



OFFICE OF THE
HARRIS COUNTY ATTORNEY
CHRISTIAN D. MENEFEE

July 17, 2023

Submitted via TCEQ Public Comment System

Ms. Vanessa T. De Arman

Texas Commission on Environmental Quality

P.O. Box 13087

Austin, Texas 78711

tceq.commentinput.com

**HARRIS COUNTY'S COMMENTS ON THE PROPOSED ATTAINMENT
DEMONSTRATION STATE IMPLEMENTATION PLAN REVISION FOR THE 2015
EIGHT-HOUR OZONE NATIONAL AMBIENT AIR QUALITY STANDARD**

RE: HGB 2015 Ozone NAAQS Moderate AD SIP Revision; Project No. 2022-022-SIP-NR; Docket No. 2023-0306-SIP

Dear Ms. De Arman,

Harris County, Texas ("Harris County" or "County") appreciates the opportunity to submit comment regarding the proposed Houston-Galveston-Brazoria Moderate Area Attainment Demonstration State Implementation Revision for the 2015 eight-hour ozone National Ambient Air Quality Standard.

Background and TCEQ's Proposed Action

The Houston-Galveston-Brazoria ("HGB") area consists of six counties: Brazoria, Chambers, Fort Bend, Galveston, Montgomery, and Harris counties. On June 4, 2018, the Environmental Protection Agency ("EPA") designated the HGB area as marginal nonattainment for the 2015 eight-hour ozone National Ambient Air Quality Standards ("NAAQS").¹ Based on monitoring data from 2018, 2019, and 2020, the HGB area did not attain for the 2015 eight-hour ozone NAAQS by August

¹ 83 Fed. Reg. 107, 25776 (June 4, 2018).

3, 2021 (the specified attainment date for areas classified as marginal).² On October 7, 2022, EPA reclassified the HGB area from marginal to moderate.³ This reclassification became effective on November 7, 2022,⁴ meaning that the HGB area is now subject to moderate nonattainment area requirements.⁵ The Texas Commission on Environmental Quality (“TCEQ”) must submit a moderate ozone classification attainment demonstration (“AD”) and reasonable further progress (“RFP”) state implementation plan (“SIP”) revision to the EPA. TCEQ has published and opened public comment on the proposed HGB Moderate Area AD SIP Revision for the 2015 eight-hour ozone NAAQS.

Ozone Health and Environmental Impacts

Ground level ozone is a harmful air pollutant that has negative impacts on people and the environment.⁶ Ground level ozone is created by chemical reactions between oxides of nitrogen (“NO_x”) and volatile organic compounds (“VOC”), which is often caused when “pollutants emitted by cars, power plants, industrial boilers, refineries, chemical plants, and other sources chemically react in the presence of sunlight.”⁷ Specifically, in Houston, “metal recycling and concrete batch plants are magnets for heavy duty trucks emitting black carbon” and NO_x throughout residential neighborhoods.⁸ As of April 2022, the American Lung Association’s State of the Air report ranked “Houston as the 8th most polluted city for ozone pollution”.⁹ According to this report, ozone pollution in Houston worsened since the publication of the 2021 report, in which Houston was ranked 11th.¹⁰ In just a year, Houston has jumped three rankings.

Houston is experiencing an upward trend in ozone pollution.¹¹ During 2022, Houston saw the highest numbers of days with high ozone levels in the past seven years and 2023 is expected to be the same or possibly even worse.¹² Ozone levels can reach unhealthy levels in cold and hot weather. However, ozone is more than likely to reach unhealthy levels on hot sunny days in urban environments.¹³ As Texan summers are a lot hotter and lasting a lot longer, Harris County is at greater risk for greater ozone pollution.

² Texas Commission on Environmental Quality (TCEQ), Houston-Galveston-Brazoria (HGB) Moderate Area Attainment Demonstration (AD) State Implementation Plan (SIP) for the 2015 Eight-Hour Ozone National Ambient Air Quality Standard, ES-1 (May 31, 2023).

³ 87 Fed. Reg. 60897 (October 7, 2022).

⁴ *Id.*

⁵ *Id.*

⁶ U.S. EPA, *Ground-level Ozone Basics*, <https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics> (last visited June 15, 2023).

⁷ *Id.*

⁸ Environmental Defense Fund, *Global Clean Air—Houston, Texas*, <https://globalcleanair.org/data-to-action/houston-texas/> (last visited June 15, 2023).

⁹ American Lung Association, *New Report: Houston’s Air Quality Gets Mixed Grades, Residents Exposed to Unhealthy Air Pollution*, <https://www.lung.org/media/press-releases/sota-houston-fy22> (last visited June 28, 2023).

¹⁰ *Id.*

¹¹ Air Alliance Houston, *Hot weather and air pollution are driving unhealthy ozone season in Houston*, <https://airalliancehouston.org/hot-weather-and-air-pollution-are-driving-an-unhealthy-ozone-season-in-houston/> (last visited June 15, 2023).

¹² *Id.*

¹³ U.S. EPA, *Ground-level Ozone Basics*.

Health Impacts of Ozone Pollution

Breathing in ozone can harm human health and negative impacts on vegetation and the ecosystem. Decades of research and hundreds of studies have “confirmed that ozone harms people at levels currently found in the United States” and can be deadly.¹⁴ Ozone exposure can cause a plethora of problems depending on the level of that exposure. Anyone that spends time outside with high ozone pollution levels may be at risk to suffer health impacts.¹⁵ For instance, ozone can cause coughing, sore or scratchy throat, make it more difficult to breathe deeply and vigorously, cause pain when taking a deep breath, inflame/damage airways, lungs can become more susceptible to infection, aggravate long diseases, and increase the frequency of asthma attacks.¹⁶

Individuals are that have a higher risk of being impacted by ozone pollution are people with lung disease, children and teens, anyone 65 and older, and people who work or exercises.¹⁷ Of these groups, children have the highest risk as their lungs are “still developing and are more likely to be active outdoors” and are “more likely to have asthma.”¹⁸ A study conducted in Southern California determined that children with asthma that spent more time outside in areas with high ozone levels had reduced lung function.¹⁹

Healthy individuals can experience ozone pollution effects. A community study conducted demonstrated that living for just 4 years in a region with high levels of ozone and related co-pollutants diminished lung function and found frequent reports of respiratory symptoms.²⁰ However, people with lung diseases can have more serious reactions to ozone exposure.²¹ For example, ozone exposure for people with lung diseases may lead to increased school absences, medication use, visits to doctors/emergency rooms, and hospital admissions.

Both short-term and long-term ozone exposure can lead to health problems. A study on lifeguards in Galveston demonstrates the impacts of short-term exposure to ozone pollution.²² The study found that “lifeguards had greater obstruction of their airways at the end of the day when ozone levels were high.”²³ Long-term ozone exposure has been linked to aggravation of asthma and is likely one of the causes of asthma even developing.²⁴ Studies have been done in areas with elevated concentrations of ozone, which associate ozone with deaths from respiratory causes.²⁵

¹⁴ American Lung Association, *Ozone*, <https://www.lung.org/clean-air/outdoors/what-makes-air-unhealthy/ozone> (last visited July 5, 2023).

¹⁵ *Id.*

¹⁶ U.S. EPA, *Health Effects of Ozone Pollution*, <https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution> (last visited June 28, 2023).

¹⁷ *Id.*

¹⁸ U.S. EPA, *Health Effects of Ozone Pollution*, <https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution> (last visited July 5, 2023).

¹⁹ American Lung Association, *Children and Air Pollution*, <https://www.lung.org/clean-air/outdoors/who-is-at-risk/children-and-air-pollution> (last visited June 28, 2023).

²⁰ *Id.*

²¹ U.S. EPA, *Health Effects of Ozone Pollution*.

²² *Id.*

²³ *Id.*

²⁴ *Id.*

²⁵ *Id.*

Environmental Impacts of Ozone Pollution

Ozone can also have serious impacts on vegetation and the ecosystem.²⁶ Forests, parks, wildlife refuges, and wilderness areas can all be impacted by ozone pollution.²⁷ Specifically, ozone causes harm to sensitive vegetation during the growing season.²⁸ Ozone impacts on sensitive vegetation can result in reduced photosynthesis, slow plant growth, and increased risk of disease, damage from insects, effects of other pollutants, and harm from severe weather.²⁹

The effects on plants and vegetation can result in negative ecological impacts. Some impacts include changes in the assortment of plants in a forest, changes to habitat quality, and changes to water and nutrient cycles.³⁰

Environmental Justice Impacts

It is no secret that minority and low-income communities are disproportionately impacted by air pollution. People of color suffer disproportionately from exposure to pollution when compared to white people.³¹ Broadly speaking, people of color are exposed to more pollution from almost every source type.³² For example, Black people are exposed to more pollution from every type of source including industry, agricultural, vehicles, construction, and more.³³ Studies have shown that Black people are also “exposed to higher than average concentrations of all major emissions groups compared to white people that are exposed to lower than average concentrations from almost all categories”.³⁴ These disparities are seen on national and state levels as well as across income levels and across urban-rural divide.³⁵

High levels of pollution continue to harm minorities and low-income communities, including those in Harris County. According to the American Lung Association, people of color “may be more likely to live in counties with higher levels of pollution”.³⁶ For instance, non-Hispanic Black individuals are more likely to live in counties with worse ozone pollution.³⁷ Additionally, high pollution disproportionately harms Black and Latino children.³⁸ In 2017, Rice University did a study showing that 13% of Black children in Houston have asthma compared with 7% of Hispanic children,

²⁶ U.S. EPA, *Ecosystem Effects of Ozone Pollution*, <https://www.epa.gov/ground-level-ozone-pollution/ecosystem-effects-ozone-pollution> (last visited July 5, 2023).

²⁷ *Id.*

²⁸ *Id.*

²⁹ *Id.*

³⁰ *Id.*

³¹ Hiroko Tabuchi and Nadja Popovich, *People of Color Breathe More Hazardous Air. The Sources Are Everywhere*, The New York Times, <https://www.nytimes.com/2021/04/28/climate/air-pollution-minorities.html> (last visited July 6, 2023).

³² *Id.*

³³ *Id.*

³⁴ *Id.*

³⁵ *Id.*

³⁶ American Lung Association, *Disparities in the Impact of Air Pollution*, <https://www.lung.org/clean-air/outdoors/who-is-at-risk/disparities> (last visited July 5, 2023).

³⁷ *Id.*

³⁸ Erin Douglas, *EPA seeks more smog controls in Houston, Dallas after they fail to meet standards*, The Texas Tribune, <https://www.texastribune.org/2022/04/13/texas-epa-pollution-smog-dallas-houston/> (last visited July 6, 2023).

and 4% of white and Asian children.³⁹ Thus, it is extremely evident that children in minority communities are disproportionately affected by ozone pollution.

A study comparing ozone pollution on various Houston neighborhoods has been conducted. Two of the neighborhoods studied include Fifth Ward and River Oaks, very polar opposite neighborhoods located within Houston. Fifth Ward is littered with clusters of metal recyclers and concrete processing plants,⁴⁰ which as mentioned above lead to more ozone pollution. The study demonstrates that NO₂ levels are 48% higher in the Fifth Ward than the rest of the city.⁴¹ Fifth Ward consists 90% of people of color and 40% of residents live below the federal poverty line,⁴² which means the community is predominantly made up of minority and low-income individuals. Furthermore, Fifth Ward faces “higher rates of asthma, chronic obstructive pulmonary disease (“COPD”), coronary heart disease, and stroke”.⁴³ Life expectancy is also lower in Fifth Ward by almost a decade than the rest of the region.⁴⁴ Fifth Ward life expectancy is about 69 years of age compared to 78 years for the rest of the Houston area.⁴⁵ River Oaks is an extremely affluent community. River Oaks has no major industrial sources and has lower levels of pollution.⁴⁶ River Oaks is predominately white, and it is one of the wealthiest communities in the area.⁴⁷ “Its residents have less asthma, COPD, and fewer strokes than the area average.”⁴⁸ The life expectancy of the residents of River Oaks is higher,⁴⁹ as River Oaks residents live longer with a life expectancy of about 85.⁵⁰ This study is a perfect example of the disparity in ozone pollution impacts on low-income and minority communities.

Flawed Modeling

Weight of Evidence

A weight of evidence (“WoE”) analysis is used to evaluate the attainment status of the area.⁵¹ The EPA “recommends that a weight of the evidence approach be used to determine whether a particular modeling application is valid for assessing the future attainment status of an area.”⁵² A WoE determination should be made by aggregating the modeled attainment test and supplemental analyses to evaluate whether the emissions reductions will yield attainment.⁵³ According to the EPA, the basic criteria needed for an attainment demonstration based on weight of the evidence are the following:

³⁹ *Id.*

⁴⁰ Environmental Defense Fund, *Global Clean Air—Houston, Texas*.

⁴¹ *Id.*

⁴² *Id.*

⁴³ *Id.*

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ *Id.*

⁴⁷ *Id.*

⁴⁸ *Id.*

⁴⁹ *Id.*

⁵⁰ *Id.*

⁵¹ TCEQ, Texas Commission on Environmental Quality Interoffice Memorandum at page 1.

⁵² U.S. EPA, *Modeling Guidance for Demonstrating Air Quality Goals for Ozone, PM_{2.5}, and Regional Haze* at 69.

https://www.epa.gov/sites/default/files/2020-10/documents/o3-pm-rh-modeling_guidance-2018.pdf (last visited July 12, 2023).

⁵³ *Id.* at 99.

1. “A fully-evaluated, high-quality modeling analysis that projects future values that are close to the NAAQS
2. A description and explanation of each of the individual supplemental analyses, preferably from multiple categories. Analyses that utilize well-established analytical procedures and are grounded with sufficient data should be weighted accordingly higher.
3. A written description as to why the full set of evidence leads to a conclusive determination regarding the future attainment status of the area that differs from the results of the modeled attainment test alone.”⁵⁴

TCEQ asserts that the WoE assessment demonstrates the progress that the HGB nonattainment area is making toward attainment.⁵⁵ TCEQ further states that under the WoE assessment it analyzed air quality and emission trends, which include ozone, NO_x, and VOC trends.⁵⁶ As TCEQ addresses ozone trends, it also discusses exceptional events, which are examined in more detail below.⁵⁷ TCEQ examines NO_x trends, finding that overall trends in NO_x emissions have increased 7% between 2012 through 2021 correlating with that fact that ambient NO_x trends have shown little change between 2012 through 2021.⁵⁸ TCEQ states that VOC levels have increased from 2012 through 2021.⁵⁹ The goal of a WoE approach is to help make a comprehensive evaluation based on the available scientific data. However, based on some of the statistics cited by TCEQ regarding NO_x and VOC trends their conclusion that ozone levels are decreasing seems inaccurate. NO_x and VOCs mix with sunlight to cause ozone pollution. If both NO_x and VOC trends show increases, it follows that ozone pollution would also be on the rise. TCEQ does not seem to be applying the WoE approach as it was intended.

Additionally, TCEQ outlines additional measures that are expected to further reduce ozone levels.⁶⁰ TCEQ proceeds to list out the measures and describe those measures.⁶¹ However, TCEQ fails to provide a full description of how these measures will lower ozone levels and lead to attainment. Again, TCEQ fails to apply WoE analysis correctly.

Exceptional Events

TCEQ has analyzed various trends in ozone concentration to determine the progress that the HGB area is making towards attainment.⁶² Design values are “used to designate and classify nonattainment areas” and to “assess progress towards meeting the NAAQs”.⁶³ Design values are calculated by averaging the four highest daily maximum ozone values at each regulatory monitor over

⁵⁴ *Id.* at 177.

⁵⁵ TCEQ, HGB Moderate Area AD SIP Revision for the 2015 Eight-Hour Ozone National Ambient Air Quality Standard at 5-1.

⁵⁶ *Id.*

⁵⁷ *Id.* at 5-6 – 5.7.

⁵⁸ *Id.* at 5-11.

⁵⁹ *Id.* at 5-12.

⁶⁰ *Id.* at 5-21.

⁶¹ *Id.* at 5-21 – 5-27.

⁶² *Id.* at 5-1.

⁶³ EPA, *Air Quality Design Values*, <https://www.epa.gov/air-trends/air-quality-design-values> (last visited July 12, 2023).

three years.⁶⁴ TCEQ states that most monitors demonstrate an overall decrease in ozone from 2010 and 2022, with the exception of the Bayland Park monitor and the Westhollow monitors.⁶⁵ However, TCEQ also confirms that several of the highest ozone days at Bayland Park are under investigation as exceptional events.⁶⁶

Exceptional events are “unusual or naturally occurring events that can affect air quality but are not reasonably controllable using techniques that tribal, state, and local air agencies may implement in order to attain and maintain the NAAQS”.⁶⁷ Examples of exceptional events include “wildfires, high wind dust events, prescribed fires stratospheric ozone intrusion, and volcanic and seismic activities”.⁶⁸ The criteria needed to be met for an event to be excluded from regulatory determination is the following:

- “The event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation,
- The event was not reasonably controllable or preventable, and
- The event was a human activity that is unlikely to recur at a particular location or was a natural event.”⁶⁹

TCEQ is insinuating that the high ozone readings at the Bayland Park monitor are nothing more than errors without confirmation that the readings actually fall under exceptional events. Removing high ozone days incorrectly gives the appearance that ozone pollution is decreasing, and attainment will be reached. According to TCEQ, the HGB area’s ozone pollution is declining. In reality other sources, like the American Lung Association and others, have continued to ring the alarm on the increasing ozone pollution within our area.

Contingency Measures

TCEQ admits that this SIP revision does not rely on valid case law because EPA has not put out specific guidance on contingency measures.⁷⁰ TCEQ willingly ignored valid case law making this SIP invalid. Case law has been extremely clear in stating that “previously implemented measures cannot qualify as contingency measures”.⁷¹ “Contingency measures are ‘control measures that will be implemented in the future’”.⁷² Basically, a contingency measure is a measure that has not yet been implemented. The Court has described a measure not yet implemented as “a measure ‘to be undertaken if’ certain standards are not met”.⁷³ According to TCEQ, the proposed SIP “relies on the historically approved approach of using surplus mobile source emissions reductions to fulfill the

⁶⁴ TCEQ, HGB Moderate Area AD SIP Revision for the 2015 Eight-Hour Ozone National Ambient Air Quality Standard at 5-3.

⁶⁵ *Id.*

⁶⁶ *Id.*

⁶⁷ EPA, *Treatment of Air Quality Data Influenced by Exceptional Events (Homepage for Exceptional Events)*, <https://www.epa.gov/air-quality-analysis/treatment-air-quality-data-influenced-exceptional-events-homepage-exceptional> (last visited July 12, 2023).

⁶⁸ *Id.*

⁶⁹ 81 Fed. Reg. 191, 68216 (October 3, 2016).

⁷⁰ TCEQ, Interoffice Memorandum at page 1.

⁷¹ *Sierra Club v. Env'tl. Prot. Agency*, 21 F. 4th 815, 827 (D.C. Cir. 2021).

⁷² *Id.* at 828. (Citing *Bahr v. Env'tl. Prot. Agency*, 836 F. 3d 1218, 1235 (9th Cir. 2016)).

⁷³ *Id.*

contingency measures requirements”.⁷⁴ TCEQ states it meets the standards because it meets the contingency requirement detailed by EPA, meaning “additional emission reductions that are sufficient to equal up to 3% of the emissions in the baseline year inventory”.⁷⁵ TCEQ is implying that it most only show that the contingency measures provide 1 year’s worth of emission reductions or about 3% of the baseline emissions inventory.⁷⁶ However, TCEQ fails to provide control measures that will apply in the future and only provides previously implemented measures, which clearly do not qualify as contingency measures. TCEQ should update the contingency measures provided in this proposed SIP to comply with the law.

Reasonably Available Control Technologies

TCEQ reaffirmed the 2020 reasonably available control technology (“RACT”) analysis for this SIP revision and promised to assess the need for any updates to existing control measures required to satisfy RACT for severe nonattainment areas.⁷⁷ Please see April 9, 2021 letter attached as *Exhibit A* that was previously submitted by Harris County regarding the current reasonably RACT. Harris County reaffirms its position detailed in this letter to EPA.

Reasonably Available Control Measures

TCEQ states that no control measures were identified as RACM for this SIP revision.⁷⁸ Please see that attached letter dated August 6, 2021 that was previously submitted by Harris County Pollution Control Services Department (“PCS”) regarding the current reasonably available control measures (“RACM”). PCS requested ideas for the RACM because moderate areas must review sources for RACT and RACM. Harris County affirms this position again in this letter. (See attached *Exhibit B*, and PCS’s expert reports on the matter).

Conclusion

Ozone pollution can be extremely dangerous to human health and the environment. Children, minority communities, and low-income communities seem to be the most effected by ozone pollution impacts. As ozone levels continue to rise within Harris County, it is extremely important that TCEQ is correctly evaluating and assessing the necessary criteria to ensure that we are lowering ozone levels and ultimately reach attainment.

Thank you for the opportunity to comment on the proposed HGB Moderate Area AD SIP Revision for the 2015 eight-hour ozone NAAQS.

⁷⁴ TCEQ, HGB Moderate Area AD SIP Revision for the 2015 Eight-Hour Ozone National Ambient Air Quality Standard at 4-9.

⁷⁵ *Id.*

⁷⁶ *Id.* at 4-9 – 4-10.

⁷⁷ TCEQ, HGB Moderate Area AD SIP Revision for the 2015 Eight-Hour Ozone National Ambient Air Quality Standard at 4-8.

⁷⁸ TCEQ, Interoffice Memorandum at page 2. “The TCEQ determined that no potential control measures met the criteria to be considered RACM. Because it is not possible to implement any control measures before January 2023, no control measures can meet the criteria of advancing attainment of the NAAQS.” TCEQ, HGB Moderate Area AD SIP Revision for the 2015 Eight-Hour Ozone National Ambient Air Quality Standard at 4-8.

Sincerely,

Christian D. Menefee
Harris County Attorney

Jonathan Fombonne
First Assistant County Attorney

Tiffany Bingham
Managing Counsel for Affirmative,
Environmental and Compliance

/s/ Sarah Jane Utley
Sarah Jane Utley
Environmental Division Director
Elizabeth Hidalgo
Assistant County Attorney
Environmental Division
1019 Congress Plaza, 15th Floor
Houston, Texas 77002
713.274-5124

Special Counsel:

/s/ Charles Irvine
Charles Irvine
Janet Campos
IRVINE & CONNER PLLC
4709 Austin St.
Houston, Texas 77004
713.533.1704

**ATTORNEYS HARRIS
COUNTY, TEXAS**

Exhibit A



OFFICE OF THE
HARRIS COUNTY ATTORNEY
CHRISTIAN D. MENEFEE

April 9, 2021

Robert Todd
Region 6
Environmental Protection Agency
1201 Elm St.
Dallas, Texas 75270
Submitted via regulations.gov

Re.: Harris County comment on proposed Air Approval Plans; Texas; Reasonably Available Control Technology in the Houston-Galveston-Brazoria Ozone Nonattainment Area, EPA-R06-2020-0165

Harris County, Texas (Harris County or the County) appreciates this opportunity to submit comment on a pending revision to the Texas State Implementation Plan (SIP) to implement Reasonably Available Control Technology (RACT) for the Houston-Galveston-Brazoria ozone nonattainment area (HGB area), (RACT Rule).¹ In this SIP revision, the Texas Commission on Environmental Quality's (TCEQ) proposes no new RACT and cursorily dismisses all control technologies identified in public comment. Harris County, along with other commenters, identified available control technologies in public comment to TCEQ. TCEQ failed to rationally explain its refusal to implement these technologies, claiming that existing rules fulfill RACT requirements. But the existence of rules alone cannot fulfill RACT. As the County's expert explains in an appended report, existing U.S. Environmental Protection Agency's (EPA) guidance and TCEQ RACT rules are both are very old, some dating back to the 70s. Further, that new control technologies exist, especially those included in public comment, that qualify as RACT. EPA must not approve the RACT Rule until each of the control technologies identified in public comment is thoroughly evaluated.

¹ 86 Fed. Reg. 13,679 (Mar. 10, 2021).

Harris County requests that EPA conduct an independent analysis of RACT available in the HGB area. Further, that EPA require that the TCEQ implement the Oil and Natural Gas Industry Control Techniques Guidance (CTG) prior to finalizing any SIP revision. Lastly, Harris County requests a meeting to discuss this SIP revision.

The County's interest in the RACT Rule

Harris County has a duty to protect its residents from environmental pollution. At a population of over 4.7 million residents,² Harris County is the most populous county in Texas and along the coast of the Gulf of Mexico, as well as the third most populous county in the nation. The County is home to the petrochemical capital of the nation, the Houston Ship Channel. Proliferating air polluting industry occupy much of the 1,778 square miles that comprise the County. Chemical disasters are common in the County, such as the 2019 multi-day ITC Deer Park tank fires that emitted a visible miles-long plume over the City of Houston. Proximity to the Gulf of Mexico means that the County is also hurricane and flood-prone.

Harris County is a political subdivision of the State of Texas and Texas law vests Harris County with authority to enforce environmental laws concurrently with the TCEQ.³ This means that the TCEQ and Harris County enforce the same environmental statutes and rules in the County. The County's Pollution Control Services Department (PCS) administers environmental enforcement for the County. Among other duties, PCS staff enforce HGB SIP provisions in the County, such as implementation of emission control technologies and enforcement of permit terms.

The impact that unhealthy air has on Harris County residents, especially those in environmental justice communities, is unquantifiable. The typical environmental justice community in Harris County is low-resource, predominantly comprised of racial and ethnic minorities, and may include linguistically isolated populations. These communities are environmental justice communities because they share their fence and neighborhoods with sources of pollution. For example, the east Harris County community of Manchester that abuts a Valero refinery. Similarly, in Baytown, Texas, residents share their neighborhoods with the ExxonMobil Baytown complex, the largest petroleum and petrochemical complex in the nation. And in Pasadena, Texas, the PRSI Chevron refinery envelops neighborhoods already segmented by a major highway.

² U.S. Census Bureau, 2019 Population Estimates.

³ Tex. Water Code § 7.351; Tex. Health & Safety Code §§ 382.111, 382.113.



Source: Yvette Arellano, Texas Environmental Justice Advocacy Services. Young people skating at Unidad Park across from the ExxonMobil Baytown complex.

Other sources of pollution also burden our environmental justice communities. For example, many are within one mile of Toxic Release Inventory facilities,⁴ Superfund sites, and brownfields, like Clinton Park, Pleasantville, Fifth Ward, and Third Ward. Prolonged exposure to unhealthy levels of ozone adds another burden to our environmental justice communities. Improvements to Texas's air pollution regulations could lessen this burden and bring benefits to all Harris County residents. A stronger RACT Rule requiring updates to decades-old control technology requirements could do just that.

Harris County's Public Comment on the RACT Rule

EPA's proposed RACT Rule renders the Clean Air Act (the Act) meaningless in the face of stagnating improvements to air quality in the HGB area. According to TCEQ itself, "[o]ver the past three years (2016 through 2018), the eight-hour ozone design values for the HGB area have not shown as significant a downward trend compared to longer-term trends."⁵ Yet TCEQ proposes to implement no new control technologies to improve air quality in the HGB area even when technologies are available. Instead, TCEQ recycles,

⁴ These facilities handle extremely hazardous substances and must report their emissions to the EPA's Toxic Release Inventory.

⁵ TCEQ, Response to Comments Received Concerning the Houston-Galveston-Brazoria (HGB) Serious Classification Attainment Demonstration (AD) State Implementation Plan (SIP) Revision for the 2008 Eight-Hour Ozone National Ambient Air Quality Standards (NAAQS) (adopted March 4, 2021) (TCEQ RTC), at 14.

and EPA proposes to approve, existing RACT requirements implementing decades-old guidance to fulfill a newly-created RACT obligation.⁶ EPA must not let TCEQ belie the requirements of the Clean Air Act because doing nothing is irrational and because doing nothing carries a human cost.

Between 2006 and 2017, state death certificates noted that 264 people died of asthma in Harris County.⁷ For this period, **Black people comprised approximately 20% of the Harris County population⁸ but accounted for nearly 50% of asthma related deaths.**

President Joe Biden and EPA Administrator Michael Regan tasked EPA and all of its regions to correct racial disparities like this one. To redress this and other historic injustices, EPA has powerful tools at its disposal, including the Clean Air Act. When areas fail to meet deadlines, the Act requires enhanced air pollution abatement measures so that the area can meet its next deadline. The HGB area failed to meet a deadline and Texas must implement enhanced control technologies. Control technologies listed in EPA and TCEQ guidance and rules are very outdated, including many dating back to the 70s, but new and better control technologies are available.⁹ Plainly, Harris County requests that EPA require that Texas implement new and better control technologies because many are available and because the Act so requires.

On these points, Harris County asks: How can EPA Region 6 implement RACT requirements in the HGB area in a manner that “advanc[es] equity for all, including people of color and others who have been historically underserved, marginalized, and

⁶ See EPA, Technical Support Document, Reasonably Available Control Technology Application Analysis (RACT) for the Houston-Galveston-Brazoria (HGB) Ozone Serious Nonattainment Area (HGB Area) (EPA-R06-OAR-2020-0165), at 17-18 (EPA states that the VOC and NOx RACT determinations that it made for the HGB area regarding the 1997 ozone standard are sufficient because “the fundamental control techniques described in the control technology documents are still applicable and any new RACT determinations by the state would be expected to result in the same or similar control technology as the RACT determinations made for the 1979 1-hour or the 1997 ozone standard.”).

⁷ Texas Department of State Health Services, Texas Health Data, Deaths (2006-2017), https://healthdata.dshs.texas.gov/dashboard/births-and-deaths/deaths-2006-2017?utm_source=govdelivery&utm_medium=email&utm_campaign=march2021updates.

⁸ U.S. Census, QuickFacts, Harris County, Texas, <https://www.census.gov/quickfacts/fact/table/harriscountytexas/PST045219#qf-headnote-a>.

⁹ See Sahu, Ranajit, PhD, Comments on EPA’s Proposed Approval of the May 13, 2020 Revisions to the Texas State Implementation Plan (SIP) Concerning the Houston-Galveston-Brazoria (HGB) 2008 8-Hour Ozone NAAQS VOC and NOx Reasonably Available Control Technology (RACT) Requirements (April 8, 2021) (Sahu 2021 Report), Attachment 1.

adversely affected by persistent poverty and inequality”?¹⁰ How will Region 6 “[t]ake immediate and affirmative steps to incorporate environmental justice into [its] work,” especially for those Harris County residents who are pollution-burdened and underserved?¹¹

I. Public participation language barriers

As a preliminary matter, Harris County addresses language barriers present in the Texas SIP revision process. Approximately 20% of Harris County residents speak English “less than very well,” with Spanish being the most common language spoken at home, according to the U.S. Census Bureau. There are many linguistically isolated communities in Harris County; the table below lists Census data for two such communities in relation to state and national figures.

	Percentage of the population 5 years and over that speaks English less than very well
United States	8.2%
Texas	13.3%
Harris County	20.4%
Manchester¹²	49.1%
Pasadena	23.6%

For these residents, Spanish is also the most frequently spoken language at home. Despite these figures, the public hearing notices provided by TCEQ were entirely in English. The notice includes two sentences directed at “[p]ersons who have special communication or other accommodation needs.”¹³ This vague statement provides little recourse for Spanish-speaking and other Limited English Proficient (LEP) Harris County residents. In response to comment, TCEQ did not respond to comment regarding language barriers.¹⁴ It is not apparent to the County whether TCEQ provided any

¹⁰ Advancing Racial Equity and Support for Underserved Communities Through the Federal Government, Exec. Order No. 13,985, 86 Fed. Reg. 7,009 (signed Jan. 20, 2021, published Jan. 25, 2021).

¹¹ Email from Michael Regan, EPA Administrator, to EPA employees, “Message from The Administrator,” (Apr. 7, 2021).

¹² Encompassed in the 77012 zip code.

¹³ 44 Tex. Reg. 5,449, 5,658 (Sept. 27, 2019), Attachment 2 (along with the newspaper notice).

¹⁴ Compare Comments of Environmental and Community Groups: Achieving Community Tasks Successfully, *et al.* on TCEQ Proposed Houston-Galveston-Brazoria (HGB) Serious Classification Attainment Demonstration (AD) State Implementation Plan (SIP) Revision for the 2008 Eight- Hour Ozone National Ambient Air Quality Standard (NAAQS) (submitted Oct. 28, 2019) (NGO Comments) , Attachment 3, at 11-13 with TCEQ RTC at 3-4.

information about the RACT Rule in Spanish or another language. In effect, LEP Harris County residents were excluded from this process.

Harris County requests that EPA work with TCEQ to develop a public participation plan for SIP revisions tailored to LEP persons. This plan should include culturally appropriate translation and interpretation to reflect the Spanish speaking population in the area, which is comprised predominantly of Mexican and Mexican American persons in Harris County. Language access should not be relegated to notices. For example, TCEQ could provide a multi-lingual plain language explanation SIP revisions and publish explanations, notices, and other information in appropriate alternative language newspapers. TCEQ is in the process of developing a similar requirement for its permitting programs.¹⁵ The U.S. Department of Justice has compiled a number of resources that could assist EPA and TCEQ with outreach to LEP persons at www.lep.gov/. Harris County welcomes the opportunity to work with EPA and TCEQ to correct this public participation barrier.

II. Ozone pollution is harmful to Harris County residents, especially those living in environmental justice communities

Ozone is not emitted; rather, it is formed through a chemical reaction between nitrogen oxides (NOx) and volatile organic compounds (VOCs) when they are exposed to sunlight. Ozone is a corrosive air pollutant that can inflame the lungs, constrict breathing, and even lead to life-threatening conditions. Ozone's precursor pollutants are harmful to public health on their own, like cancer-causing VOCs benzene and ethylene. According to EPA's own findings in support of the ozone National Ambient Air Quality Standards (NAAQS), ozone pollution can harm healthy persons but vulnerable populations are more susceptible to its harmful effects. Children, elders, persons with disabilities, and residents of environmental justice communities are among the most vulnerable to ozone pollution. For example, children living in areas with higher concentrations of ozone in ambient air have been shown to be more likely to have asthma or to experience asthma attacks compared to children who are exposed to less ozone pollution.¹⁶ Ozone can also harm vegetation and entire ecosystems, thereby exacerbating the loss of vegetative cover and poor environmental conditions in the community.

¹⁵ See TCEQ March 10, 2021 rule proposal so amend and create language access rules, TCEQ Docket No. 2020-0040-RUL, https://www.tceq.texas.gov/assets/public/legal/rules/rule_lib/proposals/20018039_pex.pdf.

¹⁶ Akinbami, The association between childhood asthma prevalence and monitored air pollutants in metropolitan areas, United States 2001-2004 (Environ. Res. Apr. 2010), 110(3):294-301, <http://dx.doi.org/10.1016/j.envres.2010.01.001>.

a. The National Ambient Air Quality Standards

The Clean Air Act requires that EPA make health- and welfare-protective standards for six “criteria pollutants”: ozone, lead, sulfur dioxide, nitrogen dioxide, particulate matter, and carbon monoxide. These are known as the National Ambient Air Quality Standards, the NAAQS. Pursuant to the Act, EPA must divide the country into air quality control regions, also referred to as “areas.” Depending on the location of the area, a state, local, or tribal government may submit proposals to EPA recommending designations for their respective area. The area’s air quality determines whether it will be classified as “attainment” (in compliance), “nonattainment” (not in compliance), or “unclassifiable” (insufficient information).

The Act sets deadlines by which areas must attain ozone standards. Deadlines vary by the severity of an area’s pollution. An area may be classified as “marginal,” “moderate,” “serious,” “severe,” and “extreme.” If an area fails to meet its attainment date, EPA must reclassify the area to a higher classification with a new attainment date. Higher classifications carry increasingly more stringent public health protections.

b. HGB has a historic ozone pollution problem

Harris County, and the HGB area, have never met any of the ozone standards at the time of their initial implementation. Based on the best available science, the four ozone standards, established in 1979, 1997, 2008, and 2015, have set progressively lower permissible ozone levels. The standards reflect eight-hour averages, except the 1979 standard, which reflects a one-hour average.

The HGB area remains in nonattainment for the 2008¹⁷ and 2015¹⁸ standards. For the 2008 ozone standard, the HGB area was initially classified as marginal, then it failed to meet the attainment deadline and was reclassified to moderate. Then again, in 2018, the HGB area failed to meet the moderate attainment deadline and was reclassified to serious in 2019. Modeling data prepared by the TCEQ indicate that the HGB area will fail to meet the serious area deadline of July 20, 2021.¹⁹ If so, the HGB area will be reclassified to severe, triggering some of the Act’s most stringent public health protections. For

¹⁷ 75 parts per billion (ppb); *see also* 42 U.S.C. § 7511a(b); 40 C.F.R. § 51.1103(a) tbl. 1 (attainment dates for Texas).

¹⁸ 70 ppb.

¹⁹ RACT Rule at ES-1 (“The peak ozone design value for the HGB nonattainment area is projected to be 76 ppb in 2020...”); at 76 ppb, it is also possible that the HGB area may fail to attain by the 2015 ozone standard marginal area attainment date of August 3, 2021.

example, higher VOC and NO_x emission offsets, more major source permitting, a failure to attain fee, and more technology-forcing requirements.

- c. Ozone pollution in the HGB area disproportionately burdens Black, brown, and poor communities

Black, brown, and poor people bear the brunt of pollution in Harris County. Unhealthy air, contaminated water, Superfund sites, and other pollution unjustly burden our communities. The impacts of this pollution are well documented by voluminous studies, a selection of which is attached to this comment.²⁰ EPA is in a unique position to begin to dismantle the racism and elitism that oppresses environmental justice communities in Harris County. Consistent with Clean Air Act requirements, the RACT Rule presents a means to cut emissions from the largest sources of pollution in the County, especially in environmental justice communities in and around the Houston Ship Channel.



Source: Yvette Arellano, Texas Environmental Justice Advocacy Services, Greenpeace.
View of Valero refinery in Manchester shortly after Hurricane Harvey in 2017.

²⁰ Harris County appends a selection of studies, photos, and school data to better characterize the vulnerability experienced in the County's environmental justice communities, Attachment 4.



Source: Yvette Arellano, Texas Environmental Justice Advocacy Services, Greenpeace. View of the Exxon Baytown complex shortly after Hurricane Harvey in 2017.

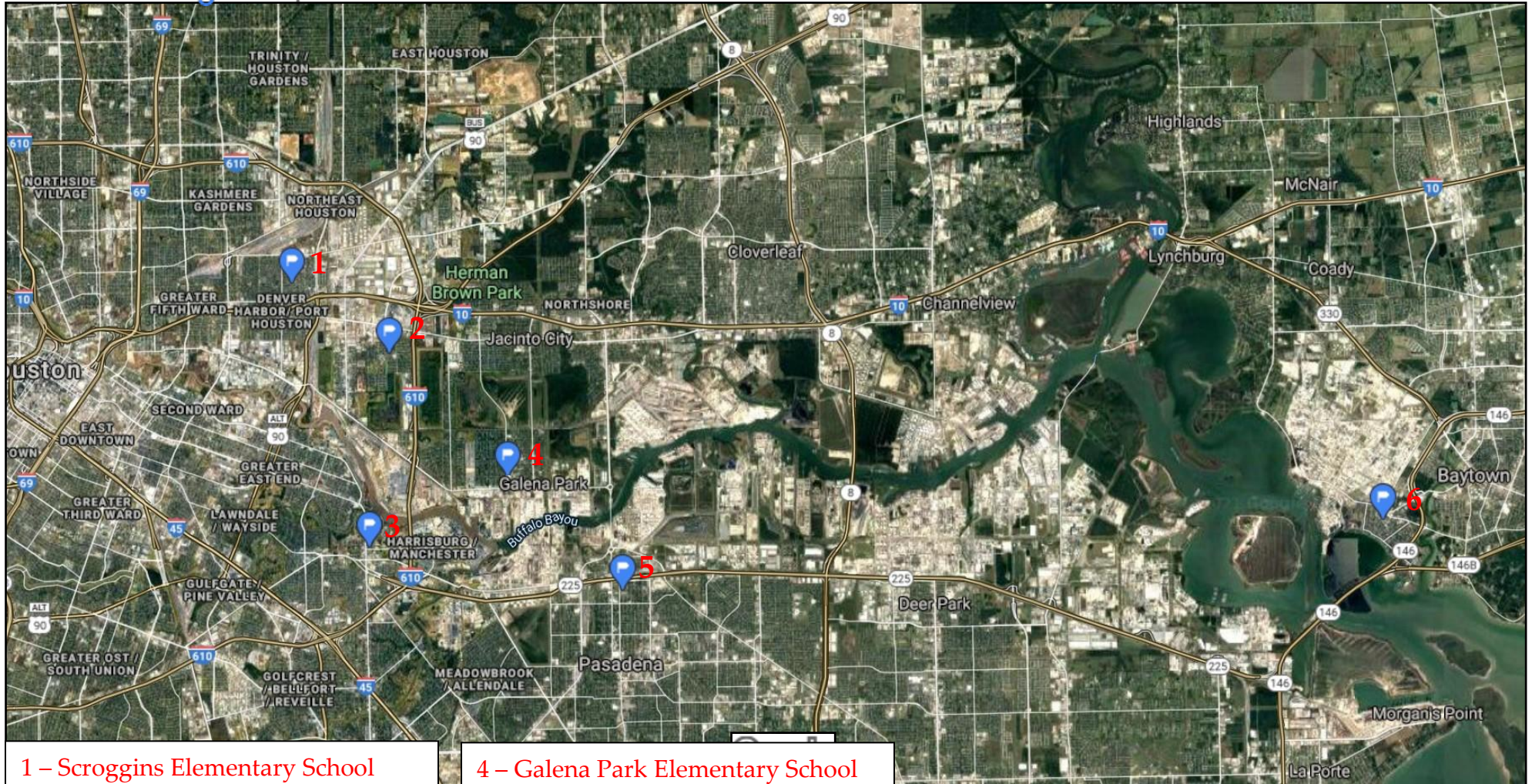
Many children live, learn, and play in Harris County environmental justice communities. Because their respiratory tracts are not fully developed, children are especially vulnerable to ozone pollution, particularly when they have elevated respiratory rates, as when playing outdoors.²¹



Source: Yvette Arellano, Texas Environmental Justice Advocacy Services (2019). Children play soccer at Peiser Park in Manchester across from Eco Services, a sulfuric acid plant.

There are an unfortunate number of elementary schools located extremely close to major stationary sources of air pollution in east Harris County and along the Houston Ship Channel. These sources emit VOCs and NO_x and are subject to the RACT Rule.

²¹ 80 Fed. Reg. 65,292, 65,310/3, 65,446/1 (Oct. 26, 2015); EPA, Integrated Science Assessment for Ozone and Related Photochemical Oxidants 3-81 -82 tbl.2-1 (Feb. 2013), EPA-HQ-OAR-2008-0699-0405.



1 – Scroggins Elementary School
 2 – Pleasantville Elementary School
 3 – J.R. Harris Elementary School

4 – Galena Park Elementary School
 5 – Kruse Elementary School
 6 – San Jacinto Elementary School

Nearly every child attending these public elementary schools is economically disadvantaged,²² a racial or ethnic minority, and many are English Language Learners.²³

Elementary School	% African American	% Hispanic	% White	% Other ²⁴	% Economically Disadvantaged	% English Language Learners
Scroggins	2.1%	96.8%	1.1%	-	91.8%	46.2%
Pleasantville	61.9%	35.2%	1.8%	1.1%	94.3%	20.3%
J.R. Harris	2.1%	97.9%	-	-	100%	59.7%
Galena Park	4.1%	90.7%	4.8%	0.4%	87.3%	54%
Kruse	2.6%	93.2%	3.8%	0.4%	93.2%	40.7%
San Jacinto	7.2%	82.7%	7.4%	2.7%	85.8%	38.3%

Scroggins Elementary School in Fifth Ward is about half a mile south of a recently identified cancer cluster where the childhood leukemia rate is five times that of the general population.

J.R. Harris Elementary School in Manchester is located across the street from a major sulfuric acid plant, Eco Services Operations LLC, and within one mile of concentrated industrial operations, including a Valero refinery.

Pleasantville Elementary School in the Pleasantville neighborhood of east Harris County is surrounded by 18-wheeler trucking stations and PM_{2.5} hot spots.

²² According to the Texas Education Agency “[a]n economically disadvantaged student is defined as one who is eligible for free or reduced-price meals under the National School Lunch and Child Nutrition Program,”

<https://rptsrv1.tea.texas.gov/acctres/gloss0708.html#:~:text=An%20economically%20disadvantaged%20student%20is,Lunch%20and%20Child%20Nutrition%20Program>; see also Benefits.gov, National School Breakfast and Lunch Program for Texas (“Children from families with incomes at or below 130 percent of the Federal poverty level are eligible for free meals. Those with incomes between 130 and 185 percent of the Federal poverty level are eligible for reduced price meals.”), <https://www.benefits.gov/benefit/1990#:~:text=Children%20from%20families%20with%20incomes,eligible%20for%20reduced%20price%20meals>.

²³ According to data from the Texas Education Agency 2019-2020 School Report Cards, included in Attachment 4.

²⁴ American Indian, Asian, Pacific Islander, and two or more races.

Kruse Elementary School in Pasadena, Texas is approximately half a mile from the Chevron Pasadena Refining System, Inc. refinery—a facility that is over 100 years old.

Galena Park Elementary School is just a few blocks away from major sources of pollution, including an expansive Kinder Morgan aboveground storage tank farm.

San Jacinto Elementary School in Baytown, Texas is just a few blocks away from the ExxonMobil Baytown complex – the largest petroleum and petrochemical complex in the nation.

III. Reasonably Available Control Technology requirements

When an area fails to attain an ozone NAAQS by the respective attainment date, the state must revise its SIP to implement or enhance RACT requirements.²⁵ RACT determinations must be made and implemented quickly, even “potentially expensive technology or expensive process changes to reduce pollution.”²⁶ In any event, states must justify their SIP revision and provide supporting evidence for their RACT determinations, even if these are previously implemented control technologies.²⁷ EPA too must “adequately explain” its RACT determinations, including explaining decision that are contradictory to information in the record.²⁸

EPA defines RACT as “the lowest emission limit that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.”²⁹ RACT can include:

“devices, systems, process modifications, or other apparatus or techniques that are reasonably available taking into account: (1) [t]he necessity of imposing such controls in order to attain and maintain a national air quality

²⁵ See 42 U.S.C. § 7411a(b)-(e) (RACT does not apply to marginal nonattainment areas).

²⁶ See *Miss. Comm’n on Env’tl. Quality v. EPA*, 790 F.3d 138, 146 (D.C. Cir. 2015).

²⁷ *NRDC v. EPA*, 571 F.3d 1245, 1254 (D.C. Cir. 2009).

²⁸ *Sierra Club v. EPA*, 972 F.3d 290, 303 (Aug. 27, 2020).

²⁹ EPA, Memorandum from Roger Strelow, Assistant Administrator for Air and Waste Management, to Regional Administrators, Region I-X, on “Guidance for determining Acceptability of SIP Regulations in Non-attainment Areas,” section 1.a. (Dec. 9, 1976) (Strelow Memo); see also NGO Comments at 16-17.

standard; (2) [t]he social, environmental, and economic impact of such controls; and (3) [a]lternative means of providing for attainment and maintenance of such standard [for requests for deadline extensions].”³⁰

In the course of the 1977 amendments to the Clean Air Act, Congress directed EPA to develop guidance materials to assist states with RACT implementation. Congress tasked EPA with developing “a **basic resource** available to State and local governments in determining the measures to be included in plans to achieve and maintain the [NAAQS].”³¹ At that time, Congress was aware of existing EPA Control Techniques Guidelines (CTGs) for stationary sources of VOCs—EPA continued issuing CTGs after the amendments. EPA also issued Alternative Control Techniques (ACTs) guidance for sources of NO_x. Unfortunately, EPA’s existing guidance is decades-old, even dating back to the 70s.

CTGs are not defined as RACT. According to EPA, implementing CTGs can create a “presumptive norm” for RACT but “CTG does not establish conclusively how issues must be resolved.”³² And even when states submit RACT rules that implement CTGs, EPA must “consider not only the information in the CTG, but also any material included in the State submittal and in public comments on the submittal.”³³ “In every case RACT should represent the toughest controls considering technological and economic feasibility that can be applied to a specific situation.”³⁴ CTGs are only “basic resources,” in essence, a starting point for EPA.

EPA can accept CTGs as RACT under specific circumstances. If the emission limit proposed by the state is consistent with the information in the applicable CTG, a state may rely on the CTG to satisfy RACT. But, “[w]here this is not the case, EPA believes that the State must submit justification of its own to support its determination.”³⁵ EPA does not define “consistent.” Consistency with the CTGs could include emission limits that are above and below what a specific CTG can achieve. In guidance, EPA makes clear that it contemplated, and encouraged, ‘beyond CTG’ controls. “As control technology improves and as new control measures become feasible for the area, it will be necessary for the SIP to be periodically revised to include these measures until attainment and maintenance can be demonstrated.”³⁶ EPA directs this guidance to RACT, not CTGs.

³⁰ 40 C.F.R. § 51.100(o).

³¹ 44 Fed. Reg. 53,761, 53,762/2 (Sept. 17, 1979) (internal quotations omitted) (emphasis added).

³² *Id.*

³³ *Id.* at 53,763.

³⁴ Strelow Memo at 3 (emphasis added).

³⁵ *Id.*

³⁶ Strelow Memo at 1-2.

Per EPA's guidance, public comment on SIP revisions can provide evidence that facilities in a source category have installed 'beyond CTG' control technologies. This type of evidence would suggest that the control technology is reasonably available and technologically feasible. Economic feasibility may vary, but it is doubtful that facilities that installed a technology would have done so if it would have rendered them bankrupt. At the very least, where one or more facilities have installed a 'beyond CTG' control technology, thereby demonstrating availability and technical practicability, a RACT determination is warranted to determine whether the technology meets RACT requirements.

IV. The RACT Rule is inconsistent with the Clean Air Act

EPA fails to rationally explain why it proposes to allow TCEQ to disregard control technologies identified in public comment. "EPA is able neither to offer a reasonable justification for failing to require a stricter standard, nor to justify the standard it endorsed. That standard represents a mere acceptance of the status quo."³⁷ Harris County requests that EPA withdraw the RACT Rule proposal until it conducts a rigorous independent analysis and provides a rational explanation for its actions. Through this process, Harris County recommends that EPA find that new RACT is available for the HGB area, including adopting the technologies identified below, in public comment to TCEQ, and in the appended expert report.

- a. Commenters presented evidence that rebuts the CTG RACT presumptive norm

The County's expert reviewed applicable CTGs and Available Control Technologies (ACTs) and found that, with the exemption of an oil and gas CTG, "every single CTG/ACT document is over 10 years old...[t]he earlier CTG dates to 1975."³⁸ Technological developments have far outpaced this guidance yet EPA continues to rely on these dated documents. Reliance on outdated guidance to establish RACT "would only make sense if these documents were being kept up to date"—but they are not.³⁹ Similarly, TCEQ rules implementing RACT requirements are outdated. **Over half of the TCEQ's RACT rules for VOCs are over a decade old, dating as back as 1994.**⁴⁰ All of the NOx RACT rules were last updated in 2007, over a decade ago.⁴¹ Better control

³⁷ *Sierra Club*, 972 F.3d at 302.

³⁸ *Id.* at 20.

³⁹ Sahu 2021 Report at 9-18.

⁴⁰ *Id.* at 19-20.

⁴¹ *Id.* at 39-40.

technologies are available, as evidenced by already-installed controls in the HGB area and the fact that these controls are part of RACT requirements in other jurisdictions, like the San Joaquin Valley.⁴²

b. TCEQ's RACT analysis framework contravenes the Act

At the outset, EPA has not rationally explained how TCEQ's RACT analysis framework is consistent with the Clean Air Act. Applying a contrived interpretation of the Act, the TCEQ disqualifies all possible new RACT for the HGB area. With a few exceptions, TCEQ stops its analysis at the existence of EPA-approved, outdated RACT rules in Title 30, Chapters 115 and 117.⁴³ TCEQ claims that "additional control measures are not necessary for the area to demonstrate attainment by the attainment date."⁴⁴ The Act does not restrict RACT requirements only for when a state deems them necessary; it mandates RACT when an area fails an attainment deadline and the technology meets certain criteria.⁴⁵ According to TCEQ, its existing rules incorporate all of EPA's outdated CTGs and ACTs and this satisfies RACT. But CTGs and ACTs are supposed to be a starting point, not the end of the story.

TCEQ's RACT analysis framework fails to consider the CTGs in comparison to other available control technologies. As discussed above, neither Congress nor EPA intended for states to fulfill RACT requirements by merely citing to CTGs incorporated into state rules without rigorous analysis. EPA's guidance provides that states must revise SIPs "[a]s control technology improves and as new control measures become feasible in the area"⁴⁶—not as CTGs are developed or updated. The Clean Air Act requires that a RACT analysis go beyond the mere existence of rules. For TCEQ to avail itself of the CTG "presumptive norm," it must provide justification as to how any CTG provides the "toughest controls" available in a source category.

TCEQ failed to rationally respond to comment regarding its deficient framework. An expert report submitted to TCEQ outlined a framework that can achieve a comparison of CTG and non-CTG control technologies. For example, a RACT analysis for sources of NO_x could:

⁴² *Id.* at 35.

⁴³ *Id.* at 1, 7-9.

⁴⁴ TCEQ RTC at 15.

⁴⁵ *Cf. Sierra Club v. EPA, et al.*, 793 F.3d 656, (6th Cir. 2015) (discussing RACT and its sister requirement, Reasonably Available Control Measures (RACM), and finding that, upon redesignation, RACT and RACM are required).

⁴⁶ Strelow Memo at 1-2.

“(a) identify the NO_x rates for each such large source; (b) identify the current NO_x controls if any (such as: low NO_x burners, ultra-low NO_x burners, flue gas recirculation (FGR), over-fire air, SNCR, or SCR, etc.) that each source has; (c) identify, based on (a) and (b), the additional NO_x reductions that can be obtained if additional or higher/better types of technically feasible NO_x controls could be applied; (d) determine cost-effectiveness of the additional controls. Only then can an informed RACT (and RACM) analysis can be complete.”⁴⁷

Sources of VOCs could follow a similar process. This framework goes beyond the mere existence of rules and accounts for evaluation of control technologies outside of the CTGs and ACTs, consistent with the Act. Further, it allows for an evaluation of technology performance, such as maintenance needs. The TCEQ does not explain how it evaluates control technologies by source category outside of CTGs, or why it disregarded the expert’s recommendation.

c. TCEQ failed to adequately analyze RACT identified in public comment

The TCEQ provides little explanation as to why it rejected commenters’ RACT recommendations. For example, emission reductions at the W.A. Parish power plant, the HGB area’s largest source of NO_x.⁴⁸ At the W.A. Parish plant, coal-burning units burn more efficiently than the gas-burning units, perhaps due to a lack of maintenance on the installed controls.

Commenters identified several available control technologies that TCEQ failed to adequately analyze.⁴⁹ By category, the technologies include:

- i. Boilers, furnaces, and heaters:
 - 1. Ultra-low NO_x burners
 - 2. Flue gas recirculation (FGR)
 - 3. Selective non-catalytic reduction (SNCR)
 - 4. Selective catalytic reduction (SCR)
- ii. Turbines, a dry low NO_x combustors followed by SCR

⁴⁷ Sahu, Ranajit, PhD, Comments on the Reasonably Available Control Technology (RACT) and Reasonably Available Control Measures (RACM) for the 2008 Ozone NAAQS Attainment SIP Modifications Proposed by the TCEQ for the Houston-Galveston-Brazoria (HGB) and Dallas Fort Worth (DFW) Non-Attainment Areas (Sahu 2019 Report), at 17, Attachment 5.

⁴⁸ *Id.* at 15.

⁴⁹ *Id.* at 17-21.

- iii. Cooling towers, enhanced surveillance
- iv. Fugitive emissions from equipment like valves and pumps, optical gas imaging (OGI) or similar technologies
- v. Aboveground storage tanks:
 - 1. Vapor recovery or vapor control system with capture or control efficiency of at least 99%
 - 2. Vapor oxidizers
 - 3. Carbon adsorbers and concentrators
 - 4. Catalytic oxidizers
 - 5. Regenerative thermal oxidizers

TCEQ dismisses every one of these recommendations with little to no analysis.⁵⁰ For example, a recommendation for enhanced fugitive emissions monitoring: the agency points to existing rules that implement CTGs, stating that the rules allow, but do not require, the use of OGI or similar advanced technologies. A recommendation to address emissions from refinery cooling tower water: the TCEQ cites to existing National Emission Standards for Hazardous Air Pollutants (NESHAP) for the refinery sector but fails to walk these regulations through a RACT analysis in comparison to other available technologies. The agency does not address the use of VOC vapor oxidizers for aboveground storage tanks. Nor does the agency address maintenance and other issues impinging upon the efficiency of installed controls, including available NO_x reductions at the W.A. Parish power plant. The TCEQ's cursory dismissal of these control technologies runs contrary to the Clean Air Act.



Source: Texas Environmental Justice Advocacy Services. View of aboveground storage tanks behind Groveland Missionary Baptist church in Pleasantville, 2019.

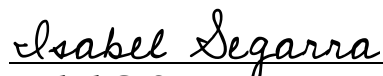
⁵⁰ See TCEQ RTC at 17-19.

Facilities in the HGB area that install and operate with ‘beyond-CTG’ control technology, such as vapor oxidizers at aboveground storage tanks, demonstrate that the technology is available and technically and economically feasible, at least in some circumstances. Even when it is not feasible for a specific facility, the operator could apply for a “source-specific RACT” to justify deviation from the standard.⁵¹ By failing to identify these control technologies as RACT, TCEQ irrationally frustrates RACT requirements.

Harris County requests to EPA

1. That EPA withdraw the RACT Rule proposal.
2. That EPA conduct an independent RACT analysis outside of TCEQ’s submission, but considering all comment submitted to TCEQ and EPA. Harris County asks EPA to independently review control technologies available for the HGB area, including the need for RACT maintenance requirements.
3. That EPA require TCEQ to incorporate into the Texas SIP the overdue 2016 CTG for the Oil and Natural Gas Industry prior to this finalizing this SIP revision.
4. Harris County requests a meeting to discuss this SIP revision.

Respectfully submitted,



Isabel G. Segarra Treviño
Assistant County Attorney
Environmental Division
Harris County Attorney
E: isabel.segarra@cao.hctx.net
P: (832) 510-9173

⁵¹ *Sierra Club*, 972 F.3d at 301-02.

Exhibit B



OFFICE OF THE
HARRIS COUNTY ATTORNEY
CHRISTIAN D. MENEFEE

August 6, 2021

Via Email at Joseph.Thomas@tceq.texas.gov
and Anthony.DeJesus@tceq.texas.gov
Mr. Joespeh Thomas
Mr. Anthony DeJesus
Texas Commission on Environmental Quality
12100 Park 35 Circle
Austin, Texas 78711

Re: Request for Ideas for Reasonably Available Control Measures

Dear Mr. Thomas and Mr. DeJesus:

On behalf of the Harris County Pollution Control Services Department (PCS), the Office of the Harris County Attorney submits this letter to the Texas Commission on Environmental Quality (TCEQ) regarding Reasonably Available Control Measures (RACM) for two National Ambient Air Quality Standards for ozone. On July 23, 2021, PCS received a notice through an email subscription that the TCEQ would be accepting comments on potential ideas for RACM in the Houston, Dallas, and San Antonio ozone nonattainment areas. The comment period is only two weeks. As a preliminary matter, PCS would like to request an extension of the comment period. RACM is a highly-complex topic and the TCEQ is requesting very specific information including technical and economic feasibility, citations for suggested rules, feasibility on a dollar per ton of pollutant basis, and as much detail as possible. It is impossible to develop RACM suggestions and provide the requested detail in a two week time period. Two weeks is half the time typically allotted for TCEQ public comment periods. In addition to the length of the public comment period, PCS is concerned about the method of public notice. This was not published in the Texas Register or listed on the TCEQ Commissioner Agenda. Interested parties either had to be registered with the email listserv or discover the information on the TCEQ website. Therefore, PCS requests that TCEQ re-notice this matter and allow for an extended comment period. Further, PCS requests that TCEQ provide potential commenters with information requisite to make informed recommendations, as detailed in the appended report.

The Houston-Galveston-Brazoria ozone nonattainment area has failed to meet each of the four ozone standards at the time of their initial implementation and remains in nonattainment for the 2008 and 2015 standards. Our low-income and minority residents face the brunt of the health impacts from prolonged ozone exposure. For example, residents who live by major sources of ozone forming pollution along the Houston Ship Channel and residents who live along our busy highways—especially those who live in and

around a major highway project that may start as early as this year, the North Houston Highway Improvement Project. PCS would like to see an expeditious reduction in ozone levels in the County and believes that the historic nature of our ozone problem alone warrants a longer comment period and more stakeholder involvement, as detailed in the appended report.

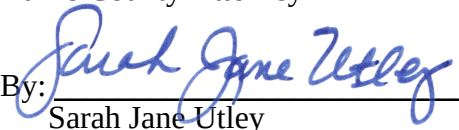
In this action, TCEQ solicits ideas for RACM for the 2008 and 2015 ozone standards. While this may be helpful to the agency as it proceeds with its planning activities, each standard carries with it distinct State Implementation Plan (SIP) obligations. For example, facilities in marginal nonattainment areas must offset their ozone-forming pollution at a ratio of 1.1:1 tons, while the ratio in moderate areas is 1.15:1 tons. 42 U.S.C. § 7511a(a)(4), (b)(5). Marginal areas must only conduct a general Reasonably Available Control Technology (RACT) review, while moderate areas must review sources for RACT and RACM. *Id.* at § 7511a(a)(2)(A), (b)(2). In moderate areas, states must implement RACT and RACM controls for major stationary sources that emit volatile organic compounds (VOCs) and oxides of nitrogen (NOx). *Id.* at § 7511a(b)(2), (f). The permitting threshold for both classifications is 100 tpy of potential ozone-forming emissions. 70 C.F.R. § 70.2. In serious areas, the offset ratio is 1.2:1 and for severe areas it is 1.3:1 but it can be 1.2:1 if states implement BACT (Best Available Control Technology). *Id.* at § 7511a(c)(10), (d)(2). The major source permitting threshold for serious is 50 tpy and for severe it is 25 tpy. *Id.* at § 7511a(c), (d). Taken together, shifting nonattainment classifications mean that more and different facilities will require permits, offset ratios will increase, and technology requirements will become more stringent. Caselaw makes clear that “EPA is required by statute to keep in place measures intended to constraint ozone levels—even the ones that apply to outdated standards—in order to prevent backsliding.” *South Coast Air Qual. Mgmt. Dist. v. EPA*, 882 F.3d 1138, 1149 (D.C. Cir. 2018). Thus, TCEQ must delineate its obligations and review the requirements for each standard separately, even if there is some overlap in the SIP.

PCS’s expert on this matter, Dr. Ranajit Sahu, prepared a report, attached as *Exhibit A*, that outlines areas that merit further consideration by TCEQ and areas that PCS would be able to comment upon if it had more time. PCS also appends an earlier report by Dr. Sahu on this matter, attached as *Exhibit B*. PCS looks forward to working with TCEQ on these future revisions.

If you have any questions, please contact me at 713-274-5124.

Sincerely,

CHRISTIAN D. MENEFEE
Harris County Attorney

By: 

Sarah Jane Utley
Assistant County Attorney
Environment Division

Exhibit A

Developing Reasonably Available Control Measures (RACM) for the Houston-Galveston-Brazoria Ozone Non- Attainment Area

Comments by

Dr. Ranajit (Ron) Sahu, Consultant¹

A. Introduction

The Texas Commission on Environmental Quality (TCEQ) has solicited ideas² for developing RACM for ozone planning. The TCEQ expects that the US EPA will reclassify three areas in Texas, including the Houston-Galveston-Brazoria (HGB) area³ under the 2008 and 2015 ozone eight hour ozone National Ambient Air Quality Standards (NAAQS).⁴ The TCEQ notes that under the Clean Air Act, RACM (including Reasonably Available Control Technology, RACT) must be implemented as expeditiously as practicable.

RACM is defined, per EPA guidance as any potential control measure for application to point, area, on-road, and non-road emission source categories that meets the following criteria:

- The control measure is economically feasible;
- The control measure is technologically feasible;
- The control measure does not cause “substantial widespread and long-term adverse impacts”;
- The control measure is not “absurd, unenforceable, or impracticable”;
- The control measure can advance the attainment date by at least one year;

With regards to implementation, as TCEQ has noted, EPA requires that all RACM be implemented no later than the beginning of ozone season in the attainment year. The ozone season is May-September in each year and the attainment years for the two ozone NAAQS are as follows:

- 2026, for the 2008 eight-hour ozone NAAQS nonattainment areas classified as “severe”;
and
- 2023, for the 2015 eight- hour ozone NAAQS nonattainment areas classified as
“moderate.”

¹ Resume provided in Attachment A.

² https://www.tceq.texas.gov/assets/public/implementation/air/sip/ruledocs/RACM_Solicitation_FINAL.pdf

³ These comments pertain to the HGB ozone non-attainment areas although they are general and can also apply to the two other ozone non-attainment areas: the

⁴ For the 2015 ozone NAAQS, the HGB area includes the following counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, and Montgomery. For the 2008 ozone NAAQS, the HGB area includes all these counties plus Liberty and Waller counties.

Based on the above, control measures that are RACM have to be ready to be implemented one year before the 2023 ozone season (i.e., before May 2022) for the 2015 ozone NAAQS and by May 2025 for the 2008 ozone NAAQS.

May 2022 is just 9 months from now, including August 2021. From the TCEQ's RACM solicitation, it is not clear how much work it has already done to identify potential additional candidate RACM measures, especially considering that RACM includes measure that can reduce precursor NOx and VOC emissions from stationary (or point and area) sources but also from on-road and non-road source categories, including transportation sources.

TCEQ's solicitation requests suggestions for new control strategies as well as modifications for existing control strategies for stationary and mobile sources. While the TCEQ does maintain a listing of all prior state implementation plan (SIPs)⁵ submittals to the EPA including for the HGB area, there is no information that is available on the implementation status or effectiveness of all of the existing RACM strategies that have been or are being implemented in the HGB ozone non-attainment area.

For each potential RACM, the solicitation asks commenters to:

- Describe technical and economic feasibility for each RACM idea;
- Provide as much detail and technical information as possible;
- Specify whether the measure is a volatile organic compounds (VOC), nitrogen oxides (NOx), or VOC and NOx strategy;
- Provide a copy, web link, or citation for suggested rules when possible;
- Identify any confidential information; and
- Explain feasibility information provided on a dollar per ton of pollutant basis.

It requested all of this information within two weeks of the solicitation, ending August 6, 2021.

B. Discussion

While TCEQ has previously solicited and received comments on RACT for stationary sources for the HGB ozone non-attainment area, which apply to stationary sources, including additional control technologies that can be implemented beyond existing RACT rules, RACM is far broader and includes numerous types of emissions reduction strategies that can be implemented to reduce NOx, VOC or both emissions from mobile or transportation sources, whether on-road or non-/off-road as well as stationary sources not previously covered under RACT.

In the short time (i.e., less than two weeks) that TCEQ has solicited all of this information, it is simply not practical to provide all of the detail that TCEQ requests, especially relating to “feasibility information...on a dollar per ton basis” for specific candidate measures that can apply to sources in the specific HGB especially when, as noted above, TCEQ has not provided the implementation status of prior RACM under its previous SIP submittals.

⁵ <https://www.tceq.texas.gov/airquality/sip/sipplans.html>

While the type of information requested can be developed, it will take significant additional time to do so especially since the HGB ozone non-attainment area is not new and RACM candidates will not just be potential new measures. For example, RACM could include measures that may have been rejected in prior SIPs but may be now viable, and likely modifications of existing RACM. Given where we stand today, doing all this and meeting the requirement that a viable RACM has to move forward the ozone attainment date by one year makes it nearly impossible to identify proper RACM for the 2015 moderate ozone NAAQS since those RACM have to be ready to be implemented, as noted previously, in less than 9 months starting August 1, 2021. This includes modeling demonstrations to show that the RACM, collectively meet the attainment dates as expeditiously as possible.

However, there is still enough time to properly develop RACM to meet the 2026 ozone attainment designation since those have to be implementable and in place by May 2025, the start of the prior year's ozone season. But, developing RACM for this NAAQS cannot be practically and could not be practically done in less than two weeks as TCEQ has demanded. I ask therefore that TCEQ reconsider and provide more time for the meaningful development of comments for the 2008 ozone NAAQS.

Given the very short time TCEQ provided in the solicitation, the most that was practically feasible option is to provide TCEQ with lists of RACM that other ozone non-attainment areas have considered (including those they may have rejected based on their own considerations but which may be viable for the HGB). Developing RACM requires including control measures that have been implemented at the federal level, in other states, and in other local air districts.

C. RACM Development Process and Examples from Various Jurisdictions

As the TCEQ is well aware, since RACM considers reductions of NO_x and VOCs from a wide range of emissions sources including on-road and non-road sources that are not typically regulated by the TCEQ, development of RACM requires expensive coordination with other stakeholders and agencies including those that have responsibilities for land use and transportation planning as well as for area sources such as oil and gas development and the like. These can include county governments and transportation planning organizations and agencies. This is what is typically done in developing RACM for other ozone non-attainment areas.

Even though the time provided by TCEQ (i.e., less than two weeks) is too short to provide more complete comments, nonetheless, in the spirit of the solicitation, the following example of RACM aspects and candidates considered by other jurisdictions is provided. In addition to examples of RACM, in some of the examples, I have highlighted the types of cost-effectiveness criteria used by others.

C1. California, South Coast Air Basin

For example, the South Coast Air Quality Management District (SCAQMD) typically develops its ozone attainment SIPs in conjunction with local area governments such as various Councils of

Government (COGs) including the Southern California Association of Governments (SCAG), which also serve as regional transportation planning agencies. Notably, TCEQ's solicitation for RACM did not identify any other agencies that it is presently engaging with to develop RACM.

Typical steps that previous SIPs have used⁶ to develop RACM⁷ include:

- Step 1 – Air Quality Technology Symposium;
- Step 2 – US EPA's List of Control Measures;
- Step 3 – RACT;
- Step 4 – Other Districts' (i.e., other ozone non-attainment areas in the country) Rules and Regulations;
- Step 5 – Other Districts' Control Measures; and
- Step 6 – Additional Studies and Analyses.

C2. California, San Diego County

Similarly, the San Diego county ozone non-attainment area required the development of an attainment plan in 2007.⁸ In developing that plan, the county identified stationary source control measures where another jurisdiction had more stringent rules, per the table excerpted below:

⁶ The list below is taken, just as an example, from the 2012 SCAQMD Air Quality Management Plan (AQMP).

⁷ [http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2012-air-quality-management-plan/final-2012-aqmp-\(february-2013\)/appendix-vi-final-2012.pdf](http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2012-air-quality-management-plan/final-2012-aqmp-(february-2013)/appendix-vi-final-2012.pdf).

⁸ <https://www.sdapcd.org/content/dam/sdc/apcd/PDF/Air%20Quality%20Planning/8-Hour-O3-Attain-Plan.pdf>

TABLE 3-6
Stationary Source Categories for Which More Stringent
Control Requirements Have Been Adopted by Another District

Control Measure	Other District Rule Number*	San Diego Rule Number	Estimated Emission Reduction Potential (Tons/Day)	Implementation Period (Years)	Pollutant
Low VOC Solvent Cleaning	SC 1122	67.6	1	1	VOC
Architectural Coatings	SC 1113	67.0	5	1	VOC
Automotive Refinishing	ARB SCM	67.20	1	2	VOC
Adhesive and Sealant Applications	SC 1168	67.21	1.4	1	VOC
Solvent Wipe Cleaning Operations	SC 1171	Various Rules	0.57	1	VOC
Wood Products Coating Operations	SC 1136	67.11-67.11.1	0.25	2	VOC
Graphic Arts	SC 1130	67.16	0.23	1	VOC
High Emitting Spray Booth Facilities	SC 1132	Various Coating Rules	0.15	2	VOC
Petroleum Storage Tanks	SC 1178	61.1	0.03	3	VOC
Mobile Transport Tanks Loading	SJV 4621	61.2	0.02	1	VOC
Food Products Manufacturing/Processing	SC 1131	No comparable rule	0.02	2	VOC
Polyester Resins Operations	SC 1162	67.12	0.02	1	VOC
Equipment Leaks	BA 8-18	Various Rules	<0.02	1	VOC
Aerospace Manufacturing Operations	SC 1124	67.9	<0.01	1	VOC
Industrial, Commercial, and Institutional Boilers	SJV 4306	69.2	0.1	2	NOx
Small Boilers and Large Commercial Water Heaters	SC 1146.1 & 1146.2	No comparable rule	0.3	25**	NOx
Residential Water Heaters	SC 1121	69.5	1.5	10**	NOx

*SC = South Coast air district; ARB = Air Resources Board; BA = Bay Area district; SJV = San Joaquin Valley district; SCM = Suggested Control Measure

**Emissions reductions would occur gradually, as new low-emitting units replace existing higher-emitting units at the end of their useful lives.

This would be a helpful exercise for the HGB since it would show that these measures can be implemented, having already been implemented elsewhere.

Similarly, RACM for transportation measures considered by San Diego county, including its location, climate, and other considerations includes those shown in the table below.

TABLE 3-7
Transportation Control Measures listed in Clean Air Act Section 108(f)
Implementation Status in San Diego County

Transportation Control Measures	Implemented	In 1982 SIP
1. Programs for improved public transit	Yes	Yes
2. Restriction of certain roads or lanes to, or construction of such roads or lanes for use by, passenger buses or high occupancy vehicles	Yes	
3. Employer-based transportation management plans, including incentives	Yes	Yes
4. Trip-reduction ordinances *Adopted in 1994, but rescinded in 1995 when federal and State laws were amended eliminating the mandate for such measures	No*	
5. Traffic flow improvement programs that achieve emission reductions	Yes	Yes
6. Fringe and transportation corridor parking facilities serving multiple occupancy vehicle programs or transit service	Yes	
7. Programs to limit or restrict vehicle use in downtown areas or other areas of emission concentration particularly during periods of peak use	No	
8. Programs for the provision of all forms of high-occupancy, shared-ride services	Yes	Yes
9. Programs to limit portions of road surfaces or certain sections of the metropolitan area to the use of non-motorized vehicles or pedestrian use, both as to time and place	Yes	
10. Programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas	Yes	Yes
11. Programs to control extended idling of vehicles	Yes	
12. Programs to reduce motor vehicle emissions, consistent with Title II, which are caused by extreme cold start conditions	Not Applicable	
13. Employer-sponsored programs to permit flexible work schedules	Yes	
14. Programs and ordinances to facilitate non-automobile travel, provision and utilization of mass transit, and to generally reduce the need for single-occupant vehicle travel, as part of transportation planning and development efforts of a locality, including programs and ordinances applicable to new shopping centers, special events, and other centers of vehicle activity	Yes	
15. Programs for new construction and major reconstructions of paths, tracks or areas solely for the use by pedestrian or other non-motorized means of transportation when economically feasible and in the public interest	Yes	
16. Program to encourage the voluntary removal from use and the marketplace of pre-1980 model year light duty vehicles and pre-1980 model light duty trucks	Yes	

C3. California, Sacramento

RACM for this ozone non-attainment area were developed by the Sacramento Area Council of Governments⁹ and not by just the air quality management district, highlighting the importance of multi-agency planning that is essential for development of RACM.

⁹ <https://www.sacog.org/sites/main/files/file-attachments/4-racm.pdf?1478627805>

Among others, the candidate RACM that were included in this ozone non-attainment area included:

- programs for improved use of public transit;
- programs to limit portions of road surfaces or certain sections of the metropolitan area to the use of non-motorized vehicles or pedestrian use, both as to time and place;
- programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas;
- programs to control extended idling of vehicles;
- programs to reduce motor vehicle emissions, consistent with Title II of the Clean Air Act, which are caused by extreme cold start conditions;
- employer-sponsored programs to permit flexible work schedules;
- programs and ordinances to facilitate non-automobile travel, provision and utilization of mass transit, and to generally reduce the need for single-occupant vehicle travel, as part of transportation planning and development efforts of a locality, including programs and ordinances applicable to new shopping centers, special events, and other centers of vehicle activity;
- programs for new construction and major reconstruction of paths, tracks, or areas solely for the use by pedestrian or other non-motorized means of transportation, when economically feasible and in the public interest;
- programs to encourage the voluntary removal from use and the marketplace of pre-1980 model year light duty vehicles and pre-1980 model light duty trucks;
- restriction of certain roads or lanes to, or construction of such roads or lanes for use by, passenger buses or high occupancy vehicles;
- employer-based transportation management plans, including incentives;
- trip-reduction ordinances;
- traffic flow improvement programs that achieve emission reductions;
- fringe and transportation corridor parking facilities, serving multiple occupancy vehicle programs or transit service;
- programs to limit or restrict vehicle use in downtown areas or other areas of emission concentration, particularly during periods of peak use; and
- Programs for the provision of all forms of high-occupancy, including shared-ride services.

In developing these types of control measures, the Sacramento Area Council of Governments reviewed previous SIPs developed by all prior ozone non-attainment areas (including the HGB SIP of 2010) such as those listed in the table below. Multiple additional measures were sought through a public outreach process including multiple meetings that were held throughout the region.

Table 3-1 1997 8-Hour Ozone Standard Nonattainment Areas Reviewed for RACM		
Region	Designation	Applicable SIP
South Coast, CA (including Riverside and W. Mojave Desert)	Severe/ Extreme	Air Quality Management Plan, South Coast Air Quality Management District, 2012
San Joaquin Valley, CA	Extreme	San Joaquin Valley 2007 Ozone Plan
Ventura, CA	Serious	Ventura County Air Quality Management Plan, 2007
Washington DC	Moderate	State Implementation Plan for 8-Hour Ozone Standard for the Washington DC-DV-MA Nonattainment Area, 2007
Baltimore, MD	Serious	Baltimore Serious Nonattainment Area 0.08 ppm 8-Hour Ozone Implementation Plan, 2013
Maricopa, Arizona	Moderate	MAG Eight-Hour Ozone Resignation Request and Maintenance Plan for the Maricopa Nonattainment Area, February, 2009
Denver-Boulder, Colorado	Marginal	Denver Metro Area & North Front Range Ozone Action Plan Including Revisions to the State Implementation Plan, 2008
Boston-Manchester, NH	Moderate	Revision to the New Hampshire State Implementation Plan Request for Redesignation of the Boston-Manchester-Portsmouth (SE), NH 8-Hour Ozone (1997 Standard) Nonattainment Area, 2012
Philadelphia-Wilmington, PA	Moderate	State Implementation Plan Revision: Attainment Demonstration and Base Year Inventory Bucks, Chester, Delaware, Montgomery and Philadelphia Counties located in the Philadelphia-Wilmington-Atlantic City, PA-NJ-DE Eight-Hour Ozone Nonattainment Area, 2007
Houston-Galveston, TX	Severe	Houston-Galveston-Brazoria Reasonable Further Progress State Implementation Plan Revision for the 1997 Eight-Hour Ozone Standard, 2010
Dallas-Fort Worth, TX	Serious	Dallas-Fort Worth 1997 Eight-Hour Ozone Standard Nonattainment Area Plan, 2011
New York-New Jersey, NY	Moderate	New Jersey Department of Environmental Protection State Implementation Plan (SIP) Revision for the Attainment and Maintenance of Ozone NAAQS, 2007

Examples of candidate Transportation Control Measures (TCMs) considered by Sacramento included those in the table excerpted below.

Table 3-2 Adopted California Statewide and Regional Transportation Control Measures		
Transportation Control Measure	Implementing Agency	Implemented in SACOG?
Urban Forest Air Quality Development Program	SMAQMD	Yes
California Diesel Fuel Regulation	ARB	Yes
On-Road Heavy-Duty Diesel Vehicles Regulation	ARB	Yes
California Reformulated Gasoline	ARB	Yes
Advanced Clean Cars (Low Emission Vehicle Standards III)	ARB	Yes
Transportation Refrigeration Unit ATCM	ARB	Yes
Light Duty Early Retirement	SMAQMD	Yes
School Bus Idling ATCM	ARB	Yes
Fleet Rule for Transit Agencies	ARB	Yes
Drayage Truck Regulation	ARB	Yes
Hybrid Truck and Bus Voucher Incentive Program	ARB	Yes
Clean Vehicle Rebate Project	ARB	Yes
Solid Waste Collection Vehicle Rule	ARB	Yes
Heavy-Duty Vehicle Inspection Program	ARB/BAR	Yes
Periodic Smoke Inspection Program	ARB/BAR	Yes
Spare the Air Program	SMAQMD	Yes
SECAT Program	SMAQMD	Yes
School Bus Retrofit Program	ARB/ SMAQMD	Yes
Goods Movement Program/Proposition 1B	ARB/CTC/ SMAQMD	Yes
Portable Diesel Engines ATCM	ARB	Yes
In-Use Off-Road Diesel Equipment Regulation	ARB	Yes
Railyard Emission Reduction and Fuel Use Program	ARB/ SMAQMD	Yes
In-Use Off-Road Mobile Agricultural Equipment Regulation	ARB	Yes
Cargo Handling Equipment Regulation	ARB	Yes
Ocean-Going Vessels and Commercial Harborcraft Regulations	ARB	Yes
Airport Ground Support Equipment	ARB/ SMAQMD	Yes

Table 3-2 Adopted California Statewide and Regional Transportation Control Measures		
Transportation Control Measure	Implementing Agency	Implemented in SACOG?
Off-Road Large Spark-Ignition Equipment Regulation	ARB	Yes
Off-Road CI Incentive Program	SMAQMD	Yes
Zero-Emission Lawn and Garden Equipment	SMAQMD	Yes

Based on the above, the specific TCMs that were recommended as well as those that were rejected, for the reasons stated are provided in the series of excerpted tables below.

Table 4-1 Transportation Control Measures for Consideration in Sacramento Area Council of Governments RACM Analysis				
TCM #	TCM	Description	Implemented in Sacramento?	Justification for Not Implementing
<i>i. Improved Public Transit</i>				
1.1	Public transit facility improvements/operating assistance	Construct and/or improve bus and rail terminals, stations, and maintenance facilities	Yes	NA
1.2	Expansion of public transportation services	Provide additional rail and bus service	Yes	NA
1.3	Light rail and other transit access to airports	Expand rail and bus service to airports	Yes	
1.4	Free transit during special events	Provide free alternative transportation to special events	No	Not economically feasible; will not advance attainment
1.5	Accelerated bus retrofit	Accelerate installation of retrofits on diesel-powered buses	Yes	
1.6	Transit service improvement including parking management	Install park-and-ride facilities near transit stations, improve bicycle and pedestrian access, install lights and real-time information systems	Yes	
1.7	Clean fuel buses	Purchase of alternative fuel buses	Yes	
1.8	Free rail-to-bus/bus-to-rail transfers	Vanpool and shuttle services at non-intermodal centers	No	Not economically feasible; will not advance attainment
1.9	Bus queue jumps	Installing special lanes and signals to allow transit to get ahead in traffic	No	No implementation authority
1.10	Transit voucher programs	Provide transit vouchers to certain population groups (e.g., elderly, minorities, homeless) to reduce transit costs	Yes	

Table 4-1 Transportation Control Measures for Consideration in Sacramento Area Council of Governments RACM Analysis				
TCM #	TCM	Description	Implemented in Sacramento?	Justification for Not Implementing
1.11	Intermodal centers	Improve travel connection of various transportation modes	Yes	
	<i>ii. Limit Access to Roads in Metro Area to Non-Vehicular Use</i>			
2.1	Establish Auto Free Zones and Pedestrian Malls	Self-explanatory	Yes	
2.2	Close streets for special events for use by bikes and pedestrians when/where appropriate	Self-explanatory	Yes	
2.3	Close roads for use of non-motorized traffic	Convert roadways to bike/pedestrian paths	No	Not economically feasible; will not advance attainment
2.4	Bus and carpool lanes on arterials	Provide fixed lanes for buses and carpools on arterial streets	No	No implementation authority
2.5	Express toll lanes/HOT lanes	Construct toll lanes to reduce congestion	No	No implementation authority
	<i>iii. Bicycle Facilities</i>			
3.1	Regional bike parking	Construct bike parking facilities at transit centers	Yes	
3.2	Free bikes	Provide free bikes to transit users	No	Not economically feasible
3.3	Bike racks on buses	South Coast, San Joaquin Valley, Washington DC	Yes	
3.4	Mandatory bike racks for worksites	Mandate that employers install bike racks at businesses	No	No implementation authority

Table 4-1 Transportation Control Measures for Consideration in Sacramento Area Council of Governments RACM Analysis				
TCM #	TCM	Description	Implemented in Sacramento?	Justification for Not Implementing
3.5	Bicycle facility improvements	Construct bike lanes, off-street bikeways, multi-use trails, route lighting, and street signage	Yes	
	<i>iv. Control Extended Idling of Vehicles</i>			
4.1	Truck stop electrification	Self-explanatory	No	Not economically feasible
4.2	Idle reduction	Prohibit idling at schools	Yes; Implemented through Safe Routes to School	
4.3	Reduce idling at drive-throughs, parking lots, and in traffic	Self-explanatory	No	Will not advance attainment; not economically feasible nor easily enforceable; difficult to quantify
	<i>v. Reduce Extreme Cold-Start Emissions</i>			
5.0	Not Applicable			
	<i>vi. Employer-Sponsored Flexible Work Schedules</i>			
6.1	Compressed work weeks/flexible work schedules	Encourage employers to implement alternate work schedules to reduce travel	Yes; Implemented through TDM Funding Program	
6.2	Telecommuting	Encourage employers to allow employees to work from home	Yes; Implemented through TDM Funding Program	

Table 4-1 Transportation Control Measures for Consideration in Sacramento Area Council of Governments RACM Analysis				
TCM #	TCM	Description	Implemented in Sacramento?	Justification for Not Implementing
<i>vii. Planning and Development Efforts to Reduce SOV Travel</i>				
7.1	Traffic reduction strategies	Public awareness and education programs to encourage carpooling and the use of public transportation	Yes	
7.2	Pay-As-You-Drive Insurance	Charge insurance fees based on driving patterns	No	No implementation authority; would require changes to state law
7.3	Bike share program	Implement bike share system and provide planning efforts for potential regional expansion of a Bike Share pilot program	Yes	
7.4	Spare the air program	Voluntary no-drive days during high ozone season	Yes	
7.5	Blueprint vision	Implementation and technical assistance with programs to encourage land-use patterns and development near transit centers that decrease urban sprawl and reduce overall travel	Yes; implemented through Sustainable Communities Strategy	
7.6	Development of rural-urban connections strategy and create best practices toolkit	Develop best practices to promote environmentally sustainable land use in economically viable rural areas for land owners and local governments	Yes	
<i>viii. Construction/Reconstruction of Paths for Non-Motorized Use</i>				
8.1	Bicycle/pedestrian overpasses	Construct bike and pedestrian bridges and/or tunnels over major highways	Yes	
8.2	Bicycle/pedestrian facilities	Construct sidewalks, curbs, gutters, landscaping, lighting for bike and pedestrian pathways	Yes	

Table 4-1 Transportation Control Measures for Consideration in Sacramento Area Council of Governments RACM Analysis				
TCM #	TCM	Description	Implemented in Sacramento?	Justification for Not Implementing
<i>ix. Pre-1980 Model-Year Vehicle Scrappage</i>				
9.1	Accelerate retirements of trucks/buses	Replace high mileage trucks and buses	Yes	
<i>x. Transit-Only or High Occupancy Vehicle Lanes</i>				
10.1	Express busways/dedicated bus lanes	Construct bus-only lanes	No	No implementation authority
10.2	HOV lanes	Construct additional high occupancy vehicle (HOV) lanes; allow use by alternative fuel vehicles	Yes	
<i>xi. Employer-Based Plans and Incentives</i>				
11.1	Satellite work centers	Employers open new remote offices near employees' residences	No	No implementation authority
11.2	Proximity job swap	Encourage employers to give incentives to employees to move close to worksite	Yes; Implemented through TDM Funding Program	
11.3	Bike to work month	Encourage biking to work during April bike awareness month	Yes	
11.4	Preferential parking for carpools and vanpools	Encourage employers to provide preferential parking for carpools and vanpools to reduce SOV trips	Yes; Implemented through TDM Funding Program	
11.5	Promote business closure on high ozone days	Self-explanatory	No	Not economically feasible

Table 4-1 Transportation Control Measures for Consideration in Sacramento Area Council of Governments RACM Analysis				
TCM #	TCM	Description	Implemented in Sacramento?	Justification for Not Implementing
11.6	Purchase vans for vanpools	Encourage employers to purchase vans for employee commute travel	Yes; Implemented through TDM Funding Program	
11.7	Income tax credit to telecommuters	Self-explanatory	No	No implementation authority
11.8	Employee parking fees/parking study	Study to gauge benefits from increased parking fees at employment centers	Yes; Implemented through TDM Funding Program	
	xii. Trip-Reduction Ordinances			
12.0	The state law prohibits mandatory employer-based trip reduction programs (California Health & Safety Code §40717.6). Instead, SACOG is involved in and provides funds for educational and outreach programs to educate employers of the environmental benefits of a variety of employer-based trip reduction options through the Transportation Demand Measure Funding Program.			
	iii. Traffic Flow Improvements			
13.1	Intelligent Transportation Systems	Install ITS on freeways and arterials to increase traffic operations efficiency	Yes	
13.2	Roundabouts at low traffic intersections	Construct roundabouts and remove stop sign as appropriate	Yes	
13.3	Speed limit reduction	Reduce freeway speed limit to 55mph	No	No implementation authority
13.4	One-way streets	Redesignate streets as one-way to improve traffic	Yes	
13.5	Intersection Improvements	Installation of turn lanes, curbs, traffic signals	Yes	

Table 4-1 Transportation Control Measures for Consideration in Sacramento Area Council of Governments RACM Analysis				
TCM #	TCM	Description	Implemented in Sacramento?	Justification for Not Implementing
13.6	Eco-driving educational program	Education program to improve vehicle efficiency by improving driving habits	No	Minimal air quality benefits; will not advance attainment; difficult to quantify
13.7	Ramp-Metering	Ventura, South Coast, San Joaquin Valley	Yes	
13.8	Land-use strategies	South Coast, San Joaquin Valley	Yes	
13.9	Real-Time Transit Information Systems	Provide real-time information to transit riders to increase ridership and system efficiency	Yes	
13.10	Freeway Service Patrol	Emergency services to clean up motor accidents in a timely fashion	Yes	
13.11	Traffic Signal Synchronization/Traffic Signal Improvements	Install synchronized traffic signals, median dividers, turn lanes, and grade separations	Yes	
13.12	Truck only lanes	Construct or convert lanes for use by heavy-duty trucks only	No	No implementation authority
<i>xiv. Fringe and Transportation Corridor Parking Facilities for Vanpools/Transit</i>				
14.1	Preferential parking for vanpools, carpools	Self-explanatory	Yes	
14.2	Free parking near transit facilities	Self-explanatory	Yes	
14.3	Park-and-ride facilities	Construct park-and-ride lots near transit centers and transfer stations	Yes	

Table 4-1 Transportation Control Measures for Consideration in Sacramento Area Council of Governments RACM Analysis				
TCM #	TCM	Description	Implemented in Sacramento?	Justification for Not Implementing
14.4	Rail grade separation	Adjust road surface heights in line with rail to improve traffic flow	Yes	
<i>xv. Limit or Restrict Vehicle Use in Downtown Areas</i>				
15.1	Removal of on-street parking	Self-explanatory	No	No implementation authority
15.2	Graduate parking fees	Charge the most for parking in central business districts	Yes	
15.3	Increase parking fees	Self-explanatory	Yes	
15.4	Transit-oriented/sustainable development	Encourage land-use planning that promote development near transit centers	Yes; implemented through Sustainable Communities Strategy	
15.5	Reversible lanes	Change direction of travel during special events or during congestion periods	No	Minimal air quality benefits; not advance attainment; difficult to quantify
15.6	Off-peak goods movement	Require trucks to operate during off-peak hours	No	No implementation authority
15.7	Encourage students to bike or walk to school	Self-explanatory	Yes; implemented though Safe Routes to School	
15.8	Central business district vehicle restrictions	Restrict vehicle use in downtown areas	No	Minimal air quality benefits; will not advance attainment; difficult to quantify

Table 4-1 Transportation Control Measures for Consideration in Sacramento Area Council of Governments RACM Analysis				
TCM #	TCM	Description	Implemented in Sacramento?	Justification for Not Implementing
<i>xvi. High-Occupancy and Ridesharing Programs</i>				
16.1	Rideshare program	Provide rideshare service	Yes	
16.2	Transit voucher program	Provide transit vouchers to certain population groups (elderly, minorities, homeless) to reduce transit costs	Yes	
16.3	Vanpool program	Provide vanpool service for certain communities; purchase new vans	Yes	
16.4	Rideshare information systems and marketing	Self-explanatory	Yes	
16.5	"Guaranteed Ride Home" program	Provide vanpool service in emergency situations to transit riders	Yes	
16.6	Station cars	Provide vanpool service from transit stations to parking lots	Yes	
16.7	Cash incentives for carpoolers	Self-explanatory	No	No implementation authority
16.8	Paratransit service	Self-explanatory	Yes	
OTHER				
17.1	Divert trucks from nonattainment areas	Require pass-through trucks to choose routes away from Sacramento region	No	No implementation authority
17.2	Programs to encourage goods movement by rail	Self-explanatory	Yes	

Table 4-1 Transportation Control Measures for Consideration in Sacramento Area Council of Governments RACM Analysis				
TCM #	TCM	Description	Implemented in Sacramento?	Justification for Not Implementing
17.3	Buy parking lots and convert to land use	Self-explanatory	Yes; implemented through Sustainable Communities Strategy	

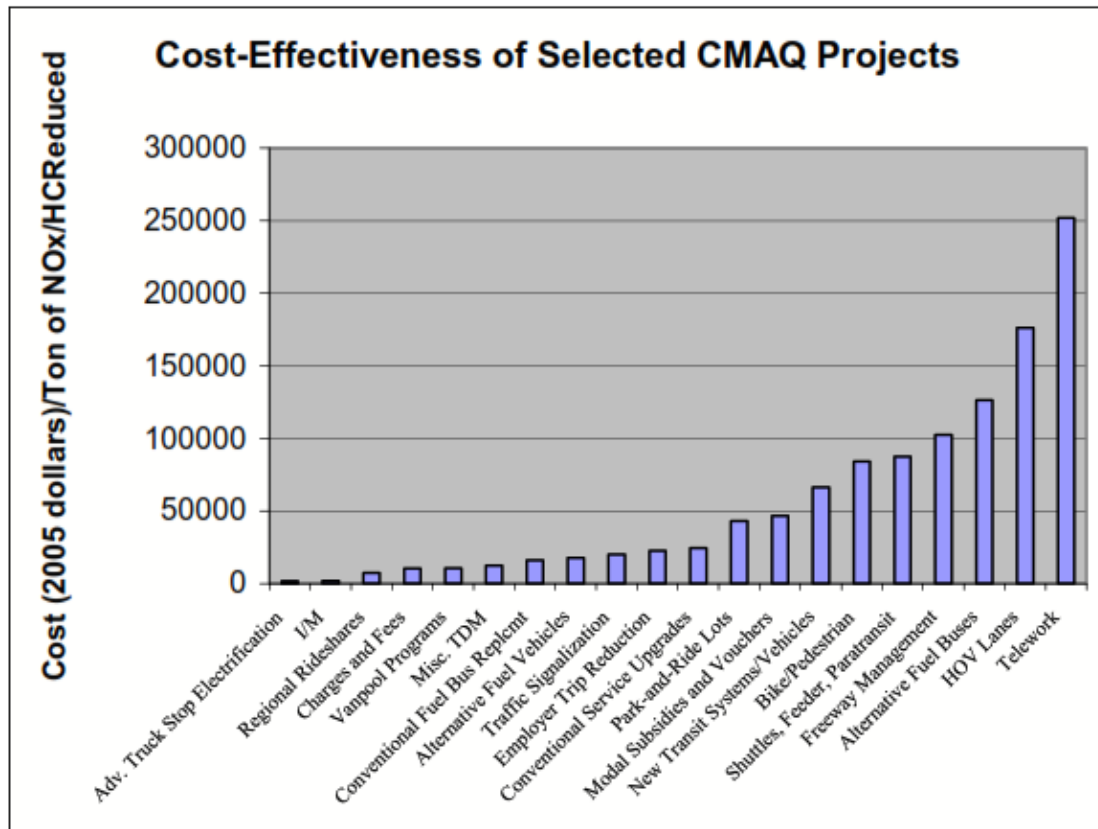
C4. California, San Joaquin Valley

San Joaquin Valley, an ozone non-attainment area in central California went through an extensive RACM development process in the mid-2000s¹⁰ including by the local air quality management agency and numerous metropolitan planning organizations. Specifically, for transportation measures, the RACM included numerous congestion mitigation and air quality (CMAQ) options. The excerpted figure below shows some of the types of CMAQ projects and the associated cost-effectiveness ranges considered.

¹⁰

https://www.valleyair.org/Air_Quality_Plans/docs/AQ_Ozone_2007_Adopted/20%20Appendix%20C%20April%202007.pdf

Table C-1 Cost-Effectiveness of Selected CMAQ Projects



Source: TRB Special Report 264—The Congestion Mitigation and Air Quality Improvement Program: Assessing 10 Years of Experience, Chapter 4.

The specific lists of RACM candidates are shown in the excerpted tables below.

C.6 List of Control Measures for Consideration

Number	Measure Title	Source
1	Programs For Improved Public Transit	
	Regional Express Bus Program	Suggested List
	Transit Access to Airports	Suggested List
	Study Benefits of Bus (Particulate Trap) Retrofit Program	Suggested List
	Mass Transit Alternatives	Suggested List
	Expansion of Public Transportation Systems	Suggested List, Town Hall Meetings, LADCO
	Transit Service Improvements in Combination with Park-and-Ride Lots and Parking Management	Suggested List
	Free transit during special events	Suggested List, Town Hall Meetings
	Require that government employees use transit for home to work trips, expand transit, and encourage large businesses to promote transit use	Suggested List, Town Hall Meetings
	Increase parking at transit centers or stops	Suggested List
	Eliminate parking zoning near transit	LGCM Template
1 - Extras	Make small dial-a-ride systems free	Suggested List
	Regional Express across county lines	Suggested List
	Consolidation of Public Transit Operators	Suggested List
	Transit Stop Improvements	Suggested List
	Productivity Improvements	Suggested List, Town Hall Meetings, BAAQMD
	Ridership Targets	Suggested List
	Free transit / more incentives on Spare the Air days	Town Hall Meetings
	Create and subsidize light rail system w/in cities	Town Hall Meetings, BAAQMD
	Create and subsidize high speed rail throughout valley	Town Hall Meetings, BAAQMD
	Queue jumps for buses	MWCOG
	Personalized rapid transit; subscription bus service, Business First enhanced bus	HGAC
2	Restriction Of Certain Roads Or Lanes To, Or Construction Of Such Roads Or Lanes For Use By, Passenger Buses Or High Occupancy	
	Update High Occupancy Vehicle (HOV) Lane Master Plan	LGCM Template
	Study Effects of High Speed Freeway Travel	LGCM Template
	Fixed Lanes for Buses and Carpools on Arterials	Suggested List, BAAQMD
	Expand number of freeway miles available, allow use by alternative fuel vehicles, changes to HOV lane requirements and hours	LGCM Template, LADCO
2-Extras	SOV using peak pricing to managed lanes and transit stations	HGAC
3	Employer-Based Transportation Management Plans, Including	
	Commute Solutions	Suggested List
	Parking Cash-Out	Suggested List, MWCOG
	Employer Rideshare Program Incentives	Suggested List, LADCO, EPA, MWCOG
	Implement Parking Charge Incentive Program	LGCM Template
	Preferential Parking for Carpools and Vanpools	Suggested List, HGAC
	Employee Parking Fees	Suggested List, MCOG
	Merchant Transportation Incentives	LGCM Template, SCAQMD
	Purchase vans for vanpools	Suggested List, HGAC
	Encourage merchants and employers to subsidize the cost of transit for employees	Suggested List
	Off-days" for ozone alerts just like sick days	LGCM Template
	Pay for in-house meals on ozone action days	LGCM Template, SCAQMD
	(Promote) Voluntary business closures on ozone action days	Suggested List, LADCO
	Close government offices on Ozone action days to serve as an example	LGCM Template, SCAQMD, MWCOG
	Mandatory (or Promote) compressed work weeks	Suggested List, HGAC
	Extend parking cash-out rule to more employers	Suggested List

3 - Extras	Incentives for vanpool programs	Town Hall Meetings
4	Trip Reduction Ordinance	LGCM Template
4-extra	Support voluntary employer based trip reduction programs	BAAQMD
5	Traffic Flow Improvement Programs That Achieve Emission Reductions	
	Develop Intelligent Transportation Systems	Suggested List
	Coordinate Traffic Signal Systems	Suggested List, Town Hall Meetings
	Reduce Traffic Congestion at Major Intersections	Suggested List
	Site-Specific Transportation Control Measures	Suggested List, MWCOG
	Removal of On-Street Parking	Suggested List
	Reversible Lanes	Suggested List
	One-Way Streets	Suggested List
	On-Street Parking Restrictions	Suggested List
	Bus Pullouts in Curbs for Passenger Loading	Suggested List
	Additional Freeway Service Patrol	Suggested List
	Consider coordinating scheduling of arterial and highway maintenance to exclude ozone action days if the maintenance activities require lane reductions on heavily utilized arterials and highways	Suggested List
	Re-routing of trucks on ozone days	LGCM Template, HGAC
	Fewer stop signs (remove unwarranted and "political" stop signs and signals)	Suggested List
	Ban left turns	Suggested List, SCAQMD
	Changeable lane assignments	Suggested List
	Adaptive traffic signals and signal timing	Suggested List, LADCO
	Freeway bottleneck improvements (add lanes, construct shoulders, etc.)	Suggested List
	Minimize impact of construction on traveling public. Have contractors pay when lanes are closed as an incentive to keep lanes open	Suggested List
	Internet provided road and route information	Suggested List, LADCO
	Regional route marking systems to encourage underutilized capacity	Suggested List
	Congestion management field team to clear incidents	LGCM Template, LADCO
	Use dynamic message signs to direct/smooth speeds during incidents	Suggested List, LADCO
	Get real-time traffic information to trucking centers and rental car agencies	LGCM Template
	55 mph speed limit during ozone season	LGCM Template, LADCO, EPA
	Require 40 mph speed limit on all facilities	LGCM Template
	Require lower speeds during peak periods	LGCM Template, Town Hall Meetings
5 - Extras	Place vehicle sensors further away from intersections	Suggested List
	User fees on I-5 and highway 99	Town Hall Meetings
	Value pricing for traffic lanes	MWCOG
	Video monitor system deployment	LADCO
	Fee based VMT	EPA
	Pay-As-You-Drive insurance (per mile)	HGAC
6	Fringe And Transportation Corridor Parking Facilities Serving Multiple Occupancy Vehicle Programs Or Transit Service	
	Park and Ride Lots	Suggested List, EPA
	Park and Ride lots serving perimeter counties	Suggested List
7	Programs To Limit Or Restrict Vehicle Use In Downtown Areas Or Other Areas Of Emission Concentration Particularly During Periods Of Peak Use. See also Measure 14	
	Off-Peak Goods Movement	LGCM Template
	Truck Restrictions During Peak Periods	LGCM Template
	Involve school districts to encourage walking to school	Suggested List, Town Hall Meetings
	Adjust school hours so they do not coincide with peak traffic periods and Ozone seasons	Suggested List

	Area-wide tax for parking	LGCM Template, MWCOG
	Increase parking fees	LGCM Template, SCAQMD
	Graduated pricing starting with highest in CBD	LGCM Template
	Buy parking lots and convert to other land use	LGCM Template
	Limit the number of parking spaces at commercial airlines to support mass transit	LGCM Template
	No CBD vehicles unless LEV or alt fuel or electric	LGCM Template
	Auto restricted zones	Suggested List
	Incentives to increase density around transit centers	Suggested List
	Land use/air quality guidelines	Suggested List, Town Hall Meetings
	Incentives for cities with good development practices	Suggested List
	Cash incentives to foster jobs/housing balance	Suggested List, Town Hall Meetings
	Trip reduction oriented development	Suggested List
	Transit oriented development	Suggested List
	Sustainable development	Suggested List
7 - Extras		
	Establishment of Urban Growth Boundaries	Suggested List, ISSRC
	Shortened government work days during ozone alerts	Suggested List
	Distribute special parking passes for carpoolers	Suggested List
	Outreach program encouraging reduced trips during warmest part of the day	Suggested List
	Encourage Infill Development	Suggested List, Town Hall Meetings
	Create walkable communities	Town Hall Meetings
8	Programs For The Provision Of All Forms Of High-Occupancy, Shared-Ride Services (see also measures 2 and 3)	
	Financial Incentives, Including Zero Bus Fares	Suggested List
	Internet ridematching services	Suggested List
	Preferential parking for carpoolers	Suggested List
	Credits and incentives for carpoolers	Suggested List, BAAQMD
	(Encourage) Employers provide vehicles to carpoolers for running errands or emergencies	Suggested List
	Subscription Services	Suggested List
8 - Extras		
	Shared LEV Vehicles at Work Sites	Suggested List
9	Programs To Limit Portions Of Road Surfaces Or Certain Sections Of The Metropolitan Area To The Use Of Non-Motorized Vehicles Or Pedestrian Use, Both As To Time And Place (see also measure 10).	
	Establish Auto Free Zones and Pedestrian Malls	Suggested List
	Encouragement of Pedestrian Travel	Suggested List, Town Hall Meetings
	Bicycle/Pedestrian Program	Suggested List, LADCO, EPA, BAAQMD
	Close certain roads for use by non-motorized traffic	Suggested List, Town Hall Meetings
	Encouragement of Bicycle Travel	Suggested List, Town Hall Meetings
	Free Bikes	LGCM Template, SCAQMD
	Cash Rebates for Bikes	Suggested List
	Close streets for special events for use by bikes and pedestrians	Suggested List
	Use condemned dirt roads for bike trails	Suggested List
	Provide funding so volunteers do not have to pay the cost of trail creation and maintenance	Suggested List
9 - Extras		
	Safe Routes to School	Suggested List
10	Programs For Secure Bicycle Storage Facilities And Other Facilities, Including Bicycle Lanes, For The Convenience And Protection Of Bicyclists In Both Public And Private Areas	

10	Programs For Secure Bicycle Storage Facilities And Other Facilities, Including Bicycle Lanes, For The Convenience And Protection Of Bicyclists, In Both Public And Private Areas	
	Region-wide mandatory bike racks at work sites	Suggested List, Town Hall Meetings
	Bike Racks on Buses	Suggested List
	Regional Bike Parking Ordinance for all new construction	Suggested List
10 - Extras	Development of Bicycle Travel Facilities	Suggested List, Town Hall Meetings
	Expedite Bicycle Projects from RTP	Suggested List
	Provide Bike/Pedestrian facilities safety patrols	Suggested List
	Require inclusion of bicycle lanes on state or federally funded thoroughfare projects.	Suggested List
	Require Inclusion of Paved Shoulders Adequate for Bicycle Use on State or Federally Funded Reconstruction or Widening of Federal Major Collectors or Greater	Suggested List
11	Programs To Control Extended Idling Of Vehicles	
	Limit Excessive Car Dealership Vehicle Starts	LGCM Template
	Encourage Limitations on Vehicle Idling	Suggested List, LADCO, EPA
	Turn off engines while stalled in traffic	Suggested List
	Outlaw idling in parking lots	LGCM Template
	Reduced idling at drive-throughs. Shut windows down	LGCM Template, Town Hall Meetings, EPA
	Promote use of Pony engines	Suggested List
	Idle restrictions at airport curbsides	LGCM Template
11 - Extras	Ban cruising during Ozone Alert Days	Suggested List
	Discourage drive-thrus in new development	Suggested List
	Make drive-throughs pay a fee	Town Hall Meetings
	Truck stop electrification	LADCO, EPA
12	Program To Reduce Motor Vehicle Emissions, Consistent With Title II, Which Are Caused By Extreme Cold Start Conditions	
13	Employer-Sponsored Programs To Permit Flexible Work Schedules. See also measure 3.	
	Alternative Work Schedules	Suggested List
	Modifications of Work Schedules	Suggested List
	Telecommunications-Telecommuting	Suggested List, LADCO, MWCOG
	Telecommunications-Teleconferencing	Suggested List
13 - Extras	Internet commerce and education	Suggested List
	Encourage employers to provide money to employees for home computer purchase so employees can work from home.	Suggested List
14	Programs And Ordinances To Facilitate Non-Automobile Travel, Provision And Utilization Of Mass Transit, And To Generally Reduce The Need For Single-Occupant Vehicle Travel, As Part Of Transportation Planning And Development Efforts Of A Locality, Including Programs And Ordinances Applicable To New Shopping Centers, Special Events, And Other Centers Of Vehicle Activity	
	Areawide Public Awareness Programs	Suggested List, Town Hall Meetings, LADCO
	Special Event Controls	Suggested List
	Land Use/Development Alternatives	Suggested List, LADCO, BAAQMD
	Voluntary No Drive Day Programs	Suggested List, Town Hall Meetings
	Evaluation of the Air Quality Impacts of New Development and Mitigation of Adverse Impacts	Suggested List
	Transportation for Livable Communities (TLC)/Housing Incentive Program	Suggested List

	Areawide Public Awareness Programs	Suggested List, Town Hall Meetings, LADCO
	Special Event Controls	Suggested List
	Land Use/Development Alternatives	Suggested List, LADCO, BAAQMD
	Voluntary No Drive Day Programs	Suggested List, Town Hall Meetings
	Evaluation of the Air Quality Impacts of New Development and Mitigation of Adverse Impacts	Suggested List
	Transportation for Livable Communities (TLC)/Housing Incentive Program	Suggested List
	Incentives to increase density around transit centers	Suggested List
	Incentives for cities with good development practices	Suggested List
14 - Extras	COG comments on land use planning decisions that affect transportation and air quality issues	Suggested List
	Business, Industry and Governmental Outreach Program	Suggested List, MWCOG
	Public Education Program	Suggested List, Town Hall Meetings, LADCO
	Charge businesses for every parking space	Town Hall Meetings
	Government planning require fewer parking spaces	Town Hall Meetings
	Youth transportation program	BAAQMD
	Promote traffic calming	BAAQMD
15	Programs For New Construction And Major Reconstructions Of Paths, Tracks Or Areas Solely For The Use By Pedestrian Or Other Non-Motorized Means Of Transportation When Economically Feasible And In The Public Interest. For Purposes Of This Clause, The Administrator Shall Also Consult With The Secretary Of The Interior	
	Encouragement of Pedestrian Travel	Suggested List
	Pedestrian and Bicycle Overpasses Where Safety Dictates	Suggested List, Town Hall Meetings
16	Program To Encourage The Voluntary Removal From Use And The Marketplace Of Pre-1980 Model Year Light Duty Vehicles And Pre-1980 Model Light Duty Trucks	
	Counties assess ten dollar license plate fee to fund repair/replacement program for high-emitters	LGCM Template
	Buy vehicles older than 1975	LGCM Template
	Demolish impounded vehicles that are high emitters	LGCM Template
	Do whatever is necessary to allow cities to remove the engines of high emitting vehicles (pre-1980) that are abandoned and to be auctioned	LGCM Template
	Accelerated retirement program	LGCM Template
17	Additional Programs Not Listed In Section 108f	
	Enforcement of Traffic, Parking, and Air Pollution Regulations	Suggested List
	Raise the driving age	LGCM Template
	License plates determine access to vehicle use (odd/even driving days)	LGCM Template
	Discounts for paying bills by mail	LGCM Template
	Waive sales taxes for internet purchases	LGCM Template
	Satellite campuses	Suggested List
	Charge more for higher emission fuels	Suggested List
	Raise fuel prices during ozone season	LGCM Template
	Vehicle tax for two and more vehicles per household	LGCM Template
	Incentives to high HOV users (track and waive registration fees)	LGCM Template
	Sell cheap lottery tickets to people who buy gas in the afternoon as opposed to the morning	LGCM Template
	Use scout troops, churches, public figures to carry message of air pollution problems	Suggested List
	Deny registration to vehicles with repeated emission failures	LGCM Template

	Cool cities approach to reduce heat build-up	Suggested List
17 - Extras		
	Contact other areas that have been subject to EPA sanctions to determine best ways to implement new air quality measures	Suggested List
	Alternative fuel outreach program	Suggested List
	Encourage the purchase and use of alternative, cleaner vehicles	Suggested List
	Programs to reduce emissions or accelerate retirement of high emitting vehicles	EPA
1994	Existing Local Government Control Measures	
	Traffic Flow Improvements	Suggested List
	Public Transit	Suggested List
	Rideshare Programs	Suggested List
	Bicycle Programs	Suggested List
	Alternative Fuels Program	Suggested List
ARB	Parking Cash-Out	Suggested List
EPA	Commute Benefits	Suggested List
District	Heavy Duty Engine Emission Reduction Incentive Program	Suggested List
Additional		
	Park and Ride Fringe Parking	Suggested List
	Pedestrian facilities	Suggested List
	Encourage Use of Alternative Energy Sources	Suggested List
	Develop Programs that Encourage Good Movements by Rail	Suggested List, EPA
	Promote Use of Cleaner Lawn and Garden Equipment such as Lower-Emission Four-Stroke and Electric-Powered Equipment	Suggested List
	Encourage service organizations to promote clean air practices	Suggested List

C5. New Jersey

For the 8-hour ozone RACM analysis, the New Jersey Department of Transportation (NJDOT) (and not the air quality agency) conducted the RACM analysis for TCMs.¹¹

Specifically, with regards to economic feasibility (since the TCEQ solicitation asked for cost information), the following considerations were used (note that the dollars are not current dollars but as used when New Jersey did the analysis circa mid-2000 or thereabouts):

- Control measures with cost-effectiveness ratios below the local RACT amount were considered to be *presumptively* feasible;
- Control measures with cost-effectiveness ratios above the RACT level but below \$5,000/ton were considered to be *probably* feasible;
- Control measures with ratios between \$5,000/ton and \$25,000 or \$50,000/ton (the values cited by the Transportation Research Board (TRB) for Congestion Mitigation and Air Quality program (CMAQ)-funded TCMs) were considered as “*may*” be economically feasible but required further analysis; and
- Control measures with ratios above \$25,000 or \$50,000/ton were considered to be “*probably not*” economically feasible

¹¹ <https://www.nj.gov/dep/baqp/8hrsip/Chapter%207%20-%20RACM.pdf>

For measures that do not cause “substantial widespread and long-term adverse impacts” and measures that are not “absurd, unenforceable, or impracticable” the New Jersey analysis used the following evaluation criteria:

- Considerations such as disruption of fuel supplies, discrimination among various population groups, critical reduction in mobility, and other similar concerns.
- Must be legally enforceable, and legal under federal and state law.
- Must be practical, realistic, and have a strong potential to achieve estimated emissions reductions.
- Must be capable of being implemented and producing the anticipated emissions reductions in the required timeframe. This includes consideration of the schedule for planning, regulatory action, implementation and time to achieve the targeted results.

As an illustration of the wide net that was cast by New Jersey’s RACM development, the analysis noted that even for non-transportation control measures, “[A] list of 457 original potential non-transportation control measures (TCMs) was compiled through review of various sources, including Regional Planning Organizations (RPOs), other State Organizations, existing NJDEP documents, USEPA regions, and Early Action documents.” These were screened and “[T]here were 81 potential non-TCM control measures that advanced to the next phase of the analysis. New Jersey used wide public participation in development of its RACM including multiple workgroups, as described below:

“The NJDEP organized the “Reducing Air Pollution Together Initiative”, which began at a public workshop on June 29, 2005. This workshop served to initiate a dialogue between the NJDEP and interested and affected parties about reducing emissions in order to improve air quality in New Jersey. Over 200 persons representing various industries, environmental and civic groups attended the initial workshop. At the workshop, six workgroups were formed to focus on key sources of emissions resulting in nonattainment of federal air quality standards and to recommend control strategies to reduce these emissions. The excerpted table below lists the six workgroups and their missions.

Table 7.2: Reducing Air Pollution Together Initiative Workgroups

Workgroup	Workgroup Mission
Diesel Initiatives (DI)	To recommend potential ways to control and/or reduce emissions from diesel engines. Topics include vehicles (all categories – Light Duty Diesel Vehicles (LDDVs), Medium Duty Diesel Vehicles (MDDVs) and Heavy Duty Diesel Vehicles (HDDVs), nonroad equipment (e.g. construction equipment), commercial marine vessels (ships), locomotives and stationary diesel engines. Discussion topics include use of fuels that would reduce emissions, as well as retrofit technologies and idling strategies.
Gasoline Cars and Trucks (C&T)	To recommend potential ways to control and/or reduce emissions from gasoline-fueled motor vehicles and trucks (including SUVs and heavier trucks) and their use. This includes inspection and maintenance as well as transportation control measures.
Homes and Restaurants (HR)	To recommend potential ways to control and/or reduce emissions from the varied sources of combustion used by homeowners and restaurants. Topics include wood burning, space heating, energy efficiency, and emissions from restaurant operations.
Non-Automobile Gasoline Engines (NA)	To recommend potential ways to control and/or reduce emissions from gasoline engines other than those used in cars and trucks. Topics include engines used on outboard pleasure craft and in lawnmowers.
Stationary Combustion Sources (SCS)	To recommend potential ways to control and/or reduce emissions from facilities identified as stationary sources of combustion, including both Electric Generating Units (EGUs) and non-EGUs. The focus will be on NO _x , SO ₂ , VOC and particulate emissions.
Volatile Organic Compounds from Processes and Consumer Products (VOC)	To recommend potential ways to control and/or reduce VOC emissions from various chemical products and/or processes. Topics include all consumer products (from paints and deodorants to gas cans) as well as industrial processes.

“The workgroups met during the summer of 2005 and developed potential air emission control strategies. Reports containing their recommendations for further consideration were submitted to the NJDEP on October 31, 2005. A total of 250 potential control measures...were submitted to NJDEP.”

In addition, “[A]fter the workgroup reports were submitted, the 250 workgroup measures were further evaluated by NJDEP and ranked (High, Medium, Low, Not Ranked) so that every measure could be compared equally. Each workgroup state team worked with the NJDEP Air Quality Management Team to determine which of the workgroup recommended strategies should be further evaluated for possible inclusion in the SIP and/or implementation. The final list of measures to be further evaluated was provided to the workgroup members. Sixty draft white papers were developed by the NJDEP staff. The draft white papers were presented to the public at a workshop on May 17, 2006. The NJDEP accepted public comments on the white papers and updated the white papers, as appropriate. The 60 white papers were evaluated to identify additional potential control measures for the RACM analysis. After this evaluation, 21 white papers were added to the RACM analysis and were fully evaluated according to RACM criteria (3 of the 21 white papers overlapped with regional control measures and 3 overlapped with existing potential RACM measures). A total of 9 white paper control measures passed all of the RACM criteria.”

The 21 white paper measures were added to the RACM analysis along with measures suggested by the Ozone Transport Commission (OTC) as shown in the excerpted table below.

Table 7.3: Measures Identified from NJDEP Workgroup and OTC Regional Efforts

New Jersey Identifier	Measure Name	NJDEP White Paper Identifier/OTC Regional Measure Source
Area		
2	Consumer Products	OTC, VOC001
3	Portable Fuel Containers	OTC, VOC002
4	Adhesives and Sealants (Industrial)	OTC, VOC011
5	Smoke Management Plan	GEN001
6	Vapor Recovery Systems at Gasoline Service Stations	VOC003
7	Architectural and Industrial Maintenance Coatings	VOC010
Onroad		
30	Diesel Engine Chip Reflash	OTC
31	Efficient Vehicle Purchase Incentives/Disincentives	CT004
32	Onroad Vehicle Idling	DI001
33	Early Retirement Program for Heavy Duty Diesel Vehicles	DI009
34	Opacity Cutpoint Revision	DI011
35	Light Duty Diesel Vehicle Inspection	DI012
36	Medium Duty Vehicle Inspection	DI013
46	Low Income Vehicle Repair Assistance Program (LIRAP)	CT002
Nonroad		
74	Nonroad Idling	DI002
75	Idling Reduction for Train Engines	DI003
76	Leveraging Airport Leases to Achieve Reductions from Ground Support Equipment	DI006
77	Increasing the Rate of Small Engine Turnovers and Portable Fuel Container Turnovers through the Use of Incentive-Based Initiatives	NA002 (& NA006)
78	Insure Proper Disposal of Fuel Samples After Daily Aircraft Pre-Flight Checks	NA005
79	Stage II Vapor Recovery Compatibility for Boat Fueling and Marina Gasoline Fueling Facilities	NA007
85	Providing Electric Power to Ships (Cold Ironing) at the Ports (Shoreside Power)	DI004
89	Graduated Registration Fees for Recreational Boats	NA008

The New Jersey discussion is provided above to not just show the actual list of measures but also the process that was used, along with significant public input, to develop the measures.

C6. Maryland

Finally, in the excerpted tables that follow in the subsequent pages, I am providing an extensive list of RACM considered by Maryland in its ozone planning efforts.¹²

¹² <https://mde.maryland.gov/programs/air/airqualityplanning/pages/index.aspx>

Appendix C List of Potential RACM

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
Stationary Sources											
1	1	Reduction in emissions of Total Mass Rule	Adopt the Multi-Pollutant Mass Rule for ozone	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008
2	2	Reduction in emissions of ozone RAT/Tiered Based on ozone	Adopt the Rule Additional ozone or ozone precipitation reduction Tiered rule	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008
3	3	OT Mass Rule Distributed emissions Rule	Adopt Rule to require additional distributed Distributed emissions curbs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008
4	4	OT Mass Rule Additional OT Rule	Adopt Rule to require additional distributed emissions curbs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008
5	5	OT Mass Rule Better standard	Adopt Rule to standard for industrial and instituted Better	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008
6	6	Control emissions of ozone precursors	Require emissions of ozone precursors production facilities	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008
7	7	Control emissions of ozone precursors	Adopt Rule to RAT Adopt for ozone precursors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
□	8	Municipal Solid Waste Reduction Program Waste-to-Energy	Control of land fill of solid waste of waste.	□	□	□	□	□	□	□	□ It will be a reduction of waste in 2008
□	9	Control of Municipal Solid Waste	Control Rule for RST Control for MSW waste.	□	□	□	□	□	□	□	□ It will be a reduction of waste in 2008
□	□	Control of Municipal Solid Waste	Control of waste waste for all of waste of waste.	□	□	□	□	□	□	□	□ It will be a reduction of waste in 2008
□	□2	Control of Municipal Solid Waste	Control of waste waste for all of waste of waste.	□	□	□	□	□	□	□	□ It will be a reduction of waste in 2008
□	□	Control of Municipal Solid Waste	Control of waste waste for all of waste of waste.	□	□	□	□	□	□	□	□ It will be a reduction of waste in 2008
□	□4	Control of Municipal Solid Waste	Control of waste waste for all of waste of waste.	□	□	□	□	□	□	□	□ It will be a reduction of waste in 2008
□	□5	Control of Municipal Solid Waste	Control of waste waste for all of waste of waste.	□	□	□	□	□	□	□	□ It will be a reduction of waste in 2008

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
☐	6	Recessed fluorescent lighting in all classrooms	Recessed fluorescent lighting in all classrooms. This measure will reduce energy consumption and reduce greenhouse gas emissions. It is a cost-effective measure that can be implemented immediately.	☐	Yes	Yes	Yes	Yes	Yes	Yes	Recessed fluorescent lighting in all classrooms.
☐	7	Recessed fluorescent lighting in all classrooms	Recessed fluorescent lighting in all classrooms. This measure will reduce energy consumption and reduce greenhouse gas emissions. It is a cost-effective measure that can be implemented immediately.	☐	Yes	Yes	Yes	Yes	Yes	Yes	Recessed fluorescent lighting in all classrooms.
☐	8	Recessed fluorescent lighting in all classrooms	Recessed fluorescent lighting in all classrooms. This measure will reduce energy consumption and reduce greenhouse gas emissions. It is a cost-effective measure that can be implemented immediately.	☐	Yes	Yes	Yes	Yes	Yes	Yes	Recessed fluorescent lighting in all classrooms.
☐	9	Recessed fluorescent lighting in all classrooms	Recessed fluorescent lighting in all classrooms. This measure will reduce energy consumption and reduce greenhouse gas emissions. It is a cost-effective measure that can be implemented immediately.	☐	Yes	Yes	Yes	Yes	Yes	Yes	Recessed fluorescent lighting in all classrooms.

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
□	20	Replaceable components to add controls for	Replaceable components to add controls for and to replace the existing controls for the existing equipment.	□	□□□	□□□	□□	□□□	□	□□	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
□	21	Replaceable components to add controls for	Replaceable components to add controls for and to replace the existing controls for the existing equipment.	□	□□□	□□□	□	□□□	□	□□	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
□	22	Replaceable components to add controls for	Replaceable components to add controls for and to replace the existing controls for the existing equipment.	□	□□□	□□□	□	□□□	□	□□	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
□	23	Replaceable components to add controls for	Replaceable components to add controls for and to replace the existing controls for the existing equipment.	□	□□□	□□□	□□□	□□□	□	□□	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
□	24	Replaceable components to add controls for	Replaceable components to add controls for and to replace the existing controls for the existing equipment.	□	□□□	□□□	□	□□□	□	□□	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
☐	25	Encourage businesses to reduce their energy consumption	Encourage businesses and institutions to reduce energy use and/or install energy efficient Retrofit with energy efficient equipment.	☐	Yes	Yes	☐	Yes	☐	Yes	☐ If not achieved attainment not date
☐	26	Encourage businesses to use LED street light retrofits	Encourage businesses to install LED street lighting.	☐	Yes	☐	☐	Yes	☐	Yes	☐ If not achieved attainment not date
☐	27	Encourage businesses to use air conditioning	Encourage businesses to install LED lighting and T equipment.	☐	Yes	Yes	☐	Yes	☐	Yes	☐ If not achieved attainment not date
☐	28	Reduce energy consumption	Reduce energy use in commercial and industrial buildings.	☐	Yes	☐	☐	☐	☐	Yes	☐ If not achieved reduction by January 2008
☐	29	Manufacturing energy consumption and cost	Control energy use and cost in manufacturing.	☐	Yes	☐	☐	☐	☐	Yes	☐ If not achieved reduction by January 2008
☐	30	Manufacturing energy consumption and cost	Control energy use and cost in manufacturing.	☐	Yes	☐	☐	☐	☐	Yes	☐ If not achieved reduction by January 2008
☐	31	Manufacturing energy consumption and cost	Control energy use and cost in manufacturing.	☐	Yes	☐	☐	☐	☐	Yes	☐ If not achieved reduction by January 2008

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
□	□2	Manufacturing Industry Controlled Storage/Processing	Controlled Storage/Processing of other materials	□□	□□□	□	□	□	□	□□	□ II □□□ □□□□□ reductions by □□□□□2008
□	□□	Manufacturing Industry Controlled Storage/Processing	Controlled Storage/Processing of other materials	□□	□□□	□	□	□	□	□□	□ II □□□ □□□□□ reductions by □□□□□2008
□	□4	Manufacturing Industry Controlled Storage/Processing	Controlled Storage/Processing of other materials	□□	□□□	□	□	□	□	□□	□ II □□□ □□□□□ reductions by □□□□□2008
□	□5	Controlled Storage/Processing	Controlled Storage/Processing of other materials	□□	□□□	□	□	□	□	□□	□ II □□□ □□□□□ reductions by □□□□□2008
□	□6	Controlled Storage/Processing	Controlled Storage/Processing of other materials	□□	□□□	□	□	□	□□	□□	□ II □□□ □□□□□ reductions by □□□□□2008
□	□7	Controlled Storage/Processing	Controlled Storage/Processing of other materials	□□	□□□	□	□	□□	□□	□□	□ II □□□ □□□□□ reductions by □□□□□2008
Area Sources											
□	□	Controlled Storage/Processing	Controlled Storage/Processing of other materials	□□	□□	□□	□	□□	□	□□	□□ □□□□□ □□ □□□□ reductions

[illegible]

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
☐	7	Control Resource Consumption	Implement water conservation reducing the amount of water used in the community and drought at home.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	It will conserve water and reduce the community's water use in 2008.
☐	8	"Green for All" - Community Greening Reduction of Green	Implement the Redwood Project in the community. The community will be able to reduce the amount of water used in the community and drought at home.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	It will conserve water and reduce the community's water use in 2008.
☐	9	Community Greening Reduction of Green Consumption	Implement the Redwood Project in the community. The community will be able to reduce the amount of water used in the community and drought at home.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	It will conserve water and reduce the community's water use in 2008.
☐	20	Minimize the Amount of Green	Implement the Redwood Project in the community. The community will be able to reduce the amount of water used in the community and drought at home.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	It will conserve water and reduce the community's water use in 2008.
☐	21	Community Greening Reduction of Green Consumption	Implement the Redwood Project in the community. The community will be able to reduce the amount of water used in the community and drought at home.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	It will conserve water and reduce the community's water use in 2008.
☐	22	Control the Amount of Green	Implement the Redwood Project in the community. The community will be able to reduce the amount of water used in the community and drought at home.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	It will conserve water and reduce the community's water use in 2008.

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
☐	23	Require that activities that utilize certain diesel engines to meet diesel	to diesel not allowed to operate or to operate and maintain on diesel engines on the utilize certain Diesel engines that on diesel engines to the diesel engines or to the unauthorized diesel.	☐	☐	☐	☐	☐	☐	☐	Not creditable as it does not reduce
☐	24	Eliminate or restrict public outdoor and educational	to diesel not to operate on a diesel engine on diesel to operate public educational diesel to the diesel engines or to the unauthorized diesel.	☐	☐	☐	☐	☐	☐	☐	Not creditable as it does not reduce
☐	25	Limit the number of educational or other	to diesel not to operate on a diesel engine on diesel to operate public educational diesel to the diesel engines or to the unauthorized diesel.	☐	☐	☐	☐	☐	☐	☐	Not creditable as it does not reduce
☐	26	Maintain Meters on all	Maintain meters on all buses and trucks to operate public educational diesel to the diesel engines or to the unauthorized diesel.	☐	☐	☐	☐	☐	☐	☐	Not creditable as it does not reduce
☐	27	Public outdoor and educational	Public outdoor and educational to operate public educational diesel to the diesel engines or to the unauthorized diesel.	☐	☐	☐	☐	☐	☐	☐	Not creditable as it does not reduce
☐	28	Require that activities that utilize certain Diesel	to diesel not to operate on a diesel engine on diesel to operate public educational diesel to the diesel engines or to the unauthorized diesel.	☐	☐	☐	☐	☐	☐	☐	Not creditable as it does not reduce

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
□	29	□□□□ □□ □□□□□□□□ □□□□ □□□□ □□□□	□□□□ □□□□□□□□ □□ □□ □□□□ □□□□ □□□□ □□□□ □□ □□□□ □□□□ □□□□ □□ □□□□□□□□ □□□□□□□□	□□	□□	□□□	□□□	□□□	□□□	□□	□□ □□□□□□ □□ □□□□ □□□□□□
Non-road Sources											
□	□	□□□□ □□ □□□□□□□□ □□□□□□□□□□□□□□ □□□□□□□□ □□□□□□	□□□□□ □□□□□□□ □□□□□ □□ □□□□ □□□□ □□□□□□ □□□□□□□□ □□□□□□ □□□□□□□□ □□ □□□□□□□□□□□□ □□ □□□□□□ □□□□□□ □□□□□□□□□□□□□□ □□□□□□□□□□□□□□	□□	□□	□□□	□	□	□□□	□□	□□ □□□□□□ □□ □□□□ □□□□□□
□	2	□□□□ □□ □□□□□□□□ □□□□□□□□ □□□□□□ □□□□□□□□ □□□□□□	□□□□□ □□□□□□□ □□□□□ □□ □□□□ □□□□ □□□□□□ □□□□□□□□ □□□□□□ □□□□□□□□ □□ □□□□□□ □□□□□□ □□ □□□□□□ □□□□□□ □□□□□□□□□□□□□□ □□□□□□□□□□□□□□	□□	□□	□□□	□	□	□□□	□□	□□ □□□□□□ □□ □□□□ □□□□□□

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
1	1	Eliminate or Minimize Intervenor Road Maintenance Activities	Develop alternative program for state and local agencies to double efforts to reduce paved and unpaved construction and a maintenance related program. Consideration of on or off road restrictions or construction control restrictions.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable as measure reductions
2	4	Eliminate or Minimize Intervenor Roadwork or Local Agency Industrial Source Act	Implement or consider act restrictions and other measures to reduce volume of on source industrial source act.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable as measure reductions
3	5	Control Construction of Sources	Limitation and strict Rules for construction source act.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not credible measure
4	6	Reduce Road Dust Control Restriction Programs of Sources	Develop reduction program concurrent restriction measure road dust source act in public and/or private district.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable as measure reductions
5	7	Reduce Road Dust Control Restriction Programs of Motorists	Develop a reduction program reduction restriction concurrent dust source act in public and/or private district.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable as measure reductions b source 2008

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
□	8	Retreat/Retrofit or Leak Detection	Provide financial incentives to retrofit or replace or leak detection equipment in the community set area or leak detection equipment or detection well.	□	□	□	□	□	□	□	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □
□	9	Leak Detection Reduction	Support installation and/or Reduction Technology in Leak Detection.	□	□	□	□	□	□	□	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □
□	10	Control of Road Dust Emissions in the Community Set Area	In the set area, provide the community set area or community set area 50 percent road dust reduction.	□	□	□	□	□	□	□	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □
□	11	Support the community set in the community set area	Support the community set to support the community set area the community set area.	□	□	□	□	□	□	□	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □
□	12	Support the community set	Support the community set the community set area the community set area.	□	□	□	□	□	□	□	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □
□	13	Support the community set	Support the community set the community set area the community set area.	□	□	□	□	□	□	□	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □
□	14	Support the community set	Support the community set the community set area the community set area.	□	□	□	□	□	□	□	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
☐	5	Report on emissions	Public utilities are not to reduce use of fossil fuels or use of other fossil fuels or other fossil fuels	☐	☐	☐	☐	☐	☐	☐	☐ It is not advisable to reduce fossil fuels
☐	6	Local air quality standards	Public utilities are not to reduce use of fossil fuels or use of other fossil fuels or other fossil fuels	☐	☐	☐	☐	☐	☐	☐	☐ It is not advisable to reduce fossil fuels or other fossil fuels or other fossil fuels
☐	7	Local air quality standards	Public utilities are not to reduce use of fossil fuels or use of other fossil fuels or other fossil fuels	☐	☐	☐	☐	☐	☐	☐	☐ It is not advisable to reduce fossil fuels or other fossil fuels or other fossil fuels
☐	8	Local air quality standards	Public utilities are not to reduce use of fossil fuels or use of other fossil fuels or other fossil fuels	☐	☐	☐	☐	☐	☐	☐	☐ It is not advisable to reduce fossil fuels or other fossil fuels or other fossil fuels
☐	9	Local air quality standards	Public utilities are not to reduce use of fossil fuels or use of other fossil fuels or other fossil fuels	☐	☐	☐	☐	☐	☐	☐	☐ It is not advisable to reduce fossil fuels or other fossil fuels or other fossil fuels
☐	20	Local air quality standards	Public utilities are not to reduce use of fossil fuels or use of other fossil fuels or other fossil fuels	☐	☐	☐	☐	☐	☐	☐	☐ It is not advisable to reduce fossil fuels or other fossil fuels or other fossil fuels
☐	21	Local air quality standards	Public utilities are not to reduce use of fossil fuels or use of other fossil fuels or other fossil fuels	☐	☐	☐	☐	☐	☐	☐	☐ It is not advisable to reduce fossil fuels or other fossil fuels or other fossil fuels

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
□	22	Control Limit on a total sulfur ox	Restrict portable engines and generators.	□	□	□	□	□	□	□	Not enough mill credit
□	23	Restrict sulfur ox Restrict	Require restricted sulfur ox to be restricted to portable flare and/or addition controls.	□	□	□	□	□	□	□	Not enough mill credit
□	24	Control Restricted Motor on engine	Grade engines for power boats and engines.	□	□	□	□	□	□	□	Not credit to mill reduction
□	25	Limit Restriction for Limit on a total sulfur ox	Limit total on a total limit on a total sulfur ox.	□	□	□	□	□	□	□	Not enough credit
□	26	Restrict sulfur ox Restrict	Require restricted sulfur ox to be restricted to on engine control.	□	□	□	□	□	□	□	Not credit reduction to 2008
□	27	Restrict sulfur ox on Restriction	Base on restricted sulfur ox on a total to the D.	□	□	□	□	□	□	□	Not credit
□	28	Limit on Restrict sulfur ox	Require on a total on engine restricted sulfur ox to the.	□	□	□	□	□	□	□	Not credit reduction to 2008
□	29	Restrict sulfur ox Restrict	Require restricted sulfur ox to be restricted to on engine control.	□	□	□	□	□	□	□	Not credit reduction to 2008
□	30	Limit on on a total and Restrict sulfur ox	Require on a total on engine on a total and restricted sulfur ox to reduction.	□	□	□	□	□	□	□	Not credit reduction to 2008

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
1	1	Limit Rerouting or Use of Road and Industrial Source	Limit the use of road and industrial source.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable reduction
2	2	Control Limit Use of Road Source	Require use of road source to be limited.	Yes	Yes	No	Yes	Yes	Yes	Yes	Not creditable reduction
3	3	Control Use of Road Motor Source	Turbine/Belt Source Reduction	Yes	Yes	Yes	Yes	Yes	No	Yes	Not creditable reduction
4	4	Bandwidth or Road Source	Require use of bandwidth source to be limited during certain periods.	Yes	Yes	No	No	No	No	Yes	Not creditable reduction
5	5	Control Source	Require use of Source Control for certain periods.	Yes	Yes	Yes	Yes	Yes	No	Yes	Not creditable reduction by January 2008
6	6	Require Road Source or Road Source Source	Require road source to use limited bandwidth during certain periods.	Yes	Yes	Yes	Yes	No	No	Yes	Not creditable reduction data
7	7	Limit Source or Road Source Source	Require limited use of road source to use limited bandwidth during certain periods.	Yes	Yes	No	Yes	Yes	No	Yes	Not creditable reduction
8	8	Limit Source or Road Source Motor Source	Require limited road source to use limited bandwidth during certain periods.	Yes	Yes	Yes	Yes	Yes	No	Yes	Not creditable reduction

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
□	39	Require Landfillers to use or report on	Require report on to use landfillers additional during periods of	□	□	□	□	□	□	□	□ □ □ □ □ □ □ □ □ □ reduction
□	40	Require Landfillers to use or industrial waste	Require industrial waste to use landfills additional during periods of	□	□	□	□	□	□	□	□ □ □ □ □ □ □ □ □ □ reduction
□	41	Require Landfillers to use or Landfillers to use waste	Require landfills to use waste to use landfills additional during periods of	□	□	□	□	□	□	□	□ □ □ □ □ □ □ □ □ □ reduction
□	42	Require Landfillers to use or construction waste	Require demolition construction waste to be reported to use landfills additional during periods of	□	□	□	□	□	□	□	□ □ □ □ □ □ □ □ □ □ reduction
□	43	Require Landfillers to use or construction waste	Require demolition construction waste to be reported to use landfills additional during periods of	□	□	□	□	□	□	□	□ □ □ □ □ □ □ □ □ □ reduction
□	44	Require Landfillers to use or construction waste	Require construction waste to use landfills additional during periods of	□	□	□	□	□	□	□	□ □ □ □ □ □ □ □ □ □ reduction

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
□	45	Controlled Rerouting of Culverts and/or Structures	Controlled rerouting and/or rerouting structures located on the flood plain area.	□	□	□	□	□	□	□	□ Controlled rerouting structures
□	46	Controlled Flood Port or Structure	Controlled flood port or structure related mobile structure.	□	□	□	□	□	□	□	□ Controlled flood port structure rerouting
□	47	Controlled rerouting and/or rerouting barriers	Controlled additional rerouting and/or rerouting barriers to the floodplain area structure.	□	□	□	□	□	□	□	□ Controlled rerouting barriers structure 2008
□	48	Controlled Flood	Controlled flood area and road structure.	□	□	□	□	□	□	□	□ Controlled flood structure
□	49	Controlled Flood	Controlled flood area and road structure.	□	□	□	□	□	□	□	□ Controlled flood structure
□	50	Controlled Rerouting of Leakage or Flood Culverts and/or Structures	Rerouting of leakage and flood culverts and/or structures during or after the flood event.	□	□	□	□	□	□	□	□ Controlled flood structure rerouting
□	51	Controlled Rerouting of Rerouting Culverts and or Structures	Rerouting of rerouted culverts and/or structures during or after the flood event.	□	□	□	□	□	□	□	□ Controlled flood structure rerouting
□	52	Controlled Rerouting of Leakage or Flood Culverts and/or Structures	Rerouting of leakage or flood culverts and/or structures during or after the flood event.	□	□	□	□	□	□	□	□ Controlled flood structure rerouting

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
☐	53	Revised Air Quality Criteria Lanes to be reduced to meet the Restrictive Reduction	Restrictive Reduction to be reduced to meet the Restrictive Reduction to be Reduced to meet the Restrictive Reduction	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Restrictive Reduction to be reduced to meet the Restrictive Reduction
☐	54	Revised Roadway Lanes to be reduced to meet the Restrictive Reduction	Restrictive Reduction to be reduced to meet the Restrictive Reduction to be Reduced to meet the Restrictive Reduction	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Restrictive Reduction to be reduced to meet the Restrictive Reduction
☐	55	Revised Air Quality Criteria Lanes to be reduced to meet the Restrictive Reduction	Restrictive Reduction to be reduced to meet the Restrictive Reduction to be Reduced to meet the Restrictive Reduction	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Restrictive Reduction to be reduced to meet the Restrictive Reduction
☐	56	Revised Air Quality Criteria Lanes to be reduced to meet the Restrictive Reduction	Restrictive Reduction to be reduced to meet the Restrictive Reduction to be Reduced to meet the Restrictive Reduction	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Restrictive Reduction to be reduced to meet the Restrictive Reduction
☐	57	Revised Roadway Lanes to be reduced to meet the Restrictive Reduction	Restrictive Reduction to be reduced to meet the Restrictive Reduction to be Reduced to meet the Restrictive Reduction	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Restrictive Reduction to be reduced to meet the Restrictive Reduction
☐	58	Revised Roadway Lanes to be reduced to meet the Restrictive Reduction	Restrictive Reduction to be reduced to meet the Restrictive Reduction to be Reduced to meet the Restrictive Reduction	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Restrictive Reduction to be reduced to meet the Restrictive Reduction
☐	59	Revised Roadway Lanes to be reduced to meet the Restrictive Reduction	Restrictive Reduction to be reduced to meet the Restrictive Reduction to be Reduced to meet the Restrictive Reduction	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Restrictive Reduction to be reduced to meet the Restrictive Reduction
☐	60	Revised Roadway Lanes to be reduced to meet the Restrictive Reduction	Restrictive Reduction to be reduced to meet the Restrictive Reduction to be Reduced to meet the Restrictive Reduction	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Restrictive Reduction to be reduced to meet the Restrictive Reduction

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
☐	60	Recreational Motorboat Restrictions on Acceleration	Boat idling ban/restricted idling hours during certain seasons.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable due to no reduction
☐	62	Recreational Motorboat Restrictions	Boat idling ban/restricted idling hours during certain seasons.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable due to no reduction
☐	63	"Clean Air Club" 20 mph speed limit	10 mph and 20 mph speed reductions on certain roads.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable due to no reduction
☐	64	"Clean Air Club" Low idling and idling hours	10 mph and 20 mph speed reductions on certain roads.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable due to no reduction
☐	65	"Clean Air Club" Outboard Motors	10 mph and 20 mph speed reductions on certain roads.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable due to no reduction
☐	66	"Clean Air Club" Recreational boats on certain roads	10 mph and 20 mph speed reductions on certain roads.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable due to no reduction
☐	67	Control of idling and low idling hours	10 mph and 20 mph speed reductions on certain roads.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable due to no reduction
☐	68	Recreational boats on certain roads	10 mph and 20 mph speed reductions on certain roads.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable due to no reduction

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
69		Low Maintenance Loadwater Intake	"Low water or chlorine or chlorine use and low maintenance loadwater."								Reduction in chlorine use and low maintenance loadwater.
Mobile Sources											
M	1	Reduction in Diesel Exhaust Emissions from Load Water Intake	Reduction in diesel exhaust emissions from load water intake.								Reduction in diesel exhaust emissions from load water intake.
M	2	Reduction in Diesel Exhaust Emissions from Load Water Intake	Reduction in diesel exhaust emissions from load water intake.								Reduction in diesel exhaust emissions from load water intake.
M	3	Low water or chlorine or chlorine use and low maintenance loadwater.	Low water or chlorine or chlorine use and low maintenance loadwater.								Reduction in chlorine use and low maintenance loadwater.
M	4	Low water or chlorine or chlorine use and low maintenance loadwater.	Low water or chlorine or chlorine use and low maintenance loadwater.								Reduction in chlorine use and low maintenance loadwater.
M	5	Reduction in Diesel Exhaust Emissions from Load Water Intake	Reduction in diesel exhaust emissions from load water intake.								Reduction in diesel exhaust emissions from load water intake.
M	6	Reduction in Diesel Exhaust Emissions from Load Water Intake	Reduction in diesel exhaust emissions from load water intake.								Reduction in diesel exhaust emissions from load water intake.
M	7	Reduction in Diesel Exhaust Emissions from Load Water Intake	Reduction in diesel exhaust emissions from load water intake.								Reduction in diesel exhaust emissions from load water intake.

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	8	Lowest emissions available Sulfur dioxide from State and Local electric	Consider electric peaking on some coal-fired units bridge units on state and local loads.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not demonstrated attainment date
M	9	Lowest emissions available Sulfur dioxide from Electric peaking plant	Consider electric peaking on some coal-fired peaking units after installation.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not demonstrated attainment date
M	10	Electric peaking units	Establish maximum Sulfur dioxide emissions.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not demonstrated
M	11	Lowest emissions available Sulfur dioxide from Rapid start	Consider electric peaking on some coal-fired rapid start units.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not demonstrated attainment date
M	12	Lowest emissions available Sulfur dioxide from Turbine	Consider electric peaking on some coal-fired turbine units.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not demonstrated attainment date
M	13	NOx control strategy	NOx control strategy electricity generation and Duct burner burner control Module (M) Rapid start units control 95 control.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not demonstrated attainment date
M	14	True diesel Reduction True diesel electricity generation	NOx control strategy electricity generation.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not demonstrated attainment date
M	15	True diesel Reduction Sulfur dioxide from units	NOx control strategy electricity generation diesel.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not demonstrated attainment date

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	6	Set back projects and fill Disturbance and erosion	Require disturbance and/roadwork and erosion to be minimized and to be revegetated. Require erosion control to be greater on disturbed and disturbance and erosion control.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Reduction in erosion and disturbance
M	7	Minimize air and water treatment	Include measures for a minimum disturbance and treatment to reduce erosion and MT.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Reduction in erosion and disturbance by 2008
M	8	Fill Disturbance	Fill disturbance and disturbance and erosion treatment to a minimum level.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Reduction in erosion and disturbance by 2008
M	9	Minimize erosion and water treatment and erosion	Minimize erosion and disturbance and erosion and disturbance and erosion.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Reduction in erosion and disturbance by 2008
M	20	Set back projects and Disturbance	Require a minimum disturbance and.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Reduction in erosion and disturbance
M	21	Reduce erosion and water treatment	Require a minimum disturbance and erosion and disturbance and erosion.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Reduction in erosion and disturbance

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	22	Grading to 1000 feet Low water curb or dike	Grading to 1000 feet to low water or dike to dissipate wave energy near to the shore.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Grading to 1000 feet to low water or dike to dissipate wave energy near to the shore.
M	23	Tidal gate structure and Tidal gate structure	Tidal gate structure including a structure to dissipate wave energy near to the shore and to the shore.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Tidal gate structure including a structure to dissipate wave energy near to the shore and to the shore.
M	24	Tidal gate structure at Low water and structure	Tidal gate structure at Low water and structure to reduce wave energy.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Tidal gate structure at Low water and structure to reduce wave energy.
M	25	Grading to 1000 feet Grading	Grading to 1000 feet and grading to 1000 feet to reduce MT.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Grading to 1000 feet and grading to 1000 feet to reduce MT.
M	26	Grading to 1000 feet Grading	Grading to 1000 feet and grading to 1000 feet to reduce MT.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Grading to 1000 feet and grading to 1000 feet to reduce MT.
M	27	Grading to 1000 feet Grading	Grading to 1000 feet and grading to 1000 feet to reduce MT.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Grading to 1000 feet and grading to 1000 feet to reduce MT.

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	28	Convert to bio energy	Identify areas in transit across both sets of lanes on roadways and lanes on the air for bio energy.								Not creditable as measure reductions
M	29	Integrated Reductions	Develop transportation plan and telecommuter program to all city and county of Detroit.								Not creditable as measure reductions
M	30	Integrated Reductions Program	Transportation program in the Metropolitan and the Detroit area club.								Not creditable as measure reductions
M	31	Convert energy to	Convert energy to electricity and use to generate the power of electricity in the room.								Not creditable as measure reductions
M	32	Convert energy to electricity/energy	Convert energy to electricity for all energy or energy.								Not creditable as measure reductions
M	33	Convert energy to electricity/energy	Convert energy to electricity for all energy or energy.								Not creditable as measure reductions

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	4	Improve water to Borel and wastewater treatment	Provide incentives to develop wastewater treatment and improve water borel/wastewater treatment. This includes the water to the wastewater treatment plant and the water to the wastewater treatment plant.								Not creditable as it is reducing
M	5	Borel/Roadway improvements	Install borel roadway improvements to reduce the roadway.								Not creditable as it is reducing
M	6	Borel/Landfill at Metro treatment plant and Road Landfill treatment	Provide incentives to the Metro treatment plant borel treatment and the road treatment.								Not creditable as it is reducing
M	7	Borel/Roadway at Transit Borel	Provide incentives to the transit borel.								Not creditable as it is reducing
M	8	Borel to the Road	Provide incentives to the road borel. Provide incentives to the borel to the road borel and the road borel.								Not creditable as it is reducing
M	9	Borel/wastewater treatment	Build wastewater treatment plant and borel/wastewater treatment at the roadway.								Not creditable as it is reducing

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	40	On-site construction area Barracks or Middle area	Require on-site construction area to be 50% of the total area of the barracks or middle area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On-site construction area to be 50% of the total area of the barracks or middle area.
M	41	On-site construction area	Require on-site construction area to be 50% of the total area of the barracks or middle area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On-site construction area to be 50% of the total area of the barracks or middle area.
M	42	On-site construction area	Require on-site construction area to be 50% of the total area of the barracks or middle area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On-site construction area to be 50% of the total area of the barracks or middle area.
M	43	On-site construction area	Require on-site construction area to be 50% of the total area of the barracks or middle area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On-site construction area to be 50% of the total area of the barracks or middle area.
M	44	On-site construction area	Require on-site construction area to be 50% of the total area of the barracks or middle area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On-site construction area to be 50% of the total area of the barracks or middle area.
M	45	On-site construction area	Require on-site construction area to be 50% of the total area of the barracks or middle area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On-site construction area to be 50% of the total area of the barracks or middle area.
M	46	On-site construction area	Require on-site construction area to be 50% of the total area of the barracks or middle area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On-site construction area to be 50% of the total area of the barracks or middle area.
M	47	On-site construction area	Require on-site construction area to be 50% of the total area of the barracks or middle area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On-site construction area to be 50% of the total area of the barracks or middle area.

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	48	Expanded MWR Trunk Collection	Expanded MWR trunk collection to include additional development.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes. Will expand collection reductions by 2008.
M	49	Expanded Outer Ring Collection	Expanded collection of MWR from Outer Ring to the Brunswick area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes. Will expand collection reductions by 2008.
M	50	Expanded additional Trunk Collection area	Expanded collection of development to trunk collection.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes. Will expand collection reductions by 2008.
M	51	Expanded additional Trunk Collection area	Expanded collection of development to trunk collection.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes. Will expand collection reductions.
M	52	Expanded Brunswick Outer Ring	Will not directly expand the Outer Ring Ridgely and the Suburban area collection.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes. Will expand collection reductions.
M	53	Expanded Ridgely Outer Ring	Will not directly expand the Brunswick area. Bldg and the Outer Ring collection.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes. Will expand collection reductions.

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	54	Porter Districts and Buildings to Buildings	For existing buildings, route traffic to allow buildings to be closer to the building. For new buildings, alter building footprint to allow closer building.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable No reduction
M	55	MRP Operations	Curbside addition operations for MRP to allow a date increased ridership.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable No reduction by January 2008
M	57	Additional Transit	Additional addition transit routes in the region.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable No reduction reduction
M	58	Transit to the station	Regularly add to transit routes to reduce delay and increase the number.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable No reduction reduction
M	59	Transit Orientation in Urban Areas	Provide access to the building at appropriate intermediate transit points. Provide to the building to use a shoulder or other dedicated lane to bypass intermediate access and to the ground transportation line.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable No reduction reduction

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	60	Modest Roadway Improvement Modest	Roadway Improvement Program/Drainage Improvement Program Modest Modest								Modest Modest Modest
M	61	Roadway Improvement Program	Roadway Improvement Program/Drainage Improvement Program								Modest Modest Modest
M	62	Modest Roadway Improvement Program	Roadway Improvement Program/Drainage Improvement Program								Modest Modest Modest
M	63	Roadway Improvement Program	Roadway Improvement Program/Drainage Improvement Program								Modest Modest Modest

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	64	Construction of new or Leak or release of contaminants	On-site or off-site construction contaminants to be stored or disposed of in a designated roadside construction area bridged during the time of construction.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On-site or roadside reductions by construction 2008
M	65	Establishment of a fund	On-site or off-site contaminants to be stored or disposed of in a designated roadside construction area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On-site or roadside reductions by construction 2008
M	66	Construction of a fund	On-site or off-site contaminants to be stored or disposed of in a designated roadside construction area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On-site or roadside reductions by construction 2008
M	67	Construction of a fund	On-site or off-site contaminants to be stored or disposed of in a designated roadside construction area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On-site or roadside reductions by construction 2008
M	68	Construction of a fund	On-site or off-site contaminants to be stored or disposed of in a designated roadside construction area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On-site or roadside reductions by construction 2008
M	69	Construction of a fund	On-site or off-site contaminants to be stored or disposed of in a designated roadside construction area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On-site or roadside reductions by construction 2008
M	70	Construction of a fund	On-site or off-site contaminants to be stored or disposed of in a designated roadside construction area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On-site or roadside reductions by construction 2008

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	70	Reduced Air Toxics Control Board Programs and	Implement risk reduction for the air toxics control program.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008
M	72	Reduced Mobile Registration and Board on Suburban Communities	Implement reduced mobile registration and/or the mobile control board program in the region. Suburbanize the ultimate control on the motor vehicle pollution control.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008
M	73	Suburbanize Out Control and	Implement suburbanize control to sub urban control and be control.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008
M	74	Mobile Control Mitigation and Control Program	Implement the mobile control and/or the control program.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008
M	75	Mobile Control Mitigation and Control Program	Reduce the suburbanize and be suburbanize the suburbanize board on the sub urbanize and.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008
M	76	Control and Control Program	Implement the control and/or the control and.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008
M	77	Control and Control Program	Implement the control and/or the control and.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	78	Diesel Truck idling	On idling of a unit to be removed.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On idling of a unit to be removed.
M	79	On idling of a unit to be removed.	On idling of a unit to be removed.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On idling of a unit to be removed.
M	80	On idling of a unit to be removed.	On idling of a unit to be removed.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On idling of a unit to be removed.
M	81	On idling of a unit to be removed.	On idling of a unit to be removed.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On idling of a unit to be removed.
M	82	On idling of a unit to be removed.	On idling of a unit to be removed.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On idling of a unit to be removed.
M	83	On idling of a unit to be removed.	On idling of a unit to be removed.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On idling of a unit to be removed.
M	84	On idling of a unit to be removed.	On idling of a unit to be removed.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On idling of a unit to be removed.
M	85	On idling of a unit to be removed.	On idling of a unit to be removed.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	On idling of a unit to be removed.

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	86	Outer County Local Solid Waste Disposal Site	Prohibit the receipt, storage, and use of hazardous waste at the site.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable as it is a reduction.
M	87	Site for All Transfer	Prohibit the use of public transfer stations for the transfer of all waste from the site.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable as it is a reduction by 2008.
M	88	Suburban Transfer Station	Prohibit the use of Outer County Municipal to all public transfer stations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable as it is a reduction by 2008.
M	89	Area Bui	Prohibit the use of Outer County Municipal to all public transfer stations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable as it is a reduction by 2008.
M	90	Outer County	Prohibit the use of Outer County Municipal to all public transfer stations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable as it is a reduction by 2008.
M	91	Area Transfer Station	Prohibit the use of Outer County Municipal to all public transfer stations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable as it is a reduction by 2008.
M	92	Outer County	Prohibit the use of Outer County Municipal to all public transfer stations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not creditable as it is a reduction by 2008.

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	93	District Multi-Trip Bu sines	Introduce district order reduction cost of multiple business trips businesses to business and district	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will cost district district district
M	94	Business	Establish a business rule to reduce the cost of business	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will reduce business reduction
M	95	Out of District Credit	Out of district to district credit to district credit to district credit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will reduce business reduction
M	96	Robot or Business Order	Robot or Business and reduction order order	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will reduce business reduction
M	97	Reduction Bu Business	Reduction Bu Business	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will reduce business reduction
M	98	Business Bu Business	Business Bu Business	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will reduce business reduction
M	99	Business Bu Business	Business Bu Business	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will reduce business reduction

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	00	Control of Diesel Duty Diesel Engines	Control of diesel engines in the Mobile Equipment and Machinery fleet.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Control of diesel engines in the Mobile Equipment and Machinery fleet.
M	01	Control of Diesel Engines in the Mobile Equipment and Machinery fleet	Control of diesel engines in the Mobile Equipment and Machinery fleet.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Control of diesel engines in the Mobile Equipment and Machinery fleet.
M	02	Mobile Diesel Engines	Mobile Diesel Engines	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Control of diesel engines in the Mobile Equipment and Machinery fleet.
M	03	Diesel Engines	Diesel Engines	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Control of diesel engines in the Mobile Equipment and Machinery fleet.
M	04	Control of Diesel Engines in the Mobile Equipment and Machinery fleet	Control of diesel engines in the Mobile Equipment and Machinery fleet.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Control of diesel engines in the Mobile Equipment and Machinery fleet.
M	05	Mobile Diesel Engines	Mobile Diesel Engines	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Control of diesel engines in the Mobile Equipment and Machinery fleet.
M	06	Mobile Diesel Engines	Mobile Diesel Engines	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Control of diesel engines in the Mobile Equipment and Machinery fleet.
M	07	Control of Diesel Duty Diesel Engines	Control of diesel engines in the Mobile Equipment and Machinery fleet.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Control of diesel engines in the Mobile Equipment and Machinery fleet.
M	08	Control of Diesel Engines	Control of diesel engines in the Mobile Equipment and Machinery fleet.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Control of diesel engines in the Mobile Equipment and Machinery fleet.

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	09	Construction dust	Require construction dust control for enclosed construction.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not contribute to regional particulate burden in 2008.
M	10	Landfill dust	Require reduced use of open piles and additional for road dust control.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not contribute to regional particulate burden in 2008.
M	11	Landfill Road Dust in open piles	Require use of covers or additional enclosed dust control during active operations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not contribute to regional particulate burden in 2008.
M	12	Landfill Road Dust in open piles	Require use of covers or additional enclosed dust control during active operations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not contribute to regional particulate burden in 2008.
M	13	Dust addition to Roadway dust	Open unimproved dust and dust burden control measures.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not contribute to regional particulate burden in 2008.
M	14	ARB Dust	Will not contribute to ARB dust standard.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not contribute to regional particulate burden in 2008.
M	15	Construction activity Burdened Trucks	Require construction activity to regulate to prevent burdened trucks.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not contribute to regional particulate burden in 2008.
M	16	Construction activity Road dust	Require construction activity to regulate dust reduction for enclosed construction.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not contribute to regional particulate burden in 2008.
M	17	Construction activity Mobile Source Regulation	Require use of mobile source control.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not contribute to regional particulate burden in 2008.

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	18	Prohibited storage and use of lead in	Prohibit lead in the storage of oil and gas and related equipment at or below the stated limit.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Prohibit lead in storage equipment
M	19	Control storage of oil	Oil spill Rule Restriction. Limit oil to 5 gallons or all storage or control equipment or restricted equipment to the storage equipment. Restrict storage of oil. Restrict storage of oil.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Oil spill equipment reduction by 2008
M	20	Control of Road Turbidity	Reduce storage of oil to 5 gallons or all storage equipment to the storage equipment.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Prohibit lead in storage equipment
M	21	Control storage of oil	Oil spill Rule Restriction. Limit oil to 5 gallons or all storage or control equipment to the storage equipment.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Oil spill equipment reduction by 2008
M	22	Control storage of oil	Oil spill Rule Restriction. Limit oil to 5 gallons or all storage or control equipment to the storage equipment.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Oil spill equipment reduction by 2008

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	23	Eliminate or retrofit existing audit station Doses	There is current construction of an audit station Dose to reduce the number and the range of audit area transmittal concentrations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes creditable Yes reductions
M	24	Eliminate existing audit station doses and alter to other doses	It does not alter the number of audit stations and the range of audit station Doses. The number of audit stations is the same as the current scheduled number.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes creditable Yes reductions
M	25	Eliminate or retrofit existing public outflows and education	It does not eliminate any education or public outflows to increase public education. Education reduces overall usage.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes creditable Yes reductions
M	26	Local education and education of the public	It does not eliminate any education or public outflows to increase local education. Local education and public outflows are the same as the current education and public outflows.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes creditable Yes reductions
M	27	Mass media education and education of the public	Mass media education and education of the public is the same as the current education and public outflows.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes creditable Yes reductions

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	28	"Green for All" - 100 Reduction	Build additional green space for recreation in old areas for recreation. Target 1980 building to 100% of the area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100% reduction in building
M	29	"Green for All" - 100% Building Reduction	Reduction in building density in the MTA building to 100% density.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100% reduction in building
M	30	"Green for All" - 100% Building Reduction	Reduction in building density in the MTA building to 100% density.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100% reduction in building
M	31	"Green for All" - 100% Building Reduction	Build additional green space for recreation in old areas for recreation. Target 1980 building to 100% of the area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100% reduction in building
M	32	Controlled Density Truck	Controlled density in reduction area to 100% density.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100% reduction in building
M	33	Modular 100% Reduction	Modular 100% reduction to 100% density.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100% reduction in building

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	004	Minimize Roadway Construction on Driveways	Prohibit driveway reconstruction during certain times or clear driveways to meet criteria. Also be a good source of stormwater control.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008
M	005	Transportation Audits	Require that transportation facilities be audited. Measures used to reduce air emissions at each facility.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008
M	006	Restrict parking at schools	Restrict new school students from driving to and parking at the school. Also bus parking is prohibited.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Prohibitory measures reduction
M	007	Restrict construction of new parking	Restrict construction of parking at all new and existing buildings and urban areas.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Prohibitory measures reduction
M	008	Eliminate or Restrict Street Parking	Eliminate street parking and reduce its attractiveness to attract bus.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Will not exceed reduction by January 2008

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	39	Use of Low VOC and Low HAP Paints	Require that all new and existing buildings use low VOC and low HAP paints for interior painting.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Reduction in VOC and HAP emissions.
M	40	Use of Low VOC and Low HAP Paints	Require that all new and existing buildings use low VOC and low HAP paints for interior painting.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Reduction in VOC and HAP emissions.
M	41	Use of Low VOC and Low HAP Paints	Require that all new and existing buildings use low VOC and low HAP paints for interior painting.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Reduction in VOC and HAP emissions.
M	42	Use of Low VOC and Low HAP Paints	Require that all new and existing buildings use low VOC and low HAP paints for interior painting.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Reduction in VOC and HAP emissions.
M	43	Use of Low VOC and Low HAP Paints	Require that all new and existing buildings use low VOC and low HAP paints for interior painting.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Reduction in VOC and HAP emissions.
M	44	Use of Low VOC and Low HAP Paints	Require that all new and existing buildings use low VOC and low HAP paints for interior painting.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Reduction in VOC and HAP emissions.

List #		Measure	Description	RACM: Implementation by January 2008?	RACM: Enforceable?	RACM: Technologically Feasible?	RACM: Economically Feasible?	RACM: No Adverse Impacts?	RACM: Reductions >0.1tpd?	RACM: Yes/No?	RACM: Explanation
M	45	Require Truck idling audit program	Require idling of tires and tires for truck idling in area	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Require idling of tires reduction

Attachment A

RANAJIT (RON) SAHU, Ph.D, QEP, CEM (Nevada)

CONSULTANT, ENVIRONMENTAL AND ENERGY ISSUES

311 North Story Place

Alhambra, CA 91801

Phone: 702.683.5466

e-mail (preferred): ronsahu@gmail.com; sahuron@earthlink.net

EXPERIENCE SUMMARY

Dr. Sahu has over thirty one years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services; design and specification of pollution control equipment for a wide range of emissions sources including stationary and mobile sources; soils and groundwater remediation including landfills as remedy; combustion engineering evaluations; energy studies; multimedia environmental regulatory compliance (involving statutes and regulations such as the Federal CAA and its Amendments, Clean Water Act, TSCA, RCRA, CERCLA, SARA, OSHA, NEPA as well as various related state statutes); transportation air quality impact analysis; multimedia compliance audits; multimedia permitting (including air quality NSR/PSD permitting, Title V permitting, NPDES permitting for industrial and storm water discharges, RCRA permitting, etc.), multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and regulatory strategy development and support including negotiation of consent agreements and orders.

He has over twenty eight years of project management experience and has successfully managed and executed numerous projects in this time period. This includes basic and applied research projects, design projects, regulatory compliance projects, permitting projects, energy studies, risk assessment projects, and projects involving the communication of environmental data and information to the public.

He has provided consulting services to numerous private sector, public sector and public interest group clients. His major clients over the past twenty six years include various trade associations as well as individual companies such as steel mills, petroleum refineries, chemical plants, cement manufacturers, aerospace companies, power generation facilities, lawn and garden equipment manufacturers, spa manufacturers, chemical distribution facilities, land development companies, and various entities in the public sector including EPA, the US Dept. of Justice, several states (including Oregon, New Mexico, Pennsylvania, and others), various agencies such as the California DTSC, and various municipalities. Dr. Sahu has performed projects in all 50 states, numerous local jurisdictions and internationally.

In addition to consulting, for approximately twenty years, Dr. Sahu taught numerous courses in several Southern California universities including UCLA (air pollution), UC Riverside (air pollution, process hazard analysis), and Loyola Marymount University (air pollution, risk assessment, hazardous waste management). He also taught at Caltech, his alma mater (various engineering courses), at the University of Southern California (air pollution controls) and at California State University, Fullerton (transportation and air quality).

Dr. Sahu has and continues to provide expert witness services in a number of environmental areas discussed above in both state and Federal courts as well as before administrative bodies (please see Annex A).

EXPERIENCE RECORD

2000-present **Independent Consultant.** Providing a variety of private sector (industrial companies, land development companies, law firms, etc.), public sector (such as the US Department of Justice), and public interest group clients with project management, environmental consulting, project management, as well as regulatory and engineering support consulting services.

- 1995-2000 Parsons ES, **Associate, Senior Project Manager and Department Manager for Air Quality/Geosciences/Hazardous Waste Groups**, Pasadena. Responsible for the management of a group of approximately 24 air quality and environmental professionals, 15 geoscience, and 10 hazardous waste professionals providing full-service consulting, project management, regulatory compliance and A/E design assistance in all areas.
- Parsons ES, **Manager for Air Source Testing Services**. Responsible for the management of 8 individuals in the area of air source testing and air regulatory permitting projects located in Bakersfield, California.
- 1992-1995 Engineering-Science, Inc. **Principal Engineer and Senior Project Manager** in the air quality department. Responsibilities included multimedia regulatory compliance and permitting (including hazardous and nuclear materials), air pollution engineering (emissions from stationary and mobile sources, control of criteria and air toxics, dispersion modeling, risk assessment, visibility analysis, odor analysis), supervisory functions and project management.
- 1990-1992 Engineering-Science, Inc. **Principal Engineer and Project Manager** in the air quality department. Responsibilities included permitting, tracking regulatory issues, technical analysis, and supervisory functions on numerous air, water, and hazardous waste projects. Responsibilities also include client and agency interfacing, project cost and schedule control, and reporting to internal and external upper management regarding project status.
- 1989-1990 Kinetics Technology International, Corp. **Development Engineer**. Involved in thermal engineering R&D and project work related to low-NO_x ceramic radiant burners, fired heater NO_x reduction, SCR design, and fired heater retrofitting.
- 1988-1989 Heat Transfer Research, Inc. **Research Engineer**. Involved in the design of fired heaters, heat exchangers, air coolers, and other non-fired equipment. Also did research in the area of heat exchanger tube vibrations.

EDUCATION

- 1984-1988 Ph.D., Mechanical Engineering, California Institute of Technology (Caltech), Pasadena, CA.
- 1984 M. S., Mechanical Engineering, California Institute of Technology (Caltech), Pasadena, CA.
- 1978-1983 B. Tech (Honors), Mechanical Engineering, Indian Institute of Technology (IIT) Kharagpur, India

TEACHING EXPERIENCE

Caltech

- "Thermodynamics," Teaching Assistant, California Institute of Technology, 1983, 1987.
- "Air Pollution Control," Teaching Assistant, California Institute of Technology, 1985.
- "Caltech Secondary and High School Saturday Program," - taught various mathematics (algebra through calculus) and science (physics and chemistry) courses to high school students, 1983-1989.
- "Heat Transfer," - taught this course in the Fall and Winter terms of 1994-1995 in the Division of Engineering and Applied Science.
- "Thermodynamics and Heat Transfer," Fall and Winter Terms of 1996-1997.

U.C. Riverside, Extension

- "Toxic and Hazardous Air Contaminants," University of California Extension Program, Riverside, California. Various years since 1992.
- "Prevention and Management of Accidental Air Emissions," University of California Extension Program, Riverside, California. Various years since 1992.

"Air Pollution Control Systems and Strategies," University of California Extension Program, Riverside, California, Summer 1992-93, Summer 1993-1994.

"Air Pollution Calculations," University of California Extension Program, Riverside, California, Fall 1993-94, Winter 1993-94, Fall 1994-95.

"Process Safety Management," University of California Extension Program, Riverside, California. Various years since 1992-2010.

"Process Safety Management," University of California Extension Program, Riverside, California, at SCAQMD, Spring 1993-94.

"Advanced Hazard Analysis - A Special Course for LEPCs," University of California Extension Program, Riverside, California, taught at San Diego, California, Spring 1993-1994.

"Advanced Hazardous Waste Management" University of California Extension Program, Riverside, California. 2005.

Loyola Marymount University

"Fundamentals of Air Pollution - Regulations, Controls and Engineering," Loyola Marymount University, Dept. of Civil Engineering. Various years since 1993.

"Air Pollution Control," Loyola Marymount University, Dept. of Civil Engineering, Fall 1994.

"Environmental Risk Assessment," Loyola Marymount University, Dept. of Civil Engineering. Various years since 1998.

"Hazardous Waste Remediation" Loyola Marymount University, Dept. of Civil Engineering. Various years since 2006.

University of Southern California

"Air Pollution Controls," University of Southern California, Dept. of Civil Engineering, Fall 1993, Fall 1994.

"Air Pollution Fundamentals," University of Southern California, Dept. of Civil Engineering, Winter 1994.

University of California, Los Angeles

"Air Pollution Fundamentals," University of California, Los Angeles, Dept. of Civil and Environmental Engineering, Spring 1994, Spring 1999, Spring 2000, Spring 2003, Spring 2006, Spring 2007, Spring 2008, Spring 2009.

International Programs

"Environmental Planning and Management," 5 week program for visiting Chinese delegation, 1994.

"Environmental Planning and Management," 1 day program for visiting Russian delegation, 1995.

"Air Pollution Planning and Management," IEP, UCR, Spring 1996.

"Environmental Issues and Air Pollution," IEP, UCR, October 1996.

PROFESSIONAL AFFILIATIONS AND HONORS

President of India Gold Medal, IIT Kharagpur, India, 1983.

Member of the Alternatives Assessment Committee of the Grand Canyon Visibility Transport Commission, established by the Clean Air Act Amendments of 1990, 1992.

American Society of Mechanical Engineers: Los Angeles Section Executive Committee, Heat Transfer Division, and Fuels and Combustion Technology Division, 1987-mid-1990s.

Air and Waste Management Association, West Coast Section, 1989-mid-2000s.

PROFESSIONAL CERTIFICATIONS

EIT, California (#XE088305), 1993.

REA I, California (#07438), 2000.

Certified Permitting Professional, South Coast AQMD (#C8320), since 1993.

QEP, Institute of Professional Environmental Practice, since 2000.

CEM, State of Nevada (#EM-1699). Expiration 10/07/2021.

PUBLICATIONS (PARTIAL LIST)

"Physical Properties and Oxidation Rates of Chars from Bituminous Coals," with Y.A. Levendis, R.C. Flagan and G.R. Gavalas, *Fuel*, **67**, 275-283 (1988).

"Char Combustion: Measurement and Analysis of Particle Temperature Histories," with R.C. Flagan, G.R. Gavalas and P.S. Northrop, *Comb. Sci. Tech.* **60**, 215-230 (1988).

"On the Combustion of Bituminous Coal Chars," PhD Thesis, California Institute of Technology (1988).

"Optical Pyrometry: A Powerful Tool for Coal Combustion Diagnostics," *J. Coal Quality*, **8**, 17-22 (1989).

"Post-Ignition Transients in the Combustion of Single Char Particles," with Y.A. Levendis, R.C. Flagan and G.R. Gavalas, *Fuel*, **68**, 849-855 (1989).

"A Model for Single Particle Combustion of Bituminous Coal Char." Proc. ASME National Heat Transfer Conference, Philadelphia, **HTD-Vol. 106**, 505-513 (1989).

"Discrete Simulation of Cenospheric Coal-Char Combustion," with R.C. Flagan and G.R. Gavalas, *Combust. Flame*, **77**, 337-346 (1989).

"Particle Measurements in Coal Combustion," with R.C. Flagan, in "**Combustion Measurements**" (ed. N. Chigier), Hemisphere Publishing Corp. (1991).

"Cross Linking in Pore Structures and Its Effect on Reactivity," with G.R. Gavalas in preparation.

"Natural Frequencies and Mode Shapes of Straight Tubes," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Optimal Tube Layouts for Kamui SL-Series Exchangers," with K. Ishihara, Proprietary Report for Kamui Company Limited, Tokyo, Japan (1990).

"HTRI Process Heater Conceptual Design," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Asymptotic Theory of Transonic Wind Tunnel Wall Interference," with N.D. Malmuth and others, Arnold Engineering Development Center, Air Force Systems Command, USAF (1990).

"Gas Radiation in a Fired Heater Convection Section," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1990).

"Heat Transfer and Pressure Drop in NTIW Heat Exchangers," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1991).

"NO_x Control and Thermal Design," Thermal Engineering Tech Briefs, (1994).

"From Purchase of Landmark Environmental Insurance to Remediation: Case Study in Henderson, Nevada," with Robin E. Bain and Jill Quillin, presented at the AQMA Annual Meeting, Florida, 2001.

"The Jones Act Contribution to Global Warming, Acid Rain and Toxic Air Contaminants," with Charles W. Botsford, presented at the AQMA Annual Meeting, Florida, 2001.

PRESENTATIONS (PARTIAL LIST)

"Pore Structure and Combustion Kinetics - Interpretation of Single Particle Temperature-Time Histories," with P.S. Northrop, R.C. Flagan and G.R. Gavalas, presented at the AIChE Annual Meeting, New York (1987).

"Measurement of Temperature-Time Histories of Burning Single Coal Char Particles," with R.C. Flagan, presented at the American Flame Research Committee Fall International Symposium, Pittsburgh, (1988).

"Physical Characterization of a Cenospheric Coal Char Burned at High Temperatures," with R.C. Flagan and G.R. Gavalas, presented at the Fall Meeting of the Western States Section of the Combustion Institute, Laguna Beach, California (1988).

"Control of Nitrogen Oxide Emissions in Gas Fired Heaters - The Retrofit Experience," with G. P. Croce and R. Patel, presented at the International Conference on Environmental Control of Combustion Processes (Jointly sponsored by the American Flame Research Committee and the Japan Flame Research Committee), Honolulu, Hawaii (1991).

"Air Toxics - Past, Present and the Future," presented at the Joint AIChE/AAEE Breakfast Meeting at the AIChE 1991 Annual Meeting, Los Angeles, California, November 17-22 (1991).

"Air Toxics Emissions and Risk Impacts from Automobiles Using Reformulated Gasolines," presented at the Third Annual Current Issues in Air Toxics Conference, Sacramento, California, November 9-10 (1992).

"Air Toxics from Mobile Sources," presented at the Environmental Health Sciences (ESE) Seminar Series, UCLA, Los Angeles, California, November 12, (1992).

"Kilns, Ovens, and Dryers - Present and Future," presented at the Gas Company Air Quality Permit Assistance Seminar, Industry Hills Sheraton, California, November 20, (1992).

"The Design and Implementation of Vehicle Scrapping Programs," presented at the 86th Annual Meeting of the Air and Waste Management Association, Denver, Colorado, June 12, 1993.

"Air Quality Planning and Control in Beijing, China," presented at the 87th Annual Meeting of the Air and Waste Management Association, Cincinnati, Ohio, June 19-24, 1994.

Annex A

Expert Litigation Support

A. Occasions where Dr. Sahu has provided Written or Oral testimony before Congress:

1. In July 2012, provided expert written and oral testimony to the House Subcommittee on Energy and the Environment, Committee on Science, Space, and Technology at a Hearing entitled “Hitting the Ethanol Blend Wall – Examining the Science on E15.”

B. Matters for which Dr. Sahu has provided affidavits and expert reports include:

2. Affidavit for Rocky Mountain Steel Mills, Inc. located in Pueblo Colorado – dealing with the technical uncertainties associated with night-time opacity measurements in general and at this steel mini-mill.
3. Expert reports and depositions (2/28/2002 and 3/1/2002; 12/2/2003 and 12/3/2003; 5/24/2004) on behalf of the United States in connection with the Ohio Edison NSR Cases. *United States, et al. v. Ohio Edison Co., et al.*, C2-99-1181 (Southern District of Ohio).
4. Expert reports and depositions (5/23/2002 and 5/24/2002) on behalf of the United States in connection with the Illinois Power NSR Case. *United States v. Illinois Power Co., et al.*, 99-833-MJR (Southern District of Illinois).
5. Expert reports and depositions (11/25/2002 and 11/26/2002) on behalf of the United States in connection with the Duke Power NSR Case. *United States, et al. v. Duke Energy Corp.*, 1:00-CV-1262 (Middle District of North Carolina).
6. Expert reports and depositions (10/6/2004 and 10/7/2004; 7/10/2006) on behalf of the United States in connection with the American Electric Power NSR Cases. *United States, et al. v. American Electric Power Service Corp., et al.*, C2-99-1182, C2-99-1250 (Southern District of Ohio).
7. Affidavit (March 2005) on behalf of the Minnesota Center for Environmental Advocacy and others in the matter of the Application of Heron Lake BioEnergy LLC to construct and operate an ethanol production facility – submitted to the Minnesota Pollution Control Agency.
8. Expert Report and Deposition (10/31/2005 and 11/1/2005) on behalf of the United States in connection with the East Kentucky Power Cooperative NSR Case. *United States v. East Kentucky Power Cooperative, Inc.*, 5:04-cv-00034-KSF (Eastern District of Kentucky).
9. Affidavits and deposition on behalf of Basic Management Inc. (BMI) Companies in connection with the BMI vs. USA remediation cost recovery Case.
10. Expert Report on behalf of Penn Future and others in the Cambria Coke plant permit challenge in Pennsylvania.
11. Expert Report on behalf of the Appalachian Center for the Economy and the Environment and others in the Western Greenbrier permit challenge in West Virginia.
12. Expert Report, deposition (via telephone on January 26, 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women’s Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) in the Thompson River Cogeneration LLC Permit No. 3175-04 challenge.
13. Expert Report and deposition (2/2/07) on behalf of the Texas Clean Air Cities Coalition at the Texas State Office of Administrative Hearings (SOAH) in the matter of the permit challenges to TXU Project Apollo’s eight new proposed PRB-fired PC boilers located at seven TX sites.
14. Expert Testimony (July 2007) on behalf of the Izaak Walton League of America and others in connection with the acquisition of power by Xcel Energy from the proposed Gascoyne Power Plant – at the State of Minnesota, Office of Administrative Hearings for the Minnesota PUC (MPUC No. E002/CN-06-1518; OAH No. 12-2500-17857-2).

15. Affidavit (July 2007) Comments on the Big Cajun I Draft Permit on behalf of the Sierra Club – submitted to the Louisiana DEQ.
16. Expert Report and Deposition (12/13/2007) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case. *Plaintiffs v. Allegheny Energy Inc., et al.*, 2:05cv0885 (Western District of Pennsylvania).
17. Expert Reports and Pre-filed Testimony before the Utah Air Quality Board on behalf of Sierra Club in the Sevier Power Plant permit challenge.
18. Expert Report and Deposition (October 2007) on behalf of MTD Products Inc., in connection with *General Power Products, LLC v MTD Products Inc.*, 1:06 CVA 0143 (Southern District of Ohio, Western Division) .
19. Expert Report and Deposition (June 2008) on behalf of Sierra Club and others in the matter of permit challenges (Title V: 28.0801-29 and PSD: 28.0803-PSD) for the Big Stone II unit, proposed to be located near Milbank, South Dakota.
20. Expert Reports, Affidavit, and Deposition (August 15, 2008) on behalf of Earthjustice in the matter of air permit challenge (CT-4631) for the Basin Electric Dry Fork station, under construction near Gillette, Wyoming before the Environmental Quality Council of the State of Wyoming.
21. Affidavits (May 2010/June 2010 in the Office of Administrative Hearings))/Declaration and Expert Report (November 2009 in the Office of Administrative Hearings) on behalf of NRDC and the Southern Environmental Law Center in the matter of the air permit challenge for Duke Cliffside Unit 6. Office of Administrative Hearing Matters 08 EHR 0771, 0835 and 0836 and 09 HER 3102, 3174, and 3176 (consolidated).
22. Declaration (August 2008), Expert Report (January 2009), and Declaration (May 2009) on behalf of Southern Alliance for Clean Energy in the matter of the air permit challenge for Duke Cliffside Unit 6. *Southern Alliance for Clean Energy et al., v. Duke Energy Carolinas, LLC*, Case No. 1:08-cv-00318-LHT-DLH (Western District of North Carolina, Asheville Division).
23. Declaration (August 2008) on behalf of the Sierra Club in the matter of Dominion Wise County plant MACT.us
24. Expert Report (June 2008) on behalf of Sierra Club for the Green Energy Resource Recovery Project, MACT Analysis.
25. Expert Report (February 2009) on behalf of Sierra Club and the Environmental Integrity Project in the matter of the air permit challenge for NRG Limestone’s proposed Unit 3 in Texas.
26. Expert Report (June 2009) on behalf of MTD Products, Inc., in the matter of *Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al.*
27. Expert Report (August 2009) on behalf of Sierra Club and the Southern Environmental Law Center in the matter of the air permit challenge for Santee Cooper’s proposed Pee Dee plant in South Carolina).
28. Statements (May 2008 and September 2009) on behalf of the Minnesota Center for Environmental Advocacy to the Minnesota Pollution Control Agency in the matter of the Minnesota Haze State Implementation Plans.
29. Expert Report (August 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).
30. Expert Report and Rebuttal Report (September 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.
31. Expert Report (December 2009) and Rebuttal reports (May 2010 and June 2010) on behalf of the United States in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).
32. Pre-filed Testimony (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

33. Pre-filed Testimony (July 2010) and Written Rebuttal Testimony (August 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions*, No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.
34. Expert Report (August 2010) and Rebuttal Expert Report (October 2010) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Liability Phase.
35. Declaration (August 2010), Reply Declaration (November 2010), Expert Report (April 2011), Supplemental and Rebuttal Expert Report (July 2011) on behalf of the United States in the matter of DTE Energy Company and Detroit Edison Company (Monroe Unit 2). *United States of America v. DTE Energy Company and Detroit Edison Company*, Civil Action No. 2:10-cv-13101-BAF-RSW (Eastern District of Michigan).
36. Expert Report and Deposition (August 2010) as well as Affidavit (September 2010) on behalf of Kentucky Waterways Alliance, Sierra Club, and Valley Watch in the matter of challenges to the NPDES permit issued for the Trimble County power plant by the Kentucky Energy and Environment Cabinet to Louisville Gas and Electric, File No. DOW-41106-047.
37. Expert Report (August 2010), Rebuttal Expert Report (September 2010), Supplemental Expert Report (September 2011), and Declaration (November 2011) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)’s Cherokee power plant. No. 09-cv-1862 (District of Colorado).
38. Written Direct Expert Testimony (August 2010) and Affidavit (February 2012) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).
39. Deposition (August 2010) on behalf of Environmental Defense, in the matter of the remanded permit challenge to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).
40. Expert Report, Supplemental/Rebuttal Expert Report, and Declarations (October 2010, November 2010, September 2012) on behalf of New Mexico Environment Department (Plaintiff-Intervenor), Grand Canyon Trust and Sierra Club (Plaintiffs) in the matter of *Plaintiffs v. Public Service Company of New Mexico* (PNM), Civil No. 1:02-CV-0552 BB/ATC (ACE) (District of New Mexico).
41. Expert Report (October 2010) and Rebuttal Expert Report (November 2010) (BART Determinations for PSCo Hayden and CSU Martin Drake units) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.
42. Expert Report (November 2010) (BART Determinations for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.
43. Declaration (November 2010) on behalf of the Sierra Club in connection with the Martin Lake Station Units 1, 2, and 3. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Case No. 5:10-cv-00156-DF-CMC (Eastern District of Texas, Texarkana Division).
44. Pre-Filed Testimony (January 2011) and Declaration (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).
45. Declaration (February 2011) in the matter of the Draft Title V Permit for RRI Energy MidAtlantic Power Holdings LLC Shawville Generating Station (Pennsylvania), ID No. 17-00001 on behalf of the Sierra Club.
46. Expert Report (March 2011), Rebuttal Expert Report (June 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (District of Colorado).
47. Declaration (April 2011) and Expert Report (July 16, 2012) in the matter of the Lower Colorado River Authority (LCRA)’s Fayette (Sam Seymour) Power Plant on behalf of the Texas Campaign for the Environment. *Texas Campaign for the Environment v. Lower Colorado River Authority*, Civil Action No. 4:11-cv-00791 (Southern District of Texas, Houston Division).

48. Declaration (June 2011) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.
49. Expert Report (June 2011) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).
50. Declaration (August 2011) in the matter of the Sandy Creek Energy Associates L.P. Sandy Creek Power Plant on behalf of Sierra Club and Public Citizen. *Sierra Club, Inc. and Public Citizen, Inc. v. Sandy Creek Energy Associates, L.P.*, Civil Action No. A-08-CA-648-LY (Western District of Texas, Austin Division).
51. Expert Report (October 2011) on behalf of the Defendants in the matter of *John Quiles and Jeanette Quiles et al. v. Bradford-White Corporation, MTD Products, Inc., Kohler Co., et al.*, Case No. 3:10-cv-747 (TJM/DEP) (Northern District of New York).
52. Declaration (October 2011) on behalf of the Plaintiffs in the matter of *American Nurses Association et. al. (Plaintiffs), v. US EPA (Defendant)*, Case No. 1:08-cv-02198-RMC (US District Court for the District of Columbia).
53. Declaration (February 2012) and Second Declaration (February 2012) in the matter of *Washington Environmental Council and Sierra Club Washington State Chapter v. Washington State Department of Ecology and Western States Petroleum Association*, Case No. 11-417-MJP (Western District of Washington).
54. Expert Report (March 2012) and Supplemental Expert Report (November 2013) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.*, Civil Action No. 4:10-cv-4969 (Southern District of Texas, Houston Division).
55. Declaration (March 2012) in the matter of *Center for Biological Diversity, et al. v. United States Environmental Protection Agency*, Case No. 11-1101 (consolidated with 11-1285, 11-1328 and 11-1336) (US Court of Appeals for the District of Columbia Circuit).
56. Declaration (March 2012) in the matter of *Sierra Club v. The Kansas Department of Health and Environment*, Case No. 11-105,493-AS (Holcomb power plant) (Supreme Court of the State of Kansas).
57. Declaration (March 2012) in the matter of the Las Brisas Energy Center *Environmental Defense Fund et al., v. Texas Commission on Environmental Quality*, Cause No. D-1-GN-11-001364 (District Court of Travis County, Texas, 261st Judicial District).
58. Expert Report (April 2012), Supplemental and Rebuttal Expert Report (July 2012), and Supplemental Rebuttal Expert Report (August 2012) on behalf of the states of New Jersey and Connecticut in the matter of the Portland Power plant *State of New Jersey and State of Connecticut (Intervenor-Plaintiff) v. RRI Energy Mid-Atlantic Power Holdings et al.*, Civil Action No. 07-CV-5298 (JKG) (Eastern District of Pennsylvania).
59. Declaration (April 2012) in the matter of the EPA’s EGU MATS Rule, on behalf of the Environmental Integrity Project.
60. Expert Report (August 2012) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Harm Phase.
61. Declaration (September 2012) in the Matter of the Application of *Energy Answers Incinerator, Inc.* for a Certificate of Public Convenience and Necessity to Construct a 120 MW Generating Facility in Baltimore City, Maryland, before the Public Service Commission of Maryland, Case No. 9199.
62. Expert Report (October 2012) on behalf of the Appellants (Robert Concilus and Leah Humes) in the matter of Robert Concilus and Leah Humes v. Commonwealth of Pennsylvania Department of Environmental Protection and Crawford Renewable Energy, before the Commonwealth of Pennsylvania Environmental Hearing Board, Docket No. 2011-167-R.
63. Expert Report (October 2012), Supplemental Expert Report (January 2013), and Affidavit (June 2013) in the matter of various Environmental Petitioners v. North Carolina DENR/DAQ and Carolinas Cement Company, before the Office of Administrative Hearings, State of North Carolina.

64. Pre-filed Testimony (October 2012) on behalf of No-Sag in the matter of the North Springfield Sustainable Energy Project before the State of Vermont, Public Service Board.
65. Pre-filed Testimony (November 2012) on behalf of Clean Wisconsin in the matter of Application of Wisconsin Public Service Corporation for Authority to Construct and Place in Operation a New Multi-Pollutant Control Technology System (ReACT) for Unit 3 of the Weston Generating Station, before the Public Service Commission of Wisconsin, Docket No. 6690-CE-197.
66. Expert Report (February 2013) on behalf of Petitioners in the matter of Credence Crematory, Cause No. 12-A-J-4538 before the Indiana Office of Environmental Adjudication.
67. Expert Report (April 2013), Rebuttal report (July 2013), and Declarations (October 2013, November 2013) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).
68. Declaration (April 2013) on behalf of Petitioners in the matter of *Sierra Club, et al., (Petitioners) v Environmental Protection Agency et al. (Respondents)*, Case No., 13-1112, (Court of Appeals, District of Columbia Circuit).
69. Expert Report (May 2013) and Rebuttal Expert Report (July 2013) on behalf of the Sierra Club in connection with the Luminant Martin Lake Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 5:10-cv-0156-MHS-CMC (Eastern District of Texas, Texarkana Division).
70. Declaration (August 2013) on behalf of A. J. Acosta Company, Inc., in the matter of *A. J. Acosta Company, Inc., v. County of San Bernardino*, Case No. CIVSS803651.
71. Comments (October 2013) on behalf of the Washington Environmental Council and the Sierra Club in the matter of the Washington State Oil Refinery RACT (for Greenhouse Gases), submitted to the Washington State Department of Ecology, the Northwest Clean Air Agency, and the Puget Sound Clean Air Agency.
72. Statement (November 2013) on behalf of various Environmental Organizations in the matter of the Boswell Energy Center (BEC) Unit 4 Environmental Retrofit Project, to the Minnesota Public Utilities Commission, Docket No. E-015/M-12-920.
73. Expert Report (December 2013) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).
74. Expert Testimony (December 2013) on behalf of the Sierra Club in the matter of Public Service Company of New Hampshire Merrimack Station Scrubber Project and Cost Recovery, Docket No. DE 11-250, to the State of New Hampshire Public Utilities Commission.
75. Expert Report (January 2014) on behalf of Baja, Inc., in *Baja, Inc., v. Automotive Testing and Development Services, Inc. et. al*, Civil Action No. 8:13-CV-02057-GRA (District of South Carolina, Anderson/Greenwood Division).
76. Declaration (March 2014) on behalf of the Center for International Environmental Law, Chesapeake Climate Action Network, Friends of the Earth, Pacific Environment, and the Sierra Club (Plaintiffs) in the matter of *Plaintiffs v. the Export-Import Bank (Ex-Im Bank) of the United States*, Civil Action No. 13-1820 RC (District Court for the District of Columbia).
77. Declaration (April 2014) on behalf of Respondent-Intervenors in the matter of *Mexichem Specialty Resins Inc., et al., (Petitioners) v Environmental Protection Agency et al.*, Case No., 12-1260 (and Consolidated Case Nos. 12-1263, 12-1265, 12-1266, and 12-1267), (Court of Appeals, District of Columbia Circuit).
78. Direct Prefiled Testimony (June 2014) on behalf of the Michigan Environmental Council and the Sierra Club in the matter of the Application of DTE Electric Company for Authority to Implement a Power Supply Cost Recovery (PSCR) Plan in its Rate Schedules for 2014 Metered Jurisdictional Sales of Electricity, Case No. U-17319 (Michigan Public Service Commission).
79. Expert Report (June 2014) on behalf of ECM Biofilms in the matter of the US Federal Trade Commission (FTC) v. ECM Biofilms (FTC Docket #9358).

80. Direct Prefiled Testimony (August 2014) on behalf of the Michigan Environmental Council and the Sierra Club in the matter of the Application of Consumers Energy Company for Authority to Implement a Power Supply Cost Recovery (PSCR) Plan in its Rate Schedules for 2014 Metered Jurisdictional Sales of Electricity, Case No. U-17317 (Michigan Public Service Commission).
81. Declaration (July 2014) on behalf of Public Health Intervenor in the matter of *EME Homer City Generation v. US EPA* (Case No. 11-1302 and consolidated cases) relating to the lifting of the stay entered by the Court on December 30, 2011 (US Court of Appeals for the District of Columbia).
82. Expert Report (September 2014), Rebuttal Expert Report (December 2014) and Supplemental Expert Report (March 2015) on behalf of Plaintiffs in the matter of *Sierra Club and Montana Environmental Information Center (Plaintiffs) v. PPL Montana LLC, Avista Corporation, Puget Sound Energy, Portland General Electric Company, Northwestern Corporation, and PacifiCorp (Defendants)*, Civil Action No. CV 13-32-BLG-DLC-JCL (US District Court for the District of Montana, Billings Division).
83. Expert Report (November 2014) on behalf of Niagara County, the Town of Lewiston, and the Villages of Lewiston and Youngstown in the matter of CWM Chemical Services, LLC New York State Department of Environmental Conservation (NYSDEC) Permit Application Nos.: 9-2934-00022/00225, 9-2934-00022/00231, 9-2934-00022/00232, and 9-2934-00022/00249 (pending).
84. *Declaration (January 2015) relating to Startup/Shutdown in the MATS Rule (EPA Docket ID No. EPA-HQ-OAR-2009-0234) on behalf of the Environmental Integrity Project.*
85. Pre-filed Direct Testimony (March 2015), Supplemental Testimony (May 2015), and Surrebuttal Testimony (December 2015) on behalf of Friends of the Columbia Gorge in the matter of the Application for a Site Certificate for the Troutdale Energy Center before the Oregon Energy Facility Siting Council.
86. Brief of Amici Curiae Experts in Air Pollution Control and Air Quality Regulation in Support of the Respondents, On Writs of Certiorari to the US Court of Appeals for the District of Columbia, No. 14-46, 47, 48. *Michigan et. al., (Petitioners) v. EPA et. al., Utility Air Regulatory Group (Petitioners) v. EPA et. al., National Mining Association et. al., (Petitioner) v. EPA et. al.*, (Supreme Court of the United States).
87. Expert Report (March 2015) and Rebuttal Expert Report (January 2016) on behalf of Plaintiffs in the matter of *Conservation Law Foundation v. Broadrock Gas Services LLC, Rhode Island LFG GENCO LLC, and Rhode Island Resource Recovery Corporation (Defendants)*, Civil Action No. 1:13-cv-00777-M-PAS (US District Court for the District of Rhode Island).
88. Declaration (April 2015) relating to various Technical Corrections for the MATS Rule (EPA Docket ID No. EPA-HQ-OAR-2009-0234) on behalf of the Environmental Integrity Project.
89. Direct Prefiled Testimony (May 2015) on behalf of the Michigan Environmental Council, the Natural Resources Defense Council, and the Sierra Club in the matter of the Application of DTE Electric Company for Authority to Increase its Rates, Amend its Rate Schedules and Rules Governing the Distribution and Supply of Electric Energy and for Miscellaneous Accounting Authority, Case No. U-17767 (Michigan Public Service Commission).
90. Expert Report (July 2015) and Rebuttal Expert Report (July 2015) on behalf of Plaintiffs in the matter of *Northwest Environmental Defense Center et. al., v. Cascade Kelly Holdings LLC, d/b/a Columbia Pacific Bio-Refinery, and Global Partners LP (Defendants)*, Civil Action No. 3:14-cv-01059-SI (US District Court for the District of Oregon, Portland Division).
91. Declaration (August 2015, Docket No. 1570376) in support of “Opposition of Respondent-Intervenor American Lung Association, et. al., to Tri-State Generation’s Emergency Motion;” Declaration (September 2015, Docket No. 1574820) in support of “Joint Motion of the State, Local Government, and Public Health Respondent-Intervenor for Remand Without Vacatur;” Declaration (October 2015) in support of “Joint Motion of the State, Local Government, and Public Health Respondent-Intervenor to State and Certain Industry Petitioners’ Motion to Govern, *White Stallion Energy Center, LLC v. US EPA*, Case No. 12-1100 (US Court of Appeals for the District of Columbia).
92. Declaration (September 2015) in support of the Draft Title V Permit for Dickerson Generating Station (Proposed Permit No 24-031-0019) on behalf of the Environmental Integrity Project.

93. Expert Report (Liability Phase) (December 2015) and Rebuttal Expert Report (February 2016) on behalf of Plaintiffs in the matter of *Natural Resources Defense Council, Inc., Sierra Club, Inc., Environmental Law and Policy Center, and Respiratory Health Association v. Illinois Power Resources LLC, and Illinois Power Resources Generating LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (US District Court for the Central District of Illinois, Peoria Division).
94. Declaration (December 2015) in support of the Petition to Object to the Title V Permit for Morgantown Generating Station (Proposed Permit No 24-017-0014) on behalf of the Environmental Integrity Project.
95. Expert Report (November 2015) on behalf of Appellants in the matter of *Sierra Club, et al. v. Craig W. Butler, Director of Ohio Environmental Protection Agency et al.*, ERAC Case No. 14-256814.
96. Affidavit (January 2016) on behalf of Bridgewatch Detroit in the matter of *Bridgewatch Detroit v. Waterfront Petroleum Terminal Co., and Waterfront Terminal Holdings, LLC.*, in the Circuit Court for the County of Wayne, State of Michigan.
97. Expert Report (February 2016) and Rebuttal Expert Report (July 2016) on behalf of the challengers in the matter of the Delaware Riverkeeper Network, Clean Air Council, et. al., vs. Commonwealth of Pennsylvania Department of Environmental Protection and R. E. Gas Development LLC regarding the Geyer well site before the Pennsylvania Environmental Hearing Board.
98. Direct Testimony (May 2016) in the matter of Tesoro Savage LLC Vancouver Energy Distribution Terminal, Case No. 15-001 before the State of Washington Energy Facility Site Evaluation Council.
99. Declaration (June 2016) relating to deficiencies in air quality analysis for the proposed Millenium Bulk Terminal, Port of Longview, Washington.
100. Declaration (December 2016) relating to EPA's refusal to set limits on PM emissions from coal-fired power plants that reflect pollution reductions achievable with fabric filters on behalf of Environmental Integrity Project, Clean Air Council, Chesapeake Climate Action Network, Downwinders at Risk represented by Earthjustice in the matter of *ARIPPA v EPA, Case No. 15-1180*. (D.C. Circuit Court of Appeals).
101. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Huntley and Huntley Poseidon Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.
102. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Apex Energy Backus Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.
103. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Apex Energy Drakulic Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.
104. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Apex Energy Deutsch Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.
105. Affidavit (February 2017) pertaining to deficiencies water discharge compliance issues at the Wood River Refinery in the matter of *People of the State of Illinois (Plaintiff) v. Phillips 66 Company, ConocoPhillips Company, WRB Refining LP (Defendants)*, Case No. 16-CH-656, (Circuit Court for the Third Judicial Circuit, Madison County, Illinois).
106. Expert Report (March 2017) on behalf of the Plaintiff pertaining to non-degradation analysis for waste water discharges from a power plant in the matter of *Sierra Club (Plaintiff) v. Pennsylvania Department of Environmental Protection (PADEP) and Lackawanna Energy Center*, Docket No. 2016-047-L (consolidated), (Pennsylvania Environmental Hearing Board).
107. Expert Report (March 2017) on behalf of the Plaintiff pertaining to air emissions from the Heritage incinerator in East Liverpool, Ohio in the matter of *Save our County (Plaintiff) v. Heritage Thermal Services, Inc. (Defendant)*, Case No. 4:16-CV-1544-BYP, (US District Court for the Northern District of Ohio, Eastern Division).

108. Rebuttal Expert Report (June 2017) on behalf of Plaintiffs in the matter of *Casey Voight and Julie Voight (Plaintiffs) v Coyote Creek Mining Company LLC (Defendant)*, Civil Action No. 1:15-CV-00109 (US District Court for the District of North Dakota, Western Division).
109. Expert Affidavit (August 2017) and Penalty/Remedy Expert Affidavit (October 2017) on behalf of Plaintiff in the matter of *Wildearth Guardians (Plaintiff) v Colorado Springs Utility Board (Defendant)*, Civil Action No. 1:15-cv-00357-CMA-CBS (US District Court for the District of Colorado).
110. Expert Report (August 2017) on behalf of Appellant in the matter of *Patricia Ann Troiano (Appellant) v. Upper Burrell Township Zoning Hearing Board (Appellee)*, Court of Common Pleas of Westmoreland County, Pennsylvania, Civil Division.
111. Expert Report (October 2017), Supplemental Expert Report (October 2017), and Rebuttal Expert Report (November 2017) on behalf of Defendant in the matter of *Oakland Bulk and Oversized Terminal (Plaintiff) v City of Oakland (Defendant)*, Civil Action No. 3:16-cv-07014-VC (US District Court for the Northern District of California, San Francisco Division).
112. Declaration (December 2017) on behalf of the Environmental Integrity Project in the matter of permit issuance for ATI Flat Rolled Products Holdings, Breckenridge, PA to the Allegheny County Health Department.
113. Expert Report (Harm Phase) (January 2018), Rebuttal Expert Report (Harm Phase) (May 2018) and Supplemental Expert Report (Harm Phase) (April 2019) on behalf of Plaintiffs in the matter of *Natural Resources Defense Council, Inc., Sierra Club, Inc., and Respiratory Health Association v. Illinois Power Resources LLC, and Illinois Power Resources Generating LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (US District Court for the Central District of Illinois, Peoria Division).
114. Declaration (February 2018) on behalf of the Chesapeake Bay Foundation, et. al., in the matter of the Section 126 Petition filed by the state of Maryland in *State of Maryland v. Pruitt (Defendant)*, Civil Action No. JKB-17-2939 (Consolidated with No. JKB-17-2873) (US District Court for the District of Maryland).
115. Direct Pre-filed Testimony (March 2018) on behalf of the National Parks Conservation Association (NPCA) in the matter of *NPCA v State of Washington, Department of Ecology and BP West Coast Products, LLC*, PCHB No. 17-055 (Pollution Control Hearings Board for the State of Washington).
116. Expert Affidavit (April 2018) and Second Expert Affidavit (May 2018) on behalf of Petitioners in the matter of *Coosa River Basin Initiative and Sierra Club (Petitioners) v State of Georgia Environmental Protection Division, Georgia Department of Natural Resources (Respondent) and Georgia Power Company (Intervenor/Respondent)*, Docket Nos: 1825406-BNR-WW-57-Howells and 1826761-BNR-WW-57-Howells, Office of State Administrative Hearings, State of Georgia.
117. Direct Pre-filed Testimony and Affidavit (December 2018) on behalf of Sierra Club and Texas Campaign for the Environment (Appellants) in the contested case hearing before the Texas State Office of Administrative Hearings in Docket Nos. 582-18-4846, 582-18-4847 (Application of GCGV Asset Holding, LLC for Air Quality Permit Nos. 146425/PSDTX1518 and 146459/PSDTX1520 in San Patricio County, Texas).
118. Expert Report (February 2019) on behalf of Sierra Club in the State of Florida, Division of Administrative Hearings, Case No. 18-2124EPP, Tampa Electric Company Big Bend Unit 1 Modernization Project Power Plant Siting Application No. PA79-12-A2.
119. Declaration (March 2019) on behalf of Earthjustice in the matter of comments on the renewal of the Title V Federal Operating Permit for Valero Houston refinery.
120. Expert Report (March 2019) on behalf of Plaintiffs for Class Certification in the matter of *Resendez et al v Precision Castparts Corporation* in the Circuit Court for the State of Oregon, County of Multnomah, Case No. 16cv16164.
121. Expert Report (June 2019), Affidavit (July 2019) and Rebuttal Expert Report (September 2019) on behalf of Appellants relating to the NPDES permit for the Cheswick power plant in the matter of *Three Rivers Waterkeeper and Sierra Club (Appellants) v. State of Pennsylvania Department of Environmental Protection (Appellee) and NRG Power Midwest (Permittee)*, before the Commonwealth of Pennsylvania Environmental Hearing Board, EHB Docket No. 2018-088-R.

122. Affidavit/Expert Report (August 2019) relating to the appeal of air permits issued to PTTGCA on behalf of Appellants in the matter of *Sierra Club (Appellants) v. Craig Butler, Director, et. al., Ohio EPA (Appellees)* before the State of Ohio Environmental Review Appeals Commission (ERAC), Case Nos. ERAC-19-6988 through -6991.
123. Expert Report (October 2019) relating to the appeal of air permit (Plan Approval) on behalf of Appellants in the matter of *Clean Air Council and Environmental Integrity Project (Appellants) v. Commonwealth of Pennsylvania Department of Environmental Protection and Sunoco Partners Marketing and Terminals L.P.*, before the Commonwealth of Pennsylvania Environmental Hearing Board, EHB Docket No. 2018-057-L.
124. Expert Report (December 2019), Affidavit (March 2020), Supplemental Expert Report (July 2020), and Declaration (February 2021) on behalf of Earthjustice in the matter of *Objection to the Issuance of PSD/NSR and Title V permits for Riverview Energy Corporation*, Dale, Indiana, before the Indiana Office of Environmental Adjudication, Cause No. 19-A-J-5073.
125. Affidavit (December 2019) on behalf of Plaintiff-Intervenor (Surfrider Foundation) in the matter of *United States and the State of Indiana (Plaintiffs), Surfrider Foundation (Plaintiff-Intervenor), and City of Chicago (Plaintiff-Intervenor) v. United States Steel Corporation (Defendant)*, Civil Action No. 2:18-cv-00127 (US District Court for the Northern District of Indiana, Hammond Division).
126. Declarations (January 2020, February 2020, May 2020, July 2020, and August 2020) and Pre-filed Testimony (April 2021) in support of Petitioner's Motion for Stay of PSCAA NOC Order of Approval No. 11386 in the matter of the *Puyallup Tribe of Indians v. Puget Sound Clean Air Agency (PSCAA) and Puget Sound Energy (PSE)*, before the State of Washington Pollution Control Hearings Board, PCHB No. P19-088.
127. Expert Report (April 2020) on behalf of the plaintiff in the matter of Orion Engineered Carbons, GmbH (Plaintiff) vs. Evonik Operations, GmbH (formerly Evonik Degussa GmbH) (Respondent), before the German Arbitration Institute, Case No. DIS-SV-2019-00216.
128. Expert Independent Evaluation Report (June 2020) for *PacifiCorp's Decommissioning Costs Study Reports dated January 15, 2020 and March 13, 2020 relating to the closures of the Hunter, Huntington, Dave Johnston, Jim Bridger, Naughton, Wyodak, Hayden, and Colstrip (Units 3&4) plants*, prepared for the Oregon Public Utility Commission (Oregon PUC).
129. Direct Pre-filed Testimony (July 2020) on behalf of the Sierra Club in the matter of *the Application of the Ohio State University for a certificate of Environmental Compatibility and Public Need to Construct a Combined Heat and Power Facility in Franklin County, Ohio*, before the Ohio Power Siting Board, Case No. 19-1641-EL-BGN.
130. Expert Report (August 2020) and Rebuttal Expert Report (September 2020) on behalf of WildEarth Guardians (petitioners) in the matter of *the Appeals of the Air Quality Permit No. 7482-M1 Issued to 3 Bear Delaware Operating – NM LLC (EIB No. 20-21(A) and Registrations Nos. 8729, 8730, and 8733 under General Construction Permit for Oil and Gas Facilities (EIB No. 20-33 (A))*, before the State of New Mexico, Environmental Improvement Board.
131. Expert Report (July 2020) on the *Initial Economic Impact Analysis (EIA) for A Proposal To Regulate NOx Emissions from Natural Gas Fired Rich-Burn Natural Gas Reciprocating Internal Combustion Engines (RICE) Greater Than 100 Horsepower* prepared on behalf of Earthjustice and the National Parks Conservation Association in the matter of Regulation Number 7, Alternate Rules before the Colorado Air Quality Control Commission.
132. Expert Report (August 2020) and Supplemental Expert Report (February 2021) on the Potential Remedies to Avoid Adverse Thermal Impacts from the Merrimack Station on behalf of Plaintiffs in the matter of *Sierra Club Inc. and the Conservation Law Foundation (Plaintiffs) v. Granite Shore Power, LLC et. al., (Defendants)*, Civil Action No. 19-cv-216-JL (US District Court for the District of New Hampshire.)
133. Expert Report (August 2020) and Supplemental Expert Report (December 2020) on behalf of Plaintiffs in the matter of *PennEnvironment Inc., and Clean Air Council (Plaintiffs) and Allegheny County Health Department (Plaintiff-Intervenor) v. United States Steel Corporation (Defendant)*, Civil Action No. 2-19-cv-00484-MJH (US District Court for the Western District of Pennsylvania.)
134. Pre-filed Direct Testimony (October 2020) and Sur-rebuttal Testimony (November 2020) on behalf of petitioners (Ten Persons Group, including citizens, the Town of Braintree, the Town of Hingham, and the City of Quincy)

in the matter of Algonquin Gas Transmission LLC, Weymouth MA, No. X266786 Air Quality Plan Approval, before the Commonwealth of Massachusetts, Department of Environmental Protection, the Office of Appeals and Dispute Resolution, OADR Docket Nos. 2019-008, 2019-009, 2019010, 2019-011, 2019-012 and 2019-013.

135. Expert Report (November 2020) on behalf of Protect PT in the matter of *Protect PT v. Commonwealth of Pennsylvania Department of Environmental Protection and Apex Energy (PA) LLC*, before the Commonwealth of Pennsylvania Environmental Hearing Board, Docket No. 2018-080-R (consolidated with 2019-101-R)(the “Drakulic Appeal”).
136. Expert Report (December 2020) on behalf of Plaintiffs in the matter of *Sierra Club Inc. (Plaintiff) v. GenOn Power Midwest LP (Defendants)*, Civil Action No. 2-19-cv-01284-WSS (US District Court for the Western District of Pennsylvania.)
137. Pre-filed Testimony (January 2021) on behalf of the Plaintiffs (Shrimpers and Fishermen of the Rio Grande Valley represented by Texas RioGrande Legal Aid, Inc.) in the matter of the Appeal of Texas Commission on Environmental Quality (TCEQ) Permit Nos. 147681, PSDTX1522, GHGPSDTX172 for the Jupiter Brownsville Heavy Condensate Upgrader Facility, Cameron County, before the Texas State Office of Administrative Hearings, SOAH Docket No. 582-21-0111, TCEQ Docket No. 2020-1080-AIR.
138. Expert Report (June 2021) and Declarations (May 2021 and June 2021) on behalf of Plaintiffs in the matter of *Sierra Club (Plaintiff) v. Woodville Pellets, LLC (Defendant)*, Civil Action No. 9:20-cv-00178-MJT (US District Court for the Eastern District of Texas, Lufkin Division.)
139. Declaration (July 2021) on behalf of Plaintiffs in the matter of *Stephanie Mackey and Nick Migliore, on behalf of themselves and all others similarly situated (Plaintiffs) v. Chemtool Inc. and Lubrizol Corporation (Defendants)*, Case No. 2021-L-0000165, State of Illinois, Circuit Court of the 17th Judicial Circuit, Winnebago County.
140. Expert Report (April 2021) and Sur-Rebuttal Report (June 2021) on behalf of the Plaintiffs in the matter of *Modern Holdings, LLC, et al. (Plaintiffs) v. Corning Inc., et al. (Defendants)*, Civil Action No. 5:13-cv-00405-GFVT, (US District Court for the Eastern District of Kentucky, Central Division at Lexington).
141. Expert Witness Disclosure (June 2021) on behalf of the Plaintiffs in the matter of *Jay Burdick, et. al., (Plaintiffs) v. Tanoga Inc. (d/b/a Taconic) (Defendant)*, Index No. 253835, (State of New York Supreme Court, County of Rensselaer).
142. Expert Report (June 2021) on behalf of Appellants in the matter of *PennEnvironment and Earthworks (Appellants) v. Commonwealth of Pennsylvania Department of Environmental Protection (Appellee) and MarkWest Liberty Midstream and resource, LLC (Permittee)*, before the Commonwealth of Pennsylvania Environmental Hearing Board, EHB Docket No. 2020-002-R.
143. Expert Reports (March 2021 and May 2021) regarding the Aries Newark LLC Sludge Processing Facility, Application No. CPB 20-74, Central Planning Board, City of Newark, New Jersey.
144. Expert Report (April 2021) for *Charles Johnson Jr. (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 2:20-CV-01329. (US District Court for the Eastern District of Louisiana, New Orleans Division).
145. Expert Report (April 2021) for *Floyd Ruffin (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 2:20-cv-00334-CJB-JCW (US District Court for the Eastern District of Louisiana, New Orleans Division).
146. Expert Report (May 2021) for *Clifford Osmer (Plaintiff) v. BP Exploration and Production Inc., et. al., (Defendants)* related to No. 2:19-CV-10331 (US District Court for the Eastern District of Louisiana, New Orleans Division).
147. Expert Report (June 2021) for *Antonia Saavedra-Vargas (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 2:18-CV-11461 (US District Court for the Eastern District of Louisiana, New Orleans Division).
148. Affidavit (June 2021) for Lourdes Rubi in the matter of *Lourdes Rubi (Plaintiff) v. BP Exploration and Production Inc., et. al., (Defendants)*, related to 12-968 BELO in MDL No. 2179 (US District Court for the Eastern District of Louisiana, New Orleans Division).

149. Expert Report (May 2021) for *James Noel (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 1:19-CV-00694 (US District Court for the Southern District of Alabama, Mobile Division).
150. Expert Report (June 2021) for *Wallace Smitht (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 2:19-CV-12880 (US District Court for the Eastern District of Louisiana, New Orleans Division).

C. Occasions where Dr. Sahu has provided oral testimony in depositions, at trial or in similar proceedings include the following:

151. Deposition on behalf of Rocky Mountain Steel Mills, Inc. located in Pueblo, Colorado – dealing with the manufacture of steel in mini-mills including methods of air pollution control and BACT in steel mini-mills and opacity issues at this steel mini-mill.
152. Trial Testimony (February 2002) on behalf of Rocky Mountain Steel Mills, Inc. in Denver District Court.
153. Trial Testimony (February 2003) on behalf of the United States in the Ohio Edison NSR Cases, *United States, et al. v. Ohio Edison Co., et al.*, C2-99-1181 (Southern District of Ohio).
154. Trial Testimony (June 2003) on behalf of the United States in the Illinois Power NSR Case, *United States v. Illinois Power Co., et al.*, 99-833-MJR (Southern District of Illinois).
155. Deposition (10/20/2005) on behalf of the United States in connection with the Cinergy NSR Case. *United States, et al. v. Cinergy Corp., et al.*, IP 99-1693-C-M/S (Southern District of Indiana).
156. Oral Testimony (August 2006) on behalf of the Appalachian Center for the Economy and the Environment re. the Western Greenbrier plant, WV before the West Virginia DEP.
157. Oral Testimony (May 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women’s Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) re. the Thompson River Cogeneration plant before the Montana Board of Environmental Review.
158. Oral Testimony (October 2007) on behalf of the Sierra Club re. the Sevier Power Plant before the Utah Air Quality Board.
159. Oral Testimony (August 2008) on behalf of the Sierra Club and Clean Water re. Big Stone Unit II before the South Dakota Board of Minerals and the Environment.
160. Oral Testimony (February 2009) on behalf of the Sierra Club and the Southern Environmental Law Center re. Santee Cooper Pee Dee units before the South Carolina Board of Health and Environmental Control.
161. Oral Testimony (February 2009) on behalf of the Sierra Club and the Environmental Integrity Project re. NRG Limestone Unit 3 before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.
162. Deposition (July 2009) on behalf of MTD Products, Inc., in the matter of *Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al.*
163. Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Coletto Creek coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).
164. Deposition (October 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).
165. Deposition (October 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.
166. Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Tenaska coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH). (April 2010).
167. Oral Testimony (November 2009) on behalf of the Environmental Defense Fund re. the Las Brisas Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

168. Deposition (December 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).
169. Oral Testimony (February 2010) on behalf of the Environmental Defense Fund re. the White Stallion Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.
170. Deposition (June 2010) on behalf of the United States in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).
171. Trial Testimony (September 2010) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, State of Maryland, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case in US District Court in the Western District of Pennsylvania. *Plaintiffs v. Allegheny Energy Inc., et al.*, 2:05cv0885 (Western District of Pennsylvania).
172. Oral Direct and Rebuttal Testimony (September 2010) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).
173. Oral Testimony (September 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions*, No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.
174. Oral Testimony (October 2010) on behalf of the Environmental Defense Fund re. the Las Brisas Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.
175. Oral Testimony (November 2010) regarding BART for PSCo Hayden, CSU Martin Drake units before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.
176. Oral Testimony (December 2010) regarding BART for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.
177. Deposition (December 2010) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).
178. Deposition (February 2011 and January 2012) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)’s Cherokee power plant. No. 09-cv-1862 (D. Colo.).
179. Oral Testimony (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).
180. Deposition (August 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (District of Colorado).
181. Deposition (July 2011) and Oral Testimony at Hearing (February 2012) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.
182. Oral Testimony at Hearing (March 2012) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).
183. Oral Testimony at Hearing (April 2012) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).
184. Oral Testimony at Hearing (November 2012) on behalf of Clean Wisconsin in the matter of Application of Wisconsin Public Service Corporation for Authority to Construct and Place in Operation a New Multi-Pollutant

Control Technology System (ReACT) for Unit 3 of the Weston Generating Station, before the Public Service Commission of Wisconsin, Docket No. 6690-CE-197.

185. Deposition (March 2013) in the matter of various Environmental Petitioners v. North Carolina DENR/DAQ and Carolinas Cement Company, before the Office of Administrative Hearings, State of North Carolina.
186. Deposition (August 2013) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).
187. Deposition (August 2013) on behalf of the Sierra Club in connection with the Luminant Martin Lake Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 5:10-cv-0156-MHS-CMC (Eastern District of Texas, Texarkana Division).
188. Deposition (February 2014) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).
189. Trial Testimony (February 2014) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.*, Civil Action No. 4:10-cv-4969 (Southern District of Texas, Houston Division).
190. Trial Testimony (February 2014) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).
191. Deposition (June 2014) and Trial (August 2014) on behalf of ECM Biofilms in the matter of the *US Federal Trade Commission (FTC) v. ECM Biofilms* (FTC Docket #9358).
192. Deposition (February 2015) on behalf of Plaintiffs in the matter of *Sierra Club and Montana Environmental Information Center (Plaintiffs) v. PPL Montana LLC, Avista Corporation, Puget Sound Energy, Portland General Electric Company, Northwestern Corporation, and Pacificorp (Defendants)*, Civil Action No. CV 13-32-BLG-DLC-JCL (US District Court for the District of Montana, Billings Division).
193. Oral Testimony at Hearing (April 2015) on behalf of Niagara County, the Town of Lewiston, and the Villages of Lewiston and Youngstown in the matter of CWM Chemical Services, LLC New York State Department of Environmental Conservation (NYSDEC) Permit Application Nos.: 9-2934-00022/00225, 9-2934-00022/00231, 9-2934-00022/00232, and 9-2934-00022/00249 (pending).
194. Deposition (August 2015) on behalf of Plaintiff in the matter of *Conservation Law Foundation (Plaintiff) v. Broadrock Gas Services LLC, Rhode Island LFG GENCO LLC, and Rhode Island Resource Recovery Corporation (Defendants)*, Civil Action No. 1:13-cv-00777-M-PAS (US District Court for the District of Rhode Island).
195. Testimony at Hearing (August 2015) on behalf of the Sierra Club in the matter of *Amendments to 35 Illinois Administrative Code Parts 214, 217, and 225* before the Illinois Pollution Control Board, R15-21.
196. Deposition (May 2015) on behalf of Plaintiffs in the matter of *Northwest Environmental Defense Center et. al., (Plaintiffs) v. Cascade Kelly Holdings LLC, d/b/a Columbia Pacific Bio-Refinery, and Global Partners LP (Defendants)*, Civil Action No. 3:14-cv-01059-SI (US District Court for the District of Oregon, Portland Division).
197. Trial Testimony (October 2015) on behalf of Plaintiffs in the matter of *Northwest Environmental Defense Center et. al., (Plaintiffs) v. Cascade Kelly Holdings LLC, d/b/a Columbia Pacific Bio-Refinery, and Global Partners LP (Defendants)*, Civil Action No. 3:14-cv-01059-SI (US District Court for the District of Oregon, Portland Division).
198. Deposition (April 2016) on behalf of the Plaintiffs in *UNatural Resources Defense Council, Respiratory Health Association, and Sierra Club (Plaintiffs) v. Illinois Power Resources LLC and Illinois Power Resources Generation LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (Central District of Illinois, Peoria Division).
199. Trial Testimony at Hearing (July 2016) in the matter of Tesoro Savage LLC Vancouver Energy Distribution Terminal, Case No. 15-001 before the State of Washington Energy Facility Site Evaluation Council.
200. Trial Testimony (December 2016) on behalf of the challengers in the matter of the Delaware Riverkeeper Network, Clean Air Council, et. al., vs. Commonwealth of Pennsylvania Department of Environmental Protection

and R. E. Gas Development LLC regarding the Geyer well site before the Pennsylvania Environmental Hearing Board.

201. Trial Testimony (July-August 2016) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).
202. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Huntley and Huntley Poseidon Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.
203. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Apex energy Backus Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.
204. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Apex energy Drakulic Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.
205. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Apex energy Deutsch Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.
206. Deposition Testimony (July 2017) on behalf of Plaintiffs in the matter of *Casey Voight and Julie Voight v Coyote Creek Mining Company LLC (Defendant)* Civil Action No. 1:15-CV-00109 (US District Court for the District of North Dakota, Western Division).
207. Deposition Testimony (November 2017) on behalf of Defendant in the matter of *Oakland Bulk and Oversized Terminal (Plaintiff) v City of Oakland (Defendant,)* Civil Action No. 3:16-cv-07014-VC (US District Court for the Northern District of California, San Francisco Division).
208. Deposition Testimony (December 2017) on behalf of Plaintiff in the matter of *Wildearth Guardians (Plaintiff) v Colorado Springs Utility Board (Defendant)* Civil Action No. 1:15-cv-00357-CMA-CBS (US District Court for the District of Colorado).
209. Deposition Testimony (January 2018) in the matter of National Parks Conservation Association (NPCA) v. State of Washington Department of Ecology and British Petroleum (BP) before the Washington Pollution Control Hearing Board, Case No. 17-055.
210. Trial Testimony (January 2018) on behalf of Defendant in the matter of *Oakland Bulk and Oversized Terminal (Plaintiff) v City of Oakland (Defendant,)* Civil Action No. 3:16-cv-07014-VC (US District Court for the Northern District of California, San Francisco Division).
211. Trial Testimony (April 2018) on behalf of the National Parks Conservation Association (NPCA) in the matter of NPCA v State of Washington, Department of Ecology and BP West Coast Products, LLC, PCHB No. 17-055 (Pollution Control Hearings Board for the State of Washington).
212. Deposition (June 2018) (harm Phase) on behalf of Plaintiffs in the matter of *Natural Resources Defense Council, Inc., Sierra Club, Inc., and Respiratory Health Association v. Illinois Power Resources LLC, and Illinois Power Resources Generating LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (US District Court for the Central District of Illinois, Peoria Division).
213. Trial Testimony (July 2018) on behalf of Petitioners in the matter of *Coosa River Basin Initiative and Sierra Club (Petitioners) v State of Georgia Environmental Protection Division, Georgia Department of Natural Resources (Respondent) and Georgia Power Company (Intervenor/Respondent)*, Docket Nos: 1825406-BNR-WW-57-Howells and 1826761-BNR-WW-57-Howells, Office of State Administrative Hearings, State of Georgia.
214. Deposition (January 2019) and Trial Testimony (January 2019) on behalf of Sierra Club and Texas Campaign for the Environment (Appellants) in the contested case hearing before the Texas State Office of Administrative Hearings in Docket Nos. 582-18-4846, 582-18-4847 (Application of GCGV Asset Holding, LLC for Air Quality Permit Nos. 146425/PSDTX1518 and 146459/PSDTX1520 in San Patricio County, Texas).

215. Deposition (February 2019) and Trial Testimony (March 2019) on behalf of Sierra Club in the State of Florida, Division of Administrative Hearings, Case No. 18-2124EPP, Tampa Electric Company Big Bend Unit 1 Modernization Project Power Plant Siting Application No. PA79-12-A2.
216. Deposition (June 2019) relating to the appeal of air permits issued to PTTGCA on behalf of Appellants in the matter of *Sierra Club (Appellants) v. Craig Butler, Director, et. al., Ohio EPA (Appellees)* before the State of Ohio Environmental Review Appeals Commission (ERAC), Case Nos. ERAC-19-6988 through -6991.
217. Deposition (September 2019) on behalf of Appellants relating to the NPDES permit for the Cheswick power plant in the matter of *Three Rivers Waterkeeper and Sierra Club (Appellants) v. State of Pennsylvania Department of Environmental Protection (Appellee) and NRG Power Midwest (Permittee)*, before the Commonwealth of Pennsylvania Environmental Hearing Board, EHB Docket No. 2018-088-R.
218. Deposition (December 2019) on behalf of the Plaintiffs in the matter of David Kovac, individually and on behalf of wrongful death class of Irene Kovac v. BP Corporation North America Inc., Circuit Court of Jackson County, Missouri (Independence), Case No. 1816-CV12417.
219. Deposition (February 2020, virtual) and testimony at Hearing (August 2020, virtual) on behalf of Earthjustice in the matter of *Objection to the Issuance of PSD/NSR and Title V permits for Riverview Energy Corporation*, Dale, Indiana, before the Indiana Office of Environmental Adjudication, Cause No. 19-A-J-5073.
220. Hearing (July 14-15, 2020, virtual) on behalf of the Sierra Club in the matter of *the Application of the Ohio State University for a certificate of Environmental Compatibility and Public Need to Construct a Combined Heat and Power Facility in Franklin County, Ohio*, before the Ohio Power Siting Board, Case No. 19-1641-EL-BGN.
221. Hearing (September 2020, virtual) on behalf of WildEarth Guardians (petitioners) in the matter of *the Appeals of the Air Quality Permit No. 7482-M1 Issued to 3 Bear Delaware Operating – NM LLC (EIB No. 20-21(A) and Registrations Nos. 8729, 8730, and 8733 under General Construction Permit for Oil and Gas Facilities (EIB No. 20-33 (A))*, before the State of New Mexico, Environmental Improvement Board.
222. Deposition (December 2020, March 4-5, 2021, all virtual) and Hearing (April 2021, virtual) in support of Petitioner’s Motion for Stay of PSCAA NOC Order of Approval No. 11386 in the matter of *the Puyallup Tribe of Indians v. Puget Sound Clean Air Agency (PSCAA) and Puget Sound Energy (PSE)*, before the State of Washington Pollution Control Hearings Board, PCHB No. P19-088.
223. Hearing (September 2020, virtual) on the *Initial Economic Impact Analysis (EIA) for A Proposal To Regulate NOx Emissions from Natural Gas Fired Rich-Burn Natural Gas Reciprocating Internal Combustion Engines (RICE) Greater Than 100 Horsepower* prepared on behalf of Earthjustice and the National Parks Conservation Association in the matter of Regulation Number 7, Alternate Rules before the Colorado Air Quality Control Commission.
224. Deposition (December 2020, virtual and Hearing February 2021, virtual) on behalf of the Plaintiffs (Shrimpers and Fishermen of the Rio Grande Valley represented by Texas RioGrande Legal Aid, Inc.) in the matter of the Appeal of Texas Commission on Environmental Quality (TCEQ) Permit Nos. 147681, PSDTX1522, GHGPSDTX172 for the Jupiter Brownsville Heavy Condensate Upgrader Facility, Cameron County, before the Texas State Office of Administrative Hearings, SOAH Docket No. 582-21-0111, TCEQ Docket No. 2020-1080-AIR.
225. Deposition (January 2021, virtual) on behalf of Plaintiffs in the matter of *PennEnvironment Inc., and Clean Air Council (Plaintiffs) and Allegheny County Health Department (Plaintiff-Intervenor) v. United States Steel Corporation (Defendant)*, Civil Action No. 2-19-cv-00484-MJH (US District Court for the Western District of Pennsylvania.)
226. Deposition (February 2021, virtual) on behalf of Plaintiffs in the matter of *Sierra Club Inc. (Plaintiff) v. GenOn Power Midwest LP (Defendants)*, Civil Action No. 2-19-cv-01284-WSS (US District Court for the Western District of Pennsylvania.)
227. Deposition (April 2021, virtual) on the Potential Remedies to Avoid Adverse Thermal Impacts from the Merrimack Station on behalf of Plaintiffs in the matter of *Sierra Club Inc. and the Conservation Law Foundation (Plaintiffs) v. Granite Shore Power, LLC et. al., (Defendants)*, Civil Action No. 19-cv-216-JL (US District Court for the District of New Hampshire.)

228. Deposition (June 2021, virtual) on behalf of Plaintiffs in the matter of *Sierra Club (Plaintiff) v. Woodville Pellets, LLC (Defendant)*, Civil Action No. 9:20-cv-00178-MJT (US District Court for the Eastern District of Texas, Lufkin Division).
229. Deposition (June 2021, virtual) on behalf of the Plaintiffs in the matter of *Modern Holdings, LLC, et al. (Plaintiffs) v. Corning Inc., et al. (Defendants)*, Civil Action No. 5:13-cv-00405-GFVT, (US District Court for the Eastern District of Kentucky, Central Division at Lexington).
230. Testimony (June 2021, virtual) regarding the Aries Newark LLC Sludge Processing Facility, Application No. CPB 20-74, Central Planning Board, City of Newark, New Jersey.

Exhibit B

Comments on EPA's Proposed Approval of the May 13, 2020 Revisions to the Texas State Implementation Plan (SIP) Concerning the Houston-Galveston-Brazoria (HGB) 2008 8-Hour Ozone NAAQS VOC and NO_x Reasonably Available Control Technology (RACT) Requirements

by

Dr. Ranajit (Ron) Sahu, Consultant¹

April 8, 2021

1.0 Summary

EPA has proposed to approve, with one exception, the volatile organic compounds (VOC) and nitrogen oxides (NO_x) RACT requirements for the HGB 2008 8-hour ozone nonattainment area relying on the fact that current TCEQ rules in 30 TAC 115 (for VOCs) and 30 TAC 117 (for NO_x) cover, with a few exceptions, the types of sources in the HGB area for which EPA has promulgated Control Techniques Guidelines (CTGs) and Alternative Control Techniques (ACT) documents in the past. In other words EPA's approval simply relies on the fact that the rules exist. The HGB area continues to experience significant exceedances of the 2008 (and the even more stringent 2015) 8-hour ozone NAAQS. Emissions of VOC and NO_x from stationary sources subject to RACT are very large. In its approval EPA relies on the fact that it has provided similar approvals for RACT for prior rules including the 1-hour ozone and 1997 8-hour ozone rules. The CTG and ACT documents, which purport to presumptively establish RACT requirements (specifically the CTG documents) are outdated and EPA has not promulgated any updates or new documents in the last decade or longer with one exception. Similarly, the TCEQ rules in 30 TAC 115 and 30 TAC 117 are also outdated and have not been updated, with few exceptions, in the last decade or longer. As such the *contents* of the TCEQ rules and the CTG/ACT documents – i.e., the numerical emissions requirements or control efficiency requirements or work practices – do not reflect current levels of performance that are readily achievable. In its current proposed approval, EPA did not discuss any of the actual rule requirements in the rules found at 30 TAC Sections 115 and 117. I show, by example, that had EPA reviewed the contents of the rules themselves as opposed to simply accepting that the rules exist without reviewing their contents, EPA would have readily seen how outdated the rule requirements are and how they do not meet the definition of RACT. Based on this EPA's approval is cursory and its conclusion that the extant TCEQ rules, with one exception, in fact, meet the definition of RACT is wholly unsupported.

¹ Resume provided in Attachment A.

2.0 Documents Reviewed

In preparing the comments provided in this report, I have reviewed the following materials:

- (i) Proposed Rule²
- (ii) Technical Support Document, Reasonably Available Control Technology Application Analysis (RACT) for the Houston-Galveston-Brazoria (HGB) Ozone Serious Nonattainment Area (HGB Area), Docket No. EPA-R06-OAR-2020-0165, August 2020 (hereafter “TSD”).³
- (iii) TCEQ, Revisions to the State of Texas Air Quality Implementation Plan for the Control of Ozone Air Pollution, Houston-Galveston-Brazoria 2008 Eight-Hour Ozone Standard Nonattainment Area, May 4, 2020.⁴
- (iv) TCEQ, Appendix F, RACT Analysis, May 4, 2020 (hereafter “Appendix F”).⁵
- (v) TCEQ Response to Comments (RTC) received concerning the HGB Serious Classification Attainment Demonstration (AD) State Implementation Plan (SIP) Revision for the 2008 8-Hour Ozone National Ambient Air Quality Standard;⁶
- (vi) Other documents and references, as cited in these comments.

3.0 Introductory Materials

3.1 VOCs and NOx are Ozone precursors

Atmospheric chemistry has firmly established that VOCs and NOx are “ozone precursors,” in that they react with oxygen and sunlight to form O₃ in the atmosphere via photochemical reactions. Numerous sources including many stationary sources emit VOCs including chemical manufacturing plants, refineries, chemical distribution facilities, etc. All combustion sources that use air emit NOx. Only by controlling sources of NOx and VOC emissions can lower O₃ levels in the ambient air be achieved.

3.2 Ozone Nonattainment Status of the HGB Area

EPA has promulgated numerous, increasing more stringent NAAQS for ozone over time.⁷ Of interest here, and not delving into the statistical form of the standard and just focusing on the numerical values, in 1979 EPA promulgated a 1-hour ozone NAAQS at the level of 120 parts per

² 86 FR 13679-13683, Wednesday, March 10, 2021.

³ Docket ID EPA-R06-OAR-2020-0165-0002.

⁴ Docket ID EPA-R06-OAR-2020-0165-0003.

⁵ Docket ID EPA-R06-OAR-2020-0165-0004.

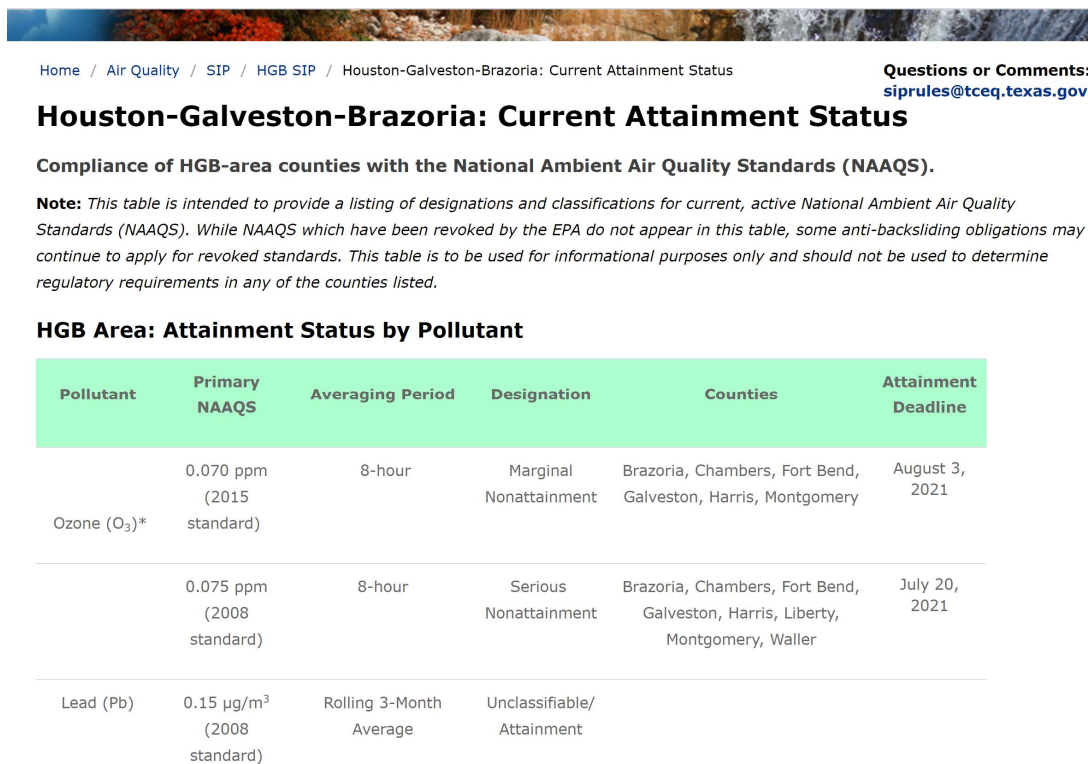
⁶ Among others, I had provided comments on the RACT and Reasonably Achievable Control Measures (RACM) portion of this SIP Revision in a report dated October 18, 2019, which is part of the record.

⁷ <https://www.epa.gov/ground-level-ozone-pollution/timeline-ozone-national-ambient-air-quality-standards-naaqs>

billion (ppb), followed by an 8-hour NAAQS of 84 ppb in 1997. In 2008, the 8-hour standard (the subject of the current proposed RACT approval) was tightened to 75 ppb. And, in 2015 this 8-hour standard was further tightened to 70 ppb.

Areas of the country are designated as varying levels of ozone non-attainment, depending on ozone levels in the area, i.e., how much they exceed the NAAQS: marginal, moderate, serious, severe (two levels severe-15 and severe-17), and extreme.⁸

The HGB area is designated as serious ozone nonattainment and it consists of Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties. Per TCEQ, Brazoria, Chambers, Fort Bend, Galveston, Harris, and Montgomery Counties are designated as marginal nonattainment of the 2015 8-hour standard. The HGB area's current attainment deadline, per TCEQ for the 2008 8-hour ozone NAAQS is July 20, 2021 and the current attainment deadline for the 2015 8-hour standard is just a few weeks later on August 3, 2021. This is confirmed by a screen shot of the relevant TCEQ website shown below.⁹



Pollutant	Primary NAAQS	Averaging Period	Designation	Counties	Attainment Deadline
Ozone (O ₃)*	0.070 ppm (2015 standard)	8-hour	Marginal Nonattainment	Brazoria, Chambers, Fort Bend, Galveston, Harris, Montgomery	August 3, 2021
	0.075 ppm (2008 standard)	8-hour	Serious Nonattainment	Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller	July 20, 2021
Lead (Pb)	0.15 µg/m ³ (2008 standard)	Rolling 3-Month Average	Unclassifiable/Attainment		

⁸ <https://www.epa.gov/green-book/ozone-designation-and-classification-information>

⁹ <https://www.tceq.texas.gov/airquality/sip/hgb/hgb-status>

Relying on monitored levels of ozone in the HGB area there is almost no likelihood that either of these attainment deadlines, now mere months away, will be met. As such, the HGB area will continue to be nonattainment for both the 2008 and 2015 8-hour ozone NAAQS.

3.3 *Ozone Monitored Values in the HGB*

By convention May-September are typically considered to be the “ozone” season given the prevalence of high temperatures/sunlight which is essential for ozone formation from the precursor VOC and NO_x compounds. The design value for ozone in the HGB for 2018-2020 exceeds the 2008 and 2015 8-hour ozone NAAQS. Attachment B shows a series of tables, taken from TCEQ’s website which show the 2019 and 2020 May-September (i.e., ozone season) monitored ozone 8-hour average values at various monitoring sites in the HGB.¹⁰ The tables clearly show the widespread nature of the ozone exceedances, both spatially and temporally.

The tables in Attachment B show, by day, the maximum 8-hour ozone value recorded at each station. The color coding (light yellow to dark yellow, to orange, and then red) shows progressively higher ozone values. While not all of the monitoring stations are “official” nonetheless the general consistency between the official and unofficial stations makes it clear that the HGB area is simply no where close to meeting its ozone NAAQS. I note that 2020 data, for a least certain months, may be affected by the COVID-19 pandemic and/or weather disturbances which could have affected monitor uptimes and data reliability. Even so, the consistent episodic exceedances of the ozone NAAQS during the ozone season months are obvious.

Three of TCEQ’s regulatory ozone monitoring sites have 2018 to 2020 design values above the 2008 8-hr standard of 75 ppb. Nine of TCEQ’s regulatory ozone monitoring sites have 2018 to 2020 design values above the 2015 8-hr standard of 70 ppb.

Ozone trends can also be investigated by looking at the number of days that the maximum eight-hour ozone levels were above a NAAQS threshold, termed an ozone exceedance day. For the 2008 eight-hour ozone NAAQS, an eight-hour ozone exceedance day is considered any day that any monitor in the area measures an eight-hour average ozone concentration greater than 75 ppb. In the SIP TCEQ indicated that the number of eight-hour ozone exceedance days occurring in the HGB area has fallen 78% when comparing 2005 through 2018. However, this does not reflect recent trends.

In Table 3-1 of the SIP, TCEQ indicates that June of 2013 only had two days with MDA8 ozone concentrations greater than 75 ppb as opposed to 6 days in 2011 and 2012. Based on monitoring data from June of 2019, there were 8 days with MDA8 ozone concentrations greater than 75 ppb with 7 exceedance days occurring within a 10-day period between June 8, 2019 through June 17, 2019.

¹⁰ https://www.tceq.texas.gov/cgi-bin/compliance/monops/8hr_monthly.pl

A summary of the data presented in Attachment B is shown in the table below, which shows the annual fourth highest ozone concentrations and the design values at several HGB monitoring locations.

Monitoring Site	2018	2019	2020	Design Value
Houston East C1/G316	82	70	67	73.0
Houston Aldine C8/AF108/X150	88	81	68	79.0
Channelview C15/AH115	79	67	62	69.3
Northwest Harris Co. C26/A110/X154	77	73	71	73.7
Hou.DeerPrk2 C35/235/1001/AFH139FP239	85	76	73	78.0
Seabrook Friendship Park C45	82	64	64	70.0
Houston Bayland Park C53/A146	77	80	73	76.7
Conroe Relocated C78/A321	75	74	75	74.7
Manvel Croix Park C84	71	79	70	73.3
Clinton C403/C304/AH113	68	73	71	70.7
Houston North Wayside C405	66	67	61	64.7
Houston Monroe C406	68	71	62	67.0
Lang C408	74	75	69	72.7
Houston Croquet C409	70	75	66	70.3
Houston Westhollow C410/C3003	69	73	66	69.3
Park Place C416	77	72	70	73.0
Lynchburg Ferry C1015/A165	74	68	61	67.7
Lake Jackson C1016	67	63	65	65.0
Baytown Garth C1017	81	69	66	72.0
Galveston 99th St. C1034/A320/X183	76	79	68	74.3

Annual fourth highest ozone concentrations and design value in ppb

11

The ozone nonattainment problem in the HGB is long-standing. As noted in the TSD, “[T]he HGB area...was classified as a severe nonattainment area for the 1997 O₃ standard (73 FR 56983, October 1, 2008).¹²

3.4 Clean Air Act Requirements for Nonattainment Areas

As summarized in the TSD accompanying EPA’s proposed approval, the Federal Clean Air Act and its Amendments (CAA) requires states with areas in violation of the NAAQS to develop and submit for approval to the EPA State Implementation Plans (SIP), including RACT, that will bring

¹¹ Consistent with EPA regulations at 40 CFR pt.50 app.P, § 2.2, app.U, § 3(e), when making determinations, EPA uses truncated values. That is, for example, 73 instead of 73.7. Data provided here use the full figure for illustrative purposes.

¹² The TSD states that “[O]n April 2, 2013, April 15, 2014, August 4, 2014 and March 27, 2015, EPA approved RACT analyses for all affected VOC and NO_x emission sources in the HGB area for the 1997 eight-hour ozone NAAQS (78 FR 19599, 79 FR 21144, 79 FR 45105, and 80 FR 16291).”

the areas into compliance with the NAAQS for a regulated pollutant. As noted earlier, in 2008, EPA revised the 8-hour ozone NAAQS to a level of 75 ppb and the HGB area has been classified as a “serious” ozone nonattainment area for this NAAQS.

Texas has proposed a SIP to bring the area into attainment and EPA has proposed to approve the SIP requirements for RACT in the proposed rule.

3.5 *RACT Definition*

EPA’s longstanding definition of RACT is the lowest emissions limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological factors and economic feasibility.¹³

As noted in the TSD, “...the CAA, Section 172(c)(1) requires that the state SIP “provide for the implementation of all reasonably available control measures as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology) and shall provide for attainment of the national primary ambient air quality standards.”¹⁴ (internal citation omitted)...The text of the CAA Section 182(b) states the SIP shall include reasonably available control technology requirements for each category of VOC sources in the nonattainment area covered by control technology guidance document issued by the EPA and effective at the time of attainment of the area and all other major stationary sources of VOC located in the NA area. The text of the CAA Section 182(f) requires the state SIP to include RACT requirements for major sources of NO_x emissions in the non-attainment area.” (internal citation omitted)¹⁵

3.6 *RACT and CTGs/ACT*

Sections 172(c)(1) and 182 of the CAA require ozone nonattainment areas that are classified as moderate or above to adopt RACT requirements for VOC source categories subject to Control Techniques Guidelines (CTGs) issued by EPA and also for “major sources” of VOCs and NO_x not covered by CTGs. CTGs provide guidance on control techniques and establish a “presumptive norm” for RACT, as confirmed by the TSD.

The TSD notes that “EPA has issued a number of CTGs to assist States in implementing RACT requirements. These documents are available at <https://www.epa.gov/ozone-pollution/control-techniques-guidelinesand-alternative-control-techniques-documents-reducing> and provide information on the available control technology for various source categories and establish a “presumptive norm” for RACT for these source categories. State rules that conform to the

¹³ 44 FR 53762, September 17, 1979.

¹⁴ TSD, p. 2. (internal citation omitted).

¹⁵ TSD, p. 2-3 (internal citation omitted)..

presumptive norm established in the CTG have generally been approved as RACT. As noted, the Clean Air Act requires that SIPs implement RACT for all CTG categories.”¹⁶

The TSD also notes that “EPA has also issued Alternative Control Technique (ACT) Guidelines for some source categories. ACTs do not provide a presumptive norm, but rather describe available control technologies and their respective cost effectiveness. ACTs provide information that is sometimes useful for implementing RACT for non-CTG major source categories or achieve VOC reductions necessary to meet RACT requirements or otherwise achieve attainment. EPA has also issued ACTs for NO_x source categories but has not issued CTGs for sources of NO_x.”¹⁷

4.0 EPA’s Current Proposed Approval Simply Relies on Prior RACT Approvals

A review of the proposed approval and accompanying TSD makes it clear that EPA’s current proposed approval of VOC and RACT simply relies on its prior approvals of RACT – without an analysis of the appropriateness of the specific emissions limits or control efficiencies or work practices contained in either the CTGs or TCEQ rules and therefore without any analysis showing why such limits contained in the rules would meet the definition of RACT under the CAA.

For starters, EPA states that “EPA previously found that the Texas rules meet VOC and NO_x RACT for major sources using the 25 tons per year definition, as well as VOC RACT requirements for all applicable CTG categories in the eight county HGB 1997 8-hour ozone NAAQS nonattainment area. 78 FR 19599, April 2, 2013, docket number EPA-R06-OAR-2012-0100, and reaffirmed at 80 FR 16291, March 27, 2015, docket number EPA-R06-OAR-2013-0804. We last approved RACT for sources in the HGB area April 30, 2019 (84 FR 18145). We are not proposing to alter this previous determination.”¹⁸

Confirming this, in the proposal, EPA states that it “...has approved the 30 TAC Chapter 115 VOC rules as RACT for the HGB area under the 1-hour and 1997 8-hour ozone NAAQS (71 FR, 52670, September 6, 2006; 78 FR 19599, April 2, 2013; 79 FR 21144, April 15, 2014; 79 FR 45105, August 4, 2014; and 80 FR 16291, March 27, 2015) and later the 2008 Moderate NAAQS area designation (84 FR 18145, April 30, 2019). The EPA determined that VOC RACT is in place for all CTG and non-CTG major sources in the HGB area for the 1-hour, 1997 8-hour ozone NAAQS and 2008 moderate area NAAQS (71 FR 52676, September 6, 2006; 79 FR 21144, April 15, 2014; and 84 FR 18145, April 30, 2019), respectively. Texas's May 13, 2020 submittal relies on those EPA-approved Chapter 115 rules for the 1-hour, 1997 8-hour and 2008 8-hour ozone NAAQS to fulfill RACT requirement for CTG and non-CTG VOC major sources for the 2008 8-hour serious ozone NAAQS.”¹⁹

Finally, EPA simply states, “[W]e are proposing to find that the rules we approved as meeting RACT for the 1-hour and 1997 8-hour ozone NAAQS also meet RACT for the 2008 8-hour ozone

¹⁶ TSD, p. 4.

¹⁷ TSD, p. 4.

¹⁸ TSD, p. 5.

¹⁹ 45 FR 13681, first column (emphasis added, internal citation omitted).

NAAQS. We have determined this is appropriate because the fundamental control techniques described in the CTG and ACT documents and implemented in the Texas Rules are still applicable. This is supported by the implementing rule for the 2008 ozone NAAQS. The Chapter 115 rules provide appropriate VOC emissions reductions that are equivalent to control options cited in the CTG and ACT documents and any non-CTG major sources are appropriately controlled.”²⁰

4.1 EPA’s Only Exception to the Proposed Approval is Telling

As I will show later, EPA’s CTGs and ACT documents containing “presumptive” RACT levels are very old and have not been updated. Therefore, simply as a matter of passage of time, they are obsolete for the most part and cannot meet the definition of RACT which is “the lowest emissions limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological factors and economic feasibility...” as noted earlier.

There is only one CTG that EPA has promulgated in the last decade, namely for Oil and Gas, in 2016. Yet, even though this has now been promulgated for around 5 years, TCEQ has not taken steps to incorporate it into the rules and the SIP. EPA was therefore forced to disapprove this one aspect. As EPA states, “EPA issued a finding of failure to submit an implementation plan revision to adopt the Oil and Gas CTG published on November 16, 2020. This FR action establishes an eighteen month window for the state to submit a complete SIP revision request to include the Oil and Gas CTG into their SIP and a two year time frame in which EPA must either affirmatively approve the Texas SIP submittal requesting inclusion of the Oil and Gas CTG into the state SIP or finalize a Federal Implementation Plan addressing this CTG in each Ozone NA area in the state. Texas is expected to submit a SIP revision to address this requirement.”²¹

Elaborating further, in the proposal, EPA states that the “...state did not include any revisions to implement the new CTG for the Oil and Natural Gas Industry (EPA-453/B-16-001, October 2016) in the HGB area. As explained in EPA's implementing memo for this CTG, Texas was required to adopt and submit revisions to the SIP by no later than two years after the availability of the said CTG. In this case, the date of the notice of availability was October 27, 2016 (See 81 FR 74798). EPA issued a notice of failure to submit on November 16, 2020 (85 FR 72963) establishing a 24-month deadline for EPA to either approve SIPs or finalize Federal Implementation Plans (FIPs) that address the Oil and Natural Gas Industry CTG in the HGB area....The EPA is committed to working with Texas to expedite the development and submission of the required SIP revisions addressing the Oil and Natural Gas Industry CTG for the affected areas, and to review and act on their submissions in accordance with the requirements of the CAA.”²²

In other words, TCEQ simply did not take any action as it was required to by October 2018 (two years after promulgation of the 2016 CTG, which was itself over two years ago. In spite of this tardiness, and HGB’s ongoing ozone nonattainment status, and the need to deploy all tools

²⁰ 45 FR 13681, second column (emphasis added, internal citation omitted).

²¹ TSD, p. 20-21 (emphasis added)..

²² 45 FR 13681, second column (emphasis added).

including RACT to bring the area into attainment, EPA's mild disapproval comes with a commitment to working with TCEQ. EPA's disapproval should have been more forceful.

5.0 EPA's CTG and ACT Documents are Old and Outdated

This is readily ascertained by simply reviewing EPA's list of CTGs and ACTs. I have provided the list in the table below and have color coded the date of the document, including any updated. Red denotes documents that were issued (including any updates) in 2010 or before, or at least 10 years ago. As the table clearly shows, with one exception (the Oil and Gas CTG discussed earlier, which was issued in 2016 (itself almost 5 years old now), every single CTG/ACT document is over 10 years old. The earlier CTG dates to 1975, i.e., it is over 45 years old.

For EPA to claim, as it has done, that these old documents contain "presumptive" RACT meeting the definition that is per the CAA would only make sense if these documents were being kept up to date. As such they cannot be presumptive for current RACT.

EPA CTG and ACT Documents and Their Age		
Pollutant	EPA Report	Description
Control Techniques Guidelines (CTG)		
VOC	EPA-450/R-75-102	Design Criteria for Stage I Vapor Control Systems – Gasoline Service Stations (PDF 15 pp, 766KB)
	1975/11	<i>Note – This document is regarded as a CTG although it was never published with an EPA document number.</i>
VOC	EPA-450/2-76-028	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume I: Control Methods for Surface Coating Operations (PDF 174 pp, 4.6MB)
	1976/11	<i>Note – Although often listed with the CTGs for historical reasons, this document does not define RACT for any source. It is a compilation of control techniques.</i>
VOC	EPA-450/2-77-008	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks (PDF 232 pp, 2.7MB)
	1977/05	
VOC	EPA-450/2-77-022	Control of Volatile Organic Emissions from Solvent Metal Cleaning (PDF 229 pp, 7.0MB)
	1977/11	
VOC	EPA-450/2-77-025	Control of Refinery Vacuum Producing Systems, Wastewater Separators, and Process Unit Turnarounds (PDF 50 pp, 1.3MB)
	1977/10	
VOC	EPA-450/2-77-026	Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals (PDF 62 pp, 1.6MB)
	1977/10	
VOC	EPA-450/2-77-032	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume III: Surface Coating of Metal Furniture (PDF 66 pp, 1.9MB)
	1977/12	
VOC	EPA-450/2-77-033	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume IV: Surface Coating of Insulation of Magnet Wire (PDF 44 pp, 1.1MB)
	1977/12	
VOC	EPA-450/2-77-034	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume V: Surface Coating of Large Appliances (PDF 70 pp, 2.1MB)

	1977/12	
VOC	EPA-450/2-77-035	Control of Volatile Organic Emissions from Bulk Gasoline Plants (PDF 49 pp, 1.3MB)
	1977/12	
VOC	EPA-450/2-77-036	Control of Volatile Organic Emissions from Storage of Petroleum Liquids in Fixed-Roof Tanks (PDF 43 pp, 1.1MB)
	1977/12	
VOC	EPA-450/2-77-037	Control of Volatile Organic Emissions from Use of Cutback Asphalt (PDF 18 pp, 481KB)
	1977/12	
VOC	EPA-450/2-78-022	Control Techniques for Volatile Organic Emissions from Stationary Sources (PDF 580 pp, 21.9MB)
	1978/05	<i>Note – This document is often listed with CTGs, but it does not define RACT for any particular source</i>
VOC	EPA-450/2-78-015	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume VI: Surface Coating of Miscellaneous Metal Parts and Products (PDF 82 pp, 2.6MB)
	1978/06	
VOC	EPA-450/2-78-032	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume VII: Factory Surface Coating of Flat Wood Paneling (PDF 66 pp, 2.0MB)
	1978/06	
VOC	EPA-450/2-78-036	Control of Volatile Organic Compound Leaks from Petroleum Refinery Equipment (PDF 78 pp, 6.0MB)
	1978/06	
VOC	EPA-450/2-78-029	Control of Volatile Organic Emissions from Manufacture of Synthesized Pharmaceutical Products (PDF 134 pp, 3.8MB)
	1978/12	
VOC	EPA-450/2-78-030	Control of Volatile Organic Emissions from Manufacture of Pneumatic Rubber Tires (PDF 72 pp, 1.6MB)
	1978/12	
VOC	EPA-450/2-78-033	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume VIII: Graphic Arts-Rotogravure and Flexography (PDF 64 pp, 1.9MB)

	1978/12	
VOC	EPA-450/2-78-047	Control of Volatile Organic Emissions from Petroleum Liquid Storage in External Floating Roof Tanks (PDF 66 pp, 2.0MB)
	1978/12	
VOC	EPA-450/2-78-050	Control of Volatile Organic Emissions from Perchloroethylene Dry Cleaning Systems (PDF 76 pp, 2.5MB)
	1978/12	<i>Note – Perchloroethylene has been exempted as a VOC, so this CTG is no longer relevant. However, there is a MACT standard for perchloroethylene dry cleaners.</i>
VOC	EPA-450/2-78-051	Control of Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor Collection Systems (PDF 32 pp, 887KB)
	1978/12	
VOC	EPA-450/3-82-009	Control of Volatile Organic Compound Emissions from Large Petroleum Dry Cleaners (PDF 174 pp, 5.0MB)
	1982/09	
VOC	EPA-450/3-83-008	Control of Volatile Organic Compound Emissions from Manufacture of High-Density Polyethylene, Polypropylene, and Polystyrene Resins (PDF 308 pp, 14.0MB)
	1983/11	
VOC	EPA-450/3-83-007	Control of Volatile Organic Compound Equipment Leaks from Natural Gas/Gasoline Processing Plants (PDF 194 pp, 6.3MB)
	1983/12	
VOC	EPA-450/3-83-006	Control of Volatile Organic Compound Leaks from Synthetic Organic Chemical Polymer and Resin Manufacturing Equipment (PDF 148 pp, 6.2MB)
	1984/03	
VOC	EPA-450/3-84-015	Control of Volatile Organic Compound Emissions from Air Oxidation Processes in Synthetic Organic Chemical Manufacturing Industry (PDF 259 pp, 9.4MB)
	1984/12	
VOC	EPA-450/4-91-031	Control of Volatile Organic Compound Emissions from Reactor Processes and Distillation Operations in Synthetic Organic Chemical Manufacturing Industry (PDF 277 pp, 8.7MB)
	1993/08	
VOC	EPA-453/R-96-007	Control of Volatile Organic Compound Emissions from Wood Furniture Manufacturing Operations (PDF 288 pp, 13.8MB)

	1996/04	<i>Note – Wood Furniture (CTG-MACT) – Draft MACT out 5-1994; Final CTG issued 4-1996. See also 61 FR-25223, May 20, 1996 and 61 FR-50823, September 27, 1996.</i>
VOC	EPA-453/R-94-032	Alternative Control Technology Document – Surface Coating Operations at Shipbuilding and Ship Repair Facilities (PDF 217 pp, 9.8MB)
	1994/04	<i>Note – For CTG, see 61 FR-44050, August 27, 1996</i>
VOC	61 FR-44050 8/27/96	Control Techniques Guidelines for Shipbuilding and Ship Repair Operations (Surface Coating) (PDF 30 pp, 4.0MB)
	1996/08	<i>Note – See also EPA-453/R-94-032.</i>
VOC	59 FR-29216 6/06/94	Aerospace MACT (PDF 37 pp, 6MB)
	1994/06	<i>Note – See also EPA-453/R-97-004.</i>
VOC	EPA-453/R-97-004	Aerospace (CTG & MACT) (PDF 62 pp, 288KB)
	1997/12	<i>Note – See also 59 FR-29216, June 6, 1994.</i>
VOC	EPA-453/R-06-001	Control Techniques Guidelines for Industrial Cleaning Solvents (PDF 290 pp, 7.6MB)
	2006/09	
VOC	EPA-453/R-06-002	Control Techniques Guidelines for Offset Lithographic Printing and Letterpress Printing (PDF 52 pp, 349KB)
	2006/09	
VOC	EPA-453/R-06-003	Control Techniques Guidelines for Flexible Package Printing (PDF 33 pp, 216KB)
	2006/09	
VOC	EPA-453/R-06-004	Control Techniques Guidelines for Flat Wood Paneling Coatings (PDF 27 pp, 212KB)
	2006/09	
VOC	EPA 453/R-07-003	Control Techniques Guidelines for Paper, Film, and Foil Coatings (PDF 102 pp, 488KB)
	2007/09	
VOC	EPA 453/R-07-004	Control Techniques Guidelines for Large Appliance Coatings (PDF 44 pp, 374KB)

	2007/09	
VOC	EPA 453/R-07-005	Control Techniques Guidelines for Metal Furniture Coatings (PDF 100 pp, 293KB)
	2007/09	
VOC	EPA 453/R-08-003	Control Techniques Guidelines for Miscellaneous Metal and Plastic Parts Coatings (PDF 143 pp, 897KB)
	2008/09	
VOC	EPA 453/R-08-004	Control Techniques Guidelines for Fiberglass Boat Manufacturing Materials (PDF 41 pp, 336KB)
	2008/09	
VOC	EPA 453/R-08-005	Control Techniques Guidelines for Miscellaneous Industrial Adhesives (PDF 47 pp, 350KB)
	2008/09	
VOC	EPA 453/R-08-006	Control Techniques Guidelines for Automobile and Light-Duty Truck Assembly Coatings (PDF 44 pp, 2.64MB)
	2008/09	<i>Note – See also EPA-453/R-08-002.</i>
VOC	EPA 453/R-08-002	Protocol for Determining the Daily Volatile Organic Compound Emission Rate of Automobile and Light-Duty Truck Primer-Surfacer and Topcoat Operations (PDF 129 pp, 450KB)
	2008/09	<i>Note – See also EPA-453/R-08-006.</i>
VOC	EPA-453/B-16-001	Control Techniques Guidelines for the Oil and Natural Gas Industry (343 pp, 1.6 MB)
	2016/10	
Alternative Control Technology (ACT)		
VOC	EPA-450/3-83-012	Control Techniques for Organic Emissions from Plywood Veneer Dryers (PDF 113 pp, 3.4MB)
	1983/05	<i>Note – This document is labeled as a control technique document (CTD) rather than an ACT. However, the information is similar to that in an ACT.</i>
VOC	EPA-450/3-88-007	Reduction of Volatile Organic Compound Emissions from the Application of Traffic Markings (PDF 52 pp, 1.6MB)
	1988/08	<i>Note – The Architectural and Industrial Maintenance coatings (AIM) national rule issued in 1998 includes limits for traffic coatings and superseded the ACT.</i>

VOC	EPA-450/3-89-007 1989/03	Alternative Control Technology Document – Ethylene Oxide Sterilization / Fumigation Operations (PDF 102 pp, 3.2MB)
VOC	EPA-450/3-89-030 1989/08	Alternative Control Technology Document – Halogenated Solvent Cleaners (PDF 239 pp, 6.7MB)
VOC	EPA-450/3-91-007 1990/12	Alternative Control Technology Document – Organic Waste Process Vents (PDF 192 pp, 6.9MB)
VOC	EPA-450/3-90-020 1990/09	Control of VOC Emissions from Polystyrene Foam Manufacturing (PDF 113 pp, 3.5MB)
VOC	EPA-453/R-92-017 1992/12	Alternative Control Technology Document – Bakery Ovens (PDF 126 pp, 1.2MB)
VOC	EPA-453/R-92-018 1992/12	Control Techniques for Volatile Organic Compound Emissions from Stationary Sources (PDF 287 pp, 9.2MB)
VOC	EPA-453/D-93-056 1992/09	Control of Volatile Organic Compound Emissions from Industrial Wastewater CTG (draft) (PDF 234 pp, 9.4MB) <i>Note – CTG not finalized but issued as ACT in 1994.</i>
VOC	(No Report ID) 1994/04	Industrial Wastewater Alternative Control Technology (PDF 266 pp, 9MB) <i>Note – ACT consists of cover memo with option tables + CTG (draft) EPA-453/D-93-056.</i>
VOC	EPA-453/R-92-011 1993/03	Control of VOC Emissions from the Application of Agricultural Pesticides (PDF 250 pp, 9.8MB)
VOC	EPA-453/R-94-001 1994/01	Alternative Control Techniques Document – Volatile Organic Liquid Storage In Floating and Fixed Roof Tanks (PDF 202 pp, 8.6MB)

VOC	EPA-453/R-93-020	Control of Volatile Organic Compound Emissions from Batch Processes ACT (PDF 377 pp, 11.9MB)
	1994/02	<i>Note – Document also released under the Report ID of EPA-453/R-93-017.</i>
VOC	EPA-453/R-94-015	Alternative Control Techniques Document – Industrial Cleaning Solvents (PDF 234 pp, 10.6MB)
	1994/02	
VOC	EPA-453/R-94-017	Alternative Control Techniques Document – Surface Coating of Automotive/Transportation and Business Machine Plastic Parts (PDF 207 pp, 6.3MB)
	1994/02	
VOC	EPA-453/R-94-031	Alternative Control Techniques Document – Automobile Refinishing (PDF 90 pp, 3.6MB)
	1994/04	<i>Note – A national rule for autobody refinishing was issued in 1998 after the ACT.</i>
VOC/PM	EPA-453/R-94-032	Alternative Control Techniques Document – Surface Coating Operations at Shipbuilding and Ship Repair Facilities (PDF 217 pp, 9.0MB)
	1994/04	<i>Note – This was superseded by the Ship Building CTG which was issued in August 1996.</i>
VOC	EPA-453/D-95-001	Control of Volatile Organic Compound Emissions from Offset Lithographic Printing (PDF 246 pp, 8.6MB)
	1993/09	<i>Note – Draft CTG predecessor to the ACT released under the Report ID of EPA-453/R-94-054.</i>
VOC	EPA-453/R-94-054	Alternative Control Techniques Document: Offset Lithographic Printing – Supplemental Information Based on Public Comment on Draft Control Techniques Guidance announced in Federal Register November 8, 1993 (PDF 25 pp, 57KB)
	1994/06	<i>Note – See draft CTG (EPA-453/D-95-001) September 1993.</i>
NOx	EPA-453/3-91-026	NOx Emissions from Nitric and Adipic Acid Manufacturing Plants (PDF 146 pp, 312KB)
	1991/12	
NOx	EPA-453/R-93-007	NOx Emissions from Stationary Combustion Turbines (PDF 399 pp, 1.2MB)
	1993/01	
NOx	EPA-453/R-93-034	NOx Emissions from Process Heaters (PDF 216 pp, 8.5MB)
	1993/09	<i>Note – Revised September 1993.</i>

NOx	EPA-453/R-93-032	NOx Emissions from Stationary Internal Combustion Engines (PDF 340 pp, 13.3MB)
	1993/07	<i>Note – Updated September 2000.</i>
NOx	EPA-453/R-94-004	NOx Emissions from Cement Manufacturing (PDF 198 pp, 624KB)
	1994/03	<i>Note – Updated September 2000. See document EPA-457/R-00-002.</i>
NOx	EPA-457/R-00-002	NOx Control Technologies for the Cement Industry: Final Report (PDF 123 pp, 1.09MB)
	2000/09	<i>Note – Update to March 1994 ACT document EPA-453/R-94-004.</i>
NOx	EPA-453/R-94-022	NOx Emissions from Industrial, Commercial & Institutional Boilers (PDF 479 pp, 18.8MB)
	1994/03	
NOx	EPA-453/R-94-023	Alternative Control Techniques Document – NOx Emissions from Utility Boilers (PDF 538 pp, 18.8MB)
	1994/03	
NOx	EPA-453/R-94-037	Alternative Control Techniques Document – NOx Emissions from Glass Manufacturing (PDF 161 pp, 4.2MB)
	1994/06	
NOx	EPA 453/R-94-065	Alternative Control Techniques Document – NOx Emissions from Iron and Steel Mills (PDF 170 pp, 7.9MB)
	1994/09	
VOC	EPA-450/3-88-009	Reduction of Volatile Organic Compound Emissions from Automobile Refinishing (PDF 112 pp, 896KB)
	1988/10	
Other Control Technology Documents		
SOx	EPA-450/2-77-019	Final Guideline Document: Control of Sulfuric Acid Mist Emissions from Existing Sulfuric Acid Production Units (PDF 188 pp, 5.3MB)
	1977/09	
NOx	EPA-450/1-78-001	Control Techniques for Nitrogen Oxides Emissions from Stationary Sources – Second Edition (PDF 396 pp, 14.0MB)

	1978/01	<i>Note – This document is the second edition of the EPA document entitled: Control Techniques for Nitrogen Oxides Emissions from Stationary Sources. This document was first published in 1970 as National Air Pollution Control Administration Publication No. AP-67.</i>
VOC	EPA-450/2-78-022	Control Techniques for Volatile Organic Emissions from Stationary Sources (PDF 580 pp, 21.9MB)
	1978/05	
VOC	EPA-453/R-95-010	Beyond Volatile Organic Compound-Reasonably Available Control Technology – Control Technology Guidelines Requirements (PDF 442 pp, 10.6MB)
	1996/04	
VOC	EPA-453/R-97-002	A Guide to the Wood Furniture CTG and NESHAP (PDF 177 pp, 8.5 MB)
	1997/09	
VOC	EPA-453/R-00-004	Preliminary Industry Characterization: Wood Building Products Surface Coating (PDF 50 pp, 1.8 MB)
	1998/09	

(Source: <https://www.epa.gov/ground-level-ozone-pollution/control-techniques-guidelines-and-alternative-control-techniques>). Accessed 3.25.21

Last Modified 2010 or Before
Last Modified Between 2011-2019
Modified After 2019

6.0 TCEQ 30 TAC Chapter 115 (VOC) Rules Are Old and Outdated

Like the EPA CTG and ACT documents noted earlier, much of TCEQ's 30 TAC Chapter 115 rules dealing with VOCs are also outdated since they were promulgated years ago and have not been updated, with few exceptions. The table below shows the relevant rules – i.e., those containing emissions limits or control efficiencies and work practices, etc.

I use the same color coding scheme as with the EPA documents. As the table clearly shows, with one exception, most of the rules have not been updated recently (i.e., after 2019) and many are over a decade old (red).

Air Approval Plans; Texas; Reasonably Available Control Technology In the Houston-Galveston-Brazoria Ozone Nonattainment Area

30 TAC 115 (VOC RACT Rules)		
Subchapter A: Definitions	Description	Last Modified
Rule 115.10	Definitions (10)	
Subchapter B: General Volatile Organic Compound Sources		
Division 1	Storage of Volatile Organic Compounds (112)	2020
Division 2	Vent Gas Control (121)	2015
Division 3	Water Separation (131)	1995
Division 4	Industrial Wastewater (140)	2003
Division 5	Municipal Solid Waste Landfills (152)	1994
Division 6	Batch Processes (160)	2001
Subchapter C: Volatile Organic Compound Transfer Operations		
Division 1	Loading and Unloading of Volatile Organic Compounds (211)	2003
Division 2*3	Filling of Gasoline Storage Vessels (Stage I) for Motor Vehicle Fuel Dispensing Facilities (221)	2014
Division 3*3	Control of Volatile Organic Compound Leaks from Transport Vessels (221)	1999
Division 4*3	Stage II Vapor Recovery Definitions (240)	2013
Division 5*3	Control of Reid Vapor Pressure of Gasoline (252)	-
Subchapter D: Petroleum Refining and Petrochemical Processes		
Division 1	Process Unit Turnaround and Vacuum-Producing Systems in Petroleum Refineries (311)	2003
Division 2	Fugitive Emission Control in Petroleum Refineries in Gregg, Nueces, and Victoria Counties (322)	-
Division 3	Fugitive Emission Control in Petroleum Refining, Natural Gas/Gasoline Processing, and Petrochemical Processes in Ozone Nonattainment Areas (352)	2010
Subchapter E: Solvent-Using Processes		
Division 1	Degreasing and Clean-Up Processes (412)	2004
Division 2	Surface Coating Processes (421)	2015
Division 3	Graphic Arts (Printing) by Flexographic and Rotogravure Processes (432)	2011
Division 4	Offset Lithographic Printing (442)	2015
Division 5	Control Requirements for Surface Coating Processes (450)	2015
Division 6	Industrial Cleaning Solvents (460)	2011
Division 7	Miscellaneous Industrial Adhesives (470)	2015
Last Modified 2010 or Before		
Last Modified Between 2011-2019		
Modified After 2019		

6.1 TCEQ's Top VOC Sources

Table F-5 in Appendix F of TCEQ's submittal contains a list of VOC sources in the HGB area based on actual 2017 reported VOC emissions. In the table below, I have excerpted all of the sources in Table F-5 with 100 tons per year or greater reported 2017 emissions. Collectively, these sources alone account for 17,518 tons per year of VOC emissions. In each case, the last column shows the VOC RACT rules that apply to each source per TCEQ. Specifically, I have highlighted two sets of rules that apply to almost all of the sources: namely 115.352 relating to fugitive emissions from components such as pump and compressor seals; and 115.211 to 115.212 dealing with VOC emissions from loading/transfer operations.

In the next discussion, I show that these rules are outdated and should have been updated by TCEQ and EPA to meet current RACT standards, and that is not being done as part of EPA's proposed approval. I should also note that in my October 2019 comments on TCEQ's proposed SIP revisions, I had provided several examples of deficient RACT (and RACM) measures. This applies to VOC and NO_x RACT (which I discuss later) and includes not just technology issues but also maintenance aspects that should be considered in the context of RACT. I have reviewed TCEQ's response to these previous comments, i.e., the RTC previously noted, and it is clear that TCEQ did not meaningfully respond to previous comments.

VOC: Sources With Greater Than 100 tons/year Actual VOC in 2017 (Source: TCEQ Appendix F, Table F-5)							
RN	Account	Company	County	SIC	SIC Description	2017 VOC Actual tpy	Rule Addressing RACT
RN100218049	BL0021O	BASF CORPORATION	BRAZORIA	2869	INDUSTRIAL ORGANIC CHEMICALS	198.7	§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.140 - §115.149
							§115.211 - §115.219
							§115.352 - §115.359
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN100225945	BL0082R	DOW CHEMICAL COMPANY	BRAZORIA	2869	INDUSTRIAL ORGANIC CHEMICALS	583	§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.140 - §115.149
							§115.160 - §115.169
							§115.211 - §115.219
							§115.352 - §115.359
							§115.410 - §115.419
							§115.460 - §115.460
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN100237668	BL0268B	EQUISTAR CHEMICALS	BRAZORIA	2821	PLASTICS MATERIALS AND SYNTHETIC RESINS	330.9	§115.110 - §115.119
							§115.120 - §115.129
							§115.211 - §115.219
							§115.352 - §115.359
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789

RN100238708	BL0002S	INEOS USA	BRAZORIA	2869	INDUSTRIAL ORGANIC CHEMICALS	498.6	§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.211 - §115.219
							§115.352 - §115.359
							§115.410 - §115.419
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN100825249	BL0758C	CHEVRON PHILLIPS CHEMICAL COMPANY	BRAZORIA	2869	INDUSTRIAL ORGANIC CHEMICALS	461.1	§115.110 - §115.119
							§115.120 - §115.129
							§115.211 - §115.219
							§115.352 - §115.359
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN101619179	BL0042G	PHILLIPS 66 COMPANY	BRAZORIA	2911	PETROLEUM REFINING	279.9	§115.110 - §115.119
							§115.120 - §115.129
							§115.211 - §115.219
							§115.311 - §115.319
							§115.352 - §115.359
							§115.780 - §115.789
RN108772245	BLA044R	BLUE CUBE OPERATIONS	BRAZORIA	2869	INDUSTRIAL ORGANIC CHEMICALS	103.8	§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.140 - §115.149
							§115.211 - §115.219
							§115.352 - §115.359
							§115.412 - §115.419
							§115.460 - §115.469
							§115.540 - §115.549
RN100222900	CI0022A	TARGA MIDSTREAM SERVICES	CHAMBERS	1321	NATURAL GAS LIQUIDS	257.8	§115.110 - §115.119
							§115.120 - §115.129

							§115.352 - §115.359
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN102323268	CI0008R	ENTERPRISE PRODUCTS OPERATING	CHAMBERS	2869	INDUSTRIAL ORGANIC CHEMICALS	345.1	§115.110 - §115.119
							§115.120 - §115.129
							§115.211 - §115.219
							§115.352 - §115.359
							§115.420 - §115.429
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN102501020	CI0009P	EXXONMOBIL CHEMICAL COMPANY	CHAMBERS	2821	PLASTICS MATERIALS AND SYNTHETIC RESINS	134	§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.140 - §115.149
							§115.211 - §115.219
							§115.352 - §115.359
							§115.410 - §115.419
							§115.540 - §115.549
							§115.420 - §115.429
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN100888312	FG0020V	NRG TEXAS POWER	FORT BEND	4911	ELECTRIC SERVICES	120.8	§115.110 - §115.119
							§115.131 - §115.139
							§115.211 - §115.219
RN100210608	GB0055R	MARATHON PETROLEUM COMPANY	GALVESTON	2911	PETROLEUM REFINING	176.9	§115.110 - §115.119
							§115.120 - §115.129
							§115.140 - §115.149
							§115.211 - §115.219
							§115.352 - §115.359
							§115.410 - §115.419

RN100219351	GB0076J	UNION CARBIDE CORPORATION	GALVESTON	2869	INDUSTRIAL ORGANIC CHEMICALS	129.4	§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.211 - §115.219
							§115.352 - §115.359
							§115.410 - §115.419
							§115.420 - §115.429
							§115.720 - §115.729
							§115.760 - §115.769
RN100238385	GB0073P	VALERO REFINING TEXAS	GALVESTON	2911	PETROLEUM REFINING	605.5	§115.780 - §115.789
							§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.140 - §115.149
							§115.211 - §115.219
							§115.311 - §115.319
RN102535077	GB0004L	BLANCHARD REFINING COMPANY	GALVESTON	2911	PETROLEUM REFINING	1460.5	§115.352 - §115.359
							§115.110 - §115.119
							§115.120 - §115.129
							§115.211 - §115.219
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN102536307	GB0001R	BP AMOCO CHEMICAL	GALVESTON	2869	INDUSTRIAL ORGANIC CHEMICALS	101.2	§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.211 - §115.219
							§115.352 - §115.359
							§115.720 - §115.729
							§115.760 - §115.769
RN100210319	HG0770G	EQUISTAR CHEMICALS	HARRIS	2869		120.1	§115.780 - §115.789
							§115.110 - §115.119

							§115.120 - §115.129
							§115.131 - §115.139
							§115.140 - §115.149
							§115.211 - §115.219
					INDUSTRIAL ORGANIC CHEMICALS		§115.352 - §115.359
							§115.410 - §115.419
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN100210806	HG0403N	INTERCONTINENTAL TERMINALS COMPANY	HARRIS	4226	SPECIAL WAREHOUSING & STORAGE	173.5	§115.110 - §115.119
							§115.211 - §115.219
							§115.352 - §115.359
							§115.720 - §115.729
RN100211697	HG0030H	ANHEUSER BUSCH	HARRIS	2082	MALT BEVERAGES	193.9	§115.120 - §115.129
RN100211879	HG0659W	SHELL CHEMICAL	HARRIS	2911	PETROLEUM REFINING	1075.3	§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.140 - §115.149
							§115.211 - §115.219
							§115.352 - §115.359
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN100214212	HG0786O	TARGA DOWNSTREAM	HARRIS	5171	PETROLEUM BULK STATIONS & TERMINALS	110.1	§115.110 - §115.119
							§115.211 - §115.219
							§115.352 - §115.359
							§115.410 - §115.419
							§115.720 - §115.729
RN100218130	HG0048L	HOUSTON REFINING	HARRIS	2911	PETROLEUM REFINING	819.9	§115.110 - §115.119
							§115.120 - §115.129
							§115.140 - §115.149

							§115.211 - §115.219
							§115.311 - §115.319
							§115.352 - §115.359
							§115.420 - §115.429
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN100218247	HG0225N	ALBEMARLE CORPORATION	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS	120.2	§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.160 - §115.169
							§115.211 - §115.219
							§115.410 - §115.419
							§115.420 - §115.429
							§115.720 - §115.729
							§115.760 - §115.769
RN100219310	HG0130C	VALERO REFINING TEXAS	HARRIS	2911	PETROLEUM REFINING	160.1	§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.211 - §115.219
							§115.311 - §115.319
							§115.352 - §115.359
							§115.410 - §115.419
							§115.720 - §115.729
RN100219526	HG0562P	TPC GROUP	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS	115.1	§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.140 - §115.149
							§115.211 - §115.219
							§115.352 - §115.359
							§115.410 - §115.419
							§115.720 - §115.729
							§115.760 - §115.769

RN100221589	HG0459J	LUBRIZOL CORPORATION	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS	204.8	§115.110 - §115.119
							§115.120 - §115.129
RN100223205	HG0632T	ROHM AND HAAS TEXAS	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS	227.4	§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.140 - §115.149
							§115.160 - §115.169
							§115.211 - §115.219
							§115.352 - §115.359
							§115.410 - §115.419
RN100224740	HG0531D	ENTERPRISE PRODUCTS OPERATING	HARRIS	4226	SPECIAL WAREHOUSING & STORAGE	154.5	§115.110 - §115.119
							§115.131 - §115.139
							§115.352 - §115.359
							§115.410 - §115.419
RN100224815	HG0261J	KM LIQUIDS TERMINALS	HARRIS	4226	SPECIAL WAREHOUSING & STORAGE	588.4	§115.420 - §115.429
							§115.110 - §115.119
RN100225093	HG0629I	VOPAK TERMINAL DEER PARK	HARRIS	4226	SPECIAL WAREHOUSING & STORAGE	287	§115.211 - §115.219
							§115.110 - §115.119
							§115.211 - §115.219
RN100227016	HG0126Q	CELANESE	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS	126	§115.352 - §115.359
							§115.110 - §115.119
							§115.120 - §115.129
							§115.140 - §115.149
							§115.211 - §115.219
							§115.352 - §115.359
							§115.410 - §115.419
							§115.420 - §115.429
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789

RN100229905	HG0665E	INEOS USA	HARRIS	2821	PLASTICS MATERIALS AND SYNTHETIC RESINS	283	§ 115.110 - § 115.119
							§ 115.120 - § 115.129
							§ 115.211 - § 115.219
							§ 115.352 - § 115.359
							§ 115.410 - § 115.419
							§ 115.420 - § 115.429
							§ 115.720 - § 115.729
							§ 115.760 - § 115.769
							§ 115.780 - § 115.789
RN100237452	HG0262H	KM LIQUIDS TERMINALS	HARRIS	4226	SPECIAL WAREHOUSING & STORAGE	429.9	§ 115.110 - § 115.119
							§ 115.211 - § 115.219
							§ 115.352 - § 115.359
RN100542281	HG0033B	EQUISTAR CHEMICALS	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS	646.7	§ 115.110 - § 115.119
							§ 115.120 - § 115.129
							§ 115.131 - § 115.139
							§ 115.140 - § 115.149
							§ 115.211 - § 115.219
							§ 115.352 - § 115.359
							§ 115.420 - § 115.429
							§ 115.720 - § 115.729
							§ 115.760 - § 115.769
RN100633650	HG1575W	LYONDELL CHEMICAL COMPANY	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS	279	§ 115.110 - § 115.119
							§ 115.120 - § 115.129
							§ 115.131 - § 115.139
							§ 115.140 - § 115.149
							§ 115.211 - § 115.219
							§ 115.352 - § 115.359
							§ 115.420 - § 115.429
							§ 115.720 - § 115.729
							§ 115.760 - § 115.769
RN100677491	HGA197O	CONTANDA TERMINALS	HARRIS	4226		106	§ 115.110 - § 115.119

					SPECIAL WAREHOUSING & STORAGE		§115.211 - §115.219
							§115.352 - §115.359
RN100716661	HG0175D	PASADENA REFINING SYSTEM INC.	HARRIS	2911	PETROLEUM REFINING	561.7	§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.211 - §115.219
							§115.311 - §115.319
							§115.352 - §115.359
							§115.410 - §115.419
							§115.420 - §115.429
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN100870898	HG0289K	GOODYEAR TIRE & RUBBER COMPANY	HARRIS	2822	SYNTHETIC RUBBER	207.7	§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.211 - §115.219
							§115.352 - §115.359
							§115.420 - §115.429
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN100909373	HG4662F	TOTAL PETROCHEMICALS & REFINING	HARRIS	2821	PLASTICS MATERIALS AND SYNTHETIC RESINS	149.8	§115.110 - §115.119
							§115.120 - §115.129
							§115.211 - §115.219
							§115.352 - §115.359
							§115.420 - §115.429
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN101062610	HG0565J	PHILLIPS 66 PIPELINE	HARRIS	5171	PETROLEUM BULK STATIONS & TERMINALS	128.3	§115.110 - §115.119
							§115.131 - §115.139

							§115.211 - §115.219
							§115.410 - §115.419
RN101851517	HG0467K	MARATHON PIPE LINE	HARRIS	4613	REFINED PETROLEUM PIPELINES	113.2	§115.110 - §115.119
RN102018322	HG0566H	CHEVRON PHILLIPS CHEMICAL COMPANY	HARRIS	2821	PLASTICS MATERIALS AND SYNTHETIC RESINS	493.4	§115.110 - §115.119
							§115.120 - §115.129
							§115.211 - §115.219
							§115.352 - §115.359
							§115.410 - §115.419
							§115.420 - §115.429
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN102180486	HG0017W	MAGELLAN TERMINALS HOLDINGS	HARRIS	4226	SPECIAL WAREHOUSING & STORAGE	222.1	§115.110 - §115.119
							§115.211 - §115.219
							§115.131 - §115.139
RN102212925	HG0228H	EXXONMOBIL CHEMICAL COMPANY	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS	436.2	§115.110 - §115.119
							§115.120 - §115.129
							§115.140 - §115.149
							§115.211 - §115.219
							§115.352 - §115.359
							§115.410 - §115.419
							§115.420 - §115.429
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN102523107	HG0537O	LYONDELL CHEMICAL COMPANY	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS	146.3	§115.110 - §115.119
							§115.120 - §115.129
							§115.140 - §115.149
							§115.211 - §115.219
							§115.352 - §115.359

							§115.410 - §115.419
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN102574803	HG0229F	EXXONMOBIL CHEMICAL COMPANY	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS	705.6	§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.140 - §115.149
							§115.211 - §115.219
							§115.352 - §115.359
							§115.410 - §115.419
							§115.420 - §115.429
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN102579307	HG0232Q	EXXONMOBIL REFINING & SUPPLY CO	HARRIS	2911	PETROLEUM REFINING	1903	§115.110 - §115.119
							§115.120 - §115.129
							§115.140 - §115.149
							§115.211 - §115.219
							§115.352 - §115.359
							§115.410 - §115.419
RN103919817	HG0310V	CHEVRON PHILLIPS CHEMICAL COMPANY	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS	332.4	§115.110 - §115.119
							§115.120 - §115.129
							§115.131 - §115.139
							§115.140 - §115.149
							§115.211 - §115.219
							§115.352 - §115.359
							§115.410 - §115.419
							§115.720 - §115.729
							§115.760 - §115.769
							§115.780 - §115.789
RN109290692	HGA164H	VALERO ENERGY PARTNERS	HARRIS	5171	PETROLEUM BULK STATIONS & TERMINALS	110.5	§115.110 - §115.119
							§115.311 - §115.319

							§115.352 - §115.359
							§115.540 - §115.549
							§115.780 - §115.789

6.2 Example 1 (30 TAC 115.352)

For reference, I reproduce portions of this rule which deal with fugitive VOC emissions from components such as valves, flanges, pump seals, and the like. It applies to the HGB area VOC sources, including almost every one of the high emitting VOC sources that I have listed in the previous table, based on TCEQ's own analysis.

TITLE 30	ENVIRONMENTAL QUALITY
PART 1	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
CHAPTER 115	CONTROL OF AIR POLLUTION FROM VOLATILE ORGANIC COMPOUNDS
SUBCHAPTER D	PETROLEUM REFINING, NATURAL GAS PROCESSING, AND PETROCHEMICAL PROCESSES
DIVISION 3	FUGITIVE EMISSION CONTROL IN PETROLEUM REFINING, NATURAL GAS/GASOLINE PROCESSING, AND PETROCHEMICAL PROCESSES IN OZONE NONATTAINMENT AREAS
RULE §115.352	Control Requirements

For the Beaumont-Port Arthur, Dallas-Fort Worth, El Paso, and Houston-Galveston-Brazoria areas as defined in §115.10 of this title (relating to Definitions), no person shall operate a petroleum refinery; a synthetic organic chemical, polymer, resin, or methyl-tert-butyl ether manufacturing process; or a natural gas/gasoline processing operation, as defined in §115.10 of this title, without complying with the following requirements.

(1) Except as provided in paragraph (2) of this section, no component may be allowed to have a volatile organic compound (VOC) leak for more than 15 calendar days after the leak is found that meets the following:

(A) for all components except pump seals and compressor seals, a screening concentration greater than 500 parts per million by volume (ppmv) above background as methane, or the dripping or exuding of process fluid based on sight, smell, or sound;

(B) **for pump seals and compressor seals, a screening concentration greater than 10,000 ppmv** above background as methane, or the dripping or exuding of process fluid based on sight, smell, or sound; and

.....

Source Note: The provisions of this §115.352 adopted to be effective December 3, 1993, 18 TexReg 8538; amended to be effective May 27, 1994, 19 TexReg 3703; amended to be effective May 22, 1997, 22 TexReg 4213; amended to be effective May 16, 2002, 27 TexReg 4113; amended to be effective January 17, 2003, 28 TexReg 113; amended to be effective November 13, 2003, 28 TexReg 9835; amended to be effective December 23, 2004, 29 TexReg 11705; **amended to be effective June 24, 2010, 35 TexReg 5293**

As highlighted in the table above, the rule, which was last updated in June 2010 (i.e., over 10 years ago) requires that pump and compressor seals meet a limit of 10,000 ppmv before they are considered as leaking components which then subject them to the repair provisions of the rule. This 10,000 ppm requirement is no longer appropriate as current RACT in my opinion. It is my experience that there is no technological barrier to achieving much lower levels of leaks for pump and compressor seals. And, that they are routinely required. As support for this, I excerpt below the table from TCEQ's guidance for fugitive emissions²³ which shows clearly that there are at least

²³ TCEQ Air Permit Technical Guidance for Chemical Sources, Fugitive Guidance, APDG 6422, June 2018. Available at <https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/fugitive-guidance.pdf>

three TCEQ LDAR programs that define the maximum allowable concentration much lower than 10,000 ppmv, including 28VHP (2000 ppmv), 28MID (500 ppmv), and 28LAER (500 ppmv). Other jurisdictions in ozone non-attainment have lower thresholds. For example, in the Central Valley in California, Rule 4455 of the San Joaquin Valley Air Pollution Control District (SJVAPCD) applicable to components at petroleum refineries, gas liquids processing facilities and chemical plants, adopted as RACT in 2005, contains leak thresholds that are significantly lower. In this rule, minor leaks (which cannot be found in more than 1 or 2 components when 200 or fewer are sampled, for example, start at 100 ppm to 1000 ppm depending on the component and service.²⁴ The SJVAPCD rule is itself over 15 years old and more stringent than the one EPA proposes to approve here.

Not only did EPA (or TCEQ) not review the rule and recognize that the 10,000 ppmv level specified is old and obsolete, the agencies did not provide any cost calculations to show that the 2000 ppmv or the 500 ppmv levels would not be cost effective as RACT for pump and compressor seals. This is an example of why TCEQ's proposal and EPA's approval of this old and outdated rule as RACT is improper.

Table III: Leak Detection and Repair (LDAR) Program Instrument Monitoring Options

LDAR Program	28M	28RCT	28VHP	28MID	28LAER	28CNTQ	28CNTA
Leak Definition for Pumps and Compressors	10,000 ppmv	10,000 ppmv	2,000 ppmv	500 ppmv	500 ppmv	N/A	N/A
Leak Definition for All Other Components	10,000 ppmv	500 ppmv	500 ppmv	500 ppmv	500 ppmv	500 ppmv	500 ppmv
Applicable Vapor Pressure	>0.5 psia at 100°F	>0.044 psia at 68°F	>0.044 psia at 68°F	>0.044 psia at 68°F	>0.044 psia at 68°F	>0.044 psia at 68°F	>0.044 psia at 68°F
Monitoring Frequency	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Annually
Directed/Nondirected Maintenance	Nondirected	Nondirected	Nondirected	Directed	Directed	Nondirected	Nondirected
Most Common State/Federal Programs with Similar Requirements	40 CFR Part 60 Subpart VV 40 CFR Part 61 30 TAC §115.322	30 TAC §115.352 ¹	40 CFR Part 60 Subpart VVa 40 CFR Part 63 Subparts H, CC	N/A	Nonattainment NSR	N/A	40 CFR Part 60 Subpart VVa, 40 CFR Part 63 Subparts H, CC

Endnotes Table III

¹ Except in Gregg, Nueces, and Victoria Counties where 28M applies.

I also note that TCEQ itself has been incorporating better methods for leak detection than Method 21-based sniffing alone, such as incorporating Optical Gas Imaging (OGI) along with Method 21, called Enhanced LDAR, into permits. I excerpt the following from a permit issued permit to

²⁴ <https://www.valleyair.org/rules/curnrules/r4455.pdf>; 71 FR 14652 (Mar. 23, 2006).

Motiva²⁵ by the TCEQ, dealing with the required use of enhanced LDAR and OGI for controlling VOC emissions from fugitives.

“11. The following enhancements to the 28MID program specified in Special Condition 10 shall be implemented. The enhancements were specified in order for the permit holder to be allowed to calculate fugitive emissions using the EPA Petroleum Industry Screening Value/Leak Rate Correlation Equations as specified in Special Condition 58.C.

A. The EPA Method 21 monitoring shall be conducted with data loggers capable of assigning time stamps to individual monitoring events.

B. Any component found to be leaking by physical inspection (i.e., sight, sound, or smell) shall be repaired or monitored with an approved gas analyzer within 15 days to determine whether the component is leaking in excess of 500 ppmv of VOC. If the component is found to be leaking in excess of 500 ppmv of VOC, it shall be subject to the repair and replacement requirements contained in Special Condition 10.

C. The holder of this permit shall make a “first attempt” at repair on any valve that has a reading greater than 100 ppm of VOC, excluding control valves, pumps, and components that LDAR personnel are not authorized to repair. As part of the “first attempt at repair program,” the holder of this permit shall record, track and re-monitor leaks above the leak definitions in Special Condition 10. However, the holder of this permit shall immediately re-monitor all valves that personnel attempted to repair to ensure that the leaks have not been made worse. If the holder of this permit can demonstrate with sufficient monitoring data that “first attempt” repair at 100 ppm worsen leaks, after 2 years the holder of this permit may request that the Executive Director reconsider or amend this requirement.

D. The holder of this permit will conduct annual training of all LDAR technicians in the application of Method 21 consistent with the requirements of this permit. Documentation of this training and the technicians trained shall be recorded.

E. The holder of this permit shall obtain a third party audit by no later than December 31, 2015 and then at least once every two years thereafter to verify whether EPA Method 21 is being properly applied such that the resulting screening values are reliable when used to calculate emissions as required by Special Condition 58.C. The audit shall, at a minimum, focus on comparative monitoring, records review, tagging, data management, and observation of the LDAR technicians' calibration and monitoring techniques. During the audits, leak rates shall be calculated for each process unit where comparative monitoring was performed. The audit-calculated leak rates shall be compared to the permit-authorized emission rates including any subsequent Permits by Rule. A detailed audit protocol shall be submitted to the TCEQ for approval at least 6 months prior

²⁵ Special Conditions for Permit Numbers 6056, PSDTX1062M2, and GHGPSDTX121.

to the first scheduled audit. Copies of the report detailing the results of the audit shall be sent to the TCEQ Air Permits Division and Regional Office.

F. Beginning no later than October 1, 2014, the holder of this permit will apply the following optical gas imaging (OGI) enhanced monitoring program for equipment leaks at those process units subject to EPA Method 21 monitoring pursuant to the special conditions of this permit. The Executive Director may extend the date for initiation of this OGI monitoring program provided the holder of this permit provides documentation demonstrating that the monitoring equipment was not available for purchase in the time frame needed to initiate the program by that date. The monitoring will be conducted using an optical gas imaging instrument as defined in 40 CFR 60.18(g)(4). OGI surveys will occur every two months at each applicable process unit at pre-established viewing stations. The number and location of the viewing stations will be designed to ensure that two thirds of the fugitive equipment components in each process unit can be viewed. Each viewing station will have a unique identification number. Any OGI leaks observed will be tagged as close as possible to the leaking component. OGI leaks will be managed in accordance with the requirements in Special Condition 10.H of this permit. Leak repairs for equipment in gas/vapor and light liquid service will be remonitored in accordance with Method 21. Leak repairs for equipment in heavy liquid service will be re-monitored with the OGI monitoring instrument. Each OGI survey will be manually documented and saved electronically. Documentation will include the OGI technician's name, process unit name, date, time, viewing station identification number and results (leaks, no leaks). Electronic records will also be maintained of individual leaks found, repairs, and re-monitor results.

After the OGI monitoring program has been implemented for a period of at least four years, the holder of this permit may evaluate the effectiveness of the program in identifying and repairing leaks. If undertaken, this evaluation will be based on the costs of conducting the OGI monitoring program and on emission rates before and after repairs of leaks detected by the program. Emission rates will be determined as specified in Special Condition 58.C. Based on the results of that evaluation, the holder of the permit may make a request to the Executive Director that the OGI monitoring program be modified or eliminated based on a demonstration that the program as originally implemented is not economically reasonable in reducing or eliminating VOC emissions.”

This permit was issued in 2014. It is my opinion that, taken collectively, the above enhanced LDAR program with OGI, should be included as RACT as compared to what is currently provided in this rule.

6.2 Example 2 (30 TAC 115.212)

Next, I discuss the requirements in 115.212 that apply to loading and unloading VOC compounds. I have excerpted portions of the rule below, highlighting the requirement that a vapor control system meet a control efficiency of “at least 90%”, which appears in several locations in the rule.

The rule also requires that certain transport vessels be kept vapor-tight, without defining that requirement, making it unenforceable in my opinion.

TITLE 30	ENVIRONMENTAL QUALITY
PART 1	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
CHAPTER 115	CONTROL OF AIR POLLUTION FROM VOLATILE ORGANIC COMPOUNDS
SUBCHAPTER C	VOLATILE ORGANIC COMPOUND TRANSFER OPERATIONS
DIVISION 1	LOADING AND UNLOADING OF VOLATILE ORGANIC COMPOUNDS
RULE §115.212	Control Requirements

(a) The owner or operator of each volatile organic compound (VOC) transfer operation, transport vessel, and marine vessel in the Beaumont/Port Arthur, Dallas/Fort Worth, El Paso, and Houston/Galveston areas shall comply with the following control requirements.

(1) General VOC loading. At VOC loading operations other than gasoline terminals, gasoline bulk plants, and marine terminals, vapors from the transport vessel caused by the loading of VOC with a true vapor pressure greater than or equal to 0.5 psia under actual storage conditions must be controlled by:

- (A) a vapor control system which maintains a control efficiency of at least 90%; or
- (B) a vapor balance system, as defined in §115.10 of this title (relating to Definitions); or
- (C) pressurized loading.

(2) Disposal of transported vapors. After unloading, transport vessels must be kept vapor-tight until the vapors in the transport vessel are returned to a loading, cleaning, or degassing operation and discharged in accordance with the control requirements of that operation.

(3) Leak-free requirements. All land-based VOC transfer to or from transport vessels shall be conducted such that:

- (A) All liquid and vapor lines are:
 - (i) equipped with fittings which make vapor-tight connections that close automatically when disconnected; or

...

(5) Gasoline bulk plants. The following additional control requirements apply to transfer of gasoline at gasoline bulk plants.

(A) A vapor balance system must be used between the storage tank and transport vessel. Alternatively, a vapor control system which maintains a control efficiency of at least 90% may be used to control the vapors.

...

(6) Marine terminals. The following control requirements apply to marine terminals in the Houston/Galveston area.

(A) VOC emissions shall not exceed 0.09 pound from the vapor control system vent per 1,000 gallons (10.8 mg/liter) of VOC loaded into the marine vessel, or the vapor control system shall maintain a control efficiency of at least 90%. Alternatively, a vapor balance system or pressurized loading may be used to control the vapors.

...

Source Note: The provisions of this §115.212 adopted to be effective February 19, 1990, 15 TexReg 549; amended to be effective July 17, 1991, 16 TexReg 3719; amended to be effective August 1, 1992, 17 TexReg 4683; amended to be effective December 3, 1993, 18 TexReg 8538; amended to be effective May 27, 1994, 19 TexReg 3703; amended to be effective June 16, 1995, 20 TexReg 4048; amended to be effective March 7, 1996, 21 TexReg 1548; amended to be effective May 22, 1997, 22 TexReg 4213; amended to be effective July 21, 1999, 24 TexReg 5488; amended to be effective December 2, 1999, 24 TexReg 10559; **amended to be effective January 18, 2001, 26 TexReg 493**

This rule was last updated in January 2001 or over 20 years ago. While the requirement to maintain a control efficiency of the vapor control system at 90% may have been appropriate 20 years ago, it does not represent current RACT in my opinion. It is my experience that current control efficiencies are typically 98% and even higher and there are no technological barriers to achieving 98% vapor control efficiencies that I am aware of. And, while there may be certain additional costs associated with increasing the control efficiency from 90% to 98%, neither EPA nor TCEQ has provided any cost analysis showing that such costs are unreasonable. Since control efficiencies of 98% and 99% are widely used in permitting for these types of vapor control systems, it is my opinion that they are not cost prohibitive. Therefore, it is my opinion that EPA's approval of this 20 year old requirement as current RACT is improper and plainly does not meet the definition of RACT that I have noted prior.

7.0 TCEQ 30 TAC Chapter 117 (NOx) Rules Are Old and Outdated

Like the EPA CTG and ACT documents noted earlier, and many of TCEQ's VOC rules, all of the TCEQ's 30 TAC Chapter 117 rules dealing with NOx are also outdated since they were last updated in 2007 and have not been updated since. The table below shows the relevant rules – i.e., those containing emissions limits or control efficiencies and work practices, etc.

I use the same color coding scheme as with the EPA documents. As the table clearly shows, all of them are over a decade old (red).

30 TAC 117 (NO _x RACT Rules)		
Subchapter	Description	Last Modified
 SUBCHAPTER B	COMBUSTION CONTROL AT MAJOR INDUSTRIAL, COMMERCIAL, AND INSTITUTIONAL SOURCES IN OZONE NONATTAINMENT AREAS	2007
SUBCHAPTER C	COMBUSTION CONTROL AT MAJOR UTILITY ELECTRIC GENERATION SOURCES IN OZONE NONATTAINMENT AREAS	2007
SUBCHAPTER D	COMBUSTION CONTROL AT MINOR SOURCES IN OZONE NONATTAINMENT AREAS	2007
SUBCHAPTER E	MULTI-REGION COMBUSTION CONTROL	2007
SUBCHAPTER F	ACID MANUFACTURING	2007
Last Modified 2010 or Before		
Last Modified Between 2011-2019		
Modified After 2019		

7.1 TCEQ's Top NOx Sources

Table F-4 in Appendix F of TCEQ's submittal contains a list of NOx sources in the HGB area based on actual 2017 reported NOx emissions. In the table below, I have excerpted all of the sources in TCEQ's Table F-4 with 100 tons per year or greater reported 2017 emissions. Collectively, these sources alone account for 29,084 tons per year of NOx emissions. In each case, the last column shows the NOx RACT rules that apply to each source per TCEQ. As is clear, the rules in 117.300 through 117.356 apply to almost every one of these sources. Included in these rules is 117.305 dealing with the NOx emissions from gas-fired combustion equipment, such as boilers and heaters burning natural gas, expressed in pounds per million Btu's (lb/MMBtu) of heat input to such devices. I show below that the requirements of 117.305 for gas-fired combustion equipment are outdated and are not consistent with current RACT.

NOx: Sources With Greater Than 100 tons/year Actual NOx in 2017 (Source: TCEQ Appendix F, Table F-4)							
RN	Account		County	SIC	SIC Description	2017 NOx Actual tpy	Rules Addressing RACT
RN100888312	FG0020V	NRG TEXAS POWER LLC	FORT BEND	4911	ELECTRIC SERVICES	5658.8	§117.1200 - §117.1256 §101.350 - §101.363
RN102212925	HG0228H	EXXONMOBIL CHEMICAL COMPANY	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	1885.8	§117.300 - §117.356 §101.350 - §101.363
RN102579307	HG0232Q	EXXONMOBIL REFINING & SUPPLY CO	HARRIS	2911	PETROLEUM REFINING	1815.5	§117.300 - §117.356 §101.350 - §101.363
RN102535077	GB0004L	GALVESTON BAY REFINING LOGISTICS	GALVESTON	2911	PETROLEUM REFINING	1673.4	§117.300 - §117.356 §101.350 - §101.363
RN100211879	HG0659W	SHELL CHEMICAL LP	HARRIS	2911	PETROLEUM REFINING	1495.2	§117.300 - §117.356 §101.350 - §101.363
RN100225945	BL0082R	DOW CHEMICAL COMPANY	BRAZORIA	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	1439.1	§117.300 - §117.356 §101.350 - §101.363
RN100238708	BL0002S	INEOS USA LLC	BRAZORIA	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	1403.3	§117.300 - §117.356 §101.350 - §101.363
RN100542281	HG0033B	EQUISTAR CHEMICALS LP	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	1089.6	§117.300 - §117.356 §101.350 - §101.363
RN100825249	BL0758C	CHEVRON PHILLIPS CHEMICAL	BRAZORIA	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	1055.6	§117.300 - §117.356 §101.350 - §101.363
RN100218130	HG0048L	HOUSTON REFINING LP	HARRIS	2911	PETROLEUM REFINING	748.2	§117.300 - §117.356 §101.350 - §101.363
RN100210319	HG0770G	EQUISTAR CHEMICALS LP	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	737.4	§117.300 - §117.356 §101.350 - §101.363
RN102323268	CI0008R	ENTERPRISE PRODUCTS	CHAMBERS	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	730.2	§117.300 - §117.356 §101.350 - §101.363
RN100218049	BL0021O	BASF CORPORATION	BRAZORIA	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	568.6	§117.300 - §117.356 §101.350 - §101.363
RN100716661	HG0175D	PASADENA REFINING SYSTEM INC	HARRIS	2911	PETROLEUM REFINING	491.1	§117.300 - §117.356 §101.350 - §101.363
RN101619179	BL0042G	PHILLIPS 66 COMPANY	BRAZORIA	2911	PETROLEUM REFINING	485.7	§117.300 - §117.356 §101.350 - §101.363
RN100217033	BL0622F	SWEENEY COGENERATION LP	BRAZORIA	4961	STEAM AND AIR CONDITIONING SUPPLY	430.9	§117.300 - §117.356 §101.350 - §101.363
RN100238385	GB0073P	VALERO REFINING TEXAS LP	GALVESTON	2911	PETROLEUM REFINING	397.5	§117.300 - §117.356 §101.350 - §101.363
RN108772245	BLA044R	BLUE CUBE OPERATIONS LLC	BRAZORIA	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	380.2	§117.300 - §117.356 §101.350 - §101.363

RN100223122	BL0378Q	FREEPORT POWER LIMITED	BRAZORIA	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	366.9	§117.300 - §117.356 §101.350 - §101.363
RN100219526	HG0562P	TPC GROUP LLC	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	346.7	§117.300 - §117.356 §101.350 - §101.363
RN100633650	HG1575W	LYONDELL CHEMICAL COMPANY	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	335.9	§117.300 - §117.356 §101.350 - §101.363
RN100222041	HG9954A	PASADENA COGENERATION LP	HARRIS	4911	ELECTRIC SERVICES	323.2	§117.300 - §117.356 §101.350 - §101.363
RN100210863	HG1174V	ALTURA COGEN LLC	HARRIS	4931	ELECTRIC AND OTHER SERVICES COMBINED	319.5	§117.300 - §117.356 §101.350 - §101.363
RN100233998	HG0071Q	AIR LIQUIDE AMERICA CORP	HARRIS	2813	INDUSTRIAL GASES	318.3	§117.300 - §117.356 §101.350 - §101.363
RN100542224	HG3307M	STYROLUTION AMERICA LLC	HARRIS	2865	CYCLIC CRUDES, INTERMEDIATES, ORGANIC DYES	317.5	§117.300 - §117.356 §101.350 - §101.363
RN100223205	HG0632T	ROHM AND HAAS TEXAS	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	308.9	§117.300 - §117.356 §101.350 - §101.363
RN103934493	GBA004D	SOUTH HOUSTON GREEN POWER	GALVESTON	4931	ELECTRIC AND OTHER SERVICES COMBINED	286.1	§117.300 - §117.356 §101.350 - §101.363
RN100238682	BL0038U	ASCEND PERFORMANCE MATERIALS	BRAZORIA	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	282.6	§117.300 - §117.356 §101.350 - §101.363
RN100220276	HX2342B	EIF CHANNELVIEW COGENERATION	HARRIS	4911	ELECTRIC SERVICES	281.3	§117.300 - §117.356 §101.350 - §101.363
RN100222033	HX2762V	DEER PARK ENERGY CENTER LP	HARRIS	4931	ELECTRIC AND OTHER SERVICES COMBINED	277.3	§117.300 - §117.356 §101.350 - §101.363
RN102574803	HG0229F	EXXONMOBIL CHEMICAL COMPANY	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	267.4	§117.300 - §117.356 §101.350 - §101.363
RN103919817	HG0310V	CHEVRON PHILLIPS	HARRIS	2869	INDUSTRIAL ORGANIC	250.3	§117.300 - §117.356 §101.350 - §101.363
RN100217363	HG0194W	OXYVINYLS LP	HARRIS	2812	ALKALIES AND CHLORINE	206.1	§117.300 - §117.356 §101.350 - §101.363
RN100224245	GB0153Q	TEXAS CITY COGENERATION LP	GALVESTON	4911	ELECTRIC SERVICES	195.7	§117.300 - §117.356 §101.350 - §101.363
RN100213107	HX2690V	CHANNEL ENERGY CENTER LP	HARRIS	4911	ELECTRIC SERVICES	183.1	§117.300 - §117.356 §101.350 - §101.363
RN100226067	CI0184T	BAYTOWN ENERGY CENTER LP	CHAMBERS	4911	ELECTRIC SERVICES	173.7	§117.300 - §117.356 §101.350 - §101.363
RN100226877	MQ0009F	ENTERGY TEXAS INC	MONTGOMERY	4911	ELECTRIC SERVICES	168.4	§117.1200 - §117.1256 §101.350 - §101.363
RN102576063	HG0035U	FLINT HILLS HOUSTON CHEMICAL	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	144.5	§117.300 - §117.356 §101.350 - §101.363

RN100210608	GB0055R	MARATHON PETROLEUM	GALVESTON	2911	PETROLEUM REFINING	140.3	§117.300 - §117.356 §101.350 - §101.363
RN100219310	HG0130C	VALERO REFINING TEXAS LP	HARRIS	2911	PETROLEUM REFINING	136.2	§117.300 - §117.356 §101.350 - §101.363
RN100542901	HG4955K	NRG TEXAS POWER LLC	HARRIS	4911	ELECTRIC SERVICES	116.3	§117.1200 - §117.1256 §101.350 - §101.363
RN100211523	HGA010J	ALBEMARLE CORPORATION	HARRIS	2819	INDUSTRIAL INORGANIC CHEMICALS	112.6	§117.300 - §117.356 §101.350 - §101.363
RN100216092	FG0595L	BRAZOS VALLEY ENERGY LP	FORT BEND	4911	ELECTRIC SERVICES	111	§117.1200 - §117.1256 §101.350 - §101.363
RN100214931	HG0473P	ATLANTIC COFFEE	HARRIS	2095	ROASTED COFFEE	106.2	§117.300 - §117.356 §101.350 - §101.363
RN100217413	HG0114A	WYMAN GORDON FORGINGS LP	HARRIS	3462	IRON AND STEEL FORGINGS	105.3	§117.300 - §117.356 §101.350 - §101.363
RN102184173	HG0633R	CLEAN HARBORS DEER PARK LLC	HARRIS	4953	REFUSE SYSTEMS	105.3	§117.300 - §117.356 §101.350 - §101.363
RN104150123	HGA005E	ARKEMA INC	HARRIS	2869	INDUSTRIAL ORGANIC	104.9	§117.300 - §117.356 §101.350 - §101.363
RN102523107	HG0537O	LYONDELL CHEMICAL COMPANY	HARRIS	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	103.5	§117.300 - §117.356 §101.350 - §101.363
RN100229905	HG0665E	INEOS USA LLC	HARRIS	2821	PLASTICS MATERIALS AND SYNTHETIC RESINS	102.7	§117.300 - §117.356 §101.350 - §101.363

7.2 Example 3 (30 TAC 117.305)

<u>TITLE 30</u>	ENVIRONMENTAL QUALITY
<u>PART 1</u>	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
<u>CHAPTER 117</u>	CONTROL OF AIR POLLUTION FROM NITROGEN COMPOUNDS
<u>SUBCHAPTER B</u>	COMBUSTION CONTROL AT MAJOR INDUSTRIAL, COMMERCIAL, AND INSTITUTIONAL SOURCES IN OZONE NONATTAINMENT AREAS
<u>DIVISION 3</u>	HOUSTON-GALVESTON-BRAZORIA OZONE NONATTAINMENT AREA MAJOR SOURCES
RULE §117.305	Emission Specifications for Reasonably Available Control Technology (RACT)

(a) No person shall allow the discharge of air contaminants into the atmosphere to exceed the emission specifications of this section, except as provided in §§117.315, 117.323, or 117.9800 of this title (relating to Alternative Plant-Wide Emission Specifications; Source Cap; and Use of Emission Credits for Compliance).

(1) For purposes of this subchapter, the lower of any permit nitrogen oxides (NO_x) emission limit in effect on June 9, 1993, under a permit issued in accordance with Chapter 116 of this title (relating to Control of Air Pollution by Permits for New Construction or Modification) and the emission specifications of subsections (b) - (d) of this section apply, except that:

(A) gas-fired boilers and process heaters operating under a permit issued after March 3, 1982, with a NO_x emission limit of 0.12 pounds per million British thermal units (lb/MMBtu) heat input, are limited to that rate for the purposes of this subchapter; and

...

(b) For each boiler and process heater with a maximum rated capacity greater than or equal to 100.0 MMBtu/hr of heat input, the applicable NO_x emission specification is as follows:

(1) gas-fired boilers, as follows:

(A) low heat release boilers with no preheated air or preheated air less than 200 degrees Fahrenheit, 0.10 lb/MMBtu of heat input;

(B) low heat release boilers with preheated air greater than or equal to 200 degrees Fahrenheit and less than 400 degrees Fahrenheit, 0.15 lb/MMBtu of heat input;

(C) low heat release boilers with preheated air greater than or equal to 400 degrees Fahrenheit, 0.20 lb/MMBtu of heat input;

(D) high heat release boilers with no preheated air or preheated air less than 250 degrees Fahrenheit, 0.20 lb/MMBtu of heat input;

(E) high heat release boilers with preheated air greater than or equal to 250 degrees Fahrenheit and less than 500 degrees Fahrenheit, 0.24 lb/MMBtu of heat input; or

(F) high heat release boilers with preheated air greater than or equal to 500 degrees Fahrenheit, 0.28 lb/MMBtu of heat input;

(2) gas-fired process heaters, based on either air preheat temperature or firebox temperature, as follows:

(A) based on air preheat temperature:

(i) process heaters with preheated air less than 200 degrees Fahrenheit, 0.10 lb/MMBtu of heat input;

(ii) process heaters with preheated air greater than or equal to 200 degrees Fahrenheit and less than 400 degrees Fahrenheit, 0.13 lb/MMBtu of heat input; or

(iii) process heaters with preheated air greater than or equal to 400 degrees Fahrenheit, 0.18 lb/MMBtu of heat input; or

(B) based on firebox temperature:

(i) process heaters with a firebox temperature less than 1,400 degrees Fahrenheit, 0.10 lb/MMBtu of heat input;

(ii) process heaters with a firebox temperature greater than or equal to 1,400 degrees Fahrenheit and less than 1,800 degrees Fahrenheit, 0.125 lb/MMBtu of heat input; or

(iii) process heaters with a firebox temperature greater than or equal to 1,800 degrees Fahrenheit, 0.15 lb/MMBtu of heat input;

Source Note: The provisions of this §117.305 adopted to be effective June 14, 2007, 32 TexReg 3206

As the highlighted requirements for NO_x for gas-fired equipment greater than 100 million Btu/hr heat input show, the NO_x limits, depending on the type of equipment (i.e., boiler or heater) and the types of air-preheat temperature or firebox temperature, the NO_x limits can range from 0.10 lb/MMBtu to as high as 0.28 lb/MMBtu. For units permitted after 1982 the limit is capped at 0.12 lb/MMBtu.

In its analysis, neither TCEQ nor EPA discusses how many such combustion devices are present in the HGB area and whether they were permitted before or after 1982. And, what their applicable NO_x limits are, given the various potential limits in 117.305 which can range from 0.1 lb/MMBtu to 0.28 lb/MMBtu as noted.

In any case, even 0.10 lb/MMBtu, the lowest applicable limit is still not current RACT for gas-fired combustion equipment. This is readily verified by looking at permit limits for such equipment that EPA can readily verify, such as by reviewing the RACT/BACT/LAER Clearinghouse (RBLC) database. While the RBLC database contains equipment that have undergone BACT review, I note that EPA has relied on the RBLC database in its TSD for this rule to determine in this database contains limits that may apply as RACT.²⁶ It is appropriate to rely on the RBLC (but not exclusively so) because there is no question that limits in the RBLC are technically feasible, one of the requirements of RACT. And, the age and prevalence of limits in the RBLC are strong indicators of the levels that can be readily achieved, which is also indicative of RACT.

I summarize my review of the RBLC relating to gas-fired combustion equipment in the next section.

7.3 Summary of EPA RBLC Review (accessed 3/28/2021)

I searched EPA's RBLC²⁷ from 1/1/2016 through current (i.e., the last 5 years or so), for boilers and heaters using natural gas or gaseous fuels greater than 100 MMBtu/hr firing rate: The process codes are 12.310 (Industrial) and 13.310 (Commercial/Institutional). The results of the searches are voluminous and I am attaching the output from the 12.310 search in Attachment C to this comment report.

I have highlighted in Attachment C, numerous instances of NO_x limits from gas fired units that are lower (and often significantly lower) than 0.1 lb/MMBtu, the lowest value in current rule 117.305 as discussed in the previous section. In fact, the RBLC search shows that much lower

²⁶ TSD, Appendix A discussion for phosphatic fertilizer plants, showing the results of the RBLC search on p. 25-27.

²⁷ <https://cfpub.epa.gov/rblc/index.cfm?action=Search.BasicSearch&lang=en>

limits apply to equipment that is not just 100 MMBtu/hr or greater but also to equipment that have smaller heat input sizes.

Values in the RBLC are as low as 0.01 lb/MMBtu for NO_x, which is not inconsistent with levels that can be achieved by current low NO_x and ultra low-NO_x burner technologies including internal flue gas recirculation. Certainly many limits are around 0.05 lb/MMBtu as I have marked in red box highlights in Attachment C. These are readily achieved by low-NO_x burner technologies.

Thus, EPA's approval of 117.305 in its current form is improper because it does not represent current RACT in my opinion.

Attachment A – Resume

RANAJIT (RON) SAHU, Ph.D, QEP, CEM (Nevada)

CONSULTANT, ENVIRONMENTAL AND ENERGY ISSUES

311 North Story Place

Alhambra, CA 91801

Phone: 702.683.5466

e-mail (preferred): ronsahu@gmail.com; sahuron@earthlink.net

EXPERIENCE SUMMARY

Dr. Sahu has over thirty one years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services; design and specification of pollution control equipment for a wide range of emissions sources including stationary and mobile sources; soils and groundwater remediation including landfills as remedy; combustion engineering evaluations; energy studies; multimedia environmental regulatory compliance (involving statutes and regulations such as the Federal CAA and its Amendments, Clean Water Act, TSCA, RCRA, CERCLA, SARA, OSHA, NEPA as well as various related state statutes); transportation air quality impact analysis; multimedia compliance audits; multimedia permitting (including air quality NSR/PSD permitting, Title V permitting, NPDES permitting for industrial and storm water discharges, RCRA permitting, etc.), multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and regulatory strategy development and support including negotiation of consent agreements and orders.

He has over twenty eight years of project management experience and has successfully managed and executed numerous projects in this time period. This includes basic and applied research projects, design projects, regulatory compliance projects, permitting projects, energy studies, risk assessment projects, and projects involving the communication of environmental data and information to the public.

He has provided consulting services to numerous private sector, public sector and public interest group clients. His major clients over the past twenty six years include various trade associations as well as individual companies such as steel mills, petroleum refineries, chemical plants, cement manufacturers, aerospace companies, power generation facilities, lawn and garden equipment manufacturers, spa manufacturers, chemical distribution facilities, land development companies, and various entities in the public sector including EPA, the US Dept. of Justice, several states (including Oregon, New Mexico, Pennsylvania, and others), various agencies such as the California DTSC, and various municipalities. Dr. Sahu has performed projects in all 50 states, numerous local jurisdictions and internationally.

In addition to consulting, for approximately twenty years, Dr. Sahu taught numerous courses in several Southern California universities including UCLA (air pollution), UC Riverside (air pollution, process hazard analysis), and Loyola Marymount University (air pollution, risk assessment, hazardous waste management). He also taught at Caltech, his alma mater (various engineering courses), at the University of Southern California (air pollution controls) and at California State University, Fullerton (transportation and air quality).

Dr. Sahu has and continues to provide expert witness services in a number of environmental areas discussed above in both state and Federal courts as well as before administrative bodies (please see Annex A).

EXPERIENCE RECORD

2000-present **Independent Consultant.** Providing a variety of private sector (industrial companies, land development companies, law firms, etc.), public sector (such as the US Department of Justice), and public interest group clients with project management, environmental

consulting, project management, as well as regulatory and engineering support consulting services.

- 1995-2000 Parsons ES, **Associate, Senior Project Manager and Department Manager for** Air Quality/Geosciences/Hazardous Waste Groups, Pasadena. Responsible for the management of a group of approximately 24 air quality and environmental professionals, 15 geoscience, and 10 hazardous waste professionals providing full-service consulting, project management, regulatory compliance and A/E design assistance in all areas.
- Parsons ES, **Manager for Air Source Testing Services.** Responsible for the management of 8 individuals in the area of air source testing and air regulatory permitting projects located in Bakersfield, California.
- 1992-1995 Engineering-Science, Inc. **Principal Engineer and Senior Project Manager** in the air quality department. Responsibilities included multimedia regulatory compliance and permitting (including hazardous and nuclear materials), air pollution engineering (emissions from stationary and mobile sources, control of criteria and air toxics, dispersion modeling, risk assessment, visibility analysis, odor analysis), supervisory functions and project management.
- 1990-1992 Engineering-Science, Inc. **Principal Engineer and Project Manager** in the air quality department. Responsibilities included permitting, tracking regulatory issues, technical analysis, and supervisory functions on numerous air, water, and hazardous waste projects. Responsibilities also include client and agency interfacing, project cost and schedule control, and reporting to internal and external upper management regarding project status.
- 1989-1990 Kinetics Technology International, Corp. **Development Engineer.** Involved in thermal engineering R&D and project work related to low-NO_x ceramic radiant burners, fired heater NO_x reduction, SCR design, and fired heater retrofitting.
- 1988-1989 Heat Transfer Research, Inc. **Research Engineer.** Involved in the design of fired heaters, heat exchangers, air coolers, and other non-fired equipment. Also did research in the area of heat exchanger tube vibrations.

EDUCATION

- 1984-1988 Ph.D., Mechanical Engineering, California Institute of Technology (Caltech), Pasadena, CA.
- 1984 M. S., Mechanical Engineering, California Institute of Technology (Caltech), Pasadena, CA.
- 1978-1983 B. Tech (Honors), Mechanical Engineering, Indian Institute of Technology (IIT) Kharagpur, India

TEACHING EXPERIENCE

Caltech

"Thermodynamics," Teaching Assistant, California Institute of Technology, 1983, 1987.

"Air Pollution Control," Teaching Assistant, California Institute of Technology, 1985.

"Caltech Secondary and High School Saturday Program," - taught various mathematics (algebra through calculus) and science (physics and chemistry) courses to high school students, 1983-1989.

"Heat Transfer," - taught this course in the Fall and Winter terms of 1994-1995 in the Division of Engineering and Applied Science.

"Thermodynamics and Heat Transfer," Fall and Winter Terms of 1996-1997.

U.C. Riverside, Extension

"Toxic and Hazardous Air Contaminants," University of California Extension Program, Riverside, California. Various years since 1992.

"Prevention and Management of Accidental Air Emissions," University of California Extension Program, Riverside, California. Various years since 1992.

"Air Pollution Control Systems and Strategies," University of California Extension Program, Riverside, California, Summer 1992-93, Summer 1993-1994.

"Air Pollution Calculations," University of California Extension Program, Riverside, California, Fall 1993-94, Winter 1993-94, Fall 1994-95.

"Process Safety Management," University of California Extension Program, Riverside, California. Various years since 1992-2010.

"Process Safety Management," University of California Extension Program, Riverside, California, at SCAQMD, Spring 1993-94.

"Advanced Hazard Analysis - A Special Course for LEPCs," University of California Extension Program, Riverside, California, taught at San Diego, California, Spring 1993-1994.

"Advanced Hazardous Waste Management" University of California Extension Program, Riverside, California. 2005.

Loyola Marymount University

"Fundamentals of Air Pollution - Regulations, Controls and Engineering," Loyola Marymount University, Dept. of Civil Engineering. Various years since 1993.

"Air Pollution Control," Loyola Marymount University, Dept. of Civil Engineering, Fall 1994.

"Environmental Risk Assessment," Loyola Marymount University, Dept. of Civil Engineering. Various years since 1998.

"Hazardous Waste Remediation" Loyola Marymount University, Dept. of Civil Engineering. Various years since 2006.

University of Southern California

"Air Pollution Controls," University of Southern California, Dept. of Civil Engineering, Fall 1993, Fall 1994.

"Air Pollution Fundamentals," University of Southern California, Dept. of Civil Engineering, Winter 1994.

University of California, Los Angeles

"Air Pollution Fundamentals," University of California, Los Angeles, Dept. of Civil and Environmental Engineering, Spring 1994, Spring 1999, Spring 2000, Spring 2003, Spring 2006, Spring 2007, Spring 2008, Spring 2009.

International Programs

"Environmental Planning and Management," 5 week program for visiting Chinese delegation, 1994.

"Environmental Planning and Management," 1 day program for visiting Russian delegation, 1995.

"Air Pollution Planning and Management," IEP, UCR, Spring 1996.

"Environmental Issues and Air Pollution," IEP, UCR, October 1996.

PROFESSIONAL AFFILIATIONS AND HONORS

President of India Gold Medal, IIT Kharagpur, India, 1983.

Member of the Alternatives Assessment Committee of the Grand Canyon Visibility Transport Commission, established by the Clean Air Act Amendments of 1990, 1992.

American Society of Mechanical Engineers: Los Angeles Section Executive Committee, Heat Transfer Division, and Fuels and Combustion Technology Division, 1987-mid-1990s.

Air and Waste Management Association, West Coast Section, 1989-mid-2000s.

PROFESSIONAL CERTIFICATIONS

EIT, California (#XE088305), 1993.

REA I, California (#07438), 2000.

Certified Permitting Professional, South Coast AQMD (#C8320), since 1993.

QEP, Institute of Professional Environmental Practice, since 2000.

CEM, State of Nevada (#EM-1699). Expiration 10/07/2021.

PUBLICATIONS (PARTIAL LIST)

"Physical Properties and Oxidation Rates of Chars from Bituminous Coals," with Y.A. Levendis, R.C. Flagan and G.R. Gavalas, *Fuel*, **67**, 275-283 (1988).

"Char Combustion: Measurement and Analysis of Particle Temperature Histories," with R.C. Flagan, G.R. Gavalas and P.S. Northrop, *Comb. Sci. Tech.* **60**, 215-230 (1988).

"On the Combustion of Bituminous Coal Chars," PhD Thesis, California Institute of Technology (1988).

"Optical Pyrometry: A Powerful Tool for Coal Combustion Diagnostics," *J. Coal Quality*, **8**, 17-22 (1989).

"Post-Ignition Transients in the Combustion of Single Char Particles," with Y.A. Levendis, R.C. Flagan and G.R. Gavalas, *Fuel*, **68**, 849-855 (1989).

"A Model for Single Particle Combustion of Bituminous Coal Char." Proc. ASME National Heat Transfer Conference, Philadelphia, **HTD-Vol. 106**, 505-513 (1989).

"Discrete Simulation of Cenospheric Coal-Char Combustion," with R.C. Flagan and G.R. Gavalas, *Combust. Flame*, **77**, 337-346 (1989).

"Particle Measurements in Coal Combustion," with R.C. Flagan, in "**Combustion Measurements**" (ed. N. Chigier), Hemisphere Publishing Corp. (1991).

"Cross Linking in Pore Structures and Its Effect on Reactivity," with G.R. Gavalas in preparation.

"Natural Frequencies and Mode Shapes of Straight Tubes," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Optimal Tube Layouts for Kamui SL-Series Exchangers," with K. Ishihara, Proprietary Report for Kamui Company Limited, Tokyo, Japan (1990).

"HTRI Process Heater Conceptual Design," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Asymptotic Theory of Transonic Wind Tunnel Wall Interference," with N.D. Malmuth and others, Arnold Engineering Development Center, Air Force Systems Command, USAF (1990).

"Gas Radiation in a Fired Heater Convection Section," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1990).

"Heat Transfer and Pressure Drop in NTIW Heat Exchangers," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1991).

"NO_x Control and Thermal Design," Thermal Engineering Tech Briefs, (1994).

"From Purchase of Landmark Environmental Insurance to Remediation: Case Study in Henderson, Nevada," with Robin E. Bain and Jill Quillin, presented at the AQMA Annual Meeting, Florida, 2001.

"The Jones Act Contribution to Global Warming, Acid Rain and Toxic Air Contaminants," with Charles W. Botsford, presented at the AQMA Annual Meeting, Florida, 2001.

PRESENTATIONS (PARTIAL LIST)

"Pore Structure and Combustion Kinetics - Interpretation of Single Particle Temperature-Time Histories," with P.S. Northrop, R.C. Flagan and G.R. Gavalas, presented at the AIChE Annual Meeting, New York (1987).

"Measurement of Temperature-Time Histories of Burning Single Coal Char Particles," with R.C. Flagan, presented at the American Flame Research Committee Fall International Symposium, Pittsburgh, (1988).

"Physical Characterization of a Cenospheric Coal Char Burned at High Temperatures," with R.C. Flagan and G.R. Gavalas, presented at the Fall Meeting of the Western States Section of the Combustion Institute, Laguna Beach, California (1988).

"Control of Nitrogen Oxide Emissions in Gas Fired Heaters - The Retrofit Experience," with G. P. Croce and R. Patel, presented at the International Conference on Environmental Control of Combustion Processes (Jointly sponsored by the American Flame Research Committee and the Japan Flame Research Committee), Honolulu, Hawaii (1991).

"Air Toxics - Past, Present and the Future," presented at the Joint AIChE/AAEE Breakfast Meeting at the AIChE 1991 Annual Meeting, Los Angeles, California, November 17-22 (1991).

"Air Toxics Emissions and Risk Impacts from Automobiles Using Reformulated Gasolines," presented at the Third Annual Current Issues in Air Toxics Conference, Sacramento, California, November 9-10 (1992).

"Air Toxics from Mobile Sources," presented at the Environmental Health Sciences (ESE) Seminar Series, UCLA, Los Angeles, California, November 12, (1992).

"Kilns, Ovens, and Dryers - Present and Future," presented at the Gas Company Air Quality Permit Assistance Seminar, Industry Hills Sheraton, California, November 20, (1992).

"The Design and Implementation of Vehicle Scrapping Programs," presented at the 86th Annual Meeting of the Air and Waste Management Association, Denver, Colorado, June 12, 1993.

"Air Quality Planning and Control in Beijing, China," presented at the 87th Annual Meeting of the Air and Waste Management Association, Cincinnati, Ohio, June 19-24, 1994.

Annex A

Expert Litigation Support

A. Occasions where Dr. Sahu has provided Written or Oral testimony before Congress:

1. In July 2012, provided expert written and oral testimony to the House Subcommittee on Energy and the Environment, Committee on Science, Space, and Technology at a Hearing entitled “Hitting the Ethanol Blend Wall – Examining the Science on E15.”

B. Matters for which Dr. Sahu has provided affidavits and expert reports include:

2. Affidavit for Rocky Mountain Steel Mills, Inc. located in Pueblo Colorado – dealing with the technical uncertainties associated with night-time opacity measurements in general and at this steel mini-mill.
3. Expert reports and depositions (2/28/2002 and 3/1/2002; 12/2/2003 and 12/3/2003; 5/24/2004) on behalf of the United States in connection with the Ohio Edison NSR Cases. *United States, et al. v. Ohio Edison Co., et al.*, C2-99-1181 (Southern District of Ohio).
4. Expert reports and depositions (5/23/2002 and 5/24/2002) on behalf of the United States in connection with the Illinois Power NSR Case. *United States v. Illinois Power Co., et al.*, 99-833-MJR (Southern District of Illinois).
5. Expert reports and depositions (11/25/2002 and 11/26/2002) on behalf of the United States in connection with the Duke Power NSR Case. *United States, et al. v. Duke Energy Corp.*, 1:00-CV-1262 (Middle District of North Carolina).
6. Expert reports and depositions (10/6/2004 and 10/7/2004; 7/10/2006) on behalf of the United States in connection with the American Electric Power NSR Cases. *United States, et al. v. American Electric Power Service Corp., et al.*, C2-99-1182, C2-99-1250 (Southern District of Ohio).
7. Affidavit (March 2005) on behalf of the Minnesota Center for Environmental Advocacy and others in the matter of the Application of Heron Lake BioEnergy LLC to construct and operate an ethanol production facility – submitted to the Minnesota Pollution Control Agency.
8. Expert Report and Deposition (10/31/2005 and 11/1/2005) on behalf of the United States in connection with the East Kentucky Power Cooperative NSR Case. *United States v. East Kentucky Power Cooperative, Inc.*, 5:04-cv-00034-KSF (Eastern District of Kentucky).
9. Affidavits and deposition on behalf of Basic Management Inc. (BMI) Companies in connection with the BMI vs. USA remediation cost recovery Case.
10. Expert Report on behalf of Penn Future and others in the Cambria Coke plant permit challenge in Pennsylvania.
11. Expert Report on behalf of the Appalachian Center for the Economy and the Environment and others in the Western Greenbrier permit challenge in West Virginia.
12. Expert Report, deposition (via telephone on January 26, 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women’s Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) in the Thompson River Cogeneration LLC Permit No. 3175-04 challenge.
13. Expert Report and deposition (2/2/07) on behalf of the Texas Clean Air Cities Coalition at the Texas State Office of Administrative Hearings (SOAH) in the matter of the permit challenges to TXU Project Apollo’s eight new proposed PRB-fired PC boilers located at seven TX sites.

14. Expert Testimony (July 2007) on behalf of the Izaak Walton League of America and others in connection with the acquisition of power by Xcel Energy from the proposed Gascoyne Power Plant – at the State of Minnesota, Office of Administrative Hearings for the Minnesota PUC (MPUC No. E002/CN-06-1518; OAH No. 12-2500-17857-2).
15. Affidavit (July 2007) Comments on the Big Cajun I Draft Permit on behalf of the Sierra Club – submitted to the Louisiana DEQ.
16. Expert Report and Deposition (12/13/2007) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case. *Plaintiffs v. Allegheny Energy Inc., et al.*, 2:05cv0885 (Western District of Pennsylvania).
17. Expert Reports and Pre-filed Testimony before the Utah Air Quality Board on behalf of Sierra Club in the Sevier Power Plant permit challenge.
18. Expert Report and Deposition (October 2007) on behalf of MTD Products Inc., in connection with *General Power Products, LLC v MTD Products Inc.*, 1:06 CVA 0143 (Southern District of Ohio, Western Division) .
19. Expert Report and Deposition (June 2008) on behalf of Sierra Club and others in the matter of permit challenges (Title V: 28.0801-29 and PSD: 28.0803-PSD) for the Big Stone II unit, proposed to be located near Milbank, South Dakota.
20. Expert Reports, Affidavit, and Deposition (August 15, 2008) on behalf of Earthjustice in the matter of air permit challenge (CT-4631) for the Basin Electric Dry Fork station, under construction near Gillette, Wyoming before the Environmental Quality Council of the State of Wyoming.
21. Affidavits (May 2010/June 2010 in the Office of Administrative Hearings)/Declaration and Expert Report (November 2009 in the Office of Administrative Hearings) on behalf of NRDC and the Southern Environmental Law Center in the matter of the air permit challenge for Duke Cliffside Unit 6. Office of Administrative Hearing Matters 08 EHR 0771, 0835 and 0836 and 09 HER 3102, 3174, and 3176 (consolidated).
22. Declaration (August 2008), Expert Report (January 2009), and Declaration (May 2009) on behalf of Southern Alliance for Clean Energy in the matter of the air permit challenge for Duke Cliffside Unit 6. *Southern Alliance for Clean Energy et al., v. Duke Energy Carolinas, LLC*, Case No. 1:08-cv-00318-LHT-DLH (Western District of North Carolina, Asheville Division).
23. Declaration (August 2008) on behalf of the Sierra Club in the matter of Dominion Wise County plant MACT.us
24. Expert Report (June 2008) on behalf of Sierra Club for the Green Energy Resource Recovery Project, MACT Analysis.
25. Expert Report (February 2009) on behalf of Sierra Club and the Environmental Integrity Project in the matter of the air permit challenge for NRG Limestone’s proposed Unit 3 in Texas.
26. Expert Report (June 2009) on behalf of MTD Products, Inc., in the matter of *Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al.*
27. Expert Report (August 2009) on behalf of Sierra Club and the Southern Environmental Law Center in the matter of the air permit challenge for Santee Cooper’s proposed Pee Dee plant in South Carolina).
28. Statements (May 2008 and September 2009) on behalf of the Minnesota Center for Environmental Advocacy to the Minnesota Pollution Control Agency in the matter of the Minnesota Haze State Implementation Plans.
29. Expert Report (August 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

30. Expert Report and Rebuttal Report (September 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.
31. Expert Report (December 2009) and Rebuttal reports (May 2010 and June 2010) on behalf of the United States in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).
32. Pre-filed Testimony (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).
33. Pre-filed Testimony (July 2010) and Written Rebuttal Testimony (August 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions*, No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.
34. Expert Report (August 2010) and Rebuttal Expert Report (October 2010) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Liability Phase.
35. Declaration (August 2010), Reply Declaration (November 2010), Expert Report (April 2011), Supplemental and Rebuttal Expert Report (July 2011) on behalf of the United States in the matter of DTE Energy Company and Detroit Edison Company (Monroe Unit 2). *United States of America v. DTE Energy Company and Detroit Edison Company*, Civil Action No. 2:10-cv-13101-BAF-RSW (Eastern District of Michigan).
36. Expert Report and Deposition (August 2010) as well as Affidavit (September 2010) on behalf of Kentucky Waterways Alliance, Sierra Club, and Valley Watch in the matter of challenges to the NPDES permit issued for the Trimble County power plant by the Kentucky Energy and Environment Cabinet to Louisville Gas and Electric, File No. DOW-41106-047.
37. Expert Report (August 2010), Rebuttal Expert Report (September 2010), Supplemental Expert Report (September 2011), and Declaration (November 2011) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)'s Cherokee power plant. No. 09-cv-1862 (District of Colorado).
38. Written Direct Expert Testimony (August 2010) and Affidavit (February 2012) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).
39. Deposition (August 2010) on behalf of Environmental Defense, in the matter of the remanded permit challenge to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).
40. Expert Report, Supplemental/Rebuttal Expert Report, and Declarations (October 2010, November 2010, September 2012) on behalf of New Mexico Environment Department (Plaintiff-Intervenor), Grand Canyon Trust and Sierra Club (Plaintiffs) in the matter of *Plaintiffs v. Public Service Company of New Mexico* (PNM), Civil No. 1:02-CV-0552 BB/ATC (ACE) (District of New Mexico).
41. Expert Report (October 2010) and Rebuttal Expert Report (November 2010) (BART Determinations for PSCo Hayden and CSU Martin Drake units) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.
42. Expert Report (November 2010) (BART Determinations for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.
43. Declaration (November 2010) on behalf of the Sierra Club in connection with the Martin Lake Station Units 1, 2, and 3. *Sierra Club v. Energy Future Holdings Corporation and Luminant*

Generation Company LLC, Case No. 5:10-cv-00156-DF-CMC (Eastern District of Texas, Texarkana Division).

44. Pre-Filed Testimony (January 2011) and Declaration (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).
45. Declaration (February 2011) in the matter of the Draft Title V Permit for RRI Energy MidAtlantic Power Holdings LLC Shawville Generating Station (Pennsylvania), ID No. 17-00001 on behalf of the Sierra Club.
46. Expert Report (March 2011), Rebuttal Expert Report (June 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (District of Colorado).
47. Declaration (April 2011) and Expert Report (July 16, 2012) in the matter of the Lower Colorado River Authority (LCRA)'s Fayette (Sam Seymour) Power Plant on behalf of the Texas Campaign for the Environment. *Texas Campaign for the Environment v. Lower Colorado River Authority*, Civil Action No. 4:11-cv-00791 (Southern District of Texas, Houston Division).
48. Declaration (June 2011) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.
49. Expert Report (June 2011) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).
50. Declaration (August 2011) in the matter of the Sandy Creek Energy Associates L.P. Sandy Creek Power Plant on behalf of Sierra Club and Public Citizen. *Sierra Club, Inc. and Public Citizen, Inc. v. Sandy Creek Energy Associates, L.P.*, Civil Action No. A-08-CA-648-LY (Western District of Texas, Austin Division).
51. Expert Report (October 2011) on behalf of the Defendants in the matter of *John Quiles and Jeanette Quiles et al. v. Bradford-White Corporation, MTD Products, Inc., Kohler Co., et al.*, Case No. 3:10-cv-747 (TJM/DEP) (Northern District of New York).
52. Declaration (October 2011) on behalf of the Plaintiffs in the matter of *American Nurses Association et. al. (Plaintiffs), v. US EPA (Defendant)*, Case No. 1:08-cv-02198-RMC (US District Court for the District of Columbia).
53. Declaration (February 2012) and Second Declaration (February 2012) in the matter of *Washington Environmental Council and Sierra Club Washington State Chapter v. Washington State Department of Ecology and Western States Petroleum Association*, Case No. 11-417-MJP (Western District of Washington).
54. Expert Report (March 2012) and Supplemental Expert Report (November 2013) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.*, Civil Action No. 4:10-cv-4969 (Southern District of Texas, Houston Division).
55. Declaration (March 2012) in the matter of *Center for Biological Diversity, et al. v. United States Environmental Protection Agency*, Case No. 11-1101 (consolidated with 11-1285, 11-1328 and 11-1336) (US Court of Appeals for the District of Columbia Circuit).
56. Declaration (March 2012) in the matter of *Sierra Club v. The Kansas Department of Health and Environment*, Case No. 11-105,493-AS (Holcomb power plant) (Supreme Court of the State of Kansas).

57. Declaration (March 2012) in the matter of the Las Brisas Energy Center *Environmental Defense Fund et al., v. Texas Commission on Environmental Quality*, Cause No. D-1-GN-11-001364 (District Court of Travis County, Texas, 261st Judicial District).
58. Expert Report (April 2012), Supplemental and Rebuttal Expert Report (July 2012), and Supplemental Rebuttal Expert Report (August 2012) on behalf of the states of New Jersey and Connecticut in the matter of the Portland Power plant *State of New Jersey and State of Connecticut (Intervenor-Plaintiff) v. RRI Energy Mid-Atlantic Power Holdings et al.*, Civil Action No. 07-CV-5298 (JKG) (Eastern District of Pennsylvania).
59. Declaration (April 2012) in the matter of the EPA's EGU MATS Rule, on behalf of the Environmental Integrity Project.
60. Expert Report (August 2012) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Harm Phase.
61. Declaration (September 2012) in the Matter of the Application of *Energy Answers Incinerator, Inc.* for a Certificate of Public Convenience and Necessity to Construct a 120 MW Generating Facility in Baltimore City, Maryland, before the Public Service Commission of Maryland, Case No. 9199.
62. Expert Report (October 2012) on behalf of the Appellants (Robert Concilus and Leah Humes) in the matter of Robert Concilus and Leah Humes v. Commonwealth of Pennsylvania Department of Environmental Protection and Crawford Renewable Energy, before the Commonwealth of Pennsylvania Environmental Hearing Board, Docket No. 2011-167-R.
63. Expert Report (October 2012), Supplemental Expert Report (January 2013), and Affidavit (June 2013) in the matter of various Environmental Petitioners v. North Carolina DENR/DAQ and Carolinas Cement Company, before the Office of Administrative Hearings, State of North Carolina.
64. Pre-filed Testimony (October 2012) on behalf of No-Sag in the matter of the North Springfield Sustainable Energy Project before the State of Vermont, Public Service Board.
65. Pre-filed Testimony (November 2012) on behalf of Clean Wisconsin in the matter of Application of Wisconsin Public Service Corporation for Authority to Construct and Place in Operation a New Multi-Pollutant Control Technology System (ReACT) for Unit 3 of the Weston Generating Station, before the Public Service Commission of Wisconsin, Docket No. 6690-CE-197.
66. Expert Report (February 2013) on behalf of Petitioners in the matter of Credence Crematory, Cause No. 12-A-J-4538 before the Indiana Office of Environmental Adjudication.
67. Expert Report (April 2013), Rebuttal report (July 2013), and Declarations (October 2013, November 2013) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).
68. Declaration (April 2013) on behalf of Petitioners in the matter of *Sierra Club, et al., (Petitioners) v Environmental Protection Agency et al. (Respondents)*, Case No., 13-1112, (Court of Appeals, District of Columbia Circuit).
69. Expert Report (May 2013) and Rebuttal Expert Report (July 2013) on behalf of the Sierra Club in connection with the Luminant Martin Lake Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 5:10-cv-0156-MHS-CMC (Eastern District of Texas, Texarkana Division).
70. Declaration (August 2013) on behalf of A. J. Acosta Company, Inc., in the matter of *A. J. Acosta Company, Inc., v. County of San Bernardino*, Case No. CIVSS803651.
71. Comments (October 2013) on behalf of the Washington Environmental Council and the Sierra Club in the matter of the Washington State Oil Refinery RACT (for Greenhouse Gases), submitted to the Washington State Department of Ecology, the Northwest Clean Air Agency, and the Puget Sound Clean Air Agency.

72. Statement (November 2013) on behalf of various Environmental Organizations in the matter of the Boswell Energy Center (BEC) Unit 4 Environmental Retrofit Project, to the Minnesota Public Utilities Commission, Docket No. E-015/M-12-920.
73. Expert Report (December 2013) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).
74. Expert Testimony (December 2013) on behalf of the Sierra Club in the matter of Public Service Company of New Hampshire Merrimack Station Scrubber Project and Cost Recovery, Docket No. DE 11-250, to the State of New Hampshire Public Utilities Commission.
75. Expert Report (January 2014) on behalf of Baja, Inc., in *Baja, Inc., v. Automotive Testing and Development Services, Inc. et. al*, Civil Action No. 8:13-CV-02057-GRA (District of South Carolina, Anderson/Greenwood Division).
76. Declaration (March 2014) on behalf of the Center for International Environmental Law, Chesapeake Climate Action Network, Friends of the Earth, Pacific Environment, and the Sierra Club (Plaintiffs) in the matter of *Plaintiffs v. the Export-Import Bank (Ex-Im Bank) of the United States*, Civil Action No. 13-1820 RC (District Court for the District of Columbia).
77. Declaration (April 2014) on behalf of Respondent-Intervenors in the matter of *Mexichem Specialty Resins Inc., et al., (Petitioners) v Environmental Protection Agency et al.*, Case No., 12-1260 (and Consolidated Case Nos. 12-1263, 12-1265, 12-1266, and 12-1267), (Court of Appeals, District of Columbia Circuit).
78. Direct Prefiled Testimony (June 2014) on behalf of the Michigan Environmental Council and the Sierra Club in the matter of the Application of DTE Electric Company for Authority to Implement a Power Supply Cost Recovery (PSCR) Plan in its Rate Schedules for 2014 Metered Jurisdictional Sales of Electricity, Case No. U-17319 (Michigan Public Service Commission).
79. Expert Report (June 2014) on behalf of ECM Biofilms in the matter of the US Federal Trade Commission (FTC) v. ECM Biofilms (FTC Docket #9358).
80. Direct Prefiled Testimony (August 2014) on behalf of the Michigan Environmental Council and the Sierra Club in the matter of the Application of Consumers Energy Company for Authority to Implement a Power Supply Cost Recovery (PSCR) Plan in its Rate Schedules for 2014 Metered Jurisdictional Sales of Electricity, Case No. U-17317 (Michigan Public Service Commission).
81. Declaration (July 2014) on behalf of Public Health Intervenors in the matter of *EME Homer City Generation v. US EPA* (Case No. 11-1302 and consolidated cases) relating to the lifting of the stay entered by the Court on December 30, 2011 (US Court of Appeals for the District of Columbia).
82. Expert Report (September 2014), Rebuttal Expert Report (December 2014) and Supplemental Expert Report (March 2015) on behalf of Plaintiffs in the matter of *Sierra Club and Montana Environmental Information Center (Plaintiffs) v. PPL Montana LLC, Avista Corporation, Puget Sound Energy, Portland General Electric Company, Northwestern Corporation, and PacifiCorp (Defendants)*, Civil Action No. CV 13-32-BLG-DLC-JCL (US District Court for the District of Montana, Billings Division).
83. Expert Report (November 2014) on behalf of Niagara County, the Town of Lewiston, and the Villages of Lewiston and Youngstown in the matter of CWM Chemical Services, LLC New York State Department of Environmental Conservation (NYSDEC) Permit Application Nos.: 9-2934-00022/00225, 9-2934-00022/00231, 9-2934-00022/00232, and 9-2934-00022/00249 (pending).
84. *Declaration (January 2015) relating to Startup/Shutdown in the MATS Rule (EPA Docket ID No. EPA-HQ-OAR-2009-0234) on behalf of the Environmental Integrity Project.*
85. Pre-filed Direct Testimony (March 2015), Supplemental Testimony (May 2015), and Surrebuttal Testimony (December 2015) on behalf of Friends of the Columbia Gorge in the matter of the Application for a Site Certificate for the Troutdale Energy Center before the Oregon Energy Facility Siting Council.

86. Brief of Amici Curiae Experts in Air Pollution Control and Air Quality Regulation in Support of the Respondents, On Writs of Certiorari to the US Court of Appeals for the District of Columbia, No. 14-46, 47, 48. *Michigan et. al., (Petitioners) v. EPA et. al., Utility Air Regulatory Group (Petitioners) v. EPA et. al., National Mining Association et. al., (Petitioner) v. EPA et. al.*, (Supreme Court of the United States).
87. Expert Report (March 2015) and Rebuttal Expert Report (January 2016) on behalf of Plaintiffs in the matter of *Conservation Law Foundation v. Broadrock Gas Services LLC, Rhode Island LFG GENCO LLC, and Rhode Island Resource Recovery Corporation (Defendants)*, Civil Action No. 1:13-cv-00777-M-PAS (US District Court for the District of Rhode Island).
88. Declaration (April 2015) relating to various Technical Corrections for the MATS Rule (EPA Docket ID No. EPA-HQ-OAR-2009-0234) on behalf of the Environmental Integrity Project.
89. Direct Prefiled Testimony (May 2015) on behalf of the Michigan Environmental Council, the Natural Resources Defense Council, and the Sierra Club in the matter of the Application of DTE Electric Company for Authority to Increase its Rates, Amend its Rate Schedules and Rules Governing the Distribution and Supply of Electric Energy and for Miscellaneous Accounting Authority, Case No. U-17767 (Michigan Public Service Commission).
90. Expert Report (July 2015) and Rebuttal Expert Report (July 2015) on behalf of Plaintiffs in the matter of *Northwest Environmental Defense Center et. al., v. Cascade Kelly Holdings LLC, d/b/a Columbia Pacific Bio-Refinery, and Global Partners LP (Defendants)*, Civil Action No. 3:14-cv-01059-SI (US District Court for the District of Oregon, Portland Division).
91. Declaration (August 2015, Docket No. 1570376) in support of “Opposition of Respondent-Intervenors American Lung Association, et. al., to Tri-State Generation’s Emergency Motion;” Declaration (September 2015, Docket No. 1574820) in support of “Joint Motion of the State, Local Government, and Public Health Respondent-Intervenors for Remand Without Vacatur;” Declaration (October 2015) in support of “Joint Motion of the State, Local Government, and Public Health Respondent-Intervenors to State and Certain Industry Petitioners’ Motion to Govern, *White Stallion Energy Center, LLC v. US EPA*, Case No. 12-1100 (US Court of Appeals for the District of Columbia).
92. Declaration (September 2015) in support of the Draft Title V Permit for Dickerson Generating Station (Proposed Permit No 24-031-0019) on behalf of the Environmental Integrity Project.
93. Expert Report (Liability Phase) (December 2015) and Rebuttal Expert Report (February 2016) on behalf of Plaintiffs in the matter of *Natural Resources Defense Council, Inc., Sierra Club, Inc., Environmental Law and Policy Center, and Respiratory Health Association v. Illinois Power Resources LLC, and Illinois Power Resources Generating LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (US District Court for the Central District of Illinois, Peoria Division).
94. Declaration (December 2015) in support of the Petition to Object to the Title V Permit for Morgantown Generating Station (Proposed Permit No 24-017-0014) on behalf of the Environmental Integrity Project.
95. Expert Report (November 2015) on behalf of Appellants in the matter of *Sierra Club, et al. v. Craig W. Butler, Director of Ohio Environmental Protection Agency et al.*, ERAC Case No. 14-256814.
96. Affidavit (January 2016) on behalf of Bridgewatch Detroit in the matter of *Bridgewatch Detroit v. Waterfront Petroleum Terminal Co., and Waterfront Terminal Holdings, LLC.*, in the Circuit Court for the County of Wayne, State of Michigan.
97. Expert Report (February 2016) and Rebuttal Expert Report (July 2016) on behalf of the challengers in the matter of the Delaware Riverkeeper Network, Clean Air Council, et. al., vs. Commonwealth of Pennsylvania Department of Environmental Protection and R. E. Gas Development LLC regarding the Geyer well site before the Pennsylvania Environmental Hearing Board.

98. Direct Testimony (May 2016) in the matter of Tesoro Savage LLC Vancouver Energy Distribution Terminal, Case No. 15-001 before the State of Washington Energy Facility Site Evaluation Council.
99. Declaration (June 2016) relating to deficiencies in air quality analysis for the proposed Millenium Bulk Terminal, Port of Longview, Washington.
100. Declaration (December 2016) relating to EPA's refusal to set limits on PM emissions from coal-fired power plants that reflect pollution reductions achievable with fabric filters on behalf of Environmental Integrity Project, Clean Air Council, Chesapeake Climate Action Network, Downwinders at Risk represented by Earthjustice in the matter of *ARIPPA v EPA*, Case No. 15-1180. (D.C. Circuit Court of Appeals).
101. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Huntley and Huntley Poseidon Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.
102. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Apex Energy Backus Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.
103. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Apex Energy Drakulic Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.
104. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Apex Energy Deutsch Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.
105. Affidavit (February 2017) pertaining to deficiencies water discharge compliance issues at the Wood River Refinery in the matter of *People of the State of Illinois (Plaintiff) v. Phillips 66 Company, ConocoPhillips Company, WRB Refining LP (Defendants)*, Case No. 16-CH-656, (Circuit Court for the Third Judicial Circuit, Madison County, Illinois).
106. Expert Report (March 2017) on behalf of the Plaintiff pertaining to non-degradation analysis for waste water discharges from a power plant in the matter of *Sierra Club (Plaintiff) v. Pennsylvania Department of Environmental Protection (PADEP) and Lackawanna Energy Center*, Docket No. 2016-047-L (consolidated), (Pennsylvania Environmental Hearing Board).
107. Expert Report (March 2017) on behalf of the Plaintiff pertaining to air emissions from the Heritage incinerator in East Liverpool, Ohio in the matter of *Save our County (Plaintiff) v. Heritage Thermal Services, Inc. (Defendant)*, Case No. 4:16-CV-1544-BYP, (US District Court for the Northern District of Ohio, Eastern Division).
108. Rebuttal Expert Report (June 2017) on behalf of Plaintiffs in the matter of *Casey Voight and Julie Voight (Plaintiffs) v Coyote Creek Mining Company LLC (Defendant)*, Civil Action No. 1:15-CV-00109 (US District Court for the District of North Dakota, Western Division).
109. Expert Affidavit (August 2017) and Penalty/Remedy Expert Affidavit (October 2017) on behalf of Plaintiff in the matter of *Wildearth Guardians (Plaintiff) v Colorado Springs Utility Board (Defendant)*, Civil Action No. 1:15-cv-00357-CMA-CBS (US District Court for the District of Colorado).
110. Expert Report (August 2017) on behalf of Appellant in the matter of *Patricia Ann Troiano (Appellant) v. Upper Burrell Township Zoning Hearing Board (Appellee)*, Court of Common Pleas of Westmoreland County, Pennsylvania, Civil Division.
111. Expert Report (October 2017), Supplemental Expert Report (October 2017), and Rebuttal Expert Report (November 2017) on behalf of Defendant in the matter of *Oakland Bulk and Oversized Terminal (Plaintiff) v City of Oakland (Defendant)*, Civil Action No. 3:16-cv-07014-VC (US District Court for the Northern District of California, San Francisco Division).

112. Declaration (December 2017) on behalf of the Environmental Integrity Project in the matter of permit issuance for ATI Flat Rolled Products Holdings, Breckenridge, PA to the Allegheny County Health Department.
113. Expert Report (Harm Phase) (January 2018), Rebuttal Expert Report (Harm Phase) (May 2018) and Supplemental Expert Report (Harm Phase) (April 2019) on behalf of Plaintiffs in the matter of *Natural Resources Defense Council, Inc., Sierra Club, Inc., and Respiratory Health Association v. Illinois Power Resources LLC, and Illinois Power Resources Generating LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (US District Court for the Central District of Illinois, Peoria Division).
114. Declaration (February 2018) on behalf of the Chesapeake Bay Foundation, et. al., in the matter of the Section 126 Petition filed by the state of Maryland in *State of Maryland v. Pruitt (Defendant)*, Civil Action No. JKB-17-2939 (Consolidated with No. JKB-17-2873) (US District Court for the District of Maryland).
115. Direct Pre-filed Testimony (March 2018) on behalf of the National Parks Conservation Association (NPCA) in the matter of *NPCA v State of Washington, Department of Ecology and BP West Coast Products, LLC*, PCHB No. 17-055 (Pollution Control Hearings Board for the State of Washington).
116. Expert Affidavit (April 2018) and Second Expert Affidavit (May 2018) on behalf of Petitioners in the matter of *Coosa River Basin Initiative and Sierra Club (Petitioners) v State of Georgia Environmental Protection Division, Georgia Department of Natural Resources (Respondent) and Georgia Power Company (Intervenor/Respondent)*, Docket Nos: 1825406-BNR-WW-57-Howells and 1826761-BNR-WW-57-Howells, Office of State Administrative Hearings, State of Georgia.
117. Direct Pre-filed Testimony and Affidavit (December 2018) on behalf of Sierra Club and Texas Campaign for the Environment (Appellants) in the contested case hearing before the Texas State Office of Administrative Hearings in Docket Nos. 582-18-4846, 582-18-4847 (Application of GCGV Asset Holding, LLC for Air Quality Permit Nos. 146425/PSDTX1518 and 146459/PSDTX1520 in San Patricio County, Texas).
118. Expert Report (February 2019) on behalf of Sierra Club in the State of Florida, Division of Administrative Hearings, Case No. 18-2124EPP, Tampa Electric Company Big Bend Unit 1 Modernization Project Power Plant Siting Application No. PA79-12-A2.
119. Declaration (March 2019) on behalf of Earthjustice in the matter of comments on the renewal of the Title V Federal Operating Permit for Valero Houston refinery.
120. Expert Report (March 2019) on behalf of Plaintiffs for Class Certification in the matter of *Resendez et al v Precision Castparts Corporation* in the Circuit Court for the State of Oregon, County of Multnomah, Case No. 16cv16164.
121. Expert Report (June 2019), Affidavit (July 2019) and Rebuttal Expert Report (September 2019) on behalf of Appellants relating to the NPDES permit for the Cheswick power plant in the matter of *Three Rivers Waterkeeper and Sierra Club (Appellees) v. State of Pennsylvania Department of Environmental Protection (Appellee) and NRG Power Midwest (Permittee)*, before the Commonwealth of Pennsylvania Environmental Hearing Board, EHB Docket No. 2018-088-R.
122. Affidavit/Expert Report (August 2019) relating to the appeal of air permits issued to PTTGCA on behalf of Appellants in the matter of *Sierra Club (Appellants) v. Craig Butler, Director, et. al., Ohio EPA (Appellees)* before the State of Ohio Environmental Review Appeals Commission (ERAC), Case Nos. ERAC-19-6988 through -6991.
123. Expert Report (October 2019) relating to the appeal of air permit (Plan Approval) on behalf of Appellants in the matter of *Clean Air Council and Environmental Integrity Project (Appellants) v. Commonwealth of Pennsylvania Department of Environmental Protection and Sunoco Partners Marketing and Terminals L.P.*, before the Commonwealth of Pennsylvania Environmental Hearing Board, EHB Docket No. 2018-057-L.
124. Expert Report (December 2019), Affidavit (March 2020), and Supplemental Expert Report (July 2020) on behalf of Earthjustice in the matter of *Objection to the Issuance of PSD/NSR and Title V*

- permits for Riverview Energy Corporation, Dale, Indiana, before the Indiana Office of Environmental Adjudication, Cause No. 19-A-J-5073.*
125. Affidavit (December 2019) on behalf of Plaintiff-Intervenor (Surfrider Foundation) in the matter of *United States and the State of Indiana (Plaintiffs), Surfrider Foundation (Plaintiff-Intervenor), and City of Chicago (Plaintiff-Intervenor) v. United States Steel Corporation (Defendant)*, Civil Action No. 2:18-cv-00127 (US District Court for the Northern District of Indiana, Hammond Division).
 126. Declarations (January 2020, February 2020, May 2020, July 2020, and August 2020) in support of Petitioner's Motion for Stay of PSCAA NOC Order of Approval No. 11386 in the matter of the *Puyallup Tribe of Indians v. Puget Sound Clean Air Agency (PSCAA) and Puget Sound Energy (PSE)*, before the State of Washington Pollution Control Hearings Board, PCHB No. P19-088.
 127. Expert Report (April 2020) on behalf of the plaintiff in the matter of *Orion Engineered Carbons, GmbH (Plaintiff) vs. Evonik Operations, GmbH (formerly Evonik Degussa GmbH) (Respondent)*, before the German Arbitration Institute, Case No. DIS-SV-2019-00216.
 128. Expert Independent Evaluation Report (June 2020) for *PacifiCorp's Decommissioning Costs Study Reports dated January 15, 2020 and March 13, 2020 relating to the closures of the Hunter, Huntington, Dave Johnston, Jim Bridger, Naughton, Wyodak, Hayden, and Colstrip (Units 3&4) plants*, prepared for the Oregon Public Utility Commission (Oregon PUC).
 129. Direct Pre-filed Testimony (July 2020) on behalf of the Sierra Club in the matter of *the Application of the Ohio State University for a certificate of Environmental Compatibility and Public Need to Construct a Combined Heat and Power Facility in Franklin County, Ohio*, before the Ohio Power Siting Board, Case No. 19-1641-EL-BGN.
 130. Expert Report (August 2020) and Rebuttal Expert Report (September 2020) on behalf of WildEarth Guardians (petitioners) in the matter of *the Appeals of the Air Quality Permit No. 7482-M1 Issued to 3 Bear Delaware Operating – NM LLC (EIB No. 20-21(A) and Registrations Nos. 8729, 8730, and 8733 under General Construction Permit for Oil and Gas Facilities (EIB No. 20-33 (A)*, before the State of New Mexico, Environmental Improvement Board.
 131. Expert Report (July 2020) on the *Initial Economic Impact Analysis (EIA) for A Proposal To Regulate NOx Emissions from Natural Gas Fired Rich-Burn Natural Gas Reciprocating Internal Combustion Engines (RICE) Greater Than 100 Horsepower* prepared on behalf of Earthjustice and the National Parks Conservation Association in the matter of Regulation Number 7, Alternate Rules before the Colorado Air Quality Control Commission.
 132. Expert Report (August 2020) and Supplemental Expert Report (February 2021) on the Potential Remedies to Avoid Adverse Thermal Impacts from the Merrimack Station on behalf of Plaintiffs in the matter of *Sierra Club Inc. and the Conservation Law Foundation (Plaintiffs) v. Granite Shore Power, LLC et. al., (Defendants)*, Civil Action No. 19-cv-216-JL (US District Court for the District of New Hampshire.)
 133. Expert Report (August 2020) and Supplemental Expert Report (December 2020) on behalf of Plaintiffs in the matter of *PennEnvironment Inc., and Clean Air Council (Plaintiffs) and Allegheny County Health Department (Plaintiff-Intervenor) v. United States Steel Corporation (Defendant)*, Civil Action No. 2-19-cv-00484-MJH (US District Court for the Western District of Pennsylvania.)
 134. Pre-filed Direct Testimony (October 2020) and Sur-rebuttal Testimony (November 2020) on behalf of petitioners (Ten Persons Group, including citizens, the Town of Braintree, the Town of Hingham, and the City of Quincy) in the matter of *Algonquin Gas Transmission LLC, Weymouth MA, No. X266786 Air Quality Plan Approval*, before the Commonwealth of Massachusetts, Department of Environmental Protection, the Office of Appeals and Dispute Resolution, OADR Docket Nos. 2019-008, 2019-009, 2019010, 2019-011, 2019-012 and 2019-013.
 135. Expert Report (November 2020) on behalf of Protect PT in the matter of *Protect PT v. Commonwealth of Pennsylvania Department of Environmental Protection and Apex Energy (PA)*

- LLC*, before the Commonwealth of Pennsylvania Environmental Hearing Board, Docket No. 2018-080-R (consolidated with 2019-101-R)(the “Drakulic Appeal”).
136. Expert Report (December 2020) on behalf of Plaintiffs in the matter of *Sierra Club Inc. (Plaintiff) v. GenOn Power Midwest LP (Defendants)*, Civil Action No. 2-19-cv-01284-WSS (US District Court for the Western District of Pennsylvania.)
 137. Pre-filed Testimony (January 2021) on behalf of the Plaintiffs (Shrimpers and Fishermen of the Rio Grande Valley represented by Texas RioGrande Legal Aid, Inc.) in the matter of the Appeal of Texas Commission on Environmental Quality (TCEQ) Permit Nos. 147681, PSDTX1522, GHGPSDTX172 for the Jupiter Brownsville Heavy Condensate Upgrader Facility, Cameron County, before the Texas State Office of Administrative Hearings, SOAH Docket No. 582-21-0111, TCEQ Docket No. 2020-1080-AIR.

C. Occasions where Dr. Sahu has provided oral testimony in depositions, at trial or in similar proceedings include the following:

138. Deposition on behalf of Rocky Mountain Steel Mills, Inc. located in Pueblo, Colorado – dealing with the manufacture of steel in mini-mills including methods of air pollution control and BACT in steel mini-mills and opacity issues at this steel mini-mill.
139. Trial Testimony (February 2002) on behalf of Rocky Mountain Steel Mills, Inc. in Denver District Court.
140. Trial Testimony (February 2003) on behalf of the United States in the Ohio Edison NSR Cases, *United States, et al. v. Ohio Edison Co., et al.*, C2-99-1181 (Southern District of Ohio).
141. Trial Testimony (June 2003) on behalf of the United States in the Illinois Power NSR Case, *United States v. Illinois Power Co., et al.*, 99-833-MJR (Southern District of Illinois).
142. Deposition (10/20/2005) on behalf of the United States in connection with the Cinergy NSR Case. *United States, et al. v. Cinergy Corp., et al.*, IP 99-1693-C-M/S (Southern District of Indiana).
143. Oral Testimony (August 2006) on behalf of the Appalachian Center for the Economy and the Environment re. the Western Greenbrier plant, WV before the West Virginia DEP.
144. Oral Testimony (May 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women’s Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) re. the Thompson River Cogeneration plant before the Montana Board of Environmental Review.
145. Oral Testimony (October 2007) on behalf of the Sierra Club re. the Sevier Power Plant before the Utah Air Quality Board.
146. Oral Testimony (August 2008) on behalf of the Sierra Club and Clean Water re. Big Stone Unit II before the South Dakota Board of Minerals and the Environment.
147. Oral Testimony (February 2009) on behalf of the Sierra Club and the Southern Environmental Law Center re. Santee Cooper Pee Dee units before the South Carolina Board of Health and Environmental Control.
148. Oral Testimony (February 2009) on behalf of the Sierra Club and the Environmental Integrity Project re. NRG Limestone Unit 3 before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.
149. Deposition (July 2009) on behalf of MTD Products, Inc., in the matter of *Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al.*
150. Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Coletto Creek coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

151. Deposition (October 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).
152. Deposition (October 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.
153. Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Tenaska coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH). (April 2010).
154. Oral Testimony (November 2009) on behalf of the Environmental Defense Fund re. the Las Brisas Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.
155. Deposition (December 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).
156. Oral Testimony (February 2010) on behalf of the Environmental Defense Fund re. the White Stallion Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.
157. Deposition (June 2010) on behalf of the United States in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).
158. Trial Testimony (September 2010) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, State of Maryland, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case in US District Court in the Western District of Pennsylvania. *Plaintiffs v. Allegheny Energy Inc., et al.*, 2:05cv0885 (Western District of Pennsylvania).
159. Oral Direct and Rebuttal Testimony (September 2010) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).
160. Oral Testimony (September 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions*, No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.
161. Oral Testimony (October 2010) on behalf of the Environmental Defense Fund re. the Las Brisas Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.
162. Oral Testimony (November 2010) regarding BART for PSCo Hayden, CSU Martin Drake units before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.
163. Oral Testimony (December 2010) regarding BART for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.
164. Deposition (December 2010) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).
165. Deposition (February 2011 and January 2012) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)'s Cherokee power plant. No. 09-cv-1862 (D. Colo.).

166. Oral Testimony (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).
167. Deposition (August 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (District of Colorado).
168. Deposition (July 2011) and Oral Testimony at Hearing (February 2012) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.
169. Oral Testimony at Hearing (March 2012) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).
170. Oral Testimony at Hearing (April 2012) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).
171. Oral Testimony at Hearing (November 2012) on behalf of Clean Wisconsin in the matter of Application of Wisconsin Public Service Corporation for Authority to Construct and Place in Operation a New Multi-Pollutant Control Technology System (ReACT) for Unit 3 of the Weston Generating Station, before the Public Service Commission of Wisconsin, Docket No. 6690-CE-197.
172. Deposition (March 2013) in the matter of various Environmental Petitioners v. North Carolina DENR/DAQ and Carolinas Cement Company, before the Office of Administrative Hearings, State of North Carolina.
173. Deposition (August 2013) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).
174. Deposition (August 2013) on behalf of the Sierra Club in connection with the Luminant Martin Lake Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 5:10-cv-0156-MHS-CMC (Eastern District of Texas, Texarkana Division).
175. Deposition (February 2014) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).
176. Trial Testimony (February 2014) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.*, Civil Action No. 4:10-cv-4969 (Southern District of Texas, Houston Division).
177. Trial Testimony (February 2014) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).
178. Deposition (June 2014) and Trial (August 2014) on behalf of ECM Biofilms in the matter of the *US Federal Trade Commission (FTC) v. ECM Biofilms* (FTC Docket #9358).
179. Deposition (February 2015) on behalf of Plaintiffs in the matter of *Sierra Club and Montana Environmental Information Center (Plaintiffs) v. PPL Montana LLC, Avista Corporation, Puget Sound Energy, Portland General Electric Company, Northwestern Corporation, and Pacificorp (Defendants)*, Civil Action No. CV 13-32-BLG-DLC-JCL (US District Court for the District of Montana, Billings Division).
180. Oral Testimony at Hearing (April 2015) on behalf of Niagara County, the Town of Lewiston, and the Villages of Lewiston and Youngstown in the matter of CWM Chemical Services, LLC New

- York State Department of Environmental Conservation (NYSDEC) Permit Application Nos.: 9-2934-00022/00225, 9-2934-00022/00231, 9-2934-00022/00232, and 9-2934-00022/00249 (pending).
181. Deposition (August 2015) on behalf of Plaintiff in the matter of *Conservation Law Foundation (Plaintiff) v. Broadrock Gas Services LLC, Rhode Island LFG GENCO LLC, and Rhode Island Resource Recovery Corporation (Defendants)*, Civil Action No. 1:13-cv-00777-M-PAS (US District Court for the District of Rhode Island).
 182. Testimony at Hearing (August 2015) on behalf of the Sierra Club in the matter of *Amendments to 35 Illinois Administrative Code Parts 214, 217, and 225* before the Illinois Pollution Control Board, R15-21.
 183. Deposition (May 2015) on behalf of Plaintiffs in the matter of *Northwest Environmental Defense Center et. al., (Plaintiffs) v. Cascade Kelly Holdings LLC, d/b/a Columbia Pacific Bio-Refinery, and Global Partners LP (Defendants)*, Civil Action No. 3:14-cv-01059-SI (US District Court for the District of Oregon, Portland Division).
 184. Trial Testimony (October 2015) on behalf of Plaintiffs in the matter of *Northwest Environmental Defense Center et. al., (Plaintiffs) v. Cascade Kelly Holdings LLC, d/b/a Columbia Pacific Bio-Refinery, and Global Partners LP (Defendants)*, Civil Action No. 3:14-cv-01059-SI (US District Court for the District of Oregon, Portland Division).
 185. Deposition (April 2016) on behalf of the Plaintiffs in *UNatural Resources Defense Council, Respiratory Health Association, and Sierra Club (Plaintiffs) v. Illinois Power Resources LLC and Illinois Power Resources Generation LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (Central District of Illinois, Peoria Division).
 186. Trial Testimony at Hearing (July 2016) in the matter of Tesoro Savage LLC Vancouver Energy Distribution Terminal, Case No. 15-001 before the State of Washington Energy Facility Site Evaluation Council.
 187. Trial Testimony (December 2016) on behalf of the challengers in the matter of the Delaware Riverkeeper Network, Clean Air Council, et. al., vs. Commonwealth of Pennsylvania Department of Environmental Protection and R. E. Gas Development LLC regarding the Geyer well site before the Pennsylvania Environmental Hearing Board.
 188. Trial Testimony (July-August 2016) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).
 189. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Huntley and Huntley Poseidon Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.
 190. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Apex energy Backus Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.
 191. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Apex energy Drakulic Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.
 192. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Apex energy Deutsch Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.
 193. Deposition Testimony (July 2017) on behalf of Plaintiffs in the matter of *Casey Voight and Julie Voight v Coyote Creek Mining Company LLC (Defendant)* Civil Action No. 1:15-CV-00109 (US District Court for the District of North Dakota, Western Division).

194. Deposition Testimony (November 2017) on behalf of Defendant in the matter of *Oakland Bulk and Oversized Terminal (Plaintiff) v City of Oakland (Defendant,)* Civil Action No. 3:16-cv-07014-VC (US District Court for the Northern District of California, San Francisco Division).
195. Deposition Testimony (December 2017) on behalf of Plaintiff in the matter of *Wildearth Guardians (Plaintiff) v Colorado Springs Utility Board (Defendant)* Civil Action No. 1:15-cv-00357-CMA-CBS (US District Court for the District of Colorado).
196. Deposition Testimony (January 2018) in the matter of National Parks Conservation Association (NPCA) v. State of Washington Department of Ecology and British Petroleum (BP) before the Washington Pollution Control Hearing Board, Case No. 17-055.
197. Trial Testimony (January 2018) on behalf of Defendant in the matter of *Oakland Bulk and Oversized Terminal (Plaintiff) v City of Oakland (Defendant,)* Civil Action No. 3:16-cv-07014-VC (US District Court for the Northern District of California, San Francisco Division).
198. Trial Testimony (April 2018) on behalf of the National Parks Conservation Association (NPCA) in the matter of NPCA v State of Washington, Department of Ecology and BP West Coast Products, LLC, PCHB No. 17-055 (Pollution Control Hearings Board for the State of Washington).
199. Deposition (June 2018) (harm Phase) on behalf of Plaintiffs in the matter of *Natural Resources Defense Council, Inc., Sierra Club, Inc., and Respiratory Health Association v. Illinois Power Resources LLC, and Illinois Power Resources Generating LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (US District Court for the Central District of Illinois, Peoria Division).
200. Trial Testimony (July 2018) on behalf of Petitioners in the matter of *Coosa River Basin Initiative and Sierra Club (Petitioners) v State of Georgia Environmental Protection Division, Georgia Department of Natural Resources (Respondent) and Georgia Power Company (Intervenor/Respondent)*, Docket Nos: 1825406-BNR-WW-57-Howells and 1826761-BNR-WW-57-Howells, Office of State Administrative Hearings, State of Georgia.
201. Deposition (January 2019) and Trial Testimony (January 2019) on behalf of Sierra Club and Texas Campaign for the Environment (Appellants) in the contested case hearing before the Texas State Office of Administrative Hearings in Docket Nos. 582-18-4846, 582-18-4847 (Application of GCGV Asset Holding, LLC for Air Quality Permit Nos. 146425/PSDTX1518 and 146459/PSDTX1520 in San Patricio County, Texas).
202. Deposition (February 2019) and Trial Testimony (March 2019) on behalf of Sierra Club in the State of Florida, Division of Administrative Hearings, Case No. 18-2124EPP, Tampa Electric Company Big Bend Unit 1 Modernization Project Power Plant Siting Application No. PA79-12-A2.
203. Deposition (June 2019) relating to the appeal of air permits issued to PTTGCA on behalf of Appellants in the matter of *Sierra Club (Appellants) v. Craig Butler, Director, et. al., Ohio EPA (Appellees)* before the State of Ohio Environmental Review Appeals Commission (ERAC), Case Nos. ERAC-19-6988 through -6991.
204. Deposition (September 2019) on behalf of Appellants relating to the NPDES permit for the Cheswick power plant in the matter of *Three Rivers Waterkeeper and Sierra Club (Appellees) v. State of Pennsylvania Department of Environmental Protection (Appellee) and NRG Power Midwest (Permittee)*, before the Commonwealth of Pennsylvania Environmental Hearing Board, EHB Docket No. 2018-088-R.
205. Deposition (December 2019) on behalf of the Plaintiffs in the matter of David Kovac, individually and on behalf of wrongful death class of Irene Kovac v. BP Corporation North America Inc., Circuit Court of Jackson County, Missouri (Independence), Case No. 1816-CV12417.
206. Deposition (February 2020) and testimony at Hearing (August 2020, virtual) on behalf of Earthjustice in the matter of *Objection to the Issuance of PSD/NSR and Title V permits for Riverview Energy Corporation, Dale, Indiana*, before the Indiana Office of Environmental Adjudication, Cause No. 19-A-J-5073.

207. Hearing (July 14-15, 2020, virtual) on behalf of the Sierra Club in the matter of *the Application of the Ohio State University for a certificate of Environmental Compatibility and Public Need to Construct a Combined Heat and Power Facility in Franklin County, Ohio*, before the Ohio Power Siting Board, Case No. 19-1641-EL-BGN.
208. Hearing (September 2020, virtual) on behalf of WildEarth Guardians (petitioners) in the matter of *the Appeals of the Air Quality Permit No. 7482-M1 Issued to 3 Bear Delaware Operating – NM LLC (EIB No. 20-21(A) and Registrations Nos. 8729, 8730, and 8733 under General Construction Permit for Oil and Gas Facilities (EIB No. 20-33 (A))*, before the State of New Mexico, Environmental Improvement Board.
209. Deposition (December 2020, March 4-5, 2021, all virtual) in support of Petitioner’s Motion for Stay of PSCAA NOC Order of Approval No. 11386 in the matter of *the Puyallup Tribe of Indians v. Puget Sound Clean Air Agency (PSCAA) and Puget Sound Energy (PSE)*, before the State of Washington Pollution Control Hearings Board, PCHB No. P19-088.
210. Hearing (September 2020, virtual) on the *Initial Economic Impact Analysis (EIA) for A Proposal To Regulate NOx Emissions from Natural Gas Fired Rich-Burn Natural Gas Reciprocating Internal Combustion Engines (RICE) Greater Than 100 Horsepower* prepared on behalf of Earthjustice and the National Parks Conservation Association in the matter of Regulation Number 7, Alternate Rules before the Colorado Air Quality Control Commission.
211. Deposition (December 2020, virtual and Hearing February 2021, virtual) on behalf of the Plaintiffs (Shrimpers and Fishermen of the Rio Grande Valley represented by Texas RioGrande Legal Aid, Inc.) in the matter of the Appeal of Texas Commission on Environmental Quality (TCEQ) Permit Nos. 147681, PSDTX1522, GHGPSDTX172 for the Jupiter Brownsville Heavy Condensate Upgrader Facility, Cameron County, before the Texas State Office of Administrative Hearings, SOAH Docket No. 582-21-0111, TCEQ Docket No. 2020-1080-AIR.
212. Deposition (January 2021, virtual) on behalf of Plaintiffs in the matter of *PennEnvironment Inc., and Clean Air Council (Plaintiffs) and Allegheny County Health Department (Plaintiff-Intervenor) v. United States Steel Corporation (Defendant)*, Civil Action No. 2-19-cv-00484-MJH (US District Court for the Western District of Pennsylvania.)
213. Deposition (February 2021) on behalf of Plaintiffs in the matter of *Sierra Club Inc. (Plaintiff) v. GenOn Power Midwest LP (Defendants)*, Civil Action No. 2-19-cv-01284-WSS (US District Court for the Western District of Pennsylvania.)
- 214.

Attachment B – Monitored Ozone Values in the HGB (2019, 2020 Ozone Seasons)

Monitoring Site	May-19																																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Houston East C1/G316	31	31	22	50	53	55	NV	NA	NV	38	15	30	58	58	51	51	36	25	30	21	23	23	22	35	34	45	40	23	37	35	42		
Houston Aldine C8/AF108/X150	33	38	22	NV	66	62	38	31	47	46	21	36	51	64	64	59	41	25	38	25	26	27	27	42	41	52	46	28	38	47	59		
Channelview C15/AH115	28	32	22	48	45	46	38	29	48	48	20	30	50	57	49	49	35	25	28	18	23	23	24	36	35	44	40	22	35	27	43		
Northwest Harris Co. C26/A110/X154	31	35	28	43	60	58	44	35	42	36	17	36	45	60	76	61	35	25	36	25	26	28	28	39	35	41	40	27	35	42	40		
Hou.DeerPrk2 C35/235/1001/AFH139FP239	32	33	27	54	49	53	46	35	50	53	21	31	58	55	50	51	38	27	26	20	24	25	27	38	38	45	39	25	38	32	40		
Seabrook Friendship Park C45	31	32	27	47	43	49	43	34	49	48	22	30	51	52	48	48	39	27	20	18	22	24	26	35	34	40	37	25	37	30	33		
Houston Bayland Park C53/A146	34	38	NV	NA	NA	NA	NV	41	51	49	22	45	80	69	60	58	37	29	34	22	26	27	27	38	36	45	45	26	38	44	42		
Conroe Relocated C78/A321	42	41	26	45	55	62	43	NV	40	40	25	37	47	57	57	61	48	29	43	38	32	37	36	48	48	54	50	36	46	37	42		
Manvel Croix Park C84	31	33	26	59	47	47	NV	31	NA	NA	NA	NA	NA	NV	56	50	31	27	30	21	23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Clinton C403/C304/AH113	23	30	20	51	48	47	37	27	40	44	16	30	56	54	45	47	29	21	26	16	20	19	20	31	31	41	37	20	31	30	43		
Houston North Wayside C405	29	32	20	48	55	53	35	28	NV	39	18	31	46	54	53	50	35	23	30	20	22	23	23	36	34	44	39	22	34	35	48		
Houston Monroe C406	25	28	21	48	43	44	NV	NA	NV	43	13	29	51	49	48	51	32	27	27	19	23	23	24	33	32	40	39	25	37	34	39		
Lang C408	31	33	22	49	55	53	44	30	44	33	19	37	51	65	59	55	34	25	36	22	24	26	26	36	35	42	43	24	36	44	44		
Houston Croquet C409	31	33	26	53	49	49	47	33	46	45	17	41	66	57	53	51	33	26	28	19	23	24	23	33	32	39	40	23	35	34	34		
Houston Westhollow C410/C3003	33	35	29	51	53	51	50	34	56	46	17	40	77	69	59	54	33	25	34	22	24	27	25	36	33	41	38	24	37	42	42		
Park Place C416	31	33	24	56	52	53	47	32	47	50	14	35	66	57	49	52	33	26	29	19	23	24	23	34	32	40	40	24	36	37	43		
Baytown Wetlands Center C552	24	26	18	36	32	39	24	19	30	39	11	24	41	43	40	40	29	20	13	11	14	15	18	24	24	32	32	17	28	22	22		
Crosby Library C553	25	25	19	31	38	38	27	25	35	35	12	24	38	49	45	43	29	22	25	15	19	20	20	29	29	36	36	19	33	31	36		
West Houston C554	54	56	57	58	54	54	53	56	57	56	55	55	53	53	57	56	55	56	55	58	56	56	57	58	56	54	54	53	54	56	NV		
La Porte Sylvan Beach C556	NA	18	20	34	30	35	29	24	29	29	12	18	34	35	36	38	31	19	13	12	13	17	18	25	23	28	27	18	26	22	24		
Tom Bass C558	32	34	28	59	50	52	47	36	48	53	20	40	63	56	52	54	34	28	29	21	29	29	27	36	34	41	41	29	40	39	NV		
Katy Park C559	NV	34	30	46	52	51	48	34	49	37	13	39	67	74	62	52	33	24	33	23	24	27	26	37	35	42	39	24	33	41	40		
Atascocita C560	25	26	17	32	43	42	29	22	36	35	13	22	37	45	41	41	32	19	28	17	18	20	20	30	31	39	33	19	28	31	37		
Meyer Park C561	32	34	21	40	63	59	38	30	44	38	18	34	44	58	66	57	36	24	35	24	25	27	28	39	36	44	42	26	37	45	44		
Huffman Wolf Road C563	21	20	14	22	29	29	21	18	NV	NV	11	18	25	35	29	29	22	18	23	15	17	17	17	23	22	26	26	17	24	24	25		
HRM-3 Haden Road C603/A114	29	33	23	51	52	52	37	NV	47	50	17	31	60	58	53	52	37	24	29	20	24	25	25	39	38	46	41	24	34	36	41		
Wallisville Road C617	33	34	27	43	45	48	40	34	51	53	22	33	51	59	49	51	37	29	25	20	23	24	24	33	34	42	42	25	38	34	38		
Danciger C618	NA	NA	NV	52	48	42	45	35	NV	NA	NA	NA	NA	NV	54	43	NA	NV	25	19	23	23	25	33	27	37	34	24	33	27	26		
Texas City 34th St. C620	36	35	33	65	50	NV	49	39	59	NV	36	35	54	61	57	57	48	34	25	NV	NV	28	33	38	40	45	44	29	42	31	38		
UH Moody Tower C695	34	36	27	60	56	57	49	34	NV	NV	NV	NA	72	66	53	55	36	28	32	22	26	26	25	37	35	43	42	25	40	42	47		
UH WG Jones Forest C698	38	39	24	45	61	67	42	33	41	42	23	38	48	60	62	65	49	29	43	36	31	35	35	51	47	56	49	33	43	46	47		
UH West Liberty C699	32	33	NV	NA	NA	NA	34	30	44	44	17	30	42	59	49	48	33	27	32	19	24	23	23	32	32	40	42	24	39	35	36		
Lynchburg Ferry C1015/A165	29	33	25	36	41	47	41	33	48	51	18	26	52	54	48	48	36	27	24	18	24	24	25	36	34	41	40	23	37	33	34		
Lake Jackson C1016	32	30	26	52	46	47	50	37	53	54	23	45	54	55	56	48	35	30	20	19	24	25	30	35	31	40	40	26	38	24	27		
Baytown Garth C1017	NV	44	36	54	57	64	53	45	NV	NA	NA	NA	NA	NA	NV	49	37	30	27	21	25	26	27	35	35	43	42	27	40	37	41		
Galveston 99th St. C1034/A320/X183	33	32	39	70	46	NV	47	39	56	59	46	32	48	58	56	55	47	34	26	20	25	27	33	36	41	44	44	NV	NA	NV	34		
UH Smith Point C1606	34	38	NV	NV	45	51	43	NV	NV	NA	NA	NA	49	56	53	54	46	32	25	NV	NA	NA	NA	NA	NA	NV	NA	NV	40	NV	NA		
Oyster Creek C1607	33	29	29	53	45	51	49	NV	NV	31	14	25	33	53	NV	47	37	29	18	16	19	23	28	32	33	37	37	26	38	24	NV		

Monitoring Site	Jun-19																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Houston East C1/G316	65	40	57	34	11	62	56	55	88	36	52	65	53	64	22	31	76	58	27	18	15	19	21	40	17	19	22	39	32	38
Houston Aldine C8/AF108/X150	81	48	72	43	17	62	59	56	72	42	58	70	64	71	22	40	81	61	35	21	20	21	25	47	22	19	28	55	34	50
Channelview C15/AH115	71	47	45	30	18	56	57	NV	NV	42	50	62	59	67	21	37	76	58	30	19	14	19	23	43	17	18	29	47	33	58
Northwest Harris Co. C26/A110/X154	42	36	58	42	17	48	54	48	63	41	54	56	54	66	25	NV	NV	49	27	21	22	22	27	51	24	23	22	37	30	34
Hou.DeerPrk2 C35/235/1001/AFH139FP239	63	37	48	32	19	60	59	60	74	45	68	78	66	67	22	37	65	57	25	21	17	22	23	47	21	23	30	32	34	45
Seabrook Friendship Park C45	56	34	37	28	21	43	56	63	57	43	59	67	63	63	20	37	59	46	22	17	16	21	22	47	23	20	27	33	34	56
Houston Bayland Park C53/A146	46	33	44	30	20	56	59	61	83	54	78	91	80	68	25	43	70	NV	NV	19	22	24	24	50	22	22	22	37	35	40
Conroe Relocated C78/A321	41	42	61	51	21	47	51	48	43	40	48	55	50	83	28	43	60	54	36	27	32	29	31	55	33	26	32	38	32	49
Manvel Croix Park C84	NA	NA	NA	NA	NV	52	52	59	62	54	80	90	79	61	18	38	52	46	21	17	16	19	20	46	20	17	NA	NV	31	28
Clinton C403/C304/AH113	55	34	45	26	15	53	51	53	92	44	58	73	62	54	NA	NA	NV	40	20	13	14	17	21	40	13	17	15	27	32	31
Houston North Wayside C405	66	38	59	32	14	50	49	49	73	39	49	62	53	60	16	31	67	50	24	15	14	16	19	38	14	17	21	36	28	37
Houston Monroe C406	44	30	41	27	17	54	55	58	69	41	67	81	71	55	19	37	55	49	22	16	15	19	20	43	20	18	24	28	32	32
Lang C408	55	37	51	33	15	52	54	51	88	41	60	74	62	64	23	40	75	51	31	21	20	21	24	43	22	16	21	42	30	41
Houston Croquet C409	33	25	35	23	16	48	50	53	68	47	83	84	75	58	20	34	61	46	21	15	17	18	18	42	20	NV	18	28	30	33
Houston Westhollow C410/C3003	39	34	41	27	19	48	52	56	76	47	67	70	65	61	24	43	55	49	22	18	16	19	NV	47	22	21	21	32	30	36
Park Place C416	49	33	46	30	14	56	56	57	88	49	68	82	72	61	21	35	65	NV	NV	17	17	21	23	45	20	20	21	31	37	36
Baytown Wetlands Center C552	44	30	25	19	12	40	NV	NA	NA	NA	NV	50	48	52	16	23	55	37	14	10	9	13	12	23	8	10	12	16	16	38
Crosby Library C553	50	49	41	28	13	54	37	42	49	35	40	47	42	59	19	29	56	54	28	19	14	18	17	34	16	15	23	45	22	48
West Houston C554	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NV	55	56	21	36	48	42	20	16	16	19	21	43	19	NV	NV	NV	NA	NA
La Porte Sylvan Beach C556	37	24	24	19	15	30	37	42	35	28	39	45	51	51	17	28	46	32	13	12	12	18	18	35	17	15	NV	29	32	52
Tom Bass C558	NV	NA	NA	NA	26	55	55	60	73	54	79	91	80	62	33	39	60	52	28	23	25	NA	NV	38	26	24	27	30	35	35
Katy Park C559	41	33	43	28	19	41	49	55	71	41	60	58	58	65	23	41	51	47	21	17	16	14	17	47	22	21	22	30	31	35
Atascocita C560	53	40	46	29	12	39	38	35	39	28	35	43	39	59	30	32	56	43	26	15	13	15	18	38	15	12	23	38	22	38
Meyer Park C561	56	39	63	45	16	43	48	45	60	NA	NA	NV	53	68	23	37	63	47	28	20	23	22	24	48	23	22	21	39	27	40
Huffman Wolf Road C563	29	36	30	21	13	33	30	27	28	25	27	31	27	40	14	24	36	35	24	18	13	15	16	27	15	13	17	25	19	32
HRM-3 Haden Road C603/A114	69	41	52	32	14	59	55	54	86	40	53	64	56	59	19	33	75	57	27	18	15	19	24	42	15	NV	26	39	31	41
Wallisville Road C617	56	53	37	28	22	65	57	53	62	42	52	58	53	66	22	38	76	61	28	NA	NV	25	27	46	21	22	26	48	33	57
Danciger C618	23	20	24	18	19	43	36	52	57	60	53	57	73	55	19	40	50	42	18	19	17	21	18	47	22	20	20	23	28	30
Texas City 34th St. C620	46	31	42	28	24	51	54	73	74	47	72	83	77	68	23	44	59	51	25	20	20	26	26	55	26	23	30	38	35	47
UH Moody Tower C695	52	36	50	32	16	62	59	59	93	49	69	83	75	65	23	39	77	58	26	19	18	22	25	48	23	22	25	37	38	40
UH WG Jones Forest C698	59	48	71	55	20	49	55	51	51	43	53	60	55	83	28	NV	64	NV	35	26	30	28	30	59	32	27	29	36	31	52
UH West Liberty C699	40	57	43	28	18	57	49	43	44	40	43	51	46	65	21	38	58	55	37	NV	18	21	25	43	23	19	25	46	31	51
Lynchburg Ferry C1015/A165	70	44	38	NV	NV	58	55	48	69	32	49	58	61	66	22	38	77	53	27	21	17	22	25	46	18	19	26	47	31	59
Lake Jackson C1016	23	21	22	20	22	38	35	50	48	63	54	57	68	59	20	42	47	41	18	17	17	21	18	49	25	22	24	26	29	31
Baytown Garth C1017	57	55	39	30	23	68	58	53	63	42	49	56	52	67	24	40	76	63	30	22	19	25	28	50	24	23	28	50	36	58
Galveston 99th St. C1034/A320/X183	43	24	38	28	25	53	43	81	73	44	72	73	81	70	21	45	51	48	29	17	20	25	23	55	29	26	29	38	40	42
UH Smith Point C1606	NV	NV	NA	NA	NV	NA	NA	NV	NA	NV	NV	NV	NV	NA	NA	NA	NA	NV	26	NV	NA	NA	NV	NV	NA	NA	NV	NV	NV	56
Oyster Creek C1607	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NV	32	15	12	NA	NA	NA	NA	NA	NA	NV	29	31	33

Monitoring Site	Jul-19																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Houston East C1/G316	43	28	25	18	24	42	38	29	31	57	39	43	33	39	26	26	25	24	22	24	26	23	28	36	NV	NV	46	23	19	30	54	
Houston Aldine C8/AF108/X150	52	33	30	24	33	47	42	38	45	66	39	NV	37	40	27	30	30	32	30	29	33	36	37	51	54	64	55	28	24	34	52	
Channelview C15/AH115	45	28	23	21	25	61	45	30	31	56	39	48	33	41	26	27	23	23	23	25	30	24	33	41	48	57	44	23	22	32	39	
Northwest Harris Co. C26/A110/X154	43	31	29	22	27	36	28	30	32	36	40	47	35	36	29	27	28	30	29	30	26	26	37	49	51	60	54	21	23	27	42	
Hou.DeerPrk2 C35/235/1001/AFH139FP239	43	28	25	19	21	37	32	23	27	44	50	49	36	40	28	26	22	24	23	23	26	25	36	47	64	59	47	25	22	31	47	
Seabrook Friendship Park C45	41	24	23	18	17	35	33	22	23	33	46	44	34	34	23	20	20	19	20	19	24	24	30	40	51	47	37	21	19	24	37	
Houston Bayland Park C53/A146	44	29	NV	21	23	34	35	29	33	49	59	59	42	40	27	24	28	27	25	27	28	NV	43	60	74	73	56	28	23	31	53	
Conroe Relocated C78/A321	56	35	43	31	47	51	34	39	48	42	33	47	35	33	30	35	NV	43	44	43	28	32	38	47	46	51	45	29	28	27	32	
Manvel Croix Park C84	36	19	16	NV	NV	NV	30	25	27	42	NA	NV	42	36	24	19	23	24	20	22	22	23	39	55	79	57	44	24	18	26	37	
Clinton C403/C304/AH113	33	21	18	17	19	31	30	22	25	53	47	49	37	39	22	22	21	21	18	22	24	20	36	44	59	62	45	23	15	24	46	
Houston North Wayside C405	41	25	22	18	24	37	35	26	30	54	39	43	32	33	20	23	23	23	22	23	25	24	32	40	45	55	47	22	18	25	49	
Houston Monroe C406	37	22	23	18	20	31	29	23	25	39	52	49	40	37	24	24	23	21	19	21	22	22	31	45	69	53	43	25	20	NV	39	
Lang C408	42	30	26	20	25	40	35	31	39	53	45	47	36	39	29	24	28	27	26	27	28	26	34	50	60	64	59	25	20	28	56	
Houston Croquet C409	39	23	22	17	19	28	29	22	24	43	54	53	37	36	23	21	25	23	21	24	24	24	37	54	77	60	49	24	18	29	42	
Houston Westhollow C410/C3003	39	28	26	21	23	37	31	25	28	NV	53	52	36	NV	25	25	25	24	23	26	27	23	41	58	73	76	64	24	21	NV	49	
Park Place C416	40	24	25	20	24	34	33	26	29	48	54	51	40	40	27	26	27	24	23	24	25	23	34	45	69	61	48	26	20	30	47	
Baytown Wetlands Center C552	24	15	10	9	10	24	19	13	14	31	22	32	22	28	12	11	13	18	20	23	27	22	34	45	54	54	38	22	19	30	36	
Crosby Library C553	41	26	20	17	27	54	37	29	32	41	34	45	31	40	26	27	27	26	26	27	32	29	31	40	47	59	39	26	24	31	34	
West Houston C554	NA	NV	28	30	21	37	26	29	24	NV	NV	44	24	33	17	NV	27	24	23	25	NV	19	37	42	NV	46	54	35	23	24	51	
La Porte Sylvan Beach C556	38	22	22	17	16	32	30	21	21	32	38	42	31	34	21	18	19	18	19	19	24	22	28	39	44	42	34	21	16	27	32	
Tom Bass C558	41	27	28	22	24	32	30	27	27	41	59	48	43	40	24	26	23	25	24	24	28	27	38	51	82	59	45	31	23	31	45	
Katy Park C559	36	26	25	18	18	26	28	24	24	32	40	43	35	36	26	22	23	23	23	25	26	25	42	57	70	81	53	NV	NV	NV	NA	
Atascocita C560	41	23	20	15	26	43	31	29	31	43	25	33	23	27	19	22	21	20	28	29	28	25	30	40	41	54	45	23	22	27	39	
Meyer Park C561	45	27	25	21	29	41	31	32	37	46	38	44	32	33	26	27	27	32	30	31	26	27	38	53	54	63	56	22	21	26	43	
Huffman Wolf Road C563	29	19	18	15	25	37	26	24	26	27	21	28	18	19	16	20	19	20	NV	NA	NA	NV	36	43	47	64	47	33	33	34	37	
HRM-3 Haden Road C603/A114	42	26	22	NV	NV	41	NV	27	29	52	36	43	32	36	25	19	25	25	22	23	26	NV	33	42	55	60	40	22	19	30	47	
Wallisville Road C617	NV	NV	25	24	28	52	50	32	34	56	38	48	33	39	29	25	28	26	27	28	33	28	36	44	51	61	45	26	25	36	46	
Danciger C618	34	23	20	16	15	25	25	19	20	25	48	56	37	35	20	19	19	19	17	18	22	21	45	66	66	57	41	17	17	26	28	
Texas City 34th St. C620	43	29	28	23	20	35	35	24	24	33	61	58	46	38	29	25	25	24	24	23	27	29	42	48	65	52	43	25	23	24	41	
UH Moody Tower C695	42	27	28	21	26	36	38	28	32	55	53	54	42	41	28	29	28	27	25	25	27	29	39	50	67	70	53	28	23	31	54	
UH WG Jones Forest C698	57	40	39	28	41	50	35	39	49	42	39	50	37	35	31	35	38	41	43	40	31	31	41	51	51	57	50	26	27	28	41	
UH West Liberty C699	42	29	23	22	35	53	42	37	40	42	32	45	27	32	26	29	27	30	28	29	30	27	32	40	44	61	41	28	30	31	33	
Lynchburg Ferry C1015/A165	42	29	22	20	20	50	38	24	25	52	30	38	27	36	26	25	22	21	23	23	25	23	28	38	47	53	42	23	21	30	40	
Lake Jackson C1016	37	23	19	17	15	24	26	17	18	19	59	60	38	35	22	21	19	19	17	18	20	21	47	52	63	NV	NA	NA	NV	21	30	
Baytown Garth C1017	44	29	25	23	27	53	52	34	34	57	37	47	33	38	28	24	27	26	26	26	32	29	35	43	49	60	44	25	24	36	43	
Galveston 99th St. C1034/A320/X183	40	27	25	21	20	32	32	20	19	25	66	52	45	34	29	22	22	21	22	20	25	26	35	46	59	48	39	24	20	20	34	
UH Smith Point C1606	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NV	37	
Oyster Creek C1607	39	25	23	17	15	26	29	17	18	20	55	62	40	30	24	20	19	NV	17	17	21	21	46	49	58	50	37	19	18	21	31	

Monitoring Site	Aug-19																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Houston East C1/G316	53	57	55	36	37	30	25	27	27	25	28	33	38	54	74	NV	19	18	20	22	24	25	16	38	23	NV	27	43	49	38	48	
Houston Aldine C8/AF108/X150	55	64	55	50	60	41	33	38	35	31	36	46	51	54	69	68	NV	NA	NA	NV	33	33	25	45	23	25	34	34	65	50	56	
Channelview C15/AH115	44	51	55	42	52	33	28	30	31	27	29	35	45	51	57	59	26	21	24	24	28	25	22	39	26	24	35	35	43	38	47	
Northwest Harris Co. C26/A110/X154	46	46	35	39	38	36	26	31	30	26	30	33	34	33	47	55	29	23	32	21	31	50	30	45	26	28	33	40	70	54	53	
Hou.DeerPrk2 C35/235/1001/AFH139FP239	46	67	64	35	35	31	22	29	29	25	29	31	33	59	107	62	22	18	22	NV	25	29	22	37	29	24	29	44	44	43	52	
Seabrook Friendship Park C45	34	47	48	29	29	25	19	27	25	18	23	25	27	45	90	53	19	15	18	21	21	24	24	30	25	20	25	28	37	44	46	
Houston Bayland Park C53/A146	73	69	60	38	42	32	25	34	33	28	28	36	38	52	73	51	25	21	24	26	29	35	29	49	26	26	27	47	NV	37	76	
Conroe Relocated C78/A321	40	44	35	39	39	47	39	34	44	39	36	47	41	33	41	51	34	29	45	35	40	35	27	29	28	37	48	31	52	42	49	
Manvel Croix Park C84	38	47	44	32	28	24	18	25	23	19	23	25	25	41	63	36	19	16	18	19	21	26	22	36	23	21	21	32	44	29	56	
Clinton C403/C304/AH113	57	60	57	35	NV	26	19	23	20	21	25	24	30	51	78	48	18	17	19	18	21	26	17	36	23	18	16	39	46	35	46	
Houston North Wayside C405	49	51	50	39	44	31	23	26	24	23	28	34	41	46	64	56	21	17	22	20	27	31	16	39	21	20	25	32	54	40	47	
Houston Monroe C406	49	58	53	32	31	25	19	25	23	21	26	NV	NV	NV	82	49	20	19	20	21	21	28	21	35	24	21	22	40	50	32	61	
Lang C408	60	67	52	39	45	33	27	31	33	33	28	38	41	48	64	54	25	21	27	24	32	36	24	49	23	27	31	38	69	42	63	
Houston Croquet C409	56	57	51	32	33	25	19	25	23	20	23	27	27	45	65	40	20	16	18	20	22	28	25	39	23	22	21	37	50	30	65	
Houston Westhollow C410/C3003	72	62	49	37	35	29	22	27	26	24	28	27	33	44	60	43	24	20	25	21	25	34	31	46	23	24	27	40	60	38	67	
Park Place C416	59	70	61	34	36	29	21	27	25	22	28	29	31	56	86	55	22	18	23	24	26	29	24	41	25	23	24	49	61	36	58	
Sheldon C551	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NV	29
Baytown Wetlands Center C552	35	57	60	33	39	31	21	27	27	20	26	29	32	54	67	49	20	14	17	20	24	23	22	29	29	20	27	33	31	33	46	
Crosby Library C553	36	45	47	39	43	39	31	30	30	29	34	41	49	39	41	49	26	20	28	28	34	25	25	34	25	26	39	24	43	35	40	
West Houston C554	45	57	41	33	35	29	19	50	49	20	34	33	31	33	65	NV	NA	NA	NV	15	NV	NA	NA	NA	NA	NA	NV	38	62	38	61	
La Porte Sylvan Beach C556	30	42	47	26	29	25	17	23	22	16	21	23	23	49	72	49	18	14	15	18	20	22	23	26	23	16	21	26	31	38	41	
Mercer Arboretum C557	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NV	22	31	29	25	33	18	27	37	23	45	46	43	
Tom Bass C558	52	56	53	35	35	NV	NA	NV	24	21	24	27	27	48	74	44	21	18	21	22	23	30	24	39	24	23	24	40	53	31	62	
Katy Park C559	NA	NA	NA	NA	NA	NV	22	27	25	22	25	27	32	39	55	44	24	21	24	21	25	37	33	45	22	25	25	38	56	37	59	
Atascocita C560	41	43	43	44	49	37	31	31	28	29	32	43	45	33	NV	NV	27	23	30	28	35	29	27	34	26	29	41	17	46	44	45	
Meyer Park C561	49	51	44	43	44	32	26	28	30	33	31	39	43	36	50	58	26	23	33	22	35	44	25	47	22	28	36	34	67	61	55	
Bunker Hill Village C562	NA	NA	NA	NA	NA	NA	NV	24	26	27	24	29	33	40	55	33	17	15	17	16	23	28	23	39	17	23	24	33	54	29	58	
Huffman Wolf Road C563	43	44	42	46	42	46	40	39	41	40	38	51	51	39	42	52	33	28	37	40	40	28	30	34	30	34	46	26	49	39	45	
HRM-3 Haden Road C603/A114	50	60	54	36	40	28	24	NV	NV	24	28	33	41	53	NV	NV	22	NV	NV	24	24	28	18	40	26	23	31	49	44	40	48	
Wallisville Road C617	41	55	54	42	49	39	29	NA	NA	NA	NA	NA	NV	42	43	50	24	21	24	26	31	25	27	37	32	28	35	35	38	35	48	
Danciger C618	32	35	36	30	18	24	NV	NV	23	20	25	24	24	28	NV	NV	21	NA	NA	NV	9	14	12	16	10	13	10	12	NV	NV	43	
Texas City 34th St. C620	40	47	51	35	30	25	NV	28	25	NA	NA	NV	NA	NA	NA	NA	NA	NA	NV	19	20	27	26	29	28	19	25	31	42	47	50	
UH Moody Tower C695	66	67	63	37	43	33	23	29	27	24	28	34	39	58	88	61	24	20	26	26	29	33	26	45	26	25	28	54	67	40	66	
UH WG Jones Forest C698	45	49	NV	24	NV	46	36	35	38	39	39	45	43	36	49	60	33	29	42	30	41	39	33	33	30	35	47	35	60	53	56	
UH West Liberty C699	37	37	38	40	33	37	33	33	38	32	34	44	45	32	34	46	29	21	30	28	32	25	24	28	26	29	39	21	39	32	39	
Lynchburg Ferry C1015/A165	40	60	58	33	40	32	22	28	29	22	26	28	34	48	68	55	22	18	22	24	26	24	23	34	27	24	32	41	37	36	44	
Lake Jackson C1016	28	32	NV	NV	19	17	14	23	20	15	20	19	17	21	30	23	16	15	15	16	18	NV	22	26	19	NV	15	22	34	24	39	
Baytown Garth C1017	39	54	51	40	47	37	27	31	32	26	32	38	49	NV	NV	52	25	20	24	27	34	26	28	37	32	NA	NV	NV	40	37	49	
Galveston 99th St. C1034/A320/X183	39	38	36	31	26	21	16	23	21	17	23	22	19	30	81	43	19	21	19	22	25	NV	28	29	27	18	20	28	41	50	55	
UH Smith Point C1606	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NV	NV	NA	NA	NV	19	19	NV	NV	27	29	32	32	21	26	31	37	45	49	
Oyster Creek C1607	28	30	34	25	22	19	15	23	21	16	21	19	18	22	33	25	16	17	16	20	20	24	26	26	23	19	16	22	34	37	42	

Monitoring Site	Sep-19																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Houston East C1/G316	42	32	33	46	66	70	51	36	47	44	27	36	49	49	41	26	28	24	18	30	31	29	29	41	44	56	25	35	34	27
Houston Aldine C8/AF108/X150	45	36	29	51	93	85	63	49	58	49	36	49	53	57	44	38	35	25	27	38	42	35	35	57	53	67	27	45	43	35
Channelview C15/AH115	43	31	30	48	65	62	62	45	48	43	27	34	47	49	42	29	30	27	21	32	30	28	28	37	40	52	25	35	33	26
Northwest Harris Co. C26/A110/X154	44	35	30	45	86	73	44	40	53	45	46	58	48	53	38	38	30	24	25	28	43	33	42	65	53	73	30	39	38	33
Hou.DeerPrk2 C35/235/1001/AFH139FP239	50	38	46	49	61	62	44	33	48	42	27	35	51	54	42	31	31	NA	NA	NV	35	31	31	43	46	47	34	39	37	31
Seabrook Friendship Park C45	45	32	39	43	51	74	43	35	47	42	NA	NV	46	51	43	36	35	32	25	37	29	29	27	38	40	38	34	35	34	29
Houston Bayland Park C53/A146	57	43	50	68	73	72	47	37	53	50	38	49	69	65	57	39	30	35	31	33	39	33	34	53	45	71	31	35	34	26
Conroe Relocated C78/A321	43	36	27	41	63	67	61	58	63	47	38	39	43	49	38	37	30	27	29	35	34	39	38	50	62	47	39	46	42	36
Manvel Croix Park C84	59	44	44	48	58	54	36	31	47	41	28	36	57	61	46	35	33	30	19	33	32	30	27	43	36	45	25	31	29	23
Clinton C403/C304/AH113	43	33	37	49	59	63	43	33	40	38	27	36	51	51	43	NV	30	24	19	NV	32	29	25	38	37	55	23	32	33	26
Houston North Wayside C405	39	31	26	46	74	73	51	39	47	44	29	37	44	48	39	29	27	15	16	25	32	28	28	43	45	58	17	35	34	27
Houston Monroe C406	54	40	45	47	57	61	41	33	44	40	30	38	55	59	45	34	35	31	21	32	35	28	27	41	39	49	26	30	30	25
Lang C408	49	37	31	50	79	75	48	37	47	43	35	42	50	55	41	32	28	24	24	26	36	29	33	NV	46	71	24	33	33	27
Houston Croquet C409	52	38	50	51	60	57	39	32	46	41	30	39	60	58	48	35	28	30	25	29	32	29	30	44	38	48	26	31	29	23
Houston Westhollow C410/C3003	53	42	NV	62	70	65	39	35	46	45	36	43	63	61	50	39	29	34	29	33	35	30	34	49	43	67	31	35	32	26
Park Place C416	51	39	47	52	64	68	46	36	47	44	32	40	60	58	51	35	35	30	21	33	35	31	32	46	42	56	26	34	35	28
Sheldon C551	33	27	23	47	65	61	25	22	23	20	10	16	23	21	17	16	15	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Baytown Wetlands Center C552	43	32	44	47	62	64	53	40	50	42	20	30	50	51	42	32	33	29	23	33	28	27	29	36	38	39	34	34	34	27
Crosby Library C553	39	31	27	50	62	64	74	53	51	45	27	37	40	48	37	34	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NV
West Houston C554	49	39	37	53	76	69	40	36	47	42	39	46	55	57	43	38	28	28	26	31	36	30	34	53	43	78	29	34	32	26
La Porte Sylvan Beach C556	36	27	33	38	46	63	41	33	44	38	23	28	43	43	35	30	31	26	23	33	26	22	21	32	37	33	32	32	32	27
Mercer Arboretum C557	36	29	22	36	72	67	52	44	50	39	28	36	38	42	31	28	22	12	17	21	30	28	25	42	45	45	18	33	31	28
Tom Bass C558	57	42	48	50	60	59	40	34	47	42	32	41	60	61	47	34	31	28	21	31	32	27	28	44	36	49	26	30	28	24
Katy Park C559	51	42	44	57	74	65	38	34	48	46	39	39	59	58	44	42	32	34	26	29	33	31	34	50	40	68	29	33	32	25
Atascocita C560	36	NV	NA	NA	NA	NA	NA	NA	NA	NA	NV	28	31	32	26	26	24	16	15	24	22	23	19	31	37	37	17	27	26	21
Meyer Park C561	44	36	28	45	90	80	51	42	51	43	38	52	47	52	39	37	27	19	23	27	40	32	40	63	56	70	26	42	41	34
Bunker Hill Village C562	46	36	37	53	68	65	39	32	42	37	30	35	53	53	42	31	20	22	17	22	27	20	21	31	32	60	19	23	24	19
Huffman Wolf Road C563	43	34	30	45	64	64	77	56	54	48	32	40	47	50	40	36	33	31	31	37	31	33	31	42	51	53	33	38	36	31
HRM-3 Haden Road C603/A114	46	34	37	51	63	69	55	39	49	46	30	39	52	54	45	32	30	27	21	32	34	NV	30	41	43	55	27	37	34	28
Wallisville Road C617	41	32	33	52	57	59	68	47	51	44	28	35	49	51	43	36	38	34	29	40	33	33	32	39	41	48	35	36	34	29
Danciger C618	61	48	38	45	54	51	30	29	47	43	30	37	53	61	49	42	35	28	NV	38	35	30	NV	50	34	42	31	33	28	24
Texas City 34th St. C620	60	41	40	50	60	72	43	41	52	46	31	41	59	59	53	43	40	36	27	43	37	33	34	45	43	42	38	40	39	33
UH Moody Tower C695	52	40	45	60	71	74	49	39	47	47	34	42	61	59	52	37	34	33	27	34	37	32	34	49	45	67	28	35	35	28
UH WG Jones Forest C698	46	37	29	43	78	72	57	56	62	54	41	NV	47	51	41	39	32	25	27	34	37	41	42	59	67	58	38	49	46	41
UH West Liberty C699	38	29	27	40	56	56	72	49	48	41	28	34	44	45	36	31	27	29	27	32	28	27	25	29	41	44	29	31	28	24
Lynchburg Ferry C1015/A165	40	32	36	48	59	60	57	41	50	42	25	34	48	49	41	31	32	29	24	31	27	27	31	37	41	41	29	34	30	26
Lake Jackson C1016	55	40	29	40	48	45	23	28	42	39	25	31	52	57	41	36	34	33	17	36	33	29	25	41	34	34	27	32	29	27
Baytown Garth C1017	43	34	35	54	60	62	70	48	52	46	29	37	52	53	44	36	39	33	30	40	33	33	31	41	41	48	34	37	35	30
Galveston 99th St. C1034/A320/X183	64	45	35	51	58	65	42	46	52	48	33	40	61	58	53	42	40	39	26	43	36	32	40	43	NV	42	38	41	39	35
UH Smith Point C1606	54	37	38	46	57	70	48	42	52	46	32	37	NV	56	48	38	38	37	31	42	34	34	33	41	42	NV	NV	38	37	NA
Oyster Creek C1607	62	45	32	48	47	44	27	38	45	40	27	31	54	61	49	36	34	32	18	35	31	27	26	38	35	35	30	NV	28	28

Monitoring Site	May-20																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Houston East C1/G316	58	52	48	42	59	47	61	45	39	50	57	50	45	42	30	54	49	86	46	41	40	27	30	41	52	56	57	38	36	48	46
Houston Aldine C8/AF108/X150	63	52	48	42	43	48	64	41	43	47	64	49	44	37	26	48	46	74	47	40	38	25	28	35	47	53	48	41	41	42	41
Channelview C15/AH115	54	49	47	41	56	43	56	44	40	45	50	47	42	40	29	54	47	81	47	40	37	24	28	42	54	57	NV	32	39	41	49
Northwest Harris Co. C26/A110/X154	65	53	52	NV	NV	51	64	43	44	47	74	52	48	46	35	45	47	62	NV	44	44	32	34	42	42	51	51	47	41	41	39
Hou.DeerPrk2 C35/235/1001/AFH139FP239	60	52	47	40	54	54	62	46	45	57	54	51	43	47	38	52	50	81	41	39	39	26	29	48	54	59	53	38	45	52	49
Seabrook Friendship Park C45	54	46	39	32	35	52	55	42	44	52	51	44	38	43	34	46	47	75	36	31	34	22	25	45	47	53	44	37	40	46	38
Houston Bayland Park C53/A146	63	52	47	39	51	62	64	46	49	59	60	51	45	53	39	50	49	67	41	39	39	26	27	46	46	54	52	41	49	57	48
Conroe Relocated C78/A321	75	62	56	56	35	48	69	43	43	42	60	55	55	42	35	39	45	59	49	54	52	38	39	44	45	47	51	48	39	38	37
Manvel Croix Park C84	55	51	46	38	39	54	58	NV	49	63	NV	47	41	45	35	48	49	65	38	34	33	25	25	41	45	53	47	36	53	57	37
Clinton C403/C304/AH113	51	47	45	36	49	50	54	37	43	53	52	40	38	44	NV	NA	NA	71	35	32	34	24	26	40	46	48	45	33	43	50	45
Houston North Wayside C405	53	46	42	36	45	40	54	NV	36	42	53	44	39	36	24	43	40	64	39	35	35	23	26	34	43	45	47	36	37	38	42
Houston Monroe C406	50	44	43	35	41	50	NV	44	41	55	52	45	37	44	30	NA	NA	NV	38	33	33	23	23	43	46	54	47	NV	NV	52	41
Lang C408	59	51	46	32	43	48	NV	41	42	51	62	48	43	45	32	46	46	67	42	43	39	27	28	40	44	51	51	44	40	47	49
Houston Croquet C409	52	48	43	34	44	59	56	42	44	61	52	46	40	46	29	46	46	64	36	34	35	25	25	42	43	52	48	36	45	57	41
Houston Westhollow C410/C3003	59	48	47	40	42	56	58	42	45	56	58	49	39	49	39	46	46	61	39	38	38	25	28	46	43	53	51	43	NV	53	47
Park Place C416	56	48	44	34	46	52	NV	42	42	56	53	46	40	45	32	47	46	52	40	36	35	24	24	42	46	53	49	36	43	52	44
Sheldon C551	55	49	46	41	46	45	56	42	41	44	53	47	41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NV	26	29
Baytown Wetlands Center C552	59	49	44	36	44	50	57	45	43	53	54	49	43	42	31	52	48	85	41	36	35	23	25	41	53	56	48	33	39	43	48
Crosby Library C553	57	48	45	39	43	42	54	39	38	39	50	44	39	32	24	29	NV	50	NV	NV	NV	25	23	34	50	50	57	35	34	36	47
West Houston C554	43	30	26	19	23	39	48	28	36	38	47	39	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
La Porte Sylvan Beach C556	56	46	41	34	38	50	58	45	44	53	55	49	43	43	37	48	49	79	38	31	38	24	25	46	50	55	49	41	39	42	43
Mercer Arboretum C557	62	52	47	44	38	44	62	39	40	43	61	50	48	35	29	42	40	61	46	47	44	29	34	35	40	46	49	46	35	36	32
Tom Bass C558	55	49	45	38	41	59	58	43	45	63	55	47	40	46	33	48	48	67	38	35	35	25	25	43	46	54	47	36	49	57	39
Katy Park C559	57	48	46	37	38	57	57	40	47	55	57	47	39	46	36	45	45	56	37	36	36	25	28	41	41	48	48	42	41	50	43
Atascocita C560	59	52	48	45	40	42	58	41	39	41	55	49	46	39	30	46	41	67	49	46	42	28	34	39	45	48	52	43	36	37	43
Meyer Park C561	65	54	49	46	34	50	63	41	44	47	70	51	48	41	33	44	43	61	44	46	43	30	32	39	40	49	48	48	39	40	37
Bunker Hill Village C562	57	45	43	36	41	51	56	38	43	52	56	46	37	46	30	41	44	59	37	38	36	24	25	34	39	48	45	38	44	47	40
Huffman Wolf Road C563	66	56	53	50	44	NV	60	46	42	43	56	51	49	35	33	55	44	71	60	53	45	33	32	43	52	49	62	47	41	40	41
HRM-3 Haden Road C603/A114	54	46	44	38	54	47	56	40	41	48	52	44	40	38	27	50	45	79	43	37	35	23	26	38	50	NA	NA	NV	40	44	47
Wallisville Road C617	62	53	48	42	56	50	61	47	44	51	54	51	46	44	34	60	50	81	51	44	41	30	30	49	62	65	65	42	43	47	58
Texas City 34th St. C620	59	52	48	38	NV	NV	65	54	55	65	62	55	46	54	42	55	57	88	43	36	41	27	29	52	56	63	55	46	53	65	48
UH Moody Tower C695	60	53	48	43	52	56	62	46	47	56	59	50	44	48	36	53	51	77	44	41	39	NV	28	44	51	59	57	NV	48	57	52
UH WG Jones Forest C698	71	60	53	54	37	50	70	43	44	45	62	56	54	41	36	42	48	62	49	51	53	36	41	45	44	48	53	47	40	39	38
UH West Liberty C699	60	51	48	45	40	43	55	42	39	39	52	46	43	31	26	54	41	63	56	46	39	28	25	42	52	48	60	44	38	38	40
Lynchburg Ferry C1015/A165	55	50	45	36	52	47	58	45	41	49	51	48	42	40	29	49	43	76	42	33	37	24	27	44	49	52	52	NV	33	41	51
Lake Jackson C1016	56	50	47	34	30	57	62	50	51	65	54	48	40	49	41	51	45	56	35	33	36	22	26	43	47	50	50	39	60	57	29
Baytown Garth C1017	61	52	47	41	54	49	59	46	42	49	53	50	45	42	34	58	48	81	49	44	41	30	29	47	59	62	62	41	41	45	58
Galveston 99th St. C1034/A320/X183	58	52	49	37	33	57	61	52	46	62	59	52	48	51	42	57	52	76	48	38	39	25	27	47	57	62	52	47	61	54	41
UH Smith Point C1606	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	44	48	55	46
Oyster Creek C1607	52	50	47	36	34	54	59	50	NV	NV	53	48	NV	49	45	53	46	58	44	37	40	28	31	49	52	53	NV	52	68	62	41
UH Launch Trailer C1611	59	51	47	41	50	52	59	45	44	54	57	48	43	46	34	NV	50	75	43	40	38	27	27	41	50	57	56	40	44	53	48

Monitoring Site	Jun-20																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Houston East C1/G316	43	66	30	33	40	34	24	42	33	43	44	50	51	62	41	65	56	50	34	26	19	21	29	40	25	16	18	19	19	23
Houston Aldine C8/AF108/X150	43	64	37	42	46	33	24	44	37	NV	49	57	55	58	46	75	63	55	32	28	21	20	25	40	26	14	20	19	18	19
Channelview C15/AH115	39	59	24	34	31	33	23	45	33	43	42	50	52	54	36	59	57	49	32	27	19	24	27	42	22	12	16	17	15	21
Northwest Harris Co. C26/A110/X154	49	71	40	40	69	36	27	43	38	47	50	59	56	59	60	84	63	58	34	35	22	17	25	38	NV	19	23	21	22	24
Hou.DeerPrk2 C35/235/1001/AFH139FP239	55	58	27	32	33	40	27	43	30	51	51	58	62	57	37	63	54	49	37	24	17	30	30	40	23	18	18	18	19	NV
Seabrook Friendship Park C45	49	51	24	25	28	34	25	35	22	42	46	50	57	50	31	NV	49	43	31	21	17	30	28	34	22	17	16	15	17	17
Houston Bayland Park C53/A146	62	61	31	32	44	46	29	40	35	64	59	63	59	66	NV	NA	NV	46	27	21	17	NV	NV	NV	20	14	16	16	16	17
Conroe Relocated C78/A321	36	48	42	48	42	34	27	38	49	NV	47	55	55	54	41	68	79	67	41	36	27	21	31	37	34	20	30	24	28	31
Manvel Croix Park C84	54	54	27	24	37	48	31	35	26	61	63	67	65	61	40	54	51	NV	26	20	17	34	27	36	23	17	16	18	19	21
Clinton C403/C304/AH113	50	61	24	24	36	38	25	33	26	50	47	55	56	61	38	59	48	42	31	24	19	20	28	34	22	14	16	19	NV	20
Houston North Wayside C405	36	61	NV	33	40	31	24	39	32	36	43	49	48	56	40	65	55	47	26	25	17	NV	NV	34	21	12	16	16	15	19
Houston Monroe C406	50	51	26	23	33	38	27	35	25	50	49	54	55	54	36	60	49	43	27	21	16	NV	28	37	21	15	16	16	17	20
Lang C408	57	73	35	41	55	41	28	44	43	53	50	58	56	66	50	73	61	51	30	31	21	19	29	42	24	17	19	18	19	22
Houston Croquet C409	56	53	28	25	40	43	28	40	28	57	56	60	57	60	42	56	55	44	26	19	16	26	25	35	22	16	16	16	17	18
Houston Westhollow C410/C3003	58	61	33	36	48	45	29	40	32	52	56	62	57	65	47	58	54	48	29	26	21	23	32	41	28	19	18	18	19	21
Park Place C416	53	56	29	27	35	40	26	39	28	52	50	55	56	56	39	62	52	45	29	21	17	25	28	NV	23	16	17	18	18	22
Sheldon C551	21	34	13	22	19	17	10	24	19	27	30	39	39	37	21	40	43	36	20	16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Baytown Wetlands Center C552	39	52	21	27	23	32	22	39	22	42	45	52	56	50	30	55	55	46	31	23	17	25	29	37	20	15	16	14	16	16
Crosby Library C553	33	53	24	45	30	28	20	45	32	39	40	48	48	49	33	54	61	48	28	26	19	20	22	41	22	12	15	15	17	20
West Houston C554	NA	NV	34	35	57	43	27	40	29	50	54	60	57	65	49	61	53	48	28	27	18	18	24	37	26	15	17	16	17	19
La Porte Sylvan Beach C556	49	49	24	26	26	31	23	38	22	41	43	49	55	50	31	48	47	41	28	18	13	26	26	31	18	14	11	8	9	11
Mercer Arboretum C557	34	56	35	50	48	32	22	37	47	42	42	52	50	52	40	71	65	56	36	29	19	12	23	32	24	13	19	16	19	21
Tom Bass C558	53	52	26	24	36	44	29	37	26	56	61	63	61	57	39	57	50	43	26	19	16	29	27	35	22	16	15	17	18	20
Katy Park C559	61	65	31	28	52	42	26	42	29	47	53	63	58	66	48	57	52	44	27	28	18	19	23	37	26	15	15	15	16	18
Atascocita C560	37	54	33	42	41	30	23	42	39	38	38	44	44	46	34	60	59	50	30	27	18	19	25	36	25	14	16	14	16	19
Meyer Park C561	42	61	35	44	58	35	26	40	42	50	48	56	54	57	50	80	62	53	33	34	20	15	24	32	25	14	18	17	18	22
Bunker Hill Village C562	52	60	30	31	43	38	25	30	32	53	50	57	52	63	41	57	51	43	25	19	15	12	21	31	19	12	13	12	13	17
Huffman Wolf Road C563	35	58	32	52	35	34	26	38	44	45	45	53	53	54	39	60	72	56	37	32	26	26	32	45	31	20	24	24	24	28
HRM-3 Haden Road C603/A114	43	60	23	32	35	35	24	40	31	45	46	53	NV	NA	NV	59	53	47	35	26	18	21	26	39	22	15	16	16	16	20
Wallisville Road C617	44	62	26	45	31	37	26	51	31	45	47	55	58	55	37	60	61	53	35	28	21	30	33	47	28	NA	NA	NA	NA	NA
Texas City 34th St. C620	64	61	32	25	36	58	30	NV	NA	NV	63	67	80	68	NV	NV	65	60	42	NV	NA	NV	48	48	28	23	23	21	22	NV
UH Moody Tower C695	56	64	34	NV	42	43	30	43	32	55	55	59	58	64	43	68	55	50	32	25	20	30	30	43	NV	18	19	20	20	23
UH WG Jones Forest C698	38	57	46	47	48	34	27	41	44	NV	48	57	56	56	43	78	75	67	45	40	25	19	29	36	NV	19	27	21	25	29
UH West Liberty C699	34	55	26	43	28	29	21	35	36	40	40	48	48	50	33	NV	61	50	32	27	21	23	30	44	26	16	20	19	19	23
Lynchburg Ferry C1015/A165	33	55	23	31	27	31	19	42	28	39	44	50	53	53	33	57	55	48	32	23	17	23	29	37	23	15	16	17	18	21
Lake Jackson C1016	53	51	24	17	25	50	35	38	20	70	59	58	63	58	32	52	47	37	27	16	15	24	28	30	23	17	14	15	16	17
Baytown Garth C1017	41	60	27	44	32	36	25	51	27	43	45	53	57	55	38	59	59	52	35	28	21	29	33	46	29	NV	23	21	21	24
Galveston 99th St. C1034/A320/X183	61	57	29	23	31	57	25	37	25	46	58	65	62	58	50	55	52	48	32	25	21	41	41	40	26	NV	18	17	19	18
UH Smith Point C1606	57	56	30	30	27	43	24	39	28	46	51	55	64	NV	42	56	60	49	35	26	22	38	34	39	25	18	20	19	21	NV
Oyster Creek C1607	67	NV	30	22	29	59	41	39	27	73	65	68	68	64	38	56	56	50	33	26	22	35	41	39	31	24	21	22	23	23
UH Launch Trailer C1611	51	61	NV	32	40	39	28	42	31	49	51	55	54	61	41	65	54	49	30	23	20	26	30	41	25	17	18	18	20	NV

Monitoring Site	POC	Jul-20																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Houston East C1/G316	2	22	36	41	52	35	19	17	21	25	30	37	35	43	26	27	46	37	29	44	23	22	25	27	23	21	28	34	21	24	21	30
Houston Aldine C8/AF108/X150	2	23	40	31	43	28	22	17	24	27	NV	34	27	45	29	29	42	35	32	42	26	28	29	27	26	21	25	30	19	24	20	27
Channelview C15/AH115	3	21	38	43	53	37	18	18	22	24	28	37	38	38	26	26	48	30	25	38	24	22	26	26	25	21	25	27	21	24	22	31
Northwest Harris Co. C26/A110/X154	2	25	NV	28	29	25	22	24	24	27	35	26	25	36	29	29	37	50	43	54	36	41	34	35	29	25	27	36	25	28	22	27
Hou.DeerPrk2 C35/235/1001/AFH139FP239	1	22	29	41	42	32	20	20	22	22	25	27	31	29	23	25	37	36	28	42	28	26	28	35	29	26	29	36	25	24	22	24
Seabrook Friendship Park C45	1	17	24	35	35	24	16	16	18	18	20	23	24	21	20	20	31	30	25	36	27	22	24	32	23	23	27	29	17	19	18	20
Houston Bayland Park C53/A146	1	17	23	25	32	24	16	17	13	NV	28	28	27	30	22	25	34	34	28	47	28	28	24	38	31	24	24	45	22	26	20	26
Conroe Relocated C78/A321	1	31	33	31	37	27	33	22	36	39	42	31	30	51	46	43	44	37	30	39	29	27	NV	29	23	23	24	29	33	32	27	29
Manvel Croix Park C84	1	18	22	28	31	23	16	16	17	21	22	19	22	20	18	19	23	27	26	39	28	23	22	43	NV	25	23	42	22	21	17	19
Clinton C403/C304/AH113	3	19	27	36	43	31	16	14	17	21	26	33	31	31	21	21	34	33	28	43	27	25	21	32	28	23	28	37	18	16	17	22
Houston North Wayside C405	1	18	35	32	43	28	17	15	19	23	32	35	31	41	24	24	42	35	30	40	22	24	21	NV	23	20	23	27	NV	NV	16	22
Houston Monroe C406	1	18	24	33	37	29	16	15	17	20	21	25	26	23	19	19	29	29	26	39	25	24	24	35	28	23	27	38	21	20	NV	NV
Lang C408	2	24	30	31	37	26	19	20	26	23	39	31	26	39	29	33	39	37	33	50	26	29	27	33	28	24	25	40	22	27	24	24
Houston Croquet C409	2	17	24	29	32	24	16	16	17	18	21	26	24	24	18	20	29	30	26	41	28	25	22	37	29	23	22	43	21	21	15	20
Houston Westhollow C410/C3003	1	20	25	28	30	26	19	19	21	23	28	26	26	30	23	22	32	37	34	49	32	31	27	41	33	27	26	43	23	27	18	25
Park Place C416	1	20	27	35	40	30	18	16	19	24	26	33	32	28	21	22	36	31	29	43	27	28	25	34	28	24	27	42	20	23	18	24
Baytown Wetlands Center C552	1 N	16	23	46	49	30	15	15	16	17	20	25	27	24	20	20	39	25	20	34	22	20	21	25	23	20	24	26	18	18	16	21
Crosby Library C553	1 N	21	38	34	40	31	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
West Houston C554	1 N	18	22	26	27	21	16	17	19	21	26	25	20	27	22	22	32	38	34	49	31	30	23	37	30	25	25	42	20	24	16	22
La Porte Sylvan Beach C556	1 N	11	16	32	31	19	10	11	12	12	12	16	17	15	14	14	24	23	17	27	19	17	16	21	17	16	18	19	16	15	12	14
Mercer Arboretum C557	1 N	24	29	26	35	22	18	22	27	26	41	34	28	47	33	37	45	36	29	39	26	26	30	26	23	17	18	26	20	24	24	24
Tom Bass C558	1 N	18	21	29	33	26	16	16	17	22	22	24	25	21	19	19	26	28	23	38	26	23	22	38	29	22	23	44	20	20	16	18
Katy Park C559	1 N	18	21	24	22	23	16	16	17	19	21	22	20	23	19	20	26	38	35	48	35	30	22	39	31	24	25	39	20	21	15	23
Atascocita C560	1 N	18	36	26	39	25	18	16	20	24	33	31	27	42	29	29	41	28	23	31	23	24	25	21	21	16	17	20	18	19	18	22
Meyer Park C561	1 N	22	28	26	31	22	16	19	22	28	37	28	25	42	34	29	40	41	37	44	29	32	29	30	26	20	22	31	21	24	17	23
Bunker Hill Village C562	1 N	16	22	23	28	20	15	16	18	17	30	24	23	31	22	23	31	30	26	43	22	22	18	31	25	19	13	33	14	18	15	18
Huffman Wolf Road C563	1 N	31	47	35	44	35	29	26	33	33	44	41	39	52	40	38	53	32	26	39	29	26	28	28	27	24	25	29	31	32	31	34
HRM-3 Haden Road C603/A114	1 N	19	32	39	49	33	17	16	20	22	28	35	34	37	22	23	43	30	25	39	20	19	23	28	25	20	25	34	19	21	19	26
Wallisville Road C617	1 N	NA	NA	NA	NA	NA	NA	NA	NA	NV	33	47	47	42	28	26	52	NV	NA	NA	NA	NV	NV	31	30	25	29	34	27	26	25	35
Texas City 34th St. C620	1 N	20	25	27	35	27	17	18	20	21	20	21	23	21	20	21	32	33	33	41	32	29	30	44	31	30	32	34	26	24	19	21
UH Moody Tower C695	1 N	22	33	NV	44	33	20	18	21	25	29	37	32	35	24	25	40	NV	32	46	29	29	27	36	30	25	28	44	24	27	19	28
UH WG Jones Forest C698	1 N	NA	NV	30	35	24	29	23	30	36	41	30	29	49	43	36	44	41	34	42	31	31	38	31	26	NV	24	33	29	31	24	28
UH West Liberty C699	1 N	26	40	32	40	32	23	22	27	28	40	35	34	44	33	32	49	28	19	35	26	21	22	25	23	21	22	25	28	29	28	31
Lynchburg Ferry C1015/A165	1	21	27	41	49	34	18	19	21	21	22	34	36	29	24	25	45	27	22	34	24	20	22	27	27	22	25	32	20	22	22	25
Lake Jackson C1016	1	16	18	16	23	21	13	14	15	17	16	12	14	15	16	17	17	21	29	36	NV	NA	NA	NV	27	26	24	20	20	17	14	16
Baytown Garth C1017	1	25	36	48	60	43	23	24	26	25	35	49	48	45	30	29	54	32	23	42	30	26	28	NV	NV	26	31	34	28	29	27	37
Galveston 99th St. C1034/A320/X183	1	17	19	19	24	21	14	15	16	16	13	14	14	15	NV	NA	NV	26	33	34	NV	NV	28	NV	NV	NA	NA	NA	NA	NV	17	19
UH Smith Point C1606	1 N	20	24	30	41	NV	NV	17	19	21	19	25	21	22	19	21	33	31	29	39	29	27	26	37	28	25	30	32	NV	NA	NA	NA
Oyster Creek C1607	1 N	22	26	23	28	29	20	20	22	23	21	19	21	21	23	24	25	29	31	42	32	32	28	NV	NA	NA	NA	NV	25	25	18	20
UH Launch Trailer C1611	1 N	21	33	34	43	32	20	18	21	25	28	36	31	35	24	24	39	32	30	43	23	27	26	31	27	23	27	41	23	26	19	27

Monitoring Site	POC	Aug-20																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Houston East C1/G316	2	32	60	61	62	50	53	57	38	23	23	23	29	32	30	42	55	54	67	47	54	73	60	56	30	NV	NA	NV	23	28	23	20
Houston Aldine C8/AF108/X150	2	38	49	55	62	56	59	66	42	24	NV	29	39	40	40	47	46	53	63	45	55	68	62	53	34	NV	20	41	28	35	29	27
Channelview C15/AH115	3	40	51	55	67	47	53	59	38	22	20	22	30	33	30	36	49	46	58	42	46	69	56	53	29	NV	NA	NV	23	27	21	18
Northwest Harris Co. C26/A110/X154	2	44	37	52	57	52	58	63	45	24	31	30	27	32	29	34	NV	NA	NA	NA	NV	51	52	43	31	22	35	31	30	28	25	
Hou.DeerPrk2 C35/235/1001/AFH139FP239	1	41	66	67	61	51	53	61	35	22	22	24	26	26	25	28	57	63	81	65	62	74	62	62	40	NV	NA	NA	25	27	24	19
Seabrook Friendship Park C45	1	38	58	74	47	40	42	53	29	15	16	18	18	21	20	21	52	51	64	50	49	55	50	51	31	NV	NA	NA	NV	20	18	14
Houston Bayland Park C53/A146	1	39	55	61	55	43	47	50	35	19	24	21	28	23	28	37	44	73	84	61	73	62	57	66	41	NV	27	39	21	26	24	18
Conroe Relocated C78/A321	1	50	43	50	52	66	77	77	59	28	42	41	40	47	43	44	41	54	61	38	47	61	53	49	40	27	19	41	34	36	34	36
Manvel Croix Park C84	1	31	58	50	47	43	44	46	28	20	20	21	21	21	21	22	30	68	98	70	70	52	53	61	48	NV	25	38	18	20	21	19
Clinton C403/C304/AH113	3	37	NV	NV	NV	43	43	51	32	22	20	22	25	25	26	37	56	58	72	56	61	71	57	58	37	NV	NA	NV	13	23	23	18
Houston North Wayside C405	1	30	51	52	57	48	51	54	35	19	22	23	31	32	31	43	45	51	59	41	47	62	56	49	28	NV	NA	NV	20	28	24	19
Houston Monroe C406	1	32	50	61	51	42	40	43	30	20	19	20	22	21	21	24	38	58	80	62	67	60	55	57	38	NV	NA	NV	NV	20	19	17
Lang C408	2	39	50	60	58	52	53	55	41	22	27	30	36	33	33	40	48	61	70	50	61	69	57	55	35	NV	NA	NV	26	33	28	21
Houston Croquet C409	2	33	49	53	46	38	42	43	31	18	22	19	23	19	24	31	36	65	81	57	69	55	52	63	43	NV	NA	NV	20	22	22	18
Houston Westhollow C410/C3003	1	38	47	56	53	47	47	50	34	23	24	24	29	26	28	32	40	NV	74	57	66	52	51	56	43	NV	NA	NV	19	20	21	17
Park Place C416	1	38	67	67	56	44	45	48	34	21	22	22	25	26	26	34	47	62	80	59	67	66	56	64	38	NV	NA	NV	23	25	24	21
Baytown Wetlands Center C552	1 N	44	44	66	57	40	44	51	32	18	18	19	21	24	23	25	51	44	63	48	50	65	51	52	27	NV	NA	NA	NA	NA	NA	NA
West Houston C554	1 N	35	37	45	51	42	44	47	35	18	23	23	26	24	25	28	37	62	69	51	60	54	48	55	42	33	24	34	24	25	25	20
La Porte Sylvan Beach C556	1 N	41	44	67	45	34	40	47	27	16	13	15	16	17	18	18	44	42	60	44	44	52	48	47	27	NV	NA	NA	NA	NA	NA	NA
Mercer Arboretum C557	1 N	36	36	43	50	54	62	69	43	21	29	32	36	39	36	41	37	44	54	36	43	58	51	44	33	23	16	32	27	29	25	22
Tom Bass C558	1 N	30	56	56	47	41	43	45	28	19	19	21	20	21	20	23	35	63	87	65	71	55	52	58	43	33	23	39	18	21	20	19
Katy Park C559	1 N	31	38	45	48	39	49	49	30	18	20	21	23	19	21	25	35	59	66	49	58	49	46	56	46	34	26	32	23	24	23	18
Atascocita C560	1 N	27	37	39	48	50	56	61	38	19	25	25	31	35	34	38	36	40	48	32	41	56	51	42	25	18	14	36	24	29	22	19
Meyer Park C561	1 N	37	36	49	51	54	55	58	40	20	28	30	34	35	33	37	45	50	60	41	50	62	50	49	38	27	19	34	27	29	27	24
Bunker Hill Village C562	1 N	25	40	52	47	42	41	43	31	16	21	22	26	24	25	30	37	61	69	51	61	55	46	50	34	31	23	34	18	21	20	16
Huffman Wolf Road C563	1 N	36	39	46	58	68	58	63	51	30	36	37	43	50	46	46	41	40	55	38	47	58	56	47	33	24	20	43	36	39	31	27
HRM-3 Haden Road C603/A114	1 N	28	54	52	58	46	47	52	32	20	19	22	28	30	28	38	50	50	61	47	50	71	57	53	31	23	22	50	21	26	20	16
Wallisville Road C617	1 N	53	48	66	74	56	51	54	39	25	24	28	35	36	37	45	51	45	62	45	50	71	58	55	33	24	24	51	27	31	28	19
Texas City 34th St. C620	1 N	49	71	58	49	47	46	57	34	21	20	21	20	21	23	25	39	69	78	71	61	61	61	63	44	26	26	36	19	22	22	17
UH Moody Tower C695	1 N	45	69	68	61	48	49	52	37	22	24	25	30	28	30	40	54	67	80	60	67	71	62	63	40	32	27	46	24	27	26	22
UH WG Jones Forest C698	1 N	48	41	52	52	60	76	81	57	27	38	7	39	42	40	43	42	56	67	42	52	65	NV	50	40	NV	19	NV	34	36	32	32
UH West Liberty C699	1 N	33	36	42	55	63	52	54	44	25	27	33	36	43	39	38	35	34	50	34	42	53	52	43	29	19	16	NV	32	34	26	21
Lynchburg Ferry C1015/A165	1	31	51	63	61	47	48	55	35	20	19	21	23	27	26	31	50	42	59	38	45	72	57	52	28	NV	NA	NA	NV	20	19	17
Lake Jackson C1016	1	28	48	34	38	38	37	39	17	16	16	16	13	12	14	15	23	52	73	73	59	40	40	48	41	NV	NA	NV	14	17	17	14
Baytown Garth C1017	1	53	48	66	76	59	53	56	40	26	26	30	37	39	39	47	53	45	61	45	50	71	59	57	35	NV	NA	NV	30	34	31	22
Galveston 99th St. C1034/A320/X183	1	54	69	43	40	41	43	57	39	19	19	18	17	16	17	17	28	67	65	83	NV	56	53	59	42	NV	NA	NA	NV	20	18	NV
UH Smith Point C1606	1 N	NV	60	89	NV	45	49	54	40	23	20	20	NV	21	25	28	52	65	66	51	57	59	55	60	NV	NA	NA	NA	NA	NA	NA	NA
Oyster Creek C1607	1 N	37	61	46	NV	45	45	47	28	22	22	22	19	20	22	22	27	69	79	93	69	56	53	62	47	NV	NA	NA	NA	NA	NA	NA
UH Launch Trailer C1611	1 N	43	66	65	59	47	48	51	36	NV	23	24	30	27	29	41	52	63	75	56	NV	75	59	58	34	28	23	45	24	26	25	22

Monitoring Site	POC	Sep-20																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Houston East C1/G316	2	21	16	24	18	36	48	35	31	32	23	35	34	21	19	25	33	22	40	37	28	19	23	16	11	54	55	36	27	32	52	
Houston Aldine C8/AF108/X150	2	18	15	21	13	19	29	25	20	20	18	22	26	15	16	23	NV	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NV	52	
Channelview C15/AH115	3	19	17	23	15	32	41	42	31	29	24	36	32	22	22	29	33	26	43	40	26	17	19	19	17	43	49	37	31	36	48	
Northwest Harris Co. C26/A110/X154	2	24	21	33	21	33	41	39	34	34	32	33	37	22	26	32	36	32	51	47	30	NV	20	24	19	34	51	34	34	36	50	
Hou.DeerPrk2 C35/235/1001/AFH139FP239	1	21	18	24	18	42	61	43	36	35	32	47	39	31	27	35	41	34	51	45	27	23	29	21	18	51	52	38	33	41	56	
Seabrook Friendship Park C45	1	17	15	17	15	35	41	38	31	30	28	38	33	23	25	30	45	27	43	38	21	20	24	14	NV	35	40	29	26	33	NV	
Houston Bayland Park C53/A146	1	20	19	29	24	54	59	34	32	26	36	48	50	32	30	42	45	37	56	51	32	20	22	23	20	59	54	34	37	28	51	
Conroe Relocated C78/A321	1	33	28	38	19	26	38	45	49	43	30	27	38	24	26	31	35	33	50	46	30	22	21	21	18	42	61	46	37	41	58	
Manvel Croix Park C84	1	20	16	20	22	41	43	30	29	24	38	54	47	38	32	46	49	36	55	47	29	24	23	25	20	60	47	32	35	NV	50	
Clinton C403/C304/AH113	3	19	14	23	18	38	50	32	29	27	24	38	37	25	25	34	39	29	48	42	29	19	26	18	13	54	50	34	31	37	45	
Houston North Wayside C405	1	18	16	22	19	29	36	36	30	30	23	35	35	20	24	31	34	25	42	39	28	17	19	16	12	43	52	32	28	33	44	
Houston Monroe C406	1	18	14	17	17	36	57	30	28	23	22	36	34	28	22	33	36	28	43	37	24	NV	25	20	16	51	47	32	28	37	48	
Lang C408	2	22	20	31	26	37	53	38	32	26	30	36	41	28	26	36	39	31	49	46	30	20	21	22	19	56	57	37	30	36	53	
Houston Croquet C409	2	19	16	22	23	47	54	33	30	25	34	47	45	30	32	41	44	34	51	46	28	22	25	22	17	49	48	31	32	34	45	
Houston Westhollow C410/C3003	1	18	13	24	25	42	44	32	28	25	32	39	42	28	29	37	38	32	53	47	23	13	17	19	13	44	45	28	30	33	45	
Park Place C416	1	20	17	24	24	47	67	35	34	29	26	46	42	29	27	37	42	30	47	43	29	20	26	20	14	63	53	34	NV	39	51	
Sheldon C551	1	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NV	28	30	24	45	39	28	17	19	19	17	37	52	35	32	37	46
Baytown Wetlands Center C552	1	N	NV	14	19	15	32	39	43	33	29	29	36	33	20	25	28	34	28	47	41	27	NV	NA	NV	14	30	40	24	27	32	47
Crosby Library C553	1	N	NA	NA	NA	NA	NV	31	50	33	NV	50	30	29	17	18	25	29	24	44	37	24	15	17	16	15	32	58	35	29	34	52
West Houston C554	1	N	19	17	30	27	40	41	37	29	27	31	37	41	27	28	35	37	32	52	47	29	17	22	23	18	44	51	31	35	39	52
La Porte Sylvan Beach C556	1	N	NV	10	13	12	28	32	38	31	28	24	33	30	18	19	24	40	23	39	36	24	NV	NA	NA	NA	NV	38	28	26	33	51
Mercer Arboretum C557	1	N	21	20	29	19	24	31	36	33	30	25	25	31	20	20	26	30	24	42	38	25	16	17	16	15	37	53	33	29	35	52
Tom Bass C558	1	N	18	14	19	20	38	52	29	29	24	32	44	42	30	27	38	41	30	49	42	28	21	23	21	19	52	47	30	31	40	50
Katy Park C559	1	N	20	16	30	25	41	39	32	29	28	24	32	38	25	27	34	35	31	52	48	30	18	21	24	18	34	48	30	35	37	47
Atascocita C560	1	N	19	18	22	13	20	29	34	35	29	21	24	28	16	18	24	26	22	41	34	25	18	18	14	14	34	53	32	26	32	49
Meyer Park C561	1	N	24	18	31	22	27	38	38	33	30	26	32	34	22	23	30	34	27	47	43	28	18	18	19	18	40	53	36	32	36	52
Bunker Hill Village C562	1	N	17	14	26	17	34	43	25	23	18	28	32	37	25	26	34	37	30	49	44	27	14	15	18	16	45	46	29	32	35	45
Huffman Wolf Road C563	1	N	29	27	29	21	23	30	49	36	32	29	37	36	23	24	32	34	29	50	42	29	21	24	20	19	31	63	43	33	38	58
HRM-3 Haden Road C603/A114	1	N	17	15	21	20	33	45	34	29	29	22	33	32	22	20	27	32	24	42	37	26	16	22	18	15	55	50	34	29	34	50
Wallisville Road C617	1	N	21	19	29	17	36	46	46	33	31	36	40	35	25	26	31	35	29	49	43	29	23	26	21	21	40	54	35	34	38	57
Texas City 34th St. C620	1	N	20	17	20	21	40	49	50	42	36	35	58	41	33	29	36	55	42	56	46	34	33	32	25	21	45	47	36	39	44	57
UH Moody Tower C695	1	N	22	19	26	24	49	60	37	35	29	31	45	44	28	29	39	41	31	50	44	29	19	24	22	20	61	57	35	33	41	NV
UH WG Jones Forest C698	1	N	30	24	36	23	29	40	42	46	45	33	32	37	24	26	33	NV	32	50	46	31	20	21	22	21	43	59	42	36	42	57
UH West Liberty C699	1	N	21	22	27	19	21	26	46	30	26	30	34	32	20	21	27	29	NV	44	38	25	17	21	17	17	NV	NA	NA	NV	34	55
Lynchburg Ferry C1015/A165	1	19	17	21	15	31	38	37	29	30	19	24	24	20	15	21	26	25	43	38	20	21	24	14	10	36	40	35	23	29	46	
Lake Jackson C1016	1	16	12	15	16	29	36	31	22	23	24	55	49	31	NV	49	43	39	54	49	29	23	20	23	NV	40	39	28	40	NV	39	
Baytown Garth C1017	1	23	22	31	20	38	48	49	34	34	38	42	38	27	29	33	37	32	50	44	30	24	29	21	21	42	56	39	35	38	57	
Galveston 99th St. C1034/A320/X183	1	16	16	17	18	33	48	48	41	35	36	54	44	33	26	32	44	NV	57	44	33	33	32	24	22	48	47	37	39	NV	58	
UH Smith Point C1606	1	N	NA	NV	20	NV	36	47	49	39	33	34	43	34	28	26	31	36	33	51	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NV	53
Oyster Creek C1607	1	N	NV	18	22	21	37	44	45	38	35	37	70	51	41	39	51	52	51	59	51	35	35	32	33	29	51	50	40	43	51	61
UH Launch Trailer C1611	1	N	22	18	16	22	44	56	35	32	27	28	42	41	25	26	36	38	27	46	NA	NA	19	23	20	17	58	56	34	31	38	50

Attachment C – EPA RBLC Report
(Accessed March 28, 2021)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021

Control Technology Determinations (Freeform)

Facility Information: LION OIL COMPANY

RBLC ID: *AR-0167
 +Facility Name: LION OIL COMPANY
 Date determination entered in RBLC: 01/12/2021
 Permit Type: U: Unspecified
 Facility Description: Lion Oil Co. owns and operates a petroleum refinery located in El Dorado, Union County, Arkansas.
 Permit Notes: This modification permits the installation of backup thermal oxidizers as SN-878 to provide emissions control for vessel purging and other potential release activities during facility turnarounds/outages, adds Maintenance, Startup, and Shutdown (MSS) limits and conditions for #7 FCCU Catalyst Regenerator Stack (SN-809), Refinery Boilers (SN-821), and various boilers and heaters (SN-803, 804, 805, 805N, 808, 810, 811, and 842), and add MSS-specific secondary Best Available Control Technology (BACT) limits for various boilers and heaters (SN-803, 804, 805, 805N, 808, 810, 811, and 842).

Process Information: LION OIL COMPANY

+Process Name: SN-804 - #4 Atmospheric Furnace
 +Process Type: 11.310
 Primary Fuel: Natural Gas 0.059 lb/MMBtu
 Throughput: 280.00
 Throughput Unit: MMBtu/hr
 Process Notes: SN-804 is a 280 MMBTU/hr source used to heat the bottoms from the pre-flash column in order to separate them into naphtha, kerosene, diesel, and gas oil. The furnace is fueled by NSPS Subpart J quality gas. As a result of the refinery expansion permit revision, this source has undergone PSD review for PM10, NOx, and CO. BACT for this source is good combustion practice and next generation ultra-low NOx burners. This source is equipped with a CEMS for monitoring NOx emissions.

Pollutant Information: LION OIL COMPANY - SN-804 - #4 Atmospheric Furnace

+Pollutant Name Nitrogen Oxides (NOx)
 Emission Limit 1: 16.4000
 Emission Limit 1 Unit: LB/HR

Emission Limit 1 Avg.
Time/Condition: 3-HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 14.6000
Emission Limit 1 Unit: LB/HR
Emission Limit 1 Avg.
Time/Condition: 3-HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: LION OIL COMPANY

+Process Name: SN-811 - #9 Reformer Furnace
+Process Type: 12.310
Primary Fuel: Natural Gas 0.054 lb/MMBtu
Throughput: 170.00
Throughput Unit: MMBtu/hr
Process Notes: SN-811 is a 170 MMBtu/hr furnace (nominal design) used to heat the #9 Unit Stripper bottoms. It is fueled by NSPS Subpart J quality gas. It was installed in 1980. BACT for this source is good combustion practice. This source is equipped with a CEMS for monitoring NOx emissions

Pollutant Information: LION OIL COMPANY - SN-811 - #9 Reformer Furnace

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 9.1000
Emission Limit 1 Unit: LB/HR
Emission Limit 1 Avg.
Time/Condition: 3-HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: LION OIL COMPANY

+Process Name: SN-803 - #4 Pre-Flash Column Reboiler
+Process Type: 13.310
Primary Fuel: Natural Gas

0.048 lb/MMBtu

Throughput: 40.00
Throughput Unit: MMBtu/hr
Process Notes: SN-803 is a 40 MMBtu/hr reboiler (nominal design) used to maintain the temperature in the pre-flash column in order to separate crude oil into gasoline and naphtha. The reboiler is fueled by NSPS Subpart J quality gas. It was installed in 1979 and will be retrofitted with next generation, ultra-low NOx burners. As a result of the refinery expansion permit revision, this source has undergone PSD review for PM10. BACT for this source is good combustion practice.

Pollutant Information: LION OIL COMPANY - SN-803 - #4 Pre-Flash Column Reboiler

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 1.9000
Emission Limit 1 Unit: LB/HR
Emission Limit 1 Avg.
Time/Condition: 3-HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: LION OIL COMPANY

+Process Name: SN-805 - #4 Pre-Flash Reboiler
+Process Type: 13.310

0.047 lb/MMBtu

Primary Fuel: Natural Gas
Throughput: 75.00
Throughput Unit: MMBtu/hr
Process Notes: SN-805 is a 75 MM Btu/hr reboiler (nominal design). It was installed in 1996 and will be retrofitted with next generation, ultra-low NOx burners. On May 17, 2000, this source was tested for NOx emissions using EPA Reference Method 7E pursuant to §19.702 of Regulation 19, and 40 C.F.R., Part 52, Subpart E. The test results submitted to the Department demonstrated compliance. As a result of the refinery expansion permit revision, this source has undergone PSD review for PM10. BACT for this source is good combustion practice.

Pollutant Information: LION OIL COMPANY - SN-805 - #4 Pre-Flash Reboiler

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 3.5000
Emission Limit 1 Unit: LB/HR
Emission Limit 1 Avg.
Time/Condition: 3-HOUR AVERAGE
Emission Limit 2: 0

Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: LION OIL COMPANY

+Process Name:	SN-808 - #7 FCCU Furnace	
+Process Type:	13.310	
Primary Fuel:	Natural Gas	0.05 lb/MMBtu
Throughput:	56.00	
Throughput Unit:	MMBtu/hr	
Process Notes:	SN-808 is a 56 MMBtu/hr furnace (nominal design) used to heat gas oil. It is fueled by NSPS Subpart J quality gas. It was installed in 1979. BACT for this source is good combustion practice.	

Pollutant Information: LION OIL COMPANY - SN-808 - #7 FCCU Furnace

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	2.8000
Emission Limit 1 Unit:	LB/HR
Emission Limit 1 Avg.	
Time/Condition:	3-HOUR AVERAGE
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: LION OIL COMPANY

+Process Name:	SN-810 - #9 Hydrotreater Furnace/Reboiler
+Process Type:	13.310
Primary Fuel:	Natural Gas
Throughput:	70.00
Throughput Unit:	MMBtu/hr
Process Notes:	SN-810 is a 70 MMBtu/hr furnace (nominal design) used to heat naphtha. It is fueled NSPS Subpart J quality gas. It was installed in 1958. This source was declared subject to NSPS Subpart J as a result of the Consent Decree (CIV. No. 03-1028) between Lion Oil, ADEQ, and the US EPA.

Pollutant Information: LION OIL COMPANY - SN-810 - #9 Hydrotreater Furnace/Reboiler

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	12.7000
Emission Limit 1 Unit:	LB/HR
Emission Limit 1 Avg.	
Time/Condition:	3-HOUR AVERAGE

Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: LION OIL COMPANY

+Process Name: SN-842 - #12 Unit Distillate Hydrotreater
+Process Type: 13.310
Primary Fuel: Natural Gas
Throughput: 50.00
Throughput Unit: MMBtu/hr
Process Notes: SN-842 is a 50.0 MMBtu/hr furnace (nominal design). It is fueled by NSPS Subpart J quality gas. It was installed in 1993. BACT for this source is good combustion practice.

Pollutant Information: LION OIL COMPANY - SN-842 - #12 Unit Distillate Hydrotreater

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 5.3000
Emission Limit 1 Unit: LB/HR
Emission Limit 1 Avg.
Time/Condition: 3-HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: LION OIL COMPANY

+Process Name: SN-805N - #4 Vacuum Furnace
+Process Type: 12.310
Primary Fuel: Natural Gas 0.046 lb/MMBtu
Throughput: 142.20
Throughput Unit: MMBtu/hr
Process Notes: SN-805N is a 142.2 MMBTU/hr (annual) source. The furnace will be fueled by NSPS Subpart J quality gas. As a result of the refinery expansion permit revision, this source has undergone PSD review for PM10, NOx, and CO. BACT for this source is good combustion practice and next generation ultra low NOx burners.

Pollutant Information: LION OIL COMPANY - SN-805N - #4 Vacuum Furnace

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 6.5000
Emission Limit 1 Unit: LB/HR

Emission Limit 1 Avg.
Time/Condition: 3-HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 7.4000
Emission Limit 1 Unit: LB/HR
Emission Limit 1 Avg.
Time/Condition: 3-HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: MONT BELVIEU NGL FRACTIONATION UNIT

RBLC ID: TX-0886
+Facility Name: MONT BELVIEU NGL FRACTIONATION UNIT
Date determination
entered in RBLC: 02/10/2020
Permit Type: B: Add new process to existing facility
Facility Description: Oneok proposes to authorize an additional E/P Splitter (EP-2) and two additional fractionation units (Frac-5 and Frac-6) at its site. The E/P Splitter will separate ethane from propane and heavier materials in a mixed ethane-propane feed. Both fractionation units will treat and fractionate a demethanized natural gas liquids mixture (Y-grade) into ethane, propane, isobutane, normal butane, and natural gasoline. Emissions from production operations as well as emissions from planned maintenance, startup, and shutdown activities are included with this project.

Permit Notes:

Process Information: MONT BELVIEU NGL FRACTIONATION UNIT

+Process Name: HOT OIL HEATERS
+Process Type: 12.310
Primary Fuel: SWEET NATURAL GAS
Throughput: 150.00
Throughput Unit: MMBTU/H
Process Notes: EPNs: H-EP2, H-61500, H-61501, H-71500, H-71501

Pollutant Information: MONT BELVIEU NGL FRACTIONATION UNIT - HOT OIL HEATERS

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	0.0100
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	HOURLY
Emission Limit 2:	0.0060
Emission Limit 2 Unit:	LB/MMBTU
Emission Limit 2 Avg.	
Time/Condition:	ANNUAL

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	0.0020
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: MONT BELVIEU NGL FRACTIONATION UNIT

+Process Name:	HOT OIL HEATERS MSS
+Process Type:	12.310
Primary Fuel:	
Throughput:	0
Throughput Unit:	
Process Notes:	BURNER CLEANING

Pollutant Information: MONT BELVIEU NGL FRACTIONATION UNIT - HOT OIL HEATERS MSS

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	0.0500
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: MONT BELVIEU NGL FRACTIONATION UNIT

+Process Name: PROCESS VENTS
+Process Type: 50.002
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: MONT BELVIEU NGL FRACTIONATION UNIT - PROCESS VENTS

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: MONT BELVIEU NGL FRACTIONATION UNIT

+Process Name: COOLING TOWER
+Process Type: 99.009
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: MONT BELVIEU NGL FRACTIONATION UNIT - COOLING TOWER

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.7000
Emission Limit 1 Unit: LB/MMGAL
Emission Limit 1 Avg.
Time/Condition: HOURLY
Emission Limit 2: 0.3000
Emission Limit 2 Unit: LB/MMGAL
Emission Limit 2 Avg.
Time/Condition: ANNUAL

Process Information: MONT BELVIEU NGL FRACTIONATION UNIT

+Process Name: TRUCK LOADING

+Process Type: 42.010
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: MONT BELVIEU NGL FRACTIONATION UNIT - TRUCK LOADING

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: MONT BELVIEU NGL FRACTIONATION UNIT

+Process Name: PRESSURIZED LOADING
+Process Type: 50.999
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: MONT BELVIEU NGL FRACTIONATION UNIT - PRESSURIZED LOADING

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: MONT BELVIEU NGL FRACTIONATION UNIT

+Process Name: EQUIPMENT LEAK FUGITIVES
+Process Type: 50.002
Primary Fuel:
Throughput: 0

Throughput Unit:

Process Notes:

Pollutant Information: MONT BELVIEU NGL FRACTIONATION UNIT - EQUIPMENT LEAK FUGITIVES

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: MONT BELVIEU NGL FRACTIONATION UNIT

+Process Name:	EMERGENCY DIESEL ENGINE
+Process Type:	17.210
Primary Fuel:	Ultra-low sulfur diesel
Throughput:	0
Throughput Unit:	
Process Notes:	

Pollutant Information: MONT BELVIEU NGL FRACTIONATION UNIT - EMERGENCY DIESEL ENGINE

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	

Emission Limit 2 Avg.
Time/Condition:

Process Information: MONT BELVIEU NGL FRACTIONATION UNIT

+Process Name: MSS FLARE
+Process Type: 19.390
Primary Fuel: NATURAL GAS
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: MONT BELVIEU NGL FRACTIONATION UNIT - MSS FLARE

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: MONT BELVIEU NGL FRACTIONATION UNIT

+Process Name: EQUIPMENT MSS
+Process Type: 50.002
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes: MSS Process Vessel and Equipment Depressure, Purge, and Degas

Pollutant Information: MONT BELVIEU NGL FRACTIONATION UNIT - EQUIPMENT MSS

+Pollutant Name Volatile Organic Compounds (VOC)

Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: PLAQUEMINE ETHYLENE PLANT 1

RBLC ID: *LA-0352
+Facility Name: PLAQUEMINE ETHYLENE PLANT 1
Date determination
entered in RBLC: 04/03/2020
Permit Type: C: Modify process at existing facility
Facility Description: An ethylene production plant
Permit Notes:

Process Information: PLAQUEMINE ETHYLENE PLANT 1

+Process Name: Cracking Heater H (EP-8, EQT0426)
+Process Type: 12.310
Primary Fuel:
Throughput: 191.28
Throughput Unit: mm btu/hr
Process Notes:

Pollutant Information: PLAQUEMINE ETHYLENE PLANT 1 - Cracking Heater H (EP-8, EQT0426)

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0840
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0840
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0425
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 0.0100
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: 30 DAY ROLLING AVERAGE
Emission Limit 2: 0
~~Emission Limit 2 Unit:~~
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0054
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: 30 DAY ROLLING AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:

Emission Limit 2 Avg.
Time/Condition:

Process Information: PLAQUEMINE ETHYLENE PLANT 1

+Process Name: BP Steam Boiler Packages (EU-2/EU-2, EQT0266/EQT0267)
+Process Type: 12.310
Primary Fuel: natural gas
Throughput: 180.13
Throughput Unit: mm btu/hr (each)
Process Notes:

Pollutant Information: PLAQUEMINE ETHYLENE PLANT 1 - BP Steam Boiler Packages
(EU-2/EU-2, EQT0266/EQT0267)

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	0.0210
Emission Limit 1 Unit:	LB/MM BTU
Emission Limit 1 Avg.	
Time/Condition:	30 DAY ROLLING AVERAGE
Emission Limit 2:	0

Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Previous Page

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: INDECK NILES, LLC

RBLC ID: *MI-0445
+Facility Name: INDECK NILES, LLC
Date determination
entered in RBLC: 12/22/2020
Permit Type: A: New/Greenfield Facility
Facility Description: Natural gas combined cycle power plant
Permit Notes:

Process Information: INDECK NILES, LLC

+Process Name: FGCTGHRSG
+Process Type: 15.210
Primary Fuel: Natural gas

Throughput:	3421.00
Throughput Unit:	MMBTU/H
Process Notes:	3421 MMBTU/H for each turbine 740 MMBTU/H for each duct burner for a combined throughput of 4161 MMBTU/H or 8322 MMBTU/H for both trains. Two combined-cycle natural gas-fired combustion turbine generators (CTGs) with Heat Recovery Steam Generators (HRSG) (EUCTGHRSG1 & EUCTGHRSG2 in FGCTGHRSG). The total hours for startup and shutdown for each train shall not exceed 500 hours per 12-month rolling time period.

Pollutant Information: INDECK NILES, LLC - FGCTGHRSG

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	4.0000
Emission Limit 1 Unit:	PPM
Emission Limit 1 Avg.	
Time/Condition:	PPMVD @15% O2. 24HR ROLL AVG EXCEPT SS
Emission Limit 2:	24.7000
Emission Limit 2 Unit:	LB/H
Emission Limit 2 Avg.	
Time/Condition:	24-HR ROLL AVG EXCEPT SS
+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	2.0000
Emission Limit 1 Unit:	PPM
Emission Limit 1 Avg.	
Time/Condition:	PPMVD @15% O2. 24HR ROLL AVG EXCEPT SS
Emission Limit 2:	15.0000
Emission Limit 2 Unit:	PPM
Emission Limit 2 Avg.	
Time/Condition:	30 DAY ROLL AVG DET. EACH OPERATING DAY
+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	9.9000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	HOURLY; EACH CTGHRSG
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	
+Pollutant Name	Particulate matter, total < 10 μ (TPM10)
Emission Limit 1:	19.8000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	HOURLY; EACH CTGHRSG

Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	
 +Pollutant Name	 Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1:	19.8000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	HOURLY; EACH CTGHRSG
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	
 +Pollutant Name	 Volatile Organic Compounds (VOC)
Emission Limit 1:	4.0000
Emission Limit 1 Unit:	PPM
Emission Limit 1 Avg.	
Time/Condition:	PPMVD@15%O2, HOURLY; EACH
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	
 +Pollutant Name	 Sulfuric Acid (mist, vapors, etc)
Emission Limit 1:	4.6000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	HOURLY; EACH CTGHRSG
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	
 +Pollutant Name	 Sulfur Dioxide (SO2)
Emission Limit 1:	11.7000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	HOURLY; EACH CTGHRSG
Emission Limit 2:	0.0600
Emission Limit 2 Unit:	LB/MMBTU
Emission Limit 2 Avg.	
Time/Condition:	HOURLY; EACH CTGHRSG
 +Pollutant Name	 Carbon Dioxide Equivalent (CO2e)
Emission Limit 1:	1911481.0000
Emission Limit 1 Unit:	T/YR

Emission Limit 1 Avg.
Time/Condition: 12-MO ROLLING TIME PERIOD; EACH CTGHRSG
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDECK NILES, LLC

+Process Name: EUAUXBOILER
+Process Type: 12.310
Primary Fuel: Natural gas
Throughput: 182.00
Throughput Unit: MMBTU/H
Process Notes: One natural gas-fired auxiliary boiler rated at 182 MMBTU/H fuel heat input (EUAUXBOILER).

Pollutant Information: INDECK NILES, LLC - EUAUXBOILER

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0400
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: HOURLY
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.0400
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: 30-DAY ROLLING AVERAGE TIME PERIOD
Emission Limit 2: 0
~~Emission Limit 2 Unit:~~
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, filterable (FPM)
Emission Limit 1: 0.0050
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: HOURLY
Emission Limit 2: 0
Emission Limit 2 Unit:

Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 1.3600
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 1.3600
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0040
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: HOURLY
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.6000
Emission Limit 1 Unit: LB/MMSCF
Emission Limit 1 Avg.
Time/Condition: BASED UPON FUEL RECEIPT RECORDS
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 93346.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: 12-MO ROLLING TIME PERIOD

Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDECK NILES, LLC

+Process Name: FGFUELHTR (2 fuel pre-heaters)
+Process Type: 13.310
Primary Fuel: Natural gas
Throughput: 27.00
Throughput Unit: MMBTU/H
Process Notes: Two natural gas-fired dew point heaters for warming the natural gas fuel (EUFUELHTR1 & EUFUELHTR2 in FGFUELHTR). The total combined heat input during operating shall not exceed 27 MMBTU/hr as well. The CO2e limit is for both units combined; however the other limits are per unit.

Pollutant Information: INDECK NILES, LLC - FGFUELHTR (2 fuel pre-heaters)

+Pollutant Name Carbon Monoxide
Emission Limit 1: 1.1100
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY; EACH FUEL HEATER
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 1.3200
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY; EACH FUEL HEATER
Emission Limit 2: 0

0.048 lb/MMBtu

Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, filterable (FPM)
Emission Limit 1: 0.0020
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: HOURLY; EACH FUEL HEATER
Emission Limit 2: 0
Emission Limit 2 Unit:

Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.1000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY; EACH FUEL HEATER
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.1000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY; EACH FUEL HEATER
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0700
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY; EACH FUEL HEATER
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 2000.0000
Emission Limit 1 Unit: GR/MMSCF
Emission Limit 1 Avg.
Time/Condition: BASED UPON FUEL RECEIPT RECORDS
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 13848.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: 12-MO ROLLING TIME PERIOD

Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDECK NILES, LLC

+Process Name:	EUENGINE (diesel fuel emergency engine)
+Process Type:	17.110
Primary Fuel:	diesel fuel
Throughput:	22.68
Throughput Unit:	MMBTU/H
Process Notes:	A 2,922 horsepower (HP) (2,179 kilowatts (kW)) natural gas-fueled emergency engine (EUENGINE) manufactured in 2011 or later and a displacement of

Pollutant Information: INDECK NILES, LLC - EUENGINE (diesel fuel emergency engine)

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	3.5000
Emission Limit 1 Unit:	G/KW-H
Emission Limit 1 Avg.	
Time/Condition:	HOURLY
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	6.4000
Emission Limit 1 Unit:	G/KW-H
Emission Limit 1 Avg.	
Time/Condition:	HOURLY
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	0.2000
Emission Limit 1 Unit:	G/KW-H
Emission Limit 1 Avg.	
Time/Condition:	HOURLY
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name Particulate matter, total < 10 µ (TPM10)
Emission Limit 1: 1.5800
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 µ (TPM2.5)
Emission Limit 1: 1.5800
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO2)
Emission Limit 1: 15.0000
Emission Limit 1 Unit: PPM
Emission Limit 1 Avg.
Time/Condition: FUEL SUPPLIER CERT. RECORDS OR TEST DATA
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 928.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: 12-MO ROLLING TIME PERIOD
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDECK NILES, LLC

+Process Name: EUFPEENGINE (Emergency engine-diesel fire pump
+Process Type: 17.210
Primary Fuel: diesel fuel
Throughput: 1.66

Throughput Unit: MMBTU/H
Process Notes: A 260 brake horsepower (bhp) diesel-fueled emergency engine manufactured in 2011 or later and a displacement of

Pollutant Information: INDECK NILES, LLC - EUFPENGINE (Emergency engine-diesel fire pump)

+Pollutant Name Carbon Monoxide

Emission Limit 1: 2.6000

Emission Limit 1 Unit: G/BHP-H

Emission Limit 1 Avg.

Time/Condition: HOURLY

Emission Limit 2: 0

Emission Limit 2 Unit:

Emission Limit 2 Avg.

Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)

Emission Limit 1: 3.0000

Emission Limit 1 Unit: G/BHP-H

Emission Limit 1 Avg.

Time/Condition: HOURLY

Emission Limit 2: 0

Emission Limit 2 Unit:

Emission Limit 2 Avg.

Time/Condition:

+Pollutant Name Particulate matter, filterable (FPM)

Emission Limit 1: 0.1500

Emission Limit 1 Unit: G/BHP-H

Emission Limit 1 Avg.

Time/Condition: HOURLY

Emission Limit 2: 0

Emission Limit 2 Unit:

Emission Limit 2 Avg.

Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)

Emission Limit 1: 0.5700

Emission Limit 1 Unit: LB/H

Emission Limit 1 Avg.

Time/Condition: HOURLY

Emission Limit 2: 0

Emission Limit 2 Unit:

Emission Limit 2 Avg.

Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)

Emission Limit 1: 0.5700
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO2)
Emission Limit 1: 15.0000
Emission Limit 1 Unit: PPM
Emission Limit 1 Avg.
Time/Condition: FUEL SUPPLIER CERT. RECORDS OR TEST DATA
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 13.5800
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: 12-MO ROLLING TIME PERIOD
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: NORTHSTAR BLUESCOPE STEEL, LLC

RBLC ID: *OH-0381
+Facility Name: NORTHSTAR BLUESCOPE STEEL, LLC
Date determination
entered in RBLC: 12/24/2019
Permit Type: B: Add new process to existing facility
Facility Description: Steel Mill
Permit Notes: Initial installation PTI for expansion of mini mill operations resulting in increased facility production capacity including modification of existing operations and installation of the following new units: Electric Arc Furnace (EAF), twin-station Ladle Metallurgy Facility (LMF), casting operations, and support systems including cooling towers, natural gas

fired ladles/tundish heaters & dryers, tunnel furnace, dust handling system, storage silos, limestone receiving, scrap handling/storage, & alloy handling/storage.

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name:	Plant Roadways & Parking Areas (F005)
+Process Type:	99.140
Primary Fuel:	
Throughput:	686399.00
Throughput Unit:	MI/YR
Process Notes:	Plant Roadways and Parking Areas. 0.88 miles unpaved and 12.94 miles paved. 27,636 unpaved VMT and 658,763 paved VMT

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - Plant Roadways & Parking Areas (F005)

+Pollutant Name	Particulate matter, fugitive
Emission Limit 1:	16.7400
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD.
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Particulate matter, filterable < 10 μ (FPM10)
Emission Limit 1:	3.5500
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD.
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Particulate matter, filterable < 2.5 μ (FPM2.5)
Emission Limit 1:	0.7500
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD.
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Visible Emissions (VE)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name:	North Alloy Storage and Handling (F006)
+Process Type:	81.290
Primary Fuel:	
Throughput:	0
Throughput Unit:	
Process Notes:	North Alloy Storage and Handling (Scrap Storage Piles)

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - North Alloy Storage and Handling (F006)

+Pollutant Name	Particulate matter, total (TPM)
Emission Limit 1:	0.0024
Emission Limit 1 Unit:	GR/DSCF
Emission Limit 1 Avg.	
Time/Condition:	SEE NOTES
Emission Limit 2:	0.6800
Emission Limit 2 Unit:	LB/H
Emission Limit 2 Avg.	
Time/Condition:	SEE NOTES

+Pollutant Name	Particulate matter, total < 10 μ (TPM10)
Emission Limit 1:	0.0024
Emission Limit 1 Unit:	GR/DSCF
Emission Limit 1 Avg.	
Time/Condition:	SEE NOTES
Emission Limit 2:	0.6800
Emission Limit 2 Unit:	LB/H
Emission Limit 2 Avg.	
Time/Condition:	SEE NOTES

+Pollutant Name	Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1:	0.0024
Emission Limit 1 Unit:	GR/DSCF
Emission Limit 1 Avg.	
Time/Condition:	SEE NOTES

Emission Limit 2: 0.6800
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition: SEE NOTES

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 5.0000
Emission Limit 1 Unit: %
Emission Limit 1 Avg.
Time/Condition: OPACITY AS A 6 MINUTE AVERAGE. SEE NOTE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name: Limestone Receiving #2 (F007)
+Process Type: 81.290
Primary Fuel:
Throughput: 262800.00
Throughput Unit: T/YR
Process Notes:

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - Limestone Receiving #2 (F007)

+Pollutant Name Particulate matter, fugitive
Emission Limit 1: 1.1600
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD.
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, filterable < 10 μ (FPM10)
Emission Limit 1: 1.1600
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD.
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, filterable < 2.5 μ (FPM2.5)

Emission Limit 1: 1.1600
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD.
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name: Scrap Unloading (F008)
+Process Type: 81.290
Primary Fuel:
Throughput: 4070000.00
Throughput Unit: T/YR
Process Notes: Scrap unloading, transfer, and storage

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - Scrap Unloading (F008)

+Pollutant Name Particulate matter, fugitive
Emission Limit 1: 3.4600
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD.
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, filterable < 10 µ (FPM10)
Emission Limit 1: 1.6300
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD.
Emission Limit 2: 0
Emission Limit 2 Unit:

Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, filterable < 2.5 µ (FPM2.5)
Emission Limit 1: 0.2000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD.
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name: Tunnel Furnace (P001)
+Process Type: 12.310
Primary Fuel: Natural Gas
Throughput: 112.00
Throughput Unit: MMBTU/H
Process Notes: Raises and equalizes the temperature of the steel slabs to a level suitable
 for hot rolling.

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - Tunnel Furnace (P001)

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 7.8400
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:

0.07 lb/MMBtu

Emission Limit 2: 34.3400
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Carbon Monoxide
Emission Limit 1: 7.8400

Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 34.3400
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD.

+Pollutant Name Particulate matter, filterable (FPM)
Emission Limit 1: 1.1200
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 4.9100
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 1.1200
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 4.9100
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 1.1200
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 4.9100
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.6200
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 2.7200
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name	Sulfur Dioxide (SO2)
Emission Limit 1:	0.0700
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0.3100
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
Emission Limit 1:	13087.2000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	53321.9400
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name:	Finishing Mill (P003)
+Process Type:	81.290
Primary Fuel:	
Throughput:	0
Throughput Unit:	
Process Notes:	Finish Mill (hot rolling mill).

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - Finishing Mill (P003)

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	2.2000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	9.6400
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD

+Pollutant Name	Particulate matter, total < 10 µ (TPM10)
Emission Limit 1:	2.2000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	9.6400

Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD
+Pollutant Name	Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1:	2.2000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	9.6400
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name:	Contact Cooling Towers (P014)
+Process Type:	99.009
Primary Fuel:	
Throughput:	6.41
Throughput Unit:	MMGAL/H
Process Notes:	5 Cooling Towers with drift eliminators as follows: Meltshop Cooling Tower (501) Caster Non-Contact Cooling Tower (6 Cell) Caster Contact Cooling Tower (503) Mill Contact Cooling Tower (505) Laminar Flow Cooling Tower (506)

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - Contact Cooling Towers (P014)

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	8.7000
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD.
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	
+Pollutant Name	Particulate matter, filterable < 10 μ (FPM10)
Emission Limit 1:	6.9500
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD.
Emission Limit 2:	0
Emission Limit 2 Unit:	

Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, filterable < 2.5 µ (FPM2.5)
Emission Limit 1: 0.0200
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD.
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name: Tunnel Furnace #2 (P018)
+Process Type: 13.310
Primary Fuel: Natural Gas
Throughput: 88.00
Throughput Unit: MMBTU/H
Process Notes: Raises and equalizes the temperature of the steel slabs to a level suitable
 for hot rolling.

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - Tunnel Furnace #2 (P018)

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 6.1600
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 0.07 lb/MMBtu
Emission Limit 2: 26.9800
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Carbon Monoxide
Emission Limit 1: 6.1600
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 26.9800
Emission Limit 2: 26.9800
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 0.8800

Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 3.8500
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.8800
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 3.8500
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.8800
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 3.8500
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.4800
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 2.1000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.0500
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.2200
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
Emission Limit 1:	10283.0600
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	45039.5400
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name:	Contact Cooling Towers - Melt Shop 2 (P027)
+Process Type:	99.009
Primary Fuel:	
Throughput:	2.70
Throughput Unit:	MMGAL/H
Process Notes:	5 Cooling Towers with drift eliminators as follows: Meltshop 2 Cooling Tower (non-contact) Caster Mold Water Cooling Tower Tunnel Furnace Cooling Tower Caster Non-Contact 2 Cooling Tower Caster Contact 2 Cooling Tower

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - Contact Cooling Towers - Melt Shop 2 (P027)

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	1.1700
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD.
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Particulate matter, filterable < 10 μ (FPM10)
Emission Limit 1:	0.9300
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD.
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name: Tundish Dryer #2 (P030)
+Process Type: 19.600
Primary Fuel: Natural Gas
Throughput: 1.20
Throughput Unit: MMBTU/H
Process Notes:

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - Tundish Dryer #2 (P030)

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.1200
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.5300
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0200
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0900
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 0.0040
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0200
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0040
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0200

Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0040
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0200
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0100
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0300
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.0010
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0040
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 140.2200
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 614.1800
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name: Baghouse Dust Handling Melt Shop 2 (P031)

+Process Type:	81.290
Primary Fuel:	
Throughput:	0
Throughput Unit:	
Process Notes:	

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - Baghouse Dust Handling Melt Shop 2 (P031)

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	0.0300
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0.1500
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD

+Pollutant Name	Particulate matter, total < 10 μ (TPM10)
Emission Limit 1:	0.0100
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0.0800
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD

+Pollutant Name	Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1:	0.0100
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0.0800
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD

+Pollutant Name	Visible Emissions (VE)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	

Emission Limit 2 Avg.
Time/Condition:

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name:	LMF Silo #2 & Lime/Carbon Silo: P032,P033,P034
+Process Type:	81.290
Primary Fuel:	
Throughput:	0
Throughput Unit:	
Process Notes:	Consists of 3 emission units: Lime & Carbon Silos #3 (P032) Lime & Carbon Silos #4 (P033) Limestone Silo #2 (P034) All limits per each unit.

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - LMF Silo #2 & Lime/Carbon Silo: P032,P033,P034

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	0.0200
Emission Limit 1 Unit:	GR/DSCF
Emission Limit 1 Avg.	
Time/Condition:	SEE NOTES
Emission Limit 2:	0.5700
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name	Particulate matter, filterable < 10 μ (FPM10)
Emission Limit 1:	0.0200
Emission Limit 1 Unit:	GR/DSCF
Emission Limit 1 Avg.	
Time/Condition:	SEE NOTES
Emission Limit 2:	0.5700
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name	Particulate matter, filterable < 2.5 μ (FPM2.5)
Emission Limit 1:	0.0200
Emission Limit 1 Unit:	GR/DSCF
Emission Limit 1 Avg.	
Time/Condition:	SEE NOTES
Emission Limit 2:	0.5700
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name	Visible Emissions (VE)

Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name: Ladle Preheaters and Dryers (P021-023, P025-026)
+Process Type: 19.600
Primary Fuel: Natural Gas
Throughput: 16.00
Throughput Unit: MMBTU/H
Process Notes: Consists of the 5 following units: Ladle Preheat #5 (P021) Ladle Preheat #6 (P022) Ladle Dryer #5 (P023) Ladle Dryer #3 (P025) Ladle Dryer #4(P026) All limits and throughputs are for each unit.

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - Ladle Preheaters and Dryers (P021-023, P025-026)

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 1.6000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 7.0100
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.3200
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 1.4000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 0.0500
Emission Limit 1 Unit: LB/H

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.2200
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0500
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.2200
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0500
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.2200
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0900
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.3900
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.0100
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0400
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)

Emission Limit 1:	1869.6500
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	8189.0300
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name:	Electric Arc Furnace #2 (P905)
+Process Type:	81.210
Primary Fuel:	
Throughput:	250.00
Throughput Unit:	T/H
Process Notes:	EAF 2 (P905) direct evacuation control (DEC) and LMF 3/4 (P906) DEC vents to baghouse 2. Canopy hood captures emissions from P905, P906 and Caster 2 (P907) and vents to baghouse 2.

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - Electric Arc Furnace #2 (P905)

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	19.9300
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	COMBINED P905, P906 AND P907. SEE NOTES
Emission Limit 2:	87.6900
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name	Particulate matter, total < 10 μ (TPM10)
Emission Limit 1:	26.5700
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	COMBINED P905, P906 AND P907. SEE NOTES
Emission Limit 2:	116.3800
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name	Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1:	26.5700
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	COMBINED P905, P906 AND P907. SEE NOTES

Emission Limit 2: 116.3800
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 87.5000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: COMBINED P905 AND P906. SEE NOTES.
Emission Limit 2: 575.9000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 105.0000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: COMBINED P905 AND P906. SEE NOTES.
Emission Limit 2: 828.5000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Carbon Monoxide
Emission Limit 1: 500.0000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: COMBINED P905 AND P906. SEE NOTES.
Emission Limit 2: 11603.5700
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 87.5000
Emission Limit 1 Unit: LB/H

Emission Limit 1 Avg.
Time/Condition: COMBINED P905 AND P906. SEE NOTES.
Emission Limit 2: 712.2500
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 73000.0000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: COMBINED P905 AND P906. SEE NOTES.
Emission Limit 2: 594220.0000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Particulate matter, fugitive
Emission Limit 1: 20.9600
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name: Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)
+Process Type: 81.220
Primary Fuel:
Throughput: 250.00
Throughput Unit: T/H
Process Notes: EAF 2 (P905) direct evacuation control (DEC) and LMF 3/4 (P906) DEC vents to baghouse 2. Canopy hood captures emissions from P905, P906 and Caster 2 (P907) and vents to baghouse 2.

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - Twin-Station Ladle Metallurgy Facility (LMF 3/4) (P906)

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 73000.0000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: COMBINED P905 AND P906. SEE NOTES.
Emission Limit 2: 594220.0000

Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Carbon Monoxide
Emission Limit 1: 500.0000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: COMBINED P905 AND P906. SEE NOTES.
Emission Limit 2: 11603.5700
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 105.0000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: COMBINED P905 AND P906. SEE NOTES.
Emission Limit 2: 828.5000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Particulate matter, filterable (FPM)
Emission Limit 1: 19.9300
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: COMBINED P905, P906 AND P907. SEE NOTES
Emission Limit 2: 87.6900
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Particulate matter, fugitive
Emission Limit 1: 20.9600
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 26.5700
Emission Limit 1 Unit: LB/H

Emission Limit 1 Avg.
Time/Condition: COMBINED P905, P906 AND P907. SEE NOTES
Emission Limit 2: 116.3800
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 26.5700
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: COMBINED P905, P906 AND P907. SEE NOTES
Emission Limit 2: 116.3800
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 87.5000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: COMBINED P905 AND P906. SEE NOTES.
Emission Limit 2: 575.9000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 87.5000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: COMBINED P905 AND P906. SEE NOTES.
Emission Limit 2: 712.2500
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name:	Caster #2 (P907)
+Process Type:	81.230
Primary Fuel:	
Throughput:	250.00
Throughput Unit:	T/H
Process Notes:	EAF 2 (P905) direct evacuation control (DEC) and LMF 3/4 (P906) DEC vents to baghouse 2. Canopy hood captures emissions from P905, P906 and Caster 2 (P907) and vents to baghouse 2.

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - Caster #2 (P907)

+Pollutant Name	Carbon Dioxide Equivalent (CO ₂ e)
Emission Limit 1:	73000.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	COMBINED P905 AND P906. SEE NOTES.
Emission Limit 2:	594220.0000
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	500.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	COMBINED P905 AND P906. SEE NOTES.
Emission Limit 2:	11603.5700
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name	Nitrogen Oxides (NO _x)
Emission Limit 1:	105.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	COMBINED P905 AND P906. SEE NOTES.
Emission Limit 2:	828.5000
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	19.9300
Emission Limit 1 Unit:	LB/H

Emission Limit 1 Avg.
Time/Condition: COMBINED P905, P906 AND P907. SEE NOTES
Emission Limit 2: 87.6900
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Particulate matter, fugitive
Emission Limit 1: 20.9600
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 26.5700
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: COMBINED P905, P906 AND P907. SEE NOTES
Emission Limit 2: 116.3800
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 26.5700
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: COMBINED P905, P906 AND P907. SEE NOTES
Emission Limit 2: 116.3800
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 87.5000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: COMBINED P905 AND P906. SEE NOTES.
Emission Limit 2: 575.9000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

+Pollutant Name Visible Emissions (VE)

Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 87.5000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: COMBINED P905 AND P906. SEE NOTES.
Emission Limit 2: 712.2500
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING, 12-MONTH PERIOD. SEE NOTES.

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name: Shuttle Cars #1 and #2 (P019 and P020)
+Process Type: 19.600
Primary Fuel: Natural Gas
Throughput: 30.00
Throughput Unit: MMBTU/H
Process Notes: Consists of the 2 following units: Shuttle Car #1 (P019) Shuttle Car #2 (P020) All limits and throughputs are for each unit.

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - Shuttle Cars #1 and #2 (P019 and P020)

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 2.1000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 9.2000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12-MONTH PERIOD.

+Pollutant Name Carbon Monoxide
Emission Limit 1: 2.1000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:

Emission Limit 2: 9.2000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12-MONTH PERIOD.

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 0.3000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 1.3100
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12-MONTH PERIOD.

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.3000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 1.3100
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12-MONTH PERIOD.

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.3000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 1.3100
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12-MONTH PERIOD.

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.1700
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.7400
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12-MONTH PERIOD.

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.0200
Emission Limit 1 Unit: LB/H

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0900
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12-MONTH PERIOD.

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 3505.5900
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 15354.4300
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12-MONTH PERIOD.

Process Information: NORTHSTAR BLUESCOPE STEEL, LLC

+Process Name: Tundish Preheaters #3 and #4 (P028 and P029)
+Process Type: 19.600
Primary Fuel: Natural Gas
Throughput: 9.50
Throughput Unit: mmbtu/hr
Process Notes: All limits and throughputs are for each unit.

Pollutant Information: NORTHSTAR BLUESCOPE STEEL, LLC - Tundish Preheaters #3 and #4 (P028 and P029)

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.9500
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 4.1600
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12-MONTH PERIOD.

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.1900
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.8300
Emission Limit 2 Unit: T/YR

Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12-MONTH PERIOD.

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 0.0300
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.1300
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12-MONTH PERIOD.

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0300
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.1300
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12-MONTH PERIOD.

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0300
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.1300
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12-MONTH PERIOD.

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0500
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.2200
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12-MONTH PERIOD.

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.0100
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:

Emission Limit 2: 0.0400
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12-MONTH PERIOD.

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 1110.1000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 4862.2400
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12-MONTH PERIOD.

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: LEHIGH CEMENT COMPANY LLC

RBLC ID: IN-0312
+Facility Name: LEHIGH CEMENT COMPANY LLC
Date determination
entered in RBLC: 07/10/2019
Permit Type: B: Add new process to existing facility
Facility Description: Portland Cement Plant
Permit Notes:

Process Information: LEHIGH CEMENT COMPANY LLC

+Process Name: Kiln
+Process Type: 90.028
Primary Fuel: natural gas, coal, coke, Fuel oils
Throughput: 7716.00
Throughput Unit: tons clinker/day
Process Notes:

Pollutant Information: LEHIGH CEMENT COMPANY LLC - Kiln

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 1.5000
Emission Limit 1 Unit: LB/TON CLINKER
Emission Limit 1 Avg.
Time/Condition: 30-DAY ROLLING AVERAGE

Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 1.4000
Emission Limit 1 Unit: LB/TON CLINKER
Emission Limit 1 Avg.
Time/Condition: 12-MONTH ROLLING AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.1200
Emission Limit 1 Unit: LB/TON CLINKER
Emission Limit 1 Avg.
Time/Condition: 12-MONTH ROLLING AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 0.9700
Emission Limit 1 Unit: TON CO₂E/TON CLINKER
Emission Limit 1 Avg.
Time/Condition: 12-MONTH ROLLING AVERAGE BASIS
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: LEHIGH CEMENT COMPANY LLC

+Process Name: Finish Mill Air Heaters
+Process Type: 12.310
Primary Fuel: natural gas
Throughput: 16.70
Throughput Unit: MMBtu/hr (each)
Process Notes:

Pollutant Information: LEHIGH CEMENT COMPANY LLC - Finish Mill Air Heaters

+Pollutant Name Nitrogen Oxides (NO_x)

Emission Limit 1:	50.0000
Emission Limit 1 Unit:	LB/MMCF NATURAL GAS
Emission Limit 1 Avg.	
Time/Condition:	NA
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	0.0500
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	-
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	0.0054
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	--
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
Emission Limit 1:	8657.0000
Emission Limit 1 Unit:	TONS/YEAR
Emission Limit 1 Avg.	
Time/Condition:	--
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: LEHIGH CEMENT COMPANY LLC

+Process Name:	spark ignition engine
+Process Type:	17.230
Primary Fuel:	natural gas
Throughput:	750.00
Throughput Unit:	kW
Process Notes:	

Pollutant Information: LEHIGH CEMENT COMPANY LLC - spark ignition engine

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 2.0000
Emission Limit 1 Unit: G/HP-H
Emission Limit 1 Avg.
Time/Condition: --
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 4.0000
Emission Limit 1 Unit: G/HP-H
Emission Limit 1 Avg.
Time/Condition: --
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 1.0000
Emission Limit 1 Unit: G/HP-H
Emission Limit 1 Avg.
Time/Condition: --
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 206.0900
Emission Limit 1 Unit: TONS/YEAR
Emission Limit 1 Avg.
Time/Condition: --
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: LEHIGH CEMENT COMPANY LLC

+Process Name: Diesel tanks
+Process Type: 42.009

Primary Fuel: Diesel
Throughput: 1400.00
Throughput Unit: GALLONS (EACH)
Process Notes:

Pollutant Information: LEHIGH CEMENT COMPANY LLC - Diesel tanks

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: LEHIGH CEMENT COMPANY LLC

+Process Name: Gasoline tank
+Process Type: 42.009
Primary Fuel: gasoline
Throughput: 500.00
Throughput Unit: gallons
Process Notes:

Pollutant Information: LEHIGH CEMENT COMPANY LLC - Gasoline tank

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: CHICKAHOMINY POWER LLC

RBLC ID:	*VA-0332
+Facility Name:	CHICKAHOMINY POWER LLC
Date determination entered in RBLC:	08/07/2019
Permit Type:	A: New/Greenfield Facility
Facility Description:	Natural gas-fired combined cycle power plant, three 1 x1 configuration, 310 MW each, no duct firing, air cooled with two 84 MMBtu/hr natural gas-fired auxiliary boilers, three fuel gas heaters, an emergency generator, fire water pump, and circuit breakers.
Permit Notes:	The proposed project will be a new combined-cycle electrical power generating facility utilizing three power blocks consisting of a combustion turbine with a heat recovery steam generator (HRSG) and a reheat condensing steam turbine generator (three 1 x 1 configuration). The turbine model proposed is a MHPS M501JAC turbine. The project will have a nominal net generating capacity of 1,650 MW. The proposed fuel for the turbines is pipeline-quality natural gas. Emissions from the turbines will be controlled by the use of low carbon fuels and high efficiency design (for GHG), clean fuels and GCPs (for PM, PM10 and PM2.5), SCR and dry low NOx burners (for NOx), and oxidation catalyst (for CO and VOC). Other equipment at the site, including two natural gas-fired auxiliary boilers, three fuel gas heaters, a diesel-fired emergency fire water pump, and a diesel-fired emergency generator, are also proposed and will be subject to emission controls. Natural gas piping components and electrical circuit breakers potentially emit GHG pollutants (expressed as carbon dioxide equivalents, or CO2e) and they will also be covered in the permit. This facility is not proposing duct firing in the HRSGs and is proposing air-cooled turbines that will not require cooling towers.

Process Information: CHICKAHOMINY POWER LLC

+Process Name:	Three (3) Mitsubishi Hitachi Power Systems combustion turbine generators
+Process Type:	15.210
Primary Fuel:	natural gas
Throughput:	35000.00
Throughput Unit:	MMCF/YR
Process Notes:	One on one configuration: 4,066 MMBtu/hr combustion turbine. Emission limits reflect the operation of each of the three turbines.

Pollutant Information: CHICKAHOMINY POWER LLC - Three (3) Mitsubishi Hitachi Power Systems combustion turbine generators

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	2.0000
Emission Limit 1 Unit:	PPMVD 15% O2

Emission Limit 1 Avg.
Time/Condition: 1 HR AVG
Emission Limit 2: 128.4000
Emission Limit 2 Unit: TONS/YR
Emission Limit 2 Avg.
Time/Condition: 12-MO ROLLING AVG

+Pollutant Name Carbon Monoxide
Emission Limit 1: 1.0000
Emission Limit 1 Unit: PPMVD @ 15% O2
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG
Emission Limit 2: 94.3000
Emission Limit 2 Unit: TONS/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING AVG

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.7000
Emission Limit 1 Unit: PPMVD @ 15% O2
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG
Emission Limit 2: 68.1000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING AVG

+Pollutant Name Sulfur Dioxide (SO2)
Emission Limit 1: 0.0011
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG
Emission Limit 2: 20.4000
Emission Limit 2 Unit: TONS/YR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 0.0012
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG
Emission Limit 2: 21.4000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING AVG

+Pollutant Name Particulate matter, filterable (FPM)

Emission Limit 1: 0.0052
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: AVG. OF 3 TEST RUNS
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0052
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: AVG OF 3 TEST RUNS
Emission Limit 2: 12.3000
Emission Limit 2 Unit: LB/HR
Emission Limit 2 Avg.
Time/Condition: AVG OF 3 TEST RUNS

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0052
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: AVG OF 3 TEST RUNS
Emission Limit 2: 12.3000
Emission Limit 2 Unit: LB/HR
Emission Limit 2 Avg.
Time/Condition: AVG OF 3 TEST RUNS

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 812.0000
Emission Limit 1 Unit: LB/CO₂E/MW-HR
Emission Limit 1 Avg.
Time/Condition: 12 MO ROLLING TOTAL
Emission Limit 2: 6452.0000
Emission Limit 2 Unit: BTU/KW-HR NET HHV
Emission Limit 2 Avg.
Time/Condition: INITIAL HEAR RATE TEST

Process Information: CHICKAHOMINY POWER LLC

+Process Name: Three (3) Mitsubishi Hitachi Power Systems Combustion
+Process Type: 15.210
Primary Fuel: natural gas
Throughput: 35000.00
Throughput Unit: MMCF/YR
Process Notes: Alternative operating scenario: during periods of tuning

Pollutant Information: CHICKAHOMINY POWER LLC - Three (3) Mitsubishi Hitachi Power Systems Combustion

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	703.0000
Emission Limit 1 Unit:	LB/TURBINE/CAL. DAY
Emission Limit 1 Avg.	
Time/Condition:	24 HR TOTAL
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	214.0000
Emission Limit 1 Unit:	LB/TURBINE/DAY
Emission Limit 1 Avg.	
Time/Condition:	24 HR TOTAL
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: CHICKAHOMINY POWER LLC

+Process Name:	Three (3) Mitsubishi Hitachi Power Systems combustion turbine generators
+Process Type:	15.210
Primary Fuel:	natural gas
Throughput:	35000.00
Throughput Unit:	MMCF/YR
Process Notes:	Startup and Shutdown

Pollutant Information: CHICKAHOMINY POWER LLC - Three (3) Mitsubishi Hitachi Power Systems combustion turbine generators

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	60.0000
Emission Limit 1 Unit:	LB/TURBINE/EVENT
Emission Limit 1 Avg.	
Time/Condition:	COLD START-42 MINUTES OR LESS
Emission Limit 2:	0
Emission Limit 2 Unit:	LB/TURBINE/EVENT
Emission Limit 2 Avg.	
Time/Condition:	COLD START-42 MINUTES OR LESS

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	444.0000
Emission Limit 1 Unit:	LB/TURBINE/EVENT
Emission Limit 1 Avg.	
Time/Condition:	COLD START 42 MIN OR LESS
Emission Limit 2:	396.0000
Emission Limit 2 Unit:	LB/TURBINE/EVENT
Emission Limit 2 Avg.	
Time/Condition:	WARM START 42 MIN OR LESS

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	216.0000
Emission Limit 1 Unit:	LB/TURBINE/EVENT
Emission Limit 1 Avg.	
Time/Condition:	COLD START 42 MIN OR LESS
Emission Limit 2:	216.0000
Emission Limit 2 Unit:	LB/TURBINE/EVENT
Emission Limit 2 Avg.	
Time/Condition:	WARM START 42 MIN OR LESS

Process Information: CHICKAHOMINY POWER LLC

+Process Name:	Two (2) Auxiliary Boilers
+Process Type:	12.310
Primary Fuel:	Natural Gas
Throughput:	721.00
Throughput Unit:	MMCF/YR
Process Notes:	

Pollutant Information: CHICKAHOMINY POWER LLC - Two (2) Auxiliary Boilers

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	0.0110
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	CORRECTED TO 3% O2
Emission Limit 2:	1.0000
Emission Limit 2 Unit:	LB/H
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	0.0370
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	

Emission Limit 2: 3.2000
Emission Limit 2 Unit: LB/HR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.6000
Emission Limit 1 Unit: LB/HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 2.6000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING AVG

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.6000
Emission Limit 1 Unit: LB/HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 2.6000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING AVG

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.0011
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.5000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING TOTAL

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0050
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 1.9000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING AVG

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 43827.0000
Emission Limit 1 Unit: T/YR

Emission Limit 1 Avg.
Time/Condition: 12 MO ROLLING TOTAL
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: CHICKAHOMINY POWER LLC

+Process Name: Three (3) Fuel Gas Heaters
+Process Type: 19.600
Primary Fuel: Natural Gas
Throughput: 103.00
Throughput Unit: MMCF/YR
Process Notes:

Pollutant Information: CHICKAHOMINY POWER LLC - Three (3) Fuel Gas Heaters

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.0110
Emission Limit 1 Unit: LBS/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.6000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING TOTAL

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0370
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.5000
Emission Limit 2 Unit: LB/HR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.4000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.5000
Emission Limit 1 Unit: T/YR (EACH)
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO2)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.3000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: 12 MO ROLLING AVG
Emission Limit 2: 0.0050
Emission Limit 2 Unit: LB/MMBTU
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 6261.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:

Emission Limit 2 Avg.
Time/Condition:

Process Information: CHICKAHOMINY POWER LLC

+Process Name:	Emergency Diesel Generator - 300 kW
+Process Type:	17.110
Primary Fuel:	Ultra Low Sulfur Diesel
Throughput:	500.00
Throughput Unit:	H/YR
Process Notes:	

Pollutant Information: CHICKAHOMINY POWER LLC - Emergency Diesel Generator - 300 kW

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	4.8000
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	
Emission Limit 2:	11.7000
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg. Time/Condition:	12 MO ROLLING AVG

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	0.1500
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Particulate matter, total < 10 µ (TPM10)
Emission Limit 1:	0.1500
Emission Limit 1 Unit:	G/HP-HR
Emission Limit 1 Avg. Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Particulate matter, total < 2.5 µ (TPM2.5)
Emission Limit 1:	0.1500
Emission Limit 1 Unit:	G/HP-HR

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 2.6000
Emission Limit 1 Unit: G/HP-HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 6.4000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING AVG

+Pollutant Name Sulfur Dioxide (SO2)
Emission Limit 1: 0.0015
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 0.0001
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 1203.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: 12 MO ROLLING TOTAL
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: CHICKAHOMINY POWER LLC

+Process Name: Emergency Fire Water Pump
+Process Type: 17.210
Primary Fuel: Ultra Low Sulfur Diesel
Throughput: 500.00
Throughput Unit: HR/YR
Process Notes:

Pollutant Information: CHICKAHOMINY POWER LLC - Emergency Fire Water Pump

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 3.0000
Emission Limit 1 Unit: G/HP-HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.7000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, filterable (FPM)
Emission Limit 1: 0.1500
Emission Limit 1 Unit: G/HP-HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.1500
Emission Limit 1 Unit: G/HP-HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.1500
Emission Limit 1 Unit: G/HP-HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0

Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 2.6000
Emission Limit 1 Unit: G/HP-HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.6000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.1100
Emission Limit 1 Unit: G/HP-HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.0015
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 0.0001
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 106.0000
Emission Limit 1 Unit: T/YR

Emission Limit 1 Avg.
Time/Condition: 12 MO ROLLING TOTAL
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: CHICKAHOMINY POWER LLC

+Process Name: Circuit Breakers
+Process Type: 99.999
Primary Fuel:
Throughput: 0.50
Throughput Unit: %
Process Notes: Total capacity of 22,800 lbs of SF 6 Annual Leakage Rate

Pollutant Information: CHICKAHOMINY POWER LLC - Circuit Breakers

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: CHICKAHOMINY POWER LLC

+Process Name: Equipment Leaks from Natural Gas Components
+Process Type: 99.999
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes: Workpractice requirements

Pollutant Information: CHICKAHOMINY POWER LLC - Equipment Leaks from Natural Gas Components

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0

Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Previous Page

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: BIG RIVER STEEL LLC

RBLC ID:	AR-0163
+Facility Name:	BIG RIVER STEEL LLC
Date determination entered in RBLC:	07/13/2020
Permit Type:	Both B: (Add new process to existing facility) &C: (Modify process at existing facility)
Facility Description:	THE FACILITY WILL CONSIST OF TWO ELECTRIC ARC FURNACES TO MELT SCRAP IRON AND STEEL, LADLE METALLURGY FURNACES (LMF) TO ADJUST THE CHEMISTRY, A RH DEGASSER AND BOILER FOR FURTHER REFINEMENT, AND CASTERS.
Permit Notes:	

Process Information: BIG RIVER STEEL LLC

+Process Name:	Lime Injector Burners
+Process Type:	17.130
Primary Fuel:	Natural Gas
Throughput:	0
Throughput Unit:	
Process Notes:	Each EAF is equipped with a natural gas fired lime injection burner each rated at 18.5 MMBtu/hr and assigned SN-01A and SN-02A, respectively.

Pollutant Information: BIG RIVER STEEL LLC - Lime Injector Burners

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	0.0075
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name Particulate matter, total < 10 µ (TPM10)
Emission Limit 1: 0.0075
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 µ (TPM2.5)
Emission Limit 1: 0.0075
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 5.0000
Emission Limit 1 Unit: %
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0824
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.0950
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:

Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide
Emission Limit 1: 117.0000
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Methane
Emission Limit 1: 0.0022
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrous Oxide (N2O)
Emission Limit 1: 0.0002
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: BIG RIVER STEEL LLC

+Process Name: Steel Casters
+Process Type: 81.230
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes: The liquid steel proceeds from the LMF to the RH Degasser, SN-03, or to the Casters, SN-14 and SN-15 depending on the type of steel being produced.

Pollutant Information: BIG RIVER STEEL LLC - Steel Casters

+Pollutant Name Particulate matter, filterable (FPM)

Emission Limit 1: 0.0620
Emission Limit 1 Unit: LB/TON LIQUID STEEL
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0620
Emission Limit 1 Unit: LB/TON LIQUID STEEL
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0620
Emission Limit 1 Unit: LB/TON LIQUID STEEL
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: BIG RIVER STEEL LLC

+Process Name: Tunnel Furnaces
+Process Type: 12.310
Primary Fuel: Natural Gas
Throughput: 234.00
Throughput Unit:
Process Notes: 2 TUNNEL FURNCE SECTIONS 234 MMBTU/HR AND 192
MMBTU/HR MADE UP OF A SERIES OF INDIVIDUAL 3 MMBTU
BURNERS. Also includes the Tunnel Furnace Shuttle Zone.

Pollutant Information: BIG RIVER STEEL LLC - Tunnel Furnaces

+Pollutant Name Particulate matter, filterable (FPM)
Emission Limit 1: 0.0075
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:

Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	
+Pollutant Name	Particulate matter, total < 10 µ (TPM10)
Emission Limit 1:	0.0075
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	
+Pollutant Name	Particulate matter, total < 2.5 µ (TPM2.5)
Emission Limit 1:	0.0075
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	
+Pollutant Name	Visible Emissions (VE)
Emission Limit 1:	5.0000
Emission Limit 1 Unit:	%
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	
+Pollutant Name	Sulfur Dioxide (SO2)
Emission Limit 1:	0.0006
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	
+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	0.0054
Emission Limit 1 Unit:	LB/MMBTU

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0824
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.1000
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide
Emission Limit 1: 117.0000
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Methane
Emission Limit 1: 0.0022
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrous Oxide (N₂O)

Emission Limit 1: 0.0002
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: BIG RIVER STEEL LLC

+Process Name: Emergency Engines
+Process Type: 17.110
Primary Fuel: Diesel
Throughput: 0
Throughput Unit:
Process Notes: The emergency generators are diesel fired generators which provide electrical power in the event of power failure.

Pollutant Information: BIG RIVER STEEL LLC - Emergency Engines

+Pollutant Name Particulate matter, filterable (FPM)
Emission Limit 1: 0.2000
Emission Limit 1 Unit: G/KW-HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.2000
Emission Limit 1 Unit: G/KW-HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.2000
Emission Limit 1 Unit: G/KW-HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0

Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 20.0000
Emission Limit 1 Unit: %
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO2)
Emission Limit 1: 0.0015
Emission Limit 1 Unit: % SULFUR FUEL
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 1.5500
Emission Limit 1 Unit: G/KW-HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 3.5000
Emission Limit 1 Unit: G/KW-HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 4.8600
Emission Limit 1 Unit: G/KW-HR

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide
Emission Limit 1: 163.0000
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Methane
Emission Limit 1: 0.0061
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrous Oxide (N₂O)
Emission Limit 1: 0.0013
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: BIG RIVER STEEL LLC

+Process Name: EAF I/II Lime Injection System
+Process Type: 81.290
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes: EAF I/II Lime Injection System, SN-103, accounts for the emissions from the transport and storage of the various types of lime for injection into EAF I and II.

Pollutant Information: BIG RIVER STEEL LLC - EAF I/II Lime Injection System

+Pollutant Name Particulate matter, filterable (FPM)
Emission Limit 1: 0.1000
Emission Limit 1 Unit: LB/HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.4000
Emission Limit 2 Unit: TPY
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 µ (TPM10)
Emission Limit 1: 0.1000
Emission Limit 1 Unit: LB/HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.4000
Emission Limit 2 Unit: TPY
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 µ (TPM2.5)
Emission Limit 1: 0.1000
Emission Limit 1 Unit: LB/HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.4000
Emission Limit 2 Unit: TPY
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 5.0000
Emission Limit 1 Unit: %
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Facility Information: PETMIN USA INCORPORATED

RBLC ID:	OH-0379
+Facility Name:	PETMIN USA INCORPORATED
Date determination entered in RBLC:	04/02/2019
Permit Type:	A: New/Greenfield Facility
Facility Description:	Merchant Pig Iron Production
Permit Notes:	Initial PTI to convert iron ore pellets to merchant pig iron, including the installation of a process gas heater, electric arc furnace, startup boiler, black start generator, emergency generators, ladle preheaters, quenching & wastewater treatment, material handling and roadways.

Process Information: PETMIN USA INCORPORATED

+Process Name:	Startup boiler (B001)
+Process Type:	13.310
Primary Fuel:	Natural gas
Throughput:	15.17
Throughput Unit:	MMBTU/H
Process Notes:	Startup boiler, natural gas fired with maximum heat input of 15.17 MMBtu/hr.

Pollutant Information: PETMIN USA INCORPORATED - Startup boiler (B001)

+Pollutant Name	Particulate matter, total < 10 μ (TPM10)
Emission Limit 1:	0.1130
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	SEE NOTES.
Emission Limit 2:	0.4900
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING 12 MONTH PERIOD. SEE NOTES.
+Pollutant Name	Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1:	0.1130
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	SEE NOTES.
Emission Limit 2:	0.4900
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING 12 MONTH PERIOD. SEE NOTES.

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 1784.0000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 7814.0000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.6340
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:

0.04 lb/MMBtu

Emission Limit 2: 2.7800
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: PETMIN USA INCORPORATED

+Process Name: Plant Roadways (F001)
+Process Type: 99.150
Primary Fuel:
Throughput: 4195.00
Throughput Unit: MI/YR
Process Notes: Unpaved plant roadways and parking areas

Pollutant Information: PETMIN USA INCORPORATED - Plant Roadways (F001)

+Pollutant Name Particulate matter, total < 10 μ (TPM₁₀)
Emission Limit 1: 0.2100
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0

Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0200
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: PETMIN USA INCORPORATED

+Process Name: Process gas heater (P001)
+Process Type: 12.310
Primary Fuel: Natural gas
Throughput: 218.90
Throughput Unit: MMBTU/H
Process Notes: Process gas preheater, natural gas, indirect fired with maximum heat
 input of 218.9 MMBtu/hr, emissions are vented to a stack.

Pollutant Information: PETMIN USA INCORPORATED - Process gas heater (P001)

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 1.6300
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: SEE NOTES.
Emission Limit 2: 7.1400
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD. SEE NOTES.

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)

Emission Limit 1: 1.6300
 Emission Limit 1 Unit: LB/H
 Emission Limit 1 Avg.
 Time/Condition: SEE NOTES.
 Emission Limit 2: 7.1400
 Emission Limit 2 Unit: T/YR
 Emission Limit 2 Avg.
 Time/Condition: PER ROLLING 12 MONTH PERIOD. SEE NOTES.

+Pollutant Name	Nitrogen Oxides (NO _x)	0.064 lb/MMBtu
Emission Limit 1:	14.0100	
Emission Limit 1 Unit:	LB/H	
Emission Limit 1 Avg.		
Time/Condition:		
Emission Limit 2:	61.3600	
Emission Limit 2 Unit:	T/YR	
Emission Limit 2 Avg.		
Time/Condition:	PER ROLLING 12 MONTH PERIOD	

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
 Emission Limit 1: 25830.2000
 Emission Limit 1 Unit: LB/H
 Emission Limit 1 Avg.
 Time/Condition:
 Emission Limit 2: 113136.0000
 Emission Limit 2 Unit: T/YR
 Emission Limit 2 Avg.
 Time/Condition: PER ROLLING 12 MONTH PERIOD. SEE NOTES.

+Pollutant Name Visible Emissions (VE)
 Emission Limit 1: 0
 Emission Limit 1 Unit:
 Emission Limit 1 Avg.
 Time/Condition:
 Emission Limit 2: 0
 Emission Limit 2 Unit:
 Emission Limit 2 Avg.
 Time/Condition:

Process Information: PETMIN USA INCORPORATED

+Process Name: Black Start Generator (P007)
 +Process Type: 17.210
 Primary Fuel: Diesel fuel
 Throughput: 158.00
 Throughput Unit: HP
 Process Notes: Black start generator, 158 HP diesel engine.

Pollutant Information: PETMIN USA INCORPORATED - Black Start Generator (P007)

+Pollutant Name Particulate matter, filterable < 10 µ (FPM10)
Emission Limit 1: 5.2200
Emission Limit 1 Unit: X10-3 LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 2.6100
Emission Limit 2 Unit: X10-4 T/YR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, filterable < 2.5 µ (FPM2.5)
Emission Limit 1: 5.2200
Emission Limit 1 Unit: X10-3 LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 2.6100
Emission Limit 2 Unit: X10-4 T/YR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 0.1040
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 5.2000
Emission Limit 2 Unit: X10-3 T/YR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 181.7000
Emission Limit 1 Unit: LB/H

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 9.0900
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition:

Process Information: PETMIN USA INCORPORATED

+Process Name: Quenching & wastewater treatment (P008)
+Process Type: 81.900
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes: Quenching & wastewater treatment, equipped with a flare.

Pollutant Information: PETMIN USA INCORPORATED - Quenching & wastewater treatment (P008)

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0257
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: SEE NOTES.
Emission Limit 2: 0.1130
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD. SEE NOTES.

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0257
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: SEE NOTES.
Emission Limit 2: 0.1130
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD. SEE NOTES.

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.2350
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 1.0300
Emission Limit 2 Unit: T/YR

Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 405.7200
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 1777.0000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

Process Information: PETMIN USA INCORPORATED

+Process Name: Electric Arc Furnace (EAF) (P901)
+Process Type: 81.900
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes: Electric Arc Furnace, including smelting, tapping, pouring, and casting.

Pollutant Information: PETMIN USA INCORPORATED - Electric Arc Furnace (EAF) (P901)

+Pollutant Name Particulate matter, total < 10 µ (TPM10)
Emission Limit 1: 0.0740
Emission Limit 1 Unit: LB/T
Emission Limit 1 Avg.
Time/Condition: OF MERCHANT PIG IRON (MPI) PRODUCED
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 µ (TPM2.5)
Emission Limit 1: 0.0061
Emission Limit 1 Unit: LB/T
Emission Limit 1 Avg.
Time/Condition: OF MERCHANT PIG IRON (MPI) PRODUCED
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 1.4000
Emission Limit 1 Unit: LB/T

Emission Limit 1 Avg.
Time/Condition: OF MERCHANT PIG IRON (MPI) PRODUCED
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 186.4100
Emission Limit 1 Unit: LB/T
Emission Limit 1 Avg.
Time/Condition: OF MERCHANT PIG IRON (MPI) PRODUCED
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: PETMIN USA INCORPORATED

+Process Name: Material Handling (P902)
+Process Type: 81.900
Primary Fuel:
Throughput: 788000.00
Throughput Unit: T/YR
Process Notes: Raw materials handling, including screening and transfer via conveyor system.

Pollutant Information: PETMIN USA INCORPORATED - Material Handling (P902)

+Pollutant Name Particulate matter, filterable < 10 µ (FPM10)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition: SEE NOTES.
Emission Limit 2: 0
Emission Limit 2 Unit:

Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, filterable < 2.5 µ (FPM2.5)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition: SEE NOTES.
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: PETMIN USA INCORPORATED

+Process Name: Emergency Generators (P005 and P006)
+Process Type: 17.110
Primary Fuel: Diesel fuel
Throughput: 3131.00
Throughput Unit: HP
Process Notes: Two identical Emergency generators, 3131 HP diesel engines.
 Throughputs and limits are for one generator, except as noted.

Pollutant Information: PETMIN USA INCORPORATED - Emergency Generators (P005 and P006)

+Pollutant Name Particulate matter, filterable < 10 µ (FPM10)
Emission Limit 1: 0.1500
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0100
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, filterable < 2.5 µ (FPM2.5)
Emission Limit 1: 0.1500

Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0100
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 3.4500
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.1700
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 3632.0000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 181.6000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition:

Process Information: PETMIN USA INCORPORATED

+Process Name: Ladle Preheaters (P002, P003 and P004)
+Process Type: 13.310
Primary Fuel: Natural gas
Throughput: 15.00
Throughput Unit: MMBTU/H

Process Notes: Three identical Ladle dryers / preheaters, natural gas fired with maximum heat input of 15.00 MMBtu/hr, emissions are vented to the EAF baghouse. Throughputs and limits are for one preheater, except as noted.

Pollutant Information: PETMIN USA INCORPORATED - Ladle Preheaters (P002, P003 and P004)

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.1120
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.4900
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.1120
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.4900
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 2.1200
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 9.2900
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 1764.0000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 7726.0000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: NUCOR STEEL KANKAKEE, INC.

RBLC ID:	IL-0126
+Facility Name:	NUCOR STEEL KANKAKEE, INC.
Date determination entered in RBLC:	12/05/2018
Permit Type:	Both B: (Add new process to existing facility) &C: (Modify process at existing facility)
Facility Description:	Nucor Steel produces steel billets from scrap metal in an electric arc furnace shop. The billets produced at the plant are either further processed at the rolling mills. The rolling mills at the plant produce steel bars and rods in various shapes and sizes from the billets produced at the plant.
Permit Notes:	Operation of certain existing emission units at the plant were considered to be affected units for the project. These existing units were appropriately addressed in the permit. The existing units that were considered as affected units are an existing electric arc furnace, a reheat furnace and existing roadways.

Process Information: NUCOR STEEL KANKAKEE, INC.

+Process Name:	Natural Gas-Fired Reheat Furnace
+Process Type:	81.290
Primary Fuel:	Natural Gas
Throughput:	125.50
Throughput Unit:	mmBtu/hr
Process Notes:	

Pollutant Information: NUCOR STEEL KANKAKEE, INC. - Natural Gas-Fired Reheat Furnace

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	0.0700
Emission Limit 1 Unit:	LBS/MMBTU
~~Emission Limit 1 Avg.~~	
Time/Condition:	DAILY (24-HR) AVERAGE
Emission Limit 2:	11.3000
Emission Limit 2 Unit:	LBS/HR
Emission Limit 2 Avg.	
Time/Condition:	AVERAGE VALID TEST RUN
+Pollutant Name	Particulate matter, total (TPM)
Emission Limit 1:	0.0130
Emission Limit 1 Unit:	LBS/MMBTU

Emission Limit 1 Avg.
Time/Condition: 3-HR BLOCK AVERAGE
Emission Limit 2: 5.0000
Emission Limit 2 Unit: PERCENT OPACITY
Emission Limit 2 Avg.
Time/Condition: VERIFIED USING METHOD 9 TESTING

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 65200.0000
Emission Limit 1 Unit: TONS
Emission Limit 1 Avg.
Time/Condition: TOTAL 12 CONSECUTIVE MONTHS
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: NUCOR STEEL KANKAKEE, INC.

+Process Name: Rolling Mill and Cutting Torches
+Process Type: 81.290
Primary Fuel:
Throughput: 500000.00
Throughput Unit: tons/yr
Process Notes:

Pollutant Information: NUCOR STEEL KANKAKEE, INC. - Rolling Mill and Cutting Torches

+Pollutant Name Particulate matter, filterable (FPM)
Emission Limit 1: 6.6500
Emission Limit 1 Unit: TON/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 424.0000
Emission Limit 1 Unit: TONS
Emission Limit 1 Avg.
Time/Condition: TOTAL 12 CONSECUTIVE MONTHS
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	0.1000
Emission Limit 1 Unit:	LBS/MMBTU
Emission Limit 1 Avg. Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Particulate matter, total < 10 μ (TPM10)
Emission Limit 1:	6.6500
Emission Limit 1 Unit:	TON/YR
Emission Limit 1 Avg. Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1:	2.4600
Emission Limit 1 Unit:	TON/YR
Emission Limit 1 Avg. Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

Process Information: NUCOR STEEL KANKAKEE, INC.

+Process Name:	Gas-Fired Space Heaters
+Process Type:	12.310
Primary Fuel:	Natural Gas
Throughput:	25.00
Throughput Unit:	mmBtu/hr
Process Notes:	Throughput addresses all space heaters

Pollutant Information: NUCOR STEEL KANKAKEE, INC. - Gas-Fired Space Heaters

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	0.0019
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	INDIVIDUAL UNITS

Emission Limit 2: 0.1500
Emission Limit 2 Unit: LB/HR
Emission Limit 2 Avg.
Time/Condition: TOTAL FROM ALL UNITS

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.1000
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 1.9300
Emission Limit 2 Unit: LB/HR
Emission Limit 2 Avg.
Time/Condition: (TOTAL FROM ALL UNITS)

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 10197.0000
Emission Limit 1 Unit: TON/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM₁₀)
Emission Limit 1: 0.0075
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: INDIVIDUAL UNITS
Emission Limit 2: 0.1500
Emission Limit 2 Unit: LB/HR
Emission Limit 2 Avg.
Time/Condition: TOTAL FROM ALL UNITS

+Pollutant Name Particulate matter, total < 2.5 μ (TPM_{2.5})
Emission Limit 1: 0.0075
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: FOR INDIVIDUAL UNITS
Emission Limit 2: 0.1500
Emission Limit 2 Unit: LB/HR
Emission Limit 2 Avg.
Time/Condition: TOTAL FROM ALL UNITS

Process Information: NUCOR STEEL KANKAKEE, INC.

+Process Name: Cooling Towers
+Process Type: 81.290
Primary Fuel:
Throughput: 4500.00
Throughput Unit: gallons/minute
Process Notes:

Pollutant Information: NUCOR STEEL KANKAKEE, INC. - Cooling Towers

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 0.0010
Emission Limit 1 Unit: WEIGHT PERCENT
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 4000.0000
Emission Limit 2 Unit: TOTAL DISSOLVED SOLID
Emission Limit 2 Avg.
Time/Condition:

Process Information: NUCOR STEEL KANKAKEE, INC.

+Process Name: Roadways
+Process Type: 81.290
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: NUCOR STEEL KANKAKEE, INC. - Roadways

+Pollutant Name Particulate matter, filterable (FPM)
Emission Limit 1: 2.3900
Emission Limit 1 Unit: TON/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.4800
Emission Limit 1 Unit: TON/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0

Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 µ (TPM2.5)
Emission Limit 1: 0.1200
Emission Limit 1 Unit: TON/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: CALCASIEU PASS LNG PROJECT

RBLC ID: LA-0331
+Facility Name: CALCASIEU PASS LNG PROJECT
Date determination
entered in RBLC: 02/14/2019
Permit Type: A: New/Greenfield Facility
Facility Description: New Liquefied Natural Gas (LNG) production, storage, and export
terminal.
Permit Notes: Application Received September 2, 2015.

Process Information: CALCASIEU PASS LNG PROJECT

+Process Name: Combined Cycle Combustion Turbines (CCCT1 to CCCT5)
+Process Type: 15.210
Primary Fuel: Natural Gas
Throughput: 921.00
Throughput Unit: MM BTU/h
Process Notes:

Pollutant Information: CALCASIEU PASS LNG PROJECT - Combined Cycle Combustion
Turbines (CCCT1 to CCCT5)

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 2.5000
Emission Limit 1 Unit: PPMV

Emission Limit 1 Avg.
Time/Condition: 30 DAY ROLLING AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 5.0000
Emission Limit 1 Unit: PPMV
Emission Limit 1 Avg.
Time/Condition: 30 DAY ROLLING AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 9.5300
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 9.5300
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 4.0000
Emission Limit 1 Unit: PPMV
Emission Limit 1 Avg.
Time/Condition: ANNUAL AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)

Emission Limit 1: 1.1000
Emission Limit 1 Unit: PPMV
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 2602275.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: ANNUAL TOTAL
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: CALCASIEU PASS LNG PROJECT

+Process Name: Hot Oil Heaters (HOH1 to HOH6)
+Process Type: 12.310
Primary Fuel: Natural Gas
Throughput: 115.00
Throughput Unit: MM BTU/h
Process Notes:

Pollutant Information: CALCASIEU PASS LNG PROJECT - Hot Oil Heaters (HOH1 to HOH6)

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 0.0380
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: 3-HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0820
Emission Limit 1 Unit: LB/ MM BTU
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:

Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0075
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0075
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.0006
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0054
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 354456.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition:

Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: CALCASIEU PASS LNG PROJECT

+Process Name: Acid Gas Thermal Oxidizer (AGTO)
+Process Type: 19.200
Primary Fuel: Natural Gas
Throughput: 186.00
Throughput Unit: MM BTU/h
Process Notes: Thermal Oxidizer to combust sour gas from the acid removal unit.

Pollutant Information: CALCASIEU PASS LNG PROJECT - Acid Gas Thermal Oxidizer (AGTO)

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.1500
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0900
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0082
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)

Emission Limit 1: 0.0082
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO2)
Emission Limit 1: 2.3700
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0100
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 768337.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: ANNUAL TOTAL
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: CALCASIEU PASS LNG PROJECT

+Process Name: Large Emergency Engines (>50kW)
+Process Type: 17.110
Primary Fuel: Diesel Fuel
Throughput: 5364.00
Throughput Unit: HP
Process Notes: Three emergency black-start engines and two emergency generators

Pollutant Information: CALCASIEU PASS LNG PROJECT - Large Emergency Engines (>50kW)

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 5.6000
Emission Limit 1 Unit: G/KW-H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 3.5000
Emission Limit 1 Unit: G/KW-H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.2000
Emission Limit 1 Unit: G/KW-H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.2000
Emission Limit 1 Unit: G/KW-H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.7900
Emission Limit 1 Unit: G/KW-H

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO2)
Emission Limit 1: 0
Emission Limit 1 Unit: LB/HP-H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 1481.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: ANNUAL TOTAL
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: CALCASIEU PASS LNG PROJECT

+Process Name: Fugitive Equipment Leaks
+Process Type: 50.002
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes: Fugitive Emissions

Pollutant Information: CALCASIEU PASS LNG PROJECT - Fugitive Equipment Leaks

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 5.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: ANNUAL TOTAL
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
Emission Limit 1:	3141.0000
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg.	
Time/Condition:	ANNUAL TOTAL
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: CALCASIEU PASS LNG PROJECT

+Process Name:	Flares (WRMFLR, CLDFLR, LPFLR)
+Process Type:	19.390
Primary Fuel:	Natural Gas
Throughput:	21.74
Throughput Unit:	MM BTU/h
Process Notes:	Flare system to provide safe and reliable disposal of streams released during start-up, shutdown, plant upsets, and emergency conditions.

Pollutant Information: CALCASIEU PASS LNG PROJECT - Flares (WRMFLR, CLDFLR, LPFLR)

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	0.0680
Emission Limit 1 Unit:	LB/MM BTU
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	0.3100
Emission Limit 1 Unit:	LB/MM BTU
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Particulate matter, total < 10 µ (TPM10)
Emission Limit 1:	0.0074
Emission Limit 1 Unit:	LB/MM BTU

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0074
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 4.0000
Emission Limit 1 Unit: PPMV
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0060
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: CALCASIEU PASS LNG PROJECT

+Process Name:	Marine Loading Flare
+Process Type:	19.390
Primary Fuel:	Natural Gas
Throughput:	0.31
Throughput Unit:	MM BTU/h
Process Notes:	Control Device for LNG loading process.

Pollutant Information: CALCASIEU PASS LNG PROJECT - Marine Loading Flare

+Pollutant Name	Nitrogen Oxides (NO _x)
Emission Limit 1:	0.0680
Emission Limit 1 Unit:	LB/MM BTU
Emission Limit 1 Avg. Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	0.3100
Emission Limit 1 Unit:	LB/MM BTU
Emission Limit 1 Avg. Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Particulate matter, total < 10 μ (TPM10)
Emission Limit 1:	0.0074
Emission Limit 1 Unit:	LB/MM BTU
Emission Limit 1 Avg. Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1:	0.0074
Emission Limit 1 Unit:	LB/MM BTU
Emission Limit 1 Avg. Time/Condition:	
Emission Limit 2:	0

Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO2)
Emission Limit 1: 4.0000
Emission Limit 1 Unit: PPMV
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0060
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 1107.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: ANNUAL TOTAL
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: CALCASIEU PASS LNG PROJECT

+Process Name: Aeroderivative Simple Cycle Combustion Turbine
+Process Type: 16.110
Primary Fuel: Natural Gas
Throughput: 263.00
Throughput Unit: MM BTU/h
Process Notes:

Pollutant Information: CALCASIEU PASS LNG PROJECT - Aeroderivative Simple Cycle Combustion Turbine

+Pollutant Name Nitrogen Oxides (NOx)

Emission Limit 1: 25.0000
Emission Limit 1 Unit: PPMV
Emission Limit 1 Avg.
Time/Condition: 30 DAY ROLLING AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 36.0000
Emission Limit 1 Unit: PPMV
Emission Limit 1 Avg.
Time/Condition: 30 DAY ROLLING AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 4.5000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 4.5000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 4.0000
Emission Limit 1 Unit: PPMV
Emission Limit 1 Avg.
Time/Condition: ANNUAL AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	1.5000
Emission Limit 1 Unit:	PPMV
Emission Limit 1 Avg.	
Time/Condition:	3 HOUR AVERAGE
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
Emission Limit 1:	134907.0000
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg.	
Time/Condition:	ANNUAL TOTAL
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: CALCASIEU PASS LNG PROJECT

+Process Name:	Storage Tanks
+Process Type:	50.002
Primary Fuel:	
Throughput:	7183.15
Throughput Unit:	CF
Process Notes:	Pentane and Amine Flash Drums

Pollutant Information: CALCASIEU PASS LNG PROJECT - Storage Tanks

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: CALCASIEU PASS LNG PROJECT

+Process Name:	Simple Cycle Combustion Turbines (SCCT1 to SCCT3)
+Process Type:	15.110

Primary Fuel: Natural Gas
Throughput: 927.00
Throughput Unit: MM BTU/h
Process Notes:

Pollutant Information: CALCASIEU PASS LNG PROJECT - Simple Cycle Combustion Turbines (SCCT1 to SCCT3)

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 9.0000
Emission Limit 1 Unit: PPMV
Emission Limit 1 Avg.
Time/Condition: 30 DAY ROLLING AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 25.0000
Emission Limit 1 Unit: PPMV
Emission Limit 1 Avg.
Time/Condition: 30 DAY ROLLING AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 8.0000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 8.0000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO2)
Emission Limit 1: 4.0000
Emission Limit 1 Unit: PPMV
Emission Limit 1 Avg.
Time/Condition: ANNUAL AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 1.4000
Emission Limit 1 Unit: PPMV
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 1426146.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: ANNUAL TOTAL
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: CALCASIEU PASS LNG PROJECT

+Process Name: Firewater Pumps
+Process Type: 17.110
Primary Fuel: Diesel Fuel
Throughput: 634.00
Throughput Unit: kW
Process Notes:

Pollutant Information: CALCASIEU PASS LNG PROJECT - Firewater Pumps

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 3.1000
Emission Limit 1 Unit: G/HP-H
Emission Limit 1 Avg.
Time/Condition:

Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 3.7000
Emission Limit 1 Unit: G/HP-H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.3000
Emission Limit 1 Unit: G/HP-H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.3000
Emission Limit 1 Unit: G/HP-H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.4400
Emission Limit 1 Unit: G/HP-H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.0400
Emission Limit 1 Unit: LB/GAL

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 44.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: ANNUAL TOTAL
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: C4GT, LLC

RBLC ID:	VA-0328
+Facility Name:	C4GT, LLC
Date determination entered in RBLC:	05/09/2018
Permit Type:	A: New/Greenfield Facility
Facility Description:	Natural gas-fired combined cycle power plant
Permit Notes:	The permit was written with two options for the turbines: Option 1 - GE 7HA.02 Option 2 - Siemens SGT6-8000H Facility Wide Pollutants for Siemens: CO: 293.5 NOx: 295.8 PM: 253.8 SOx: 39.3 VOC: 113.7

Process Information: C4GT, LLC

+Process Name:	GE Combustion Turbine - Option 1 - Normal Operation
+Process Type:	15.210
Primary Fuel:	natural gas
Throughput:	34000.00
Throughput Unit:	MMCF/YR
Process Notes:	Option 1: Two on one configuration: 3,482 MMBtu/hr combustion turbine with 475 MMBtu/hr duct-fired HRSG. Emission limits reflect the operation of one turbine with or without duct firing.

Pollutant Information: C4GT, LLC - GE Combustion Turbine - Option 1 - Normal Operation

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0069
Emission Limit 1 Unit: LB/MMBTU WITHOUT DUC
Emission Limit 1 Avg.
Time/Condition: AV OF 3 TEST RUNS
Emission Limit 2: 0.0049
Emission Limit 2 Unit: LB/MMBTU WITH DUC
Emission Limit 2 Avg.
Time/Condition: AV OF 3 TEST RUNS

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0069
Emission Limit 1 Unit: LB/MMBTU WITHOUT DUC
Emission Limit 1 Avg.
Time/Condition: AV OF 3 TEST RUNS
Emission Limit 2: 0.0049
Emission Limit 2 Unit: LB/MMBTU WITH DUC
Emission Limit 2 Avg.
Time/Condition: AV OF 3 TEST RUNS

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.0011
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 2.0000
Emission Limit 1 Unit: PPMVD @ 15% O₂
Emission Limit 1 Avg.
Time/Condition: 1 H AV
Emission Limit 2: 141.3000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING TOTAL

+Pollutant Name Carbon Monoxide
Emission Limit 1: 1.0000
Emission Limit 1 Unit: PPMVD@ 15% O₂
Emission Limit 1 Avg.
Time/Condition: 3 HR AV/WITHOUT DB

Emission Limit 2: 1.6000
Emission Limit 2 Unit: PPMVD@ 15% O2
Emission Limit 2 Avg.
Time/Condition: 3 HR AV/WITH DB

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.7000
Emission Limit 1 Unit: PPMVD @ 15% O2
Emission Limit 1 Avg.
Time/Condition: 3 HR AV/WITHOUT DB
Emission Limit 2: 1.4000
Emission Limit 2 Unit: PPMVD @ 15% O2
Emission Limit 2 Avg.
Time/Condition: 3 HR AV/WITH DB

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 2.5000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 3 H AV/WITHOUT DUCT BURNING
Emission Limit 2: 2.7000
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition: 3 H AV/WITH DUCT BURNING

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 883.0000
Emission Limit 1 Unit: LB CO2E/MW-H
Emission Limit 1 Avg.
Time/Condition: 12 MO ROLLING TOTAL
Emission Limit 2: 6745.0000
Emission Limit 2 Unit: BTU/KW-H NET HHV
Emission Limit 2 Avg.
Time/Condition: INITIAL HEAT RATE TEST

Process Information: C4GT, LLC

+Process Name: Siemens Combustion Turbine - Option 2 - Normal Operation
+Process Type: 15.210
Primary Fuel: Natural Gas
Throughput: 35000.00
Throughput Unit: MMCF/YR
Process Notes: Option 2: Two on one configuration: 3,116 MMBtu/hr combustion turbine with 991 MMBtu/hr duct-fired HRSG. Emission limits reflect the operation of one turbine with or without duct firing.

Pollutant Information: C4GT, LLC - Siemens Combustion Turbine - Option 2 - Normal Operation

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0065
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: AV OF 3 TEST RUNS/WITHOUT DUCT BURNING
Emission Limit 2: 0.0065
Emission Limit 2 Unit: LB/MMBTU
Emission Limit 2 Avg.
Time/Condition: AV OF 3 TEST RUNS/WITH DUCT BURNING

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0065
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: AV OF 3 TEST RUNS/WITHOUT DUCT BURNING
Emission Limit 2: 0.0065
Emission Limit 2 Unit: LB/MMBTU
Emission Limit 2 Avg.
Time/Condition: AV OF 3 TEST RUNS/WITH DUCT BURNING

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.0011
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: 3 H AV
Emission Limit 2: 19.3000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 2.0000
Emission Limit 1 Unit: PPMVD @ 15% O₂
Emission Limit 1 Avg.
Time/Condition: 1 H AV
Emission Limit 2: 141.4000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING TOTAL

+Pollutant Name Carbon Monoxide
Emission Limit 1: 1.8000
Emission Limit 1 Unit: PPMVD @ 15% O₂
Emission Limit 1 Avg.
Time/Condition: 3 H AV/WITH OR WITHOUT DB

Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	
+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	1.0000
Emission Limit 1 Unit:	PPMVD @ 15% O2
Emission Limit 1 Avg.	
Time/Condition:	3 H AV/WITHOUT DB
Emission Limit 2:	2.0000
Emission Limit 2 Unit:	PPMVD @ 15% O2
Emission Limit 2 Avg.	
Time/Condition:	3 H AV/WITH DB
+Pollutant Name	Sulfuric Acid (mist, vapors, etc)
Emission Limit 1:	2.2000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	3 H AV/WITHOUT DB
Emission Limit 2:	2.7000
Emission Limit 2 Unit:	LB/H
Emission Limit 2 Avg.	
Time/Condition:	3 H AV/WITH DB
+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
Emission Limit 1:	883.0000
Emission Limit 1 Unit:	LB CO2E/MW H
Emission Limit 1 Avg.	
Time/Condition:	12 MO ROLLING TOTAL
Emission Limit 2:	6625.0000
Emission Limit 2 Unit:	BTU/KW H NET HHV
Emission Limit 2 Avg.	
Time/Condition:	INITIAL HEAT RATE TEST

Process Information: C4GT, LLC

+Process Name:	Auxiliary Boiler
+Process Type:	12.310
Primary Fuel:	Natural Gas
Throughput:	902.00
Throughput Unit:	mmcf/y
Process Notes:	

Pollutant Information: C4GT, LLC - Auxiliary Boiler

+Pollutant Name	Nitrogen Oxides (NOx)

Emission Limit 1: 0.0110
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: CORRECTED TO 3% O2
Emission Limit 2: 1.2000
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0370
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 3.9000
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.8000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 3.3000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING TOTAL

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.8000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 3.3000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING TOTAL

+Pollutant Name Sulfur Dioxide (SO2)
Emission Limit 1: 0.0012
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.6000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING AV

+Pollutant Name	Sulfuric Acid (mist, vapors, etc)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	0.0050
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	2.3000
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	12 MO ROLLING AV

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
Emission Limit 1:	53863.0000
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg.	
Time/Condition:	12 MO ROLLING TOTAL
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: C4GT, LLC

+Process Name:	Dew Point Heater
+Process Type:	19.600
Primary Fuel:	natural gas
Throughput:	140.00
Throughput Unit:	MMCF/YR
Process Notes:	Dew Point Heater (16.0 MMBTU/HR)

Pollutant Information: C4GT, LLC - Dew Point Heater

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	0.8000
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg.	
Time/Condition:	

Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 2.6000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.5000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.5000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 0
Emission Limit 1 Unit:

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 8208.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: C4GT, LLC

+Process Name: Emergency Diesel GEN
+Process Type: 17.110
Primary Fuel: Ultra Low Sulfur Diesel
Throughput: 500.00
Throughput Unit: H/YR
Process Notes:

Pollutant Information: C4GT, LLC - Emergency Diesel GEN

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 4.8000
Emission Limit 1 Unit: G/HP H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 9.6000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING AV

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	0.1500
Emission Limit 1 Unit:	G/HP H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Particulate matter, total < 10 μ (TPM10)
Emission Limit 1:	0.1500
Emission Limit 1 Unit:	G/HP H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1:	0.1500
Emission Limit 1 Unit:	G/HP H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	2.6000
Emission Limit 1 Unit:	G/HP H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	5.2000
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	12 MO ROLLING TOTAL

+Pollutant Name	Sulfur Dioxide (SO2)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	

Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 981.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: 12 MO ROLLING TOTAL
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: C4GT, LLC

+Process Name: GE Combustion Turbine - Tuning & Water Washing
+Process Type: 15.210
Primary Fuel: natural gas
Throughput: 34000.00
Throughput Unit: MMCF/YR
Process Notes: Alternative operating scenario: during periods of tuning and water
 washing

Pollutant Information: C4GT, LLC - GE Combustion Turbine - Tuning & Water Washing

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 638.0000
Emission Limit 1 Unit: LB/TURBINE/CAL DAY
Emission Limit 1 Avg.
Time/Condition: 24 HR AV
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 194.0000

Emission Limit 1 Unit: LB/TURBINE/DAY
Emission Limit 1 Avg.
Time/Condition: 24 HR AV
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: C4GT, LLC

+Process Name: GE Combustion Turbine - Startup and Shutdown
+Process Type: 15.210
Primary Fuel: natural gas
Throughput: 34000.00
Throughput Unit: MMCF/YR
Process Notes: Startup and Shutdown

Pollutant Information: C4GT, LLC - GE Combustion Turbine - Startup and Shutdown

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 273.0000
Emission Limit 1 Unit: LB/TURBINE/EVENT
Emission Limit 1 Avg.
Time/Condition: COLD START 60 MIN OR LESS
Emission Limit 2: 163.0000
Emission Limit 2 Unit: LB/TURBINE/EVENT
Emission Limit 2 Avg.
Time/Condition: WARM START 50 MIN OR LESS

+Pollutant Name Carbon Monoxide
Emission Limit 1: 840.0000
Emission Limit 1 Unit: LB/TURBINE/EVENT
Emission Limit 1 Avg.
Time/Condition: COLD START 60 MIN OR LESS
Emission Limit 2: 188.0000
Emission Limit 2 Unit: LB/TURBINE/EVENT
Emission Limit 2 Avg.
Time/Condition: WARM START 50 MIN OR LESS

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 60.0000
Emission Limit 1 Unit: LB/TURBINE/EVENT
Emission Limit 1 Avg.
Time/Condition: COLD START 60 MIN OR LESS
Emission Limit 2: 0
Emission Limit 2 Unit: LB/TURBINE/EVENT

Emission Limit 2 Avg.
Time/Condition: WARM START 50 MIN OR LESS

Process Information: C4GT, LLC

+Process Name:	Siemens Combustion Turbine - Tuning & Water Washing
+Process Type:	15.210
Primary Fuel:	Natural Gas
Throughput:	35000.00
Throughput Unit:	MMCF/YR
Process Notes:	Alternative operating scenario: during periods of tuning and water washing

Pollutant Information: C4GT, LLC - Siemens Combustion Turbine - Tuning & Water Washing

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	564.0000
Emission Limit 1 Unit:	LB/TURBINE CAL DAY
Emission Limit 1 Avg.	
Time/Condition:	24 HR AV
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	309.0000
Emission Limit 1 Unit:	LB/TURBINE/DAY
Emission Limit 1 Avg.	
Time/Condition:	24 HR AV
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: C4GT, LLC

+Process Name:	Siemens Combustion Turbine - Startup & Shutdown
+Process Type:	15.210
Primary Fuel:	Natural Gas
Throughput:	35000.00
Throughput Unit:	MMCF/YR
Process Notes:	Startup and Shutdown

Pollutant Information: C4GT, LLC - Siemens Combustion Turbine - Startup & Shutdown

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 95.0000
Emission Limit 1 Unit: LB/TURBINE/EVENT
Emission Limit 1 Avg.
Time/Condition: COLD START 55 MIN OR LESS
Emission Limit 2: 117.0000
Emission Limit 2 Unit: LB/TURBINE/EVENT
Emission Limit 2 Avg.
Time/Condition: WARM START 55 MIN OR LESS

+Pollutant Name Carbon Monoxide
Emission Limit 1: 434.0000
Emission Limit 1 Unit: LB/TURBINE/EVENT
Emission Limit 1 Avg.
Time/Condition: COLD START 55 MIN OR LESS
Emission Limit 2: 397.0000
Emission Limit 2 Unit: LB/TURBINE/EVENT
Emission Limit 2 Avg.
Time/Condition: WARM START 55 MIN OR LESS

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 37.0000
Emission Limit 1 Unit: LB/TURBINE/EVENT
Emission Limit 1 Avg.
Time/Condition: COLD START 55 MIN OR LESS
Emission Limit 2: 34.0000
Emission Limit 2 Unit: LB/TURBINE/EVENT
Emission Limit 2 Avg.
Time/Condition: WARM START 55 MIN OR LESS

Process Information: C4GT, LLC

+Process Name: Emergency Fire Water Pump
+Process Type: 17.210
Primary Fuel: Ultra Low Sulfur Diesel
Throughput: 500.00
Throughput Unit: HR/YR
Process Notes: 315 BHP

Pollutant Information: C4GT, LLC - Emergency Fire Water Pump

+Pollutant Name Particulate matter, filterable (FPM)
Emission Limit 1: 15.0000
Emission Limit 1 Unit: G/HP/HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0

Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.1500
Emission Limit 1 Unit: G/HP HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.1500
Emission Limit 1 Unit: G/HP HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 2.6000
Emission Limit 1 Unit: G/HP HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0
Emission Limit 1 Unit:

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 1040.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: 12 MO ROLLING TOTAL
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 3.0000
Emission Limit 1 Unit: G/HP-HR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: C4GT, LLC

+Process Name: Circuit Breakers - 6
+Process Type: 99.999
Primary Fuel:
Throughput: 0.50
Throughput Unit: %
Process Notes: Quantity 6 Annual leakage rate

Pollutant Information: C4GT, LLC - Circuit Breakers - 6

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: C4GT, LLC

+Process Name:	Equipment Leaks from Natural Gas Components
+Process Type:	99.999
Primary Fuel:	
Throughput:	0
Throughput Unit:	
Process Notes:	Work practice requirements

Pollutant Information: C4GT, LLC - Equipment Leaks from Natural Gas Components

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: C4GT, LLC

+Process Name:	Cooling Tower
+Process Type:	99.009
Primary Fuel:	
Throughput:	0
Throughput Unit:	
Process Notes:	No Controls Feasible. P2=Total dissolved solids content of the cooling water effluent shall not exceed 6250 mg/L. Compliance is based on monthly water quality testing.

Pollutant Information: C4GT, LLC - Cooling Tower

+Pollutant Name	Particulate matter, filterable < 10 µ (FPM10)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Particulate matter, filterable < 2.5 µ (FPM2.5)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: TVA - JOHNSONVILLE COGENERATION

RBLC ID:	*TN-0164
+Facility Name:	TVA - JOHNSONVILLE COGENERATION
Date determination entered in RBLC:	03/21/2019
Permit Type:	Both B: (Add new process to existing facility) &C: (Modify process at existing facility)
Facility Description:	Combustion turbines and combined cycle plant
Permit Notes:	Permit 972969 adds startup and shutdown limits to the requirements established in PSD permit 970816F.

Process Information: TVA - JOHNSONVILLE COGENERATION

+Process Name:	Dual-fuel CT and HRSG with duct burner
+Process Type:	15.210
Primary Fuel:	Natural Gas
Throughput:	1020.00
Throughput Unit:	MMBtu/hr

Process Notes: Rated input capacity is 1020 MMBtu/hr (CT) and 319 MMBtu/hr (duct burner) when burning natural gas and 1084 MMBtu/hr when burning #2 oil.

Pollutant Information: TVA - JOHNSONVILLE COGENERATION - Dual-fuel CT and HRSG with duct burner

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	0.0050
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	WHEN BURNING NATURAL GAS
Emission Limit 2:	0.0150
Emission Limit 2 Unit:	LB/MMBTU
Emission Limit 2 Avg.	
Time/Condition:	WHEN BURNING #2 OIL
+Pollutant Name	Carbon Monoxide
Emission Limit 1:	2.0000
Emission Limit 1 Unit:	PPMVD @ 15% O2
Emission Limit 1 Avg.	
Time/Condition:	30-DAY AVG WHEN BURNING NATURAL GAS
Emission Limit 2:	10.0000
Emission Limit 2 Unit:	PPMVD @ 15% O2
Emission Limit 2 Avg.	
Time/Condition:	30-DAY AVG WHEN BURNING #2 OIL
+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	2.0000
Emission Limit 1 Unit:	PPMVD @ 15% O2
Emission Limit 1 Avg.	
Time/Condition:	30-DAY AVG WHEN BURNING NATURAL GAS
Emission Limit 2:	8.0000
Emission Limit 2 Unit:	PPMVD @ 15% O2
Emission Limit 2 Avg.	
Time/Condition:	30-DAY AVG WHEN BURNING #2 OIL
+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
Emission Limit 1:	1800.0000
Emission Limit 1 Unit:	LB/MWH
Emission Limit 1 Avg.	
Time/Condition:	12-MONTH MOVING AVERAGE
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: TVA - JOHNSONVILLE COGENERATION

+Process Name:	Two Auxiliary Boilers
+Process Type:	12.310
Primary Fuel:	Natural Gas
Throughput:	450.00
Throughput Unit:	MMBtu/hr, each boiler
Process Notes:	

Pollutant Information: TVA - JOHNSONVILLE COGENERATION - Two Auxiliary Boilers

+Pollutant Name	Particulate matter, total (TPM)
Emission Limit 1:	0.0080
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	0.0840
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Nitrogen Oxides (NO _x)
Emission Limit 1:	0.0130
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	30-DAY AVG EXCLUDING STARTUP & SHUTDOWN
Emission Limit 2:	0.2000
Emission Limit 2 Unit:	LB/MMBTU
Emission Limit 2 Avg. Time/Condition:	30-DAY AVG, APPLIES AT ALL TIMES

+Pollutant Name	Carbon Dioxide Equivalent (CO ₂ e)
Emission Limit 1:	117.0000
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	12-MONTH MOVING AVERAGE
Emission Limit 2:	0

Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: FILER CITY STATION

RBLC ID:	MI-0427
+Facility Name:	FILER CITY STATION
Date determination entered in RBLC:	01/26/2018
Permit Type:	B: Add new process to existing facility
Facility Description:	New natural gas combined heat and power plant proposed at existing cogenerating power plant permitted to burn wood, coal and tire derived fuel.
Permit Notes:	

Process Information: FILER CITY STATION

+Process Name:	EUCCT (Combined cycle CTG with unfired HRSG)
+Process Type:	15.210
Primary Fuel:	Natural gas
Throughput:	1934.70
Throughput Unit:	MMBTU/H
Process Notes:	A 1,934.7 MMBTU/H natural gas fired heavy frame industrial combustion turbine. The turbine operates in combined-cycle with an unfired heat recovery steam generator (HRSG).

Pollutant Information: FILER CITY STATION - EUCCT (Combined cycle CTG with unfired HRSG)

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	4.0000
Emission Limit 1 Unit:	PPM
Emission Limit 1 Avg.	
Time/Condition:	24-H ROLL.AVG., EXCEPT STARTUP/SHUTDOWN
Emission Limit 2:	17.4000
Emission Limit 2 Unit:	LB/H
Emission Limit 2 Avg.	
Time/Condition:	24-H ROLL.AVG., EXCEPT STARTUP/SHUTDOWN
+Pollutant Name	Nitrogen Oxides (NOx)

Emission Limit 1: 3.0000
 Emission Limit 1 Unit: PPM
 Emission Limit 1 Avg.
 Time/Condition: 24-H ROLL.AVG., EXCEPT STARTUP/SHUTDOWN
 Emission Limit 2: 21.4000
 Emission Limit 2 Unit: LB/H
 Emission Limit 2 Avg.
 Time/Condition: 24-H ROLL.AVG., EXCEPT STARTUP/SHUTDOWN

+Pollutant Name Particulate matter, filterable (FPM)
 Emission Limit 1: 0.0025
 Emission Limit 1 Unit: LB/MMBTU
 Emission Limit 1 Avg.
 Time/Condition:
 Emission Limit 2: 0
 Emission Limit 2 Unit:
 Emission Limit 2 Avg.
 Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
 Emission Limit 1: 0.0066
 Emission Limit 1 Unit: LB/MMBTU
 Emission Limit 1 Avg.
 Time/Condition:
 Emission Limit 2: 0
 Emission Limit 2 Unit:
 Emission Limit 2 Avg.
 Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
 Emission Limit 1: 0.0066
 Emission Limit 1 Unit: LB/MMBTU
 Emission Limit 1 Avg.
 Time/Condition:
 Emission Limit 2: 0
 Emission Limit 2 Unit:
 Emission Limit 2 Avg.
 Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
 Emission Limit 1: 992286.0000
 Emission Limit 1 Unit: T/YR
 Emission Limit 1 Avg.
 Time/Condition: 12-MO.ROLL.TIME PERIOD
 Emission Limit 2: 0
 Emission Limit 2 Unit:
 Emission Limit 2 Avg.
 Time/Condition:

Process Information: FILER CITY STATION

+Process Name:	EUCCT (Startup/Shutdown)
+Process Type:	15.210
Primary Fuel:	Natural gas
Throughput:	1934.70
Throughput Unit:	MMBTU/H
Process Notes:	This emission unit is being entered as a separate process to account for the emission limits associated with startup/shutdown events, which could not be included within the previous EUCCT original process name. A 1,934.7 MMBTU/H natural gas fired heavy frame industrial combustion turbine. The turbine operates in combined-cycle with an unfired heat recovery steam generator (HRSG).

Pollutant Information: FILER CITY STATION - EUCCT (Startup/Shutdown)

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	1580.0000
Emission Limit 1 Unit:	POUNDS
Emission Limit 1 Avg.	
Time/Condition:	POUNDS PER EVENT
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	32.0000
Emission Limit 1 Unit:	POUNDS
Emission Limit 1 Avg.	
Time/Condition:	PER EVENT
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: FILER CITY STATION

+Process Name:	EUAUXBOILER (Auxiliary boiler)
+Process Type:	12.310
Primary Fuel:	Natural gas
Throughput:	182.00
Throughput Unit:	MMBTU/H

Process Notes: A natural gas fired auxiliary boiler, rated at 182 MMBTU/H to provide auxiliary steam when the plant is off-line, used to maintain warm drums on the HRSG and maintain the steam turbine generator seals.

Pollutant Information: FILER CITY STATION - EUAUXBOILER (Auxiliary boiler)

+Pollutant Name Carbon Monoxide

Emission Limit 1: 0.0400

Emission Limit 1 Unit: LB/MMBTU

Emission Limit 1 Avg.

Time/Condition:

Emission Limit 2: 0

Emission Limit 2 Unit:

Emission Limit 2 Avg.

Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)

Emission Limit 1: 0.0400

Emission Limit 1 Unit: LB/MMBTU

Emission Limit 1 Avg.

Time/Condition: 30 DAY ROLLING AVERAGE

Emission Limit 2: 0

Emission Limit 2 Unit:

Emission Limit 2 Avg.

Time/Condition:

+Pollutant Name Particulate matter, filterable (FPM)

Emission Limit 1: 0.0050

Emission Limit 1 Unit: LB/MMBTU

Emission Limit 1 Avg.

Time/Condition:

Emission Limit 2: 0

Emission Limit 2 Unit:

Emission Limit 2 Avg.

Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)

Emission Limit 1: 0.0075

Emission Limit 1 Unit: LB/MMBTU

Emission Limit 1 Avg.

Time/Condition:

Emission Limit 2: 0

Emission Limit 2 Unit:

Emission Limit 2 Avg.

Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)

Emission Limit 1: 0.0075
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 93346.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: 12-MO.ROLL. TIME PERIOD
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: FILER CITY STATION

+Process Name: EUCOOLTWR (Cooling Tower--Wet Mechanical Drift)
+Process Type: 99.009
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes: A four-cell evaporative cooling tower in series with mechanical chilling to cool turbine inlet air. Particulate emissions will be controlled with high efficiency drift eliminators.

Pollutant Information: FILER CITY STATION - EUCOOLTWR (Cooling Tower--Wet Mechanical Drift)

+Pollutant Name Particulate matter, filterable (FPM)
Emission Limit 1: 0.0006
Emission Limit 1 Unit: %
Emission Limit 1 Avg.
Time/Condition: VENDOR-CERTIFIED MAX. DRIFT RATE
Emission Limit 2: 7700.0000
Emission Limit 2 Unit: PPM
Emission Limit 2 Avg.
Time/Condition: MAX. TDS IN COOLING WATER

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0006
Emission Limit 1 Unit: %

Emission Limit 1 Avg.
Time/Condition: VENDOR-CERTIF. MAX DRIFT RATE
Emission Limit 2: 7700.0000
Emission Limit 2 Unit: PPM
Emission Limit 2 Avg.
Time/Condition: MAX TDS IN COOLING WATER

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0006
Emission Limit 1 Unit: %
Emission Limit 1 Avg.
Time/Condition: VENDOR-CERTIF. MAX. DRIFT RATE
Emission Limit 2: 7700.0000
Emission Limit 2 Unit: PPM
Emission Limit 2 Avg.
Time/Condition: MAX TDS IN COOLING WATER

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: GUERNSEY POWER STATION LLC

RBLC ID: OH-0374
+Facility Name: GUERNSEY POWER STATION LLC
Date determination
entered in RBLC: 03/08/2019
Permit Type: A: New/Greenfield Facility
Facility Description: 1,650 MW combined cycle combustion turbine electrical generating
facility
Permit Notes: Installation PTI for a new 1,650 MW combined cycle natural-gas fired
turbine plant and associated auxiliary boiler, firewater pumps, emergency
generators and fuel gas heaters

Process Information: GUERNSEY POWER STATION LLC

+Process Name: Auxiliary Boiler (B001)
+Process Type: 12.310
Primary Fuel: Natural gas
Throughput: 185.00
Throughput Unit: MMBTU/H
Process Notes: 185.0 MMBtu/hr natural gas-fired boiler with low-NOx burners and flue
gas recirculation (FGR)

Pollutant Information: GUERNSEY POWER STATION LLC - Auxiliary Boiler (B001)

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 3.7000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 9.2500
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Carbon Monoxide
Emission Limit 1: 10.1800
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 25.4500
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.9300
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 2.3300
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 1.3000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 3.2500
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Particulate matter, total < 10 μ (TPM₁₀)
Emission Limit 1: 1.3000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:

Emission Limit 2:	3.2500
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING 12 MONTH PERIOD
+Pollutant Name	Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1:	1.3000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	3.2500
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING 12 MONTH PERIOD
+Pollutant Name	Sulfur Dioxide (SO ₂)
Emission Limit 1:	0.2800
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0.7000
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING 12 MONTH PERIOD
+Pollutant Name	Sulfuric Acid (mist, vapors, etc)
Emission Limit 1:	0.0430
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0.1100
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING 12 MONTH PERIOD
+Pollutant Name	Carbon Dioxide Equivalent (CO ₂ e)
Emission Limit 1:	54167.0000
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg.	
Time/Condition:	PER ROLLING 12 MONTH PERIOD
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	
+Pollutant Name	Visible Emissions (VE)
Emission Limit 1:	0
Emission Limit 1 Unit:	

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: GUERNSEY POWER STATION LLC

+Process Name:	Combined Cycle Combustion Turbines (3, identical) (P001 to P003)
+Process Type:	15.210
Primary Fuel:	Natural gas
Throughput:	3516.00
Throughput Unit:	MMBTU/H
Process Notes:	Three identical Combustion Turbines; GE 7HA.02 natural gas-fired lean pre-mix combined cycle combustion turbine generator equipped with dry low-NO _x (DLN) burners nominally rated at 3,516 MMBtu/hr HHV at 100% load and -18° F exhausting through a heat recovery steam generator (HRSG) with supplemental natural gas-fired duct burners nominally rated at 997 MMBtu/hr HHV controlled with catalytic oxidation and selective catalytic reduction (SCR) and cooled with an air-cooled condenser (ACC) used to generate electricity. Throughputs and limits are for a single turbine except as noted.

Pollutant Information: GUERNSEY POWER STATION LLC - Combined Cycle Combustion Turbines (3, identical) (P001 to P003)

+Pollutant Name	Nitrogen Oxides (NO _x)
Emission Limit 1:	33.8500
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	WITH DUCT BURNER. SEE NOTES.
Emission Limit 2:	26.3700
Emission Limit 2 Unit:	LB/H
Emission Limit 2 Avg. Time/Condition:	WITHOUT DUCT BURNERS. SEE NOTES.
+Pollutant Name	Carbon Monoxide
Emission Limit 1:	20.7600
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	WITH DUCT BURNER. SEE NOTES.
Emission Limit 2:	16.1700
Emission Limit 2 Unit:	LB/H
Emission Limit 2 Avg. Time/Condition:	WITHOUT DUCT BURNERS. SEE NOTES.

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 11.7300
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: WITH DUCT BURNER. SEE NOTES.
Emission Limit 2: 4.9200
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition: WITHOUT DUCT BURNERS. SEE NOTES.

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 0.0073
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: SEE NOTES.
Emission Limit 2: 23.3000
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition: WITH DUCT BURNERS. SEE NOTES.

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0073
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: SEE NOTES.
Emission Limit 2: 23.3000
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition: WITH DUCT BURNERS. SEE NOTES.

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0073
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: SEE NOTES.
Emission Limit 2: 23.3000
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition: WITH DUCT BURNERS. SEE NOTES.

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.0015
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: SEE NOTES.
Emission Limit 2: 6.7700
Emission Limit 2 Unit: LB/H

Emission Limit 2 Avg.
Time/Condition: WITH DUCT BURNERS. SEE NOTES.

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 0.0011
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: SEE NOTES.
Emission Limit 2: 4.9600
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition: WITH DUCT BURNERS. SEE NOTES.

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 846.0000
Emission Limit 1 Unit: LB/MW-H
Emission Limit 1 Avg.
Time/Condition: WITHOUT DUCT BURNER. SEE NOTES.
Emission Limit 2: 1000.0000
Emission Limit 2 Unit: LB/MW-H
Emission Limit 2 Avg.
Time/Condition: WITH DUCT BURNERS. SEE NOTES.

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: GUERNSEY POWER STATION LLC

+Process Name: Emergency Generators (2 identical, P004 and P005)
+Process Type: 17.110
Primary Fuel: Diesel fuel
Throughput: 2206.00
Throughput Unit: HP
Process Notes: Two identical Emergency Generators; 1,645 kW (2,206 HP) emergency diesel-fired generator to provide on-site emergency power capabilities independent of the utility grid. Throughputs and limits are for a single generator except as noted.

Pollutant Information: GUERNSEY POWER STATION LLC - Emergency Generators (2 identical, P004 and P005)

+Pollutant Name	Nitrogen Oxides (NO _x)
Emission Limit 1:	23.2100
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	NMHC+NOX. SEE NOTES.
Emission Limit 2:	1.1600
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	NMHC+NOX. SEE NOTES.
+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	23.2100
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	NMHC+NOX. SEE NOTES.
Emission Limit 2:	1.1600
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	NMHC+NOX. SEE NOTES.
+Pollutant Name	Carbon Monoxide
Emission Limit 1:	12.6900
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0.6300
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING 12 MONTH PERIOD
+Pollutant Name	Particulate matter, total (TPM)
Emission Limit 1:	0.7300
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0.0370
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING 12 MONTH PERIOD
+Pollutant Name	Particulate matter, total < 10 μ (TPM ₁₀)
Emission Limit 1:	0.7300
Emission Limit 1 Unit:	LB/H

Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0.0370
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING 12 MONTH PERIOD
+Pollutant Name	Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1:	0.7300
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0.0370
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING 12 MONTH PERIOD
+Pollutant Name	Sulfur Dioxide (SO ₂)
Emission Limit 1:	0.0015
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0.0220
Emission Limit 2 Unit:	LB/H
Emission Limit 2 Avg.	
Time/Condition:	
+Pollutant Name	Sulfuric Acid (mist, vapors, etc)
Emission Limit 1:	3.4000
Emission Limit 1 Unit:	X10-3 LB/H
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	1.7000
Emission Limit 2 Unit:	X10-4 T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER ROLLING 12 MONTH PERIOD
+Pollutant Name	Carbon Dioxide Equivalent (CO ₂ e)
Emission Limit 1:	120.0000
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg.	
Time/Condition:	PER ROLLING 12 MONTH PERIOD
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	
+Pollutant Name	Visible Emissions (VE)

Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: GUERNSEY POWER STATION LLC

+Process Name: Emergency Fire Pump (P006)
+Process Type: 17.210
Primary Fuel: Diesel fuel
Throughput: 410.00
Throughput Unit: HP
Process Notes: 410 HP emergency diesel-fired fire pump to provide on-site firefighting capabilities independent of the utility grid

Pollutant Information: GUERNSEY POWER STATION LLC - Emergency Fire Pump (P006)

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 2.7000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: NMHC+NOX. SEE NOTES.
Emission Limit 2: 0.1400
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: NMHC+NOX. SEE NOTES.

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 2.7000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: NMHC+NOX. SEE NOTES.
Emission Limit 2: 0.1400
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: NMHC+NOX. SEE NOTES.

+Pollutant Name Carbon Monoxide
Emission Limit 1: 2.3600
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.1200

Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 0.1300
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0065
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.1300
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0065
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.1300
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0065
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.0015
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0053
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 0.0015
Emission Limit 1 Unit: LB/MMBTU

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 8.1000
Emission Limit 2 Unit: X10-4 T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 29.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: GUERNSEY POWER STATION LLC

+Process Name: Fuel Gas Heaters (2 identical, P007 and P008)
+Process Type: 13.310
Primary Fuel: Natural gas
Throughput: 15.00
Throughput Unit: MMBTU/H
Process Notes: Two identical Fuel Gas Heaters; 15.0 MMBtu/hr natural gas-fired fuel gas heater with low-NOx burners. The natural gas heaters will heat a water bath.

Pollutant Information: GUERNSEY POWER STATION LLC - Fuel Gas Heaters (2 identical, P007 and P008)

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 0.3000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 1.3100

Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.8300
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 3.6400
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0750
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.3300
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 0.0750
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0330
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0750
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.3300
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0750
Emission Limit 1 Unit: LB/H

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0330
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.0230
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.1000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 0.0035
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0.0150
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 7695.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: PER ROLLING 12 MONTH PERIOD
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Visible Emissions (VE)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

NOTE: Draft determinations are marked with a " * " beside the RBLC ID.

Required fields are denoted by "+".

Report Date: 03/29/2021

Control Technology Determinations (Freeform)

Facility Information: MIDWEST FERTILIZER COMPANY LLC

RBLC ID:	IN-0263
+Facility Name:	MIDWEST FERTILIZER COMPANY LLC
Date determination entered in RBLC:	07/07/2017
Permit Type:	C: Modify process at existing facility
Facility Description:	STATIONARY NITROGEN FERTILIZER MANUFACTURING FACILITY
Permit Notes:	

Process Information: MIDWEST FERTILIZER COMPANY LLC

+Process Name:	STARTUP HEATER EU-002
+Process Type:	13.310
Primary Fuel:	NATURAL GAS
Throughput:	70.00
Throughput Unit:	MMBTU/HR
Process Notes:	

Pollutant Information: MIDWEST FERTILIZER COMPANY LLC - STARTUP HEATER EU-002

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	0.1300
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	3HR AVERAGE
Emission Limit 2:	200.0000
Emission Limit 2 Unit:	H/YR
Emission Limit 2 Avg. Time/Condition:	
+Pollutant Name	Particulate matter, total < 10 µ (TPM10)
Emission Limit 1:	0.5220
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	3HOUR AVERAGE
Emission Limit 2:	200.0000
Emission Limit 2 Unit:	H/YR
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.5220
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 200.0000
Emission Limit 2 Unit: H/YR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 12.6110
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 200.0000
Emission Limit 2 Unit: H/YR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 2.5560
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 200.0000
Emission Limit 2 Unit: H/YR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.3780
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 200.0000
Emission Limit 2 Unit: H/YR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide
Emission Limit 1: 8184.0000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 200.0000
Emission Limit 2 Unit: H/YR

Emission Limit 2 Avg.
Time/Condition:

Process Information: MIDWEST FERTILIZER COMPANY LLC

+Process Name: UREA SYNTHESIS PLANT (EU-006)
+Process Type: 61.012
Primary Fuel:
Throughput: 2640.00
Throughput Unit: METRIC TON/DAY
Process Notes:

Pollutant Information: MIDWEST FERTILIZER COMPANY LLC - UREA SYNTHESIS PLANT (EU-006)

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide
Emission Limit 1: 387.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: MIDWEST FERTILIZER COMPANY LLC

+Process Name: UREA AMMONIUM NITRATE PLANT (EU-007)
+Process Type: 61.012
Primary Fuel:
Throughput: 5160.00
Throughput Unit: METRIC TON/DAY
Process Notes:

Pollutant Information: MIDWEST FERTILIZER COMPANY LLC - UREA AMMONIUM NITRATE PLANT (EU-007)

+Pollutant Name Carbon Dioxide
Emission Limit 1: 1173.0000
Emission Limit 1 Unit: TONS/12 MONTH
Emission Limit 1 Avg.
Time/Condition: ROLLING AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: MIDWEST FERTILIZER COMPANY LLC

+Process Name: UREA GRANULATION UNIT (EU-008)
+Process Type: 61.012
Primary Fuel:
Throughput: 1320.00
Throughput Unit: METRIC TON/DAY
Process Notes:

Pollutant Information: MIDWEST FERTILIZER COMPANY LLC - UREA GRANULATION UNIT (EU-008)

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 0.1630
Emission Limit 1 Unit: LB/TON
Emission Limit 1 Avg.
Time/Condition: 3HOUR AVERAGE
Emission Limit 2: 368040.0000
Emission Limit 2 Unit: TON/12 CONSEC. MONTH
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.1630

Emission Limit 1 Unit: LB/TON
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 368040.0000
Emission Limit 2 Unit: TON/12 CONSEC. MONTH
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.1630
Emission Limit 1 Unit: LB/TON
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 368040.0000
Emission Limit 2 Unit: TON/12 CONSEC. MONTH
Emission Limit 2 Avg.
Time/Condition:

Process Information: MIDWEST FERTILIZER COMPANY LLC

+Process Name: NITRIC ACID PLANT (EU-009)
+Process Type: 62.014
Primary Fuel:
Throughput: 1840.00
Throughput Unit: METRIC TON/DAY
Process Notes:

Pollutant Information: MIDWEST FERTILIZER COMPANY LLC - NITRIC ACID PLANT (EU-009)

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.1780
Emission Limit 1 Unit: LB/TON
Emission Limit 1 Avg.
Time/Condition: NORMAL OPERATIONS
Emission Limit 2: 0.0830
Emission Limit 2 Unit: TON/EVENT
Emission Limit 2 Avg.
Time/Condition: 4 EVENTS/YR, 3HR/EVENT DURING STARTUP

Process Information: MIDWEST FERTILIZER COMPANY LLC

+Process Name: EIGHTEEN CELL COOLING TOWER (EU-010)
+Process Type: 99.999
Primary Fuel:
Throughput: 0

Throughput Unit:

Process Notes:

Pollutant Information: MIDWEST FERTILIZER COMPANY LLC - EIGHTEEN CELL COOLING TOWER (EU-010)

+Pollutant Name	Particulate matter, total (TPM)
Emission Limit 1:	2000.0000
Emission Limit 1 Unit:	MG/L
Emission Limit 1 Avg.	
Time/Condition:	AVG ON A MONTHLY BASIS
Emission Limit 2:	0.0005
Emission Limit 2 Unit:	%
Emission Limit 2 Avg.	
Time/Condition:	DRIFT

+Pollutant Name	Particulate matter, total < 10 μ (TPM10)
Emission Limit 1:	2000.0000
Emission Limit 1 Unit:	MG/L
Emission Limit 1 Avg.	
Time/Condition:	AVG. ON A MONTHLY BASIS
Emission Limit 2:	0.0005
Emission Limit 2 Unit:	%
Emission Limit 2 Avg.	
Time/Condition:	DRIFT

+Pollutant Name	Particulate matter, filterable < 2.5 μ (FPM2.5)
Emission Limit 1:	2000.0000
Emission Limit 1 Unit:	MG/L
Emission Limit 1 Avg.	
Time/Condition:	AVG. ON A MONTHLY BASIS
Emission Limit 2:	0.0005
Emission Limit 2 Unit:	%
Emission Limit 2 Avg.	
Time/Condition:	DRIFT

Process Information: MIDWEST FERTILIZER COMPANY LLC

+Process Name:	NATURAL GAS AUXILIARY BOILERS (EU-012A, EU-012B, EU-012C)
+Process Type:	12.310
Primary Fuel:	NATURAL GAS
Throughput:	218.60
Throughput Unit:	MMBTU/H
Process Notes:	

Pollutant Information: MIDWEST FERTILIZER COMPANY LLC - NATURAL GAS
AUXILIARY BOILERS (EU-012A, EU-012B, EU-012C)

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 1.9000
Emission Limit 1 Unit: LB/MMCF EACH
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 7.6000
Emission Limit 1 Unit: LB/MMCF EACH
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 7.6000
Emission Limit 1 Unit: LB/MMCF EACH
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 20.4000
Emission Limit 1 Unit: LB/MMCF EACH
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 1877.3900
Emission Limit 2 Unit: MMCF/12 MONTH EACH
Emission Limit 2 Avg.
Time/Condition: ROLLING AVERAGE

0.02 lb/MMbtu

+Pollutant Name Carbon Monoxide
Emission Limit 1: 37.2200
Emission Limit 1 Unit: LB/MMCF EACH

Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 1877.3900
Emission Limit 2 Unit: MMCF/12 MONTH EACH
Emission Limit 2 Avg.
Time/Condition: ROLLING AVERAGE

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 5.5000
Emission Limit 1 Unit: LB/MMCF EACH
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 1877.3900
Emission Limit 2 Unit: MMCF/12 MONTH EACH
Emission Limit 2 Avg.
Time/Condition: ROLLING AVERAGE

+Pollutant Name Carbon Dioxide
Emission Limit 1: 59.6100
Emission Limit 1 Unit: TON/MMCF EACH
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 1877.3900
Emission Limit 2 Unit: MMCF/12 MONTH EACH
Emission Limit 2 Avg.
Time/Condition: ROLLING AVERAGE

Process Information: MIDWEST FERTILIZER COMPANY LLC

+Process Name: EMERGENCY GENERATORS (EU014A AND EU-014B)
+Process Type: 17.110
Primary Fuel: DISTILLATE OIL
Throughput: 3600.00
Throughput Unit: HP EACH
Process Notes:

Pollutant Information: MIDWEST FERTILIZER COMPANY LLC - EMERGENCY GENERATORS (EU014A AND EU-014B)

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 0.1500
Emission Limit 1 Unit: G/HP-H EACH
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 500.0000
Emission Limit 2 Unit: H/YR EACH

Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.1500
Emission Limit 1 Unit: G/HP-H EACH
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 500.0000
Emission Limit 2 Unit: H/YR EACH
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.1500
Emission Limit 1 Unit: G/HP-H EACH
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 500.0000
Emission Limit 2 Unit: H/YR EACH
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 4.4200
Emission Limit 1 Unit: G/HP-H EACH
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 500.0000
Emission Limit 2 Unit: H/YR EACH
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 2.6100
Emission Limit 1 Unit: G/HP-H EACH
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 500.0000
Emission Limit 2 Unit: H/YR EACH
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.3500
Emission Limit 1 Unit: G/HP-H EACH
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE

Emission Limit 2: 500.0000
Emission Limit 2 Unit: H/YR EACH
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide
Emission Limit 1: 1044.0000
Emission Limit 1 Unit: TON/12 CONSEC. MONTH
Emission Limit 1 Avg.
Time/Condition: EACH
Emission Limit 2: 500.0000
Emission Limit 2 Unit: H/YR EACH
Emission Limit 2 Avg.
Time/Condition:

Process Information: MIDWEST FERTILIZER COMPANY LLC

+Process Name: AMMONIA STORAGE FLARE (EU-016)
+Process Type: 19.390
Primary Fuel: NATURAL GAS
Throughput: 1.10
Throughput Unit: MMBTU/H
Process Notes:

Pollutant Information: MIDWEST FERTILIZER COMPANY LLC - AMMONIA STORAGE FLARE (EU-016)

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0075
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG.
Emission Limit 2: 168.0000
Emission Limit 2 Unit: H/12 CONSEC. MONTH
Emission Limit 2 Avg.
Time/Condition: COMPLIANCE DETERMINED AT END OF EA MONTH

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 0.0019
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: 3 HOUR AVERAGE
Emission Limit 2: 168.0000
Emission Limit 2 Unit: H/12 CONSEC. MONTH
Emission Limit 2 Avg.
Time/Condition: COMPLIANCE DETERMINED AT END OF MONTHS

+Pollutant Name Particulate matter, filterable < 2.5 μ (FPM2.5)
 Emission Limit 1: 0.0075
 Emission Limit 1 Unit: LB/MMBTU
 Emission Limit 1 Avg.
 Time/Condition: 3 HOUR AVERAGE
 Emission Limit 2: 168.0000
 Emission Limit 2 Unit: H/12 CONSEC MONTH
 Emission Limit 2 Avg.
 Time/Condition: COMPLIANCE DETERMINED AT END OF MONTHS

+Pollutant Name Nitrogen Oxides (NO_x)
 Emission Limit 1: 125.0000
 Emission Limit 1 Unit: LB/H
 Emission Limit 1 Avg.
 Time/Condition: WHILE VENTING 3 HOUR AVG.
 Emission Limit 2: 0.0680
 Emission Limit 2 Unit: LB/MMBTU
 Emission Limit 2 Avg.
 Time/Condition: DURING NORMAL OP. 3 HR AVG.

+Pollutant Name Carbon Monoxide
 Emission Limit 1: 0.3700
 Emission Limit 1 Unit: LB/MMBTU
 Emission Limit 1 Avg.
 Time/Condition: NORMAL OPERATION 3 HR AVG.
 Emission Limit 2: 168.0000
 Emission Limit 2 Unit: H/YR VENTING
 Emission Limit 2 Avg.
 Time/Condition: COMPLIANCE DETERMINED AT END OF EA MONTH

+Pollutant Name Volatile Organic Compounds (VOC)
 Emission Limit 1: 0.0054
 Emission Limit 1 Unit: LB/MMBTU
 Emission Limit 1 Avg.
 Time/Condition: NORMAL OPERATIONS 3 HR AVG.
 Emission Limit 2: 168.0000
 Emission Limit 2 Unit: H/12 CONSEC. MONTH
 Emission Limit 2 Avg.
 Time/Condition: COMPLIANCE DETERMINED AT END OF EA MONTH

+Pollutant Name Carbon Dioxide
 Emission Limit 1: 563.0000
 Emission Limit 1 Unit: TON/12 CONSEC. MONTH
 Emission Limit 1 Avg.
 Time/Condition:
 Emission Limit 2: 168.0000
 Emission Limit 2 Unit: H/12 CONSEC. MONTH

Emission Limit 2 Avg.
Time/Condition: COMPLIANCE DETERMINED AT END OF EA MONTH

Process Information: MIDWEST FERTILIZER COMPANY LLC

+Process Name: FRONT END FLARE EU-017
+Process Type: 19.390
Primary Fuel: NATURAL GAS
Throughput: 1.12
Throughput Unit: MMBTU/H
Process Notes:

Pollutant Information: MIDWEST FERTILIZER COMPANY LLC - FRONT END FLARE EU-017

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 1.9000
Emission Limit 1 Unit: LB/MMCF
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG.
Emission Limit 2: 336.0000
Emission Limit 2 Unit: H/12 CONSEC. MONTH
Emission Limit 2 Avg.
Time/Condition: VENTING

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 7.6000
Emission Limit 1 Unit: LB/MMCF
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG
Emission Limit 2: 336.0000
Emission Limit 2 Unit: H/12 CONSEC. MONTH
Emission Limit 2 Avg.
Time/Condition: VENTING

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 7.6000
Emission Limit 1 Unit: LB/MMCF
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG
Emission Limit 2: 336.0000
Emission Limit 2 Unit: H/12 CONSEC. MONTH
Emission Limit 2 Avg.
Time/Condition: VENTING

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.0680
Emission Limit 1 Unit: LB/MMBTU

Emission Limit 1 Avg.
Time/Condition: NORMAL OPS. 3 HR AVG.
Emission Limit 2: 595.4900
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition: VENTING OPS. 3 HR AVG.

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.3700
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: NORMAL OPS. 3 HR AVG.
Emission Limit 2: 3240.1600
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition: VENTING OPS. 3 HR AVG.

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0054
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: NORMAL OPS. 3 HR AVG
Emission Limit 2: 47.2600
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition: VENTING OPS. 3 HR AVG.

+Pollutant Name Carbon Dioxide
Emission Limit 1: 116.8900
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: NORMAL OPS. 3 HR AVG
Emission Limit 2: 512.2000
Emission Limit 2 Unit: TON/H
Emission Limit 2 Avg.
Time/Condition: VENTING OPS., 3 HR AVG.

Process Information: MIDWEST FERTILIZER COMPANY LLC

+Process Name: BACK END FLARE (EU-018)
+Process Type: 19.390
Primary Fuel: NATURAL GAS
Throughput: 1.12
Throughput Unit: MMBTU/H
Process Notes:

Pollutant Information: MIDWEST FERTILIZER COMPANY LLC - BACK END FLARE
(EU-018)

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 0.0019
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG
Emission Limit 2: 336.0000
Emission Limit 2 Unit: HR/12 CONSEC. MONTH
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0075
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG.
Emission Limit 2: 336.0000
Emission Limit 2 Unit: HR/12 CONSEC. MONTH
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0075
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG.
Emission Limit 2: 336.0000
Emission Limit 2 Unit: HR/12 CONSEC. MONTHS
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.0680
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: NORMAL OPS. 3 HR AVG.
Emission Limit 2: 624.9400
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition: VENTING OPS. 3 HR AVG.

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.3700
Emission Limit 1 Unit: LB/MMBTU

Emission Limit 1 Avg.
Time/Condition: NORMAL OPS. 3 HR AVG.
Emission Limit 2: 804.7600
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition: VENTING OPS. 3 HR AVG.

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0054
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: NORMAL OPS. 3 HR AVG.
Emission Limit 2: 11.7300
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition: VENTING OPS. 3 HR AVG.

+Pollutant Name Carbon Dioxide
Emission Limit 1: 116.8900
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: NORMAL OPS. 3 HR AVG
Emission Limit 2: 573.0000
Emission Limit 2 Unit: TON/12 CONSEC. MONTH
Emission Limit 2 Avg.
Time/Condition:

Process Information: MIDWEST FERTILIZER COMPANY LLC

+Process Name: TRUCK AND RAIL LOADING OPERATION (EU-021A)
+Process Type: 61.012
Primary Fuel:
Throughput: 4800.00
Throughput Unit: METRIC TON/DAY
Process Notes:

Pollutant Information: MIDWEST FERTILIZER COMPANY LLC - TRUCK AND RAIL LOADING OPERATION (EU-021A)

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 0.1500
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG.
Emission Limit 2: 0
Emission Limit 2 Unit:

Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 µ (TPM10)
Emission Limit 1: 0.1500
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG.
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 µ (TPM2.5)
Emission Limit 1: 0.1500
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG.
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: MIDWEST FERTILIZER COMPANY LLC

+Process Name: PAVED ROADS AND PARKING LOTS
+Process Type: 99.190
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: MIDWEST FERTILIZER COMPANY LLC - PAVED ROADS AND PARKING LOTS

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 µ (TPM10)
Emission Limit 1: 0

Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 µ (TPM2.5)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: INDECK NILES, LLC

RBLC ID:	MI-0423
+Facility Name:	INDECK NILES, LLC
Date determination entered in RBLC:	06/02/2017
Permit Type:	A: New/Greenfield Facility
Facility Description:	Natural gas combined cycle power plant.
Permit Notes:	The permit includes equipment not entered into the RBLC due to a lack of emission limits or material limits; these include a cold cleaner, a number of space heaters, and two fuel tanks.

Process Information: INDECK NILES, LLC

+Process Name:	FGCTGHRSG (2 Combined Cycle CTGs with HRSGs)
+Process Type:	15.210
Primary Fuel:	Natural gas
Throughput:	8322.00
Throughput Unit:	MMBTU/H
Process Notes:	There are 2 combined cycle natural gas-fired combustion turbine generators (CTGs) with heat recovery steam generators (HRSG) identified as EUCTGHRSG1 & EUCTGHRSG2 in the flexible group FGCTGHRSG. The total hours for startup and shutdown for each train shall not exceed 500 hours per 12-month rolling time period. The

throughput capacity is 3421 MMBTU/H for each turbine, and 740 MMBTU/H for each duct burner for a combined throughput of 4161 MMBTU/H or 8322 MMBTU/H for both trains.

Pollutant Information: INDECK NILES, LLC - FGCTGHRSG (2 Combined Cycle CTGs with HRSGs)

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	24.7000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	24-H ROLLING AVG
Emission Limit 2:	3537.0000
Emission Limit 2 Unit:	LB/H
Emission Limit 2 Avg.	
Time/Condition:	OPERATING HR. DURING STARTUP OR SHUTDOWN

+Pollutant Name	Nitrogen Oxides (NO _x)
Emission Limit 1:	38.1000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	24-H ROLLING AVERAGE
Emission Limit 2:	286.0000
Emission Limit 2 Unit:	LB/H
Emission Limit 2 Avg.	
Time/Condition:	OPERATING HR DURING STARTUP OR SHUTDOWN

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	9.9000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	TEST PROTOCOL WILL SPECIFY AVG TIME
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Particulate matter, total < 10 μ (TPM10)
Emission Limit 1:	19.8000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg.	
Time/Condition:	TEST PROTOCOL WILL SPECIFY AVG TIME
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 19.8000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: TEST PROTOCOL WILL SPECIFY AVG TIME
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 4.0000
Emission Limit 1 Unit: PPM
Emission Limit 1 Avg.
Time/Condition: TEST PROTOCOL WILL SPECIFY
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 11.7000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: TEST PROTOCOL WILL SPECIFY AVG TIME
Emission Limit 2: 0.0600
Emission Limit 2 Unit: LB/MMBTU
Emission Limit 2 Avg.
Time/Condition: TEST PROTOCOL WILL SPECIFY AVG TIME

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 4.6000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: TEST PROTOCOL WILL SPECIFY AVG TIME
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 2097001.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: 12-MONTH ROLLING TIME PERIOD
Emission Limit 2: 0
Emission Limit 2 Unit:

Emission Limit 2 Avg.
Time/Condition:

Process Information: INDECK NILES, LLC

+Process Name:	EUAUXBOILER (Auxiliary Boiler)
+Process Type:	12.310
Primary Fuel:	natural gas
Throughput:	182.00
Throughput Unit:	MMBTU/H
Process Notes:	One natural gas-fired auxiliary boiler rated at 182 MMBTU/H fuel heat input.

Pollutant Information: INDECK NILES, LLC - EUAUXBOILER (Auxiliary Boiler)

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	0.0400
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	TEST PROTOCOL WILL SPECIFY AVG TIME
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Nitrogen Oxides (NO _x)
Emission Limit 1:	0.0400
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	30 DAY ROLLING AVG TIME PERIOD
Emission Limit 2:	0

Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	0.0050
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	TEST PROTOCOL WILL SPECIFY AVG TIME
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Particulate matter, total < 10 μ (TPM10)
Emission Limit 1:	1.3600

Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY, TEST PROTOCOL
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 1.3600
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY, TEST PROTOCOL
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0040
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: TEST PROTOCOL WILL SPECIFY AVG TIME.
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.6000
Emission Limit 1 Unit: LB/MMSCF
Emission Limit 1 Avg.
Time/Condition: BASED ON FUEL RECEIPT RECORDS
Emission Limit 2: 2000.0000
Emission Limit 2 Unit: GR/MMSCF
Emission Limit 2 Avg.
Time/Condition: BASED UPON FUEL RECEIPT RECORDS

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 93346.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: 12-MO ROLLING TIME PERIOD
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDECK NILES, LLC

+Process Name:	FGFUELHTR (Two fuel pre-heaters identified as EUFUELHTR1 & EUFUELHTR2)
+Process Type:	13.310
Primary Fuel:	Natural gas
Throughput:	27.00
Throughput Unit:	MMBTU/H
Process Notes:	Two natural gas fired dew point heaters for warming the natural gas fuel (EUFUELHTR1 & EUFUELHTR2 in flexible group FGFUELHTR). The total combined heat input during operation shall not exceed 27 MMBTU/H (each) as well. The CO2e limit is for both units combined; however the other limits are per unit.

Pollutant Information: INDECK NILES, LLC - FGFUELHTR (Two fuel pre-heaters identified as EUFUELHTR1 & EUFUELHTR2)

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	2.2200
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY; EACH UNIT
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	2.6500
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY; EACH UNIT
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	0.0020
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	TEST PROTOCOL WILL SPECIFY AVG TIME.
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name Particulate matter, total < 10 µ (TPM10)
Emission Limit 1: 0.2000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY; EACH FUEL HEATER
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 µ (TPM2.5)
Emission Limit 1: 0.2000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY; EACH FUEL HEATER
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.1500
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY; EACH FUEL HEATER
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO2)
Emission Limit 1: 2000.0000
Emission Limit 1 Unit: GR/MMSCF
Emission Limit 1 Avg.
Time/Condition: BASED UPON FUEL RECEIPT RECORDS.
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 13848.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: 12-MO ROLLING TIME PERIOD; COMBINED LIM
Emission Limit 2: 0
Emission Limit 2 Unit:

Emission Limit 2 Avg.
Time/Condition:

Process Information: INDECK NILES, LLC

+Process Name:	EUENGINE (Diesel fuel emergency engine)
+Process Type:	17.110
Primary Fuel:	Diesel Fuel
Throughput:	22.68
Throughput Unit:	MMBTU/H
Process Notes:	a 2,922 horsepower (HP) (2,179 kilowatts (kW)) diesel fueled emergency engine manufactured in 2011 or later and a displacement of

Pollutant Information: INDECK NILES, LLC - EUENGINE (Diesel fuel emergency engine)

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	3.5000
Emission Limit 1 Unit:	G/KW-H
Emission Limit 1 Avg. Time/Condition:	TEST PROTOCOL SHALL SPECIFY AVG TIME
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	6.4000
Emission Limit 1 Unit:	G/KW-H
Emission Limit 1 Avg. Time/Condition:	TEST PROTOCOL WILL SPECIFY AVG TIME
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	0.2000
Emission Limit 1 Unit:	G/KW-H
Emission Limit 1 Avg. Time/Condition:	TEST PROTOCOL WILL SPECIFY AVG TIME
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Particulate matter, total < 10 μ (TPM10)
Emission Limit 1:	1.5800

Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 1.5800
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 1.8700
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: TEST PROTOCOL WILL SPECIFY AVG TIME
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 15.0000
Emission Limit 1 Unit: PPM
Emission Limit 1 Avg.
Time/Condition: FUEL SUPPLIER CERTIFICATION RECORDS
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 928.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: 12-MO. ROLLING TIME PERIOD
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDECK NILES, LLC

+Process Name:	EUFENGINE (Emergency engine--diesel fire pump)
+Process Type:	17.210
Primary Fuel:	Diesel
Throughput:	1.66
Throughput Unit:	MMBTU/H
Process Notes:	A 260 brake horsepower (bhp) diesel-fueled emergency engine manufactured in 2011 or later and a displacement of

Pollutant Information: INDECK NILES, LLC - EUFPENGINE (Emergency engine--diesel fire pump)

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	2.6000
Emission Limit 1 Unit:	G/BHP-H
Emission Limit 1 Avg. Time/Condition:	TEST PROTOCOL WILL SPECIFY AVG. TIME
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Nitrogen Oxides (NO _x)
Emission Limit 1:	3.0000
Emission Limit 1 Unit:	G/BHP-H
Emission Limit 1 Avg. Time/Condition:	TEST PROTOCOL WILL SPECIFY AVG TIME
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Particulate matter, filterable (FPM)
Emission Limit 1:	0.1500
Emission Limit 1 Unit:	G/BHP-H
Emission Limit 1 Avg. Time/Condition:	TEST PROTOCOL WILL SPECIFY AVG TIME.
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Particulate matter, total < 10 μ (TPM10)
Emission Limit 1:	0.5700
Emission Limit 1 Unit:	LB/H

Emission Limit 1 Avg.
Time/Condition: HOURLY
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.5700
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: HOURLY
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.6400
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: TEST PROTOCOL WILL SPECIFY AVG TIME
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 15.0000
Emission Limit 1 Unit: PPM
Emission Limit 1 Avg.
Time/Condition: FUEL SUP. CERT. RECORDS OR SAMPLE TEST
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 13.5800
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: 12 MO. ROLLING TIME PERIOD
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: LINEAR ALPHA OLEFINS PLANT

RBLC ID: TX-0811
 +Facility Name: LINEAR ALPHA OLEFINS PLANT
 Date determination entered in RBLC: 10/06/2016
 Permit Type: B: Add new process to existing facility
 Facility Description: Manufactures linear alpha olefins (LAO) from ethylene
 Permit Notes:

Process Information: LINEAR ALPHA OLEFINS PLANT

+Process Name: Industrial-Sized Furnaces, Natural Gas-fired
 +Process Type: 12.310
 Primary Fuel: natural gas
 Throughput: 217.00
 Throughput Unit: MM BTU / H
 Process Notes: Thermal Fluid ("hot oil") Heater, throughput based on higher heating value basis

Pollutant Information: LINEAR ALPHA OLEFINS PLANT - Industrial-Sized Furnaces, Natural Gas-fired

+Pollutant Name Nitrogen Oxides (NOx)
 Emission Limit 1: 0.0060
 Emission Limit 1 Unit: LB / MM BTU
 Emission Limit 1 Avg. Time/Condition: HHV BASIS, ANNUAL AVERAGE
 Emission Limit 2: 0.0140
 Emission Limit 2 Unit: LB/MMBTU
 Emission Limit 2 Avg. Time/Condition: HHV BASIS, 1-HR AVERAGE

+Pollutant Name Volatile Organic Compounds (VOC)
 Emission Limit 1: 2.1500
 Emission Limit 1 Unit: T/YR
 Emission Limit 1 Avg. Time/Condition:
 Emission Limit 2: 0
 Emission Limit 2 Unit:

Emission Limit 2 Avg.
Time/Condition:

Process Information: LINEAR ALPHA OLEFINS PLANT

+Process Name:	SOCMI Floating Roof Storage Tanks
+Process Type:	64.004
Primary Fuel:	
Throughput:	0
Throughput Unit:	
Process Notes:	(9) Internal Floating Roof tanks in 1-hexene, 1-octene and 1-decene service with capacities of 300–450 Mgal

Pollutant Information: LINEAR ALPHA OLEFINS PLANT - SOCMI Floating Roof Storage Tanks

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	0.0100
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg. Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

Process Information: LINEAR ALPHA OLEFINS PLANT

+Process Name:	SOCMI Fixed Roof Storage Tanks
+Process Type:	64.004
Primary Fuel:	
Throughput:	0
Throughput Unit:	
Process Notes:	(10) fixed roof storage in C12–C24 alpha olefin service with capacities of 50–160 Mgal.

Pollutant Information: LINEAR ALPHA OLEFINS PLANT - SOCMI Fixed Roof Storage Tanks

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	0.1700
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg. Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

Process Information: LINEAR ALPHA OLEFINS PLANT

+Process Name: SOCMI Equipment Leaks
+Process Type: 64.002
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: LINEAR ALPHA OLEFINS PLANT - SOCMI Equipment Leaks

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 6.8700
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: LINEAR ALPHA OLEFINS PLANT

+Process Name: Process Vents
+Process Type: 64.003
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: LINEAR ALPHA OLEFINS PLANT - Process Vents

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.5300
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: LINEAR ALPHA OLEFINS PLANT

+Process Name: SOCM Transfer Operations
+Process Type: 64.005
Primary Fuel:
Throughput: 120000.00
Throughput Unit: gal/hr
Process Notes: Truck, railcar and barge loading

Pollutant Information: LINEAR ALPHA OLEFINS PLANT - SOCM Transfer Operations

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 99.9000
Emission Limit 1 Unit: %
Emission Limit 1 Avg.
Time/Condition: TXO
Emission Limit 2: 99.5000
Emission Limit 2 Unit: %
Emission Limit 2 Avg.
Time/Condition: VAPOR COMBUSTOR

Process Information: LINEAR ALPHA OLEFINS PLANT

+Process Name: Other Combustion
+Process Type: 19.900
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes: Collateral emissions from control devices (thermal oxidizer and vapor combustor) for truck, railcar and barge loading activities

Pollutant Information: LINEAR ALPHA OLEFINS PLANT - Other Combustion

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.0600
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: HHV BASIS, ANNUAL AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Facility Information: INDORAMA LAKE CHARLES FACILITY

RBLC ID:	LA-0314
+Facility Name:	INDORAMA LAKE CHARLES FACILITY
Date determination entered in RBLC:	03/13/2017
Permit Type:	C: Modify process at existing facility
Facility Description:	modify and restart-up a mothballed facility to produce 1,009 million lbs/yr of ethylene
Permit Notes:	

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name:	Modular Ethylene Cracking Furnaces - 001
+Process Type:	64.003
Primary Fuel:	natural gas/fuel gas
Throughput:	1028.00
Throughput Unit:	MM BTU/hr
Process Notes:	

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - Modular Ethylene Cracking Furnaces - 001

+Pollutant Name	Particulate matter, total < 10 μ (TPM10)
Emission Limit 1:	0.0070
Emission Limit 1 Unit:	LB/MM BTU
Emission Limit 1 Avg. Time/Condition:	THREE ONE-HOUR TEST AVERAGE
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1:	0.0070
Emission Limit 1 Unit:	LB/MM BTU
Emission Limit 1 Avg. Time/Condition:	THREE ONE-HOUR TEST AVERAGE
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	

+Pollutant Name	Nitrogen Oxides (NO _x)
Emission Limit 1:	0.0100
Emission Limit 1 Unit:	LB/MM BTU

Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0400
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0054
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name: Ethylene Cracking Furnace - 015
+Process Type: 64.003
Primary Fuel: natural gas/fuel gas
Throughput: 168.00
Throughput Unit: mm btu
Process Notes:

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - Ethylene Cracking Furnace - 015

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0070
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0070
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.0980
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0400
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0054
Emission Limit 1 Unit: LB/MM BTU

Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name: Dryer Regenerator Heater - 005
+Process Type: 13.390
Primary Fuel: process fuel gas
Throughput: 29.00
Throughput Unit: mm btu/hr
Process Notes:

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - Dryer Regenerator Heater - 005

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0820
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0054
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:

Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 µ (TPM₁₀)
Emission Limit 1: 0.0070
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 µ (TPM_{2.5})
Emission Limit 1: 0.0070
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.0600
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name: boiler A and B (010 and 011)
+Process Type: 12.310

Primary Fuel: natural gas/fuel gas
Throughput: 248.00
Throughput Unit: mm btu/hr (each)
Process Notes:

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - boiler A and B (010 and 011)

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0070
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0070
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.0600
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0820
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0054
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name: boiler B-201
+Process Type: 12.310
Primary Fuel: natural gas/fuel gas
Throughput: 229.00
Throughput Unit: mm btu
Process Notes:

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - boiler B-201

+Pollutant Name Particulate matter, total < 10 µ (TPM₁₀)
Emission Limit 1: 0.0070
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 µ (TPM_{2.5})
Emission Limit 1: 0.0070
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0

Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name	Nitrogen Oxides (NO _x)
Emission Limit 1:	0.0600
Emission Limit 1 Unit:	LB/MM BTU
Emission Limit 1 Avg.	
Time/Condition:	THREE ONE-HOUR TEST AVERAGE
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0370
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0054
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name: Flare No. 1 - 008

+Process Type: 19.310
Primary Fuel: natural gas
Throughput: 85097.00
Throughput Unit: MM BTU/yr
Process Notes:

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - Flare No. 1 - 008

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0070
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0070
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.0680
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.3100
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	98.0000
Emission Limit 1 Unit:	%
Emission Limit 1 Avg.	
Time/Condition:	REMOVAL EFFICIENCY
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name:	Pyrolysis Gasoline Tank Flare - 009
+Process Type:	19.310
Primary Fuel:	natural gas
Throughput:	0.66
Throughput Unit:	mm btu/hr
Process Notes:	

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - Pyrolysis Gasoline Tank Flare - 009

+Pollutant Name	Particulate matter, total < 10 μ (TPM10)
Emission Limit 1:	0.0070
Emission Limit 1 Unit:	LB/MM BTU
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1:	0.0070
Emission Limit 1 Unit:	LBS/MM BTU

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 0.0680
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.3100
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 98.0000
Emission Limit 1 Unit: %
Emission Limit 1 Avg.
Time/Condition: REMOVAL EFFICIENCY
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name: vessel evacuation flare - 018
+Process Type: 19.310
Primary Fuel: natural gas
Throughput: 3.04
Throughput Unit: mm btu/hr
Process Notes:

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - vessel evacuation flare - 018

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0070
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0070
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.0680
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.3100
Emission Limit 1 Unit: LBS/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0

Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 98.0000
Emission Limit 1 Unit: %
Emission Limit 1 Avg.
Time/Condition: REMOVAL EFFICIENCY
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name: Diesel Firewater pump engines (6 units)
+Process Type: 17.210
Primary Fuel: diesel
Throughput: 425.00
Throughput Unit: hp
Process Notes:

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - Diesel Firewater pump engines (6 units)

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 µ (TPM10)

Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name: Diesel emergency generator engine - EGEN
+Process Type: 17.210
Primary Fuel: diesel
Throughput: 350.00
Throughput Unit: hp
Process Notes:

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - Diesel emergency generator engine - EGEN

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0
Emission Limit 1 Unit:

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name: cooling towers - 007
+Process Type: 99.009
Primary Fuel:
Throughput: 86500.00
Throughput Unit: gpm
Process Notes:

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - cooling towers - 007

+Pollutant Name Particulate matter, total < 10 µ (TPM10)
Emission Limit 1: 0.0005
Emission Limit 1 Unit: %
Emission Limit 1 Avg.
Time/Condition: DRIFT RATE
Emission Limit 2: 1400.0000
Emission Limit 2 Unit: PPM
Emission Limit 2 Avg.
Time/Condition: TDS

+Pollutant Name	Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1:	0.0005
Emission Limit 1 Unit:	%
Emission Limit 1 Avg.	
Time/Condition:	DRIFT RATE
Emission Limit 2:	1400.0000
Emission Limit 2 Unit:	PPM
Emission Limit 2 Avg.	
Time/Condition:	TDS

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name:	oil tank FA-712 - 012
+Process Type:	64.004
Primary Fuel:	
Throughput:	66150.00
Throughput Unit:	gal
Process Notes:	

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - oil tank FA-712 - 012

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name:	storm water surge tank TK-9 - 013
+Process Type:	64.004

Primary Fuel:
Throughput: 291410.00
Throughput Unit: gallons
Process Notes:

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - storm water surge tank TK-9 - 013

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name: process water storage tanks TK-301A/B - 017
+Process Type: 64.004
Primary Fuel:
Throughput: 350000.00
Throughput Unit: gallons
Process Notes:

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - process water storage tanks TK-301A/B - 017

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name: Unleaded Gasoline Tank TK-33
+Process Type: 42.005
Primary Fuel:
Throughput: 1000.00

Throughput Unit: gallons
Process Notes:

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - Unleaded Gasoline Tank TK-33

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name:	Methanol Tank TK-2
+Process Type:	64.004
Primary Fuel:	
Throughput:	1469.00
Throughput Unit:	gallons
Process Notes:	

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - Methanol Tank TK-2

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name:	pyrolysis gasoline tank V-410
+Process Type:	64.004
Primary Fuel:	
Throughput:	946996.00
Throughput Unit:	gallons
Process Notes:	

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - pyrolysis gasoline tank V-410

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name:	wastewater treatment system
+Process Type:	22.200
Primary Fuel:	
Throughput:	0
Throughput Unit:	
Process Notes:	

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - wastewater treatment system

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: INDORAMA LAKE CHARLES FACILITY

+Process Name:	Fugitive Emissions
+Process Type:	64.002
Primary Fuel:	
Throughput:	0
Throughput Unit:	
Process Notes:	

Pollutant Information: INDORAMA LAKE CHARLES FACILITY - Fugitive Emissions

+Pollutant Name	Volatile Organic Compounds (VOC)

Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: GREENSVILLE POWER STATION

RBLC ID: VA-0325
+Facility Name: GREENSVILLE POWER STATION
Date determination
entered in RBLC: 09/16/2016
Permit Type: A: New/Greenfield Facility
Facility Description: The proposed project will be a new, nominal 1,600 MW combined-cycle electrical power generating facility utilizing three combustion turbines each with a duct-fired heat recovery steam generator (HRSG) with a common reheat condensing steam turbine generator (3 on 1 configuration). The proposed fuel for the turbines and duct burners is pipeline-quality natural gas.

Permit Notes:

Process Information: GREENSVILLE POWER STATION

+Process Name: COMBUSTION TURBINE GENERATOR WITH DUCT-FIRED HEAT RECOVERY STEAM GENERATORS (3)
+Process Type: 15.210
Primary Fuel: natural gas
Throughput: 3227.00
Throughput Unit: MMBTU/HR
Process Notes: 3227 MMBTU/HR CT with 500 MMBTU/HR Duct Burner, 3 on 1 configuration.

Pollutant Information: GREENSVILLE POWER STATION - COMBUSTION TURBINE GENERATOR WITH DUCT-FIRED HEAT RECOVERY STEAM GENERATORS (3)

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 890.0000
Emission Limit 1 Unit: LB/MWH

Emission Limit 1 Avg.
Time/Condition: NET OUTPUT AFTER 30 YEARS OF OPERATION
Emission Limit 2: 1911596.0000
Emission Limit 2 Unit: TONS/YR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 1.6000
Emission Limit 1 Unit: PPMVD
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG
Emission Limit 2: 286.0000
Emission Limit 2 Unit: TONS/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING AVG

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 2.0000
Emission Limit 1 Unit: PPMVD
Emission Limit 1 Avg.
Time/Condition: 1 HR AVG
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, filterable < 2.5 μ (FPM2.5)
Emission Limit 1: 0.0039
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: AVG OF 3 TEST RUNS
Emission Limit 2: 14.1000
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0039
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: AVG OF 3 TEST RUNS
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)

Emission Limit 1:	0.0011
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	DURING NORMAL OPERATION INCLUDING SU/SD
Emission Limit 2:	18.7000
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER TURBINE

+Pollutant Name	Sulfuric Acid (mist, vapors, etc)
Emission Limit 1:	0.0006
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	9.9000
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	12 MO ROLLING AVG

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	1.4000
Emission Limit 1 Unit:	PPMVD
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	214.8000
Emission Limit 2 Unit:	T/YR
Emission Limit 2 Avg.	
Time/Condition:	PER TURBINE-12 MO ROLLING TOTAL

Process Information: GREENSVILLE POWER STATION

+Process Name:	AUXILIARY BOILER (1) AND FUEL GAS HEATERS (6)
+Process Type:	12.310
Primary Fuel:	NATURAL GAS
Throughput:	185.00
Throughput Unit:	MMBTU/HR
Process Notes:	The auxiliary boiler will provide steam to the steam turbine at startup and at cold starts to warm up the ST rotor. The steam from the auxiliary boiler will not be used to augment the power generation of the combustion turbines or steam turbine. The boiler is proposed to operate 8760 hrs/yr but will be limited by an annual fuel throughput based on a capacity factor of 10%.

Pollutant Information: GREENSVILLE POWER STATION - AUXILIARY BOILER (1) AND FUEL GAS HEATERS (6)

+Pollutant Name	Volatile Organic Compounds (VOC)

Emission Limit 1: 0.5000
Emission Limit 1 Unit: T/12 MO ROLL AVG
Emission Limit 1 Avg.
Time/Condition: 12 MONTH ROLLING TOTAL
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0.0110
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.0011
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 0.0001
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0350
Emission Limit 1 Unit: LBS/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 6.6000
Emission Limit 2 Unit: LB/H
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 µ (TPM10)
Emission Limit 1: 0.0070
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, filterable < 2.5 µ (FPM2.5)
Emission Limit 1: 0.0070
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 117.1000
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: GREENSVILLE POWER STATION

+Process Name: DIESEL-FIRED EMERGENCY GENERATOR 3000 kW (1)
+Process Type: 17.110
Primary Fuel: DIESEL FUEL
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: GREENSVILLE POWER STATION - DIESEL-FIRED EMERGENCY GENERATOR 3000 kW (1)

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 163.6000
Emission Limit 1 Unit: LB/MMBTU

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 1178.0000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING TOTAL

+Pollutant Name Carbon Monoxide
Emission Limit 1: 3.5000
Emission Limit 1 Unit: G/KW
Emission Limit 1 Avg.
Time/Condition: PER HR
Emission Limit 2: 5.8000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING TOTAL

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 6.4000
Emission Limit 1 Unit: G/KW
Emission Limit 1 Avg.
Time/Condition: PER HR
Emission Limit 2: 10.6000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING TOTAL

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.4000
Emission Limit 1 Unit: G/KW
Emission Limit 1 Avg.
Time/Condition: PER HR
Emission Limit 2: 1.0000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING TOTAL

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.4000
Emission Limit 1 Unit: G/KR
Emission Limit 1 Avg.
Time/Condition: PER HR
Emission Limit 2: 0.7000
Emission Limit 2 Unit: T/YR
Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING TOTAL

+Pollutant Name Sulfur Dioxide (SO₂)

Emission Limit 1: 0.0015
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 0.0001
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 6.4000
Emission Limit 1 Unit: G/KW
Emission Limit 1 Avg.
Time/Condition: PER HR
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: GREENSVILLE POWER STATION

+Process Name: DIESEL-FIRED WATER PUMP 376 bph (1)
+Process Type: 17.210
Primary Fuel: DIESEL FUEL
Throughput: 0
Throughput Unit:
Process Notes: FWP-1: 104.0 tons/year (12-month rolling total)

Pollutant Information: GREENSVILLE POWER STATION - DIESEL-FIRED WATER PUMP 376 bph (1)

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.3000
Emission Limit 1 Unit: G/HP-H
Emission Limit 1 Avg.
Time/Condition: PER HR
Emission Limit 2: 0

Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 0.0001
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.3000
Emission Limit 1 Unit: G/HP-H
Emission Limit 1 Avg.
Time/Condition: HR
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 3.0000
Emission Limit 1 Unit: G/HP-H
Emission Limit 1 Avg.
Time/Condition: PER HR
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 104.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition: 12 MO ROLLING TOTAL
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 2.6000
Emission Limit 1 Unit: G/HP-H

Emission Limit 1 Avg.
Time/Condition: HR
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfur Dioxide (SO₂)
Emission Limit 1: 0.0015
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: GREENSVILLE POWER STATION

+Process Name: PROPANE-FIRED EMERGENCY GENERATORS 150 kW (2)
+Process Type: 17.230
Primary Fuel: PROPANE
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: GREENSVILLE POWER STATION - PROPANE-FIRED EMERGENCY GENERATORS 150 kW (2)

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 136.1000
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 121.0000
Emission Limit 2 Unit: T/YR

Emission Limit 2 Avg.
Time/Condition: 12 MO ROLLING AVG

+Pollutant Name Carbon Monoxide
Emission Limit 1: 4.0000
Emission Limit 1 Unit: G/HP-H
Emission Limit 1 Avg.
Time/Condition: HR
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 2.0000
Emission Limit 1 Unit: G/HP-H
Emission Limit 1 Avg.
Time/Condition: HR
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 0.0001
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.1900
Emission Limit 1 Unit: G/HP-H
Emission Limit 1 Avg.
Time/Condition: PER HR
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, filterable < 2.5 μ (FPM2.5)
Emission Limit 1: 0.0190
Emission Limit 1 Unit: G/HP-H
Emission Limit 1 Avg.
Time/Condition: PER HR

Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 1.0000
Emission Limit 1 Unit: G/HP-H
Emission Limit 1 Avg.
Time/Condition: PER HR
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: GREENSVILLE POWER STATION

+Process Name: CIRCUIT BREAKERS (11)
+Process Type: 99.999
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: GREENSVILLE POWER STATION - CIRCUIT BREAKERS (11)

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 1032.0000
Emission Limit 1 Unit: T/YR
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: GREENSVILLE POWER STATION

+Process Name: AUXILIARY COOLER
+Process Type: 99.190
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: GREENSVILLE POWER STATION - AUXILIARY COOLER

+Pollutant Name	Particulate matter, total < 10 µ (TPM10)
Emission Limit 1:	0.0100
Emission Limit 1 Unit:	%
Emission Limit 1 Avg.	
Time/Condition:	DRIFT RATE
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Particulate matter, total < 2.5 µ (TPM2.5)
Emission Limit 1:	0.0100
Emission Limit 1 Unit:	%
Emission Limit 1 Avg.	
Time/Condition:	DRIFT RATE
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: GREENSVILLE POWER STATION

+Process Name:	CIRCUIT BREAKERS (3)
+Process Type:	99.999
Primary Fuel:	
Throughput:	0
Throughput Unit:	
Process Notes:	

Pollutant Information: GREENSVILLE POWER STATION - CIRCUIT BREAKERS (3)

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
Emission Limit 1:	19.0000
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: GREENSVILLE POWER STATION

+Process Name:	GAS PIPING COMPONENTS-FUGITIVE LEAKS

+Process Type: 99.999
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: GREENSVILLE POWER STATION - GAS PIPING
COMPONENTS-FUGITIVE LEAKS

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: GREENSVILLE POWER STATION

+Process Name: INLET CHILLERS (4)
+Process Type: 99.999
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: GREENSVILLE POWER STATION - INLET CHILLERS (4)

+Pollutant Name Particulate matter, total < 10 µ (TPM10)
Emission Limit 1: 1500.0000
Emission Limit 1 Unit: MG/L
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 µ (TPM2.5)
Emission Limit 1: 1500.0000
Emission Limit 1 Unit: MG/L
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0

Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Previous Page

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: LINEAR ALKYL BENZENE (LAB) UNIT

RBLC ID:	LA-0275
+Facility Name:	LINEAR ALKYL BENZENE (LAB) UNIT
Date determination entered in RBLC:	06/23/2016
Permit Type:	C: Modify process at existing facility
Facility Description:	LAB production unit, PSD-LA-291(M2) issued October 18, 1998 - PSD-LA-291(M3) issued November 29, 2010. Permit PSD-LA-291(M4) for emission limits revision, No BACT change.
Permit Notes:	

Process Information: LINEAR ALKYL BENZENE (LAB) UNIT

+Process Name:	Heaters (3 units)
+Process Type:	12.310
Primary Fuel:	Natural Gas and Ethane
Throughput:	0
Throughput Unit:	
Process Notes:	LH-1(H-201): 87.3 MM BTU/hr - fires CH4 & Ethane LH-2(H-202): 21.0 MM BTU/hr - fires CH4 & Ethane LH-3(H-601): 220.5 MM BTU/hr - fires CH4, Ethane, and hydrogen waste gas

Pollutant Information: LINEAR ALKYL BENZENE (LAB) UNIT - Heaters (3 units)

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	
+Pollutant Name	Particulate matter, total < 10 µ (TPM10)
Emission Limit 1:	0

Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: LINEAR ALKYL BENZENE (LAB) UNIT

+Process Name: LF-1 - LAB Unit Flare
+Process Type: 19.310
Primary Fuel: Natural Gas
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: LINEAR ALKYL BENZENE (LAB) UNIT - LF-1 - LAB Unit Flare

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 10.1500
Emission Limit 1 Unit: LBS/HR
Emission Limit 1 Avg.
Time/Condition: HOURLY MAXIMUM
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.4000
Emission Limit 1 Unit: LBS/HR
Emission Limit 1 Avg.
Time/Condition: HOURLY MAXIMUM
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: JOHNSONVILLE COGENERATION

RBLC ID:	TN-0162
+Facility Name:	JOHNSONVILLE COGENERATION
Date determination entered in RBLC:	05/19/2016
Permit Type:	Both B: (Add new process to existing facility) & C: (Modify process at existing facility)
Facility Description:	Existing gas-fired combustion turbine with new heat recovery steam generator (HRSG) with duct burner and two new gas-fired auxiliary boilers.
Permit Notes:	Facility-wide emissions increases do not include decreases due to shutdown of coal-fired units.

Process Information: JOHNSONVILLE COGENERATION

+Process Name:	Natural Gas-Fired Combustion Turbine with HRSG
+Process Type:	15.210
Primary Fuel:	Natural Gas
Throughput:	1339.00
Throughput Unit:	MMBtu/hr
Process Notes:	Turbine throughput is 1019.7 MMBtu/hr when burning natural gas and 1083.7 MMBtu/hr when burning No. 2 oil. Duct burner throughput is 319.3 MMBtu/hr. Duct burner firing will occur during natural gas combustion only.

Pollutant Information: JOHNSONVILLE COGENERATION - Natural Gas-Fired Combustion Turbine with HRSG

+Pollutant Name	Particulate matter, total (TPM)
Emission Limit 1:	0.0050
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	
Emission Limit 2:	0.0150
Emission Limit 2 Unit:	LB/MMBTU
Emission Limit 2 Avg. Time/Condition:	
+Pollutant Name	Carbon Monoxide
Emission Limit 1:	2.0000
Emission Limit 1 Unit:	PPMVD @ 15% O2
Emission Limit 1 Avg. Time/Condition:	30 UNIT-OPERATING-DAY MOVING AVERAGE
Emission Limit 2:	10.0000
Emission Limit 2 Unit:	PPMVD @ 15% O2
Emission Limit 2 Avg. Time/Condition:	15 UNIT-OPERATING-DAY MOVING AVERAGE

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	2.0000
Emission Limit 1 Unit:	PPMVD @ 15% O2
Emission Limit 1 Avg.	
Time/Condition:	30 UNIT-OPERATING-DAY MOVING AVERAGE
Emission Limit 2:	8.0000
Emission Limit 2 Unit:	PPMVD @ 15% O2
Emission Limit 2 Avg.	
Time/Condition:	15 UNIT-OPERATING-DAY MOVING AVERAGE

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
Emission Limit 1:	1800.0000
Emission Limit 1 Unit:	LB/MWH
Emission Limit 1 Avg.	
Time/Condition:	12-MONTH MOVING AVERAGE
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

Process Information: JOHNSONVILLE COGENERATION

+Process Name:	Two Natural Gas-Fired Auxiliary Boilers
+Process Type:	12.310
Primary Fuel:	Natural Gas
Throughput:	450.00
Throughput Unit:	MMBtu/hr
Process Notes:	Two 450 MMBtu/hr natural gas-fired auxiliary boilers will provide steam generation during threshold transitional periods and during malfunction events when the CT and HRSG are not able to operate.

Pollutant Information: JOHNSONVILLE COGENERATION - Two Natural Gas-Fired Auxiliary Boilers

+Pollutant Name	Particulate matter, total (TPM)
Emission Limit 1:	0.0080
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg.	
Time/Condition:	

+Pollutant Name	Carbon Monoxide
Emission Limit 1:	0.0840
Emission Limit 1 Unit:	LB/MMBTU

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 0.0130
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 117.0000
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: MAGNOLIA LNG FACILITY

RBLC ID: LA-0307
+Facility Name: MAGNOLIA LNG FACILITY
Date determination
entered in RBLC: 03/08/2017
Permit Type: A: New/Greenfield Facility
Facility Description: A new facility to liquefy 8.0 million metric tons per year of natural gas
Permit Notes:

Process Information: MAGNOLIA LNG FACILITY

+Process Name: Gas Turbines (8 units)
+Process Type: 15.110
Primary Fuel: natural gas

Throughput: 333.00
Throughput Unit: mm btu/hr
Process Notes:

Pollutant Information: MAGNOLIA LNG FACILITY - Gas Turbines (8 units)

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, filterable < 2.5 μ (FPM2.5)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0620
Emission Limit 1 Unit: LB/MM BTU
Emission Limit 1 Avg.
Time/Condition: THREE ONE-HOUR TEST AVERAGE
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)

Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 25.0000
Emission Limit 1 Unit: PPMVD
Emission Limit 1 Avg.
Time/Condition: @15 %O₂
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: MAGNOLIA LNG FACILITY

+Process Name: Thermal oxidizers (2 units)
+Process Type: 50.008
Primary Fuel: natural gas
Throughput: 21.00
Throughput Unit: mm btu/hr
Process Notes:

Pollutant Information: MAGNOLIA LNG FACILITY - Thermal oxidizers (2 units)

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM₁₀)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:

Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: MAGNOLIA LNG FACILITY

+Process Name: Auxiliary boilers
+Process Type: 12.310

Primary Fuel: natural gas
Throughput: 171.00
Throughput Unit: mm btu/hr
Process Notes:

Pollutant Information: MAGNOLIA LNG FACILITY - Auxiliary boilers

+Pollutant Name Carbon Dioxide Equivalent (CO2e)

Emission Limit 1: 0

Emission Limit 1 Unit:

Emission Limit 1 Avg.

Time/Condition:

Emission Limit 2: 0

Emission Limit 2 Unit:

Emission Limit 2 Avg.

Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)

Emission Limit 1: 0

Emission Limit 1 Unit:

Emission Limit 1 Avg.

Time/Condition:

Emission Limit 2: 0

Emission Limit 2 Unit:

Emission Limit 2 Avg.

Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)

Emission Limit 1: 0

Emission Limit 1 Unit:

Emission Limit 1 Avg.

Time/Condition:

Emission Limit 2: 0

Emission Limit 2 Unit:

Emission Limit 2 Avg.

Time/Condition:

+Pollutant Name Nitrogen Oxides (NOx)

Emission Limit 1: 0

Emission Limit 1 Unit:

Emission Limit 1 Avg.

Time/Condition:

Emission Limit 2: 0

Emission Limit 2 Unit:

Emission Limit 2 Avg.

Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: MAGNOLIA LNG FACILITY

+Process Name: Diesel Engines
+Process Type: 17.110
Primary Fuel: Diesel
Throughput: 0
Throughput Unit:
Process Notes: Water Pumps (2 units) = 355 hp Tank Deluge Pumps (2 units) = 800 hp
Generator = 1340 hp

Pollutant Information: MAGNOLIA LNG FACILITY - Diesel Engines

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM_{2.5})
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:

Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 µ (TPM10)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Process Name: flares
+Process Type: 19.390
Primary Fuel: natural gas
Throughput: 7.33
Throughput Unit: kg/hr
Process Notes:

Pollutant Information: MAGNOLIA LNG FACILITY - flares

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, filterable < 2.5 μ (FPM2.5)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:

Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: MAGNOLIA LNG FACILITY

+Process Name: Regenerative Heaters
+Process Type: 13.310
Primary Fuel: natural gas
Throughput: 7.37
Throughput Unit: mm btu/hr
Process Notes:

Pollutant Information: MAGNOLIA LNG FACILITY - Regenerative Heaters

+Pollutant Name Particulate matter, total < 10 µ (TPM₁₀)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 µ (TPM_{2.5})
Emission Limit 1: 0
Emission Limit 1 Unit:

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Nitrogen Oxides (NO_x)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO₂e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

Process Information: MAGNOLIA LNG FACILITY

+Process Name: fugitives
+Process Type: 64.002
Primary Fuel:
Throughput: 0
Throughput Unit:
Process Notes:

Pollutant Information: MAGNOLIA LNG FACILITY - fugitives

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

[Previous Page](#)

**NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".**

Report Date: 03/29/2021 Control Technology Determinations (Freeform)

Facility Information: TENASKA PA PARTNERS/WESTMORELAND GEN FAC

RBLC ID: PA-0306
+Facility Name: TENASKA PA PARTNERS/WESTMORELAND GEN FAC
Date determination
entered in RBLC: 06/09/2017
Permit Type: U: Unspecified

Facility Description: The plan approval will allow construction and temporary operation of a power plant is a single 2 on 1 combined cycle turbine configuration with 2 combustion turbines serving a single steam turbine generator equipped with heat recovery steam generator with supplemental 400MMBtu/hr natural gas fired duct burners. The approximate maximum plant nominal generating capacity is 930-1065 MW. Additional facilities will include 245 MMBtu/hr Auxiliary Boiler, one cooling tower, one diesel-fired emergency generator, and one diesel-fired emergency fire pump engine.

Permit Notes: Application for plan approval 65-00990E received on 12/10/2015 from Tenaska to reduce the facility wide PTE authorized under plan approval 65-00990C based on revised emission information for startup and shutdown from the manufacturer.

Process Information: TENASKA PA PARTNERS/WESTMORELAND GEN FAC

+Process Name: Large combustion turbine
 +Process Type: 15.210
 Primary Fuel: Natural Gas
 Throughput: 0
 Throughput Unit:
 Process Notes: This process entry is for operations with the duct burner. Limits entered are for each turbine.

Pollutant Information: TENASKA PA PARTNERS/WESTMORELAND GEN FAC - Large combustion turbine

+Pollutant Name	Nitrogen Oxides (NOx)
Emission Limit 1:	2.0000
Emission Limit 1 Unit:	PPMVD@15% O2
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	26.5000
Emission Limit 2 Unit:	LB/HR
Emission Limit 2 Avg.	
Time/Condition:	
+Pollutant Name	Carbon Monoxide
Emission Limit 1:	15.9000
Emission Limit 1 Unit:	LB/HR
Emission Limit 1 Avg.	
Time/Condition:	3 HR AVERAGE
Emission Limit 2:	318.6000
Emission Limit 2 Unit:	TPY
Emission Limit 2 Avg.	
Time/Condition:	12 MONTH ROLLING BASIS
+Pollutant Name	Volatile Organic Compounds (VOC)

Emission Limit 1: 2.4000
Emission Limit 1 Unit: PPMDV@15% O2
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 9.4000
Emission Limit 2 Unit: LB/HR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 0.0006
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: HHV
Emission Limit 2: 1.8000
Emission Limit 2 Unit: LB/HR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 0.0039
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 11.8000
Emission Limit 2 Unit: LB/HR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0039
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 11.8000
Emission Limit 2 Unit: LB/HR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
Emission Limit 1: 1881905.0000
Emission Limit 1 Unit: TPY
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 µ (TPM2.5)
Emission Limit 1: 0.0039
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 11.8000
Emission Limit 2 Unit: LB/HR
Emission Limit 2 Avg.
Time/Condition:

Process Information: TENASKA PA PARTNERS/WESTMORELAND GEN FAC

+Process Name: 245 MMBtu natural gas fired Auxiliary boiler
+Process Type: 12.310
Primary Fuel: Natural Gas
Throughput: 1052.00
Throughput Unit: MMscf/yr
Process Notes: Total fuel usage of the auxiliary boiler shall not exceed 1052 MMsch/yr
 on a 12-month rolling basis

Pollutant Information: TENASKA PA PARTNERS/WESTMORELAND GEN FAC - 245 MMBtu natural gas fired Auxiliary boiler

+Pollutant Name Nitrogen Oxides (NOx)
Emission Limit 1: 0.0110
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:

Emission Limit 2: 9.0000
Emission Limit 2 Unit: PPMDV @ 15% O2
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Carbon Monoxide
Emission Limit 1: 0.0370
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 19.8500
Emission Limit 2 Unit: LB/HR
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total (TPM)
Emission Limit 1: 4.0000
Emission Limit 1 Unit: TPY

Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 10 μ (TPM10)
Emission Limit 1: 0.0075
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG
Emission Limit 2: 4.0000
Emission Limit 2 Unit: TPY
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Particulate matter, total < 2.5 μ (TPM2.5)
Emission Limit 1: 0.0075
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: 3 HR AVG
Emission Limit 2: 4.0000
Emission Limit 2 Unit: TPY
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
Emission Limit 1: 0.0049
Emission Limit 1 Unit: TPY
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 0
Emission Limit 2 Unit:
Emission Limit 2 Avg.
Time/Condition:

+Pollutant Name Volatile Organic Compounds (VOC)
Emission Limit 1: 0.0054
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition:
Emission Limit 2: 2.8900
Emission Limit 2 Unit: TPY
Emission Limit 2 Avg.
Time/Condition:

Process Information: TENASKA PA PARTNERS/WESTMORELAND GEN FAC

+Process Name:	Large Combustion turbine
+Process Type:	15.110
Primary Fuel:	Natural gas
Throughput:	0
Throughput Unit:	
Process Notes:	This process entry is for the VOC emissions of turbine operation without the duct burner. Limit entered is for one turbine

Pollutant Information: TENASKA PA PARTNERS/WESTMORELAND GEN FAC - Large Combustion turbine

+Pollutant Name	Volatile Organic Compounds (VOC)
Emission Limit 1:	1.4000
Emission Limit 1 Unit:	PPMVD @ 15% O2
Emission Limit 1 Avg.	
Time/Condition:	
Emission Limit 2:	9.4000
Emission Limit 2 Unit:	LB/HR
Emission Limit 2 Avg.	
Time/Condition:	

[Previous Page](#)