Title V Air Operation Permit Revision
Permit No. 0050001-024-AV

APPLICANT

The applicant for this project is Arizona Chemical Company, LLC. The applicant's responsible official and mailing address are: Mr. Michael Osborne, Plant Manager, Arizona Chemical Company, LLC, Panama City Facility, 2 South Everitt Avenue, Panama City, Florida 32401-4989.

FACILITY DESCRIPTION

The applicant operates the Panama City Facility, which is located in Bay County at 2 South Everitt Avenue in Panama City, Florida

Arizona Chemical Company, LLC, manufactures products that are made from by-products purchased from Kraft pulp mills. The facility processes black liquor soap (BLS), crude tall oil (CTO) and crude sulfate turpentine (CST) into chemical intermediates and resins which are sold into commerce and used as ingredients in the production of adhesives, plastics, inks, paints, rubber products, roofing material, chewing gum, fragrances, household cleaners, and soap.

Tall Oil Operations

Tall oil operations consist of three major operations: crude tall oil production, tall oil refining and rosin upgrading and flaking operations.

Crude Tall Oil Plant

CTO is produced by reacting BLS with sulfuric acid and subsequently processing the oil by filtering, decanting, washing and drying. The major equipment in the CTO plant includes reaction vessels, process tanks, storage tanks, decanting vessels, and screen filters. Exhaust gases from the CTO reactor, screen filter, and decanter tanks are vented to a packed bed scrubber that uses white liquor from the adjoining pulp mill as the scrubbing fluid. Total Reduced Sulfur (TRS) scrubbing is performed with white liquor or an aqueous caustic soda solution. The minimum white liquor make-up flow rate shall be four gallons per minute, with less than 75% carbonation to control TRS emissions. If utilized, the aqueous caustic soda solution flow rate shall be four gallons per minute, with a caustic concentration of no less than 6%. This emissions unit is regulated in accordance with Rule 62-296.404(3)(b)1., F.A.C., Tall Oil Plants. The unit is not subject to the Compliance Assurance Monitoring (CAM) requirements of 40 CFR 64 because the pre-controlled potential emissions of TRS are less than 100 TPY (approximately three tons per year). The CTO plant does not have a control device for VOC, but the emissions are controlled by a production limitation. The facility is required to maintain monthly VOC emission records to demonstrate compliance.

Tall Oil Refinery

The Tall Oil Refinery was constructed and placed into operation in 1949. CTO is distilled into various fractions in the refinery. The refinery consists of Nos. 1, 2 and 3 distillation units, wiped film type evaporators, ancillary equipment, process tanks, three hot wells and an oily water closed system. The oily water closed system is a closed loop cooling water system that cools steam utilized by the vacuum jet system that creates vacuum for the tall oil distillation towers. The condensed steam and oils from the system are collected, separated and removed from the system. Emissions from the three tall oil refinery hot wells, the oily water closed system and rosin treaters (G350, G360, G370 and G380) are routed to the thermal oxidizer system (EU034) for incineration.

Rosin Upgrading

The rosin fraction from the CTO distillation is either modified to make it more stable to air oxidation and sold as a product, disproportionated rosin (DR), or is used to make rosin esters, DR soaps and aqueous dispersions. Rosin acids from the tall oil distillation process are treated with caustic solutions to produce rosin esters.

DR and surfactants are produced in the treater kettles using heat, steam, nitrogen and a catalyst. Rosin esters are produced in treater kettles by reacting rosin with alcohol and a catalyst. The kettles operate under a vacuum. Emissions from the treater kettles are controlled by the thermal oxidizer (EU034).

Rosin esters are either pumped to storage tanks, tank cars, tank trucks, or drummed. A portion of the rosin esters from the storage tanks is pumped to a flaker and cooled. The flakes are then collected in hoppers and are bagged. Emissions from the "hot end" of the cooling belt are uncontrolled. Emissions from the "cold end" are in the form of particulate matter from the hoppers, weigh scales and bag collection hood, and are controlled by a Dust Collector. The dust collector contains filter cartridges and is designed to remove 98% of the fugitive Particulate Matter (PM) during the product recovery operation. The collected dust is recycled back into the raw material for reprocessing or bagged and sold. Because this dust collector is used for product recovery purposes, this emissions unit is not subject to CAM. The flaking operation is regulated in accordance with Rule 62-297.620(4), F.A.C. (5% opacity with waiver of PM testing)

DR soaps are produced by reacting DR with either caustic soda or caustic potash; the mixture is heated to boil off the water. The water vapor carries out a small quantity of soap emissions that are not controlled. The DR soap reactor is an unregulated emissions unit.

The Aqua-Tac process takes rosin ester and disperses it in water with the aid of a surfactant. The Aqua-Tac process is an unregulated emissions unit.

Thermal Oxidizer

The thermal oxidizer is a natural gas fired unit with a maximum heat input of 10.0 MM Btu per hour and a minimum control efficiency of 90% or greater for VOC (50% for TRS). Emissions from the rosin treaters G350, G360, G370, G380, the oily water closed system and the three tall oil refinery hot wells are routed to the thermal oxidizer system for incineration and is equipped with a new waste heat boiler with no supplemental fuel firing. The thermal oxidizer has been tested and was achieving 96% control efficiency. Based on compliance tests, the facility is required to maintain a minimum temperature of 1,100 degrees Fahrenheit to ensure compliance. The thermal oxidizer temperature is continuously monitored and recorded. The thermal oxidizer is subject to the CAM requirements of 40 CFR 64 and Rule 62-213.440(4)(b)4., F.A.C. This emissions unit is regulated in accordance with Rule 62-296.401, F.A.C., Incinerators. The addition of the new waste heat boiler makes this emission unit subject to the recordkeeping requirements of 40 CFR 60 Subpart Dc.

Terpene/Resin Operations

The terpene/resin operation consists of two major operations: the Terpene Refinery and the Terpene Resin Plant.

Terpene Refinery

The Terpene Refinery was placed into production in 1957. Crude sulfate turpentine is separated into four major fractions using distillation columns and batch treaters. The products from the Terpene Refinery are used as feed materials for other processes at the facility or are sold as products. The Terpene Refinery is an unregulated emissions unit.

Terpene Resin Plant

Terpene monomer blends from the terpene refinery are polymerized in xylene to produce crude resin solution. Crude resin solution is then processed using flash vaporization and steam sparging to separate the resin from the solvent. Resins are sold in bulk, drummed or flaked.

In the resin warehouse there are four resin hold tanks, a drumming station where hot resin is drummed and two flaker belts where hot resin is poured in pastilles (droplets) on top of a moving belt. Water is sprayed on the bottom of the belt to cool the hot resin. The pastilles are conveyed to hoppers for bagging. A Monsanto Brinks

Mist Eliminator controls fugitive visible emissions (VE), HAP and VOC from the hot ends of the flaker belts, the hold tanks, and the drumming station. Dust emitted from each flaker belt, conveyer, and bagging operation is collected and controlled by a dust collector. The dust collectors contain filter cartridges and are designed to remove 98% of the fugitive particulate matter during the product recovery operation. The collected dust is recycled back into the raw material for reprocessing or bagged and sold. Because the dust collectors are used for product recovery purposes, this emissions unit is not subject to CAM. The facility has a production capacity (drumming operation and both flaker belts) of 20,000 pounds of rosin per hour: 5,000 pounds per hour per each flaking belt and 10,000 pounds per hour for drumming. The resin flaking area is regulated in accordance with Rule 62-297.620(4), F.A.C. (5% opacity with waiver of PM testing).

The air strippers (EU012) remove HAP to meet the OCPSF water discharge standards (regulations for producers of organic, chemicals, plastics and synthetic fibers). The emissions from these strippers are vented to a one MM Btu per hour regenerative thermal oxidizer (RTO) with a control efficiency of 96%. This destruction efficiency equates to the RTO emitting 11.7 tons per year of VOC (including 216 hours of allowed RTO downtime). Removal of oil from the terpene resin process wastewater before it reaches the air strippers is done with a deep bed filter (filtration system) in conjunction with the induced gas flotation unit. The filtration system utilizes a technology called a walnut shell filter. The walnut shell filter collects the oil from the process wastewater prior to the air strippers, and the oil is reclaimed from the shells and reused in the process. Vapors or emissions from process storage tanks and other process equipment listed in Table 1 are collected in vacuum headers and sent to the RTO.

Table 1 – Terpene Resin Process Equipment Routed to RTO (EU036)

Source ID	Source Description
130-04A & B	Quench Decanters
130-06A & B	Reactor Vent Tanks
140-01A & B	Wash Tower Feed Tanks
140-04A & B	Wash Tower Separators
140-05A & B	Wash Storage Tanks
150-09A & B	Pre-Skimmer Tank & Skim Oil Tank
160-03 A, B & C	Rundown Tanks
160-12 & 13	Light Oil Tanks
160-20	A-Hot well
170-03 & 04C	Wet Solvent & Dry Solvent Tanks
170-08	Solvent Recovery Tower
170-11	A Solvent Decanter
170-12	Reflux Tank
130-01A & B	Primary Reactors
130-01C&150-01A	Wash Tower Separator
180-15	B Hot well
180-20	B Solvent Decanters
180-32 & 34	Light Oil Tanks
190-01B&190-03A	Wash Water Decanters
190-04 & 180-02	Rundown Feed Tank
190-14	A Hot well
ABM-1000	IGFU Tank
TNK–440 & 441	Resin Plant Sump & Decanter
TNK-443 & 444	Skimmed Oil Tanks

In the production of terpene and terpene/styrene resins, the plant utilizes styrene and xylene solvent. These are the main sources of HAP emissions, which occur at a variety of emission points from the Terpene Resin. The RTO, which is used to control these emissions, has a VOC/HAP destruction efficiency greater than 96% and uses natural gas as an auxiliary fuel.

Pinene Process

Crude Sulfate Turpentine is a dark yellow liquid that is predominately a mixture of unsaturated, bicyclic, monoterpene hydrocarbons ($C_{10}H_{16}$). Alpha-pinene is the main constituent at 55-60% of the CST. In addition, CST contains a complex mixture of other constituents including pine oils, anetholes, monocyclic terpenes, aromatics, oxygenated compounds, sulfur compounds and polymeric materials.

CST is a by-product of the Kraft papermaking process. The volatile terpenes are steam distilled from wood chips during the early stages of the Kraft pulping process and are condensed along with the steam and volatile sulfur compounds. After the water is removed, the remaining material is CST.

CST is fed continuously to a distillation tower where a heads cut is taken for odor removal. The remaining stream is fractionated into low boiling distillates and high boiling residues. The distillates are further fractionated to produce refined alpha-pinene and beta-pinene products.

Utilities

Plant utilities consists of one boiler (No. 2 boiler), a cooling tower for cooling process water, heat transfer fluid heaters, wastewater treatment plant facilities, and loading and unloading stations.

No. 2 Boiler

The No. 2 Boiler is a Combustion Engineering Model A-Type #35-A13 water-tube boiler with a nominal rated capacity of 175 MM Btu/hr. This boiler was placed in operation in 1982. In accordance with PSD requirements, a Best Available Control Technology (BACT) determination was made on February 4, 1980 for emissions of NO_x, PM and SO_2. The boiler was fueled by natural gas and tall oil by-products but currently operates only on natural gas. In accordance with the BACT determination, SO_2 emissions are controlled by using low-sulfur fuel (natural gas), PM emissions are controlled by using ash less fuel (natural gas) and NO_x emissions are controlled by the use of low-NO_x burners. This boiler is a regulated emissions unit. NSPS requirements do not apply to this boiler. PSD and BACT reviews were completed on February 4, 1980.

Heat Transfer Fluid Heaters

Heat transfer fluids are heated and circulated as needed to unit operations that require heat. The heat transfer fluid is recirculated and reheated in eight natural gas fired heaters distributed around the facility. The eight heaters have a combined nominal heat input of 78.1 MM Btu/hr. The heaters are an unregulated emissions unit.

Wastewater Treatment

Wastewater is divided into three areas: Resin Plant, Tall Oil Operations, and Terpene Refinery.

The Resin Plant wastewater contains some levels of benzene, ethyl benzene, toluene, and xylene. For this reason, it is pre-treated using two air strippers before discharging to the equalization basin where the pH is adjusted. The volatile organics are vented to the RTO for destruction. The air strippers are regulated in accordance with Rule 62-296.320(1), F.A.C., General Pollutant Emission Limiting Standards.

Process wastewater from the Tall Oil operations and the Terpene Refinery pass through skimmers to remove oils and are then discharged to the equalization basin. The equalization basin discharges to the Military Point Industrial Wastewater System. This area is an unregulated emission unit for purposes of this air permit.

Loading and Unloading
Raw materials and products enter and leave the facility through the loading/unloading operations that include stations for trucks and rail cars. This area is an unregulated emissions unit.

Raw Material and Product Storage Tanks
Tanks are used throughout the facility to store raw materials, products and by-products. Due to their size and the low volatility of chemicals being stored, these storage tanks are only subject to the record keeping provisions of 40 CFR 60.116b(b), Subpart Kb (Volatile Organic Liquid Storage Vessels).

Total potential emissions from the facility are as follows:

Pollutant (tpy)	CO	NOx	PM	PM_{10}	SO_2	VOC	H2S	TRS	HAP*
Insignificant	NA	NA	NA	NA	NA	44.93	NA	NA	0.18
Unregulated	27.41	45.69	2.48	2.48	0.20	812.23	45.93	45.93	6.65
Regulated	95.03	156.39	35.39	35.39	68.16	161.44	9.21	9.21	14.31
Total	**122.45**	**202.08**	**37.87**	**37.87**	**68.36**	**1,018.60**	**55.14**	**55.14**	**21.14**

* Note: Estimated facility-wide total HAP emissions are below the Title V major source threshold of 25 tons/year with the highest individual HAP, xylene, estimated at 8.54 tons/year. Fugitive emissions from insignificant and unregulated emissions sources account for approximately 84% of the total VOC emissions from this facility. Detailed lists of these emissions sources are included in Appendices I & U.

Also included in this permit are miscellaneous unregulated/insignificant emissions units and/or activities.

PROJECT DESCRIPTION

The purpose of this permitting project is to incorporate permit 0050001-023-AC and revise the existing Title V permit for the above referenced facility. These permits are being issued concurrently because the addition of the waste heat boiler with no supplemental fuel firing will not increase emissions and will not require additional compliance testing.

PROCESSING SCHEDULE AND RELATED DOCUMENTS

Title V Air Operation Permit issued August 23, 2013
Title V Air Operation Permit Revision issued January 27, 2014
Application for a Title V Air Operation Permit Revision [EPSAP No. 3645-1] received November 22, 2013
Notice of Intent to Issue Air Permit issued December 19, 2013
Public Notice Published December 27, 2013

PRIMARY REGULATORY REQUIREMENTS

Title III: The facility is not identified as a major source of hazardous air pollutants (HAP).

Title V: The facility is a Title V major source of air pollution in accordance with Chapter 62-213, Florida Administrative Code (F.A.C.).

PSD: The facility is a Prevention of Significant Deterioration (PSD)-major stationary source of air pollution in accordance with Rule 62-212.400, F.A.C.

NSPS: The facility does operate units subject to the New Source Performance Standards (NSPS) of 40 Code of Federal Regulations (CFR) 60.

NESHAP: The facility does not operates units subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) of 40 CFR 63.

CAIR: The facility is not subject to the Clean Air Interstate Rule (CAIR) set forth in Rule 62-296.470, F.A.C.

CAM: Compliance Assurance Monitoring (CAM) applies to Units EU034 and EU036. Emissions unit 034, Thermal Oxidizer with Caustic Scrubber, is subject to CAM for the regulated emissions of TRS, VOC and HAP.

Emissions unit 036, Regenerative Thermal Oxidizer, is subject to CAM for the regulated emissions of VOC and HAP.

PROJECT REVIEW

This project is a revision to Title V permit 0050001-022-AV, effective August 23, 2013, to incorporate permit 0050001-023-AC, which is being concurrently processed with 0050001-024-AV. The construction permit authorizes the addition of a waste heat boiler with no supplemental fuel firing to the flue gas exhaust stream of the existing Thermal Oxidizer, Emission Unit 034 (EU 034). The Thermal Oxidizer flue gas ductwork is re-routed to the waste heat boiler and then out of the existing stack. These changes will not affect the emissions.

CONCLUSION

This project revises Title V air operation permit No. 0050001-022-AV, which was effective on August 23, 2013. This Title V air operation permit revision is issued under the provisions of Chapter 403, Florida Statues (F.S.), and Chapters 62-4, 62-210 and 62-213, F.A.C.