Attachment 1

American Synthetic Company
Request for Modification
December 7, 2015

AMERICAN SYNTHETIC RUBBER COMPANY

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December 7, 2015

Matt King
Compliance and Enforcement Manager
Louisville Metro Air Pollution Control District
850 Barrett Avenue – Room 205
Louisville, Kentucky 40204-1745

RE: American Synthetic Rubber Company Plant I.D. 0011
Revised Strategic Toxic Air Reduction (STAR)

Dear Mr. King:

Enclosed is the Request for Modification of the STAR Environmental Acceptability Goal for American Synthetic Rubber Company (ASRC). Also included in this submission is an Upset Condition Prevention Program (UCPP) as requested by the District.

Please contact me at (502) 449-7209 if you have additional questions.

Sincerely,

Kathleen Cameron
Environment and Risk Protection Manager
American Synthetic Rubber Company,
A Division of Michelin North America, Inc

enclosure

American Synthetic Rubber Company
A Division of Michelin North America

Request for Modification
of Certain STAR Program Goals

ASRC

AMERICAN SYNTHETIC RUBBER COMPANY

4500 Campground Road
Louisville KY 40216
December 7, 2015

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I. Introduction

On December 28, 2006, American Synthetic Rubber Company ("ASRC") submitted a report entitled *Modeling of LMAPCD Category 1 Toxic Air Contaminants* to the Louisville Metro Air Pollution Control District ("District") in accordance with the STAR Program. Due to an error in the location of the Powerhouse, ASRC submitted the *Re-Submittal of Modeling of LMAPCD Category 1 Toxic Air Contaminants* in December 2007 ("Category 1 Report"). The Category 1 Report described the modeling of emissions of Category 1 Toxic Air Contaminants from all of the processes and process equipment at the ASRC facility to determine compliance with the Environmental Acceptability Goals ("EAGs") of the STAR Program.

On June 30, 2007, ASRC submitted the *Request for Modification of the EA Goal Applicable to a Single Process for a Single TAC: Flare and Plant-Wide Fugitive Emissions* ("Original Request"). ASRC requested that the District limit the maximum potential amount of 1,3-butadiene that could be directed to the vent header to no more than 9,500,000 pounds per year, and that the required minimum destruction efficiency for the Flare Thermal Oxidizer ("C-Flare-TO") be increased from 99.5% to 99.99%. 1,3-butadiene emissions through the stacks at ASRC were modeled on this basis. Plant-wide fugitive emissions of 1,3-butadiene were modeled based on annualized emissions as reported on APCD Form SAM 81 (2006) and submitted to the District pursuant to Regulation 1.06 Section 5. Emissions from the Powerhouse were modeled based on the maximum allowable emissions permitted pursuant to Title V Permit No. 154-97-TV.

The STAR Program establishes three Environmental Acceptability Goals ("EAGs") applicable to emissions of Toxic Air Contaminants ("TACs") from stationary sources for non-industrial property: (1) a facility-wide cancer risk goal of 7.5 in a million for emissions of all TACs from all processes; (2) a cancer risk goal of 1 in a million for emissions of an individual TAC from an individual process; and (3) a non-cancer risk goal of a Hazard Quotient of 1.0 for emissions of an individual TAC from an individual process. Regulation 5.21 Section 3.1. On industrial property, the STAR Program establishes adjusted EAGs for emissions from stationary sources: (1) a facility-wide cancer risk goal of 75 in a million for emissions of all TACs from all processes; (2) a cancer risk goal of 10 in a million for emissions of an individual TAC from an individual process; and (3) a non-cancer risk goal of a Hazard Quotient of 3.0 for emissions of an individual TAC from an individual process. Regulation 5.21 Section 3.6.

The Category 1 Report demonstrated that facility-wide emissions of all Category 1 TACs from all processes at ASRC complied with the STAR Program's EAGs for cancer risk and non-cancer risk on both industrial property and non-industrial property based upon the emissions modeled in that report.

With the exception of emissions of 1,3-butadiene from two individual processes, emissions of individual Category 1 TACs from ASRC's processes and process equipment complied with the EAGs for cancer risk and non-cancer risk on both industrial and non-industrial property. Only emissions of 1,3-butadiene from the Flare and plant-wide fugitive emissions of 1,3-butadiene exceeded the EAG for an individual process or process equipment on an individual TAC basis.

On March 31, 2008, ASRC submitted the *Modeling of LMAPCD Category 2 Toxic Air Contaminants* (Category 2 Report). In addition to the Category 2 TACs emitted by ASRC, the Category 2 Report included modeling of styrene, a Category 4 TAC, which was required to be considered for the finishing process due to a modification for which an application was submitted to the District in October 2006, as provided in Regulation 5.21 Section 4.15.1.2. The emissions of all Category 2 TACs were either de minimis or met the EAG for emissions of an individual TAC from an individual process for cancer risk and non-cancer risk on both industrial and non-industrial property.

By letter of October 13, 2008, the District stated that it would approve the Original Request, contingent upon public comment regarding the proposed Best Available Technology for Toxics ("T-BAT") and inclusion of conditions in ASRC's permit. The District has not yet issued a permit to ASRC with conditions related to the STAR Program.

By letter of March 19, 2015, the District directed ASRC to submit a revised environmental acceptability demonstration for fugitive emissions of 1,3-butadiene. The District's directive was based on ASRC's reported fugitive emission of 1,3-butadiene for calendar year 2013.

On May 1, 2015, ASRC submitted to the District the *Request for Modification of the EA Goal Applicable to an Individual Process for an Individual TAC: Flare and Plant-Wide 1,3-Butadiene Fugitive Emissions, and Compliance Plan for 1,3-Butadiene Fugitive Emissions.* The *Modeling of Fugitive Emissions of 1,3-Butadiene for Calendar Years 2013 and 2014* (April 20, 2015) was provided in Appendix 1 as the revised environmental acceptability demonstration. The modeling of fugitive emissions for calendar year 2014 was included since ASRC reported its fugitive emissions in 2014 to the District on April 15, 2015. That modeling indicated that the fugitive emissions of 1,3-butadiene in calendar years 2013 and 2014 exceeded the EAGs applicable to emissions of an individual TAC from an individual process and exceeded the EAGs applicable to emissions of all TACs from all processes on industrial and non-industrial property. By letter of July 17, 2015, ASRC submitted a *Compliance Plan Supplement* to the District.

ASRC undertook a rigorous review of its reported fugitive emissions of 1,3-butadiene in both 2013 and 2014 to confirm whether the amount of fugitive emissions had been correctly calculated. ASRC also undertook a review of the model used to determine whether the inputs were correct and whether the maximum concentration was correct. As a result of that review, ASRC determined that the amount of fugitive emissions previously reported for 2013 and 2014 had not been correctly calculated. ASRC also determined that there were errors in the model used for the environmental acceptability demonstration. ASRC made corrections to the amounts of calculated 1,3-butadiene emissions for 2013 and 2014. ASRC also made corrections to the model. The corrected model was then run using the recalculated amounts for fugitive emissions of 1,3-butadiene.

The results of that modeling were submitted to the District on September 23, 2015 in the *Revised Strategic Toxic Air Reduction (STAR) Environmental Acceptability Demonstration for 2013 and 2014* (September 17, 2015) by URS Corporation. The corrected modeling demonstrated that the fugitive emissions of 1,3-butadiene exceeded the EAG applicable to emissions of a single TAC from a single process on both industrial and non-industrial property, and that total emissions exceeded the EAG applicable to emissions of all TACs from all processes on industrial property for both 2013 and 2014. The modeling demonstrated that total emissions did not exceed the EAG applicable to emissions of all TACs from all processes on non-industrial property for 2013 or 2014.

ASRC withdraws the *Request for Modification* submitted to the District on May 1, 2015, and the *Supplemental Compliance Plan* submitted to the District on July 17, 2015. Instead, ASRC submits this *Request for Modification of Certain STAR Program Goals.*

ASRC requests that the EAG for emissions of an individual TAC from an individual process be modified for plant-wide fugitive emissions and emissions from the flare of 1,3-butadiene, and that the EAG for emissions of all TACs from all processes be modified for industrial property only. ASRC is not requesting a modification of the EAG for emissions of all TACs from all processes for non-industrial property.

II. Background for the Request to Modify the EAG Applicable to Emissions of an Individual TAC from an Individual Process

A. The ASRC Facility

ASRC's facility is located on a 60.5 acre site in southwest Jefferson County, Kentucky. The facility was originally constructed by the United States Government in 1943 within the industrial area known as "Rubbertown" to provide a vital supply of synthetic rubber during World War II. ASRC is a division of Michelin North America, Inc. and produces synthetic rubber used to manufacture automobile tires and a liquid rubber for solid rocket propellants.

ASRC produces three types of synthetic rubber at its Louisville facility: (1) 1,3-polybutadiene rubber ("PBR"); (2) solution styrene-butadiene rubber ("SSBR"); and (3) butadiene-acrylic acid-acrylonitrile terpolymer ("PBAN"). Raw materials used in the manufacturing process include toluene, 1,3-butadiene, acrylonitrile, acrylic acid, and styrene. None of these products can be manufactured without 1,3-butadiene. There is no alternative material that can be substituted for 1,3-butadiene.

ASRC also owns and operates a Powerhouse consisting of two coal-fired boilers, two standby natural gas boilers, and associated coal, lime and ash handling systems (collectively the "Powerhouse") to provide steam for its facility.

ASRC employs 360 technicians, chemists, engineers, and production employees at its Louisville facility with an annual payroll of over $36 million. Annual local taxes paid by ASRC exceed $2.5 million. ASRC also purchases approximately $10 million in goods and services from area businesses in support of the local economy.

B. ASRC Measures Implemented since 2003 to Reduce 1,3-Butadiene Emissions

1,3-butadiene was identified as a constituent of concern in ambient air in the *Final Report: West Louisville Air Toxics Study Risk Assessment* (October 2003) ("WLATS Report") and the *Final Report: West Louisville Air Toxics Study Risk Assessment* (November 16, 2006) ("WLATS Update").

In response to a request from the Mayor of Louisville in 2004, ASRC voluntarily committed to implement measures to reduce emissions of 1,3-butadiene from its facility. On May 17, 2004, ASRC formalized the voluntary commitment by entering into an Enforceable Board Agreement with the Louisville Metro Air Pollution Control Board ("Board").

As part of its voluntary commitment, ASRC implemented the following measures to reduce emissions of 1,3-butadiene:

- Installation of Gas Chromatograph ("GC") technology in August 2003 on all production lines to allow more accurate measurement and control of the amount of 1,3-butadiene used in the manufacturing process, to eliminate excess 1,3-butadiene not consumed in the manufacturing process;
- Applying for and receiving a construction permit on October 20, 2003, to modify the two production lines that were capable of making only PBR to have the capability to make either PBR or SSBR products, since the manufacture of SSBR uses less 1,3-butadiene than the production of PBR;
- Quarterly reporting of plant-wide 1,3-butadiene emissions to the District beginning with the first quarter of 2004;
- Installation of a decontamination system in 2004 to minimize emissions of 1,3-butadiene during maintenance operations;
- Completion of a report entitled *Study of the Flare Used as an Emission Control Device for 1,3-butadiene Emissions* ("Flare Study"), which was submitted to the District on April 19, 2004. This report analyzed the

ability to improve the design or operation of the Flare to reduce 1,3-butadiene emissions, and proposed conditions for inclusion in the ASRC Title V Operating Permit for operation of the Flare at maximum destruction efficiency;

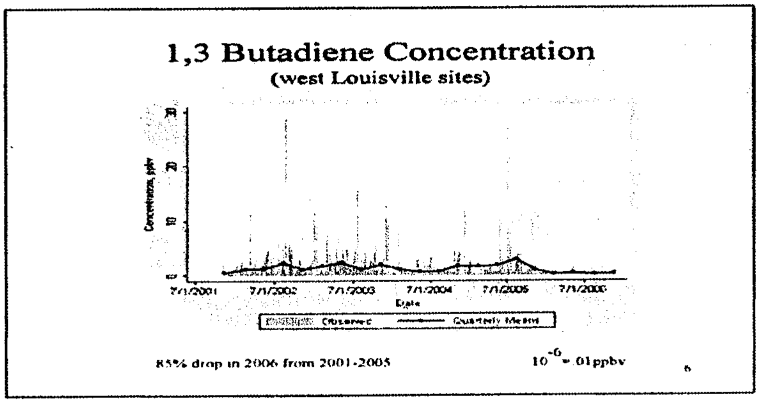
- Completion of a report entitled *Study of 1,3-butadiene Processes* ("Process Study"), which was submitted to the District on May 17, 2004. This report analyzed every process at ASRC which uses 1,3-butadiene to identify potential actions that could be implemented to reduce 1,3-butadiene emissions. This report identified the following voluntary measures which were implemented during 2004 and 2005:
  - Increased cooling of 1,3-butadiene tanks in the Purification Process to reduce volatilization (completed December 2004);
  - Increased reintroduction of 1,3-butadiene in the Concentration Process to eliminate unused 1,3-butadiene (completed December 2004);
  - Modification of the two product lines to conform to the construction permit issued on October 20, 2003 (completed December 2004);
  - Increased the efficiency of recovery equipment by upgrading and adding instrumentation (completed December 2004);
  - Implemented a recycling process during priming of 1,3-butadiene pumps in the tank storage area (completed December 2004); and
  - Installed the Flare Thermal Oxidizer ("C-FLARE-TO") to replace the Flare as the primary control device for emissions of 1,3-butadiene and to increase the destruction efficiency, with the Flare to be maintained as a safety device and backup control device (completed December 2005).

After installation of the C-FLARE-TO at the end of 2005, a statistical analysis of monitoring data from all ambient air monitors at west Louisville sites conducted by the University of Louisville indicated that ambient concentrations of 1,3-butadiene in 2006 dropped 85% from concentrations monitored during 2001-2005. *University of Louisville Air Toxic Monitoring: Statistical Analysis January – December 2006*, s. 6.[1] ("Statistical

[1] The University of Louisville's document incorrectly states that ASRC was "shut down for several weeks in January 2006 due to weather damage." *Id.* at s. 7. See Louisville Metro Air Pollution Control District, *Excess Emission Reports: December 6, 2005 through January 9, 2006* (January 10, 2006). On January 2, 2006, certain portions of ASRC's facility suffered damage as a result of a class F-1 tornado. *Id.* Damage was limited to two warehouses, several office buildings, and vehicles in the parking lot. Richard M. Robinson, Address at the *Rubbertown Community Advisory Council* (January 12, 2006). Repairs to the warehouse roofs were estimated to take approximately 30 days. *Id.* ASRC immediately shut down its production operation upon hearing the community sirens *Id.* The operation of the C-Flare-TO was interrupted for approximately one hour due to a power outage following the tornado. Louisville Metro Air

Analysis"). The Statistical Analysis indicates that the 85% drop in monitored emissions of 1,3-butadiene remained stable for all of 2006. Statistical Analysis, s. 7.

2001- 2006 Monitored 1,3-butadiene Concentrations



Source: University of Louisville Air Toxic Monitoring: Statistical Analysis January – December 2006, s. 6.

ASRC has also implemented these measures to reduced emissions of 1,3-butadiene, in addition to the voluntary measures described in the 2004 Enforceable Board Order:

- Eliminated the use of its Reject Butadiene System in late 2006 through the use of on-line Gas Chromatographs and improvements in raw material systems. Two 1,3-butadiene Recovery Compressors subject to LDAR were eliminated.
- ASRC replaced 12 control valves with 10 bellow seal control valves and 2 rotary V-ball control valves with Enviro-Seal packaging in 2008.
- Reduction of fugitive emissions during planned shutdowns by removing materials where possible from piping, tanks and vessels to eliminate the possibility of fugitive emissions during these shutdown periods.
- Since 2006, all 14 reactor agitator seals have been upgraded to nitrogen seals. ASRC has also installed nitrogen monitoring panels on the 14 reactors to help monitor potential issues associated with reactor agitator seal failures. The panel for the 14th reactor was installed in 2015.

Pollution Control District, *Excess Emission Reports: December 6, 2005 through January 9, 2006* (January 10, 2006). During the power outage, emissions from the facility were vented to the Flare for destruction. *Id.* Limited production operations resumed within 48 hours of the power outage. Full production operations resumed within five days.

- Installation of zero-emissions bellow-sealed control valves in 2008 to eliminate the potential for fugitive leaks.
- Replaced one of the three 1,3-butadiene compressors with a more modern compressor and incorporated more modern seal technology to minimize fugitive emissions in 2010.
- Retrofitted the other two 1,3-butadiene compressors in 2011-12 with new parts (additional packing glands) as recommended by the manufacturer to incorporate improved emission control features.
- Implemented revisions in 2012 and 2014 to piping specifications on 1,3-butadiene use.
    - Piping connections are to be minimized when possible to decrease fugitive emission points
    - The use of threaded fittings is to be minimized in future installations in favor of socket weld fittings
    - The use of Teflon or Delron as seat material is prohibited in favor of PEEK, based upon a recommendation by the equipment supplier
- Installed flex hose on 1,3-butadiene unloading compressor in 2012 to limit vibration and lower the likelihood of broken piping.
- Implemented a project in 2014 to remove screwed components in 1,3-butadiene piping in the 1,3-butadiene unloading pump house that eliminated 242 components from the LDAR monitoring program.

III. Request for Modification of the EAG for Emissions of an Individual TAC from an Individual Process for the Flare and Plant-Wide 1,3-Butadiene Fugitive Emissions

A. Introduction

Under the STAR Program, the EAG for emissions of an individual TAC from an individual process may be modified following a demonstration that the process complies with or, pursuant to a proposed plan and schedule, will comply with T-BAT based on a review of the practices and measures potentially applicable to the process or process equipment, including technology transfer, identified from readily available air pollution control information, including, but not limited to, the RACT/BACT/LAER Clearinghouse. Regulation 5.21 Section 5.1.

"T-BAT" or "Best Available Technology for Toxics" means

> an emission standard that reflects the maximum reduction in emissions of, and risk from, a TAC that the District determines can reasonably be achieved by the process or process equipment, taking into account energy, environmental, and economic impacts and other costs, and health and welfare benefits.

Regulation 5.00 Section 1.3.

T-BAT may include one or more of the following:

1. work practices,
2. raw material substitutions,
3. alternative processes and process design characteristics,
4. air pollution control equipment,
5. pollution prevention measures,
6. equipment maintenance measures (including leak detection and repair), and
7. upset condition prevention measures.

Id.

B. Emissions of 1,3-Butadiene from the Flare

1. Destruction Efficiency of the Flare

The Flare at ASRC was installed in the early 1940s primarily as a safety device designed to accept and combust gases that otherwise could cause over-pressurization of pressure vessels throughout the facility. To avoid a buildup of the gases that could cause over-pressurization, pressure vessels at the facility are protected by rupture disks and relief valves, which allow the gases to leave the pressure vessels and ultimately travel to the Flare to be destroyed. Process vents from the emulsion rubber processes were also vented to the Flare for thermal destruction.

In the early 1970s, a John Zink Company model STF-SA-18 smokeless tip was installed on the Flare to control visible emissions from both the emergency relief valves and the process valves. The District permitted this modification under Permit Number 197-74 issued on March 28, 1974, and set a destruction efficiency of 99% for the Flare. Several years ago, the District advised ASRC that the originally permitted destruction efficiency of 99% for the Flare was to be replaced by an assumed destruction efficiency of 98% based on U.S EPA's *Flare Efficiency Study* (July 1983), which states that flares achieved combustion efficiencies of greater than 98% when operated under optimized conditions representative of good industrial operating practices. Flare Study, Enclosures 1 and 7. ASRC's permit for the Flare has been modified by the District to apply the assumed destruction efficiency of 98%.

As part of the Flare Study, ASRC's operation of the Flare was reviewed by the John Zink Company. Flare Study, p. 2. According to the John Zink Company, ASRC's Flare is expected to achieve a destruction efficiency of greater than 99% due to ASRC's optimized operating factors. *Id.*

2. The MACT Applicable to the Flare

In September 1996, U.S. EPA published the Maximum Achievable Control Technology ("MACT") rule for rubber manufacturing facilities. The intent of the MACT rule was to define "best practices" (both in pollution control technology and procedures) in controlling emissions of Hazardous Air Pollutants ("HAPs"), including 1,3-butadiene, from rubber manufacturing facilities. ASRC, along with other rubber manufacturers, cooperated and provided input to U.S. EPA in developing the MACT rule.

In the MACT rule, U.S. EPA identified a flare, such as the one installed by the John Zink Company in the early 1970s, as the first choice in controlling HAP emissions from the "front-end" of the process. The "front-end" of the process is the manufacturing process itself, with units such as storage, monomer purification, chemical addition, reactor concentration, blending and solvent stripping. The MACT rule did not set a limit on the amount of emissions to be allowed from the front end of the process because these emissions depend so much on the type of and precise "recipe" for the rubber produced, the specific type of process, and other variable factors.

For the "back end" of the rubber manufacturing process (the finishing operations where the rubber is dried, baled and packaged), the MACT rule requires each facility to meet a limit of 10 kilogram HAP emission per megagram of production, using stripping technology or some other control device. ASRC uses both stripping technology and another control device, the Regenerative Thermal Oxidizer (RTO), to bring emissions from the "back end" below the required limit. There are no emissions of 1,3-butadiene from the back end of the manufacturing process.

As a result of U.S. EPA's industry-wide review in developing the MACT, the technology and practices in use by ASRC were acknowledged as "best practices" in the MACT rule. ASRC was the lowest-emitting rubber manufacturing plant of the five that U.S. EPA studied for the MACT rule.

3. Evaluation of the Flare to Reduce 1,3-Butadiene Emissions

As discussed in the Background above, ASRC evaluated the use of the Flare and its operation in the Flare Study performed in 2004 to determine whether changes could be made to the design or operation of the Flare to achieve reductions in emissions of 1,3-butadiene from the Flare. Based on ASRC's evaluation, operation of the Flare was already at maximum efficiency, and there were no changes that could be made to the Flare to achieve additional emissions reductions of 1,3-butadiene. Flare Study, Enclosure 10.

As part of the Process Study performed in 2004, ASRC evaluated every process at the facility to determine if reductions in emissions of 1,3-butadiene could be achieved. Through the Process Study, ASRC identified two control devices, a thermal oxidizer and an enclosed ground flare system, that could potentially be used instead of the Flare to reduce emissions of 1,3-butadiene that could not be reintroduced into the manufacturing process. Process Study, pp. 12-13. ASRC committed to installing a new control device to replace the Flare that would have a minimum destruction efficiency of 99.5%, with the Flare to be maintained as a safety device and backup control device as part of its voluntary commitment to the Board and District. Following additional review, ASRC selected the C-Flare-TO manufactured by the John Zink Company as the new primary control device. APCD Construction Permit 112-04-C, Additional Condition 1.a. Installation of the C-Flare-TO was completed at the end of 2005.

C. T-BAT for the Flare

The modeling of emissions from the Flare was based on the maximum permitted operating limit for the Flare of 876 hours of operation (10% of ASRC's annual operations or not more than 36 days of operation in a 12 month period), and a destruction efficiency of 98%. Title V Permit No. 154-97-TV, U1/U2 Additional Condition 1.a.vi.

On the basis of this maximum operating scenario for the Flare, the emissions of 1,3-butadiene from the Flare on non-industrial property were estimated to result in a potential cancer risk of 2.12 in a million at the point of maximum ambient concentration. These estimated emissions exceed the EAG for emissions of an individual TAC from an individual process in Regulation 5.21 Section 3.1.1. The emissions of 1,3-butadiene from the Flare on industrial property were modeled to have an estimated cancer risk of 3.43 in a million, which is less than the EAG of a cancer risk of ten in a million for industrial property. Regulation 5.21 Section 3.6.

If the destruction efficiency of the Flare is greater than 98% (based on the destruction efficiency recommended by the Flare's manufacturer), the estimated risk of the emissions from the Flare would be less because the amount of emissions would be less. See Table 1.

Table 1
Comparison of Flare Destruction Efficiency

Destruction Efficiency	Throughput (based on 876 hours)	Amount of modeled emissions
98%	9,500,000 pounds	190,000 pounds
99%	9,500,000 pounds	95,000 pounds

As discussed above, there are no design or operational changes that can be made to the Flare to further reduce emissions of 1, 3-butadiene. Consequently, T-BAT for the Flare is the replacement of the Flare by the C-Flare-TO as the primary control device. T-BAT for the Flare also includes the limitation on operation of the Flare to a maximum period of 876 hours in any 12 consecutive month period, and use of the Flare solely as a safety device and back-up control for the C-Flare-TO, as required by Title V Permit No. 154-97-TV, U1/U2 Additional Condition 1.

The C-Flare-TO has been determined by compliance testing to exceed the minimum required destruction efficiency of 99.5% required by the Board Agreement and Construction Permit 112-04-C. *VOC Destruction Efficiency of the Flare Thermal Oxidizer* (May 2-3, 2006), p. 1-1. ASRC requested in the Original Request that the District revise U1/U2 Additional Condition 1.a.iii for the C-Flare-TO to require that the minimum destruction efficiency of the C-Flare-TO be 99.99% rather than 99.5% and to establish a limit of 9,500,000 pounds per year of 1,3-butadiene as the maximum amount that may be directed to the vent header to the C-Flare-TO and Flare.

Table 2
Comparison of C-Flare-TO Destruction Efficiency

Destruction Efficiency	Annual Throughput	Amount of Modeled Emissions
99.5%	9,500,000 pounds	47,500 pounds
99.99%	9,500,000 pounds	950 pounds

Modeled emissions of 1,3-butadiene from the C-Flare-TO are estimated to have a potential cancer risk of 0.22 in a million on non-industrial property and 0.46 in a million on industrial property. The emissions from the C-Flare-TO comply with all applicable EAGs. As the primary control device, the C-Flare-TO represents the maximum degree of TAC emission and risk reduction for the Flare that can be reasonably achieved, when combined with the existing permit limits on the maximum operation of the Flare.

ASRC requests that the District determine the C-Flare-TO to be T-BAT for the Flare under these conditions, and modify the EAG for emissions of an individual TAC from the Flare pursuant to APCD Regulation 5.21 Section 5.

D. Proposed Emission Standard for the Flare

ASRC requests that the District set a maximum throughput rate of 9,500,000 lbs/yr of 1,3-butadiene that can be vented to the Flare and Flare Thermal Oxidizer as the T-BAT emission standard for the Flare, in addition to the existing permit limits on the maximum hours of operation of the Flare.

E. Plant-Wide Fugitive Emissions of 1,3-Butadiene

1. Modeling of Fugitive Emissions

Fugitive emissions of 1,3-butadiene were modeled and evaluated for environmental acceptability on a plant-wide basis because there is no accurate method to allocate fugitive emissions to a specific location within the facility for modeling purposes. To comport with the requirement of the ISC3ST model used for the modeling, modeling was conducted based on seven defined fugitive emission areas. These seven areas are the Liquid Polymer Source, Daytanks, Purification Level 1, Purification Level 2, Purification Level 3, 1,3-butadiene Spheres Area and the Rail Car Unloading Area. A portion of the total plant-wide fugitive emissions were allocated to each of the seven defined areas on a percentage basis based on best engineering judgment. The model was subsequently set and run to treat all of these seven fugitive sources as a single Source Group. The basis upon which emissions from each area were modeled is detailed in the *Revised Strategic Toxic Air Reduction (STAR) Environmental Acceptability Demonstration for 2013 and 2014* (September 17, 2015).

"Fugitive emissions" are "those emissions that could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening." Regulation 1.02 Section 1.34. Sources of potential fugitive emissions from process equipment at the facility include storage vessels, process vents, equipment leaks, and transfer unloading operations.

Because the manufacturing processes that use 1,3-butadiene at the facility are pressurized, the amount of fugitive emissions at the facility is not related to the amount of 1,3-butadiene directed to the vent header, and is not related to or controlled by the amount of production. Instead, fugitive emissions at ASRC are primarily the result of leaks. The amount of fugitive emissions of 1,3-butadiene varies over time because different components leak at different times at different rates. Consequently, fugitive emissions of 1,3-butadiene cannot be subjected to a throughput limit such as that requested for the Flare.

2. ASRC Measures to Control Fugitive Emissions

ASRC is subject to the Hazardous Organic NESHAP ("HON"), which regulates fugitive emissions for storage vessels, process vents, equipment leaks and transfer unloading operations, and requires reductions of emissions of hazardous air pollutants, including 1,3-butadiene.[2]

Under the HON, Leak Detection and Repair (LDAR) programs include various work practices and equipment standards. See, for example, 59 FR 19402 (National Emission Standards for Hazardous Air Pollutants for Source Categories; Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry and Other Processes Subject to the Negotiated Regulation for Equipment Leaks, Final Rule; April 22, 1994) and 61 FR 46906 (National Emission Standard for Hazardous Air Pollutant Emissions: Group I Polymers and Resins; Final Rule; September 5, 1996). LDAR programs require periodic monitoring for VOC leaks using a portable device. 59 FR 19402, 19409. The frequency of monitoring is established by the regulation and depends on the percent of leaking components identified and the consistency of performance demonstrated by the facility. *Id.* For example, connectors in gas or light liquid service that have 0.5% or greater leaking connectors are required to monitor all connectors annually. Units with less than 0.5% may monitor every two years, while units that demonstrate less than 0.5% leaking for two monitoring cycles may monitor only once every four years. *Id.* A component is defined as "leaking" if the measured concentration exceeds the threshold regulatory value. Once a leak is identified, it must be repaired within a certain amount of time as established in the regulation.

ASRC implemented its LDAR program in January 1990, four years before the LDAR program was required by regulation. As a result of ASRC's early implementation of LDAR, data from ASRC's LDAR program was used in setting some of the standards used in U.S. EPA's final regulation.

Of the 71,765 total components registered in ASRC's LDAR database for all chemical products in 2015, approximately 10,000 components are in 1,3-butadiene service.[3] These components are monitored for fugitive emissions by TEAM Industrial Services, a third-party contractor. Monitoring is conducted using a Thermo Electron Toxic Vapor Analyzer, TVA-1000B, which utilizes a flame ionization detector (FID) to detect leaks. ASRC contractually obligates TEAM Industrial Services to conduct self audits of its performance annually. The audit must be conducted by a person outside TEAM's supervising regional office.

As a result of ASRC's implementation of its LDAR program, ASRC is currently required to monitor its components in 1,3-butadiene service no more frequently than annually in accordance with the HON. For example, ASRC is below a leak rate of 0.5% for valves and connectors, and is only required to monitor those components every four

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[2] ASRC is subject to Subpart H of the HON, National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks, pursuant to 40 CFR 63.502.

[3] "In 1,3-butadiene service" means that the material in the component contains 90% or more of 1,3-butadiene by weight.

(4) years in accordance with the HON. However, since January 2005, ASRC has monitored all components in 1,3-butadiene service on a semi-annual basis.

F. T-BAT for Fugitive Emissions of 1,3-Butadiene for the EAG applicable to emissions of a single TAC from a single process

When ASRC meets the EAG applicable to emissions of all TACs from all processes on industrial property, as described in Section IV.E, ASRC proposes that the T-BAT for fugitive emission of 1,3-butadiene should be the semi-annual monitoring of components in 1,3-butadiene service, as described in the Original Request which was tentatively approved by the District. See Original Request, Table 5, at page 16.

Until ASRC demonstrates that the EAG applicable to emissions of all TACs from all processes is met, ASRC proposes that the T-BAT applicable to fugitive emissions of 1,3-butadiene should be the T-BAT described in Section IV.4.

IV. Request for modification of the EAG applicable to emissions of all TACs from all processes on industrial property

A. Introduction

As demonstrated by the *Modeling of Fugitive Emissions of 1,3-Butadiene for Calendar Years 2013 and 2014*, ASRC did not meet the EAG applicable to emissions of all TACs from all processes due to plant-wide fugitive emissions of 1,3-butadiene. All other TACs emitted by ASRC are either de minimis or the emissions of those TACs meet the EAG applicable to emissions of a single TAC from a single process, except for emissions of 1,3-butadiene from the flare as described above. As discussed above, ASRC has proposed a T-BAT for the flare, which the District has stated is adequate in its letter to ASRC of October 16, 2015.

ASRC is proposing a T-BAT to be applicable to fugitive emissions of 1,3-butadiene until ASRC demonstrates that its emissions of all TACs from all processes meet the EAG for industrial property.

B. Evaluation of factors listed in Regulation 5.21 Section 5.5

Because ASRC is requesting a modification of the EAG applicable to emissions of all TACs from all processes on industrial property, ASRC evaluated the factors listed in Regulation 5.21 Section 5.5 for the areas where the EAG is exceeded. This section discusses the relevant demographic and land use factors.

The area where the exceedance was modeled is shown in Figure 1, with a close up of the area shown in Figure 2. Figure 3 shows the concentration isopleths from the modeling superimposed on the aerial image of the close up in Figure 2. This area is located on the boundary between ASRC and the adjacent Dow Chemical Company

(Dow) facility. The boundary between ASRC and Dow is located in the middle of a gravel road between the ASRC and Dow properties. This roadway is fenced on both sides, has locked gates at both ends, and access to the road is controlled.

In addition to the area illustrated above, there are two other locations on the ASRC property boundary that showed concentrations slightly exceeding the EAG. These two areas are highlighted on Figure 4. The two areas indicated in Figure 4, Area A and Area B, represent a total of three specific property boundary receptor points. Area A has one property boundary receptor with a model estimated impact of 76.12 x 10-6. Area B has two property boundary receptors with model estimated impacts of 76.3 x 10-6 and 75.37 x 10-6. The extent of the area beyond these property boundary receptors with an impact above 75 x 10-6 is less than two (2) meters beyond the property boundary in these two locations. Area A is on the ASRC fenceline with Dow, and the Dow property is undeveloped. Area B is contained within the fenced area of the roadway between ASRC and Dow.

There is no public access to any of these areas. The fenced in roadway area can only be accessed by obtaining keys for the locked gates from the ASRC guard house. The area is accessed infrequently, less than six times per year. The area beyond the Dow fenceline shown on Figure 2 does not contain any processes, is used only for storage, and is accessed infrequently.

The nature and type of all of these areas is industrial, and has been industrial since 1943 when the Rubbertown area was developed. All of the areas have controlled access and may only be accessed by personnel authorized by ASRC and Dow. There is no regular access to any of these areas.

Because of the industrial nature of these areas and the location between two industrial facilities, it is unlikely that there will be any significant change in the nature or use of these areas in the next twenty-five years.

C. T-BAT for Fugitive Emissions of 1,3-Butadiene for the EAG applicable to emissions of all TACs from all processes

ASRC has conducted a reevaluation of the T-BAT proposed in the Original Request and in the May 2015 request, as required by Regulation 5.21 Section 5.

The reevaluation included a review of the U.S. EPA's RACT/BACT/LAER Clearing House to identify practices that could potentially be used to control fugitive emissions of 1,3-butadiene that have been listed since 2007.[4] No new practices have

[4] On December 21, 2006, U.S. EPA issued its final evaluation of the maximum achievable control technologies and the residual risk from certain equipment also subject to the HON. 71 FR 76603, 76605 (Final Rule: National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry; December 21, 2006). As part of its technology review, U.S.

been identified in the Clearing House since 2007 for the control of fugitive emissions of volatile organic compounds, such as 1,3-butadiene.

ASRC determined that the practices identified in the Clearing House for the control of fugitive emissions of volatile organic compounds involve an enhanced LDAR program. The three adjustments that may be considered to enhance an LDAR program are more frequent monitoring of components, use of a decreased rate of leakage to define a leak, and an attempt to repair a leaking component in a shorter period of time.

Regarding more frequent monitoring of components, ASRC determined that the greatest reduction in fugitive emissions of 1,3-butadiene would be achieved by focusing on more frequent monitoring of the component types that are more prone to leaking or that have historically leaked at higher emission rates.

ASRC conducted an engineering analysis of the fugitive emissions reported for 2013 and 2014. ASRC analyzed those fugitive emissions by reviewing fugitive emissions by area and fugitive emissions by component type. ASRC assessed the number of leaks and rate of leaks for all types of components in 1,3-butadiene service.

ASRC had leaks from 53 components out of a total of 10,225 components in 1,3-butadiene service in 2013, or 0.52% of the total. Those leaks accounted for approximately 60% of the reported fugitive emissions of 1,3-butadiene in 2013. ASRC had leaks from 50 components out of a total of 10,177 components in 1,3-butadiene service in 2014, or 0.49% of the total. Those leaks accounted for approximately 70% of the reported fugitive emissions of 1,3-butadiene in 2014.

ASRC determined that rupture disk holders tend to have the highest rate of leakage out of all of the component types. ASRC has identified a new type of rupture disk holder that can be used to replace the existing rupture disks. The new assembly will help assure that the disks are properly placed and torqued evenly so that fugitive emissions are less likely to occur.

Before May 1, 2015, the new rupture disk holders had been installed on Day Tanks 11 and 16 (four rupture disk assemblies total). Subsequent monitoring of the rupture disks installed on Day Tanks 11 and 16 indicated significant reductions in leakage.

ASRC previously proposed to install the new rupture disk holders at these twenty (20) additional locations:

EPA "did not identify any significant developments, practices, processes or control technologies since promulgation of the original standards in 1994," including those related to Subpart H, National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks. 71 FR 76603, 76605. ASRC is subject to Subpart H.

- Distillation columns C-1, C-1A and C-1T (2 rupture disc assemblies each, for a total of 6 replacements); and

- Day tanks 7-10 and 13-15 (2 rupture disc assemblies each, for a total of 14 replacements).

ASRC has completed the installation of these rupture disc assemblies.

ASRC determined that compressors are prone to leakage. ASRC has already implemented all of the technology controls that it has been able to identify for compressors, as previously discussed.

ASRC determined that a significant portion of previously reported fugitive emissions of 1,3-butadiene were attributable to components that are exempt from monitoring under the LDAR program and are assigned a default value leak rate, instead of using an actual leak rate determined by monitoring. ASRC was able to monitor most of those components in 1,3-butadiene service to establish an actual leak rate to calculate actual fugitive emissions from those components.

After reviewing the types of components at ASRC's facility that can leak, and historical data regarding the frequency and rate of leakage of each type of component, ASRC determined that use of more frequent monitoring of components in 1,3-butadiene service is the most effective practice to reduce fugitive emissions of 1,3-butadiene. This approach is expected to result in significant reductions in the calculated plant-wide fugitive emissions of 1,3-butadiene, because monitoring these components more frequently reduces the duration of any detected leaks that must be assumed under the LDAR program.[5]

ASRC proposes that future monitoring of components in 1,3-butadiene service be conducted at the frequency listed in Table 3 as part of the T-BAT for fugitive emissions of 1,3-butadiene that exceed the EAG applicable to emissions of all TACs from all processes.

[5] Under the LDAR program, any detected leak is conservatively assumed to have been leaking since the previous monitoring event for that component when it was not leaking. For example, with semi-annual monitoring, this could be up to 183 days. In contrast, with quarterly monitoring, a detected leak would only be assumed to have been ongoing for a maximum of 92 days.

Table 3

Comparison of Monitoring Frequency for Components in 1,3-butadiene Service

Component Type	HON Required Monitoring	2007 Proposed Enhanced Monitoring	2015 Enhanced Monitoring
Valves	Annually	Semi-annually	Quarterly
Connectors	Every 4 years	Semi-annually	Quarterly
Compressors	Annually	Semi-annually	Quarterly
Pumps with an External Shaft and Agitator Seals	Monthly	Monthly	Monthly
Pressure Relief Devices (Valves, Rupture Disks and Closed Loop Vent Systems (CLVS-H PRD))	Annually	Semi-annually	Monthly
Closed Vent Systems	Annually	Semi-annually	Quarterly
Potentially Open-ended Lines	Every 4 years	Semi-annually	Quarterly
Instruments	Exempt	Semi-annually	Quarterly
Any component in 1,3-butadiene service designated as unsafe to monitor (UTM) or difficult to monitor (DTM)	Annually	Semi-annually	Annually

ASRC also agrees to the District's request that the threshold for determining when the first attempt to fix a leak under the LDAR program is required be lowered from 500 ppm to 250 ppm.

A component in 1,3-butadiene service with a monitored leak rate of more than 250 ppm will have a first attempt at repair implemented, as provided in the LDAR program. A component in 1,3-butadiene service with a monitored leak rate of more than 500 ppm will have a second attempt at repair implemented, as provided in the LDAR program. A components in 1,3-butadiene service with a monitored leak rate of more than 500 ppm that cannot be corrected by conventional repair methods will have a permanent repair or engineered solution placed on the component within ninety (90) days of the monitored leak, provided that the cost shall not exceed five thousand dollars ($5,000.00).

ASRC also analyzed whether attempting to repair a leaking component in a shorter period of time would have a significant effect on reducing fugitive emissions. ASRC determined that it will not, because most of the calculated fugitive emissions for a leaking component relate to the LDAR assumption that the component has been leaking since the last date the component was monitored as not leaking, not the time to complete a repair. Decreasing the time to attempt a repair may not be possible, because it may be necessary to order parts or make arrangements to conduct the repair.

Based upon this analysis, ASRC proposes the following actions as the T-BAT for fugitive emissions of 1,3-butadiene that exceed the EAG applicable to emission of all TACs from all processes on industrial property:

- Replacement of the rupture disks with the new type of rupture disk that is less prone to leaking;
- Monitoring of components in 1,3-butadiene service on the frequency listed in Table 3;
- Reducing the definition of a leak under the LDAR program for components in 1,3-butadiene service from 500 ppm to 250 ppm; and
- Components in 1,3-butadiene service with a monitored leak rate of more than 500 ppm that cannot be corrected by conventional methods will have a permanent repair or engineered solution placed on the component within ninety (90) days, provided that the cost shall not exceed five thousand dollars ($5,000.00).

ASRC requests that the District determine these practices and measures to be T-BAT for fugitive emissions of 1,3-butadiene that exceed the EAG applicable to emissions of all TACs from all processes on industrial property. ASRC asks that the District approve the modification of the EAG for emissions of all TACs from all processes on industrial property from 75 to 100.

D. Proposed Emission Standard for Fugitive Emissions of 1,3-Butadiene

ASRC requests that the District establish an emission standard for fugitive emissions of 1,3-butadiene to be no more than 6994.6 pounds on a calendar year basis.

E. Reversion to T-BAT for fugitive emissions of 1,3-butadiene for emissions of a single TAC from a single process

If ASRC's fugitive emissions of 1,3-butadiene exceed the emission standard proposed in Section IV.D, ASRC will conduct a reevaluation of the T-BAT proposed in this Request for emissions of all TACs from all processes, and will submit a compliance plan to the District to reduce fugitive emissions of 1,3-butadiene within ninety (90) days of submittal of the emission inventory reporting the exceedance.

ASRC may submit modeling to the District for the emissions of all TACs from all processes using the factors and model described in the *Revised Strategic Toxic Air Reduction (STAR) Environmental Acceptability Demonstration for 2013 and 2014*, using the reported fugitive emissions of 1,3-butadiene for calendar years after 2014. If the modeling for two consecutive calendar years demonstrates that ASRC meets the EAG applicable to emissions of all TACs from all processes, ASRC will revert to the T-BAT for fugitive emissions of 1,3-butadiene described in Section III.F. If the modeled risk exceeds the unmodified EAG for emissions of all TACs from all processes on industrial or non-industrial property, ASRC will continue to implement the T-BAT described Section IV.C.

FIGURES

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Figure 1 – ASRC Industrial Area impacted above 75 x 10^{-6} cancer risk (all TACs/All Processes)

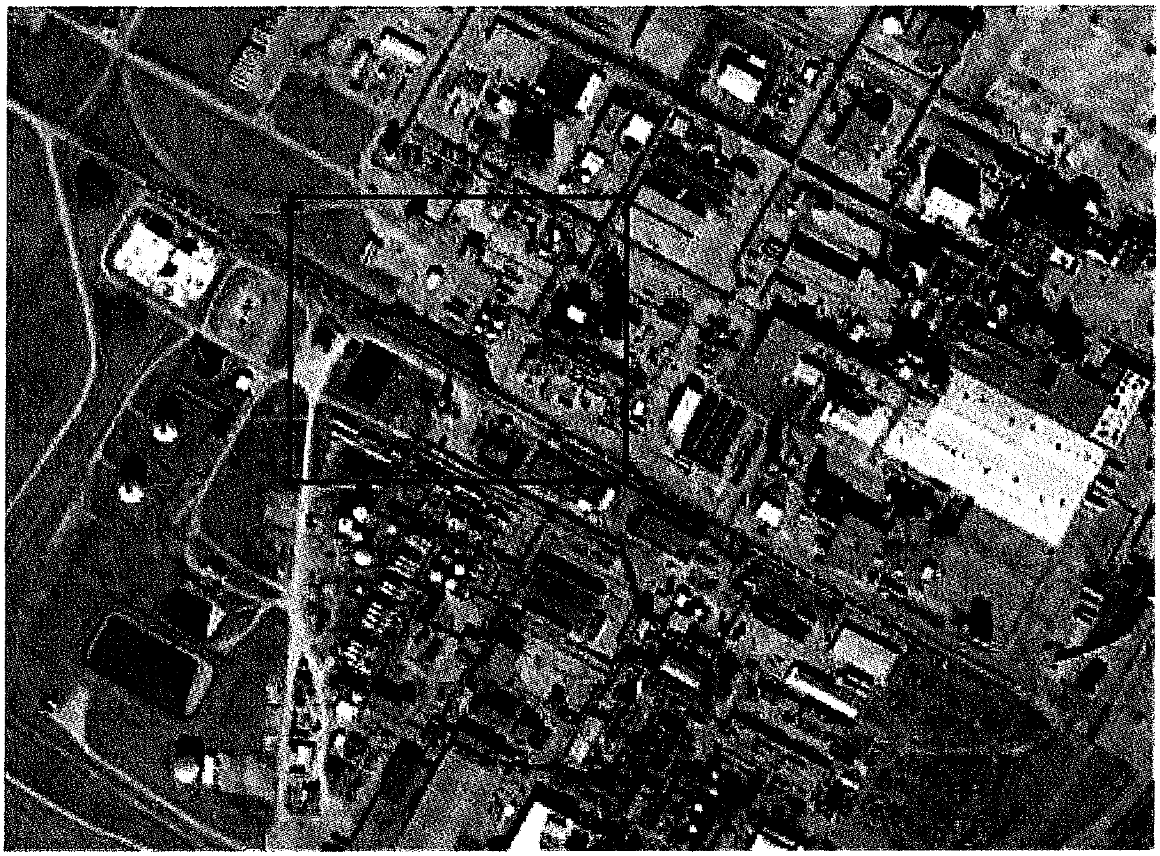

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Figure 2 – Close-up View of Impacted Area

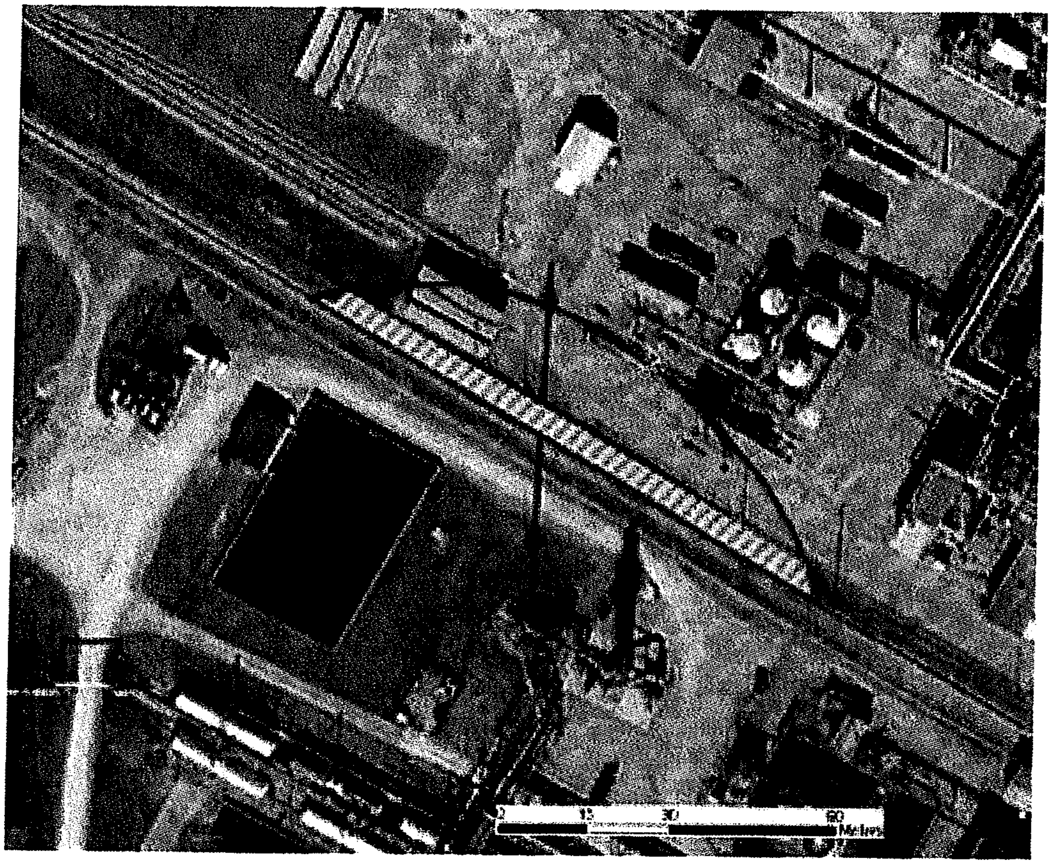

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Figure 3 - Close-up View Showing Concentration Isopleths Superimposed On Aerial Image

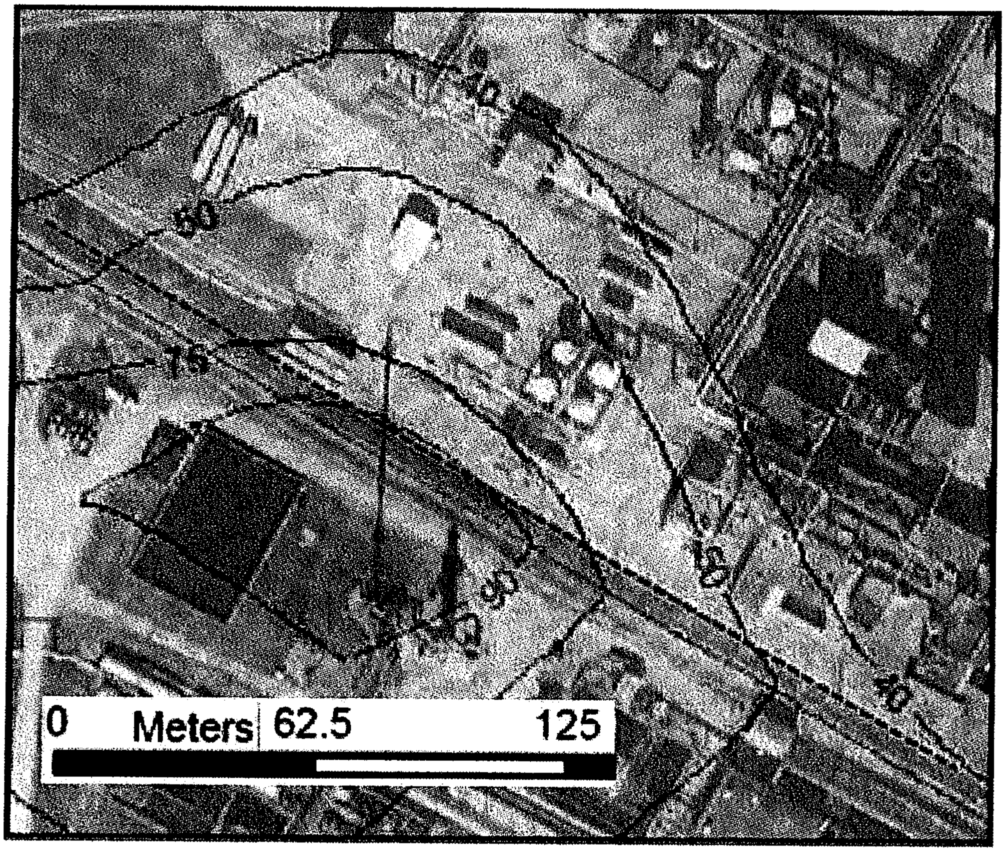

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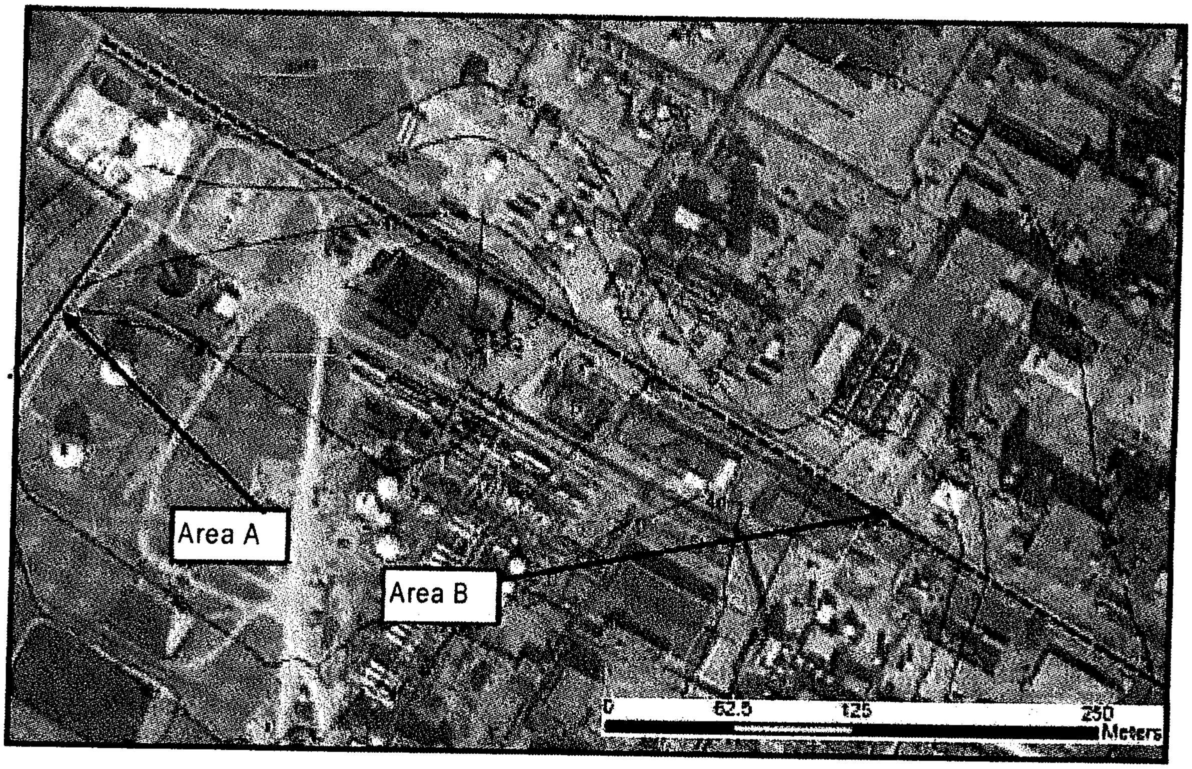
Figure 4 – Additional Property Boundary Areas Slightly Above Industrial EA goal.



Upset Condition Prevention Program for American Synthetic Rubber Company
Initial Issuance - December 1, 2015

Goal: to prevent, detect and correct upset conditions, equipment failures, or abnormal process or process equipment operating parameters that may cause an excess emission.

1. Identification of the processes, process equipment, and air pollution control equipment included in the program, including monitoring equipment and other instrumentation used to determine proper operation of the process and equipment.

   Storage tanks and process vessels which are part of E-U1/U2/U3 that vent to the vent header which uses the C-FLARE TO system as the primary control device. If the vent gas flow exceeds the capacity of the C-FLARE TO due to a process upset, the C- FLARE system is used for a maximum of 876 hours per year as the secondary control.

   Proper operation of the C-FLARE TO and the C-FLARE is identified in the Title V permit. (TO: process vent stream, combustion gas flow, temperature. FLARE: presence of a flame, no visible emissions.)

   Area gas monitors are used to detect emissions of VOCs in process areas to assist plant personnel in detecting potential leaks.

2. Identification of the individual or position responsible for inspecting, maintaining, and repairing the affected process equipment and air pollution control equipment:

   ASRC has many complex pieces of equipment and will utilize trained employees or if necessary employ expert contract personnel.

3. The maximum intervals for inspection and routine maintenance of the affected process equipment and air pollution control equipment. The maximum interval for routine inspection and maintenance shall not exceed that recommended by the manufacturer unless specifically identified in the program and justified:

   The C-FLARE TO and the C-FLARE are inspected at least annually or at each scheduled outage (approximately every 2 years) for those parameters that require a total plant outage unless taking either one out of service will cause excess emissions or unsafe conditions for plant personnel or the community. At that point the first opportunity to remove this equipment from service will be utilized.

   Area gas monitors are replaced every 6 months or as required by the manufacturer.

4. A description of the items or conditions that will be inspected:

   C-FLARE TO, C-FLARE and area gas monitors in HAP service. Inspection frequency is tracked in the Maintenance scheduling system.

5. A listing of materials and spare parts that will be maintained in inventory:

   C-FLARE TO spare parts list required by ASRC's Title V permit.

6. A description of the corrective procedures that will be taken in the event of an upset condition:

   Designated ASRC personnel will investigate the circumstances which led to the upset condition and identify and implement the corrective actions to reduce or eliminate the circumstances which could lead to a recurrence. ASRC is subject to 29 CFR 1910.119

which is OSHA's Process Safety Management standard. Incident investigations are required to be conducted by this standard.

7. The calibration schedule for any device that monitors emissions or process, process equipment, or air pollution control equipment operational parameters. The time between calibrations shall not exceed 1 year or as specified in the program, whichever is shorter:

   At least annually, or at each scheduled outage (approximately every 2 years) the parameters identified for proper operation (Title V) of the C-FLARE TO and the C-FLARE will be calibrated. Parameters that do not require a total plant outage can be calibrated at least annually unless taking equipment out of service will cause excess emissions or unsafe conditions for plant personnel or the community. Parameters which require a total plant outage can only be calibrated during the outage which may occur once every 2 years as scheduled. The first opportunity to remove this equipment from service will be utilized.

   Area gas monitors which are calibrated when received from the manufacturer and are replaced every 6 months or as otherwise required.

8. A description of any additional air pollution control equipment, monitoring equipment, or other instrumentation that will be installed, the installation and operation of which is necessary to minimize the likelihood of the occurrence of an upset condition:

   Increase the size of the vent headers at the blend tanks to reduce the impact of process upsets.
   UL5SA – T-5C, T-5D, T-5J converted April 2013
   UL12SA – T-5E, T-5F, T-5H converted August 2015
   UL34SA – T-5A, T-5B, T-5G, T-5K converted June 2002

9. A description of any operational changes that will be instituted that are necessary to minimize the likelihood of the occurrence of an upset condition:

   Due to the complexity of ASRC's process operations, appropriate and necessary operational changes can only be identified during an incident investigation. ASRC will implement those identified operational changes when necessary.

10. If full implementation of a component of the upset condition prevention program will not occur upon approval by the District, then a schedule for implementation of that component:

    None noted at this time.

11. The recommended length of time for the upset condition prevention program to remain in effect:

    This Upset Condition Prevention Program for American Synthetic Rubber Company will remain in effect until January 1, 2020.

12. Any other information that the District deems appropriate:

    None noted at this time.