SMAQMD BACT CLEARINGHOUSE

ACTIVE

CATEGORY Type: **PHARMACEUTICAL PROCESS**

BACT Category: MINOR SOURCE BACT

BACT Determination Number: 332	**BACT Determination Date:** 8/8/2023

Equipment Information

Permit Number: N/A -- Generic BACT Determination

Equipment Description: PHARMACEUTICAL MANUFACTURING PROCESS (AMPAC)

Unit Size/Rating/Capacity: BATCH PROCESSING

Equipment Location:

BACT Determination Information

District Contact: Jeff Weiss Phone No.: (279) 207-1155 email: jweiss@airquality.org

ROCs	**Standard:**	
	Technology Description:	Refrigerated condensers, afterburners, or carbon adsorbers per comments (below)
	Basis:	Achieved in Practice
NOx	**Standard:**	
	Technology Description:	
	Basis:	
SOx	**Standard:**	
	Technology Description:	
	Basis:	
PM10	**Standard:**	
	Technology Description:	
	Basis:	
PM2.5	**Standard:**	
	Technology Description:	
	Basis:	
CO	**Standard:**	
	Technology Description:	
	Basis:	
LEAD	**Standard:**	
	Technology Description:	
	Basis:	

Comments: Afterburners, Refrigerated Condensers, or Carbon Adsorbers with a capture/control efficiency of ≥ 90%. For those chemical streams which preclude a control of 90% because of their chemical or physical characteristics, a ≥ 0.3 second retention time at ≥ 1400 ºF for afterburners and an exit gas temperature of -25 °C for condensers will also satisfy BACT if emissions from reactors, distillation columns, crystallizer, evaporators, and centrifuges are less than 15 lb/day and emissions from dryers are less than 10 lb/day. A scrubber may also be used if it achieves a capture/control efficiency of ≥

777 12th Street, St. 300

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Sacramento, CA 95814

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION

DETERMINATION NO.:	332
DATE:	August 8, 2023
ENGINEER:	Jeff Weiss

Category/General Equip Description:	Pharmaceutical Manufacturing Operations
Equipment Specific Description:	Pharmaceutical Manufacturing Batch Processes (Non-Fugitive) – Area Source - at Ampac Fine Chemicals
Equipment Size/Rating:	Minor Source
Previous BACT Det. No.:	#261

This BACT determination will update Determination #261 for Pharmaceutical Manufacturing Operations which was made on June 25, 2021. This equipment category is being evaluated for pharmaceutical manufacturing equipment at Ampac Fine Chemicals that involve reactors, separators, dryers, and other similar types of equipment involved in the reacting, heating, cooling, filtering, and drying of chemical compounds. A review of the EPA, CARB, SCAQMD, SJVAPCD, BAAQMD, SDAPCD, and YSAQMD BACT clearinghouses was performed according to the District's draft BACT Guidelines (6/22). Any applicable rules and regulations from the aforementioned air pollution control agencies were also reviewed that apply to this type of operation.

The review of the emission strategies of these air pollution control agencies revealed that there has been one update since BACT Determination 261. The EPA has added one RACT/BACT/LAER strategy: IN-0345. Yolo-Solano AQMD has not updated Rule 2.35 for pharmaceutical manufacturing operations; however, a review of the rule indicated that an alternative emission strategy had mistakenly not been placed in the BACT 261 rule chart. Neither change affects the regulatory logic given in BACT determination 261. Because there have not been any consequential changes since the last BACT determination, the following BACT/T-BACT analysis will be the same as the prior BACT analysis with the exceptions noted above and the following: References to SMAQMD BACT No. 261 replace references to BACT No. 131 and agency links and contacts were updated.

BACT/T-BACT ANALYSIS

A: ACHIEVED-IN-PRACTICE (Rule 202, §205.1a)

The following control technologies are currently employed as BACT for pharmaceutical manufacturing processes by the following air pollution control districts and state and federal agencies.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

RACT/BACT/LAER

Source: https://cfpub.epa.gov/rblc/index.cfm?Action=search.BasicSearch

Pharmaceutical Production (EPA Process Type 69.011)

RBLC# (A)	Process Description	Control
MI-0312	Reactors, et al.	Use of condensing scrubber and condenser which cools exhaust to -15°C.

(A) RBLC# refers to the RACT/BACT/LAER identification number.

All other technologies found in the EPA database were for pharmaceutical manufacturing processes that were at major sources or for equipment of a different category.

RULE Requirements

Sources: https://www.epa.gov/stationary-sources-air-pollution/national-emission-standards-hazardous-air-pollutants-neshap-8

40 CFR 63, Subpart VVVVVV – National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources regulates area sources that have the target HAPs of 1,3-butadiene, 1,3-dichloropropene, acetaldehyde, chloroform, ethylene dichloride, hexachlorobenzene, methylene chloride, quinoline, arsenic compounds, cadmium compounds, chromium compounds, lead compounds, manganese compounds, nickel compounds, or hydrazine in concentrations greater than 0.1% for carcinogens or greater than 1.0% for noncarcinogens. Ampac uses acetaldehyde (VOC) and methylene chloride (non-VOC) in some of their chemical processes. When used, these chemicals are usually above the criteria concentration limits given in the regulation. However, SMAQMD Rules 443 and 464 and pharmaceutical BACT Determination 261 are at least as stringent as the control requirements given in this regulation.

40 CFR 63, Subpart GGG – National Emission Standards for Hazardous Air Pollutants for Source Categories: Pharmaceuticals Production regulates pharmaceutical facilities that are major sources of HAPs. A major source of HAPs is a source that emits at least 10 tons/year of a single HAP or an aggregate total of 25 tons/year of multiple HAPs. This BACT determination is for equipment at area sources which is covered by another NESHAP, Subpart VVVVVV. Subpart GGG, on the other hand, is for equipment with an entirely different production scope.

CALIFORNIA AIR RESOURCES BOARD

BACT

Source: https://ww2.arb.ca.gov/BACT-Tool

No BACT standards were posted for pharmaceutical manufacturing processes.

RULE REQUIREMENTS

Source: https://ww2.arb.ca.gov/resources/documents/airborne-toxic-control-measures

No ATCMs were posted for pharmaceutical manufacturing processes.

SACRAMENTO METROPOLITAN AQMD

BACT

Listed under BACT Determination #261 – Pharmaceutical Manufacturing Afterburners, refrigerated condensers, or carbon adsorbers with a capture/control efficiency of ≥ 90% for VOC. For those chemical streams which preclude a control of 90% because of their chemical or physical characteristics, a ≥ 0.3 second retention time at ≥ 1,400 ºF for afterburners and an exit gas temperature of -25 °C for condensers will also satisfy BACT if emissions from reactors, distillation columns, crystallizer, evaporators, and centrifuges are less than 15 lb/day and emissions from dryers are less than 10 lb/day. A scrubber may also be used if it achieves a capture/control efficiency of ≥ 90%.

RULE REQUIREMENTS

Source: Rule 464 – Organic Chemical Manufacturing Operations (4/28/16)

Equipment Type	Required VOC Standards
Reactors, Distillation Columns, Crystallizers and centrifuges	Emissions of more than 15 lb/day must have a capture/control efficiency of 90% by weight. Emissions of more than 10 lb/day but not more than 15 lb/day must either have a capture/control efficiency of 90% by weight or utilize a condenser with an outlet gas temperature that doesn't exceed the following: 25°C for 0.5 psi to 1.0 psi, 10°C for 1.0 psi to 1.5 psi, 0°C for 1.5 psi to 2.9 psi, -15°C for 2.9 psi to 5.8 psi, -25°C for over 5.8 psi.
Separation operations	Centrifuges, rotary vacuum filters, or other devices with an exposed liquid surface must be vented to a carbon adsorber or other approved air pollution control device.
In-Process Tanks	Tanks must be covered. If emissions are greater than 15 lb/day, a capture/control efficiency of 85%/90% is required.
Dryers	Equipment emitting > 10 lb/day must vent to a device with a capture/control efficiency of 90% by weight.

SOUTH COAST AQMD

BACT
Source: SCAQMD BACT Guidelines for Non-Major Polluting Facilities, page 97

Pharmaceutical Manufacturing - Afterburner (≥ 0.3 second retention time at ≥ 1,400 ºF), refrigerated condensers, or carbon adsorbers (emissions limit was not specified because SCAQMD states that a limit that applies to all equipment within the category is not possible. Please refer to discussion under the Technologically Feasible and Cost Effective Section below).

RULE REQUIREMENTS

Source: Reg. XI, Rule 1103 – Pharmaceuticals and Cosmetics Manufacturing Operations (3/12/99)

Equipment Type	Required VOC Standards
Reactors, Distillation Columns, Crystallizers and Centrifuges	Emissions of more than 15 lb/day must vent to a condenser with an outlet gas temperature that doesn't exceed the following: 25°C for 0.5 psi to 1.0 psi, 10°C for 1.0 psi to 1.5 psi, 0°C for 1.5 psi to 2.9 psi, -15°C for 2.9 psi to 5.8 psi, -25°C for over 5.8 psi.
In-Process Tanks	Covers [or equivalent apparatus] must be in place and closed except during loading or unloading.
Separation Operations and Air Dryers	Emissions of 330 lb/day or more must be reduced by 90%. Emissions less than 330 lb/day must be reduced to less than 33 lb/day.

SAN DIEGO COUNTY APCD

BACT
Source: https://www.sdapcd.org/content/dam/sdc/apcd/PDF/Misc/APCD_bact.pdf

Low VOC content material if emissions > 10 lb/day.

RULE REQUIREMENTS

Source: Reg. IV, Rule 67.15 -- Pharmaceutical and Cosmetic Manufacturing Operations (5/15/96)

Equipment Type	Required VOC Standards
Reactors, Distillation Columns, Crystallizers and Centrifuges	Emissions of more than 15 lb/day from this equipment must vent to a condenser with an outlet gas temperature that doesn't exceed the following: 25°C for 0.5 psi to 1.0 psi, 10°C for 1.0 psi to 1.5 psi, 0°C for 1.5 psi to 2.9 psi, -15°C for 2.9 psi to 5.8 psi, -25°C for over 5.8 psi.
Separation Operations (A)	Equipment with an exposed liquid surface with VOC of 0.5 psia or more at 20°C controlled by at least 90%. (A)
In-Process Tanks	Tanks with VOCs of 0.5 psia or more at 20°C must be closed except during loading, unloading, or maintenance.
Air Dryers	Emissions of 33 lb/day or more must be reduced by at least 90%.

(A) This control method is only technologically feasible and is not achieved in practice. Refer to the discussion that immediately follows this table.

Rules and regulations are considered to be achieved in practice; however, there are rare situations where this is not the case. During this BACT review, it was observed that San Diego APCD Rule 67.15, Section (d)(2) requires that centrifuges, rotary vacuum filters, and other filters use a control with a minimum VOC collection and control efficiency of 90% by weight. It has been determined that this rule section has not been achieved in practice for the following reasons:

This rule section is more stringent than the other district rules that were reviewed. The other district rules either specify a control without a minimum control efficiency or they specify a control with a minimum control efficiency of 90% or less but only after an uncontrolled emission threshold is reached. Further, Section (d)(2) of the rule is more stringent than San Diego's BACT determination which lists a blanket 90% control as only technologically feasible (https://www.sdapcd.org/content/dam/sdc/apcd/PDF/Misc/APCD_bact.pdf - Page 3-21).

This is significant because BACT is not supposed to be less stringent than a district's rule/BARCT. Also, it's not likely that the BACT determination is older than the rule since the rule was promulgated 32 years ago in 1988, and the section (d)(2) requirement was not changed in the Rule's 1996 revision. Lastly, Section (d)(2) is more stringent than the posted BACT determinations of other districts for this source category. In short, there's conflict between Section (d)(2) and the body of achieved-in-practice regulations.

Phone calls placed with San Diego County APCD's Engineering Division and its Rule Development Division verified that Section (d)(2) has not been achieved in practice. This is partly due to Rule 67.15, Section (d)(1) which is used as an acceptable alternative for centrifuges if a 90% control cannot be achieved. It was also reported that filters have not yet been regulated by San Diego using this section. Consequently, SMAQMD will disregard Rule 67.15, Section (d)(2) for the purposes of this achieved-in-practice review.

YOLO-SOLANO AQMD

BACT
Source: Ben Beattie, YSAQMD

Low VOC content material if emissions > 10 lb/day.

Pharmaceutical pill coating line venting solvent emissions. to a thermal oxidizer.

RULE REQUIREMENTS
Source: Rule 2.35 – Pharmaceutical Manufacturing Operations (5/14/08)

Equipment Type	Required VOC Standards
Reactors, Distillation Columns, Crystallizers and Centrifuges	For emissions over 10 lb/day, a capture/control of 85% by weight or surface condensers controlled with an outlet gas temperature that doesn't exceed the following: 25°C for 0.5 psi to 1.0 psi, 10°C for 1.0 psi to 1.5 psi, 0°C for 1.5 psi to 2.9 psi, -15°C for 2.9 psi to 5.8 psi, -25°C for over 5.8 psi.
Separation Operations	Rotary vacuum filter, other filter, or separation device with an exposed liquid surface must not emit more than 10 lb/day unless emissions have been reduced by 85% by weight.
In-Process Tanks	Covers must be closed except during loading or unloading.
Air Dryers	Emissions must not exceed 10 lb/day unless they are reduced by 85% by weight.

BAY AREA AQMD

BACT
Source: Bay Area BACT Clearinghouse

No BACT standard has been established for this category of operation.

RULE REQUIREMENTS

Source: Reg. VIII, Rule 24 -- Pharmaceutical and Cosmetic Manufacturing Operations (6/15/94)

Equipment Type	Required VOC Standards
Reactors, Distillation Columns, Crystallizers and Centrifuges	Emissions of more than 15 lb/day must vent to a condenser with an outlet gas temperature that doesn't exceed the following: 25°C for 0.5 psi to 1.0 psi, 10°C for 1.0 psi to 1.5 psi, 0°C for 1.5 psi to 2.9 psi, -15°C for 2.9 psi to 5.8 psi, -25°C for over 5.8 psi.
Separation Operations	Rotary vacuum filter, other filter, or separation device with an exposed liquid surface must not emit more than 33 lb/day unless emissions have been reduced by 90% by weight.
In-Process Tanks	Tanks must be covered
Air Dryers	Emissions must not exceed 33 lb/day unless reduced by 90% by weight.

SAN JOAQUIN VALLEY APCD

BACT

Source: San Joaquin Valley BACT Clearinghouse

No BACT standard has been established for this category of operation.

RULE REQUIREMENTS

Source: https://www.valleyair.org/rules/1ruleslist.htm#reg4

A rule has not been established.

The following control technologies have been identified and are ranked based on stringency:

<table>
<tr><th colspan="2">SUMMARY OF ACHIEVED-IN-PRACTICE CONTROL TECHNOLOGIES</th></tr>
<tr><td>VOC</td><td>
1. Afterburners, Refrigerated Condensers, or Carbon Adsorbers with a capture/control efficiency of ≥ 90%. For those chemical streams which preclude a control of 90% because of their chemical or physical characteristics, a ≥ 0.3 second retention time at ≥ 1400 ºF for afterburners and an exit gas temperature of -25 °C for condensers will also satisfy BACT if emissions from reactors, distillation columns, crystallizer, evaporators, and centrifuges are less than 15 lb/day and emissions from dryers are less than 10 lb/day. A scrubber may also be used if it achieves a capture/control efficiency of ≥ 90%. (SMAQMD)
2.
<table>
<tr><td>Reactors, Distillation Columns, Crystallizers and Centrifuges</td><td>Emissions of more than 15 lb/day must have a capture/control efficiency of 90% by weight. Emissions of more than 10 lb/day but not more than 15 lb/day must either have a capture/control efficiency of 90% by weight or utilize a condenser with an outlet gas temperature that doesn't exceed the following: 25°C for 0.5 psi to 1.0 psi, 10°C for 1.0 psi to 1.5 psi, 0°C for 1.5 psi to 2.9 psi, -15°C for 2.9 psi to 5.8 psi, -25°C for over 5.8 psi. (SMAQMD)</td></tr>
<tr><td>Separation Operations</td><td>Equipment with an exposed liquid surface must be controlled by at least 90% (SDAPCD)</td></tr>
<tr><td>In-Process Tanks</td><td>Process tanks must be covered. If emissions are greater than 15 lb/day, a capture/control efficiency of 85%/90% is required. (SMAQMD)</td></tr>
<tr><td>Dryers</td><td>Equipment emitting more than 10 lb/day must vent to a device with a capture/control efficiency of 90% by weight. (SMAQMD)</td></tr>
</table>
3. Use of condensing scrubber and condenser which cools exhaust to -15°C. (EPA)
4. Use of low VOC content material. (SDAPCD, YSAQMD)
</td></tr>
<tr><td>HAPs</td><td>T-BACT is the same as achieved-in-practice BACT for VOC.</td></tr>
</table>

The following control technologies have been identified as the most stringent, achieved-in-practice technologies. The first control technology listed is the most stringent that has been achieved in practice.

BEST CONTROL TECHNOLOGIES ACHIEVED		
Pollutant	**Standard**	**Source**
VOC	Afterburners, Refrigerated Condensers, or Carbon Adsorbers with a capture/control efficiency of ≥ 90%. For those chemical streams which preclude a control of 90% because of their chemical or physical characteristics, a ≥ 0.3 second retention time at ≥ 1,400 ºF for afterburners and an exit gas temperature of -25 °C for condensers will also satisfy BACT if emissions from reactors, distillation columns, crystallizer, evaporators, and centrifuges are less than 15 lb/day and emissions from dryers are less than 10 lb/day. A scrubber may also be used if it achieves a capture/control efficiency of ≥ 90%.	SMAQMD
HAPs	T-BACT is the same as achieved-in-practice BACT for VOC.	

B. TECHNOLOGICALLY FEASIBLE AND COST EFFECTIVE (Rule 202, §205.1.b.)

1. Technologically Feasible Alternatives for Criteria Pollutants:

Technologically feasible alternatives are any alternative basic equipment, fuel, process, emission control device, or technique, singly or in combination, that is determined to be technologically feasible by the Air Pollution Control Officer. The following are the technologically feasible alternatives identified as capable of reducing emissions beyond the levels determined to be “Achieved-in-Practice” per Rule 202, §205.1.a.

Pharmaceutical Production (EPA Process Type 69.011)

Process Description	**Technologically Feasible Alternative**
Pharmaceutical Production	Thermal oxidizer with destruction efficiency of 99%. (Reported to have 99.99% guarantee)
Bulk Chemical Mfr.	Afterburner with a 98% control efficiency
Narasin Finishing Operation	Carbon adsorber with a 98% control efficiency
Narasin Fermentation	
Monensin Process	Carbon adsorber with a 95% control efficiency

South Coast AQMD has identified BACT as the use of afterburners, refrigerated condensers, or carbon adsorbers; however, South Coast did not specify an emissions limit for these technologies because of the large physical and chemical variability of chemical process streams. This variability precludes the possibility of a fixed control efficiency (ref: http://www.aqmd.gov/docs/default-source/bact/bact-guidelines/part-c---policy-and-procedures-for-non-major-polluting-facilities.pdf?sfvrsn=13 (2/19), Page 40.) San Diego County APCD reinforces this point in their BACT determination by labeling technology with a control efficiency of 90% as being only technologically feasible: their achieved-in-practice method

specifies neither a control efficiency nor a limit. This variability is especially pronounced in Sacramento where a pharmaceutical company (Ampac Fine Chemicals) has a business model that is based on process innovation and improvement for multiple clients. The company's operations are based on variability. In addition, the control criteria identified above are from major sources that operate on a much larger scale and are involved in large scale production. Ampac Fine Chemicals, on the other hand, is largely an R&D facility. In addition to this general information, please note the following analysis for specific air pollution control technologies.

Afterburners: An afterburner is not cost-effective as BACT because Ampac's three smaller pilot buildings require BACT yet generate only a small fraction of emissions compared to the main plant area. As an alternate method, the emissions could be routed to a central afterburner located at the main plant, but this is also not feasible because the pilot plants are not located near the main plant. Furthermore, the VOC concentration in the typical emission stream is often dilute and natural gas would be required to supplement the afterburner. Also, Ampac's night operations are sporadic and may involve as much as half the plant or as little as a few pieces of equipment. The amount of night production is dependent on scheduling and the demands of any given project. Therefore, pipeline natural gas would be needed in the afterburner to allow night operation. During night operations, large amounts of natural gas combustion would add criteria pollutants into the atmosphere without appreciably reducing VOCs.

Based on EPA data, an afterburner is also not expected to be Cost-Effective (CE). Two major sources have been identified that use afterburners. The first major source (IN-0203), which utilizes an afterburner at a 98% control efficiency, reported a cost effectiveness of 29,007 $/ton. This cost is about 20% higher than the District cost threshold of 23,600 $/ton. The CE for Ampac would likely be even higher than 29,007 $/ton since Ampac's emissions are at least 4.5 times lower than IN-0203 (e.g., 25 tons/year per afterburner at IN-0203 versus 5.5 tons/year at Ampac).

The other major source (MI-0276) utilizes an afterburner with a control efficiency of 99% or 99.99% which emits 39 tons/year of VOC emissions. While a CE number wasn't reported, a CE for a higher control efficiency than for IN-0203 combined with Ampac's emissions which are more than 7 times lower than MI-0276 is not expected to make this alternative cost-effective. Therefore, for the reasons given, afterburners at these levels of control are not cost-effective.

Carbon Adsorbers: Carbon adsorbers were identified as technologically feasible at 95% control and 98% control at a major source. The major source that utilizes the less effective control of 95% (IN-0098) reported a CE of 47,354 $/ton for emissions of 23.7 tons/year and another unit at 49,303 $/ton for emissions of 23.0 tons/year. This is 2 times higher than the District CE threshold. Ampac's cost-effectiveness would likely yield a higher number since Ampac's total non-fugitive emissions are only 25% of those emissions given above. Therefore, carbon adsorbers at this level of control are not cost effective for the reasons given.

Refrigerated Condensers: Most pharmaceutical process streams can achieve a control of 90% when using afterburners, condensers, or carbon adsorbers. For APC condensers, a minimum exhaust gas temperature of -25 ºC will typically achieve a control of at least 90%. However, as reflected in the BACT clearinghouses, it is not cost effective to achieve a control of 90% for some process streams because of their individual chemical and physical characteristics.

It should be noted that BACT cannot be less stringent than District rules which are considered to be achieved-in-practice. Therefore, BACT will be the use of afterburners, refrigerated condensers, or carbon adsorbers with a capture/control efficiency of ≥ 90%. However, for those chemical streams which preclude a control of 90% because of their chemical or physical characteristics, afterburners operating at a ≥ 0.3 second retention time at ≥ 1,400 ºF and condensers operating at an exit gas temperature of -25 °C will also satisfy BACT if emissions from reactors, distillation columns, crystallizer, evaporators, and centrifuges are less than 15 lb/day and emissions from dryers are less than 10 lb/day. A scrubber may also be used if it achieves a capture/control efficiency of ≥ 90%.

2. Technologically Feasible Alternatives for Toxics (T-BACT):

Technologically feasible methods are any basic equipment, fuel, process, emission control device, or technique, singly or in combination, that is determined to be technologically feasible by the Air Pollution Control Officer. The following are the technologically feasible methods identified as capable of reducing emissions beyond the levels determined to be "Achieved-in-Practice" per Rule 202, §205.1.a.

Pollutant	Technologically Feasible Alternative
VOC Toxics	1. Afterburner with a capture/destruction efficiency of ≥ 90%. 2. Refrigerated condensers with a capture/control efficiency of ≥ 90%. 3. Carbon adsorber with a capture/control efficiency of ≥ 90%. 4. Wet Scrubbers with a capture/destruction efficiency of ≥ 90%.

The analysis for the technologically feasible alternatives is the same as mentioned for BACT. Please refer to Section B.1 (above) for discussion.

C. SELECTION OF BACT AND T-BACT:

BACT for Pharmaceutical Manufacturing Batch Operations	
Pollutant	**Standard**
VOC	Afterburners, refrigerated condensers, or carbon adsorbers with a capture/control efficiency of ≥ 90%. For those chemical streams which preclude a control of 90% because of their chemical or physical characteristics, a ≥ 0.3 second retention time at ≥ 1,400 ºF for afterburners and an exit gas temperature of -25 °C for condensers will also satisfy BACT if emissions from reactors, distillation columns, crystallizer, evaporators, and centrifuges are less than 15 lb/day and emissions from dryers are less than 10 lb/day. A scrubber may also be used if it achieves a capture/control efficiency of ≥ 90%.
Toxics	T-BACT is the same as BACT for VOCs.

APPROVED BY: *Brian F Krebs* **DATE:** 08-08-23