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**Technical Support Document
 Republic Plastics, LP
 Permit #V20689.000**

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1. BACKGROUND

1.1 Applicant

Facility: Republic Plastics Eloy Foam Manufacturing Plant
1550 West Battaglia Road, Eloy, Arizona
Assessor Parcel # 404-12-003F3

Mailing Address: Republic Plastics, LP
1550 West Battaglia Road, Eloy, Arizona

1.2 Attainment Classification

The facility is situated in an area classified as non-attainment for PM10 and attainment for all other pollutants.

1.3 Permitting History

Permit	Permit Type	Issue Date	Equipment/Change
B31034.000	Initial Minor Source	10/29/10	Initial permit for Extruder Line 1
V20648.000	Initial Title V Permit	4/25/11	Authorized installation of 3 additional extruder lines
V20689.000	Title V Permit Renewal	3/4/21	Renewal V20689.000 authorizes the facility to use actual isobutane retention data, analyzed on a quarterly basis for the purposes of quantifying VOC emissions accurately. In the absence of actual retention data, the current retention factor of 0.022 lb isobutane/lb product will be used as a backup factor to calculate VOC emissions.

1.4 Compliance/Enforcement History

The last full compliance evaluation of this facility (including inspection) was conducted on March 29, 2019. The facility was in compliance. The facility in Eloy does not have any history of compliance problems or enforcement.

Prior to being located in Eloy the facility was in San Manuel, Arizona. The San Manuel facility, now shutdown due to a fire, did receive a Notice of Violation (NOV) on 2/15/08 for having exceeded the 100 ton threshold while operating as a minor source, not having kept the records required by the permit, not having submitted a deviation report and not having submitted the annual emissions inventory on time. The violations were resolved and the applicant applied for a Title V permit for the San Manuel location.

2. PROCESS DESCRIPTION

This source's primary process is the extrusion of foam from polystyrene pellets. The source is permitted for up to 3 extruder lines which include: 2 pellet receivers (one for polystyrene resin pellets and one for polystyrene resin pellets filled with talc) equipped with fabric filters, 3 extruders, 9 thermoformers and stamping machines, 3 scrap grinders, skeleton surge hopper baghouses, an inkjet printer and a 30,000 gallon isobutane storage tank. At the time of this renewal the facility has installed and is operating 2 extruder lines.

- 2.1 Virgin polystyrene resin pellets are received via rail at an offsite rail spur. The rail spur is located south of the Republic Plastics facility at the Otto Environmental facility. The pellets are transferred from the railcars to the Republic Plastics facility via a vacuum truck.
- 2.2 Virgin polystyrene resin pellets (some filled with talc) are transferred from storage silos into receivers and transferred into the extruder. The pellets are melted in the extruders and injected with isobutane or CO₂, blowing agents, under high pressure. Volatile Organic Compounds (VOC) emissions in the form of isobutane are emitted during this process, as well as particulate matter (PM) from the transfer of the pellets.
- 2.3 The polystyrene/blowing agent mix is forced through an exit die and cooled to create a continuous tubular shape, and as it exits, the release of pressure causes the blowing agent to expand, forming bubbles with the polystyrene mixture. VOCs are emitted during this process.
- 2.4 The tubular shape leaving the extruder is then slit into two flat sheets, and they are rolled into two spindles and stored for three to four days.
- 2.5 After aging, the rolls of material are fed through the thermoformers to mold plates and bowls. The molded parts are stamped from the sheet, leaving a trim skeleton. An inkjet printer using water-based inks is used to mark the final products before inspection and packaging. VOCs are emitted during the aging of the material and during the thermoforming and stamping. A negligible amount of VOCs are emitted from the printer since the ink is water-based.
- 2.6 Any off-spec material is mixed with the trim skeleton, ground and recycled back into the process. Particulate emissions from the hopper are controlled by a baghouse.
- 2.7 This renewal, V20668.000, changed capacity of the extruder lines from 1800 lb/hr to 2400 lb/hr and reduced the total number of authorized extruder lines to 3. The Permittee found after installation that the extruder lines were capable of the higher capacity based on process flow improvements. In order to account for the increased capacity the Permittee requested that the number of authorized extruder lines be reduced from 4 to 3.

3. EMISSIONS

3.1 VOCs

Isobutane released from the foam manufacturing represents the bulk of emissions. These emissions occur during the extrusion, expansion, aging, thermoforming and stamping process.

3.1.1 Isobutane Retention Factor (IBF)

In 2006-2007, Permittee conducted a 12-month Isobutane retention sampling exercise at the San Manuel, AZ facility as required by the permit for that facility.

As requested by their permit, in August 2007, Republic Plastics submitted a final report of the 12-month isobutane retention analysis. The average retention resulted from the analysis was 0.022 lbs of isobutane retained/lb of final product (2.2%). PCAQCD has allowed the use of this emission factor for calculations of emissions at the Eloy plant.

3.1.2 Emissions During Operations

Because the production rate of the extruder varies, production is not related directly to hours of operation. Instead, since isobutane use and retention depend on foam product production, the permit limits the production on an annual basis and on a monthly basis in order to maintain emissions below 240 tpy. The annual production of foam sheet and the foam production limitations were back-calculated beginning with the 240 tpy isobutane emission cap. The total foam sheet this calculation resulted in corresponds to less than 2400 lb/hr per line. Limiting the annual production and monthly production of foam product, as opposed to the operation of each extruder, allows the applicant flexibility to operate less hours, less capacity or less lines to ensure that the emission cap is not exceeded.

Annual production was limited to 15,292 tons of foam products per year. Monthly limitations were estimated dividing by 12 months (with a 1.4 factor to allow for monthly variations and flexibility).

Permit V20668.000 did not change the allowable emissions nor the production limits already in place. Since the extruder lines were already restrained below capacity the number of authorized extruder lines were reduced in order to keep the overall design capacity of the facility at 7200 lb/hr as set forth in the original Title V permit. Four extruders at 1800 lbs/hr and three extruders at 2400 lbs/hr both equal an overall capacity of 7200 lbs/hr.

The applicant also supplements the isobutane with a percentage of CO₂. Since this facility does not trigger PSD or NNSR permitting the CO₂ emissions are not calculated.

3.1.3 Storage Emissions

During the permitting of the San Manuel facility in 2005, PCAQCD raised concerns regarding storage emissions. In March 2006, Mr. Luis Castro sent PCAQCD an e-mail describing their storage procedures, and in discussions with Mr. Castro and their consultants from Zephyr Environmental, it was understood that due to their kind of operation which caters to large customers such as Wal-Mart, their product is stored on site for a maximum of 2 weeks, with weekly shipments. As part of their explanation Mr. Castro indicated that the thermoformers make 1 million plates per day and their facility does not have enough space to store product longer than 2 weeks. The Eloy facility has the same operational scenario.

Therefore, the 12-month isobutane retention analysis conducted by Republic Plastics required that the product tested be at least 15 days old to account for any emissions released during the storage period.

3.2 PM10

Polystyrene particulate matter is controlled in the initial material handling operations by a pellet feed filter at 0.01 grains/scf. PM emissions are also controlled in the fluff reclaim by 2 baghouses with the same outlet grain loading as the pellet feed filter. The filter and baghouses vent back into the building. The permittee has estimated that 10% is released out of the building as fugitive emissions². The table below indicates the total emissions, fugitive and non-fugitive.

²Supported by guidance issued by the Texas Commission on Environmental Quality.

PM10 EMISSIONS		
Emission Source	lb/hr	TPY
Pellet feed fabric filter	0.02	0.1
Talc-filled pellet feed fabric filter	0.02	0.1
Skeleton surge hopper baghouses ³	0.69	3.01
Total PM10	0.73	3.21
Total PM10 released outside	0.07	0.32

4. REGULATORY REQUIREMENTS AND MONITORING

4.1 TITLE V/PSD Applicability

This facility constitutes a “major source” of Volatile Organic Compounds (VOCs) due to the isobutane emissions, and requires a permit pursuant to Title V of the CAA Amendments of 1990.

Without the limitations of the permit, the source would constitute a "major emitting source" for VOCs within the meaning of 40 CFR §51.166, and would require the facility to go through a Prevention of Significant Deterioration (PSD) review. This source is considered a “synthetic minor” with respect to PSD.

In order to maintain synthetic minor status of emissions of VOCs, this permit:

- Imposes an emission cap and production limits configured to limit actual, worst-case VOC emissions to 240 tpy. The production limits restrict the amount of isobutane released into the air by the amount of foam product produced;
- Requires the applicant to install flow meters on the isobutane and CO2 lines, to maintain the meters’ calibration certificates and allows replacement of the meters only by a meter with the same level of accuracy or higher (see Section 4.1.1 below for further discussion on the meters);
- Requires the applicant to keep monthly production records, and
- Requires the applicant to conduct monthly VOC calculations. If these calculations show that the source is emitting more than 200 tons, calculations will be done on a weekly basis, and monthly calculations will resume after emissions dip back down to below 200 tons. If emissions go above 230 tons, calculations shall be conducted daily.

Uncontrolled PM10 emissions from the facility will not exceed 4 tpy, making this source a natural minor with respect to PSD. To assure that emissions are minimized, this permit requires the daily visible inspections of the baghouses.

4.1.1 Monitoring Isobutane and CO2 flow

The applicant, in accordance with the permit, will be installing flow meters to monitor the flow of isobutane and CO2 to all extruder lines. The meters are manufactured by Micro

³2 hoppers, 2 baghouses for each line

Motion, Inc. The manufacturer does not recommend in-field calibration, and has indicated that since isobutane and CO₂ are not corrosive gases, the lifetime of the meters could be up to 20 years. There are no moving parts, and therefore no on-site maintenance recommended. The calibration certificates for the meters show the accuracy (labeled as “Specification” on the certificates) is $\pm 0.15\%$. The permit requires that upon breakdown of any meter, they are replaced with another one with at least the same accuracy. The Calibration Certificates showing such accuracy will be kept as records so Pinal County personnel can assess them to ensure compliance.

4.2 Regulatory Emission Limitations

4.2.1 Opacity

A federally enforceable opacity limitation of 40% applies to point sources at the facility. A 20% opacity standard applies to fugitive emissions from unpaved and vacant lots.

There is also a federally enforceable 20% opacity limitation that applies to point sources not already regulated by a new source performance standard, or having an opacity standard in Chapter 5 of the Code. Since the baghouses and filters vent inside the building, and any other particulate emissions that escape are considered fugitive, the 20% point source standard does not apply to any emission units at this plant.

4.2.2 CAM

The requirements of 40 CFR 64, Compliance Assurance Monitoring (CAM), are not applicable since Republic Plastics does not use a control device to achieve compliance with any emission limitation or standard for a pollutant for which the source has potential pre-control device emissions greater than or equal to major source levels for that pollutant.

4.2.3 NSPS/MACT: This source is not subject to §111 or §112 of CAA.

4.2.3.1 40 CFR Part 60, Subpart Kb - VOL Storage Vessels

This subpart affects storage tanks used to store volatile organic liquids with a design capacity larger than 19,800 gallons and a maximum true vapor pressure less than 204.9 kPa. The isobutane storage tank at this facility has a design capacity of 30,000 gallons and will operate in excess of 204.9 kPa. Therefore, the requirements of NSPS Subpart Kb are not applicable to this facility.

4.2.3.2 40 CFR Part 60, Subpart DDD - Polymer Manufacturing

This subpart affects facilities that manufacture the following polymers: polypropylene, polyethylene, polystyrene or poly (ethylene terephthalate). The permittee primarily extrudes foam from polystyrene pellets that are received from a third party source and is not in the business of manufacturing the aforementioned polymers. Therefore, the requirements of NSPS Subpart DDD are not applicable to this facility.

4.2.4 Chemical Accident Prevention Provisions, 40 CFR Part 68

There is an existing 30,000 gallon isobutane tank on site. Isobutane is a regulated flammable substance in accordance with Table 3 of 40 CFR §68.130, with a threshold quantity of 10,000 lbs (2,000 gallons). Sources that exceed the threshold have to comply with 40 CFR Part 68, which requires the source to submit a Risk Management Plan (RMP) that includes the following information as listed in §68.155:

- The accidental release prevention and emergency response policies at the source;
- The regulated substances handled;
- The worst-case scenario and alternative scenario including administrative controls and mitigation measures to limit the distances for each reported scenario;
- The general accidental release prevention program and chemical-specific prevention steps;
- The five-year accident history;
- The emergency response program; and
- Planned changes to improve safety.

The RMP has to be submitted on the date on which isobutane is first present above the 2,000 gallon threshold.

5. AMBIENT IMPACT ASSESSMENT - VOCs MODELING

While anticipated VOC emissions from the facility will potentially approach 240 tons-per-year, VOCs do not directly fall subject to an ambient limitation under the CAA.

Maximum anticipated emissions from this facility do not reach the quantity-threshold that would trigger an obligation to analyze the additional impact on any nearby ozone nonattainment areas.

6. LIST OF ABBREVIATIONS

CAA	Clean Air Act
CAM.....	Compliance Assurance Monitoring
CFR	Code of Federal Regulations
hr	Hour
kPa.....	kilopascals
lb.....	Pound
MACT	Maximum Achievable Control Technology
MSDS.....	Material Safety Data Sheet
NOV	Notice of Violation
NSPS	New Source Performance Standard
NSR	New Source Review
PCAQCD.....	Pinal County Air Quality Control District
PGCAQCD.....	Pinal-Gila Counties Air Quality Control District
PM10	Particulate Matter nominally less than 10 Micrometers
PSD	Prevention of Significant Deterioration
SIC	Standard Industrial Code
tpy.....	tons per year
VOC	Volatile Organic Compound
yr.....	year