



## Community Advisory Council

### APCD CAC Members

Dennis Beebe  
Janet Blevins  
Dave Davis  
Katie Davis  
Cliff Dugger  
Matt Dunn  
Jennifer Fullerton  
Lee Heller  
Dillon Kass  
Michael Lopez  
Edward McGowan  
Badaoui Mouderrres  
Laura Nuzzo  
Ben Oakley  
John Reaves  
David Rose  
Dave Savinsky  
Patrice Surmeier,  
*Vice Chair*  
Jim Taylor  
Randy Westhaus  
Murry Wilson

APCD CAC Chair:  
Aeron Arlin Genet

## AGENDA

August 23, 2023  
4:00 P.M.

Buellton Community Recreation Center  
301 Second Street  
Buellton, CA  
Room A

Pursuant to Government Code Section 54954.3(a), members of the public may address the CAC on any matter listed on the agenda before the item is considered. Matters not listed on the agenda may be addressed during the public comment period. The CAC will consider any and all public comments related to the mission of the APCD and/or the Charter of the CAC.

Additional information, including Agendas, Supplemental Materials, and Minutes of the CAC, can be obtained on the APCD District website at: <https://www.ourair.org/community-advisory-council-info/>.

Any disclosable public records related to an open session item on the meeting agenda and distributed by the Board Clerk to all or a majority of the members of the CAC less than 72 hours prior to that meeting are available for inspection in the APCD office or website. CAC meetings are audio recorded; recordings will be made available upon request pursuant to the California Public Records Act. In compliance with the Americans with Disabilities Act, individuals needing special accommodations to participate in the meeting should contact the APCD at (805) 979-8050 at least three working days prior to the scheduled meeting.

- A. 4:00 p.m. – Convene**
- B. Roll Call**
- C. Public Comment Period** – *Persons desiring to address the CAC on any subject within the jurisdiction of the CAC not included as part of the agenda may do so at this time.*
- D. Approval of Minutes of the February 22, 2023 meeting.**
- E. Organization of Agenda**
- F. APCO Report**
- G. NEW BUSINESS** – *Declaration of Interest to be conducted prior to each item.*
  - G-1) *Receive and File an update on the Assembly Bill 617 BARCT Analysis for Miscellaneous Combustion Units.*
- H. Adjourn**



**Meeting Minutes  
(Unofficial)**

**February 22, 2023**

**Community Advisory  
Council**

**REMOTE VIRTUAL PUBLIC PARTICIPATION ONLY**

**APCD CAC Members**

- Dennis Beebe
- Janet Blevins
- Dave Davis
- Katie Davis
- Cliff Dugger
- Matt Dunn
- Jennifer Fullerton
- Lee Heller
- Dillon Kass
- Michael Lopez
- Laura Nuzzo
- Ben Oakley
- John Reaves
- Dave Savinsky
- Patrice Surmeier,  
Vice-Chair
- Jim Taylor
- Randy Westhaus
- Murry Wilson

The California State Legislature recently passed, and the Governor signed, Assembly Bill 361 (Rivas, 2021), which amends the Government Code to allow Brown Act bodies to continue to meet remotely if certain elements are met. The Santa Barbara County Air Pollution Control District's Community Advisory Council meeting will temporarily be conducted via video conferencing and telephone.

**A. Convene**

The special meeting was called to order at 4:00 p.m

**B. Roll Call**

Present: 14 - Beebe (arrived at approx. 4:05 pm), D. Davis (left at approx. 4:28 pm), Dugger, Dunn, Heller, Kass, Lopez, Nuzzo (left at approx. 4:30 pm), Oakley, Savinsky, Surmeier, Taylor, Westhaus, Wilson.

Absent: 4 - Blevins, K. Davis, Fullerton, Reaves.

Staff: 7 - Aeron Arlin Genet, Brian Pettit, Dave Harris, Alex Economou, Jim Fredrickson, Tim Mitro, and Lorena Saldana.

**C. Public Comment Period – Persons desiring to address the CAC on any subject within the jurisdiction of the CAC not included as part of the agenda may do so at this time.**

There were no public comments.

**D. Approval of Minutes of the October 13, 2022, November 10, 2022, December 8, 2022, January 6, 2023, and February 2, 2023 special meetings.**

A motion was made by Lee Heller, seconded by Dave Davis to approve all the minutes as submitted. The motion carried by the following vote:

Ayes: 14 - Beebe, D. Davis, Dugger, Dunn, Heller, Kass, Lopez, Nuzzo, Oakley, Savinsky, Surmeier, Taylor, Westhaus, Wilson.

Noes: 0 - None.

Abstain: 0 - None.

Absent: 4 - Blevins, K. Davis, Fullerton, Reaves.

**E. Organization of Agenda**

There was no change to the organization of the agenda.

**APCD CAC Chair:**  
Aeron Arlin Genet

**F. APCO Report**

Received report.

**G. NEW BUSINESS – Declaration of Interest to be conducted prior to each item.**

G-1) *Discuss Brown Act Updates Regarding Teleconferencing.*

*Received item.*

*Interest: None.*

G-2) *Receive and File an update on the Assembly Bill 617 BARCT Analysis for Reciprocating Internal Combustion Engines.*

*Received item.*

*Interest: Surmeier.*

**H. Adjourn**

The meeting was adjourned at 5:04 p.m.

# COMMUNITY ADVISORY COUNCIL

## ATTENDANCE – 2023

**A Quorum of the CAC shall be a majority of the appointed members minus one. Vacant positions shall not count toward a quorum.**

NAME	Appointing Board Member	JAN+ 6	FEB+ 2	FEB 22	MAR 22	APR 26	MAY 24	JUN 28	JUL 26	AUG 23	SEP 27	OCT 25	NOV 22	DEC 27
Dennis Beebe	Infanti	Yes	Yes	Yes										
Janet Blevins	Hartmann	No	No	No										
Dave Davis	Capps	Yes	Yes	Yes										
Katie Davis	Rowse	Yes	Yes	No										
Cliff Dugger	Nelson	Yes	No	Yes										
Matt Dunn	Perotte	Yes	Yes	Yes										
Jennifer Fullerton	Perotte	Yes	No	No										
Lee Heller	Capps	Yes	Yes	Yes										
Dillon Kass	Patino	No	Yes	Yes										
Michael Lopez	Clark	No	Yes	Yes										
Laura Nuzzo	Nelson	No	Yes	Yes										
Ben Oakley	Lavagnino	Yes	Yes	Yes										
John Reaves	Hartmann	No	No	No										
David Savinsky	King	*	Yes	Yes										
Patrice Surmeier	Julian	Yes	Yes	Yes										
Jim Taylor	Clark	Yes	Yes	Yes										
Randy Westhaus	Patino	Yes	Yes	Yes										
Murry Wilson	Julian	No	Yes	Yes										

Members Present	11	14	14
Members Absent	6	4	4

*1 There was no CAC meeting.*

*\* Not yet appointed/resigned/inactive/term ended*

*◆ Special Meeting*



## MEMORANDUM

**DATE:** August 9, 2023

**TO:** Community Advisory Council (CAC) Members

**FROM:** Alex Economou, (805) 979-8333, [AJE@sbcapcd.org](mailto:AJE@sbcapcd.org)

**SUBJECT:** AB 617 BARCT Analysis for Miscellaneous Combustion Units

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### **Background**

Assembly Bill (AB) 617, enacted in July 2017, has many requirements to address the disproportionate impacts of air pollution in environmental justice communities. One of the key components of AB 617 is to reduce air pollutant emissions from facilities that participate in the California Greenhouse Gas (GHG) Cap-and-Trade system. There are six of these industrial facilities within Santa Barbara County, and AB 617 requires these facilities to implement Best Available Retrofit Control Technology (BARCT) no later than December 31, 2023.

“Miscellaneous Combustion Units” includes devices such as dryers, kilns, and furnaces. These units are typically used to directly heat the product material or heat the air that is directed to the product material. Miscellaneous Combustion Units do not include boilers, water heaters, steam generators and process heaters subject to District prohibitory rules (Rules 342, 361, and 360). Currently, the District does not have a specific prohibitory rule that focuses on Miscellaneous Combustion Units.

During the initial BARCT assessment in 2018, the District reviewed the permitted Miscellaneous Combustion Units at the AB 617 industrial sources to see if additional controls would be feasible. The evaluation focused on the larger devices with a maximum rated heat input rating of 5 MMBtu/hr or higher, which is the typical rule applicability threshold established by other air districts for these devices. The District’s preliminary review showed that it may be feasible and cost-effective to establish new BARCT standards for Miscellaneous Combustion Units subject to AB 617 within Santa Barbara County. Hence, the District included a new rule (District Rule 362) on the District’s AB 617 schedule as a measure that needed to be fully evaluated for BARCT. The BARCT schedule was adopted by the District Board in December 2018.

Out of the six AB 617 industrial facilities in Santa Barbara County, Imerys Filtration Minerals, Inc. (“Imerys”) is the only facility that is currently affected by this BARCT analysis for Miscellaneous Combustion Units. Imerys is a diatomaceous earth processing facility located approximately two miles south of the City of Lompoc.

## **Discussion**

District staff compiled the draft BARCT analysis for Miscellaneous Combustion Units, as shown in Attachment A, that demonstrates that it is technologically feasible for the applicable units at Imerys to comply with lower NOx limits. The lower NOx limits are based on the rule requirements adopted by other neighboring air districts, such as Ventura County APCD and San Joaquin Valley APCD. The lower NOx limits are also identified as BARCT in the California Air Resources Board's Technology Clearinghouse.<sup>1</sup> However, it is only cost-effective to install low-NOx burners and implement the lower NOx limits if the devices are used a certain amount. Based on the District's cost-effectiveness calculations, a low-use threshold was identified for each applicable device, and Imerys' recent operations over the past three years have been below these device-specific low-use thresholds.

Although Imerys' recent operations are below the low-use thresholds, the current operating permit for the facility allows the devices to operate at maximum capacity. Hence, Imerys submitted an application to modify the facility's Permit to Operate (PTO) to incorporate the low-use thresholds directly into its operating permit. The permit application was deemed complete, and once issued, it will have enforceable conditions that implement the low-use thresholds in the BARCT analysis. As long as the affected units operate under the low-use thresholds, no equipment changes need to be performed. If the low-use thresholds are exceeded in the future, the facility will be required to comply with the lower NOx limits, through equipment modifications or replacement, within an 18-month time frame.

Since all BARCT requirements will be incorporated directly into Imerys' operating permit and the remaining five AB 617 industrial facilities in Santa Barbara County do not use Miscellaneous Combustion Units, Staff affirms that it is no longer necessary to adopt a new rule to implement the BARCT requirements. Staff proposes to bring the BARCT analysis before the District Board of Directors to finalize this assessment. Once finalized, the BARCT analysis will continue to apply to Imerys' existing equipment units, as well as any new units permitted and installed in the future at any of the AB 617 industrial facilities to ensure that NOx emissions are effectively controlled. In addition, the BARCT analysis will be forwarded to the California Air Resources Board for inclusion into their AB 617 BARCT webpage ([ww2.arb.ca.gov/expedited-barct](http://ww2.arb.ca.gov/expedited-barct)). Staff worked with District Counsel and concluded that this approach effectively satisfied the AB 617 mandate because it accomplishes the emission reduction goals of the legislation.

For the CAC meeting on August 23, 2023, Staff will provide a presentation on the key points of the BARCT analysis and Imerys' request to comply with the analysis through enforceable permit conditions. This agenda item will be informational only (i.e., no formal CAC recommendation will be sought). The docketed materials are also available for review from the District's website, [www.ourair.org/rules-under-development](http://www.ourair.org/rules-under-development), and all six AB 617 industrial facilities have been noticed about this meeting. If there are questions or concerns that you would like to discuss prior to the meeting, please contact me or Tim Mitro at (805) 979-8329 / e-mail: [MitroT@sbcapcd.org](mailto:MitroT@sbcapcd.org).

### **ATTACHMENT:**

#### **A. Draft BARCT Analysis for Miscellaneous Combustion Units**

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<sup>1</sup> <https://ww2.arb.ca.gov/current-air-district-rules>

**SANTA BARBARA COUNTY  
AIR POLLUTION CONTROL DISTRICT**

**Attachment A  
DRAFT  
Assembly Bill 617 –  
BARCT Analysis for Miscellaneous Combustion Units**

**Date: August 9, 2023**

Aeron Arlin Genet  
Air Pollution Control Officer

Prepared By:  
Tim Mitro  
Air Quality Engineer

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Our Mission  
*Our mission is to protect the people and the environment of  
Santa Barbara County from the effects of air pollution.*

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# 1. BACKGROUND

## 1.1 Ozone and Health

Ground level ozone is a secondary pollutant formed from photochemical reactions of the precursor pollutants oxides of nitrogen (NO<sub>x</sub>) and reactive organic compounds (ROC) in the presence of heat and sunlight. Both short-term and long-term exposure to ozone can cause a number of health effects in broad segments of the population. Ozone can damage the respiratory system, causing inflammation and irritation, or symptoms such as coughing and wheezing. High levels of ozone are especially harmful for children, the elderly, and people with asthma or other respiratory problems. Ground-level ozone also impacts the economy by increasing hospital visits and medical expenses, loss of work time due to illness, and by damaging agricultural crops. Santa Barbara County is currently designated as nonattainment<sup>1</sup> for the state ozone standards.

## 1.2 The AB 617 BARCT Rule Development Schedule

Assembly Bill (AB) 617, enacted in July 2017, has many requirements to address the disproportionate impacts of air pollution in disadvantaged communities. One of the key components of AB 617 is to reduce air pollutant emissions from facilities that participate in the California Greenhouse Gas (GHG) Cap-and-Trade system. Cap-and-Trade is designed to limit GHG emissions and allows facilities to comply by either reducing GHG emissions at the source or by purchasing GHG emission allowances. Emissions of criteria pollutants and toxic air contaminants are often associated with large GHG-emitting sources, and these pollutants may impact local communities that are already experiencing a disproportionate burden from air pollution.

AB 617 helps alleviate the pollution burden near these communities by requiring each air district to adopt an expedited rule development schedule for Best Available Retrofit Control Technology (BARCT) by January 1, 2019. The District's AB 617 BARCT schedule was adopted at the December 2018 Board Hearing, and it included a list of measures that needed to be evaluated for BARCT.<sup>2</sup> BARCT is an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts. To meet the BARCT emission limits, a facility may need to install new air pollution controls on their existing unit(s) or replace the unit(s) in part or in whole. The BARCT requirements apply to the following six facilities within the District boundaries since they are industrial sources subject to the California Cap-and-Trade requirements:

- 1) Exxon Mobil – Las Flores Canyon,
- 2) Exxon Mobil – Pacific Offshore Pipeline Company (POPCO),
- 3) Pacific Coast Energy Company (PCEC) – Orcutt Hill,
- 4) Cat Canyon Resources, LLC – Cat Canyon West<sup>3</sup>,
- 5) Imerys Filtrations Minerals, Inc., and
- 6) Windset Farms.

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<sup>1</sup> In January 2023, the California Air Resources Board held a [public hearing](#) to change Santa Barbara County's designation from "nonattainment" to "nonattainment-transitional." The change in designation becomes official after it is finalized by the California Office of Administrative Law (OAL), which is expected to occur in Summer 2023.

<sup>2</sup> Additional information on the AB 617 BARCT Rule Development Schedule is available on the District's website at [www.ourair.org/community-air](http://www.ourair.org/community-air).

<sup>3</sup> Facility was previously operated by ERG Operating Company.

During the initial BARCT assessment in 2018, the District reviewed the Miscellaneous Combustion Units that were permitted at the AB 617 industrial sources. The initial BARCT assessment showed that it may be feasible and cost-effective to control the Miscellaneous Combustion Units rated at 5 million Btu and higher and to establish new BARCT standards for Santa Barbara County.

### **1.3 Miscellaneous Combustion Units**

Most external combustion units that are permitted by the District are boilers, steam generators, and water heaters that are subject to the source-specific prohibitory requirements in District Rules 342, 360, and 361. However, there are a variety of external combustion units that would not be covered by the aforementioned rules. These units are termed “Miscellaneous Combustion Units,” which includes devices such as dryers, dehydrators, ovens, kilns, calciners, furnaces, roasters, crematories, and incinerators. Most of these Miscellaneous Combustion Units are unique or custom-built devices that are designed for specific industries. However, they can be categorized and consolidated into three main types:

- 1) Equipment that heats materials directly, such as kilns and metallurgical furnaces;
- 2) Equipment that heats air that is directed to a process chamber to dry or raise the temperature of process materials. This includes most ovens, dryers, and dehydrators; and
- 3) Equipment that is used as air pollution control devices that capture and incinerate any Reactive Organic Compounds (ROCs) in the process stream.

By combusting fuel in their burners, these devices contribute to the NO<sub>x</sub> emissions within Santa Barbara County.

### **1.4 Imerys Filtration Minerals**

Imerys Filtration Minerals, Inc. (“Imerys”) is a diatomaceous earth mining and processing facility that is located approximately two miles south of the City of Lompoc. Mining has occurred at this site for over 100 years, with Imerys being the current owner and operator of the mine since 1991.<sup>1</sup> Diatomaceous earth is a sedimentary deposit composed of fossilized diatoms, a type of algae that contains siliceous skeletons. Imerys mines and processes the diatomite ore into powders of various grades for use by industries, such as for filtration aids or fillers.

Most of the ore is surface mined from lands within the facility boundaries, crushed and screened using mobile equipment, and then stored in stockpiles. The stockpiled material is then transported to the powder mill using covered conveyors. The powder mill production line consists of various equipment combinations to additionally crush, mill, dry, and convey minerals. The natural diatomaceous earth is then transformed into calcinated powders via exposure to high temperatures in the natural gas-fired rotary kilns. Finally, the product is classified into a variety of grades before being bagged for shipment, by truck or by rail, for distribution to customers.

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<sup>1</sup> Celite Corporation purchased the facility from Manville in 1991. Celite changed its name to Imerys in 2012.

## **2. EXTERNAL COMBUSTION CONTROLS**

### **2.1 NO<sub>x</sub> Formation**

NO<sub>x</sub> from combustion sources is formed through three main mechanisms: thermal NO<sub>x</sub>, fuel NO<sub>x</sub>, and prompt NO<sub>x</sub>.

- Thermal NO<sub>x</sub> is formed from the high temperature reaction of nitrogen and oxygen contained in the combustion air.
- Fuel NO<sub>x</sub> is formed from the direct oxidation of nitrogen compounds contained in the fuel.
- Prompt NO<sub>x</sub> is formed from the reaction of nitrogen from the air with the fuel under fuel-rich conditions, then through subsequent oxidation of these nitrogen compounds.

Hence, NO<sub>x</sub> formation varies in the combustion process depending on the air-to-fuel ratio, the flame temperature, the residence time, and the nitrogen content of the fuel. For gaseous fuels, thermal NO<sub>x</sub> is generally the largest contributor of NO<sub>x</sub> emissions, and so lowering the flame temperature can help reduce NO<sub>x</sub> emissions.

### **2.2 Low-NO<sub>x</sub> burners And Flue Gas Recirculation (FGR)**

To minimize the formation of thermal NO<sub>x</sub>, burners can be designed to have a reduced flame temperature and shortened residence time. These burners are typically referred to as low-NO<sub>x</sub> burners. Low-NO<sub>x</sub> burners pre-mix the fuel and air together prior to combustion, which results in a lower and more uniform flame temperature. Some burners also use a staged combustion process where they have a fuel rich zone to stabilize the flame and a fuel lean zone to complete combustion and reduce the peak flame temperature. Overall, low-NO<sub>x</sub> burners require sophisticated controls to optimize burner efficiency while maintaining emission levels and a turndown ratio that meets the demands of the operation.

Flue Gas Recirculation (FGR) can be used in combination with some low-NO<sub>x</sub> burners to achieve additional NO<sub>x</sub> reductions. FGR recycles a portion of the exhaust stream back into the burner, reducing the flame temperature by diluting the air-fuel mix with relatively inert gases like nitrogen, carbon dioxide, and water vapor (N<sub>2</sub>, CO<sub>2</sub>, and H<sub>2</sub>O). Some newer burners can also be designed to induce an internal FGR within the burner and combustion chamber, thereby negating the need for external piping and additional blowers to bring the flue gases back to the burner. As for disadvantages, FGR can destabilize the flame or slightly reduce the thermal efficiency of the process.

### **2.3 Selective Catalytic Reduction (SCR) Systems**

SCR is a post-combustion control technology that is commercially available and commonly employed to control NO<sub>x</sub> on larger emission sources. SCR systems can achieve NO<sub>x</sub> control efficiencies of 95% or higher, and they do this by injecting ammonia into the flue gas stream where it reacts with NO<sub>x</sub> and oxygen (in the presence of the catalyst) to produce nitrogen gas and water vapor. A typical SCR system consists of an ammonia storage tank, ammonia vaporization and injection equipment, a booster fan for the flue gas exhaust, an SCR reactor with catalyst, and electronic instrumentation to monitor the system parameters.

When in operation, the ammonia injection rate and the combustion parameters need to be constantly monitored to achieve the desired NO<sub>x</sub> reductions while preventing ammonia slip, which is the industry term for ammonia passing through the SCR unreacted. Ammonia slip occurs if excess ammonia is injected into the reactor, temperatures are too low for the ammonia to react, or if the catalyst has degraded or is past its useful life. The optimal flue gas temperature of a conventional SCR system will typically range between 550°F and 750°F, but there are both high temperature and low temperature SCR catalysts available that can effectively operate above or below these temperature thresholds.

### **3. REVIEW OF OTHER CALIFORNIA AIR DISTRICT RULES**

In considering what benchmarks to use for BARCT, it is important to evaluate other emission limits that have been imposed on the same categories of equipment. Other California air districts, such as the South Coast Air Quality Management District and the Ventura County Air Pollution Control District, have adopted prohibitory rules that address Miscellaneous Combustion Units. A simplified summary of the rules from other California air districts that addresses these units is presented below.

#### **3.1 South Coast AQMD Rule 1147**

Rule 1147 was initially adopted by the South Coast AQMD in December 2008, and it established NO<sub>x</sub> limits for a wide variety of Miscellaneous Combustion Sources at non-RECLAIM<sup>1</sup> facilities. Rule 1147 applies to ovens, dryers, dehydrators, heaters, kilns, calciners, furnaces, crematories, incinerators, heated pots, cookers, roasters, fryers, closed and open heated tanks and evaporators, distillation units, afterburners, degassing units, vapor incinerators, catalytic or thermal oxidizers, soil and water remediation units, and other combustion equipment that are not subject to other equipment-specific prohibitory rules.

Under Rule 1147, equipment with a total heat input greater than or equal to 325,000 Btu/hr must meet the NO<sub>x</sub> concentration limits depending on the equipment category and process temperature. Rule 1147 has been amended several times to respond to compliance challenges and to incorporate new findings and recommendations from a technology assessment. The most recent amendment occurred in May 2022 where the rule was updated to reflect newer BARCT emission limits and to apply the rule to all facilities within the South Coast AQMD jurisdiction (RECLAIM and non-RECLAIM facilities). Table 3.1 provides a summary of the various equipment categories and the emission limits for those categories in Rule 1147. All emission limits are given in units of parts per million by volume (ppmv) corrected to 3% oxygen content.<sup>2</sup>

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<sup>1</sup> RECLAIM: REgional CLean Air Incentives Market Program

<sup>2</sup> Throughout this document, all ppmv limits are referenced to 3% oxygen, unless otherwise stated.

**Table 3.1 – SCAQMD Rule 1147 NOx Emission Limits**

<b>Equipment Category</b>	<b>Process Temperature</b>	<b>NOx Limit</b>
Afterburner, Degassing Unit, Thermal Oxidizer, Catalytic Oxidizer or Vapor Incinerator	All	20 ppmv or 0.024 lb/MMBtu
Tenter Frame or Fabric or Carpet Dryer		
Chiller (Absorption or Adsorption)		
Burn-off Furnace, Burnout Oven, Incinerator or Crematory with or without Integrated Afterburner	All	30 ppmv or 0.036 lb/MMBtu
Make-Up Air Heater or Air Heater located outside with temperature controlled zone inside building		
Autoclave or Rotary Dryer		
Evaporator, Fryer, Heated Process Tank, or Parts Washer	All	60 ppmv or 0.073 lb/MMBtu
Remediation Unit		
Turbine <0.3 MW	All	9 ppmv (corrected to 15% O <sub>2</sub> ) or 0.033 lb/MMBtu
Oven, Dehydrator, Dryer, Heater, Kiln, Calciner, Cooker, Roaster, Furnace, or Heated Storage Tank	<1,200°F	20 ppmv or 0.024 lb/MMBtu
	≥1,200°F	30 ppmv or 0.036 lb/MMBtu
Tunnel Kiln, Beehive Kiln, and other remaining units	<1,200°F	30 ppmv or 0.036 lb/MMBtu
	≥1,200°F	60 ppmv or 0.073 lb/MMBtu
All liquid fuel-fired Units	<1,200°F	40 ppmv or 0.053 lb/MMBtu
	≥1,200°F	60 ppmv or 0.073 lb/MMBtu

For the equipment category that includes ovens, dehydrators, dryers, heaters, and kilns, the initial NOx limits were initially established to be 30 or 60 ppmv, depending on the process temperature. However, during the 2022 amendments, the emission limits for this category were reduced to 20 and 30 ppmv, as shown in the table above. These lower limits were deemed feasible for most burner replacements and new installations based on observed source test data and technical information from vendors. Hence, the 2022 amendments require all new units to meet the lower NOx limits upon burner replacement, and existing equipment that already complied with the initial rule limits (30 or 60 ppmv) would be required to meet the lower NOx limits (20 or 30 ppmv) when the burner reaches 32 years of age.

### **3.2 Ventura County APCD Rule 74.34**

Rule 74.34 was initially adopted by the Ventura County APCD in 2016 to reduce NOx emissions from dryers, furnaces, heaters, incinerators, kilns, ovens, and duct burners. The rule applies to units with a total rated heat input of 5 MMBtu/hr or greater, and the NOx emission standards in the rule are shown below in Table 3.2. Most of the emission standards in the rule were based on similar standards being implemented by the South Coast AQMD at the time of rule adoption. However, the NOx emission limit for kilns was raised from 60 ppmv to 80 ppmv to account for process bound nitrogen at one of the aggregate facilities within Ventura County. Since combustion controls do not impact process bound nitrogen, the 80 ppmv emission standard was determined to be the most feasible standard for the specific aggregate facility in Ventura County.

**Table 3.2 – Ventura County APCD Rule 74.34 NOx Emission Limits**

Equipment Category	Process Temperature	NOx Limit
Asphalt/Sand/Paper Dryer	All	40 ppmv or 0.048 lb/MMBtu
Metal Heat Treating or Metal Melting Furnace	All	60 ppmv or 0.072 lb/MMBtu
Kiln	All	80 ppmv or 0.096 lb/MMBtu
Oven, Heater, Incinerator, Remaining Dryer & Furnace	<1,200°F	30 ppmv or 0.036 lb/MMBtu
	≥1,200°F	60 ppmv or 0.072 lb/MMBtu

### 3.3 Sacramento Metropolitan AQMD Rule 419

Rule 419 was initially adopted by the Sacramento-Metropolitan Air Quality Management District in 2018 to reduce NOx emissions from the various Miscellaneous Combustion Units within their jurisdiction. The rule applies to units with a maximum rated heat input of 2 MMBtu/hr or greater at major stationary sources of pollution<sup>1</sup> and units with a maximum rated heat input of 5 MMBtu/hr or greater at all sources. The NOx emission standards in the rule are similar to the emission standards being implemented by the South Coast AQMD at the time of rule adoption, but additional evaluations and categories were needed for some of the more unique combustion units, such as cooking units and soybean roasters. The NOx emission standards in Rule 419 are shown below in Table 3.3.

**Table 3.3 – Sac-Metro AQMD Rule 419 NOx Emission Limits**

Equipment Category	Process Temperature	NOx Limit
Asphalt Manufacturing Operation	All	40 ppmv or 0.049 lb/MMBtu
Incinerator or Crematory, Metal Heat Treating or Metal Melting Furnace	All	60 ppmv or 0.073 lb/MMBtu
Cooking Unit	<500°F	40 ppmv or 0.049 lb/MMBtu
	≥500°F	60 ppmv or 0.073 lb/MMBtu
Soybean Roaster	<1,200°F	45 ppmv or 0.055 lb/MMBtu
	≥1,200°F	60 ppmv or 0.073 lb/MMBtu
Oven, Dehydrator, Dryer, Heater, Kiln, and Remaining Furnaces and Miscellaneous Units	<1,200°F	30 ppmv or 0.036 lb/MMBtu
	≥1,200°F	60 ppmv or 0.073 lb/MMBtu
All liquid fuel-fired Units	<1,200°F	40 ppmv or 0.053 lb/MMBtu
	≥1,200°F	60 ppmv or 0.073 lb/MMBtu

<sup>1</sup> Major stationary source means any source of air pollutants which has the potential to emit 100 tons per year or more of a regulated criteria pollutant, except that lower thresholds may apply based on the federal attainment status.

### 3.4 San Joaquin Valley Unified APCD Rule 4309

SJVUAPCD Rule 4309 was adopted in December 2005, and it applies to units that have a total rated heat input of 5 MMBtu/hr or greater. The rule sets NO<sub>x</sub> emission limits for gaseous and liquid fueled dryers, dehydrators, and ovens. The emission limits in Rule 4309 are referenced at an oxygen content level of 19%, and so Table 3.4 below also shows the equivalent concentration at 3% O<sub>2</sub> so that they can be compared to the other rules in this BARCT analysis.

**Table 3.4 – San Joaquin Valley Unified APCD Rule 4309 NO<sub>x</sub> Emission Limits**

Equipment Category	NO <sub>x</sub> Limit ppmv @ 19% O <sub>2</sub> (ppmv @ 3% O <sub>2</sub> )	
	Gaseous Fueled	Liquid Fueled
Asphalt Manufacturing Operation	4.3 (~ 40)	12.0 (~ 110)
Milk, Cheese, and Dairy Processing <20 MMBtu/hr	3.5 (~ 32)	3.5 (~ 32)
Milk, Cheese, and Dairy Processing ≥ 20 MMBtu/hr	5.3 (~ 49)	5.3 (~ 49)
Other processes (dryers, dehydrators, or ovens) not described above	4.3 (~ 40)	4.3 (~ 40)

## **4. PROPOSED BARCT FOR MISCELLANEOUS COMBUSTION UNITS**

### **4.1 Overview of Proposed Analysis**

Although there are a multitude of different equipment types that can be considered Miscellaneous Combustion Units, this BARCT analysis addresses dryers, furnaces, kilns, and heaters since these types of equipment units are permitted at the AB 617 Industrial Sources within Santa Barbara County. The following major requirements are needed to satisfy the BARCT provisions for AB 617:

- All dryers, kilns, furnaces, and heaters with a rated heat input capacity of 5 million Btu or greater need to comply with the BARCT standards;
- Units with a process temperature < 1,200°F shall meet a 30 ppmv NO<sub>x</sub> BARCT standard; and
- Units with a process temperature ≥ 1,200°F shall meet a 60 ppmv NO<sub>x</sub> BARCT standard.

All of the amendments are described in further detail in their corresponding sections below, and a comparison of the key requirements in the District's BARCT analysis to the rules from other air districts is shown in Table 4.2 at the end of this section. An evaluation of the costs and impacts of the requirements are described in Section 5 of this report.

### **4.2 Definitions**

For the purpose of this assessment, the following definitions shall apply:

- “Unit” means a dryer, furnace, kiln, heater, or any combination of such devices, with one or more burners and one or more exhaust stacks, that are collectively operated as the source(s) of heat to complete a process, such as drying, curing, or calcining a product. This definition does not include any boiler or process heater subject to District Rule 342.
- “Process Temperature” means the maximum operating temperature of the unit under maximum designed production rate.
- “Therm” means one hundred thousand (100,000) British Thermal Units.

### **4.3 Requirement – NO<sub>x</sub> and CO Emission Limit**

Based on our review of the CARB Technology Clearinghouse, the BARCT emission limits for Miscellaneous Combustion Units within Santa Barbara County are proposed to be 30 ppmv for units that have a process temperature of less than 1,200°F and 60 ppmv for units that have a process temperature greater than or equal to 1,200°F. These emission limits, as shown in Table 4.1 below, can typically be met by retrofitting the older, conventional burners with low-NO<sub>x</sub> burners. Units may also comply with the applicable lb/MMBtu emission limit in lieu of the associated ppmv limit.



**Table 4.1 – Santa Barbara County BARCT for Miscellaneous Combustion Units**

<b>Equipment Category</b>	<b>Process Temperature</b>	<b>NOx Limit</b>
Dryer, Furnace, Kiln, or Heater	<1,200°F	30 ppmv or 0.036 lb/MMBtu
	≥1,200°F	60 ppmv or 0.073 lb/MMBtu

Low-NOx burners used in miscellaneous applications have been available for over a decade, demonstrating that the use of these burners to meet the 30 and 60 ppmv limits is technologically feasible. Although lower NOx emission limits have recently been established in the South Coast AQMD (20 and 30 ppmv), the emission limits in their rule have not yet been proven to work in all applications. The combustion units subject to this BARCT assessment are older, unique devices that are challenging to retrofit with new burner technology. Hence, using the 30 and 60 ppmv NOx limits, which is representative of BARCT for most other air districts, is the lowest feasible NOx BARCT standard for the equipment in Santa Barbara County.

Based on our review of the CARB Technology Clearinghouse, the CO emission limit is proposed to be 400 ppmv. The 400 ppmv limit is mainly used as a backstop because CO emissions above this threshold are indicative of improper combustion parameters (i.e., low-excess oxygen) for equipment units of this size. Furthermore, no other air district has established lower CO emission limits in their rule.

#### **4.4 Requirement – Testing and Monitoring Conditions**

Low-NOx burners can be initially calibrated to attain the emission limits, but they typically need to be cleaned and adjusted over time. Hence, a testing and monitoring program is necessary to ensure that the units are properly tuned, and that the lower NOx limits prescribed in this BARCT assessment are achieved.

This BARCT analysis will require each unit to be source tested every two years at the unit’s actual peak load or under the unit’s typical duty cycle. Acceptable source test methods include CARB Method 100, and EPA Methods 3A (Stack Gas Oxygen), 7E (Oxides of Nitrogen), 10 (Carbon Monoxide), and 19 (NOx Emission Rate). Alternative test methods may be used as long as they have been determined to be equivalent and have been approved for use by the Control Officer, the California Air Resources Board, and the United States Environmental Protection Agency. Each source test shall consist of three separate 40-minute runs, and it shall be conducted in accordance with a source test plan that has been approved by the Control Officer.

#### **4.5 Exemption – Low-use Threshold**

One of the requirements for BARCT assessments is to evaluate the cost-effectiveness of the project. For units that aren’t operated very often, installing controls or retrofitting the device may cost a lot of money while not reducing much pollution. Low-use thresholds are typically included in rules and analyses to address these situations.

Based on our review of the CARB Technology Clearinghouse and the District’s cost-effectiveness calculations, a 90,000 therm low-use threshold has been incorporated into this analysis for each burner. For a burner that is rated at 15 MMBtu/hr, the low-use threshold correlates to approximately 600 hours per year at maximum firing capacity, or around a 7%

annual operating capacity. It would not be cost-effective to retrofit a burner that consistently operates below this amount. Please refer to Section 5 of this report for more information on the District's cost-effectiveness calculations.

To qualify for the low-use exemption, a non-resettable totalizing fuel meter shall be installed and maintained on each miscellaneous combustion unit to verify that the threshold is not exceeded. If the low-use threshold is exceeded during a calendar year, the equipment must be retrofitted to comply with the BARCT standards no later than 18 months after the end of the calendar month during which the exemption was exceeded.

**Table 4.2 – Comparison to Air District Rules**

ANALYSIS DESCRIPTION		Santa Barbara APCD BARCT - Misc. Units (Proposed)	South Coast AQMD Rule 1147 (2022)	Ventura APCD Rule 74.34 (2016)	Sac-Metro AQMD Rule 419 (2018)	San Joaquin Valley APCD Rule 4309 (2005)
Applicability	Equipment Rating & Location	5+ MMBtu/hr (at AB 617 Sources)	0.325+ MMBtu/hr	5+ MMBtu/hr	2+ MMBtu/hr (at Major Sources); 5+ MMBtu/hr (All Sources)	5+ MMBtu/hr
	Equipment Type	Dryers, Furnaces, Kilns, and Heaters	Permitted Miscellaneous Combustion Units not subject to other equipment-specific rules	Dryers, Furnaces, Heaters, Incinerators, Kilns, Ovens, and Duct Burners	Permitted Miscellaneous Combustion Units and Cooking Units	Dryers, Dehydrators, and Ovens
Exemptions	Equipment Type	Air Pollution Control Devices, Flares, Boilers, Duct Burners with SCR	Air Pollution Control Devices & Flares under specific scenarios, Charbroilers, Food Ovens	Air Pollution Control Devices, Flares, Boilers, Duct Burners with SCR	Air Pollution Control Devices, Flares, Boilers, Duct Burners with SCR	Tower/Grain Dryers, Cotton Dryers, Boilers
	Low-use	90,000 therms	---	90,000 therms	30,000 therms	---
NOx Requirements – Gaseous Fueled Equipment		<u>Dryer, Furnace, Kiln, or Heater</u> <1,200°F: 30 ppmv ≥1,200°F: 60 ppmv	<u>Oven, Dehydrator, Dryer, Heater, Kiln, Calciner, Cooker, Roaster, Furnace, or Heated Storage Tank</u> <1,200°F: 20 ppmv ≥1,200°F: 30 ppmv	<u>Oven, Heater, Incinerator, Remaining Dryer &amp; Furnace</u> <1,200°F: 30 ppmv ≥1,200°F: 60 ppmv <u>Kiln</u> 80 ppmv	<u>Oven, Dehydrator, Dryer, Heater, Kiln, Remaining Furnace</u> <1,200°F: 30 ppmv ≥1,200°F: 60 ppmv	<u>Dryers, Dehydrators, and Ovens</u> ~ 40 ppmv
CO Requirements		400 ppmv	1,000 ppmv	400 ppmv	400 ppmv	~ 400 ppmv
Source Testing Frequency		Biennial	<2 MMBtu/hr: Optional Manufacturer certification in lieu of tests <10 MMBtu/hr: 5 years 10 - <40 MMBtu/hr: Biennial 40+ MMBtu/hr: Annual	Every 4 years with Annual NOx screening	Biennial	Biennial

## 5. IMPACTS OF THE PROPOSED ANALYSIS

### 5.1 Emission Impacts

The BARCT analysis will affect new and existing Miscellaneous Combustion Units with a maximum heat input of 5 million Btu or greater at the AB 617 industrial sources. The only facility that is expected to be impacted by this analysis is Imerys. Imerys currently uses multiple burners in dryers, furnaces, and kilns to dry or calcinate its products. A listing of these units is shown below in Table 5.1.

**Table 5.1 – Miscellaneous Combustion Units at Imerys, 5 MMBtu/hr or greater**

#	Device Name	Rated Heat Input Capacity (MMBtu/hr)	Most Recent Burner Modification	Permitted Emission Rate	BARCT Assessment
1	System 7 Kiln	50	1994	5.5 lbs/hr (≈ 48 ppmv NOx)	Exempt
2	System 7 Furnace	45	2007		
3	Silicates Conveyor Dryer	45 total [3 burners]	Pre-1990	Uncontrolled (≈ 82 ppmv NOx)	30 ppmv
4	Silicates Flash Dryer	17.5	Pre-1990	Uncontrolled (≈ 82 ppmv NOx)	30 ppmv

Out of the four units listed above, two of the units are currently exempt from having to comply with the AB 617 BARCT requirements. In the implementing legislation, the AB 617 BARCT requirements were crafted by the state legislature to not apply to devices that have implemented BARCT due to a permit revision or a new permit issuance since 2007. The System 7 kiln and furnace have a combined emission rate since these two units are operated in tandem, and these units were analyzed for Best Available Control Technology (BACT) during an air permit evaluation in 2007. The BACT analysis evaluated NOx control technologies, including other low NOx burners and selective catalytic reduction (SCR), but additional controls were not cost-effective. This is partly because System 7 already uses a wet scrubber to control SOx and PM emissions, which means that additional natural gas combustion would be needed to reheat the exhaust stream to the necessary temperature for SCR to achieve high NOx control efficiencies. Hence, the engineering evaluation showed that the kiln and furnace met BACT in 2007, and so a new BARCT determination for these two units cannot be performed under the AB 617 mandate.

The remaining two devices, the silicates conveyor dryer and the flash dryer, do not have any emission controls, but they could be retrofitted with low-NOx burners to reduce their emissions of criteria pollutants. To evaluate the estimated emission impacts of the silicates conveyor and flash dryer complying with the BARCT requirements, the historical operating records of the units were reviewed and a representative operating capacity was determined based on the last three years of data. The estimated emission reductions of the silicates conveyor dryer complying with the BARCT standard are shown below in Table 5.2.

**Table 5.2 – Estimated Emission Reductions using Representative Operating Capacity**

<u>Description</u>	<b>Maximum Heat Input</b> (MMBtu/hr)	<b>Initial NOx EF</b> (lbs/MMBtu)	<b>Final NOx EF</b> (lbs/MMBtu)	<b>Representative Operating Capacity</b>	<b>NOx Reductions</b> (tons/yr)
Silicates Conveyor Dryer	45	0.098	0.036	4.3%	<b>0.53</b>
Silicates Flash Dryer	17.5	0.098	0.036	0.9%	<b>0.04</b>

Where:

- Initial NOx Emission Factor (EF) = 82 ppmv NOx [uncontrolled default]
- Final NOx Emission Factor = 30 ppmv NOx [Process Temperature <1,200°F]
- Representative Operating Capacity = (Annual Fuel Use) / (Max Potential Annual Fuel Use)
- NOx Reductions = (Max Heat Input) \* (Δ Emission Factor) \* (Rep. Op. Capacity) \* (8,760 hours/year) / (2,000 lbs/ton) / (1,050 Btu/scf)

Based on the equation above, the implementation of BARCT may reduce approximately 0.57 tons of NOx per year if the Silicates Conveyor Dryer and Flash Dryer are retrofitted with low-NOx burners. However, these two units qualify for the low-use exemption, which is discussed below in Section 5.2.

## 5.2 Cost-Effectiveness

Staff evaluated a scenario where the silicates conveyor dryer and flash dryer were retrofitted with low-NOx burners to comply with the BARCT standards. Capital and installation cost estimates were obtained from recent staff reports published by the South Coast AQMD and a confidential quote provided by Imerys. For cost-effectiveness calculations, the District uses the Levelized Cash Flow (LCF) method. In the LCF method, a capital recovery factor (CRF) is used to transform any capital costs into an equivalent annual cost. The CRF is necessary because the one-time capital expenditures reduce emissions over the entire duration of the project life. Hence, the CRF is a function of the real interest rate and equipment life. The estimated cost-effectiveness for the scenario using the representative operating capacity is shown below in Table 5.3.

**Table 5.3 – Estimated Cost-Effectiveness using Representative Operating Capacity**

<u>Description</u>	<b>Costs</b>		<b>Cost-Effectiveness</b>		
	<b>Capital Costs</b>	<b>Installation Costs</b>	<b>CRF</b>	<b>Annualized Cost</b>	<b>Cost-Effectiveness (\$/ton)</b>
Silicates Conveyor Dryer	\$240,000	\$240,000	0.078	\$37,500	<b>\$71,000</b>
Silicates Flash Dryer	\$80,000	\$80,000	0.078	\$12,500	<b>\$303,000</b>

Where:

- Cost-Effectiveness = (Annualized Cost) / (Emission Reductions)
- Annualized Cost = (Capital Costs \* CRF) + (Annual Operational Costs)

$$\bullet \text{ CRF} = \frac{i * (1 + i)^n}{(1 + i)^n - 1} = \frac{0.06 * (1 + 0.06)^{25}}{(1 + 0.06)^{25} - 1} = 0.078$$

i = Real Interest Rate (6%)

n = Project Life (25 years)

The capital and installation costs shown above represent the costs for new, low-NOx burners that are certified to comply with the 30 ppm NOx standard. It's important to note that the current, conventional burners are over 30 years old and are near the end of their useful life. This evaluation does not exclude the capital costs associated with replacing the existing conventional burners with new conventional burners. However, the evaluation does exclude costs that are unrelated to the control equipment, such as the fuel line and the burner management system. Due to current building and fire codes, these components would eventually need to be replaced with new equipment that complies with current safety standards regardless of this BARCT analysis. Using low-NOx equipment, as compared to a conventional burner, is also not anticipated to result in any additional on-going operational or maintenance costs.

Using the assumptions listed above, the cost-effectiveness values shown in Table 5.3 for retrofitting the silicates conveyor dryer and flash dryer are higher than the normally accepted values for rule development measures. Hence, the BARCT requirement to reach 30 ppmv for these dryers is not considered to be cost-effective based on the last three years of data.

### 5.3 Low-use Thresholds

Although the actual operating loads for the conveyor dryer and flash dryer have decreased in recent years, the current operating permit for the facility allows these devices to operate at maximum capacity. If these units operate at higher loads in future years, it would be cost-effective to meet the BARCT requirements at that time. Low-use thresholds are typically included in rules and analyses to determine the appropriate point in which it is cost-effective to comply with the lower emission standards. Staff reviewed the low-use thresholds established by other districts and a 90,000 therm limit per burner is being proposed for this assessment. As shown in Table 5.4 below, this allows the conveyor dryer up to 270,000 therms per year because the conveyor dryer consists of three separate 15 MMBtu/hr burners. At these higher operating capacities, the project is cost-effective.

**Table 5.4 – Estimated Emission Reductions and Cost-Effectiveness at Low-use Threshold**

<u>Description</u>	<b>Low-Use Threshold</b> (Therms)	<b>Operating Capacity At Threshold</b>	<b>NOx Reductions at Threshold</b> (tons/yr)	<b>Annualized Cost</b>	<b>Cost-Effectiveness</b> (\$/ton)
Silicates Conveyor Dryer	270,000	7%	<b>0.84</b>	\$37,500	<b>\$45,000</b>
Silicates Flash Dryer	90,000	6%	<b>0.28</b>	\$12,500	<b>\$45,000</b>

Hence, the low-use thresholds need to be incorporated into the facility's permit to satisfy BARCT. To verify the operational usage of each dryer, a non-resettable totalizing fuel meter shall be installed and maintained on each unit. If the low-use threshold is exceeded, a new permit application needs to be submitted no later than 30 days after the end of the calendar month during which the threshold was exceeded. The affected equipment must then demonstrate compliance with the BARCT standards no later than 18 months after the end of the calendar month during which the threshold was exceeded. This proposal shall ensure that the BARCT requirements are implemented in a timely and expeditious manner.

#### **5.4 Incremental Cost-Effectiveness**

Incremental cost-effectiveness evaluates and compares two or more control options available for emission reductions. For equipment subject to this BARCT analysis, the two identified pollution control technologies are low-NOx burners and selective catalytic reduction (SCR) systems. SCR systems may allow an equipment unit to operate at a NOx level of 5 ppm or less. However, SCR retrofits dramatically increase the capital and operational costs compared to a burner retrofit. Based on the size and operating capacity of the equipment units in this analysis, the alternative control option of installing an SCR system was determined to not be cost-effective.

#### **5.5 Implementation Timeline**

Imerys has submitted a permit application to comply with the BARCT analysis for Miscellaneous Combustion Units by incorporating the low-use thresholds for the dryers at the Silicates Plant. The enforceable permit conditions will be incorporated no later than December 31, 2023, in accordance with AB 617. By operating under the low-use threshold, the devices will meet BARCT. Any operation beyond the threshold will trigger the requirement to reduce the equipment's NOx emissions to the levels prescribed in this analysis.

## **6. REFERENCES**

- 1) South Coast Air Quality Management District – *Rule 1147, NOx Reductions from Miscellaneous Sources*, Adopted December 5, 2008.
- 2) South Coast Air Quality Management District – *Rule 1147, NOx Reductions from Miscellaneous Sources*, Amended May 6, 2022.
- 3) San Joaquin Valley Unified Air Pollution Control District – *Rule 4309, Dryers, Dehydrators, and Ovens*, Adopted December 15, 2005.
- 4) Ventura County Air Pollution Control District – *Rule 74.34, NOx Reductions from Miscellaneous Sources*, Adopted December 13, 2016.
- 5) Sacramento Metropolitan Air Quality Management District – *Rule 419, NOx From Miscellaneous Combustion Units*, Adopted July 26, 2018.
- 6) Santa Barbara County Air Pollution Control District – *Assembly Bill 617 Best Available Retrofit Control Technology Rule Development Schedule*, Adopted December 20, 2018.