717.5134881	717.5134881	717.5134881				0.01035121	0.01035121	0.01035121	0	0	0
AJ	SAN,C	17	Finishing	1148.752982	1148.752982	1148.752982				0.005586222	0.005586222	0.005586222	0	0	0
				1148.753206	1148.753206	1148.753206				0.005586222	0.005586222	0.005586222	0	0	0
				1148.753237	1148.753237	1148.753237				0.005586222	0.005586222	0.005586222	0	0	0
AJ	SAN,C	18	Initiator Mixing	#DIV/0!	1094.89933	#DIV/0!				#DIV/0!	0.005074124	#DIV/0!	0	0	0
				#DIV/0!	1095.129333	#DIV/0!				#DIV/0!	0.005074124	#DIV/0!	0	0	0
AJ	SAN,C	19	Devolatilization-Vac	434.675561	434.675561	434.675561				0.01278733	0.01278733	0.01278733	0	0	0
				439.0332924	439.0332924	439.0332924				0.01278733	0.01278733	0.01278733	0	0	0
				434.8014689	434.8014689	434.8014689				0.01278733	0.01278733	0.01278733	0	0	0
				19.03050485	32.4337187	43.16822544				0.295716532	0.173330529	0.130181093	0	0	0
				30.98130694	30.98130694	30.98130694				0.181468692	0.181468692	0.181468692	0	0	0
				30.99407262	30.99407262	30.99407262				0.181468692	0.181468692	0.181468692	0	0	0
				645.2525443	645.2525443	645.2525443				0.008609768	0.008609768	0.008609768	0	0	0
				648.8995884	648.8995884	648.8995884				0.008609768	0.008609768	0.008609768	0	0	0
				645.6101963	645.6101963	645.6101963				0.008609768	0.008609768	0.008609768	0	0	0
				28.10554251	47.91644758	63.78281339				0.199108621	0.116704239	0.087651526	0	0	0
				46.76363124	46.76363124	46.76363124				0.11958418	0.11958418	0.11958418	0	0	0
				46.85899259	46.85899259	46.85899259				0.11958418	0.11958418	0.11958418	0	0	0
										0	0	0	0	0	0
AX	ASA/AMSAN	20	201 mix tank	1193.481895	#DIV/0!	1193.481895				0.008271218	#DIV/0!	0.008271218	0	0	0
										0	0	0	0	0	0
AX	ASA/AMSAN	21	201 asa reactor	11191.52651	#DIV/0!	11191.52651				0.000739215	#DIV/0!	0.000739215	0	0	0
										0	0	0	0	0	0
AX	ASA/AMSAN	22	210 amsan reactor	823.9993065	#DIV/0!	823.9993065				0.010239128	#DIV/0!	0.010239128	0	0	0
										0	0	0	0	0	0
AX	ASA/AMSAN	23	301 water recovery	2357.760469	#DIV/0!	2357.760469				0.003697324	#DIV/0!	0.003697324	0	0	0
										0	0	0	0	0	0
AX	ASA/AMSAN	24	302 Water Suspensi	5069.733919	#DIV/0!	5069.733919				0.001524631	#DIV/0!	0.001524631	0	0	0
										0	0	0	0	0	0
AX	ASA/AMSAN	25	308 Water Recover	296830.2412	#DIV/0!	#DIV/0!				2.56226E-05	#DIV/0!	#DIV/0!	0	0	0
										0	0	0	0	0	0
AX	ASA/AMSAN	26	403 Water Recovery			90497855.97				0	0	1.1907E-07	0	0	0

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility ID	Subcategory	Stream ID	Stream Name	AN PPMV	EB PPMV	STY PPMV	MA PPMV	MEK ppmv	MMA ppmv	Flow Rate (scfm)	Emissions (lbs/yr) AN	EB	STY	MA	MEK	MMA	F AN
AX	ASA/AMSAN	27	304 Recovered Scru	470000		520000				2.0011E-06	0.088		0.097				8400
AX	ASA/AMSAN	28	404 Dewatering & separation			1000000				1.0849E-06			0.145				
AX	ASA/AMSAN	29	Extruder MeOH & st	880000		120000				1992.45263	102		60				8400
				880000		120000				1992.45263	102		60				0.011667193
				1.222201122		0.221162964				1992.45263	102		60				8400
				880000		120000				0.00267599	102		60				8062.90642
				846760.6333		153219.3203				0.00267599	102		60				8400
				33979.12		4796.11				1992.45263	102		60				0.302159982
AX	ASA/AMSAN	30	Dryer MeOH & Sty	700000		120000				1992.45263	3130		1384				8400
				700000		120000				1992.45263	3130		1384				0.450085683
				700000		120000				0.10353133	3130		1384				8661.865857
				700000		120000				0.10353133	3130		1384				8400
				37.50714026		5.101492369				1992.45263	3130		1384				8400
				2.85E+04		5052.43				1992.45263	3130		1384				11.03809837
				2.85E+04		5052.43				2.65335454	3130		1384				8288.711525
AW	SAN,C	31	Line 1&2 Exhaust	864400		135600				355.67762	340643		53437				8000
				864400		135600				355.67698	340643		53437				8000
				14498.26174		1103.406431				355.67698	340643		53437				8000
				864400		135600				5.30359717	340643		53437				8000
				864400		135600				355.67698	340643		53437				134.1810434
AW	SAN,C	32	Line 3 Exhaust	931600		38000			30300	562.201277	392000		16000			12760	8000
				10555.19993		209.014952			6.092796131	562.201277	392000		16000			12760	8000
				931600		38000			30300	5.94995558	392000		16000			12760	8000
				931600		38000			30300	562.201277	392000		16000			12760	90.64147642
AW	SAN,C	33	Line 3 Cyclone Dust	5.5329		1.1274			3.819934878	1094.40392	400		160			80	8000
				5.532922339		1.073721232			3.819934878	1094.40392	400		160			80	8000
AW	SAN,C	34	Die Head	1.0025		6.0723				1945.48624	128		1512				8000
				78000		922000				1945.48624	128		1512				8000

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	quency (HRS/YR) BASED ON EACH COMPOUND					Btu Content	Qs	EHAP (KG/HR) BASED ON COMPONENT					
ID		ID	Name	EB	STY	MA	MEK	MMA	BTU/SCF	m^3/min	AN	EB	STY	MA	MEK	MMA
									0							
AX	ASA/AMSAN	27	304 Recovered Scru		8400				3469.894836	5.66719E-08	0.00000999		0.00000999			
									0							
AX	ASA/AMSAN	28	404 Dewatering & se		8400				4892.275874	3.01585E-08			0.00000783			
									0							
AX	ASA/AMSAN	29	Extruder MeOH & st		8400				1203.441633	56.42626415	0.008748		0.008748			
					0.015481407				1203.441633	56.42626415	6298.27559		4746.545178			
					8400				0.001938043	56.42626415	0.008748		0.008748			
					10725.35292				1203.441633	8.14479E-05	0.00909119		0.008851355			
					8400				1366.917295	8.1448E-05	0.008748		0.008748			
					0.387349101				48.4928565	56.42626415	243.193025		189.7079399			
									0							
AX	ASA/AMSAN	30	Dryer MeOH & Sty		8400				1099.917335	56.42626415	0.243756		0.243756			
					0.357104468				1099.917335	56.42626415	4549.24579		5733.757475			
					6872.44917				1099.917335	0.002932007	0.23638676		0.297936056			
					8400				1099.917335	0.002932007	0.243756		0.243756			
					8400				0.052610819	56.42626415	0.243756		0.243756			
					8.481569442				45.60858051	56.42626415	185.498474		241.4117358			
					6368.966829				45.60858051	0.075143001	0.24702879		0.321488627			
									0							
AW	SAN,C	31	Line 1&2 Exhaust		8000				0.049754369	10.07845986	22.344336		22.344336			
					8000				2366.28154	10.07277207	22.344336		22.344336			
					8000				33.96009536	10.07277207	22.344336		22.344336			
					8000				2366.28154	0.150197872	22.344336		22.344336			
					68.35261075				0.049754369	10.07277207	1332.19033		2615.184498			
									0							
AW	SAN,C	32	Line 3 Exhaust		8000			8000	2110.982741	15.92154016	23.1336		23.1336			23.857092
					8000			8000	21.83461581	15.92154016	23.857092		23.857092			23.857092
					8000			8000	2110.982741	0.168502742	23.1336		23.1336			23.857092
					46.20330519			46.2109	2110.982741	15.92154016	2041.76727		4005.531623			4130.121122
									0							
AW	SAN,C	33	Line 3 Cyclone Dust		8000			8000	0.02773684	30.99351911	0.031752		0.031752			0.036288
					8000			8000	0.027474273	30.99351911	0.031752		0.031752			0.036288
									0							
AW	SAN,C	34	Die Head		8000				0.031682316	55.09617028	0.092988		0.092988			
					8000				4664.340244	55.09617028	0.092988		0.092988			

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	FLARE TRE BASED ON DIFFERENT HRS/YR						TI 0% BASED ON DIFFERENT HRS/YR					
ID		ID	Name	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR
AX	ASA/AMSAN	27	304 Recovered Scru	94287.40227		94287.40227				560190.7589		560190.7589			
AX	ASA/AMSAN	28	404 Dewatering & se			68306.02701						929597.0289			
AX	ASA/AMSAN	29	Extruder MeOH & st	2542.591048		2542.591048				737.5050484		737.5050484			
				0.002796237		0.003952759				-0.00013464		0.000200242			
				2581.962244		2581.962244				574.7857942		574.7857942			
				174.9610542		232.159188				320.6913951		425.5315199			
				176.4112023		176.4112023				355.6464732		355.6464732			
				0.092086526		0.118255574				0.019752755		0.025648486			
AX	ASA/AMSAN	30	Dryer MeOH & Sty	91.37023236		91.37023236				25.96436537		25.96436537			
				0.004162505		0.003151102				0.000232275		-5.51423E-05			
				6.85786379		5.44097645				11.81507868		9.374014225			
				6.650514423		6.650514423				11.45784974		11.45784974			
				92.66159141		92.66159141				20.62724073		20.62724073			
				0.120960206		0.092774829				0.026238429		0.019692923			
				7.890854315		6.063087307				6.27607097		4.8222046			
AW	SAN,C	31	Line 1&2 Exhaust	0.250950262		0.250950262				0.093884143		0.093884143			
				0.220549402		0.220549402				0.219128424		0.219128424			
				0.250422758		0.250422758				0.095663286		0.095663286			
				0.058017736		0.058017736				0.191298207		0.191298207			
				0.003486533		0.001416308				0.000434856		-0.00034706			
AW	SAN,C	32	Line 3 Exhaust	0.308692366		0.308692366			0.2993087	0.214403762		0.214403762			0.207866569
				0.324370645		0.324370645			0.324370645	0.104286778		0.104286778			0.104286778
				0.059461304		0.059461304			0.057635838	0.17172805		0.17172805			0.166485064
				0.00277255		0.001053761			0.000999852	0.001283366		8.5964E-05			4.84083E-05
AW	SAN,C	33	Line 3 Cyclone Dust	418.1971773		418.1971773			365.9224385	106.1620006		106.1620006			94.64160585
				418.1971797		418.1971797			365.9224406	106.161991		106.161991			94.64159729
AW	SAN,C	34	Die Head	237.666377		237.666377				53.17682597		53.17682597			
				223.3107086		223.3107086				112.5081106		112.5081106			

Process Vent Raw Data For SAN and ASA/AMSAN - Application of HON Existing TRE Criteria

Facility	Subcategory	Stream	Stream	TI 70% TRE BASED ON DIFFERENT HRS/YR						TOTAL HAP FLOW RATE (LBS/HR) BASED ON COMPONENT					
ID		ID	Name	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN	EB	STY	MA	MEK	MMA
										0	0	0	0	0	0
AX	ASA/AMSAN	27	304 Recovered Scru	420264.8326		420264.8326				2.2028E-05	0	2.2028E-05	0	0	0
										0	0	0	0	0	0
AX	ASA/AMSAN	28	404 Dewatering & se			624123.1923				0	0	1.72652E-05	0	0	0
										0	0	0	0	0	0
AX	ASA/AMSAN	29	Extruder MeOH & st	430.8885537		430.8885537				0.01928934	0	0.01928934	0	0	0
				0.048496417		0.04869405				13887.69767	0	10466.13212	0	0	0
				364.3052895		364.3052895				0.01928934	0	0.01928934	0	0	0
				341.1994876		452.7280359				0.020046084	0	0.015107238	0	0	0
				363.7382618		363.7382618				0.01928934	0	0.01928934	0	0	0
				0.061099365		0.064820712				536.2406201	0	418.3060075	0	0	0
										0	0	0	0	0	0
AX	ASA/AMSAN	30	Dryer MeOH & Sty	15.30450003		15.30450003				0.53748198	0	0.53748198	0	0	0
				0.048717473		0.048548595				10031.08697	0	12642.93523	0	0	0
				12.95640548		10.28969423				0.521232804	0	0.656949003	0	0	0
				12.56615505		12.56615505				0.53748198	0	0.53748198	0	0	0
				13.12059634		13.12059634				0.53748198	0	0.53748198	0	0	0
				0.065197164		0.061190976				409.0241344	0	532.3128771	0	0	0
				10.33805152		7.954754223				0.544698488	0	0.708882422	0	0	0
										0	0	0	0	0	0
AW	SAN,C	31	Line 1&2 Exhaust	0.165972529		0.165972529				49.26926088	0	49.26926088	0	0	0
				0.217224886		0.217224886				49.26926088	0	49.26926088	0	0	0
				0.166704056		0.166704056				49.26926088	0	49.26926088	0	0	0
				0.211971471		0.211971471				49.26926088	0	49.26926088	0	0	0
				0.049860336		0.048906795				2937.47967	0	5766.481817	0	0	0
										0	0	0	0	0	0
AW	SAN,C	32	Line 3 Exhaust	0.209097447		0.209097447			0.204208961	51.009588	0	51.009588	0	0	52.60488786
				0.161825028		0.161825028			0.161825028	52.60488786	0	52.60488786	0	0	52.60488786
				0.2010417		0.2010417			0.196397513	51.009588	0	51.009588	0	0	52.60488786
				0.049726397		0.048830982			0.048802898	4502.096834	0	8832.197226	0	0	9108.917075
										0	0	0	0	0	0
AW	SAN,C	33	Line 3 Cyclone Dust	90.9293171		90.9293171			79.56913997	0.07001316	0	0.07001316	0	0	0.06001504
				90.9293131		90.9293131			79.56913646	0.07001316	0	0.07001316	0	0	0.06001504
										0	0	0	0	0	0
AW	SAN,C	34	Die Head	34.1469561		34.1469561				0.20503854	0	0.20503854	0	0	0
				58.42478747		58.42478747				0.20503854	0	0.20503854	0	0	0

NEW SOURCE TRE COEFFICIENTS

Application of HON TRE to SAN Emission Streams

7/21/94

Stream ID	Emissions (lbs/yr)						Frequency (HRS/YR) BASED ON EACH COMPOUND					
	AN	EB	STY	MA	MEK	MMA	AN	EB	STY	MA	MEK	MMA
Product Drying-Rotary Dryer	3060	4	2040				4641.367736	3765.569737	3914.999518			
	3060	4	2040				4000	4000	4000			
	3060	4	2040				8400	8400	8400			
Product Transfer Slurry Tank	154		154				122.9136245		109.5077058			
	154		154				115		115			
	154		154				8400		8400			
Product Transfer-Slurry Tank	154		154				122.9136245		109.5077058			
	154		154				115		115			
	154		154				8400		8400			
Reactor Charge Purge	6160	28	220				388.950488	412.32897	990.6798221			
	6160	28	220				2664.310843	2624.463445	6786.114311			
	6160	28	220				400	400	400			
	6160	28	220				400	400	400			
	6160	28	220				8400	8400	8400			
	6160	28	220				8400	8400	8400			
Vapor Recovery-Distillate Receiver	8		6				2736.837024		2240.627682			
	8		6				2400		2400			
	8		6				8400		8400			
Feedstock Premixing Tank	1800	20	200				252.2437734	758.92166	462.4583829			
	1800	20	200				450	450	450			
	1800	20	200				8400	8400	8400			
	1800	20	200				325.4053873	758.92166	462.4583829			
	1800	20	200				450	450	450			
	1800	20	200				8400	8400	8400			
	1800	20	200				365.7534714		670.5646553			
	1800	20	200				500	500	500			
	1800	20	200				8400	8400	8400			
	1800	20	200				471.6378116	1100.436407	670.5646553			
	1800	20	200				750	750	750			
	1800	20	200				8400	8400	8400			
	1800	20	200				252.2437734		462.4583829			
	1800	20	200				360	360	360			
	1800	20	200				8400	8400	8400			
	1800	20	200				325.4053873		462.4583829			
	1800	20	200				395	395	395			
	1800	20	200				8400	8400	8400			
	1800	20	200				365.7534714		670.5646553			
	1800	20	200				620	620	620			
	1800	20	200				8400	8400	8400			
	1800	20	200				471.6378116		670.5646553			
	1800	20	200				570	570	570			
	1800	20	200				8400	8400	8400			
Feedstock Recovery Tank	19400	100	1500				2352.260456	2166.2134	1886.219373			
	19400	100	1500				2100	2100	2100			
	19400	100	1500				8400	8400	8400			
	19400	100	1500				2352.260456	3438.863772	1886.219373			
	19400	100	1500				2560	2560	2560			
	19400	100	1500				8400	8400	8400			
	19400	100	1500				2352.260456	2166.2134	4977.833374			
	19400	100	1500				3165	3165	3165			
	19400	100	1500				8400	8400	8400			
	19400	100	1500				2352.260456	3438.863772	4977.833374			
	19400	100	1500				3590	3590	3590			
	19400	100	1500				8400	8400	8400			
	19400	100	1500				10170.72616	2166.2134	1886.219373			
	19400	100	1500				4740	4740	4740			
	19400	100	1500				8400	8400	8400			
	19400	100	1500				10170.72616	3438.863772	1886.219373			
	19400	100	1500				5165	5165	5165			

Application of HON TRE to SAN Emission Streams

Stream ID	FLARE TRE BASED ON DIFFERENT HRS/YR						TI 0% BASED ON DIFFERENT HRS/YR					
	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR
Product Drying-Rotary Dryer	91.8	74.5	77.4				16.4	13.3	13.8			
	79.1	79.1	79.1				14.1	14.1	14.1			
	166.1	166.1	166.1				29.6	29.6	29.6			
Product Transfer Slurry Tank	1.4	#DIV/0!	1.2				0.5	#DIV/0!	0.5			
	1.3	#DIV/0!	1.3				0.5	#DIV/0!	0.5			
	93.4	#DIV/0!	93.4				35.0	#DIV/0!	35.0			
Product Transfer-Slurry Tank	1.4	#DIV/0!	1.2				0.5	#DIV/0!	0.5			
	1.3	#DIV/0!	1.3				0.5	#DIV/0!	0.5			
	93.4	#DIV/0!	93.4				35.0	#DIV/0!	35.0			
Reactor Charge Purge	0.1	0.1	0.3				0.1	0.1	0.2			
	0.5	0.6	1.4				0.4	0.4	1.0			
	0.1	0.1	0.1				0.1	0.1	0.1			
	0.1	0.1	0.1				0.1	0.1	0.1			
	2.6	2.6	2.6				1.4	1.4	1.4			
	1.7	1.7	1.7				1.2	1.2	1.2			
Vapor Recovery-Distillate Receiver	241.7	#DIV/0!	197.9				177.8	#DIV/0!	145.6			
	212.0	#DIV/0!	212.0				155.9	#DIV/0!	155.9			
	742.0	#DIV/0!	742.0				545.7	#DIV/0!	545.7			
Feedstock Premixing Tank	0.2	0.5	0.3				0.1	0.4	0.2			
	0.3	0.3	0.3				0.2	0.2	0.2			
	5.6	5.6	5.6				3.9	3.9	3.9			
	0.2	0.5	0.3				0.2	0.4	0.2			
	0.3	0.3	0.3				0.2	0.2	0.2			
	5.6	5.6	5.6				3.9	3.9	3.9			
	0.2	#DIV/0!	0.4				0.2	#DIV/0!	0.3			
	0.3	0.3	0.3				0.2	0.2	0.2			
	5.4	5.4	5.4				3.8	3.8	3.8			
	0.3	0.7	0.4				0.2	0.5	0.3			
	0.5	0.5	0.5				0.3	0.3	0.3			
	5.4	5.4	5.4				3.8	3.8	3.8			
	0.2	#DIV/0!	0.3				0.1	#DIV/0!	0.2			
	0.2	0.2	0.2				0.2	0.2	0.2			
	5.6	5.6	5.6				3.9	3.9	3.9			
	0.2	#DIV/0!	0.3				0.2	#DIV/0!	0.2			
	0.3	0.3	0.3				0.2	0.2	0.2			
	5.6	5.6	5.6				3.9	3.9	3.9			
	0.2	#DIV/0!	0.4				0.2	#DIV/0!	0.3			
	0.3	0.3	0.3				0.2	0.2	0.2			
	5.4	5.4	5.4				3.8	3.8	3.8			
	0.3	#DIV/0!	0.4				0.2	#DIV/0!	0.3			
	0.4	0.4	0.4				0.3	0.3	0.3			
	5.4	5.4	5.4				3.8	3.8	3.8			
Feedstock Recovery Tank	0.1	0.1	0.1				0.1	0.1	0.1			
	0.1	0.1	0.1				0.1	0.1	0.1			
	0.5	0.5	0.5				0.4	0.4	0.4			
	0.1	0.2	0.1				0.1	0.2	0.1			
	0.2	0.2	0.2				0.1	0.1	0.1			
	0.5	0.5	0.5				0.4	0.4	0.4			
	0.1	0.1	0.3				0.1	0.1	0.2			
	0.2	0.2	0.2				0.1	0.1	0.1			
	0.5	0.5	0.5				0.4	0.4	0.4			
	0.1	0.2	0.3				0.1	0.2	0.2			
	0.2	0.2	0.2				0.2	0.2	0.2			
	0.5	0.5	0.5				0.4	0.4	0.4			
	0.6	0.1	0.1				0.5	0.1	0.1			
	0.3	0.3	0.3				0.2	0.2	0.2			
	0.5	0.5	0.5				0.4	0.4	0.4			
	0.6	0.2	0.1				0.5	0.2	0.1			
	0.3	0.3	0.3				0.2	0.2	0.2			

Application of HON TRE to SAN Emission Streams

7/21/94

Stream ID	TI 70% TRE BASED ON DIFFERENT HRS/YR						TOTAL HAP FLOW RATE (LBS/HR) BASED ON COMPONENT					
	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN	EB	STY	MA	MEK	MMA
Product Drying-Rotary Dryer	4.3	3.5	3.6				1.104192472	1.361006061	1.309058478	0	0	0
	3.7	3.7	3.7				1.261240626	1.261240626	1.261240626	0	0	0
	7.8	7.8	7.8				0.61011466	0.61011466	0.61011466	0	0	0
Product Transfer Slurry Tank	0.6	#DIV/0!	0.6				2.506295625	0	2.813116224	0	0	0
	0.6	#DIV/0!	0.6				2.676764363	0	2.676764363	0	0	0
	43.3	#DIV/0!	43.3				0.03667356	0	0.03667356	0	0	0
Product Transfer-Slurry Tank	0.6	#DIV/0!	0.6				2.506295625	0	2.813116224	0	0	0
	0.6	#DIV/0!	0.6				2.676764363	0	2.676764363	0	0	0
	43.3	#DIV/0!	43.3				0.03667356	0	0.03667356	0	0	0
Reactor Charge Purge	0.1	0.1	0.3				16.47620196	15.54391074	6.466542066	0	0	0
	0.6	0.7	1.6				2.405576932	2.269184049	0.944466701	0	0	0
	0.1	0.1	0.1				16.02301176	16.02301176	16.02301176	0	0	0
	0.1	0.1	0.1				16.02301176	16.02301176	16.02301176	0	0	0
	2.0	2.0	2.0				0.76300056	0.76300056	0.76300056	0	0	0
	2.0	2.0	2.0				0.76300056	0.76300056	0.76300056	0	0	0
Vapor Recovery-Distillate Receiver	296.5	#DIV/0!	242.7				0.005116356	0	0.006249424	0	0	0
	280.0	#DIV/0!	280.0				0.00583443	0	0.00583443	0	0	0
	909.9	#DIV/0!	909.9				0.00166666	0	0.00166666	0	0	0
Feedstock Premixing Tank	0.2	0.6	0.4				6.009631644	2.662171692	4.366761786	0	0	0
	0.4	0.4	0.4				4.4697326	4.4697326	4.4697326	0	0	0
	6.3	6.3	6.3				0.2405214	0.2405214	0.2405214	0	0	0
	0.3	0.6	0.4				6.206606577	2.662171692	4.366761786	0	0	0
	0.4	0.4	0.4				4.4697326	4.4697326	4.4697326	0	0	0
	6.3	6.3	6.3				0.2405214	0.2405214	0.2405214	0	0	0
	0.3	#DIV/0!	0.5				5.623664031	0	3.012952956	0	0	0
	0.4	0.4	0.4				4.04075952	4.04075952	4.04075952	0	0	0
	6.3	6.3	6.3				0.2405214	0.2405214	0.2405214	0	0	0
	0.4	0.8	0.5				4.28193695	1.635960477	3.012952956	0	0	0
	0.6	0.6	0.6				2.69363966	2.69363966	2.69363966	0	0	0
	6.3	6.3	6.3				0.2405214	0.2405214	0.2405214	0	0	0
	0.2	#DIV/0!	0.4				6.009631644	0	4.366761786	0	0	0
	0.3	0.3	0.3				5.612166	5.612166	5.612166	0	0	0
	6.3	6.3	6.3				0.2405214	0.2405214	0.2405214	0	0	0
	0.3	#DIV/0!	0.4				6.206606577	0	4.366761786	0	0	0
	0.3	0.3	0.3				5.114665466	5.114665466	5.114665466	0	0	0
	6.3	6.3	6.3				0.2405214	0.2405214	0.2405214	0	0	0
	0.3	#DIV/0!	0.5				5.623664031	0	3.012952956	0	0	0
	0.4	0.4	0.4				3.865346692	3.865346692	3.865346692	0	0	0
	6.3	6.3	6.3				0.2405214	0.2405214	0.2405214	0	0	0
	0.4	#DIV/0!	0.5				4.28193695	0	3.012952956	0	0	0
	0.4	0.4	0.4				3.544525695	3.544525695	3.544525695	0	0	0
	6.3	6.3	6.3				0.2405214	0.2405214	0.2405214	0	0	0
Feedstock Recovery Tank	0.2	0.2	0.2				6.929261191	9.696156264	11.13547464	0	0	0
	0.2	0.2	0.2				10.00188	10.00188	10.00188	0	0	0
	0.6	0.6	0.6				2.50047	2.50047	2.50047	0	0	0
	0.2	0.3	0.2				6.929261191	6.107816242	11.13547464	0	0	0
	0.2	0.2	0.2				6.204667166	6.204667166	6.204667166	0	0	0
	0.6	0.6	0.6				2.50047	2.50047	2.50047	0	0	0
	0.2	0.2	0.4				6.929261191	9.696156264	4.219466996	0	0	0
	0.2	0.2	0.2				6.636316463	6.636316463	6.636316463	0	0	0
	0.6	0.6	0.6				2.50047	2.50047	2.50047	0	0	0
	0.2	0.3	0.4				6.929261191	6.107816242	4.219466996	0	0	0
	0.3	0.3	0.3				5.850661894	5.850661894	5.850661894	0	0	0
	0.6	0.6	0.6				2.50047	2.50047	2.50047	0	0	0
	0.8	0.2	0.2				2.0661375	9.696156264	11.13547464	0	0	0
	0.4	0.4	0.4				4.431212658	4.431212658	4.431212658	0	0	0
	0.6	0.6	0.6				2.50047	2.50047	2.50047	0	0	0
	0.8	0.3	0.2				2.0661375	6.107816242	11.13547464	0	0	0
	0.4	0.4	0.4				4.066592062	4.066592062	4.066592062	0	0	0

Application of HON TRE to SAN Emission Streams

Stream ID	Total Capital Cost ($) Based AN	Total Annual Cost ($/yr) Based AN	Cost Effectiveness ($/Mg removed) Based AN	Control Device Based AN	% Heat Recovery Based AN	Total Capital Cost ($) Based EB	Total Annual Cost ($/yr) Based EB	Cost Effectiveness ($/Mg removed) Based EB	Control Device Based EB	% Heat Recovery Based EB	Total Capital Cost ($) Based Sty	Total Annual Cost ($/yr) Based Sty
Product Drying-Rotary Dryer												
Product Transfer Slurry Tank	71365	15809	115226	Thermal Incin	0						71365	15656
	71365	15722	114592	Thermal Incin	0						71365	15722
Product Transfer-Slurry Tank	71365	15809	115226	Thermal Incin	0						71365	15656
	71365	15722	114592	Thermal Incin	0						71365	15722
Reactor Charge Purge	54264	16571	5623	Flare		54264	17001	5978	Flare		71365	22601
	36899	28492	10011	Flare		36899	29823	10483	Flare		36899	62791
	54264	16776	5695	Flare		54264	16776	5695	Flare		54264	16776
	36899	9260	3254	Flare		36899	9260	3254	Flare		36899	9260
Vapor Recovery-Distillate Receiver												
Feedstock Premixing Tank	37166	8591	9580	Flare		37166	13056	14562	Flare		37166	10441
	37166	10435	11637	Flare		37166	10435	11637	Flare		37166	10435
	37166	9271	10350	Flare		37166	13144	14659	Flare		37166	10494
	37166	10435	11637	Flare		37166	10435	11637	Flare		37166	10435
	36899	9283	10362	Flare							36899	11767
	36899	10421	11622	Flare		36899	10421	11622	Flare		36899	10421
	36899	10190	11351	Flare		36899	15333	17090	Flare		36899	11819
	36899	12544	13069	Flare		36899	12544	13069	Flare		36899	12544
	37166	8591	9581	Flare							37166	10442
	37166	9592	10607	Flare		37166	9592	10607	Flare		37166	9592
	37166	9272	10351	Flare							37166	10495
	37166	9920	11063	Flare		37166	9920	11063	Flare		37166	9920
	36899	9294	10363	Flare							36899	11760
	36899	10591	11811	Flare		36899	10591	11811	Flare		36899	10591
	36899	10191	11352	Flare							36899	11812
	36899	11015	12284	Flare		36899	11015	12284	Flare		36899	11015
Feedstock Recovery Tank	36962	25196	2702	Flare		36962	23707	2542	Flare		36962	21461
	36962	23045	2471	Flare		36962	23045	2471	Flare		36962	23045
	36962	77744	8337	Flare		36962	77744	8337	Flare		36962	77744
	36962	25203	2703	Flare		36962	33923	3637	Flare		36962	21485
	36962	27040	2899	Flare		36962	27040	2899	Flare		36962	27040
	36962	77744	8337	Flare		36962	77744	8337	Flare		36962	77744
	36962	25303	2713	Flare		36962	23803	2562	Flare		36962	46481
	36962	32292	3462	Flare		36962	32292	3462	Flare		36962	32292
	36962	77744	8337	Flare		36962	77744	8337	Flare		36962	77744
	36962	25306	2714	Flare		36962	34074	3653	Flare		36962	46488
	36962	35962	3856	Flare		36962	35962	3856	Flare		36962	35962
	36962	77744	8337	Flare		36962	77744	8337	Flare		36962	77744
	36962	92490	9916	Flare		36962	24666	2647	Flare		36962	22313
	36962	45966	4929	Flare		36962	45966	4929	Flare		36962	45966
	36962	77744	8337	Flare		36962	77744	8337	Flare		36962	77744
	36962	92512	9919	Flare		36962	35473	3803	Flare		36962	22316
	36962	49657	5324	Flare		36962	49657	5324	Flare		36962	49657

Application of HON TRE to SAN Emission Streams

Stream ID	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery
	Based Sty	Based Sty	Based Sty	Based MA	Based MA	Based MA	Based MA	Based MA	Based MEX	Based MEX	Based MEX	Based MEX	Based MEX
Product Drying-Rotary Dryer													
Product Transfer Slurry Tank	114949	Thermal Incin	0										
	114592	Thermal Incin	0										
Product Transfer-Slurry Tank	114949	Thermal Incin	0										
	114592	Thermal Incin	0										
Reactor Charge Purge	6009	Thermal Incin	0										
	22064	Flare											
	5696	Flare											
	3254	Flare											
Vapor Recovery-Distillate Receiver													
Feedstock Premixing Tank	11844	Flare											
	11637	Flare											
	11703	Flare											
	11637	Flare											
	13106	Flare											
	11622	Flare											
	13167	Flare											
	13669	Flare											
	11645	Flare											
	10697	Flare											
	11704	Flare											
	11083	Flare											
	13114	Flare											
	11811	Flare											
	13173	Flare											
	12284	Flare											
Feedstock Recovery Tank	2302	Flare											
	2471	Flare											
	6337	Flare											
	2302	Flare											
	2896	Flare											
	6337	Flare											
	4964	Flare											
	3462	Flare											
	6337	Flare											
	4965	Flare											
	3858	Flare											
	6337	Flare											
	2393	Flare											
	4929	Flare											
	6337	Flare											
	2393	Flare											
	5324	Flare											

Application of HON TRE to SAN Emission Streams

Stream ID	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery
	Based MMA	Based MMA	Based MMA	Based MMA	Based MMA
Product Drying-Rotary Dryer					
Product Transfer Slurry Tank					
Product Transfer-Slurry Tank					
Reactor Charge Purge					
Vapor Recovery-Distillate Receiver					
Feedstock Premixing Tank					
Feedstock Recovery Tank					

Application of HON TRE to SAN Emission Streams

Stream ID	Emissions (lbs/yr)						Frequency (HRS/YR) BASED ON EACH COMPOUND					
	AN	EB	STY	MA	MEK	MMA	AN	EB	STY	MA	MEK	MMA
	19400	100	1500				8400	8400	8400			
	19400	100	1500				10170.72616	2166.2134	4977.833374			
	19400	100	1500				5770	5770	5770			
	19400	100	1500				8400	8400	8400			
	19400	100	1500				10170.72616	3436.863772	4977.833374			
	19400	100	1500				6195	6195	6195			
	19400	100	1500				8400	8400	8400			
	19400	100	1500				3044.101767	2603.334966	2440.989776			
	19400	100	1500				2760	2760	2760			
	19400	100	1500				8400	8400	8400			
	19400	100	1500				3044.101767	4450.294293	2440.989776			
	19400	100	1500				3310	3310	.3310			
	19400	100	1500				8400	8400	8400			
	19400	100	1500				3044.101767	2603.334966	6441.902014			
	19400	100	1500				4095	4095	4095			
	19400	100	1500				8400	8400	8400			
	19400	100	1500				3044.101767	4450.294293	6441.902014			
	19400	100	1500				4645	4645	4645			
	19400	100	1500				8400	8400	8400			
	19400	100	1500				13162.11621	2603.334966	2440.989776			
	19400	100	1500				6135	6135	6135			
	19400	100	1500				8400	8400	8400			
	19400	100	1500				13162.11621	4450.294293	2440.989776			
	19400	100	1500				6685	6685	6685			
	19400	100	1500				8400	8400	8400			
	19400	100	1500				13162.11621	2603.334966	6441.902014			
	19400	100	1500				7470	7470	7470			
	19400	100	1500				8400	8400	8400			
	19400	100	1500				13162.11621	4450.294293	6441.902014			
	19400	100	1500				8020	8020	8020			
	19400	100	1500				8400	8400	8400			
Product Drying Rotary Dryer	1420	300	3080				6200.470377	5124.809666	2773.987134			
	1420	300	3080				4365	4365	4365			
	1420	300	3080				8400	8400	8400			
	1420	300	3080				6200.470377		2773.987134			
	1420	300	3080				3985	3985	3985			
	1420	300	3080				8400	8400	8400			
	1420	300	3080				6200.470377	5124.809666	26815.01562			
	1420	300	3080				5160	5160	5160			
	1420	300	3080				8400	8400	8400			
	1420	300	3080				6200.470377		26815.01562			
	1420	300	3080				5200	5200	5200			
	1420	300	3080				8400	8400	8400			
	1420	300	3080				72808.56627	5124.809666	2773.987134			
	1420	300	3080				3950	3950	3950			
	1420	300	3080				8400	8400	8400			
	1420	300	3080				72808.56627		2773.987134			
	1420	300	3080				2775	2775	2775			
	1420	300	3080				8400	8400	8400			
	1420	300	3080				72808.56627	5124.809666	26815.01562			
	1420	300	3080				5125	5125	5125			
	1420	300	3080				8400	8400	8400			
	1420	300	3080				72808.56627		26815.01562			
	1420	300	3080				8760	8760	8760			
	1420	300	3080				8400	8400	8400			
Product Storage-Hold Tank Before Dr	300	280	1180				185.8665045	214.7301617	174.866484			
	300	280	1180				190	190	190			
	300	280	1180				8400	8400	8400			
	300	280	1180				185.8665045	471.2134542	174.866484			
	300	280	1180				275	275	275			

Stream ID	FLARE TRE BASED ON DIFFERENT HRS/YR						TI 0% BASED ON DIFFERENT HRS/YR					
	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR
	0.5	0.5	0.5				0.4	0.4	0.4			
	0.6	0.1	0.3				0.6	0.1	0.2			
	0.4	0.4	0.4				0.3	0.3	0.3			
	0.5	0.5	0.5				0.4	0.4	0.4			
	0.6	0.2	0.3				0.6	0.2	0.2			
	0.4	0.4	0.4				0.3	0.3	0.3			
	0.5	0.5	0.5				0.4	0.4	0.4			
	0.2	0.2	0.1				0.1	0.1	0.1			
	0.2	0.2	0.2				0.1	0.1	0.1			
	0.5	0.5	0.5				0.4	0.4	0.4			
	0.2	0.3	0.1				0.1	0.2	0.1			
	0.2	0.2	0.2				0.2	0.2	0.2			
	0.5	0.5	0.5				0.4	0.4	0.4			
	0.2	0.2	0.4				0.1	0.1	0.3			
	0.2	0.2	0.2				0.2	0.2	0.2			
	0.5	0.5	0.5				0.4	0.4	0.4			
	0.2	0.3	0.4				0.1	0.2	0.3			
	0.3	0.3	0.3				0.2	0.2	0.2			
	0.5	0.5	0.5				0.4	0.4	0.4			
	0.8	0.2	0.1				0.6	0.1	0.1			
	0.4	0.4	0.4				0.3	0.3	0.3			
	0.5	0.5	0.5				0.4	0.4	0.4			
	0.8	0.3	0.1				0.6	0.2	0.1			
	0.4	0.4	0.4				0.3	0.3	0.3			
	0.5	0.5	0.5				0.4	0.4	0.4			
	0.8	0.2	0.4				0.6	0.1	0.3			
	0.4	0.4	0.4				0.3	0.3	0.3			
	0.5	0.5	0.5				0.4	0.4	0.4			
	0.8	0.3	0.4				0.6	0.2	0.3			
	0.5	0.5	0.5				0.4	0.4	0.4			
	0.6	0.5	0.5				0.4	0.4	0.4			
Product Drying Rotary Dryer	9.2	9.1	4.9				2.3	2.3	1.2			
	7.7	7.7	7.7				2.0	2.0	2.0			
	14.9	14.9	14.9				3.8	3.8	3.8			
	9.2	#DIV/0!	4.9				2.3	#DIV/0!	1.2			
	7.1	7.1	7.1				1.8	1.8	1.8			
	14.9	14.9	14.9				3.8	3.8	3.8			
	9.2	9.1	47.6				2.3	2.3	12.1			
	9.2	9.2	9.2				2.3	2.3	2.3			
	14.9	14.9	14.9				3.8	3.8	3.8			
	9.2	#DIV/0!	47.6				2.3	#DIV/0!	12.1			
	9.2	9.2	9.2				2.3	2.3	2.3			
	14.9	14.9	14.9				3.8	3.8	3.8			
	129.3	9.1	4.9				32.7	2.3	1.2			
	7.0	7.0	7.0				1.8	1.8	1.8			
	14.9	14.9	14.9				3.8	3.8	3.8			
	129.3	#DIV/0!	4.9				32.7	#DIV/0!	1.2			
	4.9	4.9	4.9				1.2	1.2	1.2			
	14.9	14.9	14.9				3.8	3.8	3.8			
	129.3	9.1	47.6				32.7	2.3	12.1			
	9.1	9.1	9.1				2.3	2.3	2.3			
	14.9	14.9	14.9				3.8	3.8	3.8			
	129.3	#DIV/0!	47.6				32.7	#DIV/0!	12.1			
	15.6	15.6	15.6				3.9	3.9	3.9			
	14.9	14.9	14.9				3.8	3.8	3.8			
Product Storage-Hold Tank Before Dr	0.3	0.4	0.3				0.1	0.2	0.1			
	0.3	0.3	0.3				0.1	0.1	0.1			
	15.5	15.5	15.5				6.0	6.0	6.0			
	0.3	0.9	0.3				0.1	0.3	0.1			
	0.5	0.5	0.5				0.2	0.2	0.2			

Stream ID	TI 70% TRE BASED ON DIFFERENT HRS/YR						TOTAL HAP FLOW RATE (LBS/HR) BASED ON COMPONENT					
	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN	EB	STY	MA	MEK	MMA
	0.6	0.6	0.6				2.50047	2.50047	2.50047	0	0	0
	0.8	0.2	0.4				2.0661376	9.696158284	4.219495996	0	0	0
	0.4	0.4	0.4				3.64019696	3.64019696	3.64019696	0	0	0
	0.6	0.6	0.6				2.50047	2.50047	2.50047	0	0	0
	0.8	0.3	0.4				2.0661376	6.107616242	4.219495996	0	0	0
	0.5	0.5	0.5				3.390467797	3.390467797	3.390467797	0	0	0
	0.6	0.6	0.6				2.50047	2.50047	2.50047	0	0	0
	0.2	0.2	0.2				6.899663647	7.492485947	8.604684953	0	0	0
	0.2	0.2	0.2				7.610126087	7.610126087	7.610126087	0	0	0
	0.6	0.6	0.6				2.50047	2.50047	2.50047	0	0	0
	0.2	0.3	0.2				6.899663647	4.719676187	8.604684953	0	0	0
	0.3	0.3	0.3				6.345603625	6.345603625	6.345603625	0	0	0
	0.6	0.6	0.6				2.50047	2.50047	2.50047	0	0	0
	0.2	0.2	0.5				6.899663647	7.492485947	3.280519635	0	0	0
	0.3	0.3	0.3				5.129169231	5.129169231	5.129169231	0	0	0
	0.6	0.6	0.6				2.50047	2.50047	2.50047	0	0	0
	0.2	0.3	0.5				6.899663647	4.719676187	3.280519635	0	0	0
	0.4	0.4	0.4				4.521840258	4.521840258	4.521840258	0	0	0
	0.6	0.6	0.6				2.50047	2.50047	2.50047	0	0	0
	1.0	0.2	0.2				1.595768066	7.492485947	8.604684953	0	0	0
	0.5	0.5	0.5				3.423626406	3.423626406	3.423626406	0	0	0
	0.6	0.6	0.6				2.50047	2.50047	2.50047	0	0	0
	1.0	0.3	0.2				1.595768066	4.719676187	8.604684953	0	0	0
	0.5	0.5	0.5				3.141951632	3.141951632	3.141951632	0	0	0
	0.6	0.6	0.6				2.50047	2.50047	2.50047	0	0	0
	1.0	0.2	0.5				1.595768066	7.492485947	3.280519635	0	0	0
	0.6	0.6	0.6				2.611773494	2.611773494	2.611773494	0	0	0
	0.6	0.6	0.6				2.50047	2.50047	2.50047	0	0	0
	1.0	0.3	0.5				1.595768066	4.719676187	3.280519635	0	0	0
	0.6	0.6	0.6				2.618946135	2.618946135	2.618946135	0	0	0
	0.6	0.6	0.6				2.50047	2.50047	2.50047	0	0	0
Product Drying Rotary Dryer	1.9	1.9	1.0				0.923168966	0.936798231	1.730699092	0	0	0
	1.6	1.6	1.6				1.099663093	1.099663093	1.099663093	0	0	0
	3.1	3.1	3.1				0.571536	0.571536	0.571536	0	0	0
	1.9	#DIV/0!	1.0				0.923168966	0	1.730699092	0	0	0
	1.5	1.5	1.5				1.204743366	1.204743366	1.204743366	0	0	0
	3.1	3.1	3.1				0.571536	0.571536	0.571536	0	0	0
	1.9	1.9	9.8				0.923168966	0.936798231	0.179037637	0	0	0
	1.9	1.9	1.9				0.930407442	0.930407442	0.930407442	0	0	0
	3.1	3.1	3.1				0.571536	0.571536	0.571536	0	0	0
	1.9	#DIV/0!	9.8				0.923168966	0	0.179037637	0	0	0
	1.9	1.9	1.9				0.923250462	0.923250462	0.923250462	0	0	0
	3.1	3.1	3.1				0.571536	0.571536	0.571536	0	0	0
	26.6	1.9	1.0				0.066940497	0.936798231	1.730699092	0	0	0
	1.5	1.5	1.5				1.215418329	1.215418329	1.215418329	0	0	0
	3.1	3.1	3.1				0.571536	0.571536	0.571536	0	0	0
	26.6	#DIV/0!	1.0				0.066940497	0	1.730699092	0	0	0
	1.0	1.0	1.0				1.730054919	1.730054919	1.730054919	0	0	0
	3.1	3.1	3.1				0.571536	0.571536	0.571536	0	0	0
	26.6	1.9	9.8				0.066940497	0.936798231	0.179037637	0	0	0
	1.9	1.9	1.9				0.936761444	0.936761444	0.936761444	0	0	0
	3.1	3.1	3.1				0.571536	0.571536	0.571536	0	0	0
	26.6	#DIV/0!	9.8				0.066940497	0	0.179037637	0	0	0
	3.2	3.2	3.2				0.646046219	0.646046219	0.646046219	0	0	0
	3.1	3.1	3.1				0.571536	0.571536	0.571536	0	0	0
Product Storage-Hold Tank Before Dr	0.2	0.2	0.2				9.47094196	8.197673566	10.06656276	0	0	0
	0.2	0.2	0.2				9.264699366	9.264699366	9.264699366	0	0	0
	7.8	7.8	7.8				0.2096632	0.2096632	0.2096632	0	0	0
	0.2	0.4	0.2				9.47094196	3.735739662	10.06656276	0	0	0
	0.3	0.3	0.3				6.4012032	6.4012032	6.4012032	0	0	0

Application of HON TRE to SAN Emission Streams

Stream ID	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery	Total Capital Cost ($)	Total Annual Cost ($/yr)
	Based AN	Based AN	Based AN	Based AN	Based AN	Based EB	Based EB	Based EB	Based EB	Based EB	Based Sty	Based Sty
	36962	77744	8337	Flare		36962	77744	8337	Flare		36962	77744
	36962	92953	9966	Flare		36962	24761	2657	Flare		36962	45729
	36962	54909	5888	Flare		36962	54909	5888	Flare		36962	54909
	36962	77744	8337	Flare		36962	77744	8337	Flare		36962	77744
	36962	92986	9968	Flare		36962	36627	3619	Flare		36962	45735
	36962	58601	6284	Flare		36962	58601	6284	Flare		36962	58601
	36962	77744	8337	Flare		36962	77744	8337	Flare		36962	77744
	36797	29706	3185	Flare		36797	27654	2967	Flare		36797	25071
	36797	27412	2939	Flare		36797	27412	2939	Flare		36797	27412
	36797	73655	7899	Flare		36797	73655	7899	Flare		36797	73655
	36797	29711	3186	Flare		36797	40521	4345	Flare		36797	25075
	36797	31922	3422	Flare		36797	31922	3422	Flare		36797	31922
	36797	73655	7899	Flare		36797	73655	7899	Flare		36797	73655
	36797	29811	3196	Flare		36797	27950	2997	Flare		36797	56048
	36797	38358	4113	Flare		36797	38358	4113	Flare		36797	38358
	36797	73655	7899	Flare		36797	73655	7899	Flare		36797	73655
	36797	29814	3197	Flare		36797	40672	4361	Flare		36797	56056
	36797	42868	4596	Flare		36797	42868	4596	Flare		36797	42868
	36797	73655	7899	Flare		36797	73655	7899	Flare		36797	73655
	36797	112074	12015	Flare		36797	28831	3092	Flare		36797	25922
	36797	56084	6006	Flare		36797	56084	6006	Flare		36797	56084
	36797	73655	7899	Flare		36797	73655	7899	Flare		36797	73655
	36797	112088	12017	Flare		36797	42071	4511	Flare		36797	25925
	36797	59593	6389	Flare		36797	59593	6389	Flare		36797	59593
	36797	73655	7899	Flare		36797	73655	7899	Flare		36797	73655
	36797	112526	12064	Flare		36797	28928	3102	Flare		36797	56296
	36797	66032	7079	Flare		36797	66032	7079	Flare		36797	66032
	36797	73655	7899	Flare		36797	73655	7899	Flare		36797	73655
	36797	112542	12065	Flare		36797	4224	4527	Flare		36797	56302
	36797	70539	7563	Flare		36797	70539	7563	Flare		36797	70539
	36797	73655	7899	Flare		36797	73655	7899	Flare		36797	73655
Product Drying Rotary Dryer	198865	101109	47436	Thermal Incin	70	198865	100232	47002	Thermal Incin	70	88311	65669
	198871	101250	47506	Thermal Incin	70						88311	65769
	198871	893547	419407	Thermal Incin	70	198871	100380	47072	Thermal Incin	70	88313	65769
	201181	1044937	490466	Thermal Incin	50						88313	65769
	88311	65708	30826	Thermal Incin	0	88311	65708	30826	Thermal Incin	0	88311	65708
Product Storage-Hold Tank Before Dr	71365	16356	20919	Thermal Incin	0	71365	16654	21269	Thermal Incin	0	71365	16248
	71365	16405	20978	Thermal Incin	0	73067	17133	21909	Thermal Incin	0	71365	16405
	71365	16368	20931	Thermal Incin	0	71365	19280	24663	Thermal Incin	0	71365	16256
	71365	17326	22156	Thermal Incin	0	71365	17326	22156	Thermal Incin	0	71365	17326

Application of HON TRE to SAN Emission Streams

7/21/94

Stream ID	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery
	Based Sty	Based Sty	Based Sty	Based MA	Based MA	Based MA	Based MA	Based MA	Based MEK	Based MEK	Based MEK	Based MEK	Based M
	8337	Flare											
	6225	Flare											
	6888	Flare											
	8337	Flare											
	6228	Flare											
	6284	Flare											
	8337	Flare											
	2868	Flare											
	2939	Flare											
	7899	Flare											
	2868	Flare											
	3422	Flare											
	7899	Flare											
	6006	Flare											
	4113	Flare											
	7899	Flare											
	6009	Flare											
	4598	Flare											
	7899	Flare											
	2779	Flare											
	5905	Flare											
	7899	Flare											
	2780	Flare											
	6369	Flare											
	7899	Flare											
	6249	Flare											
	7079	Flare											
	7899	Flare											
	6250	Flare											
	7563	Flare											
	7899	Flare											
Product Drying Rotary Dryer	30604	Thermal Incin	0										
	30641	Thermal Incin	0										
	30841	Thermal Incin	0										
	30841	Thermal Incin	0										
	30828	Thermal Incin	0										
Product Storage-Hold Tank Before Dr	20777	Thermacl Incin	0										
	20978	Thermacl Incin	0										
	20788	Thermacl Incin	0										
	22156	Thermal Incin	0										

Application of HON TRE to SAN Emission Streams

Stream ID	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery
	Based MMA	Based MMA	Based MMA	Based MMA	Based MMA
Product Drying Rotary Dryer					
Product Storage-Hold Tank Before Dr					

Application of HON TRE to SAN Emission Streams

7/21/94

Stream ID	Emissions (lbs/yr)						Frequency (HRS/YR) BASED ON EACH COMPOUND					
	AN	EB	STY	MA	MEK	MMA	AN	EB	STY	MA	MEK	MMA
	300	280	1180				8400	8400	8400			
	300	280	1180				185.8665045	214.7301817	960.3054037			
	300	280	1180				460	460	460			
	300	280	1180				8400	8400	8400			
	300	280	1180				185.8665045	471.2134542	960.3054037			
	300	280	1180				545	545	545			
	300	280	1180				8400	8400	8400			
	300	280	1180				426.1860864	214.7301817	174.888484			
	300	280	1180				270	270	270			
	300	280	1180				8400	8400	8400			
	300	280	1180				426.1860864	471.2134542	174.888484			
	300	280	1180				355	355	355			
	300	280	1180				8400	8400	8400			
	300	280	1180				426.1860864	214.7301817	960.3054037			
	300	280	1180				540	540	540			
	300	280	1180				8400	8400	8400			
	300	280	1180				426.1860864	471.2134542	960.3054037			
	300	280	1180				625	625	625			
	300	280	1180				8400	8400	8400			
Reactor-Condenser Seal Pot	3760	44	160				197.8427807	110.4452598	201.254164			
	3760	44	160				170	170	170			
	3760	44	160				8400	8400	8400			
	3760	44	160				197.8427807	777.5346292	201.254164			
	3760	44	160				390	390	390			
	3760	44	160				8400	8400	8400			
	3760	44	160				197.8427807	110.4452598	346.3893784			
	3760	44	160				220	220	220			
	3760	44	160				8400	8400	8400			
	3760	44	160				197.8427807	777.5346292	346.3893784			
	3760	44	160				440	440	440			
	3760	44	160				8400	8400	8400			
	3760	44	160				3444.30955	110.4452598	201.254164			
	3760	44	160				1250	1250	1250			
	3760	44	160				8400	8400	8400			
	3760	44	160				3444.30955	777.5346292	201.254164			
	3760	44	160				1475	1475	1475			
	3760	44	160				8400	8400	8400			
	3760	44	160				3444.30955	110.4452598	346.3893784			
	3760	44	160				1300	1300	1300			
	3760	44	160				8400	8400	8400			
	3760	44	160				3444.30955	777.5346292	346.3893784			
	3760	44	160				1520	1520	1520			
	3760	44	160				8400	8400	8400			
	3760	44	160				2710.446098	1513.10008	2757.182046			
	3760	44	160				2325	2325	2325			
	3760	44	160				8400	8400	8400			
	3760	44	160				2710.446098	10652.22442	2757.182046			
	3760	44	160				5375	5375	5375			
	3760	44	160				8400	8400	8400			
	3760	44	160				2710.446098	1513.10008	4748.834483			
	3760	44	160				2990	2990	2990			
	3760	44	160				8400	8400	8400			
	3760	44	160				2710.446098	10652.22442	4748.834483			
	3760	44	160				6035	6035	6035			
	3760	44	160				8400	8400	8400			
	3760	44	160				47167.04084	1513.10008	2757.182046			
	3760	44	160				2135	2135	2135			
	3760	44	160				8400	8400	8400			
	3760	44	160				47167.04084	10652.22442	2757.182046			
	3760	44	160				6705	6705	6705			

Stream ID	FLARE TRE BASED ON DIFFERENT HRS/YR						TI 0% BASED ON DIFFERENT HRS/YR					
	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR
	15.5	15.6	16.6				6.0	6.0	6.0			
	0.3	0.4	1.8				0.1	0.2	0.7			
	0.8	0.8	0.8				0.3	0.3	0.3			
	15.6	15.6	15.6				6.0	6.0	6.0			
	0.3	0.9	1.8				0.1	0.3	0.7			
	1.0	1.0	1.0				0.4	0.4	0.4			
	15.6	15.5	15.6				6.0	6.0	6.0			
	0.8	0.4	0.3				0.3	0.2	0.1			
	0.5	0.5	0.6				0.2	0.2	0.2			
	15.5	15.5	15.6				6.0	6.0	6.0			
	0.8	0.9	0.3				0.3	0.3	0.1			
	0.7	0.7	0.7				0.3	0.3	0.3			
	15.5	15.5	15.5				6.0	6.0	6.0			
	0.8	0.4	1.6				0.3	0.2	0.7			
	1.0	1.0	1.0				0.4	0.4	0.4			
	15.6	15.6	15.5				6.0	6.0	6.0			
	0.8	0.9	1.8				0.3	0.3	0.7			
	1.1	1.1	1.1				0.4	0.4	0.4			
	15.6	15.5	15.5				6.0	6.0	6.0			
Reactor-Condenser Seal Pot	0.1	0.1	0.1				0.1	0.0	0.1			
	0.1	0.1	0.1				0.0	0.0	0.0			
	4.3	4.3	4.3				2.2	2.2	2.2			
	0.1	0.4	0.1				0.1	0.2	0.1			
	0.2	0.2	0.2				0.1	0.1	0.1			
	4.3	4.3	4.3				2.2	2.2	2.2			
	0.1	0.1	0.2				0.1	0.0	0.1			
	0.1	0.1	0.1				0.1	0.1	0.1			
	4.3	4.3	4.3				2.2	2.2	2.2			
	0.1	0.4	0.2				0.1	0.2	0.1			
	0.2	0.2	0.2				0.1	0.1	0.1			
	4.3	4.3	4.3				2.2	2.2	2.2			
	1.8	0.1	0.1				0.9	0.0	0.1			
	0.6	0.6	0.6				0.3	0.3	0.3			
	4.3	4.3	4.3				2.2	2.2	2.2			
	1.8	0.4	0.1				0.9	0.2	0.1			
	0.7	0.7	0.7				0.4	0.4	0.4			
	4.3	4.3	4.3				2.2	2.2	2.2			
	1.8	0.1	0.2				0.9	0.0	0.1			
	0.7	0.7	0.7				0.3	0.3	0.3			
	4.3	4.3	4.3				2.2	2.2	2.2			
	1.8	0.4	0.2				0.9	0.2	0.1			
	0.8	0.8	0.8				0.4	0.4	0.4			
	4.3	4.3	4.3				2.2	2.2	2.2			
	0.8	0.5	0.8				0.6	0.4	0.6			
	0.7	0.7	0.7				0.5	0.5	0.5			
	2.6	2.6	2.6				1.9	1.9	1.9			
	0.8	3.3	0.8				0.6	2.5	0.6			
	1.7	1.7	1.7				1.2	1.2	1.2			
	2.6	2.6	2.6				1.9	1.9	1.9			
	0.8	0.5	1.5				0.6	0.4	1.1			
	0.9	0.9	0.9				0.7	0.7	0.7			
	2.6	2.6	2.6				1.9	1.9	1.9			
	0.8	3.3	1.5				0.6	2.5	1.1			
	1.9	1.9	1.9				1.4	1.4	1.4			
	2.6	2.6	2.6				1.9	1.9	1.9			
	14.8	0.5	0.9				10.8	0.3	0.6			
	0.7	0.7	0.7				0.5	0.5	0.5			
	2.6	2.6	2.6				1.9	1.9	1.9			
	14.8	3.3	0.9				10.8	2.4	0.6			
	2.1	2.1	2.1				1.6	1.6	1.6			

Application of HON TRE to SAN Emission Streams

7/21/94

Stream ID	TI 70% TRE BASED ON DIFFERENT HRS/YR						TOTAL HAP FLOW RATE (LBS/HR) BASED ON COMPONENT					
	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN	EB	STY	MA	MEK	MMA
	7.6	7.6	7.6				0.2095632	0.2095632	0.2095632	0	0	0
	0.2	0.2	0.9				9.47094198	8.197873565	1.795696396	0	0	0
	0.4	0.4	0.4				3.826806261	3.826806261	3.826806261	0	0	0
	7.6	7.6	7.6				0.2095632	0.2095632	0.2095632	0	0	0
	0.2	0.4	0.9				9.47094198	3.735739852	1.795696396	0	0	0
	0.5	0.5	0.5				3.229984917	3.229984917	3.229984917	0	0	0
	7.6	7.6	7.6				0.2095632	0.2095632	0.2095632	0	0	0
	0.4	0.2	0.2				4.130427848	8.197873565	10.08556276	0	0	0
	0.3	0.3	0.3				6.619744	6.619744	6.619744	0	0	0
	7.6	7.6	7.6				0.2095632	0.2095632	0.2095632	0	0	0
	0.4	0.4	0.2				4.130427848	3.735739852	10.08556276	0	0	0
	0.3	0.3	0.3				4.956678535	4.956678535	4.956678535	0	0	0
	7.6	7.6	7.6				0.2095632	0.2095632	0.2095632	0	0	0
	0.4	0.2	0.9				4.130427848	8.197873565	1.795696396	0	0	0
	0.5	0.5	0.5				3.259672	3.259672	3.259672	0	0	0
	7.6	7.6	7.6				0.2095632	0.2095632	0.2095632	0	0	0
	0.4	0.4	0.9				4.130427848	3.735739852	1.795696396	0	0	0
	0.6	0.6	0.6				2.816529406	2.816529406	2.816529406	0	0	0
	7.6	7.6	7.6				0.2095632	0.2095632	0.2095632	0	0	0
Reactor-Condenser Seal Pot	0.1	0.1	0.1				20.03967822	35.69783084	19.70018982	0	0	0
	0.1	0.1	0.1				23.32203078	23.32203078	23.32203078	0	0	0
	3.3	3.3	3.3				0.47199348	0.47199348	0.47199348	0	0	0
	0.1	0.3	0.1				20.03967822	5.09912367	19.70018982	0	0	0
	0.2	0.2	0.2				10.16601342	10.16601342	10.16601342	0	0	0
	3.3	3.3	3.3				0.47199348	0.47199348	0.47199348	0	0	0
	0.1	0.1	0.1				20.03967822	35.69783084	11.44592034	0	0	0
	0.1	0.1	0.1				18.02156924	18.02156924	18.02156924	0	0	0
	3.3	3.3	3.3				0.47199348	0.47199348	0.47199348	0	0	0
	0.1	0.3	0.1				20.03967822	5.09912367	11.44592034	0	0	0
	0.2	0.2	0.2				9.010784618	9.010784618	9.010784618	0	0	0
	3.3	3.3	3.3				0.47199348	0.47199348	0.47199348	0	0	0
	1.4	0.1	0.1				1.151100148	35.69783084	19.70018982	0	0	0
	0.5	0.5	0.5				3.171796186	3.171796186	3.171796186	0	0	0
	3.3	3.3	3.3				0.47199348	0.47199348	0.47199348	0	0	0
	1.4	0.3	0.1				1.151100148	5.09912367	19.70018982	0	0	0
	0.6	0.6	0.6				2.667962869	2.667962869	2.667962869	0	0	0
	3.3	3.3	3.3				0.47199348	0.47199348	0.47199348	0	0	0
	1.4	0.1	0.1				1.151100148	35.69783084	11.44592034	0	0	0
	0.5	0.5	0.5				3.049604025	3.049604025	3.049604025	0	0	0
	3.3	3.3	3.3				0.47199348	0.47199348	0.47199348	0	0	0
	1.4	0.3	0.1				1.151100148	5.09912367	11.44592034	0	0	0
	0.6	0.6	0.6				2.606385021	2.606385021	2.606385021	0	0	0
	3.3	3.3	3.3				0.47199348	0.47199348	0.47199348	0	0	0
	1.1	0.6	1.1				1.462764834	2.620279609	1.43797006	0	0	0
	0.9	0.9	0.9				1.705266768	1.705266768	1.705266768	0	0	0
	3.2	3.2	3.2				0.47199348	0.47199348	0.47199348	0	0	0
	1.1	4.1	1.1				1.462764834	0.372198608	1.43797006	0	0	0
	2.1	2.1	2.1				0.737627702	0.737627702	0.737627702	0	0	0
	3.2	3.2	3.2				0.47199348	0.47199348	0.47199348	0	0	0
	1.1	0.6	1.8				1.462764834	2.620279609	0.835466536	0	0	0
	1.2	1.2	1.2				1.32600175	1.32600175	1.32600175	0	0	0
	3.2	3.2	3.2				0.47199348	0.47199348	0.47199348	0	0	0
	1.1	4.1	1.8				1.462764834	0.372198608	0.835466536	0	0	0
	2.3	2.3	2.3				0.656958613	0.656958613	0.656958613	0	0	0
	3.2	3.2	3.2				0.47199348	0.47199348	0.47199348	0	0	0
	18.1	0.6	1.1				0.084021909	2.620279609	1.43797006	0	0	0
	0.8	0.8	0.8				1.857023626	1.857023626	1.857023626	0	0	0
	3.2	3.2	3.2				0.47199348	0.47199348	0.47199348	0	0	0
	18.1	4.1	1.1				0.084021909	0.372198608	1.43797006	0	0	0
	2.6	2.6	2.6				0.591311742	0.591311742	0.591311742	0	0	0

Application of HON TRE to SAN Emission Streams

Stream ID	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery	Total Capital Cost ($)	Total Annual Cost ($/yr)
	Based AN	Based AN	Based AN	Based AN	Based AN	Based EB	Based EB	Based EB	Based EB	Based EB	Based Sty	Based Sty
	71366	16435	21017	Thermal Incin	0	71365	16741	21381	Thermal Incin	0	71366	24827
	71366	19334	24724	Thermal Incin	0	71365	19334	24724	Thermal Incin	0	71366	19334
	71366	1644	21026	Thermal Incin	0	71366	19470	24926	Thermal Incin	0	71366	24675
	71366	20256	25903	Thermal Incin	0	71365	20256	25903	Thermal Incin	0	71366	20256
	71366	18820	24094	Thermal Incin	0	71365	16664	21282	Thermal Incin	0	71366	16256
	71366	17272	22067	Thermal Incin	0	71365	17272	22067	Thermal Incin	0	71366	17272
	71366	18844	24125	Thermal Incin	0	71366	19306	24716	Thermal Incin	0	71366	16266
	71365	18195	23267	Thermal Incin	0	71366	18195	23267	Thermal Incin	0	71366	18195
	71365	18992	24314	Thermal Incin	0	71366	16751	21393	Thermal Incin	0	71366	24675
	71366	20203	25835	Thermal Incin	0	71366	20203	25835	Thermal Incin	0	71366	20203
	71366	19016	24345	Thermal Incin	0	71365	19497	24961	Thermal Incin	0	71365	24930
	71366	21120	27039	Thermal Incin	0	71366	21120	27039	Thermal Incin	0	71366	21120
Reactor-Condenser Seal Pot	54264	12941	7344	Flare		54264	11323	6456	Flare		54264	12966
	54264	12366	7038	Flare		54264	12366	7038	Flare		54264	12366
	54264	12946	7347	Flare		71366	20970	11907	Thermal Incin	0	54264	13001
	54264	16754	9519	Flare		54264	16754	9519	Flare		54264	16754
	54264	12946	7347	Flare		54264	11326	6460	Flare		54264	15761
	54264	13360	7602	Flare		54264	13360	7602	Flare		54264	13360
	54264	12953	7351	Flare		71365	20970	11907	Thermal Incin	0	54264	15662
	54264	17745	10062	Flare		54264	17745	10062	Flare		54264	17745
	71366	46141	26215	Thermal Incin	0	54264	11463	6536	Flare		54264	13252
	71366	25918	14717	Thermal Incin	0	71366	25918	14717	Thermal Incin	0	71365	25918
	71366	46221	26260	Thermal Incin	0	71366	21641	12266	Thermal Incin	0	54264	13256
	71366	28023	15921	Thermal Incin	0	71366	28023	15921	Thermal Incin	0	71366	28023
	71365	46221	2620	Thermal Incin	0	54264	11466	6540	Flare		54264	16112
	71635	26384	14990	Thermal Incin	0	71635	26384	14990	Thermal Incin	0	71635	26384
	71366	46313	26313	Thermal Incin	0	71366	21682	12300	Thermal Incin	0	54264	16123
	71366	28442	16159	Thermal Incin	0	71366	28442	16159	Thermal Incin	0	71366	28442
	30166	25244	14343	Flare		30166	16378	9305	Flare		30166	25592
	30166	22354	12701	Flare		30166	22354	12701	Flare		30166	22354
	30166	25250	14346	Flare							30166	25598
	30166	26250	14346	Flare		30166	16381	9307	Flare		30166	40326
	30166	27350	15539	Flare		30166	27350	15539	Flare		30166	27350
	30166	25258	14349	Flare							30166	40339
						30166	16518	9365	Flare		30166	25649
	30166	20926	11869	Flare		30166	20926	11869	Flare		30166	20926
						30166	85086	48342	Flare		30166	25865

Application of HON TRE to SAN Emission Streams

Stream ID	Cost Effectiveness ($/Mg removed) Based Sty	Control Device Based Sty	% Heat Recovery Based Sty	Total Capital Cost ($) Based MA	Total Annual Cost ($/yr) Based MA	Cost Effectiveness ($/Mg removed) Based MA	Control Device Based MA	% Heat Recovery Based MA	Total Capital Cost ($) Based MEK	Total Annual Cost ($/yr) Based MEK	Cost Effectiveness ($/Mg removed) Based MEK	Control Device Based MEK	% Heat Recovery Based MEK
	31786	Thermal Incin	0										
	24724	Thermal Incin	0										
	21846	Thermal Incin	0										
	25903	Thermal Incin	0										
	20786	Thermal Incin	0										
	22087	Thermal Incin	0										
	20801	Thermal Incin	0										
	23267	Thermal Incin	0										
	31846	Thermal Incin	0										
	25836	Thermal Incin	0										
	31917	Thermal Incin	0										
	27039	Thermal Incin	0										
Reactor-Condenser Seal Pot	7392	Flare											
	7038	Flare											
	7395	Flare											
	6519	Flare											
	8913	Flare											
	7802	Flare											
	8920	Flare											
	10062	Flare											
	7536	Flare											
	14717	Thermal Incin	0										
	7541	Flare											
	15921	Thermal Incin	0										
	9164	Flare											
	14990	Thermal Incin	0										
	9171	Flare											
	16159	Thermal Incin	0										
	14540	Flare											
	12701	Flare											
	14544	Flare											
	22912	Flare											
	15539	Flare											
	22919	Flare											
	14686	Flare											
	11889	Flare											
	14689	Flare											

Application of HON TRE to SAN Emission Streams

Stream ID	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery
	Based MMA	Based MMA	Based MMA	Based MMA	Based MMA
Reactor-Condenser Seal Pot					

Stream ID	Emissions (lbs/yr)						Frequency (HRS/YR) BASED ON EACH COMPOUND					
	AN	EB	STY	MA	MEK	MMA	AN	EB	STY	MA	MEK	MMA
	3760	44	160				8400	8400	8400			
	3760	44	160				47187.04084	1513.10008	4745.534483			
	3760	44	160				3130	3130	3130			
	3760	44	160				8400	8400	8400			
	3760	44	160				47187.04084	10652.22442	4745.534483			
	3760	44	160				7700	7700	7700			
	3760	44	160				8400	8400	8400			
Reactor Condenser Seal Pot	14	2	20				142.981155	3688.121357	2039.403249			
	14	2	20				1950	1950	1950			
	14	2	20				8400	8400	8400			
	14	2	20				142.981155		2039.403249			
	14	2	20				1090	1090	1090			
	14	2	20				8400	8400	8400			
	14	2	20				142.981155	3688.121357	26041.79467			
	14	2	20				1905	1905	1905			
	14	2	20				8400	8400	8400			
	14	2	20				142.981155		26041.79467			
	14	2	20				145	145	145			
	14	2	20				8400	8400	8400			
	14	2	20				548.6959665	8069.866985	4488.667148			
	14	2	20				4370	4370	4370			
	14	2	20				8400	8400	8400			
	14	2	20				548.6959665		4488.667148			
	14	2	20				2520	2520	2520			
	14	2	20				8400	8400	8400			
	14	2	20				548.6959665	8069.866985	61691.94628			
	14	2	20				4310	4310	4310			
	14	2	20				8400	8400	8400			
	14	2	20				548.6959665		61691.94628			
	14	2	20				550	550	550			
	14	2	20				8400	8400	8400			
Product Stranding Extruders	34	500	300	2			3211.83409	2248.124299	2408.082228	2620		
	34	500	300	2			2620	2620	2620	2620		
	34	500	300	2			8400	8400	8400	8400		
	34	500	300	2			3211.83409	5901.326288	2408.082228	3840		
	34	500	300	2			3840	3840	3840	3840		
	34	500	300	2			8400	8400	8400	8400		
	34	500	300	2			3211.83409	2248.124299	4812.164453	3425		
	34	500	300	2			3425	3425	3425	3425		
	34	500	300	2			8400	8400	8400	8400		
	34	500	300	2			3211.83409	5901.326288	4812.164453	4840		
	34	500	300	2			4840	4840	4840	4840		
	34	500	300	2			8400	8400	8400	8400		
	34	500	300	2				2248.124299	2408.082228	2325		
	34	500	300	2			2325	2325	2325	2325		
	34	500	300	2			8400	8400	8400	8400		
	34	500	300	2				5901.326288	2408.082228	4155		
	34	500	300	2			4155	4155	4155	4155		
	34	500	300	2			8400	8400	8400	8400		
	34	500	300	2				2248.124299	4812.164453	3530		
	34	500	300	2			3530	3530	3530	3530		
	34	500	300	2			8400	8400	8400	8400		
	34	500	300	2				5901.326288	4812.164453	5355		
	34	500	300	2			5355	5355	5355	5355		
	34	500	300	2			8400	8400	8400	8400		
Reactor Process Equipment	2	2	2	2	2	2	6055.251916	80698.66985	17628.27094	6055	6055	6055
	2	2	2	2	2	2	6055	6055	6055	6055	6055	6055
	2	2	2	2	2	2	8400	8400	8400	8400	8400	8400
	2	2	2	2	2	2	6055.251916		17628.27094	6055	6055	6055

Application of HON TRE to SAN Emission Streams

7/21/94

Stream ID	FLARE TRE BASED ON DIFFERENT HRS/YR						TI 0% BASED ON DIFFERENT HRS/YR					
	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR
	2.6	2.6	2.6				1.9	1.9	1.9			
	14.6	0.6	1.5				10.8	0.3	1.1			
	1.0	1.0	1.0				0.7	0.7	0.7			
	2.6	2.6	2.6				1.9	1.9	1.9			
	14.6	3.3	1.5				10.8	2.4	1.1			
	2.4	2.4	2.4				1.8	1.8	1.8			
	2.6	2.6	2.6				1.9	1.9	1.9			
Reactor Condenser Seal Pot	4.9	125.5	69.8				3.6	92.8	51.6			
	66.7	66.7	66.7				49.2	49.2	49.2			
	287.4	287.4	287.4				212.0	212.0	212.0			
	4.9	#DIV/0!	69.8				3.6	#DIV/0!	51.6			
	37.3	37.3	37.3				27.5	27.5	27.5			
	287.4	287.4	287.4				212.0	212.0	212.0			
	4.9	125.5	959.1				3.6	92.7	708.9			
	65.2	65.2	65.2				48.1	48.1	48.1			
	287.4	287.4	287.4				212.0	212.0	212.0			
	4.9	#DIV/0!	959.1				3.6	#DIV/0!	708.9			
	5.0	5.0	5.0				3.7	3.7	3.7			
	287.4	287.4	287.4				212.0	212.0	212.0			
	18.2	287.7	148.8				13.8	202.5	112.6			
	145.0	145.0	145.0				109.6	109.6	109.6			
	278.7	278.7	278.7				210.5	210.5	210.5			
	18.2	#DIV/0!	148.8				13.8	#DIV/0!	112.6			
	83.6	83.6	83.6				63.2	63.2	63.2			
	278.7	278.7	278.7				210.5	210.5	210.5			
	18.2	287.7	2046.3				13.8	202.4	1547.5			
	143.0	143.0	143.0				108.0	108.0	108.0			
	278.7	278.7	278.7				210.5	210.5	210.5			
	18.2	#DIV/0!	2046.3				13.8	#DIV/0!	1547.5			
	18.2	18.2	18.2				13.8	13.8	13.8			
	278.7	278.7	278.7				210.5	210.5	210.5			
	#DIV/0!	#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!	#DIV/0!			
Product Stranding Extruders	19.8	13.9	14.8	18.2			6.1	4.3	4.6	5.0		
	18.2	18.2	18.2	18.2			5.0	5.0	5.0	5.0		
	51.8	51.8	51.8	51.8			15.9	15.9	15.9	15.9		
	19.8	38.4	14.8	23.7			6.1	11.2	4.6	7.3		
	23.7	23.7	23.7	23.7			7.3	7.3	7.3	7.3		
	51.8	51.8	51.8	51.8			15.9	15.9	15.9	15.9		
	19.8	13.9	29.7	21.1			6.1	4.3	9.1	6.5		
	21.1	21.1	21.1	21.1			6.5	6.5	6.5	6.5		
	51.8	51.8	51.8	51.8			15.9	15.9	15.9	15.9		
	19.8	38.4	29.7	28.6			6.1	11.2	9.1	8.8		
	28.6	28.6	28.6	28.6			8.8	8.8	8.8	8.8		
	51.8	51.8	51.8	51.8			15.9	15.9	15.9	15.9		
	#DIV/0!	13.9	14.8	14.3			#DIV/0!	4.3	4.6	4.4		
	14.3	14.3	14.3	14.3			4.4	4.4	4.4	4.4		
	51.8	51.8	51.8	51.8			15.9	15.9	15.9	15.9		
	#DIV/0!	38.4	14.8	25.8			#DIV/0!	11.2	4.6	7.9		
	25.8	25.8	25.8	25.8			7.9	7.9	7.9	7.9		
	51.8	51.8	51.8	51.8			15.9	15.9	15.9	15.9		
	#DIV/0!	13.9	29.7	21.8			#DIV/0!	4.3	9.1	6.7		
	21.8	21.8	21.8	21.8			6.7	6.7	6.7	6.7		
	51.8	51.8	51.8	51.8			15.9	15.9	15.9	15.9		
	#DIV/0!	38.4	29.7	33.0			#DIV/0!	11.2	9.1	10.1		
	33.0	33.0	33.0	33.0			10.1	10.1	10.1	10.1		
	51.8	51.8	51.8	51.8			15.9	15.9	15.9	15.9		
Reactor Process Equipment	588.5	7842.5	1713.0	588.4	588.4	588.4	452.9	6058.4	1318.5	452.9	452.9	452.9
	588.4	588.4	588.4	588.4	588.4	588.4	453.0	453.0	453.0	453.0	453.0	453.0
	616.3	616.3	616.3	616.3	616.3	616.3	628.4	628.4	628.4	628.4	628.4	628.4
	588.5	#DIV/0!	1713.0	588.4	588.4	588.4	452.9	#DIV/0!	1318.5	452.9	452.9	452.9

Stream ID	TI 70% TRE BASED ON DIFFERENT HRS/YR						TOTAL HAP FLOW RATE (LBS/HR) BASED ON COMPONENT					
	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN	EB	STY	MA	MEK	MMA
	3.2	3.2	3.2				0.47199348	0.47199348	0.47199348	0	0	0
	18.1	0.8	1.8				0.084021909	2.620279609	0.635466636	0	0	0
	1.2	1.2	1.2				1.266691767	1.266691767	1.266691767	0	0	0
	3.2	3.2	3.2				0.47199348	0.47199348	0.47199348	0	0	0
	18.1	4.1	1.8				0.084021909	0.372198806	0.635466636	0	0	0
	3.0	3.0	3.0				0.514601978	0.514601978	0.514601978	0	0	0
	3.2	3.2	3.2				0.47199348	0.47199348	0.47199348	0	0	0
Reactor Condenser Seal Pot	6.0	154.6	86.0				0.251826767	0.009616133	0.017665541	0	0	0
	82.2	82.2	82.2				0.018465009	0.018465009	0.018465009	0	0	0
	353.6	353.6	353.6				0.00428652	0.00428652	0.00428652	0	0	0
	6.0	#DIV/0!	86.0				0.251826767	0	0.017665541	0	0	0
	45.9	45.9	45.9				0.033033732	0.033033732	0.033033732	0	0	0
	353.6	353.6	353.6				0.00428652	0.00428652	0.00428652	0	0	0
	6.0	154.6	1161.6				0.251826767	0.009616133	0.001284039	0	0	0
	80.3	80.3	80.3				0.018901191	0.018901191	0.018901191	0	0	0
	353.6	353.6	353.6				0.00428652	0.00428652	0.00428652	0	0	0
	6.0	#DIV/0!	1161.6				0.251826767	0	0.001284039	0	0	0
	6.1	6.1	6.1				0.248322536	0.248322536	0.248322536	0	0	0
	353.6	353.6	353.6				0.00428652	0.00428652	0.00428652	0	0	0
	23.1	339.7	188.9				0.06562244	0.004461879	0.008025246	0	0	0
	183.9	183.9	183.9				0.008239535	0.008239535	0.008239535	0	0	0
	353.6	353.6	353.6				0.00428652	0.00428652	0.00428652	0	0	0
	23.1	#DIV/0!	188.9				0.06562244	0	0.008025246	0	0	0
	108.1	108.1	108.1				0.0142884	0.0142884	0.0142884	0	0	0
	353.6	353.6	353.6				0.00428652	0.00428652	0.00428652	0	0	0
	23.1	339.7	2597.0				0.06562244	0.004461879	0.000583654	0	0	0
	181.4	181.4	181.4				0.008364239	0.008364239	0.008364239	0	0	0
	353.6	353.6	353.6				0.00428652	0.00428652	0.00428652	0	0	0
	23.1	#DIV/0!	2597.0				0.06562244	0	0.000583654	0	0	0
	23.2	23.2	23.2				0.065466651	0.065466651	0.065466651	0	0	0
	353.6	353.6	353.6				0.00428652	0.00428652	0.00428652	0	0	0
	#DIV/0!	#DIV/0!	#DIV/0!				0	0	0	0	0	0
Product Stranding Extruders	6.3	4.4	4.7	5.2			0.280336351	0.37193547	0.347618118	0.319143857	0	0
	5.2	5.2	5.2	5.2			0.319143857	0.319143857	0.319143857	0.319143857	0	0
	16.5	16.5	16.5	16.5			0.09954252	0.09954252	0.09954252	0.09954252	0	0
	6.3	11.6	4.7	7.6			0.280336351	0.141669703	0.347618118	0.217749283	0	0
	7.6	7.6	7.6	7.6			0.217749283	0.217749283	0.217749283	0.217749283	0	0
	16.5	16.5	16.5	16.5			0.09954252	0.09954252	0.09954252	0.09954252	0	0
	6.3	4.4	9.5	6.7			0.280336351	0.37193547	0.173759059	0.24413348	0	0
	6.7	6.7	6.7	6.7			0.24413348	0.24413348	0.24413348	0.24413348	0	0
	16.5	16.5	16.5	16.5			0.09954252	0.09954252	0.09954252	0.09954252	0	0
	6.3	11.6	9.5	9.1			0.280336351	0.141669703	0.173759059	0.180208288	0	0
	9.1	9.1	9.1	9.1			0.180208288	0.180208288	0.180208288	0.180208288	0	0
	16.5	16.5	16.5	16.5			0.09954252	0.09954252	0.09954252	0.09954252	0	0
	#DIV/0!	4.4	4.7	4.6			#DIV/0!	0.37193547	0.347618118	0.359637492	0	0
	4.6	4.6	4.6	4.6			0.359637492	0.359637492	0.359637492	0.359637492	0	0
	16.5	16.5	16.5	16.5			0.09954252	0.09954252	0.09954252	0.09954252	0	0
	#DIV/0!	11.6	4.7	8.2			#DIV/0!	0.141669703	0.347618118	0.201241198	0	0
	8.2	8.2	8.2	8.2			0.201241198	0.201241198	0.201241198	0.201241198	0	0
	16.5	16.5	16.5	16.5			0.09954252	0.09954252	0.09954252	0.09954252	0	0
	#DIV/0!	4.4	9.5	6.9			#DIV/0!	0.37193547	0.173759059	0.236871719	0	0
	6.9	6.9	6.9	6.9			0.236871719	0.236871719	0.236871719	0.236871719	0	0
	16.5	16.5	16.5	16.5			0.09954252	0.09954252	0.09954252	0.09954252	0	0
	#DIV/0!	11.6	9.5	10.5			#DIV/0!	0.141669703	0.173759059	0.156145129	0	0
	10.5	10.5	10.5	10.5			0.156145129	0.156145129	0.156145129	0.156145129	0	0
	16.5	16.5	16.5	16.5			0.09954252	0.09954252	0.09954252	0.09954252	0	0
Reactor Process Equipment	784.1	10183.6	2224.3	784.1	784.1	784.1	0.001982123	0.000148729	0.000660093	0.001982208	0.001982208	0.001982208
	784.2	784.2	784.2	784.2	784.2	784.2	0.001982208	0.001982208	0.001982208	0.001982208	0.001982208	0.001982208
	1060.1	1060.1	1060.1	1060.1	1060.1	1060.1	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884
	784.1	#DIV/0!	2224.3	784.1	784.1	784.1	0.001982123	0	0.000660093	0.001982208	0.001982208	0.001982208

Application of HON TRE to SAN Emission Streams

Stream ID	Total Capital Cost ($) Based AN	Total Annual Cost ($/yr) Based AN	Cost Effectiveness ($/Mg removed) Based AN	Control Device Based AN	% Heat Recovery Based AN	Total Capital Cost ($) Based EB	Total Annual Cost ($/yr) Based EB	Cost Effectiveness ($/Mg removed) Based EB	Control Device Based EB	% Heat Recovery Based EB	Total Capital Cost ($) Based Sty	Total Annual Cost ($/yr) Based Sty
						30166	16522	9367	Flare		30166	40769
	30166	26403	16137	Flare		30166	26403	16137	Flare		30166	26403
											30166	40781
Reactor Condenser Seal Pot												
Product Stranding Extruders												
Reactor Process Equipment												

Application of HON TRE to SAN Emission Streams

Stream ID	Cost Effectiveness ($/Mg removed) Based Sty	Control Device Based Sty	% Heat Recovery Based Sty	Total Capital Cost ($) Based MA	Total Annual Cost ($/yr) Based MA	Cost Effectiveness ($/Mg removed) Based MA	Control Device Based MA	% Heat Recovery Based MA	Total Capital Cost ($) Based MEK	Total Annual Cost ($/yr) Based MEK	Cost Effectiveness ($/Mg removed) Based MEK	Control Device Based MEK	% Heat Recovery Based I
	23163	Flare											
	16137	Flare											
	23170	Flare											
Reactor Condenser Seal Pot													
Product Stranding Extruders													
Reactor Process Equipment													

Application of HON TRE to SAN Emission Streams

Stream ID	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery
	Based MMA	Based MMA	Based MMA	Based MMA	Based MMA
Reactor Condenser Seal Pot					
Product Stranding Extruders					
Reactor Process Equipment					

Stream ID	Emissions (lbs/yr)						Frequency (HRS/YR) BASED ON EACH COMPOUND					
	AN	EB	STY	MA	MEX	MMA	AN	EB	STY	MA	MEX	MMA
	2	2	2	2	2	2	6055	6055	6055	6055	6055	6055
	2	2	2	2	2	2	8400	8400	8400	8400	8400	8400
	2	2	2	2	2	2	6055.251916	80696.66965		6055	6055	6055
	2	2	2	2	2	2	6055	6055	6055	6055	6055	6055
	2	2	2	2	2	2	8400	8400	8400	8400	8400	8400
	2	2	2	2	2	2	6055.251916			6055	6055	6055
	2	2	2	2	2	2	6055	6055	6055	6055	6055	6055
	2	2	2	2	2	2	8400	8400	8400	8400	8400	8400
	2	2	2	2	2	2	96684.03066	80696.66965	17626.27094	8760	8760	8760
	2	2	2	2	2	2	8400	8400	8400	8400	8400	8400
	2	2	2	2	2	2	8760	8760	8760	8760	8760	8760
	2	2	2	2	2	2	96684.03066		17626.27094	8760	8760	8760
	2	2	2	2	2	2	8400	8400	8400	8400	8400	8400
	2	2	2	2	2	2	8760	8760	8760	8760	8760	8760
	2	2	2	2	2	2	96684.03066	80696.66965		8760	8760	8760
	2	2	2	2	2	2	8400	8400	8400	8400	8400	8400
	2	2	2	2	2	2	8760	8760	8760	8760	8760	8760
	2	2	2	2	2	2	96684.03066			8760	8760	8760
	2	2	2	2	2	2	8400	8400	8400	8400	8400	8400
	2	2	2	2	2	2	8760	8760	8760	8760	8760	8760
Reactor Fugitive Vent	2460	100	2780	2	2	120	1841.594307	783.2262773	1156.534221	60.15605552	955	955
	2460	100	2780	2	2	120	955	955	955	955	955	955
	2460	100	2780	2	2	120	8400	8400	8400	8400	8400	8400
	2460	100	2780	2	2	120	1841.594307	1526.456555	1156.534221	60.15605552	1145	1145
	2460	100	2780	2	2	120	1145	1145	1145	1145	1145	1145
	2460	100	2780	2	2	120	8400	8400	8400	8400	8400	8400
	2460	100	2780	2	2	120	1841.594307	783.2262773	1590.234554	60.15605552	1060	1060
	2460	100	2780	2	2	120	1060	1060	1060	1060	1060	1060
	2460	100	2780	2	2	120	8400	8400	8400	8400	8400	8400
	2460	100	2780	2	2	120	1841.594307	1526.456555	1590.234554	60.15605552	1250	1250
	2460	100	2780	2	2	120	1250	1250	1250	1250	1250	1250
	2460	100	2780	2	2	120	8400	8400	8400	8400	8400	8400
	2460	100	2780	2	2	120	1841.594307	783.2262773	1156.534221	#DIV/0!	1254	1254
	2460	100	2780	2	2	120	1254	1254	1254	1254	1254	1254
	2460	100	2780	2	2	120	8400	8400	8400	8400	8400	8400
	2460	100	2780	2	2	120	1841.594307	1526.456555	1156.534221	#DIV/0!	1510	1510
	2460	100	2780	2	2	120	1510	1510	1510	1510	1510	1510
	2460	100	2780	2	2	120	8400	8400	8400	8400	8400	8400
	2460	100	2780	2	2	120	1841.594307	783.2262773	1590.234554	#DIV/0!	1400	1400
	2460	100	2780	2	2	120	1400	1400	1400	1400	1400	1400
	2460	100	2780	2	2	120	8400	8400	8400	8400	8400	8400
	2460	100	2780	2	2	120	1841.594307	1526.456555	1590.234554	#DIV/0!	1655	1655
	2460	100	2780	2	2	120	1655	1655	1655	1655	1655	1655
	2460	100	2780	2	2	120	8400	8400	8400	8400	8400	8400
	2460	100	2780	2	2	120	2467.981713	783.2262773	1156.534221	60.15605552	1115	1115
	2460	100	2780	2	2	120	1115	1115	1115	1115	1115	1115
	2460	100	2780	2	2	120	8400	8400	8400	8400	8400	8400
	2460	100	2780	2	2	120	2467.981713	1526.456555	1156.534221	60.15605552	1305	1305
	2460	100	2780	2	2	120	1305	1305	1305	1305	1305	1305
	2460	100	2780	2	2	120	8400	8400	8400	8400	8400	8400
	2460	100	2780	2	2	120	2467.981713	783.2262773	1590.234554	60.15605552	1225	1225
	2460	100	2780	2	2	120	1225	1225	1225	1225	1225	1225
	2460	100	2780	2	2	120	8400	8400	8400	8400	8400	8400
	2460	100	2780	2	2	120	2467.981713	1526.456555	1590.234554	60.15605552	1415	1415
	2460	100	2780	2	2	120	1415	1415	1415	1415	1415	1415
	2460	100	2780	2	2	120	8400	8400	8400	8400	8400	8400
	2460	100	2780	2	2	120	2467.981713	783.2262773	1156.534221	#DIV/0!	1470	1470
	2460	100	2780	2	2	120	1470	1470	1470	1470	1470	1470
	2460	100	2780	2	2	120	8400	8400	8400	8400	8400	8400
	2460	100	2780	2	2	120	2467.981713	1526.456555	1156.534221	#DIV/0!	1725	1725

Stream ID	FLARE TRE BASED ON DIFFERENT HRS/YR						TI 0% BASED ON DIFFERENT HRS/YR					
	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR
	588.4	#DIV/0!	588.4	588.4	588.4	588.4	453.0	#DIV/0!	453.0	453.0	453.0	453.0
	816.3	#DIV/0!	816.3	816.3	816.3	816.3	628.4	#DIV/0!	628.4	628.4	628.4	628.4
	588.5	7842.6	#DIV/0!	588.4	588.4	588.4	452.9	6036.1	#DIV/0!	452.9	452.9	452.9
	588.4	588.4	588.4	588.4	588.4	588.4	453.0	453.0	453.0	453.0	453.0	453.0
	816.3	816.3	816.3	816.3	816.3	816.3	628.4	628.4	628.4	628.4	628.4	628.4
	588.5	#DIV/0!	#DIV/0!	588.4	588.4	588.4	452.9	#DIV/0!	#DIV/0!	452.9	452.9	452.9
	588.4	588.4	588.4	588.4	588.4	588.4	453.0	453.0	453.0	453.0	453.0	453.0
	816.3	816.3	816.3	816.3	816.3	816.3	628.4	628.4	628.4	628.4	628.4	628.4
	9415.7	7842.7	1713.0	851.3	851.3	851.3	7246.0	6035.5	1318.3	655.2	655.2	655.2
	816.3	816.3	816.3	816.3	816.3	816.3	628.4	628.4	628.4	628.4	628.4	628.4
	851.3	851.3	851.3	851.3	851.3	851.3	655.3	655.3	655.3	655.3	655.3	655.3
	9415.7	#DIV/0!	1713.0	851.3	851.3	851.3	7246.0	#DIV/0!	1318.3	655.2	655.2	655.2
	816.3	816.3	816.3	816.3	816.3	816.3	628.4	628.4	628.4	628.4	628.4	628.4
	851.3	851.3	851.3	851.3	851.3	851.3	655.3	655.3	655.3	655.3	655.3	655.3
	9415.6	7842.6	#DIV/0!	851.4	851.4	851.4	7245.7	6035.2	#DIV/0!	655.1	655.1	655.1
	816.3	816.3	816.3	816.3	816.3	816.3	628.4	628.4	628.4	628.4	628.4	628.4
	851.3	851.3	851.3	851.3	851.3	851.3	655.3	655.3	655.3	655.3	655.3	655.3
	9415.6	#DIV/0!	#DIV/0!	851.4	851.4	851.4	7245.6	#DIV/0!	#DIV/0!	655.1	655.1	655.1
	816.3	816.3	816.3	816.3	816.3	816.3	628.4	628.4	628.4	628.4	628.4	628.4
	851.3	851.3	851.3	851.3	851.3	851.3	655.3	655.3	655.3	655.3	655.3	655.3
Reactor Fugitive Vent	2.1	0.9	1.3	0.1	1.1	1.1	0.6	0.2	0.4	0.0	0.3	0.3
	1.1	1.1	1.1	1.1	1.1	1.1	0.3	0.3	0.3	0.3	0.3	0.3
	9.4	9.4	9.4	9.4	9.4	9.4	2.7	2.7	2.7	2.7	2.7	2.7
	2.1	1.7	1.3	0.1	1.3	1.3	0.6	0.5	0.4	0.0	0.4	0.4
	1.3	1.3	1.3	1.3	1.3	1.3	0.4	0.4	0.4	0.4	0.4	0.4
	9.4	9.4	9.4	9.4	9.4	9.4	2.7	2.7	2.7	2.7	2.7	2.7
	2.1	0.9	1.8	0.1	1.2	1.2	0.6	0.2	0.5	0.0	0.3	0.3
	1.2	1.2	1.2	1.2	1.2	1.2	0.3	0.3	0.3	0.3	0.3	0.3
	9.4	9.4	9.4	9.4	9.4	9.4	2.7	2.7	2.7	2.7	2.7	2.7
	2.1	1.7	1.8	0.1	1.4	1.4	0.6	0.5	0.5	0.0	0.4	0.4
	1.4	1.4	1.4	1.4	1.4	1.4	0.4	0.4	0.4	0.4	0.4	0.4
	9.4	9.4	9.4	9.4	9.4	9.4	2.7	2.7	2.7	2.7	2.7	2.7
	2.1	0.9	1.3	#DIV/0!	1.4	1.4	0.6	0.2	0.4	#DIV/0!	0.4	0.4
	1.4	1.4	1.4	1.4	1.4	1.4	0.4	0.4	0.4	0.4	0.4	0.4
	9.4	9.4	9.4	9.4	9.4	9.4	2.7	2.7	2.7	2.7	2.7	2.7
	2.1	1.7	1.3	#DIV/0!	1.7	1.7	0.6	0.5	0.4	#DIV/0!	0.5	0.5
	1.7	1.7	1.7	1.7	1.7	1.7	0.5	0.5	0.5	0.6	0.5	0.5
	9.4	9.4	9.4	9.4	9.4	9.4	2.7	2.7	2.7	2.7	2.7	2.7
	2.1	0.9	1.8	#DIV/0!	1.6	1.6	0.6	0.2	0.5	#DIV/0!	0.4	0.4
	1.6	1.6	1.6	1.6	1.6	1.6	0.4	0.4	0.4	0.4	0.4	0.4
	9.4	9.4	9.4	9.4	9.4	9.4	2.7	2.7	2.7	2.7	2.7	2.7
	2.1	1.7	1.8	#DIV/0!	1.8	1.8	0.6	0.5	0.5	#DIV/0!	0.6	0.5
	1.8	1.8	1.8	1.8	1.8	1.8	0.5	0.5	0.5	0.5	0.5	0.5
	9.4	9.4	9.4	9.4	9.4	9.4	2.7	2.7	2.7	2.7	2.7	2.7
	2.8	0.9	1.3	0.1	1.2	1.2	0.8	0.2	0.4	0.016	0.4	0.4
	1.2	1.2	1.2	1.2	1.2	1.2	0.4	0.4	0.4	0.4	0.4	0.4
	9.4	9.4	9.4	9.4	9.4	9.4	2.7	2.7	2.7	2.7	2.7	2.7
	2.8	1.7	1.3	0.1	1.5	1.5	0.8	0.5	0.4	0.0	0.4	0.4
	1.5	1.5	1.5	1.5	1.5	1.5	0.4	0.4	0.4	0.4	0.4	0.4
	9.4	9.4	9.4	9.4	9.4	9.4	2.7	2.7	2.7	2.7	2.7	2.7
	2.8	0.9	1.8	0.1	1.4	1.4	0.8	0.2	0.5	0.0	0.4	0.4
	1.4	1.4	1.4	1.4	1.4	1.4	0.4	0.4	0.4	0.4	0.4	0.4
	9.4	9.4	9.4	9.4	9.4	9.4	2.7	2.7	2.7	2.7	2.7	2.7
	2.8	1.7	1.8	0.1	1.6	1.6	0.8	0.5	0.5	0.016	0.5	0.5
	1.6	1.6	1.6	1.6	1.6	1.6	0.5	0.5	0.5	0.5	0.5	0.5
	9.4	9.4	9.4	9.4	9.4	9.4	2.7	2.7	2.7	2.7	2.7	2.7
	2.8	0.9	1.3	#DIV/0!	1.6	1.6	0.8	0.2	0.4	#DIV/0!	0.5	0.5
	1.6	1.6	1.6	1.6	1.6	1.6	0.5	0.5	0.5	0.5	0.5	0.5
	9.4	9.4	9.4	9.4	9.4	9.4	2.7	2.7	2.7	2.7	2.7	2.7
	2.8	1.7	1.3	#DIV/0!	1.9	1.9	0.8	0.5	0.4	#DIV/0!	0.6	0.6

Stream ID	TI 70% TRE BASED ON DIFFERENT HRS/YR						TOTAL HAP FLOW RATE (LBS/HR) BASED ON COMPONENT					
	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN	EB	STY	MA	MEK	MMA
	764.2	#DIV/0!	764.2	764.2	764.2	764.2	0.001982206	0	0.001982206	0.001982206	0.001982206	0.001982206
	1060.1	#DIV/0!	1060.1	1060.1	1060.1	1060.1	0.00142884	0	0.00142884	0.00142884	0.00142884	0.00142884
	764.1	10183.5	#DIV/0!	764.1	764.1	764.1	0.001982123	0.000148729	#DIV/0!	0.001982206	0.001982206	0.001982206
	764.2	764.2	764.2	764.2	764.2	764.2	0.001982206	0.001982206	0.001982206	0.001982206	0.001982206	0.001982206
	1060.1	1060.1	1060.1	1060.1	1060.1	1060.1	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884
	764.1	#DIV/0!	#DIV/0!	764.1	764.1	764.1	0.001982123	#DIV/0!	#DIV/0!	0.001982206	0.001982206	0.001982206
	764.2	764.2	764.2	764.2	764.2	764.2	0.001982206	0.001982206	0.001982206	0.001982206	0.001982206	0.001982206
	1060.1	1060.1	1060.1	1060.1	1060.1	1060.1	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884
	12225.7	10183.3	2224.2	1105.4	1105.4	1105.4	0.000123883	0.000148729	0.00068093	0.001370121	0.001370121	0.001370121
	1060.1	1060.1	1060.1	1060.1	1060.1	1060.1	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884
	1105.5	1105.5	1105.5	1105.5	1105.5	1105.5	0.001370121	0.001370121	0.001370121	0.001370121	0.001370121	0.001370121
	12225.6	#DIV/0!	2224.2	1105.4	1105.4	1105.4	0.000123883	#DIV/0!	0.00068093	0.001370121	0.001370121	0.001370121
	1060.1	1060.1	1060.1	1060.1	1060.1	1060.1	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884
	1105.5	1105.5	1105.5	1105.5	1105.5	1105.5	0.001370121	0.001370121	0.001370121	0.001370121	0.001370121	0.001370121
	12225.5	10183.1	#DIV/0!	1105.4	1105.4	1105.4	0.000123883	0.000148729	#DIV/0!	0.001370121	0.001370121	0.001370121
	1060.1	1060.1	1060.1	1060.1	1060.1	1060.1	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884
	1105.5	1105.5	1105.5	1105.5	1105.5	1105.5	0.001370121	0.001370121	0.001370121	0.001370121	0.001370121	0.001370121
	12225.5	#DIV/0!	#DIV/0!	1105.4	1105.4	1105.4	0.000123883	#DIV/0!	#DIV/0!	0.001370121	0.001370121	0.001370121
	1060.1	1060.1	1060.1	1060.1	1060.1	1060.1	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884	0.00142884
	1105.5	1105.5	1105.5	1105.5	1105.5	1105.5	0.001370121	0.001370121	0.001370121	0.001370121	0.001370121	0.001370121
Reactor Fugitive Vent	0.6	0.2	0.4	0.0	0.3	0.3	2.967552197	7.160409795	4.725348486	108.960467	5.722541604	5.722541604
	0.3	0.3	0.3	0.3	0.3	0.3	5.722541604	5.722541604	5.722541604	5.722541604	5.722541604	5.722541604
	2.6	2.6	2.6	2.6	2.6	2.6	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
	0.6	0.5	0.4	0.0	0.4	0.4	2.967552197	3.560204897	4.725348486	108.960467	4.772949548	4.772949548
	0.4	0.4	0.4	0.4	0.4	0.4	4.772949548	4.772949548	4.772949548	4.772949548	4.772949548	4.772949548
	2.6	2.6	2.6	2.6	2.6	2.6	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
	0.6	0.2	0.5	0.0	0.3	0.3	2.967552197	7.160409795	3.436617061	108.960467	5.155666066	5.155666066
	0.3	0.3	0.3	0.3	0.3	0.3	5.155666066	5.155666066	5.155666066	5.155666066	5.155666066	5.155666066
	2.6	2.6	2.6	2.6	2.6	2.6	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
	0.6	0.5	0.5	0.0	0.4	0.4	2.967552197	3.560204897	3.436617061	108.960467	4.372021786	4.372021786
	0.4	0.4	0.4	0.4	0.4	0.4	4.372021786	4.372021786	4.372021786	4.372021786	4.372021786	4.372021786
	2.6	2.6	2.6	2.6	2.6	2.6	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
	0.6	0.2	0.4	#DIV/0!	0.4	0.4	2.967552197	7.160409795	4.725348486	#DIV/0!	4.356075943	4.356075943
	0.4	0.4	0.4	0.4	0.4	0.4	4.356075943	4.356075943	4.356075943	4.356075943	4.356075943	4.356075943
	2.6	2.6	2.6	2.6	2.6	2.6	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
	0.6	0.5	0.4	#DIV/0!	0.5	0.5	2.967552197	3.560204897	4.725348486	#DIV/0!	3.619223332	3.619223332
	0.5	0.5	0.5	0.5	0.5	0.5	3.619223332	3.619223332	3.619223332	3.619223332	3.619223332	3.619223332
	2.6	2.6	2.6	2.6	2.6	2.6	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
	0.6	0.2	0.5	#DIV/0!	0.4	0.4	2.967552197	7.160409795	3.436617061	#DIV/0!	3.90359066	3.90359066
	0.4	0.4	0.4	0.4	0.4	0.4	3.90359066	3.90359066	3.90359066	3.90359066	3.90359066	3.90359066
	2.6	2.6	2.6	2.6	2.6	2.6	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
	0.6	0.5	0.5	#DIV/0!	0.5	0.5	2.967552197	3.560204897	3.436617061	#DIV/0!	3.302131256	3.302131256
	0.5	0.5	0.5	0.5	0.5	0.5	3.302131256	3.302131256	3.302131256	3.302131256	3.302131256	3.302131256
	2.6	2.6	2.6	2.6	2.6	2.6	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
	0.8	0.2	0.4	0.0	0.4	0.4	2.198570499	7.160409795	4.725348486	108.960467	4.901369715	4.901369715
	0.4	0.4	0.4	0.4	0.4	0.4	4.901369715	4.901369715	4.901369715	4.901369715	4.901369715	4.901369715
	2.6	2.6	2.6	2.6	2.6	2.6	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
	0.8	0.5	0.4	0.0	0.4	0.4	2.198570499	3.560204897	4.725348486	108.960467	4.187760331	4.187760331
	0.4	0.4	0.4	0.4	0.4	0.4	4.187760331	4.187760331	4.187760331	4.187760331	4.187760331	4.187760331
	2.6	2.6	2.6	2.6	2.6	2.6	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
	0.8	0.2	0.5	0.0	0.4	0.4	2.198570499	7.160409795	3.436617061	108.960467	4.46124672	4.46124672
	0.4	0.4	0.4	0.4	0.4	0.4	4.46124672	4.46124672	4.46124672	4.46124672	4.46124672	4.46124672
	2.6	2.6	2.6	2.6	2.6	2.6	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
	0.8	0.5	0.5	0.0	0.4	0.4	2.198570499	3.560204897	3.436617061	108.960467	3.862210058	3.862210058
	0.4	0.4	0.4	0.4	0.4	0.4	3.862210058	3.862210058	3.862210058	3.862210058	3.862210058	3.862210058
	2.6	2.6	2.6	2.6	2.6	2.6	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
	0.8	0.2	0.4	#DIV/0!	0.5	0.5	2.198570499	7.160409795	4.725348486	#DIV/0!	3.7177056	3.7177056
	0.5	0.5	0.5	0.5	0.5	0.5	3.7177056	3.7177056	3.7177056	3.7177056	3.7177056	3.7177056
	2.6	2.6	2.6	2.6	2.6	2.6	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848	0.65059848
	0.8	0.5	0.4	#DIV/0!	0.5	0.5	2.198570499	3.560204897	4.725348486	#DIV/0!	3.168131729	3.168131729

Application of HON TRE to SAN Emission Streams

Stream ID	Total Capital Cost ($) Based AN	Total Annual Cost ($/yr) Based AN	Cost Effectiveness ($/Mg removed) Based AN	Control Device Based AN	% Heat Recovery Based AN	Total Capital Cost ($) Based EB	Total Annual Cost ($/yr) Based EB	Cost Effectiveness ($/Mg removed) Based EB	Control Device Based EB	% Heat Recovery Based EB	Total Capital Cost ($) Based Sty	Total Annual Cost ($/yr) Based Sty
Reactor Fugitive Vent	80275	42175	17374	Thermal Incin	0	80275	27004	11133	Thermal Incin	0	80275	32529
	80263	29591	12195	Thermal Incin	0	80263	29591	12195	Thermal Incin	0	80263	29591
	80277	42211	17369	Thermal Incin	0	80277	37762	15569	Thermal Incin	0	80277	32552
	80271	32330	13324	Thermal Incin	0	80271	32330	13324	Thermal Incin	0	80271	32330
	80281	42263	17418	Thermal Incin	0	80281	27049	11152	Thermal Incin	0	80281	36725
	80269	31117	12824	Thermal Incin	0	80269	31117	12824	Thermal Incin	0	80269	31117
	80281	42263	17418	Thermal Incin	0	80281	37822	15593	Thermal Incin	0	80281	36725
	80273	33827	13941	Thermal Incin	0	80273	33827	13941	Thermal Incin	0	80273	33827
	80277	42211	17369	Thermal Incin	0	80277	27019	11140	Thermal Incin	0	80277	32552
	80275	33906	13974	Thermal Incin	0	80275	33906	13974	Thermal Incin	0	80275	33906
	80277	42211	17369	Thermal Incin	0	80277	37762	15569	Thermal Incin	0	80277	32552
	80279	37566	15482	Thermal Incin	0	80279	37566	15482	Thermal Incin	0	80279	37566
	80281	42263	17418	Thermal Incin	0	80281	27049	11152	Thermal Incin	0	80281	36725
	80277	35988	14831	Thermal Incin	0	80277	35988	14831	Thermal Incin	0	80277	35988
	80284	42319	17433	Thermal Incin	0	80284	37851	15605	Thermal Incin	0	80284	36756
	80284	39675	16351	Thermal Incin	0	80284	39675	16351	Thermal Incin	0	80284	39675
	80277	51306	2114	Thermal Incin	0	80277	27019	11140	Thermal Incin	0	80277	32552
	80269	31887	13141	Thermal Incin	0	80269	31887	13141	Thermal Incin	0	80269	31887
	80279	51365	21164	Thermal Incin	0	80279	37792	15581	Thermal Incin	0	80279	32576
	80275	34624	14269	Thermal Incin	0	80275	34624	14269	Thermal Incin	0	80275	34624
	80284	51451	21204	Thermal Incin	0	80284	27084	11159	Thermal Incin	0	80284	36756
	80273	33475	13796	Thermal Incin	0	80273	33475	13796	Thermal Incin	0	80273	33475
	80284	51451	21204	Thermal Incin	0	80284	37851	15605	Thermal Incin	0	80284	36756
	80277	36196	14918	Thermal Incin	0	80277	36196	14918	Thermal Incin	0	80277	36196
	80279	51355	21164	Thermal Incin	0	80279	27034	11146	Thermal Incin	0	80279	32575
	80279	37002	15249	Thermal Incin	0	80279	37002	15249	Thermal Incin	0	80279	37002
	80279	51355	21164	Thermal Incin	0	80279	37792	15581	Thermal Incin	0	80279	32575

Stream ID	Cost Effectiveness ($/Mg removed) Based Sty	Control Device Based Sty	% Heat Recovery Based Sty	Total Capital Cost ($) Based MA	Total Annual Cost ($/yr) Based MA	Cost Effectiveness ($/Mg removed) Based MA	Control Device Based MA	% Heat Recovery Based MA	Total Capital Cost ($) Based MEK	Total Annual Cost ($/yr) Based MEK	Cost Effectiveness ($/Mg removed) Based MEK	Control Device Based MEK	% Heat Recovery Based MEK
Reactor Fugitive Vent	13411	Thermal Incin	0	80275	16978	7017	Thermal Incin	0	80275	28704	12242	Thermal Incin	
	12195	Thermal Incin	0	80263	29591	12195	Thermal Incin	0	80263	29591	12195	Thermal Incin	
	13421	Thermal Incin	0	80277	16980	7018	Thermal Incin	0	80277	32398	13352	Thermal Incin	
	13324	Thermal Incin	0	80271	32330	13324	Thermal Incin	0	80271	32330	13324	Thermal Incin	
	15959	Thermal Incin	0	80281	16983	7019	Thermal Incin	0	80281	31242	12875	Thermal Incin	
	12824	Thermal Incin	0	80269	31117	12824	Thermal Incin	0	80269	31117	12824	Thermal Incin	
	15959	Thermal Incin	0	80281	16983	7019	Thermal Incin	0	80281	33925	13961	Thermal Incin	
	13941	Thermal Incin	0	80273	33827	13941	Thermal Incin	0	80273	33827	13941	Thermal Incin	
	13421	Thermal Incin	0						80277	33932	13984	Thermal Incin	
	13974	Thermal Incin	0	80275	33908	13974	Thermal Incin	0	80275	33908	13974	Thermal Incin	
	13421	Thermal Incin	0						80277	37538	15469	Thermal Incin	
	15462	Thermal Incin	0	80276	37566	15462	Thermal Incin	0	80276	37566	15462	Thermal Incin	
	15959	Thermal Incin	0						80281	36043	14854	Thermal Incin	
	14831	Thermal Incin	0	80277	35988	14831	Thermal Incin	0	80277	35988	14831	Thermal Incin	
	15836	Thermal Incin	0						80284	39675	13651	Thermal Incin	
	16351	Thermal Incin	0	80284	39675	16351	Thermal Incin	0	80284	39675	16351	Thermal Incin	
	13421	Thermal Incin	0	80277	16980	7018	Thermal Incin	0	80277	31976	13177	Thermal Incin	
	13141	Thermal Incin	0	80269	31887	13141	Thermal Incin	0	80269	31887	13141	Thermal Incin	
	13430	Thermal Incin	0	80279	16981	7018	Thermal Incin	0	80279	34675	14290	Thermal Incin	
	14269	Thermal Incin	0	80275	34624	14269	Thermal Incin	0	80275	34624	14269	Thermal Incin	
	15972	Thermal Incin	0	80284	16984	7019	Thermal Incin	0	80284	33596	13846	Thermal Incin	
	13796	Thermal Incin	0	80275	33475	13796	Thermal Incin	0	80275	33475	13796	Thermal Incin	
	15972	Thermal Incin	0	80284	16984	7019	Thermal Incin	0	80284	36281	14952	Thermal Incin	
	14918	Thermal Incin	0	80277	36198	14918	Thermal Incin	0	80277	36198	14918	Thermal Incin	
	13430	Thermal Incin	0						80279	37002	15249	Thermal Incin	
	15249	Thermal Incin	0	80279	37002	15249	Thermal Incin	0	80279	37002	15249	Thermal Incin	
	13430	Thermal Incin	0						80279	40597	16731	Thermal Incin	

Application of HON TRE to SAN Emission Streams

Stream ID	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery
	Based MMA	Based MMA	Based MMA	Based MMA	Based MMA
Reactor Fugitive Vent	80276	29704	12242	Thermal Incin	0
	80263	29591	12195	Thermal Incin	0
	80277	32396	13352	Thermal Incin	0
	80271	32330	13324	Thermal Incin	0
	80281	31242	12876	Thermal Incin	0
	80269	31117	12824	Thermal Incin	0
	80281	33925	13981	Thermal Incin	0
	80273	33827	13941	Thermal Incin	0
	80277	33932	13984	Thermal Incin	0
	80275	33908	13974	Thermal Incin	0
	80277	37536	15469	Thermal Incin	0
	80279	37566	15482	Thermal Incin	0
	80281	36043	14854	Thermal Incin	0
	80277	35988	14831	Thermal Incin	0
	80284	39676	16351	Thermal Incin	0
	80284	39676	16351	Thermal Incin	0
	80277	31976	13177	Thermal Incin	0
	80269	31887	13141	Thermal Incin	0
	80279	34676	14290	Thermal Incin	0
	80275	34624	14269	Thermal Incin	0
	80284	33595	13845	Thermal Incin	0
	80273	33475	13796	Thermal Incin	0
	80284	36261	14952	Thermal Incin	0
	80277	36198	14918	Thermal Incin	0
	80279	37002	15249	Thermal Incin	0
	80279	37002	15249	Thermal Incin	0
	80279	40597	16731	Thermal Incin	0

Application of HON TRE to SAN Emission Streams

7/21/94

Stream ID	Emissions (lbs/yr) AN	EB	STY	MA	MEK	MMA	Frequency (HRS/YR) BASED ON EACH COMPOUND AN	EB	STY	MA	MEK	MMA
	2460	100	2780	2	2	120	1725	1725	1725	1725	1725	1725
	2460	100	2780	2	2	120	8400	8400	8400	8400	8400	8400
	2460	100	2780	2	2	120	2467.961713	763.2262773	1590.234554	#DIV/0!	1615	1615
	2460	100	2780	2	2	120	1615	1615	1615	1615	1615	1615
	2460	100	2780	2	2	120	8400	8400	8400	8400	8400	8400
	2460	100	2780	2	2	120	2467.961713	1526.456555	1590.234554	#DIV/0!	1870	1870
	2460	100	2780	2	2	120	1870	1870	1870	1870	1870	1870
	2460	100	2780	2	2	120	8400	8400	8400	8400	8400	8400
Die Exhaust Control	19.8	327	455				6526	6526	6526			
	19.8	327	455				6526	6526	6526			
Pelletizing	13.35	27.51	28.7				6526	6526	6526			
	13.35	27.51	28.7				6526	6526	6526			
Finishing	11.7	12.5	12.28				6526	6526	6526			
	11.7	12.5	12.28				6526	6526	6526			
	11.7	12.5	12.28				6526	6526	6526			
Initiator Mixing		15.6						3075				
		15.6						3075				
Devolatilization-Vacuum System	28	1.36	56.1				6526	6526	6526			
	28	1.36	56.1				6526	6526	6526			
	28	1.36	56.1				6526	6526	6526			
	28	1.36	56.1				282.2837539	481.5983131	641.2274516			
	28	1.36	56.1				460	460	460			
	28	1.36	56.1				460	460	460			
	0.028	0.086	56.1				6526	6526	6526			
	0.028	0.086	56.1				6526	6526	6526			
	0.028	0.086	56.1				6526	6526	6526			
	0.028	0.086	56.1				282.2837539	481.5983131	641.2274516			
	0.028	0.086	56.1				470	470	470			
	0.028	0.086	56.1				470	470	470			
201 mix tank	1.65		0.19				222.5		222.5			
201 asa reactor	2.2		3.72				8010		8010			
210 amsan reactor	61.7		20.3				8010		8010			
301 water recovery	6.65		3.32				2670		2670			
302 Water Suspension Reactor	3.97		0.1				2670		2670			
306 Water Recovery	0.0057						222.5					
403 Water Recovery			0.001						8400			
304 Recovered Scrubber Material Rec	0.088		0.097				8400		8400			
404 Dewatering & separation			0.145						8400			
Extruder MeOH & sty	102		60				8400		8400			
	102		60				0.011667193		0.015461407			
	102		60				8400		8400			
	102		60				8082.90842		10728.36292			
	102		60				8400		8400			
	102		60				0.302159962		0.387349101			
Dryer MeOH & Sty	3130		1384				8400		8400			
	3130		1384				0.450085663		0.357104466			
	3130		1384				8661.866667		6872.44917			
	3130		1384				8400		8400			
	3130		1384				8400		8400			

Application of HON TRE to SAN Emission Streams

7/21/94

Stream ID	FLARE TRE BASED ON DIFFERENT HRS/YR						TI 0% BASED ON DIFFERENT HRS/YR					
	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR
	1.9	1.9	1.9	1.9	1.9	1.9	0.6	0.6	0.6	0.6	0.6	0.6
	9.4	9.4	9.4	9.4	9.4	9.4	2.7	2.7	2.7	2.7	2.7	2.7
	2.8	0.9	1.8	#DIV/0!	1.8	1.8	0.8	0.2	0.5	#DIV/0!	0.5	0.5
	1.8	1.8	1.8	1.8	1.8	1.8	0.5	0.6	0.5	0.6	0.5	0.5
	9.4	9.4	9.4	9.4	9.4	9.4	2.7	2.7	2.7	2.7	2.7	2.7
	2.8	1.7	1.8	#DIV/0!	2.1	2.1	0.8	0.5	0.5	#DIV/0!	0.6	0.6
	2.1	2.1	2.1	2.1	2.1	2.1	0.8	0.8	0.8	0.6	0.6	0.6
	9.4	9.4	9.4	9.4	9.4	9.4	2.7	2.7	2.7	2.7	2.7	2.7
Die Exhaust Control	198.5	198.5	198.5				39.4	39.4	39.4			
	198.5	198.5	198.5				39.4	39.4	39.4			
Pelletizing	1638.3	1638.3	1638.3				348.1	348.1	348.1			
	1638.3	1638.3	1638.3				348.1	348.1	348.1			
Finishing	1510.8	1510.8	1510.8				383.8	383.8	383.8			
	1510.8	1510.8	1510.8				383.8	383.8	383.8			
	1510.8	1510.8	1510.8				383.8	383.8	383.8			
Initiator Mixing	#DIV/0!	231.0	#DIV/0!				#DIV/0!	177.1	#DIV/0!			
	#DIV/0!	230.9	#DIV/0!				#DIV/0!	177.2	#DIV/0!			
Devolatilization-Vacuum System	91.4	91.4	91.4				70.4	70.4	70.4			
	90.7	90.7	90.7				73.3	73.3	73.3			
	91.4	91.4	91.4				70.4	70.4	70.4			
	3.9	6.7	8.9				3.2	5.4	7.2			
	6.4	6.4	6.4				5.2	5.2	5.2			
	6.4	6.4	6.4				5.2	5.2	5.2			
	135.8	135.8	135.8				104.3	104.3	104.3			
	135.2	135.2	135.2				108.7	108.7	108.7			
	135.7	135.7	135.7				104.5	104.6	104.6			
	5.8	10.0	13.3				4.6	7.9	10.5			
	9.7	9.7	9.7				7.7	7.7	7.7			
	9.7	9.7	9.7				7.7	7.7	7.7			
	#DIV/0!		#DIV/0!				#DIV/0!		#DIV/0!			
201 mix tank	58.5		58.5				458.3		458.3			
	#DIV/0!		#DIV/0!				#DIV/0!		#DIV/0!			
201 asa reactor	980.8		980.8				3884.4		3884.4			
	#DIV/0!		#DIV/0!				#DIV/0!		#DIV/0!			
210 amsan reactor	68.2		68.2				275.2		275.2			
	#DIV/0!		#DIV/0!				#DIV/0!		#DIV/0!			
301 water recovery	178.7		178.7				812.7		812.7			
	#DIV/0!		#DIV/0!				#DIV/0!		#DIV/0!			
302 Water Suspension Reactor	833.0		833.0				1539.1		1539.1			
	#DIV/0!		#DIV/0!				#DIV/0!		#DIV/0!			
306 Water Recovery	32173.5		#DIV/0!				89893.9		#DIV/0!			
	#DIV/0!		#DIV/0!				#DIV/0!		#DIV/0!			
403 Water Recovery	#DIV/0!		2700448.3				#DIV/0!		36757477.0			
	#DIV/0!		#DIV/0!				#DIV/0!		#DIV/0!			
304 Recovered Scrubber Material Rec	25707.9		25707.9				152761.3		152761.3			
	#DIV/0!		#DIV/0!				#DIV/0!		#DIV/0!			
404 Dewatering & separation	#DIV/0!		18623.8				#DIV/0!		253499.6			
	#DIV/0!		#DIV/0!				#DIV/0!		#DIV/0!			
Extruder MeOH & sty	893.3		893.3				201.2		201.2			
	0.0		0.0				0.0		0.0			
	704.0		704.0				158.8		158.8			
	47.7		63.3				87.4		116.0			
	48.1		48.1				97.0		97.0			
	0.0		0.0				0.0		0.0			
	#DIV/0!		#DIV/0!				#DIV/0!		#DIV/0!			
Dryer MeOH & Sty	24.9		24.9				7.1		7.1			
	0.0		0.0				0.0		0.0			
	1.9		1.5				3.2		2.6			
	1.8		1.8				3.1		3.1			
	25.3		25.3				5.8		5.8			

Stream ID	TI 70% TRE BASED ON DIFFERENT HRS/YR						TOTAL HAP FLOW RATE (LBS/HR) BASED ON COMPONENT					
	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN	EB	STY	MA	MEK	MMA
	0.5	0.5	0.5	0.5	0.5	0.5	3.166131729	3.166131729	3.166131729	3.166131729	3.166131729	3.166131729
	2.6	2.6	2.6	2.6	2.6	2.6	0.65059648	0.65059648	0.65059648	0.65059648	0.65059648	0.65059648
	0.8	0.2	0.5	#DIV/0!	0.5	0.5	2.196570499	7.160409795	3.436617081	#DIV/0!	3.363917791	3.363917791
	0.5	0.5	0.5	0.5	0.5	0.5	3.363917791	3.363917791	3.363917791	3.363917791	3.363917791	3.363917791
	2.6	2.6	2.6	2.6	2.6	2.6	0.65059648	0.65059648	0.65059648	0.65059648	0.65059648	0.65059648
	0.8	0.5	0.5	#DIV/0!	0.6	0.6	2.196570499	3.580204897	3.436617081	#DIV/0!	2.922474456	2.922474456
	0.6	0.6	0.6	0.6	0.6	0.6	2.922474456	2.922474456	2.922474456	2.922474456	2.922474456	2.922474456
	2.6	2.6	2.6	2.6	2.6	2.6	0.65059648	0.65059648	0.65059648	0.65059648	0.65059648	0.65059648
Die Exhaust Control	18.4	18.4	18.4				0.122817203	0.122817203	0.122817203	0	0	0
	18.4	18.4	18.4				0.122817203	0.122817203	0.122817203	0	0	0
Pelletizing	195.4	195.4	195.4				0.01035121	0.01035121	0.01035121	0	0	0
	195.4	195.4	195.4				0.01035121	0.01035121	0.01035121	0	0	0
Finishing	313.0	313.0	313.0				0.005586222	0.005586222	0.005586222	0	0	0
	313.0	313.0	313.0				0.005586222	0.005586222	0.005586222	0	0	0
	313.0	313.0	313.0				0.005586222	0.005586222	0.005586222	0	0	0
Initiator Mixing	#DIV/0!	298.5	#DIV/0!				#DIV/0!	0.005074124	#DIV/0!	0	0	0
	#DIV/0!	298.6	#DIV/0!				#DIV/0!	0.005074124	#DIV/0!	0	0	0
Devolatilization-Vacuum System	118.5	118.5	118.5				0.01278733	0.01278733	0.01278733	0	0	0
	119.7	119.7	119.7				0.01278733	0.01278733	0.01278733	0	0	0
	118.5	118.5	118.5				0.01278733	0.01278733	0.01278733	0	0	0
	5.2	8.8	11.8				0.295715632	0.173330529	0.130161093	0	0	0
	8.4	8.4	8.4				0.181468892	0.181468892	0.181468892	0	0	0
	8.5	8.5	8.5				0.181468892	0.181468892	0.181468892	0	0	0
	175.9	175.9	175.9				0.006609768	0.006609768	0.006609768	0	0	0
	176.9	176.9	176.9				0.006609768	0.006609768	0.006609768	0	0	0
	176.0	176.0	176.0				0.006609768	0.006609768	0.006609768	0	0	0
	7.7	13.1	17.4				0.199106621	0.116704239	0.087651526	0	0	0
	12.8	12.8	12.8				0.11958418	0.11958418	0.11958418	0	0	0
	12.8	12.8	12.8				0.11958418	0.11958418	0.11958418	0	0	0
	#DIV/0!		#DIV/0!				0	0	0	0	0	0
201 mix tank	325.5		325.5				0.006271218	#DIV/0!	0.006271218	0	0	0
	#DIV/0!		#DIV/0!				0	0	0	0	0	0
201 asa reactor	3051.8		3051.8				0.000739215	#DIV/0!	0.000739215	0	0	0
	#DIV/0!		#DIV/0!				0	0	0	0	0	0
210 amsan reactor	224.7		224.7				0.010239126	#DIV/0!	0.010239126	0	0	0
	#DIV/0!		#DIV/0!				0	0	0	0	0	0
301 water recovery	642.9		642.9				0.003697324	#DIV/0!	0.003697324	0	0	0
	#DIV/0!		#DIV/0!				0	0	0	0	0	0
302 Water Suspension Reactor	1362.4		1362.4				0.001524631	#DIV/0!	0.001524631	0	0	0
	#DIV/0!		#DIV/0!				0	0	0	0	0	0
306 Water Recovery	81485.4		#DIV/0!				2.56228E-05	#DIV/0!	#DIV/0!	0	0	0
	#DIV/0!		#DIV/0!				0	0	0	0	0	0
403 Water Recovery	#DIV/0!		24679369.6				0	0	1.1607E-07	0	0	0
	#DIV/0!		#DIV/0!				0	0	0	0	0	0
304 Recovered Scrubber Material Rec	114604.7		114604.7				2.20285E-06	0	2.20285E-06	0	0	0
	#DIV/0!		#DIV/0!				0	0	0	0	0	0
404 Dewatering & separation	#DIV/0!		170202.6				0	0	1.72862E-06	0	0	0
	#DIV/0!		#DIV/0!				0	0	0	0	0	0
Extruder MeOH & sty	117.4		117.4				0.01928934	0	0.01928934	0	0	0
	0.0		0.0				13687.69767	0	10468.13212	0	0	0
	99.2		99.2				0.01928934	0	0.01928934	0	0	0
	93.0		123.4				0.020046084	0	0.015107238	0	0	0
	99.2		99.2				0.01928934	0	0.01928934	0	0	0
	0.0		0.0				536.2408201	0	418.3060075	0	0	0
	#DIV/0!		#DIV/0!				0	0	0	0	0	0
Dryer MeOH & Sty	4.2		4.2				0.53748196	0	0.53748196	0	0	0
	0.0		0.0				10031.06697	0	12642.93523	0	0	0
	3.5		2.8				0.621232804	0	0.656940003	0	0	0
	3.4		3.4				0.53748196	0	0.53748196	0	0	0
	3.6		3.6				0.53748196	0	0.53748196	0	0	0

Application of HON TRE to SAN Emission Streams

Stream ID	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery	Total Capital Cost ($)	Total Annual Cost ($/yr)
	Based AN	Based AN	Based AN	Based AN	Based AN	Based EB	Based EB	Based EB	Based EB	Based EB	Based Sty	Based Sty
	80284	40664	16758	Thermal Incin	0	80284	40664	16758	Thermal Incin	0	80284	40664
	80284	51451	21204	Thermal Incin	0	80284	27084	11158	Thermal Incin	0	80284	36756
	80281	39078	16105	Thermal Incin	0	80281	39078	16105	Thermal Incin	0	80281	39078
	80286	51500	21224	Thermal Incin	0	80286	37861	15618	Thermal Incin	0	80286	38787
	80286	42751	17618	Thermal Incin	0	80286	42751	17618	Thermal Incin	0	80286	42751
Die Exhaust Control												
Pelletizing												
Finishing												
Initiator Mixing												
Devolatilization-Vacuum System												
201 mix tank												
201 sss reactor												
210 amsan reactor												
301 water recovery												
302 Water Suspension Reactor												
306 Water Recovery												
403 Water Recovery												
304 Recovered Scrubber Material Rec												
404 Dewatering & separation												
Extruder MeOH & sty												
	113337	19426	314646	Flare							113337	19426
	99478	20171	282112	Thermal Incin	0						99478	20172
Dryer MeOH & Sty												
	111458	19112	10727	Flare							111458	19112

Application of HON TRE to SAN Emission Streams

7/21/94

Stream ID	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery
	Based Sty	Based Sty	Based Sty	Based MA	Based MA	Based MA	Based MA	Based MA	Based MEK	Based MEK	Based MEK	Based MEK	Based MEK
	16758	Thermal Incin	0	80284	40664	16758	Thermal Incin	0	80284	40664	16758	Thermal Incin	(
	15972	Thermal Incin	0						80284	39109	16117	Thermal Incin	
	16105	Thermal Incin	0	80261	39076	16105	Thermal Incin	0	80261	39076	16105	Thermal Incin	
	15985	Thermal Incin	0						80286	42751	17618	Thermal Incin	
	17618	Thermal Incin	0	80286	42751	17618	Thermal Incin	0	80286	42751	17618	Thermal Incin	
Die Exhaust Control													
Pelletizing													
Finishing													
Initiator Mixing													
Devolatilization-Vacuum System													
201 mix tank													
201 san reactor													
210 amsan reactor													
301 water recovery													
302 Water Suspension Reactor													
306 Water Recovery													
403 Water Recovery													
304 Recovered Scrubber Material Rec													
404 Dewatering & separation													
Extruder MeOH & sty													
	421759	Flare											
	270785	Thermal Incin	0										
Dryer MeOH & Sty													
	8513	Flare											

Application of HON TRE to SAN Emission Streams

Stream ID	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery
	Based MMA	Based MMA	Based MMA	Based MMA	Based MMA
	80284	40884	16758	Thermal Incin	0
	80284	39109	16117	Thermal Incin	0
	80281	39078	16105	Thermal Incin	0
	80286	42751	17618	Thermal Incin	0
	80286	42751	17618	Thermal Incin	0
Die Exhaust Control					
Pelletizing					
Finishing					
Initiator Mixing					
Devolatilization-Vacuum System					
201 mix tank					
201 asa reactor					
210 amsan reactor					
301 water recovery					
302 Water Suspension Reactor					
308 Water Recovery					
403 Water Recovery					
304 Recovered Scrubber Material Rec					
404 Dewatering & separation					
Extruder MeOH & sty					
Dryer MeOH & Sty					

Application of HON TRE to SAN Emission Streams

Stream ID	Emissions (lbs/yr)						Frequency (HRS/YR) BASED ON EACH COMPOUND					
	AN	EB	STY	MA	MEK	MMA	AN	EB	STY	MA	MEK	MMA
	3130		1384				11.03609637		8.461569442			
	3130		1384				8288.711525		6368.966629			
Line 1&2 Exhaust	340643		53437				8000		8000			
	340643		53437				8000		8000			
	340643		53437				8000		8000			
	340643		53437				8000		8000			
	340643		53437				134.1810434		68.35261075			
Line 3 Exhaust	392000		16000			12760	8000		8000			8000
	392000		16000			12760	8000		8000			8000
	392000		16000			12760	8000		8000			8000
	392000		16000			12760	90.64147642		46.20330619			46.2109295
Line 3 Cyclone Dust Collector	400		160			80	8000		8000			8000
	400		160			80	8000		8000			8000
Die Head	128		1512				8000		8000			
	128		1512				8000		8000			

Application of HON TRE to SAN Emission Streams

Stream ID	FLARE TRE BASED ON DIFFERENT HRS/YR						TI 0% BASED ON DIFFERENT HRS/YR					
	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR
	0.033		0.0				0.0		0.0			
	2.2		1.7				1.7		1.3			
			#DIV/0!				#DIV/0!		#DIV/0!			
Line 1&2 Exhaust	0.1		0.1				0.0		0.0			
	0.1		0.1				0.1		0.1			
	0.1		0.1				0.0		0.0			
	0.016		0.0				0.1		0.1			
	0.0010		0.0				0.0		0.0			
			#DIV/0!				#DIV/0!		#DIV/0!			
Line 3 Exhaust	0.1		0.1			0.2993087	0.1		0.1			0.207866569
	0.1		0.1			0.524370645	0.0		0.0			0.104286778
	0.016		0.0			0.057636836	0.0		0.0			0.166485094
	0.0008		0.0			0.000999852	0.0		0.0			4.84083E-05
	#DIV/0!		#DIV/0!				#DIV/0!		#DIV/0!			
Line 3 Cyclone Dust Collector	114.0		114.0			365.9224365	29.5		29.5			94.64160565
	114.0		114.0			365.9224406	29.5		29.5			94.64159729
	#DIV/0!		#DIV/0!				#DIV/0!		#DIV/0!			
Die Head	64.8		64.8				14.5		14.5			
	60.9		60.9				30.7		30.7			

Application of HON TRE to SAN Emission Streams

7/21/94

Stream ID	TI 70% TRE BASED ON DIFFERENT HRS/YR						TOTAL HAP FLOW RATE (LBS/HR) BASED ON COMPONENT					
	AN HRS/YR	EB HRS/YR	STY HRS/YR	MA HRS/YR	MEK HRS/YR	MMA HRS/YR	AN	EB	STY	MA	MEK	MMA
	0.0		0.0				409.0241344	0	532.3128771	0	0	0
	2.8		2.2				0.544698488	0	0.708862422	0	0	0
	#DIV/0!		#DIV/0!				0	0	0	0	0	0
Line 1&2 Exhaust	0.0		0.0				49.26926088	0	49.26926088	0	0	0
	0.1		0.1				49.26926088	0	49.26926088	0	0	0
	0.0		0.0				49.26926088	0	49.26926088	0	0	0
	0.1		0.1				49.26926088	0	49.26926088	0	0	0
	0.0		0.0				2937.47967	0	5766.481817	0	0	0
	#DIV/0!		#DIV/0!				0	0	0	0	0	0
Line 3 Exhaust	0.1		0.1			0.204206961	51.009588	0	51.009588	0	0	52.60488786
	0.0		0.0			0.161825028	52.60488786	0	52.60488786	0	0	52.60488786
	0.1		0.1			0.198397513	51.009588	0	51.009588	0	0	52.60488786
	0.0		0.0			0.048802898	4502.098834	0	8832.197228	0	0	9108.917075
	#DIV/0!		#DIV/0!				0	0	0	0	0	0
Line 3 Cyclone Dust Collector	24.8		24.8			79.56913997	0.07001316	0	0.07001316	0	0	0.06001504
	24.8		24.8			79.56913646	0.07001316	0	0.07001316	0	0	0.06001504
	#DIV/0!		#DIV/0!				0	0	0	0	0	0
Die Head	9.3		9.3				0.20503854	0	0.20503854	0	0	0
	15.9		15.9				0.20503854	0	0.20503854	0	0	0

Application of HON TRE to SAN Emission Streams

7/21/94

Stream ID	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery	Total Capital Cost ($)	Total Annual Cost ($/yr)
	Based AN	Based AN	Based AN	Based AN	Based AN	Based EB	Based EB	Based EB	Based EB	Based EB	Based Sty	Based Sty
	99478	20269	10144	Thermal Incin	0						99478	20242
Line 1&2 Exhaust	71365	102627	586	Thermal Incin	0						71365	102627
	47547	81229	464	Flare							47547	81229
	71365	82069	409	Thermal Incin	0						71365	82069
	29927	57608	330	Flare							29927	57608
	73920	18171	104	Flare							73920	15461
Line 3 Exhaust	69196	97193	536	Flare							69196	.97193
	109184	90633	485	Thermal Incin	35						109184	90633
	29964	57852	319	Flare							29964	57852
	69196	12631	71	Flare							69196	12351
Line 3 Cyclone Dust Collector												
Die Head												

Application of HON TRE to SAN Emission Streams

7/21/94

Stream ID	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery
	Based Sty	Based Sty	Based Sty	Based MA	Based MA	Based MA	Based MA	Based MA	Based MEK	Based MEK	Based MEK	Based MEK	Based MEK
	10702	Thermal Incin	0										
Line 1&2 Exhaust	586	Thermal Incin	0										
	464	Flare											
	489	Thermal Incin	0										
	330	Flare											
	89	Flare											
Line 3 Exhaust	536	Flare											
	485	Thermal Incin	35										
	319	Flare											
	68	Flare											
Line 3 Cyclone Dust Collector													
Die Head													

Application of HON TRE to SAN Emission Streams

Stream ID	Total Capital Cost ($)	Total Annual Cost ($/yr)	Cost Effectiveness ($/Mg removed)	Control Device	% Heat Recovery
	Based MMA	Based MMA	Based MMA	Based MMA	Based MMA
Line 1&2 Exhaust					
Line 3 Exhaust	69196	97193	620	Flare	
	109184	90633	485	Thermal Incin	35
	29964	57852	310	Flare	
	69196	12351	66	Flare	
Line 3 Cyclone Dust Collector					
Die Head					

Process Vent Raw Data For PS, ABS and Nitrile - Data From Generic ICR

Facility ID	Stream ID	Process	Process Line Description	Heat Value (BTU/SCF)	Flow Rate (SCFM)	HAP Flow (LBS/HR)	Emissions (TPY)	Concen. PPM	Concen. VOL%	Average MW	Oxygen Content (%)
AI (AA)	1	Nitrile	P68 PASTE LINE-SCREENS #2	7.23	699.10	31.04	0.00	0.05		29.12	20.90
AI (AA)	2	Nitrile	P06 PASTE LINE-SCREENS #1	2.89	699.10	12.42	4.20	186.00	0.19	29.05	20.96
BE (AC)	3	ABS,Bs	B9 PRODUCT DRYING-ROTARY DRYER	0.04	4,041.00	0.64	0.33			29.00	21.00
BE (AC)	4	ABS,Be	A24 PRODUCT DRYING-ROTARY DRYER	29.74	18,755.00	1,906.24	53.64			29.44	20.88
BE (AC)	5	ABS,Be	A2 REACTOR CHARGE/PURGE	2,108.28	65.00	457.21	194.00			48.47	4.62
BE (AC)	6	ABS,Be	A3 REACTOR CHARGE/PURGE-STRIP TANK	2,887.71	8.00	72.32	3.48			54.09	0.00
BF (AD)	7	ABS,Be	B16 PRODUCT DRYING-SYNERESIS TANKS	0.97	2,947.00	13.34	21.49			29.02	20.99
BF (AD)	8	ABS,Be	B18-B19 PRODUCT DRYING-HIGH VACUUM TANK	1.02	662.00	3.24	3.49			29.01	20.99
BF (AD)	9	ABS,Cm	F7 PRODUCT STRANDING-EXTRUDER	0.29	8,400.00	8.91	13.40			29.00	21.00
BF (AD)	10	ABS,Cm	F1 REACTOR	14.82	31.00	1.93	50.90			29.23	20.90
BF (AD)	11	ABS,Cm	F2 REACTOR	135.74	0.50	0.39	15.30			31.23	19.19
BF (AD)	12	ABS,Cm	F4 FEEDSTOCK STORAGE-PRESS TANK	321.09	0.10	0.20	1.40			34.34	16.34
BF (AD)	13	ABS,Cm	F5 FEEDSTOCK STORAGE-TANK	141.93	200.00	162.91	2.31			31.32	18.40
BF (AD)	14	ABS,Cm	F6 FEEDSTOCK STORAGE-TANK	197.66	8.00	9.14	17.31			32.24	
BF (AD)	15	ABS,Bs	D6 FEEDSTOCK RECOVERY-DISTILLATE TANK	10.15	8.00	0.47	0.35			29.18	20.87
BF (AD)	16	ABS,Bs	D1 FEEDSTOCK CHARGING-RUBBER DISSOLVER	3.20	45.00	0.63	0.11			29.06	20.98
BF (AD)	17	ABS,Bs	D3 FEEDSTOCK CHARGING-REACTOR	81.10	45.00	21.12	3.39			29.84	19.57
BF (AD)	18	ABS,Bs	D2 FEEDSTOCK CHARGING-REACTOR	134.34	46.00	36.28	1.33			31.22	19.19
BF (AD)	19	ABS,Bs	D5 FEEDSTOCK CHARGING-REACTOR	188.65	33.00	31.09	1.42			32.00	19.09
BF (AD)	20	ABS,Bs	D9 PRODUCT DRYING-ROTARY DRYER	0.13	904.00	0.48	1.35			28.97	20.98
BF (AD)	21	ABS,Bs	D3 REACTOR	111.91	25.00	16.82	3.68			30.85	19.43
BF (AD)	22	ABS,Be	A3 COOLING-COOLER	103.96	668.00	223.21	4.94			29.93	20.22
BF (AD)	23	ABS,Be	A8 COOLING-COOLER	73.95	93.00	28.25	2.68			29.89	20.33
BF (AD)	24	ABS,Be	A1 FEEDSTOCK PREMIXING-TANK	105.58	200.00	129.47	0.58			30.76	19.47
BF (AD)	25	ABS,Be	A6 FEEDSTOCK PREMIXING-TANK	63.05	200.00	68.97	0.82			30.02	20.24
BF (AD)	26	ABS,Be	A11 PRODUCT DRYING-SYNERESIS TANK	5.39	4,173.00	105.97	188.32			29.08	20.95
BF (AD)	27	ABS,Be	A12 PRODUCT DRYING-CENTRIFUGE	2.50	144.00	1.79	4.57			29.00	20.95
BF (AD)	28	ABS,Be	A13 PRODUCT DRYING-HIGH VACUUM VENT	16.86	27.00	2.32	4.94			29.28	20.83
BF (AD)	29	ABS,Be	A14 PRODUCT DRYING-LOW VACUUM VENT	3.85	256.00	4.67	7.74			29.06	20.96
BF (AD)	30	ABS,Be	A4 INTERMEDIATE STORAGE-TANK	46.20	140.00	20.25	1.92			29.40	20.66
BF (AD)	31	ABS,Be	A5 INTERMEDIATE STORAGE-TANK	67.00	160.00	33.84	0.93			29.48	20.43
BF (AD)	32	PS,C	K1 REACTOR	112.64	31.00	11.90	3.15			30.66	20.54
BF (AD)	33	PS,C	K2 'SPENT FEEDSTOCK STORAGE-TANK	66.41	1.60	0.36	1.40				20.73
W (A)	34	PS,C	E6 PROCESS PURGE	56.17	0.50	0.0957	0.3500	11000		29.83	20.77
AC (B)	35	PS,C	E11 VAPOR RECOVERY	108.75	1.84	0.6799	1.9300			30.60	20.56
BI (N)	36	PS,C	E7 DIE HEADS-EXTRUSION BATH	0.03	810.00	0.0705	0.2050		0.00	29.00	21.00
BI (N)	37	PS,C	E2 DIE HEADS-EXTRUSION BATH	0.01	3,400.00	0.0592	0.2800		0.00	29.00	21.00
BI (N)	38	PS,C	E1 ORGANIC TRAP	33.10	23.80	3.3601	4.6500		0.83	29.85	20.76
Z (W)	39	PS,Bs	E6-E9 REACTOR	330.96	46.00	51.94	2.37		1.17	33.70	19.51

		calc'd		HAP			Existing	Existing Analysis				New Analysis			
Facility ID	Stream ID	op_hrs (hr/yr)	OP HRS (HRS/YR)	Flow Rate (kg/hr)	Flow Rate (scmm)	Heat (MJ/scm)	Control (Y/N)	TRE Flare	TRE Tl,0%	TRE Tl,70%	HON Control Required	TRE Flare	TRE Tl,0%	TRE Tl,70%	HON Control Required
AI (AA)	1	0.00		14.076	19.796	0.269	N	0.651	0.194	0.244	Y	0.178	0.053	0.066	Y
AI (AA)	2	676.59		5.630	19.796	0.108	N	1.630	0.485	0.537	Y	0.444	0.132	0.146	Y
BE (AC)	3	1035.77		0.289	114.429	0.002	N	151.621	29.978	13.449	N	41.344	8.179	3.660	N
BE (AC)	4	56.28		864.507	531.085	1.107	N	0.226	0.039	0.058	Y	0.062	0.011	0.016	Y
BE (AC)	5	848.62		207.354	1.841	78.488	Y	0.009	0.019	0.065	Y	0.002	0.005	0.018	Y
BE (AC)	6	96.24		32.799	0.227	107.505	Y	0.036	0.149	0.167	Y	0.010	0.041	0.046	Y
BF (AD)	7	3222.77		6.048	83.450	0.036	Y	5.369	1.110	0.628	Y	1.464	0.303	0.171	Y
BF (AD)	8	2152.51		1.471	18.746	0.038	Y	5.977	1.812	1.911	N	1.630	0.494	0.521	Y
BF (AD)	9	3006.46		4.043	237.863	0.011	N	22.012	4.055	1.367	N	6.002	1.106	0.372	Y
BF (AD)	10	52703.99		0.876	0.878	0.552	Y	2.570	1.785	2.944	N	0.701	0.487	0.803	Y
BF (AD)	11	77516.59		0.179	0.014	5.053	Y	10.620	9.235	14.486	N	2.896	2.518	3.950	N
BF (AD)	12	14222.67		0.089	0.003	11.954	Y	20.654	20.965	30.002	N	5.632	5.717	8.180	N
BF (AD)	13	28.36		73.881	5.663	5.284	Y	0.053	0.026	0.084	Y	0.014	0.007	0.023	Y
BF (AD)	14	3788.97		4.145	0.227	7.359	N	0.473	0.419	0.679	Y	0.129	0.114	0.185	Y
BF (AD)	15	1486.76		0.214	0.227	0.378	Y	9.409	7.089	11.847	N	2.566	1.933	3.230	N
BF (AD)	16	350.71		0.287	1.274	0.119	Y	8.361	5.487	8.881	N	2.280	1.496	2.421	N
BF (AD)	17	321.07		9.580	1.274	3.019	Y	0.248	0.173	0.317	Y	0.067	0.047	0.086	Y
BF (AD)	18	73.44		16.451	1.303	5.001	Y	0.144	0.104	0.206	Y	0.039	0.028	0.056	Y
BF (AD)	19	91.08		14.101	0.934	7.023	Y	0.157	0.125	0.234	Y	0.043	0.034	0.064	Y
BF (AD)	20	5687.51		0.215	25.599	0.005	Y	52.465	14.370	13.145	N	14.306	3.920	3.582	N
BF (AD)	21	438.04		7.628	0.708	4.166	Y	0.283	0.218	0.386	Y	0.077	0.059	0.105	Y
BF (AD)	22	44.26		101.227	18.916	3.870	Y	0.086	0.027	0.075	Y	0.024	0.007	0.021	Y
BF (AD)	23	189.70		12.814	2.633	2.753	Y	0.224	0.135	0.250	Y	0.061	0.037	0.068	Y
BF (AD)	24	8.96		58.718	5.663	3.931	Y	0.067	0.032	0.093	Y	0.018	0.009	0.025	Y
BF (AD)	25	23.89		31.281	5.663	2.347	Y	0.127	0.060	0.132	Y	0.035	0.016	0.036	Y
BF (AD)	26	3554.11		48.060	118.167	0.201	Y	0.939	0.184	0.129	Y	0.256	0.050	0.035	Y
BF (AD)	27	5089.27		0.814	4.078	0.093	Y	4.211	2.150	3.205	N	1.148	0.586	0.874	Y
BF (AD)	28	4252.57		1.054	0.765	0.628	Y	2.097	1.479	2.455	N	0.572	0.403	0.669	Y
BF (AD)	29	3315.42		2.118	7.249	0.143	Y	2.166	0.920	1.279	Y	0.590	0.251	0.349	Y
BF (AD)	30	189.63		9.184	3.964	1.720	Y	0.367	0.194	0.330	Y	0.100	0.053	0.090	Y
BF (AD)	31	54.80		15.345	4.531	2.494	Y	0.232	0.120	0.218	Y	0.063	0.033	0.059	Y
BF (AD)	32	529.41		5.397	0.878	4.194	Y	0.411	0.310	0.527	Y	0.112	0.085	0.144	Y
BF (AD)	33	7732.80		0.164	0.045	2.472	Y	11.768	9.580	15.587	N	3.209	2.612	4.250	N
W (A)	34	7311.01	8760	0.043	0.014	2.091	N	44.311	35.910	58.690	N	12.082	9.791	16.002	N
AC (B)	35	5677.43	8760	0.308	0.052	4.048	N	6.236	5.265	8.390	N	1.700	1.436	2.288	N
BI (N)	36	5815.29	8424	0.032	22.937	0.001	N	323.064	91.618	87.316	N	88.091	24.989	23.795	N
BI (N)	37	9461.31	8424	0.027	96.278	0.000	N	1,384.827	280.362	######	N	377.610	76.488	37.109	N
BI (N)	38	2767.77	8424	1.524	0.674	1.232	N	1.425	1.031	1.717	N	0.388	0.281	0.468	Y
Z (W)	39	91.34		23.555	1.303	12.321	N	0.098	0.082	0.162	Y	0.027	0.022	0.044	Y

Facility ID	Stream ID	Process	Process Line Description	Heat Value (BTU/SCF)	Flow Rate (SCFM)	HAP Flow (LBS/HR)	Emissions (TPY)	Concen. PPM	Concen. VOL%	Average MW	Content (%)
Z (W)	40	PS,Bs	E10-E13 DEVOLATILIZER VAC SYS	1,426.37	4.82	23.43	3.43		1.47	49.73	14.95
Z (W)	41	PS,Bs	E14-E19(-E16) DIE HEAD -EXTRUDER QUENCH SYS	0.10	901.00	0.32	3.48		NAV	29.00	21.00
AH (Z)	42	ABS,Bl	S8 2-STAGE VACUUM JET-STEAM CONDENSER ST	2,370.30	3.53	30.19	5.50	935327		52.56	0.00
AH (Z)	43	ABS,Bl	S6 BLOWDOWN-FOAM TK VENT	2,764.71	67.26	582.24	12.94	957563		18.97	0.00
AH (Z)	44	ABS,Bl	S5 VACUUM SYS-STEAM CONDENSER	1,257.20	3.41	13.43	0.30	435204			0.00

Process Vent Raw Data For PS, ABS and Nitrile - Data From Generic ICR

Facility ID	Stream ID	op_hrs (hr/yr)	OP HRS (HRS/YR)	Flow Rate (kg/hr)	Flow Rate (scmm)	Heat (MJ/scm)	Control (Y/N)	TRE Flare	TRE TI,0%	TRE TI,70%	HON Control Required	TRE Flare	TRE TI,0%	TRE TI,70%	HON Control Required
Z (W)	40	292.64		10.624	0.136	53.102	N	0.148	0.299	0.350	Y	0.040	0.082	0.095	Y
Z (W)	41	22067.44		0.143	25.514	0.004	N	78.781	21.601	19.762	N	21.482	5.892	5.385	N
AH (Z)	42	364.69		13.691	0.100	88.243	Y	0.094	0.313	0.316	Y	0.026	0.085	0.086	Y
AH (Z)	43	44.46		264.053	1.905	102.926	Y	0.006	0.017	0.063	Y	0.002	0.005	0.017	Y
AH (Z)	44	44.48		6.089	0.097	46.804	Y	0.264	0.489	0.562	Y	0.072	0.133	0.153	Y

Process Vent Raw Data For PS , ABS, and MABS - Data From Section 114 Responses - Part 1

Facility ID	Stream ID	Process	Process Vent	Flow Rate (acfm)	Temp. (F)	Pressure (mm Hg)	Operating Hours (hrs/yr)	Compound	Concentration (vol %)	Molecular Weight (lb/lb mol)	Heat Content (Btu/lb)	Calculated Btu Content (Btu/scf)	Btu Content (Btu/scf)	Emissions (lbs/yr)	Flow Rate (scfm)	HAP Flow Ra (kg/hr)
AO (AG)	1	PS,C	Before Burner (99.9%) Total	0.45	65	750	8,760.0		2.852			149.381	0.136	1623	0.42	0.094
AO (AG)		PS,C	Before Burner (99.9%)	0.45	65	750	8,760.0	ST	0.900	104.16	17,606	45.974	0.136	576	0.42	
AO (AG)		PS,C	Before Burner (99.9%)					EB	1.700	106.17	17,767	89.324		1069	0.00	
AO (AG)		PS,C	Before Burner (99.9%)					CU	0.118	120.20	17,673	7.061		88	0.00	
AO (AG)		PS,C	Before Burner (99.9%)					XY	0.134	106.17	17,719	7.022		88	0.00	
AO (AG)	2	PS,C	Before Demister Filter Total	470.00	117	760	8,424.0		0.010			0.515	0.489	2152	400.76	0.116
AO (AG)		PS,C	Before Demister Filter	470.00	117	760	8,424.0	ST	0.007	104.16	17,606	0.368	0.489	1586	400.76	0.085
AO (AG)		PS,C	Before Demister Filter					EB	0.003	106.17	17,767	0.147		566	0.00	#DIV/0!
AO (AG)	3	ABS,Cm	Before Burner (99.9%) Total	0.23	65	750	8,760.0		1.080			25.842	0.160	2103	0.21	0.109
AO (AG)		ABS,Cm	Before Burner (99.9%)	0.23	65	750	8,760.0	ST	0.090	104.16	17,606	4.597	0.160	263	0.21	0.014
AO (AG)		ABS,Cm	Before Burner (99.9%)					EB	0.160	106.17	17,767	8.407		491	0.00	#DIV/0!
AO (AG)		ABS,Cm	Before Burner (99.9%)					AN	0.810	53.06	9,786	11.716		1279	0.00	#DIV/0!
AO (AG)		ABS,Cm	Before Burner (99.9%)					CU	0.010	120.20	17,673	0.598		35	0.00	#DIV/0!
AO (AG)		ABS,Cm	Before Burner (99.9%)					XY	0.010	106.17	17,719	0.524		35	0.00	#DIV/0!
AO (AG)	4	ABS,Cm	Before Demister Filter Total	470.00	117	760	8,424.0		100.000			5,042.265	0.261	1251	400.76	0.067
AO (AG)		ABS,Cm	Before Demister Filter	470.00	117	760	8,424.0	ST	93.000	104.16	17,606	4,750.619	0.261	1163	400.76	0.063
AO (AG)		ABS,Cm	Before Demister Filter					EB	5.000	106.17	17,767	262.719		63	0.00	#DIV/0!
AO (AG)		ABS,Cm	Before Demister Filter					AN	2.000	53.06	9,786	28.927		25	0.00	#DIV/0!
AP (AH)	5	PS,C	Die Demister Total	3200.00	90	760	8,520.0		0.000			0.017	0.000	395	2,862.55	0.021
AP (AH)		PS,C	Die Demister	3200.00	90	760	8,520.0	ST	0.000	104.16	17,606	0.009		210	2,862.55	0.011
AP (AH)		PS,C	Die Demister					AN	0.000	53.06	9,786	0.000		25	0.00	#DIV/0!
AP (AH)		PS,C	Die Demister					EB	0.000	106.17	17,767	0.007		160	0.00	#DIV/0!
AP (AH)	6	PS,C	PS Raw Material Storage Total	0.92	72	760	8,520.0		100.000			3,215.666	0.000	3960	0.85	0.211
AP (AH)		PS,C	PS Raw Material Storage	0.92	72	760	8,520.0	EB	33.000	106.17	17,767	1,733.945		1310	0.85	0.070
AP (AH)		PS,C	PS Raw Material Storage					ST	14.000	104.16	17,606	715.147		540	0.00	#DIV/0!
AP (AH)		PS,C	PS Raw Material Storage					AN	53.000	53.06	9,786	766.574		2110	0.00	#DIV/0!
AP (AH)	7	ABS,Cm	ABS Condenser Total	0.03	60	0	8,520.0		100.000			1,597.224	0.000	910	0.02	0.048
AP (AH)		ABS,Cm	ABS Condenser	0.03	60	?	8,520.0	AN	96.000	53.06	9,786	1,388.511		870	0.02	0.046
AP (AH)		ABS,Cm	ABS Condenser					ST	1.000	104.16	17,606	51.082		10	0.00	#DIV/0!
AP (AH)		ABS,Cm	ABS Condenser					EB	3.000	106.17	17,767	157.631		30	0.00	#DIV/0!
AP (AH)	8	ABS,Cm	ABS Feed Preparation Total	7.90	72	760	8,520.0		100.000			3,907.099	0.000	134770	7.31	7.174
AP (AH)		ABS,Cm	ABS Feed Preparation	7.90	72	760	8,520.0	ST	62.000	104.16	17,606	3,167.079		83470	7.31	4.443
AP (AH)		ABS,Cm	ABS Feed Preparation					EB	5.000	106.17	17,767	262.719		6200	0.00	#DIV/0!
AP (AH)		ABS,Cm	ABS Feed Preparation					AN	33.000	53.06	9,786	477.301		45100	0.00	#DIV/0!
AQ (AI)	9	PS,C	Before Eliminator (Die Exhaust Hoods,99%) Total	2000.00	60	757	8,760.0		100.000			5,181.286	0.000	62000	1,892.31	3.210
AQ (AI)		PS,C	Before Eliminator (Die Exhaust Hoods,99%)	2000.00	60	757	8,760.0	ST	50.000	104.16	17,606	2,554.096	0.000	31000	1,892.31	1.605
AQ (AI)		PS,C	Before Eliminator (Die Exhaust Hoods,99%)					EB	50.000	106.17	17,767	2,627.190		31000	0.00	#DIV/0!
AQ (AI)	10	PS,C	Monomer Recovery Vent Total	0.00	48	760	8,760.0		0.820			42.647	0.000	2716	2.30	0.141
AQ (AI)		PS,C	Monomer Recovery Vent	2.3scfm	48	760	8,760.0	ST	0.300	104.16	17,606	15.325	0.000	964	2.30	0.050

Process Vent Raw Data For PS , ABS, and MABS - Data From Section 114 Responses - Part 1

Facility ID	Stream ID	Process	Process Vent	Flow Rate (acfm)	Temp. (F)	Pressure (mm Hg)	Operating Hours (hrs/yr)	Compound	Concentration (vol %)	Molecular Weight (lb/lb mol)	Heat Content (Btu/lb)	Calculated Btu Content (Btu/scf)	Btu Content (Btu/scf)	Emissions (lbs/yr)	Flow Rate (scfm)	HAP Flow Rate (kg/hr)
AQ (AI)		PS,C	Monomer Recovery Vent					EB	0.520	106.17	17,767	27.323		1752	0.00	#DIV/0!
AM (AJ)	11	ABS,Cm	Absorber Total	0.00	430	760	8,760.0		0.299			15.252	0.000	950	100.00	0.049
AM (AJ)		ABS,Cm	Absorber	100scfm	430	760	8,760.0	ST	0.299	104.16	17,606	15.248		950	100.00	0.049
AM (AJ)		ABS,Cm	Absorber					AN	0.000	53.06	9,786	0.001		ND	0.00	#VALUE!
AM (AJ)		ABS,Cm	Absorber					EB	0.000	106.17	17,767	0.002		ND	0.00	#VALUE!
AM (AJ)	12	ABS,Cm	Demister Filter Total	0.00	70	0	8,760.0		0.001			0.037	0.000	1850	2,835.00	0.096
AM (AJ)		ABS,Cm	Demister Filter	2835scfm	70	?	8,760.0	EB	0.001	106.17	17,767	0.032		1625	2,835.00	0.084
AM (AJ)		ABS,Cm	Demister Filter					ST	0.000	104.16	17,606	0.005		225	0.00	#DIV/0!
AM (AJ)	13	ABS,Cm	Devolatilization & Pelletizing (Before Filter) Total	2835.00	70	0	8,760.0		0.000			0.010	0.000	1850	2,631.74	0.096
AM (AJ)		ABS,Cm	Devolatilization & Pelletizing (Before Filter)	2635.00	70	?	8,760.0	ST	0.000	104.16	17,606	0.005		225	2,631.74	0.012
AM (AJ)		ABS,Cm	Devolatilization & Pelletizing (Before Filter)					EB	0.000	106.17	17,767	0.005		1625	0.00	#DIV/0!
AR (AK)	14	PS,C	PS Die Vent Total	0.18	72	760	8,400.0		95.000			4,852.782	19.500	350	0.17	0.019
AR (AK)		PS,C	PS Die Vent	0.18	72	760	8,400.0	ST	95.000	104.16	17,606	4,852.782	19.500	350	0.17	0.019
AR (AK)	15	PS,C	Demister (after die vent) Total	2000.00	78	760	8,400.0		0.001			0.026	0.006	370	1,829.00	0.020
AR (AK)		PS,C	Demister (after die vent)	2000.00	78	760	8,400.0	ST	0.001	104.16	17,606	0.026	0.006	370	1,829.00	0.020
AR (AK)	16	PS,C	PS Vacuum Pumps Total	1.07	77	760	8,400.0		1.746			90.502	0.002	2548	0.98	0.138
AR (AK)		PS,C	PS Vacuum Pumps	1.07	77	760	8,400.0	ST	0.848	104.16	17,606	43.317	0.002	1225	0.98	0.066
AR (AK)		PS,C	PS Vacuum Pumps					EB	0.898	106.17	17,767	47.184		1323	0.00	#DIV/0!
AN (AL)	17	PS,C	Devolatilization & Pelletizing Total	1130.00	70	760	8,064.0		0.000			0.009	0.010	323	1,048.98	0.018
AN (AL)		PS,C	Devolatilization & Pelletizing	1130.00	70	760	8,064.0	ST	0.000	104.16	17,606	0.009	0.010	300	1,048.98	0.017
AN (AL)		PS,C	Devolatilization & Pelletizing					EB	0.000	106.17	17,767	0.001		23	0.00	#DIV/0!
AN (AL)	18	PS,C	Condenser (before boiler) Total	0.07	81	765	8,064.0		0.234			12.051	0.220	26	0.06	0.001
AN (AL)		PS,C	Condenser (before boiler)	0.07	81	765	8,064.0	ST	0.156	104.16	17,606	7.969	0.220	17	0.06	0.001
AN (AL)		PS,C	Condenser (before boiler)					EB	0.078	106.17	17,767	4.063		9	0.00	#DIV/0!
AN (AL)	19	PS,C	Condensers (before boiler) Total	3.24	28	765	8,064.0		0.234			12.051	11.000	1174	3.27	0.066
AN (AL)		PS,C	Condensers (before boiler)	3.24	28	765	8,064.0	ST	0.156	104.16	17,606	7.969	11.000	783	3.27	0.044
AN (AL)		PS,C	Condensers (before boiler)					EB	0.078	106.17	17,767	4.063		391	0.00	#DIV/0!
AN (AL)	20	ABS,Cm	Devolatilization & Pelletizing Total	995.00	90	760	8,640.0		0.000			0.017	0.020	307	890.07	0.016
AN (AL)		ABS,Cm	Devolatilization & Pelletizing	995.00	90	760	8,640.0	ST	0.000	104.16	17,606	0.010	0.020	170	890.07	0.009
AN (AL)		ABS,Cm	Devolatilization & Pelletizing					AN	0.000	53.06	9,786	0.000		7	0.00	#DIV/0!
AN (AL)		ABS,Cm	Devolatilization & Pelletizing					EB	0.000	106.17	17,767	0.007		130	0.00	#DIV/0!
AN (AL)	21	ABS,Cm	Feed Preparation (before boiler) Total	12.50	. 72	765	8,160.0		100.000			4,434.790	1.000	360	11.56	0.020
AN (AL)		ABS,Cm	Feed Preparation (before boiler)	12.50	72	765	8,160.0	ST	57.900	104.16	17,606	2,957.643	1.000	209	11.56	0.012
AN (AL)		ABS,Cm	Feed Preparation (before boiler)					EB	22.800	106.17	17,767	1,197.999		82	0.00	#DIV/0!
AN (AL)		ABS,Cm	Feed Preparation (before boiler)					AN	19.300	53.06	9,786	279.149		69	0.00	#DIV/0!
AN (AL)	22	ABS,Cm	Condensers (Before boiler) Total	0.39	90	760	8,160.0		0.911			24.192	23.000	365	0.35	0.020
AN (AL)		ABS,Cm	Condensers (Before boiler)	0.39	90	760	8,160.0	ST	0.067	104.16	17,606	3.417	23.000	40	0.35	0.002
AN (AL)		ABS,Cm	Condensers (Before boiler)					EB	0.225	106.17	17,767	11.828		137	0.00	#DIV/0!
AN (AL)		ABS,Cm	Condensers (Before boiler)					AN	0.619	53.06	9,786	8.947		188	0.00	#DIV/0!

Process Vent Raw Data For PS , ABS, and MABS - Data From Section 114 Responses - Part 1

Facility ID	Stream ID	Process	Process Vent	Flow Rate (acfm)	Temp. (F)	Pressure (mm Hg)	Operating Hours (hrs/yr)	Compound	Concentration (vol %)	Molecular Weight (lb/lb mol)	Heat Content (Btu/lb)	Calculated Btu Content (Btu/scf)	Btu Content (Btu/scf)	Emissions (lbs/yr)	Flow Rate (scfm)	HAP Flow Rate (kg/hr)
AX (AM)	23	PS,C	Carbon Adsorption Canister (95%) Total	2.00	212	0	8,400.0		99.960			4,516.183	0.000	418	1.46	0.023
AX (AM)		PS,C	Carbon Adsorption Canister (95%)	2.00	212	?	8,400.0	TO	99.950	92.15	17,601	4,515.658		418	1.46	0.023
AX (AM)		PS,C	Carbon Adsorption Canister (95%)					EB	0.010	106.17	17,767	0.525		0	0.00	#DIV/0!
AX (AM)	24	PS,C	Carbon Adsorber - 132 Total	0.21	250	0	8,400.0		40.961			2,096.141	0.000	235	0.15	0.013
AX (AM)		PS,C	Carbon Adsorber - 132	0.21	250	?	8,400.0	ST	38.300	104.16	17,606	1,956.438		216	0.15	0.012
AX (AM)		PS,C	Carbon Adsorber - 132					TO	0.001	92.15	17,601	0.045		0	0.00	#DIV/0!
AX (AM)		PS,C	Carbon Adsorber - 132					XY	0.760	106.17	17,719	39.625		5	0.00	#DIV/0!
AX (AM)		PS,C	Carbon Adsorber - 132					EB	1.900	106.17	17,767	99.833		14	0.00	#DIV/0!
AX (AM)	25	PS,C	Carbon Adsorber - 136 Total	16.20	70	0	8,400.0		99.200			4,555.917	0.000	485	15.04	0.026
AX (AM)		PS,C	Carbon Adsorber - 136	16.20	70	?	8,400.0	ST	7.100	104.16	17,606	362.662		10	15.04	0.001
AX (AM)		PS,C	Carbon Adsorber - 136					TO	87.710	92.15	17,601	3,962.665		467	0.00	#DIV/0!
AX (AM)		PS,C	Carbon Adsorber - 136					XY	0.680	106.17	17,719	35.633		1	0.00	#DIV/0!
AX (AM)		PS,C	Carbon Adsorber - 136					EB	3.710	106.17	17,767	194.937		7	0.00	#DIV/0!
AX (AM)	26	PS,C	Carbon Adsorber - 139 Total	2.00	70	0	8,400.0		99.999			4,517.922	0.000	378	1.86	0.020
AX (AM)		PS,C	Carbon Adsorber - 139	2.00	70	?	8,400.0	ST	0.000	104.16	17,606	0.015		0	1.86	0.000
AX (AM)		PS,C	Carbon Adsorber - 139					TO	99.990	92.15	17,601	4,517.465		378	0.00	#DIV/0!
AX (AM)		PS,C	Carbon Adsorber - 139					XY	0.000	106.17	17,719	0.021		0	0.00	#DIV/0!
AX (AM)		PS,C	Carbon Adsorber - 139					EB	0.008	106.17	17,767	0.420		0	0.00	#DIV/0!
AX (AM)	27	PS,C	Carbon Adsorber - 101 Total	0.27	70	0	8,400.0		100.000			5,128.489	0.000	14	0.25	0.001
AX (AM)		PS,C	Carbon Adsorber - 101	0.27	70	?	8,400.0	ST	87.100	104.16	17,606	4,449.235		12	0.25	0.001
AX (AM)		PS,C	Carbon Adsorber - 101					TO	0.500	92.15	17,601	22.590		0	0.00	#DIV/0!
AX (AM)		PS,C	Carbon Adsorber - 101					XY	10.200	106.17	17,719	534.499		2	0.00	#DIV/0!
AX (AM)		PS,C	Carbon Adsorber - 101					EB	1.300	106.17	17,767	68.307		0	0.00	#DIV/0!
AX (AM)		PS,C	Carbon Adsorber - 101					CU	0.900	120.20	17,673	53.858		0	0.00	#DIV/0!
AX (AM)	28	PS,C	Carbon Adsorber - 131 Total	0.44	70	0	8,400.0		93.920			4,814.727	0.000	26	0.41	0.001
AX (AM)		PS,C	Carbon Adsorber - 131	0.44	70	?	8,400.0	ST	54.800	104.16	17,606	2,799.289		12	0.41	0.001
AX (AM)		PS,C	Carbon Adsorber - 131					TO	5.340	92.15	17,601	241.257		4	0.00	#DIV/0!
AX (AM)		PS,C	Carbon Adsorber - 131					XY	5.270	106.17	17,719	276.156		2	0.00	#DIV/0!
AX (AM)		PS,C	Carbon Adsorber - 131					EB	28.510	106.17	17,767	1,498.024		8	0.00	#DIV/0!
AX (AM)	29	PS,C	Carbon Adsorber Total	2.70	70	0	3.5		90.000			4,597.373	0.000	0	2.51	0.008
AX (AM)		PS,C	Carbon Adsorber	2.70	70	?	3.5	ST	90.000	104.16	17,606	4,597.373		0	2.51	0.008
AX (AM)	30	PS,C	Refrigerated Condenser & Carbon Adsorber - 1 Total	26.20	45	0	1,056.0		98.730			5,047.089	0.000	40	25.53	0.017
AX (AM)		PS,C	Refrigerated Condenser & Carbon Adsorber - 1	26.20	45	?	1,056.0	ST	89.940	104.16	17,606	4,594.306		34	25.53	0.014
AX (AM)		PS,C	Refrigerated Condenser & Carbon Adsorber - 1					TO	1.210	92.15	17,601	54.667		2	0.00	#DIV/0!
AX (AM)		PS,C	Refrigerated Condenser & Carbon Adsorber - 1					XY	1.180	106.17	17,719	61.834		1	0.00	#DIV/0!
AX (AM)		PS,C	Refrigerated Condenser & Carbon Adsorber - 1					EB	6.400	106.17	17,767	336.280		4	0.00	#DIV/0!
AX (AM)	31	PS,C	Refrigerated Condenser and Carbon Adsorber - 2 Total	26.20	45	0	1,056.0		98.730			5,047.089	0.000	40	25.53	0.017
AX (AM)		PS,C	Refrigerated Condenser and Carbon Adsorber - 2	26.20	45	?	1,056.0	ST	89.940	104.16	17,606	4,594.306		34	25.53	0.014
AX (AM)		PS,C	Refrigerated Condenser and Carbon Adsorber - 2					TO	1.210	92.15	17,601	54.667		2	0.00	#DIV/0!

Facility ID	Stream ID	Process	Process Vent	Flow Rate (acfm)	Temp. (F)	Pressure (mm Hg)	Operating Hours (hrs/yr)	Compound	Concentration (vol %)	Molecular Weight (lb/lb mol)	Heat Content (Btu/lb)	Calculated Btu Content (Btu/scf)	Btu Content (Btu/scf)	Emissions (lbs/yr)	Flow Rate (scfm)	HAP Flow Rate (kg/hr)
AX (AM)		PS,C	Refrigerated Condenser and Carbon Adsorber - 2					XY	1.180	106.17	17,719	61.834		1	0.00	#DIV/0!
AX (AM)		PS,C	Refrigerated Condenser and Carbon Adsorber - 2					EB	6.400	106.17	17,767	336.280		4	0.00	#DIV/0!
AX (AM)	32	PS,C	3013-01(before control) Total	16000.00	70	0	8,400.0		44.000			2,272.456	0.000	14700	14,852.83	0.794
AX (AM)		PS,C	3013-01(before control)	16000.00	70	?	8,400.0	ST	27.000	104.16	17,606	1,379.212		8900	14,852.83	0.481
AX (AM)		PS,C	3013-01(before control)					EB	17.000	106.17	17,767	893.245		5800	0.00	#DIV/0!
AX (AM)	33	PS,C	Condenser & Carbon Adsorption Cannister Total	59.40	45	0	36.0		99.811			5,098.539	0.000	51	57.87	0.645
AX (AM)		PS,C	Condenser & Carbon Adsorption Cannister	59.40	45	?	36.0	ST	99.810	104.16	17,606	5,098.487		51	57.87	0.644
AX (AM)		PS,C	Condenser & Carbon Adsorption Cannister					XY	0.000	106.17	17,719	0.010		0	0.00	#DIV/0!
AX (AM)		PS,C	Condenser & Carbon Adsorption Cannister					EB	0.001	106.17	17,767	0.042		0	0.00	#DIV/0!
AX (AM)	34	PS,C	Condenser & Carbon Adsorption System - 1 Total	26.20	45	0	1,056.0		95.830			4,894.712	0.000	40	25.53	0.017
AX (AM)		PS,C	Condenser & Carbon Adsorption System - 1	26.20	45	?	1,056.0	ST	89.940	104.16	17,606	4,594.308		34	25.53	0.014
AX (AM)		PS,C	Condenser & Carbon Adsorption System - 1					TO	1.210	92.15	17,601	54.667		2	0.00	#DIV/0!
AX (AM)		PS,C	Condenser & Carbon Adsorption System - 1					XY	1.180	106.17	17,719	61.834		1	0.00	#DIV/0!
AX (AM)		PS,C	Condenser & Carbon Adsorption System - 1					EB	3.500	106.17	17,767	183.903		4	0.00	#DIV/0!
AX (AM)	35	PS,C	Condenser & Carbon Adsorption System - 2 Total	26.20	45	0	1,056.0		98.730			5,047.069	0.000	40	25.53	0.017
AX (AM)		PS,C	Condenser & Carbon Adsorption System - 2	26.20	45	?	1,056.0	ST	89.940	104.16	17,606	4,594.308		34	25.53	0.014
AX (AM)		PS,C	Condenser & Carbon Adsorption System - 2					TO	1.210	92.15	17,601	54.667		2	0.00	#DIV/0!
AX (AM)		PS,C	Condenser & Carbon Adsorption System - 2					XY	1.180	106.17	17,719	61.834		1	0.00	#DIV/0!
AX (AM)		PS,C	Condenser & Carbon Adsorption System - 2					EB	6.400	106.17	17,767	336.280		4	0.00	#DIV/0!
AU (AO)	36	MABS	Predryer Total	35560.00	165	760	720.0		0.007			0.222	0.200	20366	27,992.83	12.841
AU (AO)		MABS	Predryer	35560.00	165	760	720.0	AN	0.002	53.06	9,786	0.033	0.200	4363	27,992.83	2.748
AU (AO)		MABS	Predryer					ST	0.002	104.16	17,606	0.117		8418	0.00	#DIV/0!
AU (AO)		MABS	Predryer					CU	0.000	120.20	17,873	0.002		194	0.00	#DIV/0!
AU (AO)		MABS	Predryer					MMA	0.002	100.13	11,400	0.057		6569	0.00	#DIV/0!
AU (AO)		MABS	Predryer					EB	0.000	106.17	17,767	0.012		842	0.00	#DIV/0!
AU (AO)	37	MABS	Dryer Total	28500.00	150	760	720.0		0.106			3.586	1.100	72475	22,966.89	45.651
AU (AO)		MABS	Dryer	28500.00	150	760	720.0	AN	0.000	53.06	9,786	0.001	1.100	6380	22,966.89	4.019
AU (AO)		MABS	Dryer					ST	0.011	104.16	17,606	0.572		34390	0.00	#DIV/0!
AU (AO)		MABS	Dryer					MMA	0.094	100.13	11,400	2.992		27475	0.00	#DIV/0!
AU (AO)		MABS	Dryer					CU	0.000	120.20	17,873	0.006		791	0.00	#DIV/0!
AU (AO)		MABS	Dryer					EB	0.000	106.17	17,767	0.016		3439	0.00	#DIV/0!
AU (AO)	38	MABS	Reactor Coagulation Vacuum Total	4000.00	150	760	720.0		0.190			5.176	0.200	107013	3,226.23	67.406
AU (AO)		MABS	Reactor Coagulation Vacuum	4000.00	150	760	720.0	AN	0.074	53.06	9,786	1.076	0.200	26833	3,226.23	16.902
AU (AO)		MABS	Reactor Coagulation Vacuum					ST	0.019	104.16	17,606	0.971		14670	0.00	#DIV/0!
AU (AO)		MABS	Reactor Coagulation Vacuum					CU	0.001	120.20	17,873	0.048		337	0.00	#DIV/0!
AU (AO)		MABS	Reactor Coagulation Vacuum					EB	0.002	106.17	17,767	0.105		1467	0.00	#DIV/0!
AU (AO)		MABS	Reactor Coagulation Vacuum					MMA	0.094	100.13	11,400	2.976		63706	0.00	#DIV/0!
AU (AO)	39	ABS,Ce	Predryer Total	35560.00	165	760	1,530.0		0.000			0.006	1.000	1356	27,992.83	0.402
AU (AO)		ABS,Ce	Predryer	35560.00	165	760	1,530.0	AN	0.000	53.06	9,786	0.001	1.000	302	27,992.83	0.090

Process Vent Raw Data For PS , ABS, and MABS - Data From Section 114 Responses - Part 1

Facility ID	Stream ID	Process	Process Vent	Flow Rate (acfm)	Temp. (F)	Pressure (mm Hg)	Operating Hours (hrs/yr)	Compound	Concentration (vol %)	Molecular Weight (lb/lb mol)	Heat Content (Btu/lb)	Calculated Btu Content (Btu/scf)	Btu Content (Btu/scf)	Emissions (lbs/yr)	Flow Rate (scfm)	HAP Flow Rate (kg/hr)
AU (AO)		ABS,Ce	Predryer					ST	0.000	104.16	17,606	0.006		938	0.00	#DIV/0!
AU (AO)		ABS,Ce	Predryer					CU	0.000	120.20	17,873	0.001		22	0.00	#DIV/0!
AU (AO)		ABS,Ce	Predryer					EB	0.000	106.17	17,767	0.001		94	0.00	#DIV/0!
AU (AO)	40	ABS,Ce	Dryer Total	28500.00	150	760	1,530.0		0.006			0.221	1.000	1393	22,986.89	0.413
AU (AO)		ABS,Ce	Dryer	28500.00	150	760	1,530.0	AN	0.002	53.06	9,786	0.028	1.000	302	22,986.89	0.090
AU (AO)		ABS,Ce	Dryer					ST	0.003	104.16	17,606	0.174		972	0.00	#DIV/0!
AU (AO)		ABS,Ce	Dryer					CU	0.000	120.20	17,873	0.006		22	0.00	#DIV/0!
AU (AO)		ABS,Ce	Dryer					EB	0.000	106.17	17,767	0.016		97	0.00	#DIV/0!
AU (AO)	41	ABS,Ce	Reactor Coagulation Vacuum Total	4000.00	150	760	3,603.0		0.084			1.996	2.200	109358	3,226.23	13.765
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum	4000.00	150	760	3,603.0	AN	0.063	53.06	9,786	0.914	2.200	55637	3,226.23	7.003
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					ST	0.019	104.16	17,606	0.971		47837	0.00	#DIV/0!
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					CU	0.001	120.20	17,873	0.048		1100	0.00	#DIV/0!
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					EB	0.001	106.17	17,767	0.063		4784	0.00	#DIV/0!
AU (AO)	42	ABS,Ce	Chip Maker Total	3000.00	150	760	3,711.0		0.023			0.872	1.000	31498	2,419.67	3.849
AU (AO)		ABS,Ce	Chip Maker	3000.00	150	760	3,711.0	AN	0.008	53.06	9,786	0.120	1.000	7018	2,419.67	0.858
AU (AO)		ABS,Ce	Chip Maker					ST	0.013	104.16	17,606	0.679		22084	0.00	#DIV/0!
AU (AO)		ABS,Ce	Chip Maker					CU	0.001	120.20	17,873	0.036		1198	0.00	#DIV/0!
AU (AO)		ABS,Ce	Chip Maker					EB	0.001	106.17	17,767	0.037		1198	0.00	#DIV/0!
AU (AO)	43	ABS,Ce	Reactor Coagulation Vacuum Total	4500.00	150	760	2,876.0		0.119			2.282	2.700	131522	3,629.51	20.740
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum	4500.00	150	760	2,876.0	AN	0.104	53.06	9,786	1.506	2.700	102241	3,629.51	16.122
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					ST	0.013	104.16	17,606	0.659		24945	0.00	#DIV/0!
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					CU	0.000	120.20	17,873	0.018		595	0.00	#DIV/0!
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					EB	0.002	106.17	17,767	0.100		3741	0.00	#DIV/0!
AU (AO)	44	ABS,Ce	Dryer Total	36000.00	150	760	2,876.0		0.003			0.077	0.100	32647	29,036.07	5.148
AU (AO)		ABS,Ce	Dryer	36000.00	150	760	2,876.0	AN	0.003	53.06	9,786	0.038	0.100	20836	29,036.07	3.286
AU (AO)		ABS,Ce	Dryer					ST	0.001	104.16	17,606	0.033		10068	0.00	#DIV/0!
AU (AO)		ABS,Ce	Dryer					CU	0.000	120.20	17,873	0.001		233	0.00	#DIV/0!
AU (AO)		ABS,Ce	Dryer					EB	0.000	106.17	17,767	0.005		1510	0.00	#DIV/0!
AU (AO)	45	MABS	Reactor Coagulation Vacuum Total	4500.00	150	760	392.0		0.111			2.844	3.500	21977	3,629.51	25.426
AU (AO)		MABS	Reactor Coagulation Vacuum	4500.00	150	760	392.0	AN	0.052	53.06	9,786	0.754	3.500	6973	3,629.51	8.067
AU (AO)		MABS	Reactor Coagulation Vacuum					ST	0.009	104.16	17,606	0.475		2436	0.00	#DIV/0!
AU (AO)		MABS	Reactor Coagulation Vacuum					MMA	0.048	100.13	11,400	1.529		12145	0.00	#DIV/0!
AU (AO)		MABS	Reactor Coagulation Vacuum					CU	0.000	120.20	17,873	0.012		59	0.00	#DIV/0!
AU (AO)		MABS	Reactor Coagulation Vacuum					EB	0.001	106.17	17,767	0.074		364	0.00	#DIV/0!
AU (AO)	46	ABS,Ce	Dryer Total	30500.00	150	760	6,368.0		0.002			0.053	1.000	30352	24,600.00	2.162
AU (AO)		ABS,Ce	Dryer	30500.00	150	760	6,368.0	AN	0.001	53.06	9,786	0.016	1.000	10126	24,600.00	0.721
AU (AO)		ABS,Ce	Dryer					ST	0.001	104.16	17,606	0.026		12068	0.00	#DIV/0!
AU (AO)		ABS,Ce	Dryer					CU	0.000	120.20	17,873	0.006		3949	0.00	#DIV/0!
AU (AO)		ABS,Ce	Dryer					EB	0.000	106.17	17,767	0.005		4187	0.00	#DIV/0!

Process Vent Raw Data For PS , ABS, and MABS - Data From Section 114 Responses - Part 1

Facility ID	Stream ID	Process	Process Vent	Flow Rate (acfm)	Temp. (F)	Pressure (mm Hg)	Operating Hours (hrs/yr)	Compound	Concentration (vol %)	Molecular Weight (lb/lb mol)	Heat Content (Btu/lb)	Calculated Btu Content (Btu/scf)	Btu Content (Btu/scf)	Emissions (lbs/yr)	Flow Rate (scfm)	HAP Flow Rate (kg/hr)
AU (AO)	47	ABS,Ce	Reactor Coagulation Vacuum Total	8000.00	150	760	5,585.0		0.427			7.024	3.600	615556	6,452.46	49.985
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum	8000.00	150	760	5,585.0	AN	0.405	53.06	9,786	5.853	3.600	547685	6,452.46	44.473
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					ST	0.016	104.16	17,608	0.828		48095	0.00	#DIV/0!
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					CU	0.005	120.20	17,873	0.317		16299	0.00	#DIV/0!
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					EB	0.001	106.17	17,767	0.026		3479	0.00	#DIV/0!
AU (AO)	48	ABS,Ce	Reactor Coagulation Vacuum Total	8000.00	150	760	8,760.0		0.092			1.762	2.100	557722	6,452.46	28.808
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum	8000.00	150	760	8,760.0	AN	0.080	53.06	9,786	1.161	2.100	428165	6,452.46	22.116
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					ST	0.012	104.16	17,608	0.596		122606	0.00	#DIV/0!
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					CU	0.000	120.20	17,873	0.016		4156	0.00	#DIV/0!
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					EB	0.000	106.17	17,767	0.005		2791	0.00	#DIV/0!
AU (AO)	49	ABS,Ce	Dryer Total	39500.00	150	760	3,266.0		0.010			0.328	1.000	146197	31,859.02	20.301
AU (AO)		ABS,Ce	Dryer	39500.00	150	760	3,266.0	AN	0.005	53.06	9,786	0.071	1.000	48377	31,859.02	6.718
AU (AO)		ABS,Ce	Dryer					ST	0.005	104.16	17,608	0.235		89241	0.00	#DIV/0!
AU (AO)		ABS,Ce	Dryer					CU	0.000	120.20	17,873	0.012		5294	0.00	#DIV/0!
AU (AO)		ABS,Ce	Dryer					EB	0.000	106.17	17,767	0.011		3285	0.00	#DIV/0!
AU (AO)	50	ABS,Ce	Reactor Coagulation Vacuum Total	6500.00	150	760	5,238.0		0.174			4.026	1.500	177749	5,242.62	15.390
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum	6500.00	150	760	5,238.0	AN	0.133	53.06	9,786	1.916	1.500	113716	5,242.62	9.846
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					ST	0.038	104.16	17,608	1.962		59781	0.00	#DIV/0!
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					CU	0.001	120.20	17,873	0.078		2497	0.00	#DIV/0!
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					EB	0.001	106.17	17,767	0.066		1755	0.00	#DIV/0!
AU (AO)	51	ABS,Ce	Dryer Total	28000.00	150	760	3,459.0		0.007			0.364	1.000	94733	22,583.61	12.421
AU (AO)		ABS,Ce	Dryer	28000.00	150	760	3,459.0	AN	0.000	53.06	9,786	0.005	1.000	14795	22,583.61	1.940
AU (AO)		ABS,Ce	Dryer					ST	0.007	104.16	17,608	0.332		76004	0.00	#DIV/0!
AU (AO)		ABS,Ce	Dryer					CU	0.000	120.20	17,873	0.006		1291	0.00	#DIV/0!
AU (AO)		ABS,Ce	Dryer					EB	0.000	106.17	17,767	0.021		2643	0.00	#DIV/0!
AU (AO)	52	ABS,Ce	Reactor Coagulation Vacuum Total	6500.00	150	760	3,459.0		0.357			7.774	2.000	165687	5,242.62	21.723
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum	6500.00	150	760	3,459.0	AN	0.287	53.06	9,786	4.147	2.000	114789	5,242.62	15.050
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					ST	0.067	104.16	17,608	3.397		47445	0.00	#DIV/0!
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					CU	0.001	120.20	17,873	0.078		2076	0.00	#DIV/0!
AU (AO)		ABS,Ce	Reactor Coagulation Vacuum					EB	0.003	106.17	17,767	0.152		1377	0.00	#DIV/0!
AU (AO)	53	ABS,Ce	Dryer Total	30000.00	150	760	3,315.0		0.025			0.888	1.000	106208	24,196.72	14.804
AU (AO)		ABS,Ce	Dryer	30000.00	150	760	3,315.0	AN	0.010	53.06	9,786	0.148	1.000	15394	24,196.72	2.106
AU (AO)		ABS,Ce	Dryer					ST	0.013	104.16	17,608	0.679		82290	0.00	#DIV/0!
AU (AO)		ABS,Ce	Dryer					CU	0.000	120.20	17,873	0.024		6592	0.00	#DIV/0!
AU (AO)		ABS,Ce	Dryer					EB	0.001	106.17	17,767	0.037		3932	0.00	#DIV/0!
AV (AP)	54	ABS,Ce	Reactor system outlet, after stripper flasher (Feed to Bd	204.00	150	765	1,312.5		8.600			248.337	245.000	1050200	164.54	362.881
AV (AP)		ABS,Ce	Reactor system outlet, after stripper flasher (Feed to Bd Re	204.00	150	765	1,312.5	BD	8.600	54.09	19,166	248.337	245.000	1050200	164.54	362.881
AV (AP)	55	ABS,Ce	Butadiene recovery system outlet (feed to flare) Total	200.00	140	765	1,312.5		0.858			24.776	24.500	105020	164.00	36.288
AV (AP)		ABS,Ce	Butadiene recovery system outlet (feed to flare)	200.00	140	765	1,312.5	BD	0.858	54.09	19,166	24.776	24.500	105020	164.00	36.288

Process Vent Raw Data For PS , ABS, and MABS - Data From Section 114 Responses - Part 1

Facility ID	Stream ID	Process	Process Vent	Flow Rate (acfm)	Temp. (F)	Pressure (mm Hg)	Operating Hours (hrs/yr)	Compound	Concentration (vol %)	Molecular Weight (lb/lb mol)	Heat Content (Btu/lb)	Calculated Btu Content (Btu/scf)	Btu Content (Btu/scf)	Emissions (lbs/yr)	Flow Rate (scfm)	HAP Flow Rate (kg/hr)
AV (AP)	56	ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Co	4412.00	120	765	5,891.0		0.082			1.913	2.100	245078	3,742.59	18.6
AV (AP)		ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Coag	4412.00	120	765	5,891.0	AN	0.062	53.06	9,786	0.897	2.100	147907	3,742.59	11.38
AV (AP)		ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Co					ST	0.019	104.16	17,606	0.971		93078	0.00	#DIV/0
AV (AP)		ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Co					CU	0.001	120.20	17,873	0.030		2729	0.00	#DIV/0
AV (AP)		ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Co					EB	0.000	106.17	17,767	0.016		1364	0.00	#DIV/0
AV (AP)	57	ABS,Ce	Pre-Dryer Outlet Total	19105.00	115	765	5,891.0		0.002			0.077	0.100	38756	16,347.23	2.964
AV (AP)		ABS,Ce	Pre-Dryer Outlet	19105.00	115	765	5,891.0	AN	0.001	53.06	9,786	0.014	0.100	12646	16,347.23	0.974
AV (AP)		ABS,Ce	Pre-Dryer Outlet					ST	0.001	104.16	17,606	0.051		24700	0.00	#DIV/0
AV (AP)		ABS,Ce	Pre-Dryer Outlet					CU	0.000	120.20	17,873	0.008		941	0.00	#DIV/0
AV (AP)		ABS,Ce	Pre-Dryer Outlet					EB	0.000	106.17	17,767	0.005		471	0.00	#DIV/
AV (AP)	58	ABS,Ce	Rotary Dryer Outlet Total	30080.00	144	765	5,891.0		0.004			0.179	0.200	107136	24,502.25	8.246
AV (AP)		ABS,Ce	Rotary Dryer Outlet	30080.00	144	765	5,891.0	AN	0.001	53.06	9,786	0.014	0.200	18800	24,502.25	1.447
AV (AP)		ABS,Ce	Rotary Dryer Outlet					ST	0.003	104.16	17,606	0.153		82690	0.00	#DIV/0
AV (AP)		ABS,Ce	Rotary Dryer Outlet					CU	0.000	120.20	17,873	0.006		3764	0.00	#DIV/0
AV (AP)		ABS,Ce	Rotary Dryer Outlet					EB	0.000	106.17	17,767	0.005		1882	0.00	#DIV/0
AV (AP)	59	ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Co	456.00	120	765	5,725.0		0.126			2.310	2.600	322651	388.51	25.559
AV (AP)		ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Coag	456.00	120	765	5,725.0	AN	0.113	53.06	9,786	1.634	2.600	262480	388.51	20.793
AV (AP)		ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Co					ST	0.013	104.16	17,606	0.664		59563	0.00	#DIV/0
AV (AP)		ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Co					CU	0.000	120.20	17,873	0.008		405	0.00	#DIV/0
AV (AP)		ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Co					EB	0.000	106.17	17,767	0.005		203	0.00	#DIV/0
AV (AP)	60	ABS,Ce	Rotary Dryer Outlet Total	31230.00	158	765	5,725.0		0.001			0.023	0.010	8329	24,862.72	0.660
AV (AP)		ABS,Ce	Rotary Dryer Outlet	31230.00	158	765	5,725.0	AN	0.000	53.06	9,786	0.001	0.010	1680	24,862.72	0.133
AV (AP)		ABS,Ce	Rotary Dryer Outlet					ST	0.000	104.16	17,606	0.010		5561	0.00	#DIV/0
AV (AP)		ABS,Ce	Rotary Dryer Outlet					CU	0.000	120.20	17,873	0.006		725	0.00	#DIV/0
AV (AP)		ABS,Ce	Rotary Dryer Outlet					EB	0.000	106.17	17,767	0.005		363	0.00	#DIV/0
AV (AP)	61	ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Co	6636.00	120	765	5,105.0		0.072			1.824	1.900	244316	5,629.16	21.704
AV (AP)		ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Coag	6636.00	120	765	5,105.0	AN	0.050	53.06	9,786	0.723	1.900	133121	5,629.16	11.826
AV (AP)		ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Co					CU	0.000	120.20	17,873	0.018		1767	0.00	#DIV/0
AV (AP)		ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Co					EB	0.000	106.17	17,767	0.011		884	0.00	#DIV/0
AV (AP)		ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Co					ST	0.021	104.16	17,606	1.073		108544	0.00	#DIV/0
AV (AP)	62	ABS,Ce	Rotary Dryer Outlet Total	61000.00	116	765	5,105.0		0.002			0.068	0.100	111273	52,104.17	9.885
AV (AP)		ABS,Ce	Rotary Dryer Outlet	61000.00	116	765	5,105.0	AN	0.000	53.06	9,786	0.008	0.100	42607	52,104.17	3.785
AV (AP)		ABS,Ce	Rotary Dryer Outlet					CU	0.000	120.20	17,873	0.008		3926	0.00	#DIV/0
AV (AP)		ABS,Ce	Rotary Dryer Outlet					EB	0.000	106.17	17,767	0.005		1963	0.00	#DIV/0
AV (AP)		ABS,Ce	Rotary Dryer Outlet					ST	0.001	104.16	17,606	0.051		62777	0.00	#DIV/0

Process Vent Raw Data For PS , ABS, and MABS - Data From Section 114 Responses - Part 2

				Existing	Existing Analysis				New Analysis			
Facility	Stream			Control	TRE	TRE	TRE	HON Control	TRE	TRE	TRE	HON Control
ID	ID	Process	Process Vent	(Y/N)	Flare	TI,0%	TI,70%	Required	Flare	TI,0%	TI,70%	Required
AO (AG)	1	PS,C	Before Burner (99.9%) Total	Y	20.095	17.688	27.506	N	5.479	4.823	7.499	N
AO (AG)	2	PS,C	Before Demister Filter Total	N	52.551	19.021	22.952	N	14.329	5.187	6.256	N
AO (AG)	3	ABS,Cm	Before Burner (99.9%) Total	Y	17.724	13.967	23.300	N	4.833	3.814	6.353	N
AO (AG)	4	ABS,Cm	Before Demister Filter Total	N	68.976	121.262	75.677	N	18.808	33.070	20.635	N
AP (AH)	5	PS,C	Die Demister Total	N	1,503.045	312.568	165.462	N	409.845	85.272	45.050	N
AP (AH)	6	PS,C	PS Raw Material Storage Total	N	4.855	25.128	19.383	N	1.324	6.852	5.286	N
AP (AH)	7	ABS,Cm	ABS Condenser Total	N	30.515	69.802	68.010	N	8.320	19.034	18.545	N
AP (AH)	8	ABS,Cm	ABS Feed Preparation Total	Y	0.124	0.853	0.663	Y	0.034	0.233	0.181	Y
AQ (AI)	9	PS,C	Before Eliminator (Die Exhaust Hoods,99%) Total	N	6.250	3.419	1.811	N	1.704	0.933	0.494	Y
AQ (AI)	10	PS,C	Monomer Recovery Vent Total	N	13.843	10.997	18.115	N	3.775	2.999	4.939	N
AM (AJ)	11	ABS,Cm	Absorber Total	N	60.326	34.310	52.096	N	16.449	9.355	14.203	N
AM (AJ)	12	ABS,Cm	Demister Filter Total	N	326.979	68.108	36.265	N	89.160	18.580	9.874	N
AM (AJ)	13	ABS,Cm	Devolatilization & Pelletizing (Before Filter) Total	N	304.984	64.340	35.554	N	83.162	17.552	9.681	N
AR (AK)	14	PS,C	PS Die Vent Total	N	28.998	382.712	257.644	N	7.906	104.365	70.261	N
AR (AK)	15	PS,C	Demister (after die vent) Total	N	1,045.779	237.171	156.620	N	285.159	64.699	42.714	N
AR (AK)	16	PS,C	PS Vacuum Pumps Total	N	13.951	11.635	18.680	N	3.804	3.172	5.093	N
AN (AL)	17	PS,C	Devolatilization & Pelletizing Total	N	705.005	184.612	158.063	N	192.237	50.358	43.089	N
AN (AL)	18	PS,C	Condenser (before boiler) Total	N	1,321.418	1,030.187	1,726.768	N	360.300	280.885	470.800	N
AN (AL)	19	PS,C	Condensers (before boiler) Total	N	29.767	22.900	38.305	N	8.116	6.244	10.444	N
AN (AL)	20	ABS,Cm	Devolatilization & Pelletizing Total	N	692.528	190.608	174.871	N	188.835	51.990	47.652	N
AN (AL)	21	ABS,Cm	Feed Preparation (before boiler) Total	Y	39.268	337.752	233.414	N	10.708	92.104	63.652	N
AN (AL)	22	ABS,Cm	Condensers (Before boiler) Total	N	95.223	74.969	124.806	N	25.964	20.446	34.028	N
AX (AM)	23	PS,C	Carbon Adsorption Canister (95%) Total	N	29.144	302.899	208.530	N	7.946	82.600	56.867	N
AX (AM)	24	PS,C	Carbon Adsorber - 132 Total	N	105.307	312.885	278.431	N	28.713	85.320	75.923	N
AX (AM)	25	PS,C	Carbon Adsorber - 136 Total	N	30.082	264.000	180.795	N	8.202	71.993	49.303	N
AX (AM)	26	PS,C	Carbon Adsorber - 139 Total	N	32.404	335.102	230.649	N	8.835	91.382	62.899	N
AX (AM)	27	PS,C	Carbon Adsorber - 101 Total	N	608.155	9,748.769	6,450.660	N	2,165.263	2,658.480	1,759.147	N
AX (AM)	28	PS,C	Carbon Adsorber - 131 Total	N	398.382	5,100.535	3,441.396	N	108.617	1,390.908	938.490	N
AX (AM)	29	PS,C	Carbon Adsorber Total	N	83.004	891.883	610.352	N	22.631	243.215	166.446	N
AX (AM)	30	PS,C	Refrigerated Condenser & Carbon Adsorber - 1 Total	N	44.293	440.284	291.559	N	12.077	120.065	79.510	N
AX (AM)	31	PS,C	Refrigerated Condenser and Carbon Adsorber - 2 Total	N	44.293	440.284	291.559	N	12.077	120.065	79.510	N
AX (AM)	32	PS,C	3013-01(before control) Total	N	195.576	38.477	10.877	N	53.329	10.496	2.957	N
AX (AM)	33	PS,C	Condenser & Carbon Adsorption Cannister Total	N	1.668	11.827	7.814	N	0.455	3.225	2.131	Y
AX (AM)	34	PS,C	Condenser & Carbon Adsorption System - 1 Total	N	46.850	429.713	287.234	N	12.774	117.183	78.330	N
AX (AM)	35	PS,C	Condenser & Carbon Adsorption System - 2 Total	N	44.293	440.284	291.559	N	12.077	120.065	79.510	N
AU (AO)	36	MABS	Predryer Total	N	22.743	3.984	0.974	Y	6.202	1.087	0.265	Y
AU (AO)	37	MABS	Dryer Total	N	5.260	0.925	0.272	Y	1.434	0.252	0.074	Y
AU (AO)	38	MABS	Reactor Coagulation Vacuum Total	Y	0.524	0.106	0.101	Y	0.143	0.029	0.028	Y
AU (AO)	39	ABS,Ce	Predryer Total	N	726.611	127.304	29.845	N	198.131	34.735	8.050	N

Process Vent Raw Data For PS , ABS, and MABS - Data From Section 114 Responses - Part 2

Facility ID	Stream ID	Process	Process Vent	Existing Control (Y/N)	Existing Analysis TRE Flare	Existing Analysis TRE TI,0%	Existing Analysis TRE TI,70%	Existing Analysis HON Control Required	New Analysis TRE Flare	New Analysis TRE TI,0%	New Analysis TRE TI,70%	New Analysis HON Control Required
AU (AO)	40	ABS,Ce	Dryer Total	N	581.661	102.408	24.798	N	158.606	27.942	6.735	N
AU (AO)	41	ABS,Ce	Reactor Coagulation Vacuum Total	Y	2.569	0.523	0.309	Y	0.700	0.143	0.084	Y
AU (AO)	42	ABS,Ce	Chip Maker Total	N	7.017	1.502	0.913	Y	1.913	0.410	0.249	Y
AU (AO)	43	ABS,Ce	Reactor Coagulation Vacuum Total	Y	1.906	0.381	0.226	Y	0.520	0.104	0.062	Y
AU (AO)	44	ABS,Ce	Dryer Total	N	58.830	10.298	2.427	N	16.042	2.810	0.659	Y
AU (AO)	45	MABS	Reactor Coagulation Vacuum Total	Y	1.555	0.311	0.195	Y	0.424	0.085	0.053	Y
AU (AO)	46	ABS,Ce	Dryer Total	N	118.842	20.885	5.028	N	32.405	5.699	1.365	N
AU (AO)	47	ABS,Ce	Reactor Coagulation Vacuum Total	Y	1.376	0.258	0.142	Y	0.375	0.070	0.039	Y
AU (AO)	48	ABS,Ce	Reactor Coagulation Vacuum Total	Y	2.388	0.448	0.210	Y	0.651	0.122	0.057	Y
AU (AO)	49	ABS,Ce	Dryer Total	N	16.359	2.857	0.698	Y	4.461	0.780	0.189	Y
AU (AO)	50	ABS,Ce	Reactor Coagulation Vacuum Total	Y	3.655	0.701	0.326	Y	0.997	0.191	0.089	Y
AU (AO)	51	ABS,Ce	Dryer Total	N	18.999	3.346	0.860	Y	5.181	0.913	0.234	Y
AU (AO)	52	ABS,Ce	Reactor Coagulation Vacuum Total	Y	2.589	0.496	0.245	Y	0.706	0.135	0.067	Y
AU (AO)	53	ABS,Ce	Dryer Total	N	17.070	3.000	0.766	Y	4.655	0.819	0.208	Y
AV (AP)	54	ABS,Ce	Reactor system outlet, after stripper flasher (Feed to Bd	Y	0.009	0.005	0.055	Y	0.002	0.001	0.015	Y
AV (AP)	55	ABS,Ce	Butadiene recovery system outlet (feed to flare) Total	Y	0.099	0.049	0.119	Y	0.027	0.013	0.032	Y
AV (AP)	56	ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Co	Y	2.158	0.430	0.248	Y	0.588	0.117	0.068	Y
AV (AP)	57	ABS,Ce	Pre-Dryer Outlet Total	N	57.430	10.222	2.727	N	15.660	2.789	0.741	Y
AV (AP)	58	ABS,Ce	Rotary Dryer Outlet Total	N	31.023	5.452	1.349	N	8.459	1.488	0.366	Y
AV (AP)	59	ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Co	Y	0.232	0.084	0.152	Y	0.063	0.023	0.041	Y
AV (AP)	60	ABS,Ce	Rotary Dryer Outlet Total	N	393.474	69.133	16.489	N	107.292	18.863	4.478	N
AV (AP)	61	ABS,Ce	Combined AN Absorber Outlet (Reactor System) and Co	Y	2.776	0.528	0.251	Y	0.757	0.144	0.066	Y
AV (AP)	62	ABS,Ce	Rotary Dryer Outlet Total	N	54.823	9.504	2.068	N	14.949	2.593	0.562	Y

PACIFIC ENVIRONMENTAL SERVICES, INC.

Central Park West
5001 South Miami Boulevard
PO Box 12077
Research Triangle Park, NC 27709-2077
(919) 941-0333 FAX (919) 941-0234

MEMORANDUM

TO: Group IV Resins Docket No. A-92-45

FROM: Ken Meardon
Pacific Environmental Services, Inc.

DATE: March 24, 1995

SUBJECT: Determination of MACT Floors for Equipment Leaks

The purpose of this memo is to describe the methodology used to calculate the MACT floors for the source categories covered by the Group IV Resins national emission standards for hazardous air pollutants (NESHAP). The same basic methodology, as described below, was used for each source category/subcategory.

Basic Methodology

The basic methodology consisted of estimating uncontrolled equipment leak emissions, identifying the level of control at each facility based on that facility's specific leak and detection repair (LDAR) program (if one was in place), applying the "controlled" equipment leak factors to estimate emissions after control, and then calculating the percent emission reduction achieved at each facility within each source category/subcategory. The information on the percent reduction achieved by the specific programs was then used to determine the MACT floors for each source category/subcategory.

Each individual plant was grouped with all other plants on the basis of the type of polymer or resin produced. Where a plant produced polymers or resins in more than one source category/subcategory, the equipment components were separated, where possible, according to the type of polymer or resin. If this was not possible, then all of the components were included in each applicable source category/subcategory for purposes of determining the MACT floors.

Estimating Uncontrolled Emissions

This step required determining (1) the equipment component counts at each plant and (2) the emission factors for each component category (e.g., valve in gas service, pump in light liquid service).

A number of facilities provided information on the component counts at a plant. Where these counts were provided, they were used directly in the estimation.

For facilities that did not provide equipment component counts, an estimate had to be made for each component type. There are many variables that affect the number of components at a facility. Such variables include, but are not limited to, the age of the facility, the number of process lines, and the capacity of each line and of the facility. Thus, for example, it is generally recognized that the number of components and thus emissions are related to the capacity of a facility. However, sufficient information was not available to perform any sophisticated analysis for estimating the number of components for those facilities.

The available information on equipment components was identified and estimates of the number of each component was made in terms of component per process line and component per design capacity. The results of this analysis showed, that for this industry, but unlike for the synthetic organic chemical industry (SOCMI), estimating the number of components by components-per-capacity was not necessarily unreasonable. The size of individual process lines within a subcategory was fairly similar and many of the facilities are of the same generation. Therefore, for estimation purposes, it was decided to use the information provided on individual facilities within the source category/subcategory, calculate an average count for each component type, and then ratio the design capacity of the target plant with the average design capacity of the plants that provided actual equipment counts.

To estimate uncontrolled emissions, the emission factors reported in the 1993 Protocol document[1] were used. These factors were used to provide a consistent baseline for estimating the impact of various LDAR programs in use in the source categories. For the several facilities that provided specific and clear information, the estimates of emissions were adjusted to account for low HAP concentrations and reduced hours of operation.

Identifying Level of Controls

A number of facilities provided information on the control programs being used to reduce emissions from equipment leaks. Other facilities simply identified a LDAR program, but did not provide any details. Still other facilities did not indicate any control programs for equipment leaks.

For facilities that provided information on the specific programs, these programs were used directly. For facilities that indicated that a LDAR program was being used,

[1] U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. EPA-453/R-93-026, June 1993.

but did not provide specifics, the State regulation that appears to be applicable to the plant was used to estimate the specifics. In most cases, this resulted in assuming a CTG-like level of control. In one or two instances, a LDAR program was indicated, but no State program could be identified. It is assumed that the LDAR program was therefore due to plant policy. For facilities that did not indicate any programs for equipment leaks, no control was assumed unless the facility was located in a State with a LDAR program that was obviously directed toward that plant or type of plant.

Controlled Emission Factors

The controlled emission factors associated with various LDAR programs used in determining the MACT floors are summarized in Table 1. Table 2 shows the percent reduction of the controlled emission factors over the uncontrolled emission factors. In most instances, the controlled emission factors are based primarily on information found in the 1993 Protocol document. The footnotes to Table 1 detail the derivation of the controlled emission factors.

Calculation of Emission Reduction and Controlled Emission Rates

Using the equipment component counts, uncontrolled emission factors, and controlled emission factors, the amount of emission reduction achieved by component and for the entire plant was calculated for each plant. The percent emission reductions were then calculated. Table 3 summarizes the estimated percent reductions for each facility within each source category/subcategory.

MACT Floor Determination

MACT floors were then determined for existing and new facilities within each source category/subcategory. For source categories with less than 5 source categories all of the facilities were used to estimate the MACT floor. The MACT floor was calculated by taking the average of the percent emission reductions achieved by each of the facilities. Thus, for example, the four facilities producing ABS using the batch emulsion process were estimated to reduce equipment leak emissions by 91.2, 84.1, 82.0, and 79.5 percent. The average of these four percent reductions is 84.2 percent, which was used to represent the MACT floor for existing sources in this subcategory.

For source categories/subcategories with more than five facilities, the five facilities with the highest percent reductions were identified, and the MACT floor was calculated as the average percent reduction achieved by these five facilities. For example, the top five polystyrene facilities using a continuous process were identified as achieving 85.8, 81.9, 80.8, 79.6, and 78.6 percent reduction. The average of these five percent reductions is 81.3 percent.

For new facilities, the MACT floor was identified as the best performing facility within the source category/subcategory based on the estimated percent reduction. For example, in the ABS, batch emulsion source category, the Monsanto, Addyston, OH, facility was estimated to be reducing equipment leak emissions by 91.2 percent. This was then selected as the MACT floor for new sources in this subcategory.

In all cases, the MACT floors estimated for existing and new sources were equivalent to or less stringent than the HON.

TABLE 1

SUMMARY OF EMISSION FACTORS (lbs/hr) FOR VARIOUS EQUIPMENT LEAK CONTROL PROGRAMS

PROGRAM	Leak Definition (ppm)	EQUIPMENT CATEGORY[a]									
		V,G	V,LL	V,HL	P,LL	P,HL	PRVs	OELs	Comp.	Samp. Conn.	Connectors
Uncontrolled[b]	--	0.0131	0.00887	0.000506	0.0438	0.01896	0.2288	0.00374	0.5016	0.033	0.00403
Annual	10,000	0.0087[c]	0.0062[c]		0.034[c]		0.1784[c]		0.419[c]		0.00052[d]
Annual	1,000	0.0083	0.00395[e]		0.0305		0.1724				0.000334[d]
Semiannual	10,000										0.000392[f]
Quarterly LDAR	10,000	0.0043[g]	0.0035[e]		0.024[h]		0.128[i]		0.3366[j]		0.000349[f]
Quarterly LDAR	1,000	0.00345[g]	0.00273[e]		0.0172[h]		0.1166[k]				0.000194[d]
Quarterly LDAR	500	0.00323[g]	0.00257[e]		0.0157[h]		0.1152[l]				0.000166[d]
Quarterly LDAR[m]	200	0.00323	0.00257		0.0157		0.1152				0.000166
Quarterly LDAR	100										0.000166
Monthly LDAR	10,000	0.00165[g]	0.00141[e]		0.0135[h]						0.000264[d]
Monthly LDAR	1,000	0.0013[g]	0.00106[e]		0.011[h]						0.000124[d]
Monthly LDAR	500	0.0012[g]	0.001[e]		0.011[h]						0.0001[d]
Monthly LDAR	100	0.0010	0.001		0.011						
No Detectable Emissions[n]	500						0.007		0.007		
HON	varies	0.001[o]	0.0011[o]		0.011[o]		0.007				0.000286[d]
Maintain Less Than 2% Leakers[p]	10,000	0.00201	0.00232		0.00942		0.135		0.23		0.002655
	1,000	0.000336	0.000379		0.00225						0.00055
Maintain less than 1% leakers[q]	10,000				0.00676		0.1164		0.213		0.00142
Maintain less than 0.5% leakers[r]	10,000	0.000718	0.000853								

TABLE 1

SUMMARY OF EMISSION FACTORS (lbs/hr) FOR VARIOUS EQUIPMENT LEAK CONTROL PROGRAMS

PROGRAM	Leak Definition (ppm)	EQUIPMENT CATEGORY[a]									
		V,G	V,LL	V,HL	P,LL	P,HL	PRVs	OELs	Comp.	Samp. Conn.	Connectors
No Evidence of Leaks[s]	10,000	0.00122	0.00129		0.00999	0.007	0.0978	0.0033	0.186		0.00054
"Inspect as suspect"											0.00334[t]
Closed-vent System	--				0.00438[u]	0.001896[u]	v		0.05016[u]		
DMS w/Barrier Fluid[w]	--				0	0			0		
Rupture Disk[w]	--						0				
Weld Together[w]	--										0
Blind, Cap, Plug, Second Valve[w]	--							0			
Closed-loop Sampling[w]	--									0	

-- = Not Applicable

FOOTNOTES TO TABLE 1

[a] V = valves; P = pumps; PRVs = pressure relief valves; OELs = open-ended lines; Comp. = compressors; Samp. Conn. = sampling connections; G = gas service; LL = light liquid service; HL = heavy liquid service.

[b] U.S. Environmental Protection Agency. Protocol for Equipment Leak Emission Estimates. EPA-453/R-93-026. June 1993. page 2-10. (1993 Protocol document). Converted from kg/hr to lbs/hr by: kg/hr x 2.2 = lbs/hr.

[c] Estimated be averaging uncontrolled emission factors and emission factors for quarterly LDAR with leak definition of 10,000 ppm. For example, for valves in gas service: (0.0131 + 0.0043)/2 = 0.0087 lbs/hr. For some components, this is a conservative estimate as annual programs may not be effective in reducing emissions.

[d] Derivation of emission factors based on taking known values (shown in double-lined boxes in the following tables), bounding unknown values, and taking mid-points as estimates of unknown emission factors. The first table shows known and estimated leak frequencies. The second table shows the known and estimated emission factors. These values were based upon the 1993 Protocol document data and equations, and apply only to connectors in gas/vapor service and to connectors in light liquid service.

CONNECTOR LEAK FREQUENCIES

LDAR PERIOD	LEAK DEFINITION (ppm)			Uncontrolled
	500	1000	10000	
Annual	0.25	0.213	0.138	
Quarterly	0.125	0.106	0.069	
Monthly	0.063	0.053	0.0345	
Uncontrolled	3.9	3.78	1.55	1.55

CONNECTOR EMISSION FACTORS (lbs/hr)

LDAR PERIOD	LEAK DEFINITION (ppm)			Uncontrolled
	500	1000	10000	
Annual	0.000286	0.000334	0.00052	
Quarterly	0.000166	0.000194	0.000349	
Monthly	0.000102	0.000124	0.000264	
Uncontrolled				1.55

Detailed Discussion

For annual LDAR, the leak frequency and emission factor at 500 ppm are known (0.25% and 0.000286 lbs/hr). As leak definition goes from 500 to 1000, the leak frequency will decrease. We also know that the emission factor will increase as the leak frequency increases (within the same LDAR monitoring period). Using this information, emission factors for 1,000 and 10,000 ppm were calculated as follows:

Annual at 1,000 ppm. The leak frequency at 1,000 ppm will be less than 0.25%. Using this leak frequency and the appropriate equation from page 5-19 of the 1993 Protocol document, we can calculate a "maximum" emission factor, which is calculated to be 0.00017 kg/hr. Next, the emission factor at 1,000 ppm must be greater than that at 500 ppm, which we know to be 0.000134 kg/hr. These two emission factors "bound" the estimate for annual LDAR at 1,000 ppm. The emission factor for 1,000 ppm was then estimated as the mid-point of these two numbers, which is 0.000152 kg/hr (= (0.000134 + 0.00017)/2) or 0.000334 lbs/hr.

Annual at 10,000 ppm. The first step was to estimate the leak frequency at 1,000 ppm. In the previous step, we estimated the emission factor at 1,000 ppm to be 0.000134 kg/hr. Using the appropriate equation on page 5-19 of the 1993 Protocol document, we can "back-calculate" the equivalent leak frequency, which is calculated to be 0.213 percent. The leak frequency at 10,000 ppm will be less than 0.213 percent. Using this leak frequency in the appropriate equation on page 5-19 yields an emission factor of 0.000321 kg/hr. We also know that the emission factor will be greater than that at 1,000 ppm, which was estimated to be 0.00015 kg/hr. The emission factor for 10,000 ppm is then bounded by these two emission factors, 0.000152 and 0.000321 kg/hr. The emission factor for 10,000 is then taken again as the mid-point between these two estimates (0.000236 kg/hr or 0.00052 lbs/hr).

Emission Factors for Quarterly and Monthly LDAR. In the absence of any information, leak frequencies were assumed to decrease by 50 percent from annual to quarterly and 50 percent from quarterly to monthly. The resulting leak frequencies were then used in the appropriate equations on page 5-19 to estimate emission factors.

FOOTNOTES TO TABLE 1
(continued)

[e] Derivation of emission factors based on taking known values (shown in double-lined boxes in the following tables), bounding unknown values, and taking mid-points as estimates of unknown emission factors. The first table shows known and estimated leak frequencies. The second table shows the known and estimated emission factors. These values were based upon the 1993 Protocol document data and equations. See footnote d for a detailed discussion of the methodology used to estimate the unknown values. The leak frequency for annual at 1,000 ppm was based on the mid-point of uncontrolled and quarterly at 1,000 ppm leak frequencies.

LIGHT LIQUID SERVICE VALVES LEAK FREQUENCIES

LDAR PERIOD	LEAK DEFINITION (ppm)			Uncontrolled
	500	1000	10000	
Annual		3.3		
Quarterly	2.42	2.26	1.60	
Monthly	0.896	0.83	0.54	
Uncontrolled	8.5	8.3	4.34	4.34

LIGHT LIQUID SERVICE VALVES EMISSION FACTORS (lbs/hr)

LDAR PERIOD	LEAK DEFINITION (ppm)			Uncontrolled
	500	1000	10000	
Annual		0.00395		
Quarterly	0.00257	0.00273	0.0035	
Monthly	0.00099	0.00106	0.00141	
Uncontrolled				0.00887

[f] Estimated by averaging the emission factors for annual LDAR and monthly LDAR both with leak definition of 10,000 ppm.

[g] Derivation of emission factors based on taking known values (shown in double-lined boxes in the following tables), bounding unknown values, and taking mid-points as estimates of unknown emission factors. The first table shows known and estimated leak frequencies. The second table shows the known and estimated emission factors. These values were based upon the 1993 Protocol document data and equations. See footnote d for a detailed discussion of the methodology used to estimate the unknown values. The leak frequency for annual at 1,000 ppm was based on the mid-point of uncontrolled and quarterly at 1,000 ppm leak frequencies.

GAS SERVICE VALVES LEAK FREQUENCIES

LDAR PERIOD	LEAK DEFINITION (ppm)			Uncontrolled
	500	1000	10000	
Annual				
Quarterly		3.095	2.33	
Monthly		1.13	0.79	
HON	1.00			
Uncontrolled	13.6	13.3	7.48	7.48

FOOTNOTES TO TABLE 1
(continued)

GAS SERVICE VALVES EMISSION FACTORS (lbs/hr)

LDAR PERIOD	LEAK DEFINITION (ppm)			Uncontrolled
	500	1000	10000	
Annual				
Quarterly	0.00323	0.00345	0.00429	
Monthly	0.00121	0.001298	0.00165	
HON	0.00099			
Uncontrolled				0.0131

[h] Derivation of emission factors based on taking known values (shown in double-lined boxes in the following tables), bounding unknown values, and taking mid-points as estimates of unknown emission factors. The first table shows known and estimated leak frequencies. The second table shows the known and estimated emission factors. These values were based upon the 1993 Protocol document data and equations. See footnote d for a detailed discussion of the methodology used to estimate the unknown values. The leak frequency for annual at 1,000 ppm was based on the mid-point of uncontrolled and quarterly at 1,000 ppm leak frequencies.

LIGHT LIQUID SERVICE PUMPS LEAK FREQUENCIES

LDAR PERIOD	LEAK DEFINITION (ppm)			Uncontrolled
	500	1000	10000	
Annual				
Quarterly	7.2	6.5	3.75	
Monthly	4.49	4.02	1.77	
HON		4.02		
Uncontrolled	17.6	17.1	7.48	7.48

LIGHT LIQUID SERVICE PUMPS EMISSION FACTORS (lbs/hr)

LDAR PERIOD	LEAK DEFINITION (ppm)			Uncontrolled
	500	1000	10000	
Annual				
Quarterly	0.0157	0.0172	0.024	
Monthly	0.010	0.011	0.0135	
HON		0.011		
Uncontrolled				0.0438

[i] Based on emission reduction of 44 percent from uncontrolled level. U.S. Environmental Protection Agency. *Fugitive Emission Sources of Organic Compounds -- Additional Information on Emissions, Emission Reductions, and Costs.* EPA 450/3-82-010. April 1982. (1982 AID document) p. 4-61.

[j] Based on 33 percent reduction, CTG.

[k] Total estimated emission reduction effectiveness of 49 percent. Based on an estimated percent reduction of 44 percent for a quarterly LDAR program with a leak definition of 10,000 ppm (see footnote d above) plus 5 percent based on increased effectiveness of decreasing the leak definition from 10,000 ppm to 1,000.

[l] Assumed to be 1 percent more effective than with leak definition of 1,000 ppm.

FOOTNOTES TO TABLE 1
(continued)

[m] Assumed 200 ppm leak definition had same emission factor as 500 ppm.

[n] 1993 Protocol document, p. 2-21:

$$1.90\times10^{-5} \times (500)^{0.824} = 0.00318 \text{ kg per hour}$$

0.007 lbs per hour

[o] 1993 Protocol document, p. F-4. The emission factor for pumps, light liquid service also applies to agitators.

[p] Calculated using the following equation:

$$\frac{\text{(Uncontrolled Emission Rate - Emission Rate at 1\%)}}{\text{Uncontrolled Emission Rate}}$$

Emission rates at 1% were calculated using the equations on p. 5-19 of the 1993 Protocol document. For example, the average leak rate (kg/hr) for valves in gas service with a leak definition of 10,000 ppm can be calculated as follows:

$$\begin{aligned}\text{Average Leak Rate} &= (0.0781 \times 0.01) + 0.000131\\ &= 0.000912 \text{ kg/hr}\\ &= 0.00201 \text{ lbs/hr}\end{aligned}$$

[q] Assume maintain 1% leakers means an average of 0.5% leakers actually occur. Used the leak rates for >10,000 and for <10,000 (see first table in footnote s) to estimate emission factors based on percent leaking and not leaking. For example,

For PRVs: kg/hr = (1.691 x 0.005) + (0.0447 x 0.995) = 0.05293
lbs/hr = 0.05293 x 2.2 = 0.1164

[r] Assume maintain 0.5% leakers means an average of 0.25% leakers actually occur. Used the leak rates for >10,000 and for <10,000 (see first table in footnote s) to estimate emission factors based on percent leaking and not leaking. For example,

For valves in gas service: kg/hr = (0.0782 x 0.0025) + (0.000131 x 0.9975) = 0.000326
lbs/hr = 0.000326 x 2.2 = 0.000718

[s] Calculation of Emission Factors for "No Evidence of Leaks" Program; Leak Definition of 10,000 ppm.

CALCULATION OF PERCENT OF COMPONENTS WITH <10,000 PPM AND ≥10,000 PPM

EQUIPMENT TYPE	AVERAGE EMISSION FACTOR (kg/hr)[a]	≥ 10,000 ppm Emission Factor (kg/hr)[b]	< 10,000 ppm Emission Factor (kg/hr)[b]	PERCENT OF COMPONENTS ≥10,000 PPM[c]	PERCENT OF COMPONENTS <10,000 PPM[c]
Valves, gas service	0.00597	0.0782	0.000131	7.48	92.52
Valves, light liquid service	0.00403	0.0892	0.000165	4.341	95.659
Valves, heavy liquid service	0.00023	0.00023	0.00023	NA	NA
Pump seals, light liquid service	0.0199	0.243	0.00187	7.48	92.52
Pump seals, heavy liquid service	0.00862	0.216	0.00210	3.048	96.952
Pressure relief valves	0.104	1.691	0.0447	3.6	96.4
Open ended lines	0.0017	0.01195	0.00150	1.91	98.09
Compressor seals	0.228	1.608	0.0894	9.13	90.87
Connectors	0.00183	0.113	0.000081	1.55	98.45

NOTE: Program assumed not applicable to sampling connections.

FOOTNOTES TO TABLE 1
(concluded)

Footnotes to first table in footnote s:

[a] 1993 Protocol document, p. 2-10.

[b] 1993 Protocol document, p. 2-16.

[c] Calculated based on average emission factor and the ≥ 10,000 and <10,000 ppm emission factors. For example, solving for valves in gas service as follows:

$$0.00597 \text{ kg/hr} = 0.0782 (X) + 0.000131 (Y)$$
$$1.00 = X + Y$$

where: X = percent of components with ≥10,000 ppm

Y = percent of components with <10,000 ppm

CALCULATION OF NO EVIDENCE OF LEAKS (10,000 PPM LEAK DEFINITION) EMISSION FACTORS

EQUIPMENT TYPE	EMISSION FACTOR (kg/hr) at 10,000 ppm[a]	PERCENT <10,000 PPM	PROGRAM EMISSION FACTOR	
			kg/hr	lbs/hr
Valves, gas service	0.005806	92.52	0.000555	0.00122
Valves, light liquid service	0.0098823	95.659	.000587	0.00129
Valves, heavy liquid service	0.00023[b]	NA	0.00023	0.000506
Pumps, light liquid service	0.03756	92.52	0.004539	0.00999
Pumps, heavy liquid service	0.03756	96.952	0.00318	0.007
Pressure relief valves	0.03756	96.4	0.0444	0.0977
Open-ended lines	0.0015[c]	98.09	0.00147	0.00324
Compressor seals	0.03756	90.87	0.0845	0.186
Connectors	0.01058	98.45	0.000244	0.00054

[a] Calculated using correlation equations found on page 2-21 of the 1993 Protocol document.

[b] Based on average emission factor for source.

[c] Assumed same as <10,000 ppm emission factor.

Sample calculation:

Valves, gas service: 0.000555 kg/hr = (0.005806 x 0.0748) + (0.000131 x 0.9252)

[t] Assumed to be midway in effectiveness between "uncontrolled" and "maintain less than 2% leakers (10,000 ppm)."

[u] Based on 90 percent control efficiency. 1993 Protocol document, p.5-2. Actual efficiency of a closed-vent system depends on percentage of vapors collected and efficiency of control device to which the vapors are routed.

[v] Control efficiency of closed-vent system installed on a pressure relief device may be lower than other closed-vent systems, because they must be designed to handle both potentially large and small volumes of vapor. 1993 Protocol document, p. 5-2.

[w] Based on 100 percent control efficiency. 1993 Protocol document, P. 5-2.

TABLE 2

SUMMARY OF PERCENT REDUCTION BY COMPONENT FOR VARIOUS EQUIPMENT LEAK CONTROL PROGRAMS[a]

PROGRAM	Leak Definition (ppm)	EQUIPMENT CATEGORY[b]									
		V,G	V,LL	V,HL	P,LL	P,HL	PRVs	OELs	Comp.	Samp. Conn.	Connectors
Uncontrolled	--										
Annual	10,000	33.6	30.1		22.4		22.0		16.5		87.1
Annual	1,000	36.6	55.5		30.4		24.7				91.7
Semiannual	10,000										90.3
Quarterly LDAR	10,000	67.2	60.5		45.2		44.1		32.9		91.3
Quarterly LDAR	1,000	73.7	69.2		60.7		49.0				95.2
Quarterly LDAR	500	75.3	71.0		64.2		49.7				95.9
Quarterly LDAR	200	75.3	71.0		64.2		49.7				95.9
Quarterly LDAR	100										95.9
Monthly LDAR	10,000	87.4	84.1		69.2						93.4
Monthly LDAR	1,000	90.1	88.0		74.9						96.9
Monthly LDAR	500	90.8	88.7		77.2						97.5
Monthly LDAR	100	92.4	88.7		77.2						
No Detectable Emissions	500						96.9		98.6		
HON	varies	92.4	87.6		74.9		96.9				92.9
Maintain Less Than 2% Leakers	10,000	84.7	73.8		78.5		41.0		54.1		34.1
	1,000	97.4	95.7		94.9						86.4
Maintain less than 1% leakers	10,000				84.6		49.1		57.5		64.8
Maintain less than 0.5% leakers	10,000	94.5	90.4								
No Evidence of Leaks	10,000	90.7	85.5		77.2	63.1	57.3	11.8	62.9		86.6

TABLE 2

SUMMARY OF PERCENT REDUCTION BY COMPONENT FOR VARIOUS EQUIPMENT LEAK CONTROL PROGRAMS[a]

PROGRAM	Leak Definition (ppm)	EQUIPMENT CATEGORY[b]									
		V,G	V,LL	V,HL	P,LL	P,HL	PRVs	OELs	Comp.	Samp. Conn.	Connectors
"Inspect as suspect"											17.1
Closed-vent System	--				90.0	90.0			90.0		
DMS w/Barrier Fluid	--				100	100			100		
Rupture Disk	--						100				
Weld Together	--										100
Blind, Cap, Plug, Second Valve	--							100			
Closed-loop Sampling	--									100	

[a] Calculated using the controlled emission factors and the uncontrolled emission factors reported in Table 1.

[b] V = valves; P = pumps; PRVs = pressure relief valves; OELs = open-ended lines; Comp. = compressors; Samp. Conn. = sampling connections; G = gas service; LL = light liquid service; HL = heavy liquid service.

TABLE 3

SUMMARY OF ESTIMATED PERCENT EMISSION REDUCTIONS
AND MACT FLOORS FOR EQUIPMENT LEAKS

SOURCE CATEGORY/ SUBCATEGORY	FACILITY	PERCENT REDUCTION	MACT FLOORS	
			EXISTING FACILITIES	NEW FACILITIES
ABS - Batch Emulsion	Monsanto, Addyston	91.2	84.2	91.2
	GE, Washington	84.1		
	Dow, Midland	82.0		
	Monsanto, Muscatine	79.5		
ABS - Batch Suspension	Monsanto, Addyston	96.1	87.1	96.1
	Monsanto, Muscatine	78.0		
ABS - Continuous - Mass	Monsanto, Addyston	90.3	62.4	90.3
	Dow, Midland	82.7		
	Dow, Torrance	71.9		
	Dow, Allyn's Point	38.9		
	Dow, Hanging Rock	28.1		
ABS Continuous - Emulsion	GE, Washington	84.1	64.0	84.1
	GE, Ottawa	43.9		
ABS - Latex	BF Goodrich, Akron	32.7	32.7	32.7

TABLE 3

SUMMARY OF ESTIMATED PERCENT EMISSION REDUCTIONS
AND MACT FLOORS FOR EQUIPMENT LEAKS

SOURCE CATEGORY/ SUBCATEGORY	FACILITY	PERCENT REDUCTION	MACT FLOORS	
			EXISTING FACILITIES	NEW FACILITIES
PS Continuous	Dow, Joilet	85.8	81.3	85.8
	BASF, Holyoke	81.9		
	Monsanto, Addyston	80.8		
	Huntsman, Chesapeake	79.6		
	Novacor, Indian Orchard	78.6		
	Dow, Torrance	76.9		
	Novacor, Decatur	75.9		
	Huntsman, Belpre	72.5		
	Dow, Riverside	70.8		
	BASF, Santa Ana	70.7		
	Dow, Midland	59.5		
	BASF, Joilet	51.5		
	Dow, Allyn's Point	47.4		
	GE, Selkirk	46.8		
	American Polymers	33.0		
	Fina Oil, Carville	25.7		
	Dow, Hanging Rock	23.9		
	Amoco, Joilet	22.1		
	Huntsman, Peru	0		
	Chevron, Marietta	0		
	Kama, Hazelton	*		

* Insufficient information to estimate emissions and emission reductions.

TABLE 3

SUMMARY OF ESTIMATED PERCENT EMISSION REDUCTIONS AND MACT FLOORS FOR EQUIPMENT LEAKS

SOURCE CATEGORY/ SUBCATEGORY	FACILITY	PERCENT REDUCTION	MACT FLOORS	
			EXISTING FACILITIES	NEW FACILITIES
EPS	Huntsman, Rome	75.4	40.4	75.4
	Scott, Saginaw (1)	33.0		
	Scott, Forth Worth	33.0		
	BASF, South Brunswick	28.4		
	Arco, Monaca	32.4*		
	Huntsman, Peru	0		
	Arco, Painesville	0		
Batch	Huntsman, Chesapeake	78.5	49.0	78.5
	American Polystyrene, Torrance	69.9		
	American Polymers, Oxford	33.8		
	ARCO, Monaca	32.4		
	Scott, Saginaw (1)	30.7		
	Scott, Saginaw (2)	30.7		
	Dart, Leola	29.7		
	Amoco, Willow Springs	26.5		
	Dart, Ownesboro (1)	0		
	Rohm and Haas, Phila.	0		
	Dart, Owensboro (2)	0		
	Huntsman, Peru	0		

* Estimate based on equipment counts for entire facility; see PS-batch estimate.

TABLE 3

SUMMARY OF ESTIMATED PERCENT EMISSION REDUCTIONS AND MACT FLOORS FOR EQUIPMENT LEAKS

SOURCE CATEGORY/ SUBCATEGORY	FACILITY	PERCENT REDUCTION	MACT FLOORS	
			EXISTING FACILITIES	NEW FACILITIES
MBS	Elf Atochem	94.0	61.1	94.0
	Kaneka	84.7		
	Rohm and Haas	4.7		
Nitrile	BP Chemicals	74.5	74.5	74.5
SAN - Batch	Monsanto, Addyston	88.9	82.6	88.9
	Monsanto, Muscatine	76.3		
SAN - Continuous	Monsanto, Addyston	88.6	77.8	88.6
	Dow, Midland	77.0		
	GE, Bay St. Louis	67.8		
MABS	GE, Washington	84.1	84.1	84.1
ASA/AMSAN	GE, Selkirk	0	0	0

TABLE 3

SUMMARY OF ESTIMATED PERCENT EMISSION REDUCTIONS AND MACT FLOORS FOR EQUIPMENT LEAKS

SOURCE CATEGORY/ SUBCATEGORY	FACILITY	PERCENT REDUCTION	MACT FLOORS	
			EXISTING FACILITIES	NEW FACILITIES
PET - DMT/BATCH	Hoechst-Celanese (HC), Spartanburg	0	0	0
	BASF, Lowland, TN	0		
	Tennessee Eastman (TE), Kingsport, TN	0		
	HC, Shelby, NC	0		
	3M, Decatur, AL (1)	0		
	3M, Decatur, AL (2)	0		
	3M, Greenville, SC	0		
	ICI, Fayetteville, NC	0		
	ICI, Hopewell, VA	0		
	Eastman Kodak, Rochester, NY	0		
PET - DMT/CONT.	HC, Spartanburg, SC	0	0	0
	DuPont, Copper River, SC	0		
	DuPont, Circleville, OH	0		
	DuPont, Florence, SC	0		
	DuPont, Kinston, NC	0		
	DuPont, Old Hickory, TN	0		
	DuPont, Brevard, NC	0		
	DuPont, Cape Fear, NC	0		
	Carolina Eastman (CE), Columbia, SC	0		
	TE, Kingsport, TN	0		

TABLE 3

SUMMARY OF ESTIMATED PERCENT EMISSION REDUCTIONS AND MACT FLOORS FOR EQUIPMENT LEAKS

SOURCE CATEGORY/ SUBCATEGORY	FACILITY	PERCENT REDUCTION	MACT FLOORS	
			EXISTING FACILITIES	NEW FACILITIES
PET - TPA/CONT.	Carolina Eastman, Columbia, SC (Plant 3)	28.1	11.9	28.1
	Carolina Eastman, Columbia, SC (Plant 2)	28.1		
	Hoechst-Celanese, Salisbury, NC	3.2		
	Hoechst-Celanese, Spartanburg	0		
	DuPont, Copper River, SC	0		
	DuPont, Kinston, NC	0		
	DuPont, Cape Fear, NC	0		
	Wellman, Palmetto, SC	0		
	YKK, Macon, GA	0		
	Tennessee Eastman, Kingsport, TN	0		
	Hoechst-Celanese, Greer, SC	0		
	Allied-Signal, Moncure, NC	0		
	Shell, Pt. Pleasant, WV	0		
PET - TPA/Batch	Shell, Pt. Pleasant, WV	0	0	0

EPA-453/R-95-003a

3. RECIPIENT'S ACCESSION NO.

4. TITLE AND SUBTITLE
Hazardous Air Pollutant Emissions from Process Units in the Thermoplastics Manufacturing Industry--Supplemental Information Document for Proposed Standards

5. REPORT DATE
March 1995

6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)

8. PERFORMING ORGANIZATION REPORT NO.

9. PERFORMING ORGANIZATION NAME AND ADDRESS
Office of Air Quality Planning and Standards
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

10. PROGRAM ELEMENT NO.

11. CONTRACT/GRANT NO.
68D10116

12. SPONSORING AGENCY NAME AND ADDRESS
Director, Office of Air Quality Planning and Standards, Office of Air and Radiation
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

13. TYPE OF REPORT AND PERIOD COVERED

14. SPONSORING AGENCY CODE
EPA/200/04

15. SUPPLEMENTARY NOTES

16. ABSTRACT

A proposed rule for the regulation of emissions of organic hazardous air pollutants (HAP) and the following Group IV polymers and resins: acrylonitrile butadiene styrene (ABS) resin, styrene acrylonitrile (SAN) resin, methyl methacrylate acrylonitrile butadiene styrene (MABS) resin, methyl methacrylate butadiene styrene (MBS) resin, polystyrene resin, poly(ethylene terephthalate) (PET) resin, and nitrile resin. This thermoplastics rule is being proposed under the authority of Sections 112, 114, 116, and 301 of the Clean Air Act, as amended in 1990. This Supplementary Information Document contains memoranda providing rationale and information used in developing the proposed standards.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Air pollution Pollution control Hazardous air pollutant	Air pollution control Thermoplastic polymer manufacturing industry	

18. DISTRIBUTION STATEMENT
Release Unlimited

19. SECURITY CLASS (This Report)
Unclassified

20. SECURITY CLASS (This page)
Unclassified

21. NO. OF PAGES
472

22. PRICE