SECTION H – ENVIRONMENTAL ASSESSMENT – Revised September 8, 2000

In accordance with the requirements of 21 CFR 25.31a, the environmental assessment for the proposed action is outlined in the following sections:

1. Date: September 8, 2000

2. Name of Applicant: ZEON CHEMICALS L.P.

3. Address: All future discussion and communications regarding this petition are to be addressed to:

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93F-0319

EA 1

SECTION H - ENVIRONMENTAL ASSESSMENT

4. DESCRIPTION OF PROPOSED ACTION

The purpose of this petition and subsequent actions requested is the amendment of the existing Food Additive regulation. This amendment would allow the use of hydrogenated acrylonitrile butadiene elastomers (HNBR) in repeated use applications such as those outlined in Section B-2.0. Other commercially available elastomers such as acrylonitrile butadiene copolymers (NBR), which are inferior in performance due to poorer heat, ozone and chemical resistance, are presently utilized in repeated use applications. Therefore, when the requested action, assuming this petition has met and or exceeded the respective FDA guidelines, has been taken, a high performance improved elastomer will be available to replace those existing elastomers which are rapidly reaching their limits of performance in the automotive, industrial, military and aerospace sectors. The approval and acceptance of this amendment will provide fabricators and end users with an expanded temperature range for their specific applications resulting in significantly longer service life and improved performance.

Acrylonitrile-Butadiene elastomers (NBR) are currently regulated in 21 CFR 177.2600. HNBR elastomers are produced by the selective hydrogenation of the base elastomer, acrylonitrile-butadiene elastomer (NBR). The resulting product from this technology yields a high performance, heat, ozone and chemical resistant elastomer with excellent resistance to aggressive fluids.

HNBR elastomers have been commercially available since 1984 from the first ZETPOL (HNBR) elastomer manufacturing facility in TAKAOKA Japan. The second commercial manufacturing facility to produce ZETPOL (HNBR) elastomers began production in Bayport Texas in May of 1990. Their respective addresses are as follows:

1. Nippon Zeon Co. LTD
   Takaoka Plant
   Ogina 630
   Takaoka City
   Toyama-Prof., JAPAN

2. Zeon Chemicals
   Bayport Plant
   11235 Choate Road
   Pasadena Texas 77507-1798

Both of these facilities are located in industrial parks and were designed, built, and are operating within their respective certificates of compliance regarding water received and discharged, areas subject to air pollution, landfill, and workplace occupational exposure requirements.

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The HNBR elastomers subject to this Petition are compounded and vulcanized to produce a variety of articles suitable for repeated use food contact applications. HNBR is utilized in a rubber manufacturing factory by mixing in an internal mixer in conjunction with other rubber ingredients such as carbon blacks, antioxidants and curatives. The uncured rubber mixture(ie. slab stock) is then formed and cured at elevated temperatures into thermoset parts like pump stators, ice cream dispensing plungers, butterfly valves, conveyor belting, seal and gaskets for a variety of repeated-food use applications. These articles are supplied to equipment manufacturers who then incorporate these parts into more complex food handling equipment. Rubber molders and equipment manufacturing companies range in size from 30 to 2000 people and can be located in both rural and urban settings.

Due to the enhanced heat resistance, chemical, oil and ozone resistance relative to NBR elastomers, the rubber parts fabricated from HNBR will yield enhanced service life as illustrated in table 19.

TABLE 19 Service Life of HNBR vs NBR Components

Application	NBR(months)	HNBR(months)
Power Steering Seals	36	70
Power Steering O-rings	36	70
A/C Seals	12	60
A/C Hose	12	70
Ball Valve	0.5	3.5
Conveyor Belt	6	30
Ice Cream Plunger	6	36

Once these articles have reached the limit of their performance in a repeated use food contact application, these materials are disposed of in the same manner as articles fabricated out of NBR. HNBR articles are expected to be classified the same as NBR articles, non-hazardous and should be disposed of in the same manner as NBR in municipal landfill sites in compliance with local, State and Federal regulations. Therefore there will be no additional burden to the landfill sites involved. In fact, due to the extended life span of articles fabricated from HNBR, as illustrated in Table 19, the quantity of waste generated from HNBR repeated use articles per unit time, relative to NBR articles, will be significantly lower thereby reducing the overall landfill burden.

Since the types of locations and subsequent environments at or adjacent to various disposal sites are the same as for the disposal of any other spent non hazardous repeated use articles, no special requirements or considerations are necessary concerning the impact on the environmental surroundings when disposal of articles

fabricated from HNBR elastomers is required.

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5. Impact of Proposed Action on the Environment

5.1 IDENTIFICATION OF CHEMICAL SUBSTANCES THAT ARE THE SUBJECT OF THE PROPOSED ACTION

Action

The subject of this Petition is hydrogenated acrylonitrile butadiene elastomers (HNBR).

TRADENAME: ZETPOL ELASTOMERS

INDUSTRIAL DESIGNATIONS: HIGHLY SATURATED NITRILE (HSN)

HYDROGENATED ACRYLONITRILE BUTADIENE ELASTOMER (HNBR)

CAS REGISTRY NUMBER: 88254-10-8

CHEMICAL FORMULA:

$[C_4H_8]_S-[C_4H_6]_U-[C_3H_2N]_T-[C_3H_3N]_N$

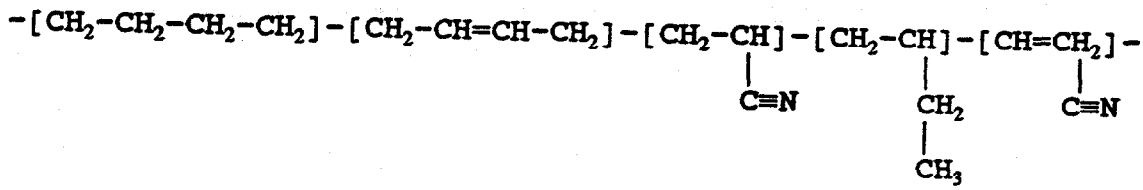
S = Saturated Butane Unit (45 - 84% by weight)

U = Unsaturated Butadiene Unit (0.4 - 20% by weight)

T = α,β, Unsaturated acrylonitrile unit (0.01-2.0% by weight)

N = Acrylonitrile Unit (16 - 55% by weight)

POLYMER STRUCTURE:



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PHYSICAL DESCRIPTION Dark amber to black-brown colored strips. An example of a typical HNBR is Zetpol 2010, containing 36% ACN, 96% hydrogenated elastomer with a weight average molecular weight (Mw) = 298,000, number average molecular weight Mn= 79,200 and the gel permeation chromatogram (GPC) and accompanying data is illustrated below in Figure 3.

Figure 3

92.02.24

ZP-2010

E.V.C.	HRI	Mi	Wi	
10.0	0.1	6.51E+06	0.02	I*
10.5	0.7	3.98E+06	0.12	I*
11.0	3.5	2.43E+06	0.58	I *
11.5	8.7	1.49E+06	1.43	I *
12.0	17.0	9.08E+05	2.80	I *
12.5	26.8	5.55E+05	4.41	I *
13.0	37.7	3.39E+05	6.20	I *
13.5	47.7	2.07E+05	7.85	I *
14.0	56.3	1.27E+05	9.27	I *
14.5	47.1	7.75E+04	7.75	I *
15.0	27.6	4.73E+04	4.54	I *
15.5	15.7	2.89E+04	2.58	I *
16.0	8.0	1.77E+04	1.32	I *
16.5	4.8	1.08E+04	0.79	I *
17.0	1.8	6.61E+03	0.30	I *
17.5	0.3	4.04E+03	0.05	I*
18.0	0.0	2.47E+03	0.00	I*
18.5	0.0	1.51E+03	0.00	I*
19.0	0.0	9.22E+02	0.00	I*
19.5	0.0	5.64E+02	0.00	I*
20.0	0.0	3.44E+02	0.00	I*
20.5	0.0	2.11E+02	0.00	I*
21.0	0.0	1.29E+02	0.00	I*
21.5	0.0	7.86E+01	0.00	I*
22.0	0.0	4.81E+01	0.00	I*
22.5	0.0	2.94E+01	0.00	I*
23.0	0.0	1.80E+01	0.00	I*

Mn= 7.92E+04 Mw= 2.98E+05 Mz= 9.40E+05 Mw/Mn= 3.77(303.8)

The average level of residual acrylonitrile in the HNBR elastomers tested was 2.7ppm. The average level of residual acetone in the various HNBR elastomers tested was 1.35ppm. There was no detectable low molecular weight polymers or oligomers below a molecular weight of two thousand (2000).

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6. 0 INTRODUCTION OF SUBSTANCES INTO THE ENVIRONMENT

HNBR elastomers are commercially manufactured in Takaoka Japan and Bayport Texas and sold for non-FDA applications. The combined capacity of these two manufacturing facilities is 5,000 metric tons (11,020,000 lbs), and the major food applications proposed for HNBR originate in the European and North American markets. These markets are serviced from the Bayport, Texas plant with a maximum capacity of 2200 metric tons (4,848,800 lbs) and therefore it has been predicted that the estimated potential food applications in these two regions, by the year 1998, will be no greater than 2% of the total production. This calculates to a maximum forecast of 45 metric tons (99,000lbs) of HNBR elastomers, which could be utilized in a repeated use food application by 1998.

The process solvent is acetone and is the only substance that is directly related to the manufacturing process and is emitted to the air during the production of HNBR elastomers. The plant in Texas was designed in compliance with the regulations established by the Texas Natural Resource Conservation Committee (TNRCC). This organization has granted the Bayport manufacturing facility permission to operate as documented in operating Permit Number R-19014, and has communicated general provisions and special provisions along with the yearly maximum allowable emission rates for acetone (APPENDIX 15).

Fugitive emissions are calculated from the results of quarterly testing by an outside agency. Point source losses are calculated based on efficiency ratings of several vent gas absorbers. Area losses are found from historical correlations between production rates and solvent emissions from the areas. There are three designated areas in the Texas plant. They are (1) Main Facility, (2) Dryer Building, and (3) Waste Pit. Emissions from the dryer building are calculated based on the amount of water/solvent that is transferred through the process in this area. The emissions from the Main Facility are calculated based on quarterly monitoring performed by Zeon employees. Specific areas include storage tank agitator seals and conservation vents. Plans for improvement in this area include the replacement of packing glands on agitators with mechanical seals. The conservation vents are checked on a planned preventive maintenance schedule. Emissions from the Waste Pit are defaulted at 2.0 tons per year, based on a low concentration of 200-ppm solvent in the wastewater discharging from the plant.

The forecast for consumption of HNBR elastomers utilized for repeated use food contact applications from 1994 - 1998 has been estimated at 45 MT. Since this is only 2% of current plant capacity, this small volume will have limited impact on total acetone emissions and thereby not significantly influencing compliance.

The Emission Point Numbers charted in Figure 4 details the location and types of various solvent absorbers that control the discharge of acetone to the environment. The following types of recovery equipment utilized in the plant are: condensers, vapor scrubbers, liquid and gaseous absorbers.

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Information and data concerning production and operating hours, sampling and -monitoring data, is maintained in a file at the plant site and made available at the request of personnel from the TNRCC. Zeon Chemicals Texas is required to monitor and record the results of the required fugitive maintenance and monitoring program. The monitoring is required by the TNRCC and strictly adhered to by the site. Zeon Chemicals Texas is also required to keep daily records of the water flow rate to the reactor/blower absorber, the serum tank absorber, the storage tank vent absorber, and the dissolving tank absorber.

As judged by the TNRCC, Zeon Chemicals Texas is a low emission source, and therefore no occupational exposure monitoring is required. However, all Zeon Chemicals Texas employees who work in solvent containing areas have worn sniffer badges and have been monitored to ensure that no employees are exposed to levels above the TLV/TWA of 750 ppm for acetone. Based on data generated in 1999 (see Figure 4), the fugitive emissions of acetone emitted at the Bayport manufacturing plant are in full compliance with local, State and Federal regulations regarding acetone emissions.

The process solvent, acetone again is the only substance directly associated with the HNBR hydrogenation process that is emitted to the wastewater discharge. All of the wastewater effluent from the manufacturing process is collected in a central wastewater-holding tank on site.

Periodic discharge of this wastewater stream is diverted to a central waste water system handled by the Gulf Coast Waste Disposal Authority, Bayport Facility. The Gulf Coast Waste Disposal Authority (GCWDA) for all wastewater effluent discharged from the ZEON Bayport plant monitors this stream on a daily basis. The GCWDA has provided the following information regarding the treatment and handling of the waste effluent streams handled on behalf of SZON CBMIICALS TEXAS INC.

TWC Permit No.:	1054
NPDES Permit No.:	TX0005380
TNRCC Permit No.:	HG002500
EPA HAZ. WASTE ID No.:	TXD980626170

Because the Zeon Chemicals Texas facility does not directly discharge process wastewater to the waters of the United States or the State of Texas, no monitoring and reporting requirements are required on the wastewater discharge. GCWDA has installed an automatic sampling device to monitor the wastewater emissions from the Zeon Chemicals Texas facility and they are in full compliance with the limits established by local, State and Federal regulations regarding acetone recovery and disposal. The GCWDA is operating in full compliance the local, State and Federal authorities regarding water, air, waste and employee occupational safety.

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The previous forecast estimated 2% of the HNBR elastomer production would be utilized in a repeated use food contact application by 1998. The acetone point source emissions expected as a result of the 45 metric tons required for FDA repeated use applications would represent 0.2-0.3 TPY. A summary of point source emissions (actual and predicted) from 1992 through 1999 is illustrated in Figure 4. The TNRCC permit allows for 21.84 TPY and as capacity increases from 628 MT to 2169 metric tons, the emissions from point sources go from 4.55 to 14.36 TPY. Therefore the estimated 0.02-0.03 TPY of acetone emitted for FDA repeated use production, relative to the permitted value of 21.84 TPY is extremely small. Based on this information, the manufacturing facility will stay well within the permitted values and there will be no additional burden to the existing permit based on the volume anticipated for FDA applications.

Zeon Chemicals Texas is in full compliance with Senate Bill 1099 of 1991. This bill is now the law for which industry in Texas follows. The goal of the State of Texas is to reduce by 50% the amount of hazardous waste generated and TRI chemical releases to the environment by the year 2000. Zeon Chemicals Texas prepared the necessary Source Reduction and Waste Minimization Plan (SR/WMP), using 1992 as the base year. An internal draft plan was developed in January 1994, and was officially implemented in November 1994.

Disposal of liquid or solid hazardous waste is managed through Safety Kleen Environmental services and incinerated at their facility in full compliance with local, State and Federal regulations. The Zeon Chemicals Texas plant operates under a TNRCC Solid Waste Permit Number 39112, along with EPA ID Number TXD987995925. These hazardous wastes are shipped off site for final disposal under strict "cradle-to-grave" procedures. Waste tracking programs are in place and closely monitored to ensure full compliance with existing regulations classifying ZEON as a small quantity hazardous waste generator (< 2200 lbs/month). The last major hazardous waste reduction project was completed July 2000. The plant projects approximately 500 pounds of hazardous waste per year beginning in 2001. A summary of various waste streams, Texas waste code numbers and companies responsible f or transportation and management of the wastes generated at the manufacturing site are described in table 19.

Disposal of solid waste (paper, cardboard, plastic, trash) from the manufacturing site is handled by conventional waste disposal methods currently used for the disposal of non-hazardous solid elastomer wastes. The Texas plant also introduced a recycling program for paper, cardboard and plastic, which has helped reduce solid waste disposal. Any solid waste generated on site is disposed of at a local sanitary landfill site in accordance with local regulations. Any solid waste generated by our outside contract with GCWDA is registered under TWC waste code class (253190-11 waste Treat Sludge) and this site is operating in compliance with its respective permits.

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HNBR elastomers consists of atoms of carbon, hydrogen and nitrogen which are linked together to form a polymer structure. The combustion of the raw polymer produced in the Bayport plant as a result of state regulated incineration techniques and procedures will not pose any concerns from a toxicity standpoint. When properly compounded and vulcanized articles fabricated from HNBR elastomers are disposed in sanitary landfills or dump sites, there will be no significant amounts of leachate anticipated. This statement is supported by the extremely low migration levels of extractable components from the HNBR elastomers tested under exaggerated test conditions (ie 7 hrs + 2 hrs at 212°F) relative to normal conditions experienced in a landfill site.

Strips of the various HNBR samples were exposed to hot water extraction at 212°F for 7 hours and the extractables measured. The same strips were further extracted under the same conditions for an additional 2 hours and the extractables measured and reported in table 14. This procedure was repeated with additional samples of the same compounds using hexane as the solvent at 156°F and the extractables measured and also reported in table 14. Another series of extractions utilizing 5% and 95% ethanol/water mixtures were conducted for 8 hours at 250°F and the average residue weight of extractables reported in table 14.

TABLE 14 AVERAGE RESIDUE WEIGHT (mg/in .^{2})[a]

See chem memo - 3/25/9

	ETHANOL/H2O		HEXANE		WATER	
SAMPLE IDENTIFICATION	5% 8-hrs	95% 8-hrs	7 HRS 156°F	2 HRS 156°F	7 HRS 212°F	2 HRS 212°F
H-001-97-1	0.160	1.680	0.824	0.056	0.461	0.096
H-001-97-2	0.150	3.221	0.796	0.059	0.486	0.120
H-001-97-3	0.731	3.010	0.098	0.020	0.595	0.220

A detailed analysis and summary of the extraction work is reported in Section B-2.0, 2.1, Appendix 6. The summary of the data in Section B and above in table 14 illustrates, even under exaggerated extraction conditions (7+2= 9 hrs, 212°F) and relative to normal landfill conditions, the cumulative amount of residue extract expected (sample H-001-97-3) from the worst case sample was only 0.815 mg/in^2. This level is extremely low and thereby supports the statement that there will be no significant amounts of leachate anticipated from HNBR compounds disposed in sanitary landfill sites.

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7.0 FATE OF EMITTED SUBSTANCES IN THE ENVIRONMENT

There are no detrimental consequences or significant effects to the composition of the atmosphere, specifically the air that can be anticipated due to the proposed use of HNBR elastomers. Assuming proper procedures for incineration are followed and standard materials are utilized during compounding and the fact that there are no volatile by-products in the HNBR raw polymer or vulcanized article, the products of combustion are carbon dioxide, water, nitrous oxide and carbon. None of these combustion products are anticipated to alter or produce a significant variation in the composition of air and exposure to any substances in freshwater, estuarine or marine ecosystems and their surrounding environments as a consequence of HNBR use.

It is anticipated that no significant quantities of any substance will be added to these water systems with proper incineration techniques of the raw polymer and the vulcanized elastomer article. This statement also applies to water runoff from landfill sites where disposal of HNBR elastomers or finished articles, not incinerated, occur due to the low levels of extractables detected. As stated previously, there will be no significant amounts of leachate anticipated and this is supported by the extremely low migration levels of extractable components from the HNBR elastomers tested (cumulative max. of 0.815 mg/in^2 in sample H-001-97-3) under exaggerated test conditions of 7+2=9 hrs at 212°F and as illustrated above in TABLE 14 and in the detailed report (APPENDIX 6).

In summary the fate of emitted substances in the environment from the production of HNBR elastomers for use in repeated food contact will have no significant impact on the concentrations and exposures to any substance in terrestrial ecosystems.

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8.0 ENVIRONMENTAL EFFECTS OF RELEASED SUBSTANCES

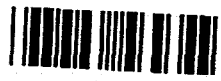
The data on the toxicity of a worst case simulated extracts prepared from all the chemicals utilized in the production of base NBR elastomer and the hydrogenated HNBR elastomer is illustrated in TABLE 17 and mutagenicity of this same extract was tested and also reported in TABLE 18.

TABLE 17 (TOXICITY AND MUTAGENICITY RESULTS - Z003)

HNBR SAMPLE CURE	RAT ORAL LD_{50}	COMMENTS	EXPERIMENTAL PROCEDURE
Z003	>5.0 G/kg of body wt.	Slight apathy and piloerection after dosing, recovery after 48 hours. No gross pathological findings observed.	EPA 83

TABLE 18 (TOXICITY AND MUTAGENICITY RESULTS - Z003)

HNBR SAMPLE CODE	COMMENTS	RESULTS
Z003	1) The DMSO extract of Sample 3, Code Z003 was tested in the Modified Ames Assay with and without metabolic activation system (cofactors supplemented liver homogenate (S9) from MOL. TOX Molecular Toxicology). 2) The DMSO extract of Sample 3, Code Z003 was tested at dose of 10mg/mL. 2000μ/mL, 1000μ/mL, 1000μg/mL and 500 μ/mL per bacterial plate with five strains (TA97A, TA98, TA100, TA1535, TA1538).	Based on results obtained Sample 3. Code Z003 was found to be non-mutagenic.

EN 

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These studies demonstrate that the simulated extract, Z003 exhibited very low toxicity to rats as indicated by the LD_{50} value in excess of 5.0 gms/Kg of body weight. The same sample was tested and classified as non-mutagenic and coupled with the very low amounts of extract measured during hot water extraction at 212°F (i.e. 0.815 mg/in^{-2}) and the very low toxicity measured, no adverse environmental effects are anticipated from the use and subsequent disposal of HNBR elastomers in repeated use food contact articles. The detailed analysis and summary of the toxicity testing for the HNBR elastomers subject to this petition as described in Section E-1.0 and appendix 10-13. The detailed analysis and summary of mutagenicity testing is also described in Section E- 2.4 and in appendix 14.

Any possible contamination from acetone, assuming full extraction from the article, yielded an EDI of 0.022 nanograms per kilogram of body weight. Given the LD50 value for acetone is 3000 mg/kg oral mice, these low levels of acetone would not present any public health concern. Potential contamination from residual levels of acrylonitrile, assuming complete extraction, indicates the low EDI value of 0.013 ng/kg of body weight versus the LD50 of 0.5 to 1.0 microgram /kg body weight per day. This illustrates the extremely low level of acrylonitrile theoretically present yielding no risk as a public health concern.

Therefore, given the extremely low levels of extractables and low levels of toxicity in the extracts, coupled with the low levels of residual acetone and acrylonitrile, this material presents limited detrimental impact to the environment and no threat to public health .

9.0 USE OF RESOURCES AND ENERGY

Other commercially available elastomers such as Acrylonitrile Butadiene (NBR) and Carboxylated Acrylonitrile Butadiene Rubber (XNBR) are currently utilized in many FDA applications, such as food conveyers, dispensers, butterfly valves and other food related sealing needs.

Since fabricated articles based on NBR and XNBR have, in some cases, reached their upper limits of performance and reliability, they will be replaced with HNBR articles. Due to its improved heat, chemical and ozone resistance these articles will out last the NBR and XNBR components by a factor of 3 to 6 times. Therefore, the replacement of these elastomers with HNBR elastomers will not cause any overall increase in the petroleum usage or any other environmental effects. Since rubber articles are already being used in these applications, the use of HNBR will replace existing rubber parts. It is not envisioned that HNBR will expand into other non rubber replacement markets.

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The replacement of NBR and XNBR elastomers with articles fabricated from HNBR elastomers that provide improved heat, oil, chemical resistance and enhanced physical properties will significantly extend the service life. This will cause less parts to be produced and parts to be replaced less frequently, thereby reducing the overall impact on the environment through disposal in landfill. Consequently no additional petroleum or petroleum derivatives will be required when substitution occurs upon approval of the requested action.

10.0 MITIGATION MEASURES

Since rubber articles based on NBR and XNBR are currently in use and HNBR articles will extend the service life of these components, the net effect is a reduction of parts produced and parts landfilled. Therefore, there will be no adverse environmental effects anticipated if the required action and the subject of this Petition is approved. Therefore, no measures or continuances are necessary to avoid or mitigate potential adverse environmental impacts associated with the proposed action.

11.0 PROPOSED ACTION ALTERNATIVES

The absolute alternative to "approving" HNBR elastomers , the precise subject of this Petition for use as an elastomer for food contact repeated use articles is to "not grant approval" for its use.

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12.0 LIST OF PREPARERS/CONSULTANTS

Michael E. Wood, Product Manager – Zetpol/HNBR Elastomers, Zeon Chemicals L.P.
B.S., Chemistry, University of Louisville
1 HNBR related patent, 9 publications
American Chemical Society, Rubber Division
16 years experience in the rubber industry

Daniel Dixler, PhD.
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36 years experience in FDA petitions

Mike S. Ishimoto
Environmental Consultant
MSI Environmental
PE Engineer, 26 years experience

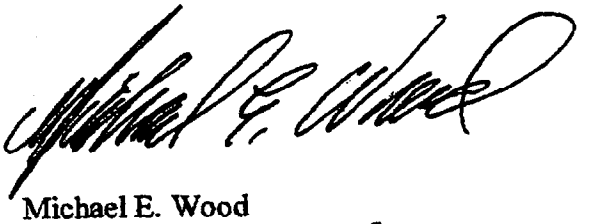
David Erbe
Senior Process Engineer
Zeon Chemicals L.P.
Chemical Engineer, University of Rhode Island
21 years experience in the rubber industry

Jimmy Roeser
Technical Manager
Zeon Chemicals L.P.
Texas manufacturing facility

13.0 CERTIFICATION OF INFORMATION

The undersigned official certifies that information provided and presented in this petition and the supporting document is true, accurate, and complete to the best of his knowledge.

Dates at Zeon Chemicals L.P., Louisville, Kentucky this 8th day of September 2000.



Michael E. Wood
Product Manager - Zetpol®/ HNBR Elastomers
ZEON CHEMICALS L.P.

Figure 4
Revised: 9/8/00

Zeon Chemicals Texas Plant
Summary Of Emissions
(Tons)

	1992 Actual	1993 Actual	1994 Actual	1995 Actual	1996 Actual	1997 Actual	1998 Actual	1999 Actual	2000 Projected	Permit Allowable
Point sources	4.55	6.50	6.74	6.86	11.68	17.00	14.54	14.36	14.00	21.84
Fugitive Emissions	4.50	5.00	3.81	3.89	3.33	2.60	15.69	6.69	3.00	8.89
Area 1, 2, & 3	59.55	27.25	8.72	13.40	9.93	15.43	14.89	7.22	5.00	18.23
Total	68.60	38.75	19.27	24.15	24.94	35.03	45.12	28.27	22.00	48.96

There are 12 emission point numbers (EPN) in the Texas plant. They are identified as follows:

EPN	**Description**	**Permit Limit (tons)**
EPN 1	Reactor Absorber	3.24
EPN 2	Serum Absorber	9.80
EPN 3	Dryer Vent	6.37
EPN 4	Storage Tank Absorber	1.52
EPN 5	Dissolving Tank Absorber	0.06
EPN 6	Maintenance Blower	0.06
EPN 7	Cooler Vent	0.77
EPN 9	Vacuum Pump Separator	0.02
Total		21.84
EPN 8	Fugitive Emissions	8.89
EPN 10	Area One	7.90
EPN 11	Area Two	8.33
EPN 12	Area Three	2.00
Total		27.12

EPN 1 through EPN 7, plus EPN 9 account for the solvent loss through point sources. The total of these eight EPNs is 21.84 tons. The TNRCC permit is obtained by adding the point source losses (21.84 tons) to the total for EPN 8 and EPN 10 through 12 (27.12 tons), which add to 48.96 tons. Although the EPA removed acetone as a VOC in 1995, followed by the TNRCC in 1996, the Texas plant continued to reduce solvent emissions. As production rates increased, it was also necessary to increase the TNRCC operating permit from 25.35 tons to the current 48.96 tons of emissions per year. The projected production for 2000 is approximately 38% higher than in 1996, while the projected solvent losses are lower in 2000 than in 1996.

Table 19
Revised: 9/8/00

Zeon Chemicals Texas Plant
Facility Waste Code Numbers

Waste Stream	Texas Waste Code	Managed By
Tank Clean Out Waste	0001101H	Safety Kleen
Sump Waste	0002609H	Safety Kleen
Coagulated Rubber (Liquid)	0003219H	Safety Kleen
Spent Amberlyst	0004403H	Safety Kleen
Lab Waste	0005204H	Safety Kleen
Parts Cleaning Waste	0016206H	Safety Kleen
Acetone & Water (Process waste water)	00071012	Safety Kleen
Rubber (Raw material)	00084032	Safety Kleen
Rubber & Plastic Waste (Off-spec product)	00099012	Safety Kleen
Plant Refuse (wood, etc.)	00109992	Safety Kleen
Plant Refuse (paper, plastic, etc.)	00119992	Safety Kleen
Used oil	00192062	Safety Kleen
Spent Catalyst	00133932	Safety Kleen
Contaminated Soils	00143011	Safety Kleen
Coagulated Rubber (Solid)	0015409H	Safety Kleen
Activated Sand	00174042	Safety Kleen
Carbon Black	00184042	Safety Kleen