TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

AGENDA ITEM REQUEST

for Proposed State Implementation Plan Revision

AGENDA REQUESTED: April 13, 2022

DATE OF REQUEST: March 25, 2022

INDIVIDUAL TO CONTACT REGARDING CHANGES TO THIS REQUEST, IF NEEDED: Jamie Zech, Agenda Coordinator, (512) 239-3935.

CAPTION: Docket No. 2022-0132-SIP. Consideration for publication of, and hearing on, the proposed Howard County Attainment Demonstration State Implementation Plan (SIP) Revision for the 2010 One-Hour Sulfur Dioxide (SO_2) National Ambient Air Quality Standard (NAAQS). The proposed SIP revision addresses federal Clean Air Act (FCAA) SIP requirements for the Howard County SO_2 nonattainment area by including a comprehensive inventory of current SO_2 emissions; evaluation and provision for implementing all reasonably available control measures and reasonably available control technology; air quality dispersion modeling to demonstrate attainment; a reasonable further progress demonstration; contingency measures; and certification that nonattainment New Source Review requirements are met.

The associated proposed 30 Texas Administrative Code Chapter 112, Subchapter E rulemaking (Rule Project No. 2021-035-112-AI) would provide the enforceable control strategy needed to demonstrate attainment of the 2010 SO_2 NAAQS by the April 30, 2026, attainment deadline. (Mary Ann Cook, Terry Salem, John Minter; SIP Project No. 2021-010-SIP-NR)

Tonya Baer

Director

Donna F. Huff

Deputy Director

Jamie Zech

Agenda Coordinator

Copy to CCC Secretary? NO ☒ YES ☐

Texas Commission on Environmental Quality
Interoffice Memorandum

To: Commissioners **Date:** March 25, 2022

Thru: Laurie Gharis, Chief Clerk
Toby Baker, Executive Director

From: Tonya Baer, Director
Office of Air

Docket No.: 2022-0132-SIP

Subject: Commission Approval to Propose the Howard County Attainment Demonstration State Implementation Plan (SIP) Revision for the 2010 One-Hour Sulfur Dioxide (SO_2) National Ambient Air Quality Standard (NAAQS)

Howard County 2010 SO_2 Attainment Demonstration SIP Revision
SIP Project No. 2021-010-SIP-NR

Background and reason(s) for the SIP revision:
On June 22, 2010, the United States Environmental Protection Agency (EPA) revised the SO_2 NAAQS, adding a 75 parts per billion (ppb) one-hour primary standard, effective August 23, 2010 (75 *Federal Register* (FR) 35520).

In the final round of designations for the 2010 SO_2 NAAQS, the EPA designated a portion of Howard County as nonattainment, effective April 30, 2021 (86 FR 16055). Texas is required to submit an attainment demonstration SIP revision for the Howard County nonattainment area to the EPA by October 30, 2022. The SIP revision is required to demonstrate attainment of the 2010 SO_2 NAAQS as expeditiously as practicable but no later than five years after the effective date of designations, or April 30, 2026.

Scope of the SIP revision:
This proposed SIP Revision would fulfill Texas' federal Clean Air Act (FCAA) SIP planning requirements for the 2010 One-Hour SO_2 NAAQS in the Howard County nonattainment area. The proposed SIP revision, together with the associated proposed 30 Texas Administrative Code (TAC) Chapter 112, Subchapter E rulemaking (Rule Project No. 2021-035-112-AI), document the state's plan to achieve the emission reductions required to demonstrate attainment of the 2010 SO_2 NAAQS in the Howard County nonattainment area and meet other FCAA-required SIP elements.

A.) Summary of what the SIP revision would do:
If adopted by the commission and approved by the EPA, this proposed SIP revision, along with the associated Chapter 112 rulemaking, would demonstrate attainment and maintenance of the 2010 SO_2 NAAQS in the Howard County nonattainment area as expeditiously as practicable, but not later than April 30, 2026.

B.) Scope required by federal regulations or state statutes:
In accordance with FCAA, §172 general requirements and FCAA, §191 and §192 specific requirements, this proposed attainment demonstration SIP revision includes a comprehensive inventory of current SO_2 emissions; a control strategy with evaluation and provision for implementing all reasonably available control measures and reasonably available control technology; air quality dispersion modeling to demonstrate attainment of the 2010 SO_2 NAAQS; a reasonable further progress demonstration; contingency measures; and the state's certification that current regulations provide the means to satisfy nonattainment New Source Review requirements for the Howard County 2010 SO_2 nonattainment area.

This SIP revision submittal must demonstrate that the 2010 SO_2 NAAQS will be attained as expeditiously as practicable and not later than April 30, 2026. Based on the EPA's *Guidance for 1-*

Hour SO_2 Nonattainment Area SIP Submissions, control strategies must be in place by January 1, 2025 to provide for attainment of the NAAQS by the April 30, 2026 attainment deadline.

C.) Additional staff recommendations that are not required by federal rule or state statute:
None.

Statutory authority:
Sections 382.002, 382.011 and 382.012 of the Texas Clean Air Act (TCAA), which is codified as Texas Health & Safety Code, (THSC), Chapter 382, provide authority for the commission's purpose to safeguard the state's air resources, as well as to control the quality of the state's air and prepare and develop a general, comprehensive plan for the proper control of the state's air. The Texas Water Code, Section 5.102 provides general authority for the commission necessary for it to exercise its jurisdiction and discharge its duties.

The authority to propose and adopt the proposed SIP revision is derived from FCAA, 42 United States Code, §7410, which requires states to submit SIP revisions that contain enforceable measures to achieve the NAAQS, and other general and specific authority in Texas Water Code, Chapters 5 and 7, and THSC, Chapter 382.

Effect on the:

A.) Regulated community:
For the Howard County nonattainment area to attain the 2010 SO_2 NAAQS, SO_2 emission reductions are necessary at sites in the nonattainment area. The control strategy for demonstrating attainment of the 2010 SO_2 NAAQS in the Howard County nonattainment area would be made enforceable with commission adoption and EPA approval of the associated proposed Chapter 112 rulemaking. All affected emissions sources in the nonattainment area would be required to comply with all requirements and stipulations of the associated proposed rules.

B.) Public:
The public in the nonattainment area and possibly the surrounding areas would benefit from improved air quality due to lower SO_2 emission levels resulting from implementation of the control strategy in this proposed SIP revision.

C.) Agency programs:
No impact on agency programs is anticipated from this proposed SIP revision.

Stakeholder meetings:
If this proposed SIP revision and associated proposed rulemaking are approved by the commission for public comment and public hearing, then a public comment period will be opened, and a public hearing will be offered.

Potential controversial concerns and legislative interest:
None.

Would this SIP revision affect any current policies or require development of new policies?
No.

What are the consequences if this SIP revision does not go forward? Are there alternatives to revising the SIP?
The commission could choose to not comply with the requirements to develop and submit this attainment demonstration SIP revision to the EPA. However, if this SIP revision is not submitted to the EPA by the submittal deadline, the EPA could issue a finding of failure to submit, requiring that the TCEQ submit the required SIP revision within a specified time. The EPA could also impose sanctions on the state. Sanctions could include 200% emissions offsets requirements for new construction and major modifications of stationary sources in the nonattainment area as well as transportation funding restrictions. The EPA would be required to promulgate a federal implementation plan (FIP) if the TCEQ fails to submit, or the EPA does not approve, the required SIP revision within two years of the finding of failure to submit. The EPA could impose sanctions and implement a FIP until the state submits and the EPA approves a replacement SIP revision for the area.

Key points in the SIP revision schedule:
Anticipated proposal date: April 13, 2022
Anticipated public hearing date: May 18, 2022
Anticipated public comment period: April 15, 2022 through June 2, 2022
Anticipated adoption date: October 5, 2022

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REVISIONS TO THE STATE OF TEXAS AIR QUALITY IMPLEMENTATION PLAN FOR THE CONTROL OF SULFUR DIOXIDE AIR POLLUTION

HOWARD COUNTY 2010 SULFUR DIOXIDE STANDARD NONATTAINMENT AREA

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P.O. BOX 13087
AUSTIN, TEXAS 78711-3087

HOWARD COUNTY ATTAINMENT DEMONSTRATION STATE IMPLEMENTATION PLAN FOR THE 2010 ONE-HOUR SULFUR DIOXIDE NATIONAL AMBIENT AIR QUALITY STANDARD

2021-010-SIP-NR

Proposal
April 13, 2022

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EXECUTIVE SUMMARY

On June 22, 2010, the United States Environmental Protection Agency (EPA) revised the sulfur dioxide (SO_2) National Ambient Air Quality Standards (NAAQS) to add the 75 parts per billion (ppb) one-hour primary standard, effective August 23, 2010 (75 *Federal Register* (FR) 35520).

In the final round of designations for the 2010 SO_2 NAAQS, the EPA designated a portion of Howard County as nonattainment, effective April 30, 2021 (86 FR 16055). Texas is required to submit an attainment demonstration state implementation plan (SIP) revision for the Howard County 2010 SO_2 NAAQS nonattainment area to the EPA by October 30, 2022. The attainment demonstration SIP revision is required to demonstrate attainment of the 2010 SO_2 NAAQS as expeditiously as practicable but no later than five years after the effective date of designation, or April 30, 2026.

This proposed Howard County Attainment Demonstration SIP Revision for the 2010 One-Hour SO_2 NAAQS demonstrates that the Howard County nonattainment area will attain the 2010 SO_2 NAAQS by the April 30, 2026 attainment deadline. There are three sites with multiple SO_2 emissions sources at each site in the Howard County 2010 SO_2 NAAQS nonattainment area.

In accordance with federal Clean Air Act (FCAA), §172 general requirements and FCAA, §191 and §192 specific requirements, this proposed Howard County Attainment Demonstration SIP Revision for the 2010 One-Hour SO_2 NAAQS includes a comprehensive inventory of current SO_2 emissions; evaluation and provision for implementing all reasonably available control measures and reasonably available control technology; air quality dispersion modeling to demonstrate attainment of the 2010 SO_2 NAAQS; a reasonable further progress demonstration; contingency measures; and the state's certification that current regulations provide the means to satisfy nonattainment New Source Review requirements for the Howard County 2010 SO_2 nonattainment area.

This proposed SIP revision incorporates associated proposed 30 Texas Administrative Code Chapter 112, Subchapter E rules (Rule Project No. 2021-035-112-AI). The proposed rulemaking provides an enforceable control strategy that limits emissions at applicable emissions sources in the nonattainment area to a level necessary to attain the 2010 SO_2 NAAQS. This proposed SIP revision, together with the associated proposed Chapter 112 rulemaking, fulfills Texas' FCAA SIP planning requirements for the Howard County nonattainment area for the 2010 SO_2 NAAQS.

SECTION V-A: LEGAL AUTHORITY

General

The Texas Commission on Environmental Quality (TCEQ) has the legal authority to implement, maintain, and enforce the National Ambient Air Quality Standards (NAAQS) and to control the quality of the state's air, including maintaining adequate visibility.

The first air pollution control act, known as the Clean Air Act of Texas, was passed by the Texas Legislature in 1965. In 1967, the Clean Air Act of Texas was superseded by a more comprehensive statute, the Texas Clean Air Act (TCAA), found in Article 4477-5, Vernon's Texas Civil Statutes. The legislature amended the TCAA in 1969, 1971, 1973, 1979, 1985, 1987, 1989, 1991, 1993, 1995, 1997, 1999, 2001, 2003, 2005, 2007, 2009, 2011, 2013, 2015, 2017, and 2019. In 1989, the TCAA was codified as Chapter 382 of the Texas Health and Safety Code.

Originally, the TCAA stated that the Texas Air Control Board (TACB) was the state air pollution control agency and was the principal authority in the state on matters relating to the quality of air resources. In 1991, the legislature abolished the TACB effective September 1, 1993, and its powers, duties, responsibilities, and functions were transferred to the Texas Natural Resource Conservation Commission (TNRCC). In 2001, the 77th Texas Legislature continued the existence of the TNRCC until September 1, 2013 and changed the name of the TNRCC to the TCEQ. In 2009, the 81st Texas Legislature, during a special session, amended section 5.014 of the Texas Water Code, changing the expiration date of the TCEQ to September 1, 2011, unless continued in existence by the Texas Sunset Act. In 2011, the 82nd Texas Legislature continued the existence of the TCEQ until 2023. With the creation of the TNRCC (and its successor the TCEQ), the authority over air quality is found in both the Texas Water Code and the TCAA. Specifically, the authority of the TCEQ is found in Chapters 5 and 7. Chapter 5, Subchapters A - F, H - J, and L, include the general provisions, organization, and general powers and duties of the TCEQ, and the responsibilities and authority of the executive director. Chapter 5 also authorizes the TCEQ to implement action when emergency conditions arise and to conduct hearings. Chapter 7 gives the TCEQ enforcement authority.

The TCAA specifically authorizes the TCEQ to establish the level of quality to be maintained in the state's air and to control the quality of the state's air by preparing and developing a general, comprehensive plan. The TCAA, Subchapters A - D, also authorize the TCEQ to collect information to enable the commission to develop an inventory of emissions; to conduct research and investigations; to enter property and examine records; to prescribe monitoring requirements; to institute enforcement proceedings; to enter into contracts and execute instruments; to formulate rules; to issue orders taking into consideration factors bearing upon health, welfare, social and economic factors, and practicability and reasonableness; to conduct hearings; to establish air quality control regions; to encourage cooperation with citizens' groups and other agencies and political subdivisions of the state as well as with industries and the federal government; and to establish and operate a system of permits for construction or modification of facilities.

Local government authority is found in Subchapter E of the TCAA. Local governments have the same power as the TCEQ to enter property and make inspections. They also

may make recommendations to the commission concerning any action of the TCEQ that affects their territorial jurisdiction, may bring enforcement actions, and may execute cooperative agreements with the TCEQ or other local governments. In addition, a city or town may enact and enforce ordinances for the control and abatement of air pollution not inconsistent with the provisions of the TCAA and the rules or orders of the commission.

In addition, Subchapters G and H of the TCAA authorize the TCEQ to establish vehicle inspection and maintenance programs in certain areas of the state, consistent with the requirements of the federal Clean Air Act; coordinate with federal, state, and local transportation planning agencies to develop and implement transportation programs and measures necessary to attain and maintain the NAAQS; establish gasoline volatility and low emission diesel standards; and fund and authorize participating counties to implement vehicle repair assistance, retrofit, and accelerated vehicle retirement programs.

Applicable Law

The following statutes and rules provide necessary authority to adopt and implement the state implementation plan (SIP). The rules listed below have previously been submitted as part of the SIP.

Statutes

All sections of each subchapter are included, unless otherwise noted.

TEXAS HEALTH & SAFETY CODE, Chapter 382	September 1, 2019
TEXAS WATER CODE	September 1, 2019

Chapter 5: Texas Natural Resource Conservation Commission
- Subchapter A: General Provisions
- Subchapter B: Organization of the Texas Natural Resource Conservation Commission
- Subchapter C: Texas Natural Resource Conservation Commission
- Subchapter D: General Powers and Duties of the Commission
- Subchapter E: Administrative Provisions for Commission
- Subchapter F: Executive Director (except §§5.225, 5.226, 5.227, 5.2275, 5.231, 5.232, and 5.236)
- Subchapter H: Delegation of Hearings
- Subchapter I: Judicial Review
- Subchapter J: Consolidated Permit Processing
- Subchapter L: Emergency and Temporary Orders (§§5.514, 5.5145, and 5.515 only)
- Subchapter M: Environmental Permitting Procedures (§5.558 only)

Chapter 7: Enforcement
- Subchapter A: General Provisions (§§7.001, 7.002, 7.0025, 7.004, and 7.005 only)
- Subchapter B: Corrective Action and Injunctive Relief (§7.032 only)
- Subchapter C: Administrative Penalties
- Subchapter D: Civil Penalties (except §7.109)
- Subchapter E: Criminal Offenses and Penalties: §§7.177, 7.179-7.183

Rules

All of the following rules are found in 30 Texas Administrative Code, as of the following latest effective dates:

Chapter 7: Memoranda of Understanding, §§7.110 and 7.119 — December 13, 1996 and May 2, 2002

Chapter 19: Electronic Reporting — March 15, 2007
- Subchapter A: General Provisions
- Subchapter B: Electronic Reporting Requirements

Chapter 35: Emergency and Temporary Orders and Permits; Temporary Suspension or Amendment of Permit Conditions
- Subchapter A: Purpose, Applicability, and Definitions — December 10, 1998
- Subchapter B: Authority of Executive Director — December 10, 1998
- Subchapter C: General Provisions — March 24, 2016
- Subchapter K: Air Orders — July 20, 2006

Chapter 39: Public Notice
- Subchapter H: Applicability and General Provisions, §§39.402(a)(1) - (6), (8), and (10) - (12), 39.405(f)(3) and (g), (h)(1)(A) - (4), (6), (8) - (11), (i) and (j), 39.407, 39.409, 39.411(a), (e)(1) - (4)(A)(i) and (iii), (4)(B), (5)(A) and (B), and (6) - (10), (11)(A)(i) and (iii) and (iv), (11)(B) - (F), (13) and (15), and (f)(1) - (8), (g) and (h), 39.418(a), (b)(2)(A), (b)(3), and (c), 39.419(e), 39.420 (c)(1)(A) - (D)(i)(I) and (II), (D)(ii), (c)(2), (d) - (e), and (h), and Subchapter K: Public Notice of Air Quality Permit Applications, §§39.601 - 39.605 — September 10, 2021

Chapter 55: Requests for Reconsideration and Contested Case Hearings; Public Comment, all of the chapter, except §55.125(a)(5) and (6) — September 10, 2021

Chapter 101: General Air Quality Rules — May 14, 2020

Chapter 106: Permits by Rule, Subchapter A — April 17, 2014

Chapter 111: Control of Air Pollution from Visible Emissions and Particulate Matter — August 3, 2017

Chapter 112: Control of Air Pollution from Sulfur Compounds — July 16, 1997

Chapter 113: Standards of Performance for Hazardous Air Pollutants and for Designated Facilities and Pollutants — May 14, 2009

Chapter 114: Control of Air Pollution from Motor Vehicles — July 2, 2020

Chapter 115: Control of Air Pollution from Volatile Organic Compounds — July 22, 2021

Chapter 116: Control of Air Pollution by Permits for New Construction or Modification May 14, 2020

Chapter 117: Control of Air Pollution from Nitrogen Compounds March 26, 2020

Chapter 118: Control of Air Pollution Episodes March 5, 2000

Chapter 122: §122.122: Potential to Emit February 23, 2017

Chapter 122: §122.215: Minor Permit Revisions June 3, 2001

Chapter 122: §122.216: Applications for Minor Permit Revisions June 3, 2001

Chapter 122: §122.217: Procedures for Minor Permit Revisions June 3, 2001

Chapter 122: §122.218: Minor Permit Revision Procedures for Permit Revisions Involving the Use of Economic Incentives, Marketable Permits, and Emissions Trading June 3, 2001

SECTION VI: CONTROL STRATEGY

A. Introduction (No change)
B. Ozone (No change)
C. Particulate Matter (No change)
D. Carbon Monoxide (No change)
E. Lead (No change)
F. Oxides of Nitrogen (No change)
G. Sulfur Dioxide (Revised)
    1. Harris County SO_2 State Implementation Plan (SIP) Revision (No change)
    2. Milam County SO_2 SIP Revision (No change)
    3. Attainment Demonstration for the Rusk-Panola 2010 SO_2 NAAQS Nonattainment Area (No change)
    4. Redesignation Request and Maintenance Plan for the Freestone-Anderson and Titus 2010 SO_2 NAAQS Nonattainment Areas (No change)
    5. Attainment Demonstration SIP Revision for the Howard County 2010 SO_2 NAAQS Nonattainment Area (New)
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J. Mobile Sources Strategies (No change)
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LIST OF ACRONYMS

AEDT	Aviation Environmental Design Tool
AERR	Air Emissions Reporting Requirements
AMS	American Meteorological Society
AERMOD	American Meteorological Society/United States Environmental Protection Agency Regulatory Model
APU	auxiliary power unit
AQD	Air Quality Division
BPIPPRM	Building Profile Input Program for PRIME
C	cap
CEV	critical emissions value
CFR	Code of Federal Regulations
DV	design value
EGU	electric generating unit
EI	emissions inventory
EPA	United States Environmental Protection Agency
EPN	Emissions Point Number
ERG	Eastern Research Group
°F	degrees Fahrenheit
FAA	Federal Aviation Administration
FCAA	federal Clean Air Act
FCCU	fluidized catalytic cracking unit
FGD	flue gas desulfurization
FIP	federal implementation plan
FMVCP	Federal Motor Vehicle Control Program
ft	feet
FR	*Federal Register*
FSA	full system audit
g	gram
GSE	ground support equipment
H_2S	hydrogen sulfide
hr	hour
HRSG	heat recovery steam generator
ICI	Industrial, Commercial, and Institutional

km	kilometers
lb	pound
m	meters
MC	Monte Carlo
MMBtu	one million British Thermal Units
MOVES	Motor Vehicle Emission Simulator
NAAQS	National Ambient Air Quality Standard
NEI	National Emissions Inventory
NSR	New Source Review
ppb	parts per billion
RACM	reasonably available control measures
RACT	reasonably available control technology
RFP	reasonable further progress
RN	Regulated Entity Reference Number
RRC	Railroad Commission of Texas
s	second
SIL	significant impact level
SIP	state implementation plan
SO_2	sulfur dioxide
STARS	State of Texas Air Reporting System
TAC	Texas Administrative Code
TACB	Texas Air Control Board
TCAA	Texas Clean Air Act
TCEQ	Texas Commission on Environmental Quality (commission)
TexN2.2	Texas NONROAD version 2.2
THSC	Texas Health and Safety Code
TNRCC	Texas Natural Resource Conservation Commission
tpy	tons per year
TSD	technical support document
TWC	Texas Water Code
TX	Texas

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CHAPTER 1: GENERAL

1.1 BACKGROUND

Information on the Texas State Implementation Plan (SIP) and a list of SIP revisions and other air quality plans adopted by the commission can be found on the Texas State Implementation Plan webpage (http://www.tceq.texas.gov/airquality/sip) and on the Texas Commission on Environmental Quality's (TCEQ) website (http://www.tceq.texas.gov/).

1.2 HISTORY OF THE HOWARD COUNTY 2010 SULFUR DIOXIDE NATIONAL AMBIENT AIR QUALITY STANDARD NONATTAINMENT AREA

On June 22, 2010, the United States Environmental Protection Agency (EPA) revised the sulfur dioxide (SO_2) National Ambient Air Quality Standards (NAAQS), adding a 75 parts per billion one-hour primary standard (75 *Federal Register* (FR) 35520). On June 2, 2011, Texas submitted a letter to the EPA recommending designations for all Texas counties, including an unclassifiable designation for Howard County. An updated recommendation submitted to the EPA on April 20, 2012 did not change the state's initial recommendation for Howard County.

On July 27, 2012, EPA extended its deadline for area designations for the 2010 primary SO_2 standard for one year due to having insufficient information to make initial area designations at that time but intending to complete initial designations by June 3, 2013. On August 5, 2013, the EPA designated parts of 16 states as nonattainment for the 2010 SO_2 standard, effective October 4, 2013 (78 FR 47191). These were 29 areas that had monitored data indicating violations of the 2010 SO_2 NAAQS within the period from 2009 through 2011. The EPA was not prepared to issue designations for any remaining areas, so no areas of Texas were designated in Round 1 of the EPA's 2010 SO_2 standard designations.

The EPA's Data Requirements Rule (DRR) for the 2010 SO_2 NAAQS required that for areas to be characterized by monitoring for Round 4 designations, all source-oriented monitors used to inform designations were to be installed and operating by January 1, 2017. The TCEQ deployed an SO_2 monitor at the Big Spring Midway site (air quality system number 482271072) on December 3, 2016, in Howard County.

The EPA published final Round 4 designations on March 26, 2021, effective April 30, 2021 (86 FR 16055). These designations were based primarily on ambient monitoring data, including data from monitors installed pursuant to the DRR and in accordance with the EPA's September 5, 2019, memorandum to Regional Air Directors, *Area Designations for the 2010 Primary Sulfur Dioxide National Ambient Air Quality Standard - Round 4*.[1] Specifically defined portions of Howard, Hutchinson, and Navarro Counties were designated nonattainment, and Texas is required to submit attainment demonstrations for all three of these partial-county nonattainment areas to the EPA by October 30, 2022.

[1] https://www.epa.gov/sites/default/files/2019-09/documents/round_4_so2_designations_memo_09-05-2019_final.pdf

This Howard County SO_2 attainment demonstration, in accordance with FCAA, §172 general requirements and FCAA, §191 and §192 specific requirements, includes a comprehensive inventory of current SO_2 emissions; identification of existing federal and state controls; evaluation and provision for implementing all reasonably available control measures and reasonably available control technology; air quality dispersion modeling and analysis to evaluate projected air quality improvements from existing and new controls; a reasonable further progress (RFP) demonstration; contingency measures that would be implemented to achieve additional emissions reductions if the area fails to attain the NAAQS or meet an RFP milestone by the deadline; and the state's certification that current regulations provide the means to satisfy nonattainment New Source Review requirements for the Howard County 2010 SO_2 nonattainment area.

This SIP revision for Howard County is proposed concurrent with proposed attainment demonstration SIP revisions for the Navarro County (Non-Rule Project No. 2021-012-SIP-NR) and Hutchinson County (Non-Rule Project No. 2021-011-SIP-NR) 2010 SO_2 NAAQS nonattainment areas and an associated proposed 30 Texas Administrative Code Chapter 112, Subchapter E rulemaking (Rule Project No. 2021-035-112-AI) to provide the control strategy applicable for each nonattainment area.

1.3 PUBLIC HEARING AND COMMENT INFORMATION

The commission will hold a public hearing for this proposed SIP revision at the following time and location

Table 1-1: Public Hearing Information

City	Date	Time	Location
Big Spring	May 18, 2022	6:00 p.m. CDT	Dora Roberts Community Center Ballroom 100 Whipkey Drive Big Spring, Texas 79720

The public comment period will open on April 15, 2022, and close on June 2, 2022. Written comments will be accepted via mail, fax, or through the eComments (https://www6.tceq.texas.gov/rules/ecomments/) system. All comments should reference the "Howard County 2010 SO_2 NAAQS Attainment Demonstration SIP Revision" and should reference Project Number 2021-010-SIP-NR. Comments may be submitted to Mary Ann Cook, MC 206, State Implementation Plan Team, Air Quality Division, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087 or faxed to (512) 239-6188. Electronic comments must be submitted through the eComments system. File size restrictions may apply to comments being submitted via the eComments system. Comments must be received by June 2, 2022.

An electronic version of this proposed Howard County 2010 SO_2 NAAQS Attainment Demonstration SIP Revision is provided on the TCEQ's Air Pollution from Sulfur Dioxide webpage (https://www.tceq.texas.gov/airquality/sip/criteria-pollutants/sip-so2#latest-air-quality-planning). An electronic version of the hearing notice will be available on the Texas SIP Revisions webpage (https://www.tceq.texas.gov/airquality/sip/sipplans.html#prosips).

1.4 HEALTH EFFECTS

Current scientific evidence links short-term exposures of SO_2, ranging from five minutes to 24 hours, with an array of adverse respiratory effects including bronchoconstriction and increased asthma symptoms (75 FR 35520). These effects are particularly important for people with asthma at elevated ventilation rates (e.g., while exercising or playing) and other at-risk populations including children and elderly people.

Sulfur oxides such as SO_2 can react with other compounds in the atmosphere to form small particles. These particles have the potential to penetrate deeply into sensitive parts of the lungs, and at high levels, can contribute to respiratory disease, such as emphysema and bronchitis. They may aggravate existing heart disease, leading to increased hospital admissions and possibly premature death (75 FR 35520). However, the health effects associated with current ambient levels of particulate matter are less clear. Some observational epidemiology studies have reported statistical associations between such health effects and ambient particulate matter. These reported effects vary widely with geographical location as well as with size and composition of the particulate matter (EPA/600/R-08/139F sections 2.1.1 and 2.2.2).

1.5 STAKEHOLDER PARTICIPATION

The TCEQ and representatives of significant SO_2 emissions sources located in the Howard County 2010 SO_2 NAAQS nonattainment area held regular meetings during the development of this proposed SIP revision to discuss modeling, control strategies, contingency measures, and development of the associated proposed Chapter 112 rules. The TCEQ, representatives of significant SO_2 emissions sources in the Howard County nonattainment area, and the EPA also held meetings to discuss modeling details.

1.6 SOCIAL AND ECONOMIC CONSIDERATIONS

No significant fiscal implications are anticipated for the TCEQ or other units of state or local governments from administration or enforcement of the associated proposed rules. All controls to reach attainment will be borne by the emission sources identified in this proposed SIP revision and Chapter 112, Subchapter E of the proposed rules. As such, any economic impacts will be limited to the SO_2 sources associated with this proposed SIP revision and associated proposed rulemaking. The proposed rules are expected to have significant fiscal impact to the affected sources in Howard County, and those impacts are discussed in the preamble to the proposed rules. The citizens living and working within the nonattainment area will benefit from reduced SO_2 emissions.

1.7 FISCAL AND MANPOWER RESOURCES

The TCEQ determined that its fiscal and manpower resources are adequate and will not be adversely affected through the implementation of this plan.

CHAPTER 2: ANTHROPOGENIC EMISSIONS INVENTORIES

2.1 INTRODUCTION

The federal Clean Air Act (FCAA) requires that attainment demonstration emissions inventories (EI) be prepared from all sources within a planning area (57 *Federal Register* (FR) 13498, April 16, 1992). The EI must be a comprehensive, accurate, and current inventory of actual emissions for all sources in the nonattainment area plus any sources located outside the nonattainment area that may affect attainment.

The Texas Commission on Environmental Quality (TCEQ) maintains an inventory of current information for sources of sulfur dioxide (SO_2) emissions that identifies the types of emissions sources present in an area, the amount of each pollutant emitted, and the types of processes and control devices employed at each site or source category. The total anthropogenic inventory of SO_2 emissions for an area is derived from estimates developed for three general categories of emissions sources: point, area, and mobile (both non-road and on-road). All inventories are developed in accordance with the Environmental Protection Agency's Air Emissions Reporting Requirements (AERR) (40 Code of Federal Regulations (CFR) Part 51, Subpart A).

This chapter discusses general EI and attainment year emissions development for each of the anthropogenic source categories. Chapter 4: *Attainment Demonstration Modeling* details specific EIs and emissions inputs developed for the Howard County 2010 SO_2 National Ambient Air Quality Standard (NAAQS) nonattainment area dispersion modeling.

The most current periodic EI data were analyzed as part of this proposed state implementation plan (SIP) revision. The TCEQ chose 2017 as the base year for most of the analyses presented in this chapter because it was the most recent periodic inventory year available for all source categories to develop an EI for this proposed SIP revision. For the two source categories that contributed the largest portion of SO_2 emissions in the Howard County 2010 SO_2 NAAQS nonattainment area (point source and area source oil and gas), the TCEQ developed 2020 EIs to forecast emissions to the 2026 attainment year. Details on the projection methods to forecast 2017 base year emissions to the 2026 attainment year for all source categories are documented in this chapter.

2.2 POINT SOURCES

Stationary point source data are collected annually from sites that meet the reporting requirements of 30 Texas Administrative Code (TAC) §101.10. The TCEQ provides detailed reporting instructions and tools for completing and submitting an EI. Companies submit EI data using a Web-based system called the Annual Emissions Inventory Report System. Companies are required to report emissions data and to provide sample calculations used to determine the emissions. Information characterizing the process equipment, the abatement units, and the emission points is also required. As required by FCAA, §182(a)(3)(B) and the United States Environmental Protection Agency (EPA) guidance, a company representative certifies that reported emissions are true, accurate, and fully represent emissions that occurred during the calendar year to the best of the representative's knowledge.

All data submitted in the EI are reviewed for quality assurance purposes and then stored in the State of Texas Air Reporting System (STARS) database. The TCEQ's Point Source Emissions Inventory webpage (https://www.tceq.texas.gov/airquality/point-source-ei/psei.html) contains guidance documents and historical point source emissions data. Additional information is available upon request from the TCEQ's Air Quality Division.

Two of the three stationary point source sites located in the Howard County 2010 SO_2 NAAQS nonattainment area emit over 99% of the 2017 SO_2 emissions. The Delek US Holdings' Big Spring Refinery (Delek Big Spring Refinery) (Regulated Entity Reference Number [RN] RN100250869) is a petroleum refinery that processes crude oil from the Permian Basin into other petroleum products such as transportation fuels, solvents, and finished asphalt. The Tokai Carbon CB LTD's Big Spring Carbon Black Plant (Tokai Big Spring Carbon Black Plant) (RN100226026) is a carbon black plant that produces carbon black used in tires, manufactured rubber goods, plastics, coatings, inks, and toners.

The third stationary point source site in the nonattainment area emits less than 1% of the 2017 SO_2 emissions. BHER Power Resources Inc C R Wing Cogeneration (BHER C R Wing Cogeneration) (RN100215896) is an electric generating facility consisting of two cogeneration turbines with associated duct burners and ancillary equipment. BHER C R Wing Cogeneration's SO_2 emissions have been below five tons per year (tpy) since 2003.

2.2.1 2017 Base Year Point Source Emissions Inventory

The TCEQ extracted the 2017 point source inventory data from STARS on December 8, 2021. The extracted data include reported annual (routine) emissions of SO_2 in tpy for the three stationary sources located in the Howard County 2010 SO_2 NAAQS nonattainment area.

The 2017 base year point source SO_2 EI is summarized in Table 2-1: *Howard County Nonattainment Area SO_2 Emissions.*

2.2.2 2026 Attainment Year Point Source Emissions Inventory

If this proposed SIP revision and the associated proposed 30 TAC Chapter 112, Subchapter E rulemaking (Rule Project No. 2021-035-112-AI) are adopted by the commission, the Delek Big Spring Refinery and Tokai Big Spring Carbon Black Plant will be subject to TCEQ SO_2 emissions regulations required for attainment. The 2026 forecasted controlled actual emissions were determined from historical emissions and/or the application of enforceable requirements from consent decrees, rules, modeled emissions rates, and/or permits to affected sources.

The historical emissions were the average of the reported 2017 through 2020 annual point source inventory SO_2 emissions. The TCEQ extracted the 2017 through 2020 point source inventory data from STARS on December 8, 2021. The extracted data include reported annual routine SO_2 emissions in tpy for point sources located in the Howard County 2010 SO_2 NAAQS nonattainment area.

The 2017 through 2020 emissions average was held constant to project the 2026 forecasted emissions for most sources. For sources subject to enforceable requirements that have annual permitted limits lower than the historical average, the

2026 forecasted emissions were projected to the annual permitted limits. For sources that did not report point source emissions inventory data, the 2026 forecasted emissions were determined from modeled emissions rates or rule limits.

Appendix A: *Stationary Point Source Sulfur Dioxide (SO_2) Emissions* provides details on the 2017 point source base year SO_2 emissions, 2018 through 2020 point source SO_2 emissions, and the 2026 projected point source SO_2 emissions.

The 2026 attainment year point source SO_2 EI is summarized in Table 2-1.

2.3 AREA SOURCES

Stationary emissions sources that do not meet the reporting requirements for point sources are classified as area sources. Area sources are small-scale stationary industrial, commercial, and residential sources that use materials or perform processes that generate emissions. Examples of typical SO_2 emissions sources include upstream oil and gas flares, compressor engines, and heaters; stationary source fossil fuel combustion at residences and businesses; outdoor refuse burning; and agricultural crop burning.

EPA rules and guidance require area source emissions to be calculated as county-wide totals rather than as individual sources. Area source emissions are typically calculated by multiplying an EPA- or TCEQ-developed emissions factor (emissions per unit of activity) by the appropriate activity or activity surrogate responsible for generating emissions. Population is one of the more commonly used activity surrogates for area source calculations. Other activities for which data are commonly used include the amount of gasoline sold in an area, employment by industry type, and crude oil and natural gas production.

The emissions data for each of the area source categories are developed, quality assured, stored in the Texas Air Emissions Repository database system, and compiled to develop the statewide area source EI.

2.3.1 2017 Base Year Area Source Emissions Inventory

The 2017 area source EIs were developed using EPA-generated EIs; TCEQ-contracted projects to develop EIs; TCEQ staff projects to develop EIs; and projecting 2014 EIs by applying growth factors derived from Eastern Research Group (ERG) study data, the Economy and Consumer Credit Analytics website (http://www.economy.com/default.asp), and the United States Energy Information Administration's *Annual Energy Outlook* publication. The documentation for the development of the ERG study projection factors is provided in Appendix B: *Growth Factors for Area and Point Sources.*

The EPA developed EIs for states to use for many area source categories as part of the National Emissions Inventory (NEI). The states access these individual EIs through the EPA's NEI website (https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data). These source categories include but are not limited to industrial coatings; degreasing; residential, commercial/institutional, and industrial fuel use; commercial cooking; aviation fuel use; and consumer products. For some source categories, the TCEQ developed state-specific emissions estimates by acquiring current state-specific activity data and applying appropriate emissions factors. These

source categories include but are not limited to gasoline storage tanks, structure fires, dry cleaners, and automobile fires.

The TCEQ committed significant resources to improve the oil and gas area source inventory categories for the 2017 base year EIs. The improvements included the development and refinement of a state-specific oil and gas area source emissions calculator. This oil and gas area source emissions calculator uses county-level production and local equipment activity data with local emissions requirements to estimate emissions from individual production categories including compressor engines, condensate and oil storage tanks, loading operations, heaters, and dehydrators. The documentation for the development of the oil and gas emissions calculator is provided in Appendix C: *Characterization of Oil and Gas Production Equipment and Develop a Methodology to Estimate Statewide Emissions*.

A significant improvement made to the oil and gas calculator for the 2017 base year inventories was the development of refined emissions factors for oil and gas wellhead flaring. County-level factors for the flared gases were developed using the amount of flared gas from each field and the hydrogen sulfide (H_2S) field concentrations from the Railroad Commission of Texas (RRC) website (https://www.rrc.state.tx.us/oil-and-gas/research-and-statistics/field-data/hydrogen-sulfide-h2s/).

Another significant improvement made for the 2017 base year EI was the development of a Texas-specific industrial, commercial, and institutional (ICI) combustion emissions calculator. This improved upon the default calculations and parameters provided by the EPA for these fuel combustion sources. The documentation for the development of the ICI combustion emissions calculator is provided in Appendix D: *Industrial, Commercial, and Institutional (ICI) Fuel Use Study*.

Quality assurance of area source emissions involves ensuring that the activity data used for each category are current and valid. Data such as current population figures, fuel usage, and material usage were updated and the EPA guidance on emissions factors was used. Other routine efforts were also implemented, such as checking calculations for errors and conducting reasonableness and completeness checks.

The 2017 base year area source SO_2 EI is summarized in Table 2-1.

2.3.2 2026 Attainment Year Area Source Emissions Inventory

Since 2017 was the most recently available periodic EI year, the TCEQ designated the 2017 EI as the starting point for the 2026 attainment year EI projections of all area source categories except oil and gas sources. Since more recent activity data are available for oil and gas sources, the area source oil and gas EI was updated using Railroad Commission of Texas 2020 production data. These newer data reflect growth that has occurred since the 2017 base year and are more representative of recent operations. This 2020 oil and gas area source EI was used as the projection base year for the 2026 attainment year EI.

The updated 2026 attainment year EI for the area source categories were developed using projection factors derived from Appendix B. The study in this appendix contains individual projection factors for each source category and for each forecasting year.

This projection method is the EPA standard and accepted methodology for developing future-year EIs.

No controls were incorporated into the area source attainment year inventories.

The 2026 attainment year area source SO_2 EI is summarized in Table 2-1.

2.4 NON-ROAD MOBILE SOURCES

Non-road vehicles do not normally operate on roads or highways and are often referred to as off-road or off-highway vehicles. Non-road emissions sources include agricultural equipment, commercial and industrial equipment, construction and mining equipment, lawn and garden equipment, aircraft and airport equipment, locomotives, and drilling rigs.

For this proposed SIP revision, EIs for non-road sources were developed for the following subcategories: NONROAD model categories, airports, locomotives, and drilling rigs used in upstream oil and gas exploration activities. The airport subcategory includes estimates for total emissions from the aircraft, auxiliary power units (APU), and ground support equipment (GSE) subcategories added together and presented as a total. The following sections describe the emissions estimation methods used for the non-road mobile source subcategories.

The 2017 base year and 2026 attainment year non-road mobile source SO_2 EIs are summarized in Table 2-1.

2.4.1 NONROAD Model Categories

The Motor Vehicle Emission Simulator 3 (MOVES3) model is the EPA's latest mobile source emissions model for estimating non-road source category emissions. The TCEQ used the most recent Texas-specific utility for the non-road mobile component of the MOVES3 model, called Texas NONROAD version 2.2 (TexN2.2), to calculate emissions from all non-road mobile source equipment and recreational vehicles, except for airports, locomotives, and drilling rigs used in upstream oil and gas exploration activities.

Because emissions for airports and locomotives are not included in either the MOVES3 model or the TexN2.2 utility, the emissions for these categories are estimated using other EPA-approved methods and guidance.

The TCEQ conducted equipment survey studies that focused on various equipment categories operating in different areas of Texas, including diesel construction equipment, liquid propane gas-powered forklifts, and agricultural equipment. The resulting survey data contributed to input updates to the TexN utility to estimate non-road emissions more accurately for the State of Texas instead of using the national default values in the EPA's MOVES model.

The TexN2 utility was recently updated to be compatible with the MOVES3 model. In addition, enhancements were added to the utility to streamline the way TexN2 handles alternative equipment scrappage curves and generates county databases for submittal for the AERR and NEI. The resulting new TexN2 utility is called TexN2.2. More information regarding the updates and development for the TexN2.2 utility is provided

in the ERG report in Appendix E: *TexN2.2 Updates for Compatibility with the US EPA MOVES3 Model.*

2.4.1.1 2017 Base Year NONROAD Model Emissions Inventory

TCEQ staff developed the 2017 base year non-road model category SO_2 emissions for this proposed SIP revision using the TexN2.2 utility set for fully controlled run scenarios that used 2017 meteorological input data.

2.4.1.2 2026 Attainment Year NONROAD Model Emissions Inventory

TCEQ staff developed the 2026 attainment year non-road model category SO_2 emissions for this proposed SIP revision using the TexN2.2 utility set for fully controlled run scenarios that used 2017 meteorological input data.

2.4.2 Drilling Rigs

Although emissions for drilling rig diesel engines used in upstream oil and gas exploration activities are included in the TexN2.2 utility, alternate emissions estimates were developed for this source category to develop more accurate county-level inventories. The equipment populations for drilling rigs were set to zero in the TexN2.2 utility to avoid duplicating emissions.

Due to significant growth in the oil and gas exploration and production industry, a 2015 TCEQ-commissioned survey of oil and gas exploration and production companies was used to develop updated drilling rig emissions characterization profiles. The drilling rig emissions characterization profiles from this study were combined with county-level drilling activity data obtained from the RRC to develop the EI. The documentation of procedures used in developing the drilling rigs EI is provided in the ERG report in Appendix F: *2014 Statewide Drilling Rig Emissions Inventory with Updated Trends Inventories.*

2.4.2.1 2017 Base Year Drilling Rig Emissions Inventory

The 2017 base year drilling rig SO_2 emissions for this proposed SIP revision were developed using the results of a 2015 statewide EI improvement study referenced in Appendix F combined with 2017 RRC drilling activity data.

2.4.2.2 2026 Attainment Year Drilling Rig Emissions Inventory

The 2026 attainment year drilling rig SO_2 emissions for this proposed SIP revision were based on 2020 drilling activity data (the most recently available activity data) combined with the 2026 year-specific projected emissions factors from the 2015 ERG report in Appendix F.

2.4.3 Locomotives

The locomotive EIs were developed from a TCEQ-commissioned study using EPA-accepted EI development methods. The locomotive EIs include line haul and yard emissions activity data from all Class I and III locomotive activity and emissions by rail segment (currently, there are no Class II operators in Texas). The method and procedures used to develop the locomotive EIs for this proposed SIP revision are detailed in the Texas A&M Transportation Institute (TTI) report in Appendix G: *2020 Texas Statewide Locomotive and Rail Yard Emissions Inventory and 2011 through 2050 Trend Inventories.*

2.4.3.1 2017 Base Year Locomotive Emissions Inventory

The 2017 base year locomotive SO_2 emissions for this proposed SIP revision were taken from the 2017 trend EI developed as part of the TTI report in Appendix G.

2.4.3.2 2026 Attainment Year Locomotive Emissions Inventory

The 2026 attainment year locomotive SO_2 emissions for this proposed SIP revision were taken from the 2026 trend EI developed as part of the TTI report in Appendix G.

2.4.4 Airports

The airport EIs were developed from a TCEQ-commissioned study using the Federal Aviation Administration (FAA) Aviation Environmental Design Tool (AEDT). The AEDT is the most recent FAA model for estimating airport emissions and replaced the FAA's Emissions and Dispersion Modeling System. The airport emissions categories used for this proposed SIP revision included aircraft (commercial air carriers, air taxis, general aviation, and military), APU, and GSE operations.

The method and procedures used to develop the airport EIs for this proposed SIP revision are provided in the TTI report in Appendix H: *2020 Texas Statewide Airport Emissions Inventory and 2011 through 2050 Trend Inventories*.

2.4.4.1 2017 Base Year Airport Emissions Inventory

The 2017 base year airport SO_2 emissions for this proposed SIP revision were taken from the 2017 statewide airport trend EI developed as part of the ERG report in Appendix H.

2.4.4.2 2026 Attainment Year Airport Emissions Inventory

The 2026 attainment year airport SO_2 emissions for this proposed SIP revision were taken from the 2026 statewide airport trend EI developed as part of the ERG report in Appendix H.

2.5 ON-ROAD MOBILE SOURCES

On-road mobile emissions sources consist of automobiles, trucks, motorcycles, and other motor vehicles traveling on public roadways as well as off-network emissions occurring outside public roadways. On-road mobile source SO_2 emissions are usually categorized as combustion-related emissions. Combustion-related emissions are estimated for vehicle engine exhaust. To calculate emissions, both the rate of emissions per unit of activity (emission factors) and the number of units of activity must be determined.

Updated on-road EIs for this proposed SIP revision were developed using the inventory mode of the EPA's mobile source emissions model, MOVES3. During a MOVES3 inventory mode run, emissions rates are first calculated and then applied to user-provided activity levels or EPA MOVES default activity levels. The MOVES3 model may be run using national default information or the default information may be modified to simulate specific data, such as the control programs, driving behavior, meteorological conditions, and vehicle characteristics. Because modifications to the national default values influence the emissions factors calculated internally by the MOVES3 model, parameters that are used in TCEQ EI development reflect local conditions to the extent that local values are available.

2.5.1 2017 Base Year On-Road Mobile Emissions Inventory

TCEQ staff developed the 2017 base year on-road mobile source category SO_2 emissions for this proposed SIP revision using the MOVES3 model. Values that reflect local conditions as well as local activity levels were used when available. Detailed information on the inputs and data sources used in the on-road EI development are provided in Appendix I: *MOVES3 On-road Inventory Development*.

The Federal Motor Vehicle Control Program (FMVCP) provides on-going emissions reductions from mobile sources. The FMVCP includes vehicle emission certification standards as well as corresponding limits on fuel sulfur content. The limits on sulfur content for diesel and gasoline fuels contribute to reduced SO_2 emissions from mobile sources.

The 2017 base year on-road mobile source SO_2 EI is summarized in Table 2-1.

2.5.2 2026 Attainment Year On-Road Mobile Emissions Inventory

TCEQ staff developed the 2026 attainment year on-road mobile source category SO_2 emissions for this proposed SIP revision using the MOVES3 model. Values reflect local conditions as well as local activity levels when available, excluding meteorology and fuel inputs, which were held constant at 2017 levels. For more detailed information on the inputs and data sources used in the on-road EI development, see Appendix I.

The 2026 attainment year on-road mobile source SO_2 EI is summarized in Table 2-1.

2.6 EMISSIONS INVENTORY IMPROVEMENT

The TCEQ EI reflects years of emissions data improvement, including extensive point and area source inventory reconciliation with ambient emissions monitoring data. Reports detailing recent TCEQ EI improvement projects are provided at the TCEQ's Air Quality Research and Contract Projects webpage (https://www.tceq.texas.gov/airquality/airmod/project/pj.html).

2.7 EMISSIONS SUMMARIES

The 2017 base year and 2026 attainment year Howard County 2010 SO_2 NAAQS nonattainment area SO_2 emissions for this proposed SIP revision are summarized in Table 2-1. In this table, annual routine emissions for all source categories are provided in tpy. These emissions summaries demonstrate that the point source category contributes the largest portion (over 99%) of SO_2 emissions in the Howard County 2010 SO_2 NAAQS nonattainment area.

The 2026 attainment year EI presented in this chapter is not the modeled emissions inventory. For more details on the modeled emissions inventory, please consult Chapter 4: *Attainment Demonstration Modeling*.

Per EPA EI rules and guidance, the area, non-road mobile, and on-road mobile sources emissions are typically calculated as county-wide totals for Howard County. To obtain area, non-road mobile, and on-road mobile source emissions for the Howard County 2010 SO_2 NAAQS nonattainment area for this proposed SIP revision, county-level emissions were ratioed based on the 2010 population located within the nonattainment boundaries for the area. Details of the population ratios applied to the

county-wide totals for the area, non-road mobile, and on-road mobile source categories are presented in Appendix J: *Population Ratios for Non-Point Sources.*

Table 2-1: Howard County Nonattainment Area SO_2 Emissions in TPY

Source Category	2017 Base Year Reported Emissions (TPY)	2026 Attainment Year Emissions (TPY)
Point – Delek Big Spring Refinery	769.78	718.31
Point – Tokai Big Spring Carbon Black Plant	5,327.70	4,830.19
Point – BHER C R Wing Cogeneration Plant	0.22	1.62
Area – Non- Oil and Gas	0.05	0.07
Area – Oil and Gas	6.30	10.53
On-road Mobile	0.02	0.02
Non-road Mobile	0.02	0.02
Total	6,104.09	5,560.76

CHAPTER 3: CONTROL STRATEGIES AND REQUIRED ELEMENTS

3.1 INTRODUCTION

On March 26, 2021, the United States Environmental Protection Agency (EPA) finalized a rule designating a portion of Howard County as nonattainment for the 2010 sulfur dioxide (SO_2) National Ambient Air Quality Standard (NAAQS), with a rule effective date of April 30, 2021 (86 *Federal Register (FR)* 16055). The SO_2 nonattainment area designated by the EPA includes Delek US Holdings' Big Spring Refinery (Delek Big Spring Refinery), Tokai Carbon CB LTD's Big Spring Carbon Black Plant (Tokai Big Spring Carbon Black Plant), and BHER Power Resources Inc's C R Wing Cogeneration Plant (BHER C R Wing Cogeneration Plant) The Delek Big Spring Refinery manufactures transportation fuels, solvents, finished asphalt, and liquified petroleum gas. The Tokai Big Spring Carbon Black Plant manufactures carbon black for use in various industrial applications, such as tires. The BHER C R Wing Cogeneration Plant is a cogeneration plant that generates electric power. Only two of the three sites, the Delek Big Spring Refinery and the Tokai Big Spring Carbon Black Plant, are proposed to be included in the associated proposed 30 Texas Administrative Code (TAC) Chapter 112, Subchapter E rulemaking. The EPA has historically used pollutant-specific concentration levels, known as significant impact levels (SIL), to identify the degree of air quality impact that causes or contributes to a violation of the NAAQS or a New Source Review (NSR) Prevention of Significant Deterioration permit program increment. As a result, the TCEQ used the SIL for SO_2 of 3 parts per billion (ppb) or 7.85 micrograms per cubic meter ($\mu g/m^3$) to determine which emission points were most likely to be significant contributors to nonattainment.

Through air dispersion modeling, the TCEQ identified the SO_2 emission rates that modeled attainment by using an iterative process that included modeling and consultation with the affected regulated entities of the nonattainment area. The associated proposed Chapter 112 rulemaking would specify the SO_2 emission rates determined necessary to model attainment of the 2010 SO_2 NAAQS in the Howard County nonattainment area.

Federal Clean Air Act (FCAA), §172(c) establishes planning requirements for attainment demonstration SIP revisions for areas that do not meet the NAAQS for a criteria pollutant. This chapter describes the statutory requirements under FCAA, §172(c)(1) for RACM including RACT; under FCAA, §172(c)(6) for enforceable emissions limitations and control measures; under FCAA, §173(a) for a nonattainment NSR permit program; and under FCAA, §172(c)(9) for an adequate contingency plan for the nonattainment area.

3.2 PERMANENT AND ENFORCEABLE MEASURES

The proposed SIP revision describes a control strategy that consists of permanent, quantifiable, and enforceable emission reductions at the Delek Big Spring Refinery and the Tokai Big Spring Carbon Black Plant necessary to demonstrate attainment of the 2010 SO_2 NAAQS. The emission rates and control measures must be accompanied by appropriate methods and conditions to determine compliance with the respective emission limit and must be quantifiable (i.e., a specific amount of emission reduction can be ascribed to the measures), fully enforceable (i.e., specifying clear, unambiguous and measurable requirements for which compliance can be practicably determined),

replicable (i.e., the procedures for determining compliance are sufficiently specific and non-subjective so that two independent entities applying the procedures would obtain the same result), and accountable (i.e., source specific limits must be permanent and must reflect the assumptions used in the SIP demonstration). This proposed SIP revision and the associated proposed 30 TAC Chapter 112, Subchapter E rulemaking (Rule Project No. 2021-035-112-AI) provide the mechanism to make quantifiable SO_2 emissions reductions, establish enforceable requirements for which compliance with the emission rates is determined in a replicable manner, and make permanent the emission rates established through the required SIP elements.

3.2.1 RACT and RACM Analysis

FCAA, §172(c)(1) requires that nonattainment areas provide for the implementation of all RACM, including RACT, as expeditiously as practicable and provide for attainment of the NAAQS. The SIP must provide for attainment of the NAAQS based on SO_2 emission reductions from control measures that are permanent and enforceable. RACT is defined in 40 Code of Federal Regulations (CFR) §51.100(o) as devices, systems, process modifications, or other apparatus or techniques that are reasonably available taking into account what is necessary to attain and maintain the NAAQS while considering the social, environmental, and economic impact of such controls. The EPA's *Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions* (2014 SO_2 SIP guidance) maintains previous EPA guidance regarding the definition of RACT.[2] The 2014 SO_2 SIP guidance also provides that states should consider all RACM, including RACT, that can be implemented in light of the attainment needs of the affected area.

Because modeling of the sources at the BHER C R Wing Cogeneration Plant and several sources at the Delek Big Spring Refinery and the Tokai Big Spring Carbon Black Plant found those sources of SO_2 emissions to have impacts below the SO_2 SIL of 3 ppb (7.85 µg/m^3), those sources were determined not to have a significant impact in the nonattainment area. Because the TCEQ determined that those sources do not have a significant impact, reasonably available control measures (RACM), including reasonably available control technology (RACT), are not required to be applied to those sources as part of the overall control strategy to reduce SO_2 emissions and attain and maintain the 2010 SO_2 NAAQS.

The Delek Big Spring Refinery and the Tokai Big Spring Carbon Black Plant contain the sources of SO_2 determined to significantly contribute to nonattainment in the Howard County 2010 SO_2 NAAQS nonattainment area and are the only sources for which RACM, including RACT, are required to be applied under FCAA §172(c)(1). The Delek Big Spring Refinery will implement RACM, including RACT, through implementation of final SO_2 emissions limits on the following sources at the site:

- Fluidized catalytic cracking unit (FCCU) with an SO_2 limit of 250.00 pounds per hour (lb/hr) on a seven-day rolling average basis;
- Northeast flare with the following limitations:
  - An SO_2 limit of 25.00 lb/hr during routine operations;

[2] EPA, April 23, 2014. *Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions* (https://www.epa.gov/sites/production/files/2016-06/documents/20140423guidance_nonattainment_sip.pdf).

    - For maintenance, startup, and shutdown (MSS) operations to occur no more than 12 calendar days per year, the following:
        - Equal to or greater than 25.01 lb/hr but less than 250.01 lb/hr in any hour within a calendar day for no more than four days per calendar year;
        - Equal to or greater than 250.01 lb/hr but less than 500.01 lb/hr in any hour within a calendar day for no more than six calendar days per year;
        - Equal to or greater than 500.01 lb/hr but less than 1,500.01 lb/hr in any hour within a calendar day for no more than two calendar days per year;
        - SO_2 emissions greater than 1,500.00 lb/hr would be prohibited; and
        - SO_2 emissions of the higher range would apply when emissions that correspond to more than one range specified occur during a calendar day;
- Crude flare with the following limitations:
    - An SO_2 limit of 51.80 lb/hr during routine operations;
    - For MSS operations to occur no more than 17 calendar days per year, the following:
        - Equal to or greater 51.81 lb/hr but less than 250.01 lb/hr in any hour within a calendar day for no more than 14 calendar days per year;
        - Equal to or greater than 250.01 lb/hr but less than 750.01 lb/hr in any hour within a calendar day for no more than three calendar days per year;
        - SO_2 emissions greater than 750.00 lb/hr would be prohibited; and
        - SO_2 emissions of the higher range would apply when emissions that correspond to more than one range specified occur during a calendar day;
- Reformer flare with the following limitations:
    - An SO_2 limit of 103.70 lb/hr during routine operations;
    - For MSS operations to occur no more than nine calendar days per year, the following:
        - Equal to or greater than 103.71 lb/hr but less than 250.01 lb/hr in any hour within a calendar day for no more than four calendar days per year;
        - Equal to or greater than 250.01 lb/hr but less than 750.01 lb/hr in any hour within a calendar day for no more than five calendar days per year;
        - SO_2 emissions greater than 750.00 lb/hr would be prohibited; and
        - SO_2 emissions of the higher range would apply when emissions that correspond to more than one range specified occur during a calendar day;
- South flare with the following limitations:
    - An SO_2 limit of 118.70 lb/hr during routine operations;
    - For MSS operations to occur no more than 18 calendar days per year, the following:
        - Equal to or greater than 118.71 lb/hr but less than 250.01 lb/hr in any hour within a calendar day for no more than four calendar days per year;
        - Equal to or greater than 250.01 lb/hr but less than 500.01 lb/hr in any hour within a calendar day for no more than 12 calendar days per year;
        - Equal to or greater than 500.01 lb/hr but less than 1,696.01 lb/hr in any hour within a calendar day for no more than two calendar days per year
        - SO_2 emissions greater than 1,696.00 lb/hr would be prohibited; and
        - SO_2 emissions of the higher range would apply when emissions that correspond to more than one range specified occur during a calendar day; and
- Two sulfur recovery unit incinerators with the following limitations:
    - An SO_2 limit of 17.03 lb/hr for Emission Point Number (EPN) 69TGINC; and

- An SO_2 limit of 12.78 lb/hr for EPN 71TGINC.

The Delek Big Spring Refinery would also implement a limit on the sulfur content of any refinery gas stream combusted in any flare covered by the proposed rule to a maximum of 162 parts per million by volume hydrogen sulfide (H_2S) determined on a three-hour rolling average and the proposed SO_2 limits previously described.

The maximum number of calendar days per year that each flare could operate in MSS would be based on ranges of emission rates and is designed to ensure that modeling demonstrates compliance with the one-hour SO_2 NAAQS. The emissions ranges would begin just above the routine emission limit and would increase sequentially through the maximum limit. If the range applicable to a specific day would be based on the maximum hourly rate during that day, with the highest emission rate applying.

The Tokai Big Spring Carbon Black Plant would implement RACM, including RACT, through implementation of final SO_2 emissions limits on the following sources at the site:

- Incinerator plus heat recovery steam generator (HRSG) with an SO_2 limit of 1,138.00 lb/hr when all furnaces in the production units are operating;
- Flare, when the incinerator plus HRSG is not operating with an SO_2 limit of 1,138.00 lb/hr when all furnaces in the production units are operating;
- Dryer stack units number 3 with an SO_2 limit of 146.00 lb/hr;
- Source cap for Dryer stack units numbers 1 and 2 and Dryer stack units number 3 with an SO_2 limit of 407.00 lb/hr when all furnaces in the production units are operating; and
- Source cap for incinerator plus HRSG, Dryer stack units numbers 1 and 2, and Dryer stack units number 3 with an SO_2 limit of 1,355.00 lb/hr when all furnaces in the production units are operating.

The Tokai Big Spring Carbon Black Plant has three production units and associated carbon black dryers to manufacture carbon black. Because the plant can operate all sources to produce carbon black but does not need all sources operating simultaneously, a minimum number of carbon black oil furnaces must be in operation for each production unit. Reduced loads at each of the production units are accommodated by operating fewer oil furnaces. With varying emission rates of SO_2 due to the various operational scenarios due to reduced loads, final SO_2 limits were developed that demonstrate attainment of the 2010 SO_2 NAAQS through air dispersion modeling. It is expected that modeled concentrations will be progressively lower at reduced loads, and the 100% load case will represent worst-case emissions. The proposed rule would specify four limits: an overall cap for the incinerator plus HRSG (or flare when operating), dryer stack units numbers 1 and 2, and dryer stack units number 3; a cap for the dryer stack units number 1 and 2 and dryer stack units number 3; a limit for the dryer stack units number 3; and a limit for the incinerator plus HRSG, or flare when the flare is operating.

There are 24 different operating scenarios representing different load levels, and two operating modes for the incinerator (on-line, or off-line [with flaring]). While distinct emission limits apply under each of the 24 load-varying scenarios, the emission limits do not change depending on whether the incinerator is on-line or off-line (the flare,

when operational, has the same emission limit as would otherwise apply to the incinerator in all case). Finally, therefore, modeling a set of cap emission limits requires four scenarios, since only three out of four emission limits can be exactly met, simultaneously. In total, therefore, a total of $4 \times 24 \times 2 = 192$ distinct model scenarios were evaluated. These scenarios and corresponding limits on SO_2 emissions would be covered through the proposed limitations on SO_2 emissions in the associated proposed 30 TAC Chapter 112, Subchapter E rulemaking (Rule Project No. 2021-035-112-AI). The proposed rule provides emission limits at full load and reduced loads. The proposed limits at reduced loads ensure attainment and maintenance of the 2010 SO_2 NAAQS as demonstrated through air dispersion modeling.

In addition to the emissions limit on SO_2, the associated proposed rules in 30 TAC Chapter 112, Subchapter E contain the other enforceable measures necessary for the affected area to attain and maintain the NAAQS, including monitoring requirements, testing requirements, and recordkeeping and reporting requirements.

An option for owners or operators to request an alternative SO_2 emission limit is also provided for in the proposed rulemaking. The owner or operator would be required to conduct and submit dispersion modeling and analysis that includes the requested new limit, all the inputs in the most recent attainment demonstration SIP, and follows the methodology laid out in the most recent attainment demonstration SIP. Any deviations from the modeling methodology from the most recent attainment demonstration would be required to be explained and approved by the executive director of the TCEQ and the EPA. The modeling and additional analyses would be required to confirm the modeled regulatory design value in the nonattainment area will not increase due to the new limit. The request would also be required to include any additional monitoring, testing, and recordkeeping requirements necessary to demonstrate compliance with the requested new limit. The owner or operator would only be allowed to comply with the alternative limit if the request is approved by both the TCEQ and the EPA. The alternative emission limit would satisfy RACM including RACT because it would ensure that any change in the emission limit would not increase the design values and will include monitoring, testing and recordkeeping necessary to determine compliance.

3.2.2 Variability Analysis

The 2014 SO_2 SIP guidance recognized that establishing one-hour limits based on the modeled critical emission value (CEV) may be overly conservative because short term periods of emissions above the CEV have an extremely low likelihood of causing a NAAQS exceedance. The 2014 SO_2 SIP guidance included a recommended approach to determine an appropriate longer-term averaging limit than a block one-hour emission rate. This approach involves calculating an appropriate longer-term averaging limit as a percentage of the one-hour CEV limit that would otherwise be applied to the source of SO_2 emissions. The first step of these calculations is to conduct air dispersion modeling to determine the CEV defined as the one-hour SO_2 emissions limit that shows attainment of the 2010 SO_2 NAAQS through modeling.

The discount factor is a percentage applied to the CEV that results in an emissions limit on a longer averaging time that can be expected to be comparably stringent as an emissions limit on a one-hour basis. This approach reconciles the inherent variability in hourly SO_2 emissions in the operations of some sources that may subsequently prove difficult to demonstrate compliance with an emissions limit on a one-hour basis.

The EPA generally expects sources with longer averaging time limits to experience some occasions of hourly emissions to exceed the CEV while the majority of hourly emissions will remain below the CEV. The EPA further expects that this emissions pattern will still allow a source to meet the final longer-term limit that is sufficiently adjusted downward from the CEV to a comparable stringency. This approach to establishing an emissions limit on a longer averaging time is expected to result in an emissions limit on the longer averaging time that remains protective of the 2010 SO_2 NAAQS because it is unlikely that the limited occurrences of hourly SO_2 emissions above the CEV would coincide with times when the meteorology is conducive for high ambient concentrations of SO_2.

The EPA recognized in its 2014 SO_2 SIP guidance that the variability of emissions is influenced by source-specific variations in operating rates and fuel sulfur content. These factors should be weighed to assure that the analysis of historical SO_2 emissions variability provides the best projection of variability in SO_2 emissions that can be expected once the limit takes effect. The EPA also expresses in its 2014 SO_2 SIP guidance that a time series of SO_2 emissions from the source itself are generally the best source of data for determining expected emissions variability. However, implementation of a control strategy might change the source's expected emissions variability. Instead of source-specific data, data from other sources of comparable source type, size, operation, fuel, and control type may be useful for these comparisons, where available.

Delek US Holding is the only company in the nonattainment area that requested a limit on a longer averaging time. Delek US Holding provided technical data concerning hourly mass SO_2 emissions from the FCCU at the Delek Big Spring Refinery. Four years of emissions data on a lb/hr basis covering the period from January 1, 2017 through December 31, 2020 for each operating hour of the FCCU were used for the emissions variability analysis to arrive at a final SO_2 emissions limit on a rolling seven-day average. The EPA's 2014 SO_2 SIP guidance allows states to consider limits on longer averaging times on a block basis and on a rolling basis; see Appendix C of the 2014 SO_2 SIP guidance. Appendices A, B, and C describe the process for determining emission rates for longer averaging times that are expected to be protective of the one-hour SO_2 NAAQS. Specifically, the 99th percentile of the one-hour lb/hr data was obtained as well as the 99th percentile of the rolling seven-day average lb/hr data. The ratio of the 99th percentile of the rolling seven-day average data to the 99th percentile of the one-hour data was then calculated to develop a discount factor to be applied to the one-hour CEV limit to arrive at the final limit on a longer averaging time basis. Delek US Holding expects to use a new catalyst for its FCCU that should result in greater control of SO_2 emissions, or fewer emissions of SO_2, compared to the current catalyst used in the FCCU and does not anticipate the new catalyst to vary significantly in design and function. Therefore, the historical emissions of the FCCU are considered representative of future emissions.

The final discount factor for the lb/hr emissions limit representing the modeled one-hour CEV was estimated to be 0.89. The TCEQ applied this discount factor to the one-hour limit of 280.90 lb/hr to derive a final limit of 250.00 lb/hr on a rolling seven-day averaging basis. The discount factor is expected to provide a degree of comparable stringency as the corresponding limit on a one-hour basis. The emission rate calculated

using the discount factor is expected to constrain emissions from the FCCU so that any occasions of emissions above the CEV will be limited in frequency and magnitude.

3.2.3 Enforceable Control Measures

The control measures needed to meet the final SO_2 emissions limits and to further demonstrate attainment of the 2010 SO_2 NAAQS in the Howard County nonattainment area are made enforceable by the associated proposed 30 TAC Chapter 112, Subchapter E rulemaking, which includes the control measures for attainment, the associated implementation schedules, and the contingency measures to be triggered in the event of failure to attain the 2010 SO_2 NAAQS. The proposed rulemaking also makes enforceable the appropriate SO_2 emissions monitoring, testing, recordkeeping, and reporting requirements necessary to determine compliance with the final SO_2 emissions limits to ensure enforceability of the final SO_2 emissions limits in lb/hr, for both the Delek Big Spring Refinery and the Tokai Big Spring Carbon Black Plant. The proposed compliance deadline is January 1, 2025.

3.3 MONITORING NETWORK

The Texas Commission on Environmental Quality (TCEQ) ambient air quality monitoring network provides monitoring data to characterize air quality based on the 2010 SO_2 NAAQS. SO_2 monitors are managed in accordance with 40 CFR Part 58 to provide data to determine compliance or progress towards compliance with the 2010 SO_2 NAAQS. The SO_2 monitor site evaluation and selection process considers the SO_2 sources' peak modeled impacts along with other monitor siting criteria, including power availability, site access, and 40 CFR Part 58, Appendix E siting criteria requirements.

In areas not previously designated under the 2010 SO_2 NAAQS, the TCEQ deployed SO_2 monitors near sources meeting specifications referenced in the EPA's SO_2 Data Requirements Rule (DRR). To meet the relevant requirement of the DRR, the TCEQ deployed an SO_2 monitor at the Big Spring Midway site (air quality system number 482271072) on December 3, 2016, in Howard County. A portion of Howard County was designated nonattainment, effective April 30, 2021 (86 F R 16055). The designation was based on three years of monitoring data that resulted in a design value exceeding the NAAQS.

The TCEQ commits to maintaining an air monitoring network that meets regulatory requirements. The TCEQ continues to work with the EPA through the air monitoring network review process, as required by 40 CFR Part 58, to determine: the adequacy of the federal air monitoring network, additional monitoring needs, and recommended monitor decommissions. Air monitoring data from the Big Spring Midway SO_2 monitor are quality assured, reported, and certified according to 40 CFR Part 58.

3.4 CONTINGENCY MEASURES

3.4.1 Introduction

FCAA, §172(c)(9) defines contingency measures as such measures in a SIP that are to be implemented in the event that an area fails to make reasonable further progress, or fails to attain the NAAQS, by the applicable attainment date. FCAA, §172(c)(9), further requires contingency measures to become effective without further action. According to the EPA's 2014 SO_2 SIP guidance, contingency measures should consist of other

available control measures that are not made enforceable as the control strategy as part of the SIP. In the 2014 SO_2 SIP guidance, the EPA acknowledged that SO_2 presents special considerations as a directly emitted pollutant. The EPA stated that control efficiencies are well understood for SO_2 control measures and are less uncertain than for other pollutants. Because the control strategy for an attainment demonstration SIP revision is based on the controls necessary through dispersion modeling to demonstrate the nonattainment area would attain the 2010 SO_2 NAAQS, it would be unlikely for the area to then fail to meet the NAAQS. As such, the EPA's 2014 SO_2 SIP guidance stated that a comprehensive program to identify sources causing a violation of the 2010 SO_2 NAAQS and undertake aggressive follow-up action for compliance and enforcement pending the adoption of a revised SIP is a valid contingency measure.

Required contingency measures, described in section 3.4.2: *Contingency Plan*, would be triggered upon the effective date of the EPA's final notice of failure to attain for the Howard County 2010 SO_2 NAAQS nonattainment area. Under FCAA, §172(c)(1), the EPA has six months following the attainment date to determine whether the area attained the standard. The EPA makes the determination of attainment based on available monitoring data, air dispersion modeling, and a demonstration that an enforceable control strategy incorporated in the SIP has been implemented. If the EPA determines that the affected nonattainment area failed to attain the 2010 SO_2 NAAQS, the contingency measures will be triggered.

3.4.2 Contingency Plan

The TCEQ's comprehensive program to identify sources of violations of the 2010 SO_2 NAAQS is satisfied through the monitoring network discussed in Section 3.3 of this chapter and follow-up for compliance and enforcement is satisfied through the TCEQ's enforcement programs authorized under the Texas Water Code (TWC) Chapter 7 and Texas Health and Safety Code (THSC) Chapter 382. See the Legal Authority (Section V-A) of this proposed SIP revision for more information on the TCEQ's enforcement authority. Texas has the authority to issue orders pursuant to §382.024 and §382.025 of the Texas Clean Air Act (TCAA or the Act), THSC Chapter 382, and the FCAA, 42 United States Code, §§7401 et seq., for the purpose of supporting attainment and maintenance of the 2010 SO_2 NAAQS. Texas has the authority to promulgate rules according to THSC, §382.017 and TWC, §5.103. State administrative procedures require that proposed rules are adopted no more than six months after notice of the proposal is published in the *Texas Register* (see Texas Government Code, §2001.027).

The sites in the Howard County 2010 SO_2 NAAQS nonattainment area determined to have a significant impact on attainment of the 2010 SO_2 NAAQS are the Delek Big Spring Refinery and Tokai Big Spring Carbon Black Plant. As discussed in Section 3.1: *Introduction*, certain sources of SO_2 at these two sites were determined to have a significant impact and contribution to nonattainment in the affected area. The control strategy that will be made enforceable if the associated proposed Chapter 112 rulemaking is adopted, discussed in Section 3.2.4: *Enforceable Control Measures* of this chapter, is protective of and provides for attainment of the 2010 SO_2 NAAQS. The TCEQ's comprehensive program to identify sources of violations of the 2010 SO_2 NAAQS is satisfied through the monitoring network discussed in Section 3.3: *Monitoring Network* of this proposed SIP revision, and follow-up for compliance and enforcement is satisfied through the TCEQ's enforcement programs authorized under

the TWC Chapter 7 and THSC Chapter 382. See the Legal Authority (Section V-A) of this SIP narrative for the TCEQ's enforcement authority.

Upon the effective date of a determination by the EPA that the affected nonattainment area in Howard County failed to attain the 2010 SO_2 NAAQS, pursuant to FCAA §179(c), 42 United States Code (U.S.C.), §7509(c), Delek US Holding and Tokai Carbon CB, Ltd. would be notified by the TCEQ that a full system audit (FSA) is required of all SO_2 emissions units at the Delek Big Spring Refinery and Tokai Carbon CB Ltd, respectively, subject to the associated proposed 30 TAC Chapter 112, Subchapter E rulemaking. Within 90 calendar days of the effective date of the EPA's determination of failure to attain the SO_2 NAAQS, Delek US Holding and Tokai Carbon CB, Ltd., respectively, must submit the FSA, including recommended provisional SO_2 emission control strategies, to the TCEQ's Deputy Director of the Air Quality Division (AQD).

As part of the FSA, Delek US Holding and Tokai Carbon CB, Ltd., respectively, will conduct a root cause analysis of the circumstances surrounding the cause of the determination of failure to attain. The root cause analysis will include:

- a review and consideration of, at a minimum, hourly mass emissions of SO_2 from the sources of SO_2 covered in the associated proposed 30 TAC Chapter 112, Subchapter E rulemaking;
- the meteorological conditions at the monitor, including the frequency distribution of wind direction temporally correlated with SO_2 readings greater than 75 ppb at the monitor for which the EPA's determination of failure to attain was made; and
- any exceptional event that may have occurred.

TCEQ AQD staff will analyze the FSA to verify and/or determine the cause of the failure to attain the 2010 SO_2 NAAQS. Any additional or adopted revised SO_2 control strategy required to achieve attainment would be submitted as a SIP revision to the EPA including any necessary changes to the adopted Chapter 112 rules.

3.5 SIP EMISSIONS YEAR FOR EMISSION CREDIT AND DISCRETE EMISSION CREDIT GENERATION

The Emissions Banking and Trading rules in 30 Texas Administrative Code (TAC) §101.300 and §101.370 define SIP emissions for emission credit and discrete emission credit generation, respectively. There has been no previous attainment demonstration SIP revision applicable to Howard County for the SO_2 NAAQS. Since this proposed SIP revision does not use a projection-base year inventory for SO_2 emissions, this proposed SIP revision establishes 2017 as the SIP emissions year for all affected point sources in the nonattainment area, under §101.300(30)(E) and §101.370(31)(E).

3.6 ADDITIONAL FEDERAL CLEAN AIR ACT REQUIREMENTS

3.6.1 General Conformity

Section 176(c) of the FCAA establishes that no federal institution may support or approve an action in a NAAQS nonattainment or maintenance area that does not conform to the approved SIP. According to FCAA, §176(c)(1)(B)(i-iii), federal actions may not "cause or contribute to any new violation of any standard in any area; increase the frequency or severity of any existing violation of any standard in any area; or delay timely attainment of any standard or any required interim emission reductions or

other milestones in any area." Requirements for complying with FCAA, §176(c) and conforming to the SIP fall under two categories, general conformity requirements (40 CFR Part 93, Subpart B) and transportation conformity requirements (40 CFR Part 93, Subpart A).

3.6.1.1 General Conformity

General conformity regulations apply in all NAAQS nonattainment and maintenance areas (ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), SO_2, and lead) for all federal actions except those related to transportation plans, programs, and projects developed, funded, or approved under Title 23 United States Code or the Federal Transit Act, namely transportation-related actions by the Federal Highway Administration or the Federal Transit Administration. Federal actions in the Howard County 2010 SO_2 NAAQS nonattainment area became subject to general conformity requirements April 20, 2022, one year after the effective date of designation as nonattainment. Federal actions with SO_2 emissions that are expected to meet or exceed 100 tons per year (tpy) will be required to demonstrate general conformity according to the criteria and procedures established in 40 CFR Part 93, Subpart B. In consultation with federal agencies that are required to approve general conformity determinations for federal actions in the Howard County 2010 SO_2 NAAQS nonattainment area, the TCEQ will ensure that those actions conform to the SIP according to the criteria established in 40 CFR §93.158.

3.6.1.2 Transportation Conformity

Federal transportation conformity regulations are only applicable for the transportation-related NAAQS: ozone, CO, NO_2, PM_{10} and $PM_{2.5}$, and certain precursor pollutants in applicable NAAQS nonattainment and maintenance areas (40 CFR §93.102(b)(1)). SO_2 is not considered a transportation-related NAAQS, and the Howard County 2010 SO_2 NAAQS nonattainment area is not subject to transportation conformity requirements.

Title 40 CFR §93.102(b)(2)(v) stipulates that transportation-related emissions of SO_2 in certain $PM_{2.5}$ nonattainment and maintenance areas may be considered significant enough to subject the areas to transportation conformity requirements for SO_2 as a precursor pollutant. The Howard County 2010 SO_2 NAAQS nonattainment area has never been designated nonattainment for another NAAQS, including $PM_{2.5}$, so only the SO_2 NAAQS is applicable. Based on the EPA's transportation conformity regulations, the Howard County 2010 SO_2 NAAQS nonattainment area has no transportation conformity obligations; therefore, this proposed SIP revision does not include a motor vehicle emissions budget, and 30 TAC §114.270 is not applicable.

3.6.2 Nonattainment New Source Review Certification Statement

SO_2 nonattainment area SIP revisions must include provisions to require permits for the construction and operation of new or modified stationary sources. Major stationary sources in SO_2 nonattainment areas are those sources emitting at least 100 tpy of SO_2. A New Source Review (NSR) permitting program for nonattainment areas is required by FCAA, §172(c)(5) and §173, and further defined in 40 CFR 51, Subpart I (Review of New Sources and Modifications). Under these requirements, new major sources or major modifications at existing sources in an SO_2 nonattainment area must comply with the lowest achievable emissions rate and obtain sufficient emissions offsets.

Nonattainment NSR permits for SO_2 authorize construction of new major sources or major modifications of existing sources of SO_2 in an area that is designated nonattainment for the SO_2 NAAQS. The NSR offset ratio for SO_2 nonattainment areas is 1.00:1.

In response to changes made by the Texas Air Control Board (a predecessor agency to the TCEQ) to address requirements of the federal Clean Air Act Amendments of 1990 as well as other changes, the EPA published its approval of Texas' nonattainment NSR regulation for SO_2 on September 27, 1995, effective November 27, 1995 (60 FR 49781). The TCEQ has determined that because the Texas SIP already includes 30 TAC §116.12 (Nonattainment and Prevention of Significant Deterioration Review Definitions), most recently approved by the EPA as published on November 10, 2014 (79 FR 66626), and 30 TAC §116.151 (New Major Source or Major Modification in Nonattainment Area Other Than Ozone), most recently approved by the EPA as published on October 25, 2012 (77 FR 65119), the nonattainment NSR SIP requirements are met for Texas for the 2010 SO_2 NAAQS for areas including the Howard County 2010 SO_2 NAAQS nonattainment area. Further, the TCEQ already certified that Texas has EPA-approved rules that cover nonattainment NSR requirements with the timely-submitted 2010 SO_2 NAAQS Infrastructure and Transport SIP Revision.

CHAPTER 4: ATTAINMENT DEMONSTRATION MODELING

4.1 INTRODUCTION

This chapter describes the air quality dispersion modeling conducted in support of the proposed Howard County Attainment Demonstration State Implementation Plan (SIP) for the 2010 One-Hour Sulfur Dioxide (SO_2) National Ambient Air Quality Standard (NAAQS). The United States Environmental Protection Agency's (EPA) *Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions* (EPA, 2014; 2014 SO_2 SIP Guidance) requires air quality dispersion modeling to demonstrate attainment of the 2010 one-hour SO_2 NAAQS of 75 parts per billion (ppb) throughout the entire area designated as nonattainment.

The modeling demonstration includes recommended and required elements for air quality dispersion modeling for SO_2 attainment demonstration SIP revisions as provided in 40 Code of Federal Regulations (CFR) Part 51 Appendix W (EPA, 2017; hereafter referred to as Appendix W) and the 2014 SO_2 SIP Guidance.

This chapter summarizes the attainment demonstration modeling and presents results that demonstrate the control measures described in Chapter 3: *Control Strategies and Required Elements* will be effective in achieving attainment of the 2010 one-hour SO_2 NAAQS. A detailed description of the various modeling elements can be found in Appendix K: *Modeling Technical Support Document (TSD).*

For this attainment demonstration SIP modeling, to better model the characteristics of some SO_2 sources in the Howard County 2010 SO_2 NAAQS nonattainment area that emit SO_2 intermittently and non-deterministically, the TCEQ contracted with Ramboll US Corporation (Ramboll) to develop a technical framework that uses the Monte Carlo (MC) method in conjunction with the air dispersion modeling. MC methods are statistical simulation techniques used to estimate possible outcomes from uncertain events by repeatedly calculating an outcome, in this case the modeled design value[3] (DV), by randomly selecting from a set of possible scenarios, in this case emission rates for sources in the nonattainment area, for each calculation. Details of the MC simulations are provided in Appendix L: *Howard County Monte Carlo Simulations.*

4.2 SOURCES OVERVIEW

There are three sites housing multiple SO_2 emissions sources in the Howard County 2010 SO_2 NAAQS nonattainment area that are included in the attainment demonstration modeling. They are listed:

- Tokai Carbon CB LTD's Big Spring Carbon Black Plant (Tokai Big Spring Carbon Black Plant),
- Delek US Holdings' Big Spring Refinery (Delek Big Spring Refinery), and
- BHER Power Resources Inc C R Wing Cogeneration (BHER C R Wing Cogeneration Plant).

[3] Although SO_2 design values are expressed in ppb, the Monte Carlo derived design values are represented in both $\mu g/m^3$ and ppb to present results with more precision because AERMOD outputs, Monte Carlo processing and results are in $\mu g/m^3$.

The emissions sources at all three sites are included in the attainment demonstration modeling. Chapter 3: Control Strategies and Required Elements explains which of these sites and emissions sources are proposed to be subject to new emissions limits or controls through this action.

Figure 4-1: *Overview of the Howard County 2010 SO_2 Nonattainment Area* shows the location and boundaries of Tokai Big Spring Carbon Black Plant, Delek Big Spring Refinery, and BHER C R Wing Cogeneration Plant sites as yellow, blue, and black solid lines, respectively. Also shown is a Data Requirements Rule (DRR) monitor, the Big Spring Midway monitor or Continuous Ambient Monitoring Station 1072 (C1072), represented by a green triangle.

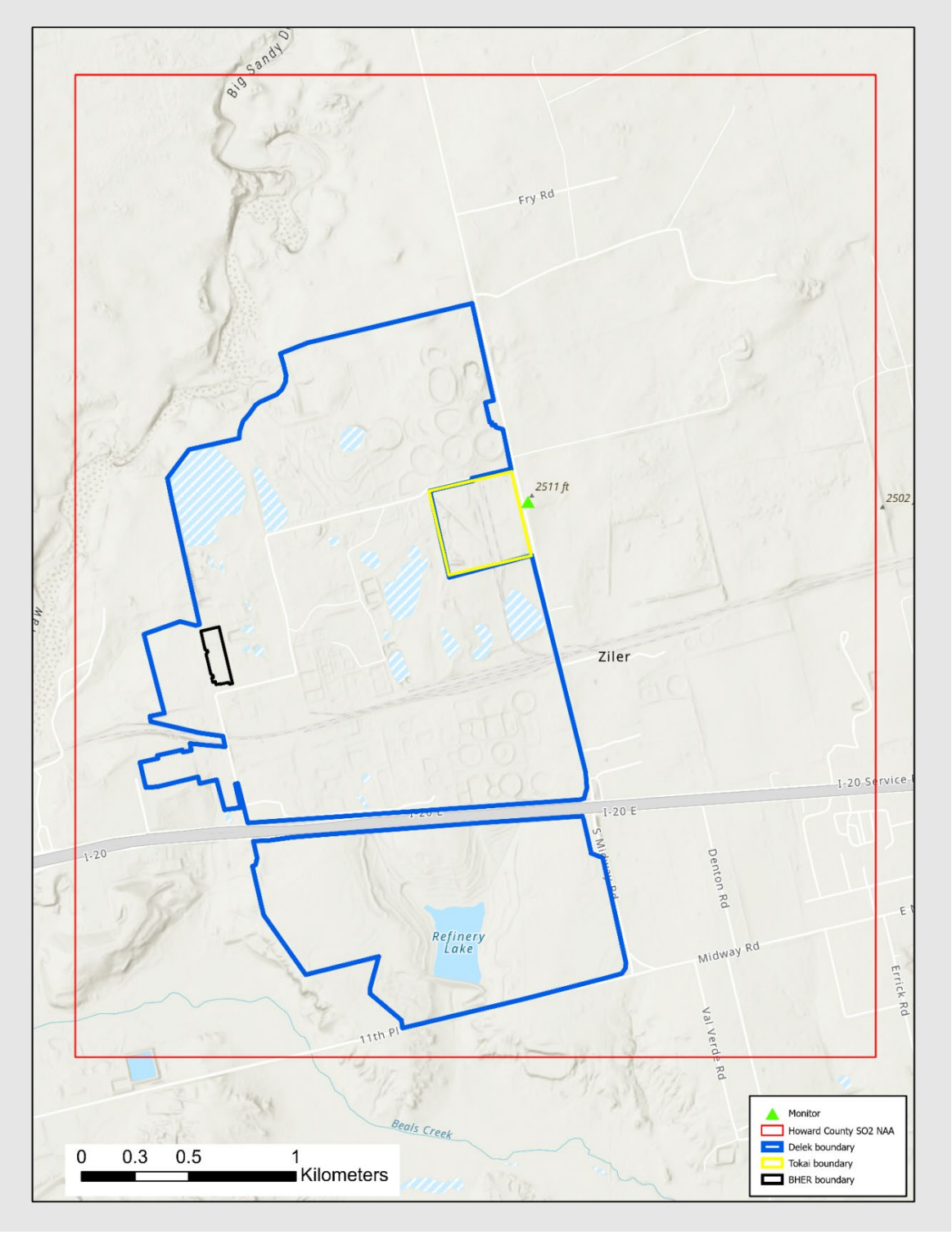

Figure 4-1: Overview of the Howard County 2010 SO_2 NAAQS Nonattainment Area

Location of emissions sources and buildings within each site's modeled site boundaries are presented in the next figures. Figure 4-2: *Tokai Big Spring Carbon Black Plant Site Overview* shows the Tokai Big Spring Carbon Black Plant modeled site boundary outlined in yellow, their associated buildings outlined in red, and their stack

locations marked with pink dots within the boundary. Figure 4-3: *Delek Big Spring Refinery Site Overview* and Figure 4-4: *BHER C R Wing Cogeneration Plant Site Overview* follow a similar display structure but the modeled site boundary is outlined in blue and black, respectively. All modeled emissions sources are discussed in Section 4.3: *Sources and Modeled Emission Rates.* A detailed list of emissions sources and parameters in all three sites in the Howard County 2010 SO_2 nonattainment area is included in Appendix K, Section 3: *Emissions Sources and Parameters.*

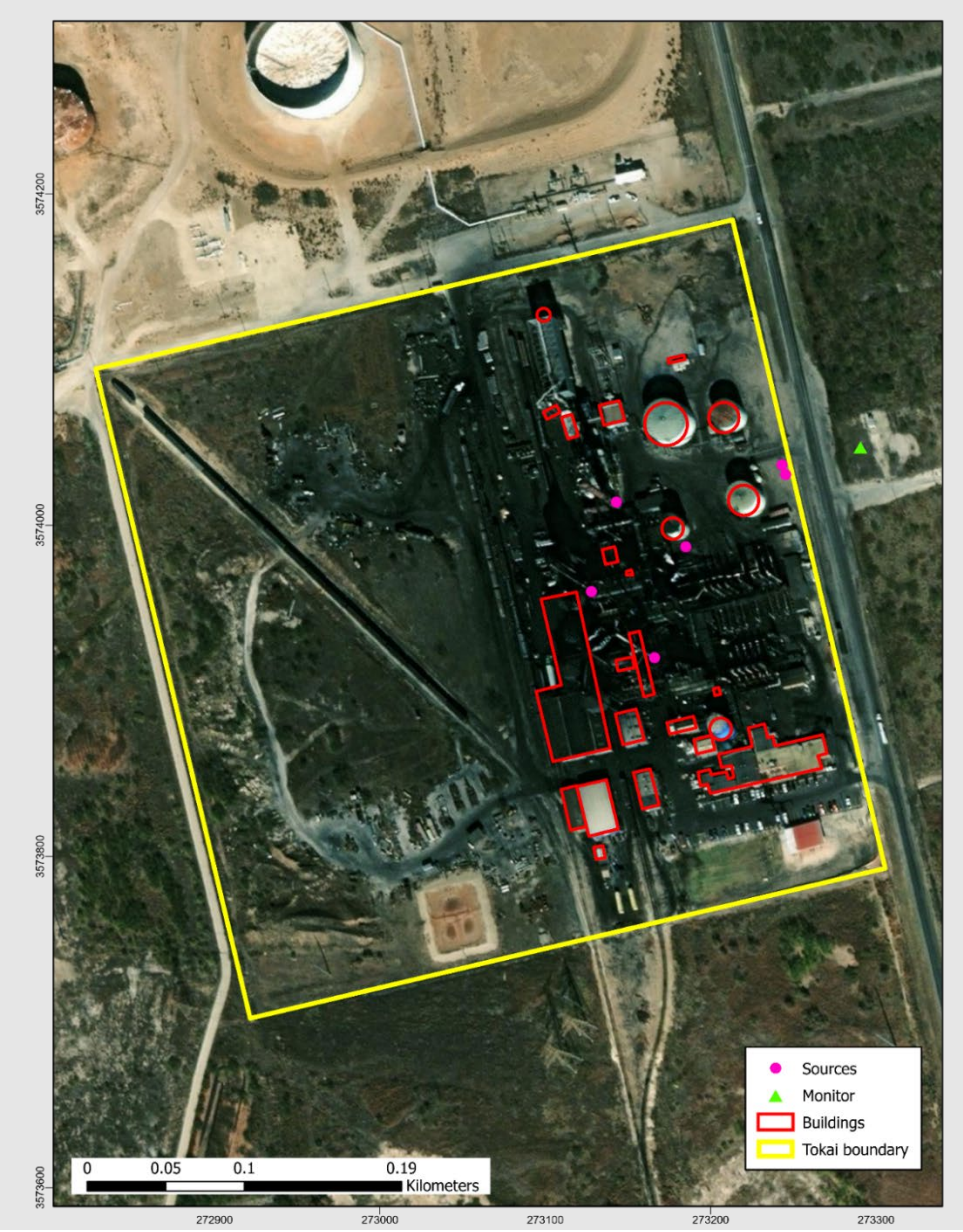

Figure 4-2: Tokai Big Spring Carbon Black Plant Site Overview

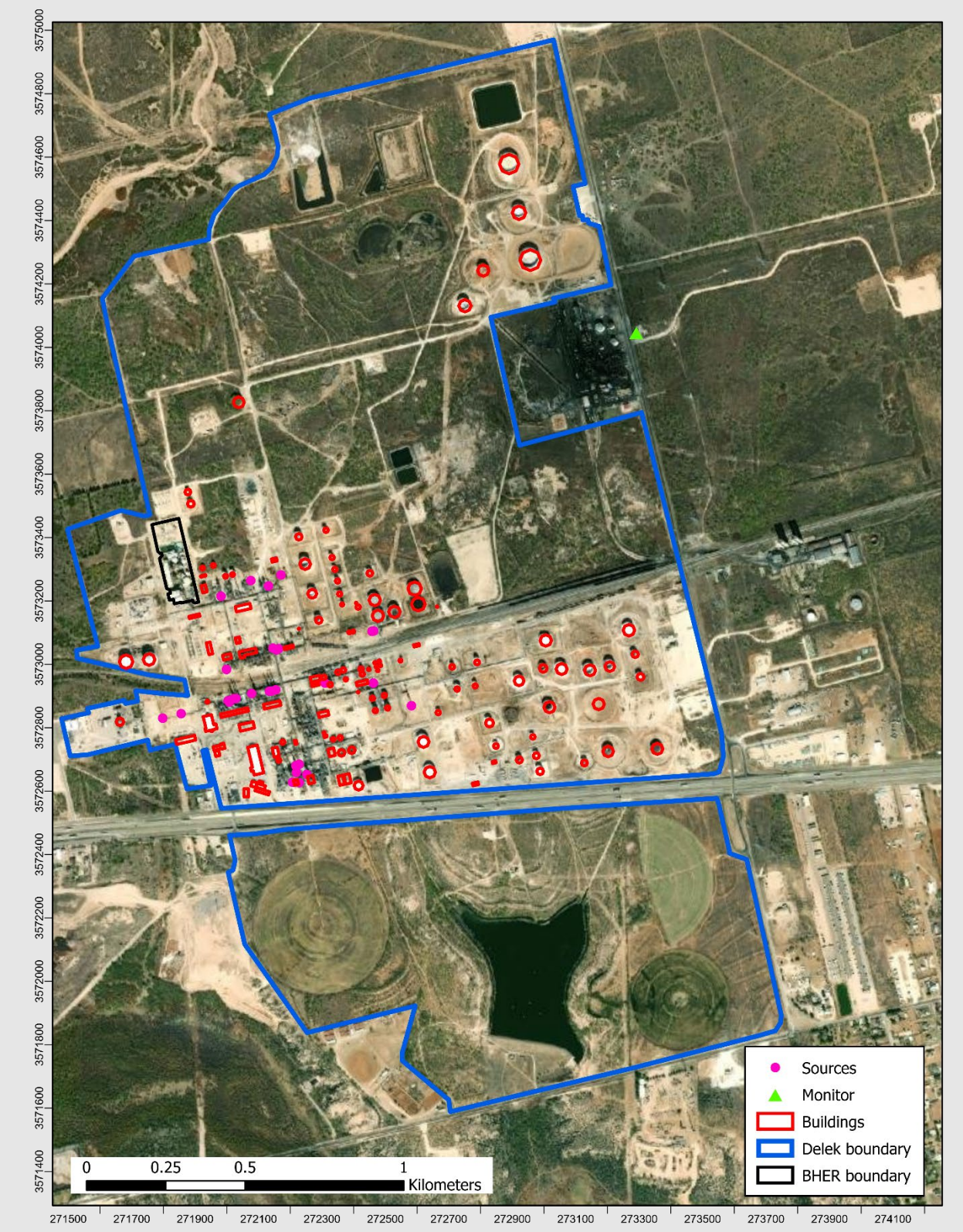

Figure 4-3: Delek Big Spring Refinery Site Overview

Figure 4-4: BHER C R Wing Cogeneration Plant Site Overview

4.3 SOURCES AND MODELED EMISSION RATES

Each of the three sites in the Howard County 2010 SO_2 NAAQS nonattainment area has many emissions sources. A detailed list of each emissions source and its parameters, including the Model Source IDs, location coordinates, and physical source parameters, can be found in Appendix K, Section 3: *Emissions Sources and Parameters*. This section provides details of the modeled emission rates for each of the sources in each site.

4.3.1 Tokai Big Spring Carbon Black Plant

Tokai Big Spring Carbon Black Plant has six emissions sources modeled as point sources[4] in two different modes of operation: routine, and planned maintenance startup and shutdown. The Emission Point Number (EPN), type of source (stack or flare), description, and modeled emission rates are provided in Table 4-1: *Tokai Big Spring Carbon Black Plant Point Sources*. Of the six emissions sources, four emissions sources, Incinerator and Heat Recovery Steam Generator (HRSG) (EPN 13A), the flare (EPN FLARE 4), and the two dryer stacks (EPN 7A and EPN 12A), have an emissions cap, designated as C in Table 4-1. The combined SO_2 emissions from the four capped sources is 1,355 pounds per hour (lb/hr) when the four emissions sources are operating at full load level, i.e., all dryers venting to EPN 7A, EPN 12A, EPN 13A and/or EPN FLARE 4 are operational. In addition to the emissions cap C, EPN 12A, EPN 13A, and EPN FLARE 4 each have individual enforceable emission rates.

Due to the site's consent decree with the EPA, Tokai Big Spring Carbon Black Plant is allowed to flare from EPN FLARE 4 only when EPN 13A is in planned MSS. As a result of the cap for the four Tokai Big Spring Carbon Black Plant sources, a total of 192 scenarios were modeled taking into consideration variations in the operating load (when one or more of the dryers are not operational) and mode (routine vs. MSS) to ensure that the emission rates demonstrate attainment under differing operating conditions. The details of emission limits and cap are presented in Chapter 3: *Control Strategies and Required Elements*. The modeling approach used to account for this cap is discussed in Section 4.4: *Modeling Technical Framework.*

Table 4-1: Tokai Big Spring Carbon Black Plant Point Sources

EPN	Type	Description	SO_2 Emission Rate (lb/hr)
14	Stack	Feedstock Oil Preheater 1	<0.01
15	Stack	Feedstock Oil Preheater 2	<0.01
12A	Stack	Dryer Stack Units No. 3	C
7A	Stack	Dryer Stack Units Nos. 1 and 2	C
13A	Stack	Incinerator + HRSG	C
FLARE 4	Flare	Flare 4	C

4.3.2 Delek Big Spring Refinery

Delek Big Spring Refinery has 33 point sources, 29 of which are continuous sources, while four of their flares (EPN 02CRUDEFLR, EPN 14NEASTFLR, EPN 05REFMRFLR, and

[4] In this chapter, "point source" refers to emissions sources with stacks and a specific location. This use of the term point source is consistent with the EPA's 2014 SO_2 SIP guidance and Appendix W.

EPN 16SOUTHFLR) have intermittent MSS emissions. The modeled emissions rates are shown in Table 4-2: *Delek Big Spring Refinery Point Sources*. There are nine heaters within an emissions cap, Heater CAP, of 12.47 lb/hr. For the heaters in the Heater CAP, the hourly emission rate modeled for each heater is the maximum hourly individual contribution from that heater to the total emissions cap value, and is based on what represented in the associated NSR permit application and provided by the company. These values are shown in Table 4-3: *Delek Big Spring Refinery Heater Emissions Cap*. When in MSS mode, the flares have tiered emission rates as shown in Table 4-4: *Delek Big Spring Refinery Flare Modeled Emissions Rate and Occurrences*. Appendix K, Section 7: *Modeling Scenarios* provides details on the modeling approach used for these emissions sources.

Table 4-2: Delek Big Spring Refinery Point Sources

EPN	Type	Description	SO_2 Emission Rate (lb/hr)
23AC-1HTR	Stack	PDA Asphalt Heater	Heater CAP
23KTTLEHTR	Stack	PDA Tea Kettle Superheater	Heater CAP
02BGVCMHTR	Stack	Big Vacuum Heater	Heater CAP
02CHRGAHTR	Stack	Crude A and B Heater	Heater CAP
02CHRGDHTR	Stack	Crude D Heater	Heater CAP
09CHRGHTR	Stack	LDH Charge Heater	Heater CAP
23GSOILHTR	Stack	PDA Gasoil Heater	Heater CAP
26C8WSTHTR	Stack	C8 Column West Heater	Heater CAP
15CHRGHTR	Stack	Gas Hydrotreater Charge Heater	Heater CAP
37BOXAHTR	Stack	Horizontal Asphalt Heater Box A	0.55
37BOXBHTR	Stack	Vertical Asphalt Heater Box B	0.29
04CHRGHTR	Stack	Naphtha HDS Charge Heater	0.63
06CHRGHTR	Stack	FCCU Charge Heater	1.84
80CHRGHTR	Stack	Heater (59 MMBtu/hr)	1.69
25CLAYHTR	Stack	Clay Tower Heater	0.43
69TGINC	Stack	No. 1 SRU Incinerator Vent	17.03
71TGINC	Stack	No. 2 SRU Incinerator Vent	12.78
04DEC5HTR	Stack	Naphtha HDS Depentanizer Heater	2.29
05DEC5HTR	Stack	Reformer Depentanizer Reboiler	1.70
77HYDGNHTR	Stack	Hydrogen Preheat Heater	0.62

EPN	Type	Description	SO_2 Emission Rate (lb/hr)
01PMAHTR	Stack	Polymer Modified Asphalt Unit Heater	0.03
37PMGTRHTR	Stack	Process Heater	0.29
06ESPPCV	Stack	FCCU Electrostatic Precipitators Stack	280.90
05CHRGHTR	Stack	Reformer 1, 2, and 3 Reactor Reheater and Charge Heater	10.36
80STABLRBR	Stack	Heater (21 MMBtu/hr)	0.60
24STM23BLR	Stack	Steam Boiler	7.19
24STM24BLR	Stack	Steam Boiler	7.46
77STRBRHTR	Stack	Naphtha Stripper Reboiler	0.44
02CRUDEFLR	Flare	Crude Unit Flare	51.80
14NEASTFLR	Flare	Northeast Flare	25.00
37PMGTRFLR	Flare	Process Vapor Combustor	0.16
05REFMRFLR	Flare	Reformer Flare	103.70
16SOUTHFLR	Flare	South Flare	118.70

Table 4-3: Delek Big Spring Refinery Heater Emissions Cap

EPN	Type	Description	SO_2 Modeled Emission Rate (lb/hr)
23AC-1HTR	Stack	PDA Asphalt Heater	0.65
23KTTLEHTR	Stack	PDA Tea Kettle Superheater	0.06
02BGVCMHTR	Stack	Big Vacuum Heater	1.35
02CHRGAHTR	Stack	Crude A and B Heater	5.71
02CHRGDHTR	Stack	Crude D Heater	2.86
09CHRGHTR	Stack	LDH Charge Heater	0.51
23GSOILHTR	Stack	PDA Gasoil Heater	0.38
26C8WSTHTR	Stack	C8 Column West Heater	0.57
15CHRGHTR	Stack	Gas Hydrotreater Charge Heater	0.38
HEATER CAP	Stack	Heater Emission Caps	12.47

Table 4-4: Delek Big Spring Flare Modeled Emissions Rate and Occurrences

EPN	Emission Tier (lb/hr)	Occurrences per Year (Days)
02CRUDEFLR	750	3
02CRUDEFLR	250	14
05REFMRFLR	750	5
05REFMRFLR	250	4
14NEASTFLR	1500	2

EPN	Emission Tier (lb/hr)	Occurrences per Year (Days)
14NEASTFLR	500	6
14NEASTFLR	250	4
16SOUTHFLR	1695	2
16SOUTHFLR	500	12
16SOUTHFLR	250	4

4.3.3 BHER C R Wing Cogeneration Plant

BHER C R Wing Cogeneration Plant has four emissions sources that operate continuously. The modeled emission rates are shown in Table 4-5: *BHER C R Wing Cogeneration Plant Point Sources*.

Table 4-5: BHER C R Wing Cogeneration Plant Point Sources

EPN	Type	Description	SO_2 Emission Rate (lb/hr)
E-3	Stack	Start-Up Emergency Electrical Generator	0.50
E-1	Stack	GE Frame 7 Turbine	16.40
E-2	Stack	GE Frame 7 Turbine	16.40
E-4	Stack	Maintenance Generator	0.10

Other sources of SO_2, affecting the Howard County 2010 SO_2 NAAQS nonattainment area that are not explicitly modeled, such as emissions from mobile sources or area sources outside of a specific site, are represented in the model as a background concentration. An hourly and seasonally varying background concentration was calculated based on data from the Midlothian Old Fort Worth monitor (C52) in Ellis County, Texas. Details on the choice of monitor and the calculation of background concentrations can be found in Appendix K, Section 6: *Background Concentration*.

4.4 MODELING TECHNICAL FRAMEWORK

The Howard County 2010 SO_2 NAAQS nonattainment area attainment demonstration SIP modeling technical framework includes the use of dispersion modeling in conjunction with a statistical technique, the MC method, to determine if the control measures described in Chapter 3: *Control Strategies and Required Elements* will result in attainment. This technical framework, referred to as MC approach, estimates modeled DVs more realistically when some emissions sources emit SO_2 intermittently and non-deterministically. Ramboll developed code using the Python programming language to implement the modeling technical framework. For this attainment demonstration SIP modeling, the emissions sources in the Howard County 2010 SO_2 NAAQS nonattainment area were split into three categories, continuous emissions sources, capped emissions sources and intermittent sources.

The continuous emissions sources in Howard County 2010 SO_2 NAAQS nonattainment area include all sources at BHER C R Wing Cogeneration Plant, two sources (EPN 14 and EPN 15) at Tokai Big Spring Carbon Black Plant, and all sources at Delek Big Spring Refinery except the four flares (EPN02CRUDEFLR, EPN 14NEASTFLR, EPN 05REFMRFLR,

and EPN 16SOUTHFLR). The continuous emissions sources were modeled at a constant emission rate as specified in Section 4.3: *Sources and Modeled Emission Rates* for all hours of a year for the five-year period modeled as required by the 2014 SO_2 SIP guidance. The American Meteorological Society (AMS)/EPA Regulatory Model (AERMOD) version 21112 with the associated suite of preprocessors was used to derive modeled concentrations for continuous emissions sources in the nonattainment area. Given emissions and meteorological inputs, AERMOD predicts pollutant concentrations at specific physical locations determined by the user, known as receptors. For a quick reference to the software versions and settings used in the preprocessors, refer to Appendix K, Section 8: *Reference Tables for Modeling Information*.

The capped emissions sources in the Howard County 2010 SO_2 NAAQS nonattainment area include four emissions sources, EPN 7A, EPN 12A, EPN 13A, and EPN FLARE 4, at Tokai Big Spring Carbon Black Plant. In addition, Tokai Big Spring Carbon Black Plant sources EPN 13A and EPN FLARE 4 operate depending on the site's mode of operation, routine and MSS, respectively, but never at the same time. The standard method of modeling capped sources is estimating modeled concentrations for each possible operational scenario. This was done in two steps. In step one, an AERMOD run with an emission rate of 1 gram per second (g/s) for each of the four capped Tokai Big Spring Carbon Black Plant sources was completed. In step two, the resultant concentrations at each receptor for every hour was scaled by the emission rates associated with each possible operational scenario. The possible operational scenarios were determined taking into consideration the operating modes and load levels. The attainment demonstration SIP modeling includes 24 different load levels and two operating modes for Tokai Big Spring Carbon Black Plant. The modeling uses distinct emission rates under each of the 24 load-varying scenarios. To account for possible variation in the allocation of the cap between the four subject sources, four scenarios were modeled at each load level and operating mode combination. In total, 192 (24 x 2 x 4) distinct scenarios were evaluated. For details on how these 192 scenarios were developed and about the enforceable cap limits, refer to Chapter 3. Taking as an example the scenario with the highest modeled DV, or "the controlling scenario" (Routine 24D), Ramboll's python code assigns 984 lb/hr to EPN 13A, 260 lb/hr to EPN 7A, and 146 lb/hr to EPN 12A, with a total cap limit of 1,355 lb/hr, for each hour of every year for the five-year period modeled. The code then appropriately scales the modeled concentrations at each receptor from the AERMOD run where each capped Tokai Big Spring Carbon Black Plant source was modeled with 1 g/s to derive the modeled concentrations at each receptor for each of the five years. The code then calculates the five-year average to derive the modeled concentrations at each receptor for the capped sources in the nonattainment area.

The intermittent sources in the Howard County 2010 SO_2 NAAQS nonattainment area include the four Delek Big Spring Refinery flares. Modeling these sources as if they operate continuously results in unrealistic modeled concentrations at each receptor. In the MC approach, the contributions from intermittent sources to SO_2 concentrations in the nonattainment area are determined in two steps. In step one, an AERMOD run is completed with an emission rate of 1 (g/s) for each of the four Delek Big Spring Refinery flares. In step two, one or more of the flares were randomly placed in MSS mode for short periods of time and assigned MSS emission rates over the course of a year for each of the modeled five-years. The code randomly determines which days of each year each of the Delek Big Spring Refinery flares (independent of the other flares)

will be in each of the MSS tiers from Table 4-4. The code then conservatively assigns the maximum emission rate for that MSS tier to that flare. Though the company stated that MSS occurrences normally last a few hours, in the MC approach it was assumed that each occurrence would last a full calendar day to ensure that the daily maximum hourly modeled concentration at each receptor would be captured. For days when the flare is not randomly assigned to be in MSS, the code assigns the routine emissions rate for that flare. The code could also randomly assign all four flares to be in MSS operations on the same day. Taking as an example the crude flare, EPN 02CRUDEFLR, for each year of the five-years being modeled, the following emission rates would be modeled:

- fourteen full days at 250 lb/hr;
- three full days at 750 lb/hr; and
- the remaining 348 days at the normal operations emission rate of 51.8 lb/hr.

Based on the assigned emission rates the code then calculates the modeled concentrations at each receptor for intermittent sources in the nonattainment area as described above.

The modeled concentrations at each receptor for the continuous sources, capped sources, and intermittent sources are combined along with background concentrations to generate a maximum DV for comparison to the SO_2 standard for one MC simulation.

The MC approach involves repeating a minimum of 10,000 MC simulations for each of the 192 Tokai Big Spring Carbon Black Plant scenarios and determining the modeled maximum DV for each of the MC simulations. Attainment is demonstrated if the modeled maximum DV for all MC simulations is less than the SO_2 standard. For a detail description of the MC approach, refer to Appendix L.

Due to the large number of MC simulations (a minimum of 192,000 simulations), a critical receptor grid was established to ensure SO_2 concentrations in the nonattainment area were appropriately characterized without placing undue burden on available computing resources. The critical receptor grid was determined using a set of AERMOD runs where all the BHER C R Wing Cogeneration Plant and Delek Big Spring Refinery sources in the Howard County 2010 SO_2 NAAQS nonattainment area were modeled at their maximum emission rates simultaneously for the five-year period for each of the 192 Tokai Big Spring Carbon Black Plant scenarios. Figure 4-5: *Modeling Domain and Receptor Grid Covering the Nonattainment Area* shows the modeling domain for the AERMOD runs used in determining the critical receptors for the MC simulations. Figure 4-5 shows the nonattainment border as a red line and black points representing modeling receptors. The receptor grid shown in Figure 4-5 covers the nonattainment area such that all areas within the nonattainment area “that are considered ambient air (i.e., where the public generally has access)” (2014 SO_2 SIP guidance) were evaluated. Receptors were removed from areas not considered ambient air, which include property that is owned/operated by the sites and to which public access is controlled through the use of physical barriers and security measures. The portions of the nonattainment area that are considered nonambient were determined based on discussion with the EPA and the companies. Additional receptors were placed on the modeled site boundaries.

A total of 648 receptors were included in the final critical receptor grid used in the MC simulations. The receptors included those in the modeling domain shown in Figure 4-5 that had a modeled design values that was 70 ppb or greater in any of the 192 scenarios modeled. Additional receptors were added to provide a buffer around those with a modeled design values that was 70 ppb or greater. Receptors were also placed along property boundaries and public road and railways. Receptors were placed 50 meter (m), 100 m, and 200 m apart based on proximity to emissions sources and the set of receptors that had modeled design values greater than 70 ppb as shown in Figure 4-6: *Critical Receptors for the Monte Carlo Analysis*. Receptors that had modeled design values less than 70 ppb in all 192 Tokai scenarios and areas not considered ambient air were not included in the critical receptor grid. Appendix K, Section 4: *Modeling Domain and Receptor Screening for Monte Carlo Analysis* provides more detail on the critical receptors included in the critical receptor grid.

Receptor elevations for the critical receptor grid were derived from AERMOD's terrain preprocessor, AERMAP.

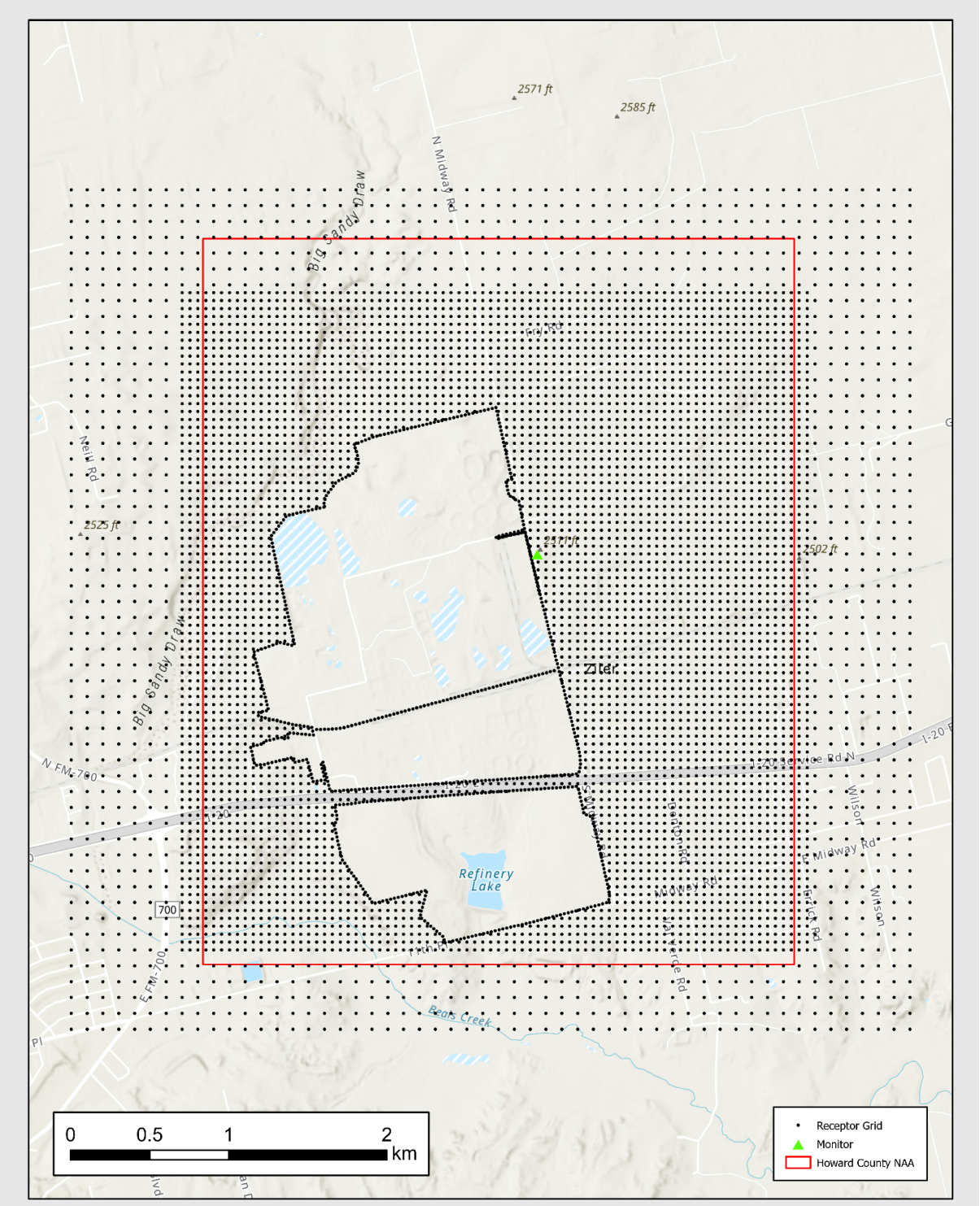

Figure 4-5: Modeling Domain and Receptor Grid Covering the Nonattainment Area

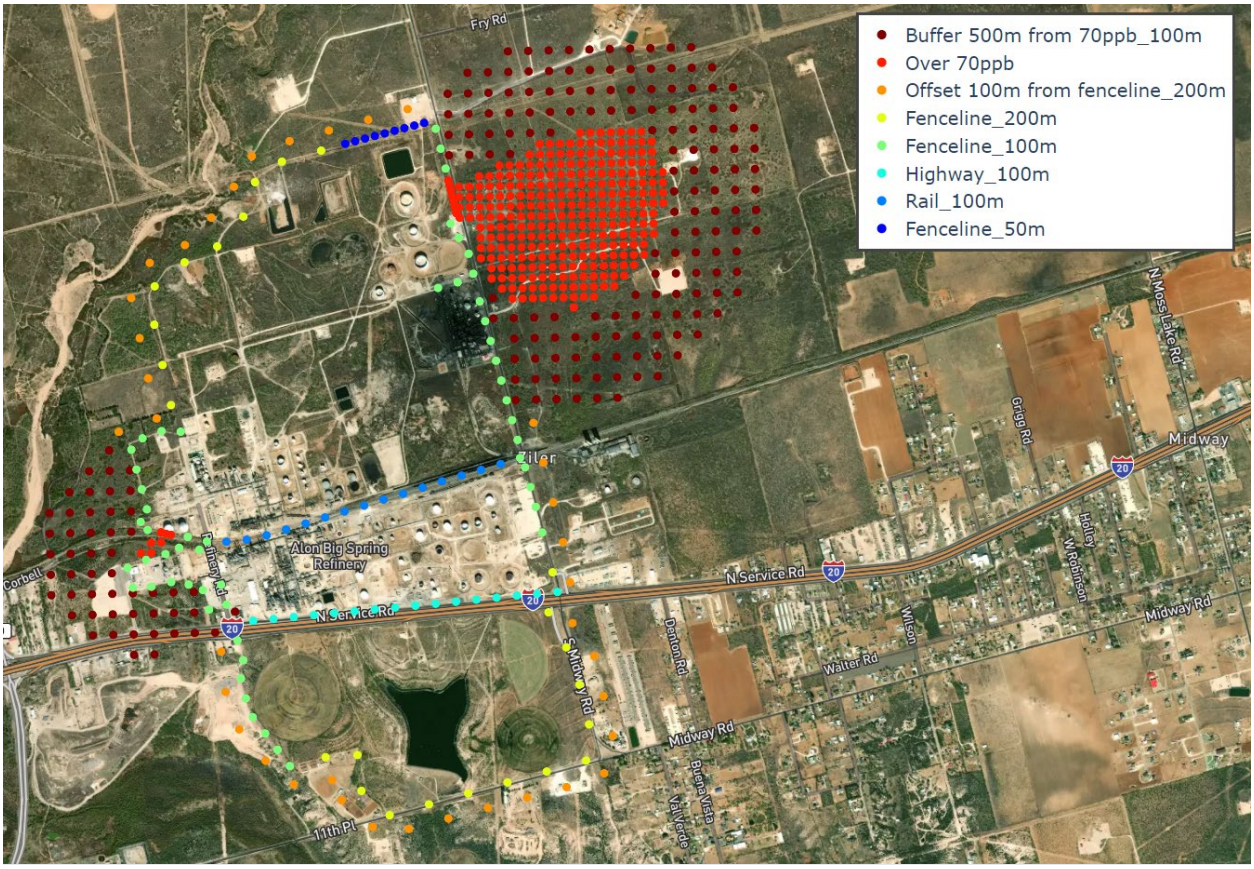

Figure 4-6: Critical Receptors for the Monte Carlo Analysis

Meteorological inputs for AERMOD were created using AERMET, AERMINUTE, and AERSURFACE. Five years of meteorological data from 2016 through 2020 were processed following the recommendations in 40 CFR Part 51 Appendix W §8.4, to capture meteorological variability. Surface and upper air data were taken from the Midland International Airport (Midland Intl AP) (Weather Bureau Army Navy [WBAN] 23023) station. Sub-hourly one-minute wind data from the surface station was included and processed with AERMINUTE using a threshold windspeed of 0.5 meters per second. AERSURFACE was used to supply surface characteristics to AERMET. Details on AERMET, AERMINUTE, and AERFURFACE settings and data are provided in Appendix K, Section 5: *Meteorology*.

Building downwash was calculated using AERMOD's downwash preprocessor, BPIPPRM. Detailed building information used for BPIPPRM can be found in Appendix K, Section 3: *Emissions Sources and Parameters.*

Modeling details relating to the MC approach, the critical receptor grid, meteorological inputs, background concentration, and property boundaries were shared with the EPA's Region 6 office and finalized after extensive consultation.

4.5 MODELING RESULTS

4.5.1 MC Simulations

The TCEQ conducted over two million MC simulations to ensure that the control measures described in Chapter 3 demonstrate attainment. The DV results of the MC simulations derived design value show no violations of the SO_2 standard at any receptors. The MC simulations completed include:

- 10,000 MC simulations for each of the 192 Tokai scenarios;
- 20,000 MC simulations for each of the top 10[5] Routine and MSS Tokai scenarios, identified as potentially most impactful via 10,000 MC simulations; and
- 20 different runs of the controlling Tokai scenario Routine 24D, each with 10,000 and 5 different runs each with 20,000 MC simulations.

The operating scenario routine 24D was identified as the top controlling scenario among 192 scenarios. The routine load scenario 24 assumes 100% capacity from all sources, resulting in higher emission rates. Cap scenario D consistently shows the highest concentrations among the four cap scenarios A to D. The results of 10,000 MC simulations for routine scenario for load 24, scenario A to D is shown in Figure 4-7: *Histogram of Monte Carlo DVs from Routine Scenario Load 24*. The results of the 20,000 MC simulations for the top 10 routine and MSS Tokai scenarios are shown in Figure 4-8: *Histogram of Monte Carlo DVs from Top 10 Routine Scenarios* and Figure 4-9: *Histogram of Monte Carlo DVs from Top 10 MSS Scenarios*. The modeled maximum DVs for each scenario are in Appendix K, Table 7.1*: Modeling Scenarios and Maximum Modeled DV*. The scenario with the highest modeled DV, or the controlling scenario, was scenario Routine 24D, with a DV of 193.7 micrograms per cubic meter ($\mu g/m^3$)[6] or 73.96 ppb, which demonstrates attainment. Modeled DVs for each of the 20,000 MC simulations are shown in Figure 4-10: *Histogram of Monte Carlo DVs from Routine Scenario 24D.* A concentration plot for the critical receptors corresponding to the MC simulation that resulted in the DV of 193.7 µg/m3 or 73.96 ppb is shown in Figure 4-11: *Design Value Concentration at Critical Receptors*.

[5] The TCEQ identified the "top 10" or potentially most impactful routine (24D, 21D, 23D, 18D, 21C, 20D, 24A, 22D, 23C, and 18C) and Maintenance/Start-up/Shutdown (MSS) (24D, 24C, 21D, 23D, 21C, 18D, 23C, 20D, 18C, and 22D) scenarios. An additional set of 20,000 simulations was conducted on these top 10 scenarios.

[6] Although SO_2 design values are expressed in ppb, the Monte Carlo derived design values are represented in both $\mu g/m^3$ and ppb to present results with more precision because AERMOD outputs, Monte Carlo processing, and results are in $\mu g/m^3$.

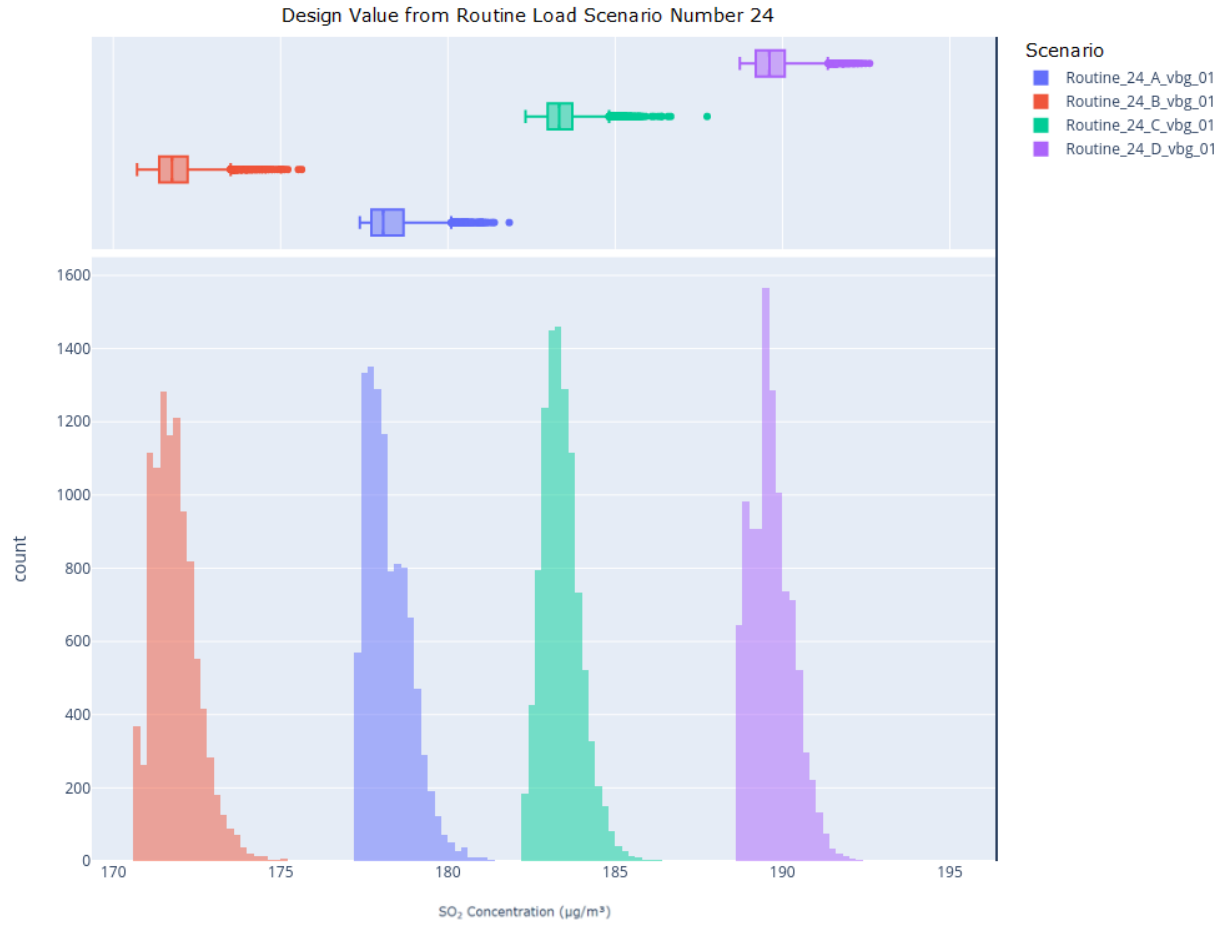

Figure 4-7: Histogram of Monte Carlo DVs from Routine Scenario Load 24

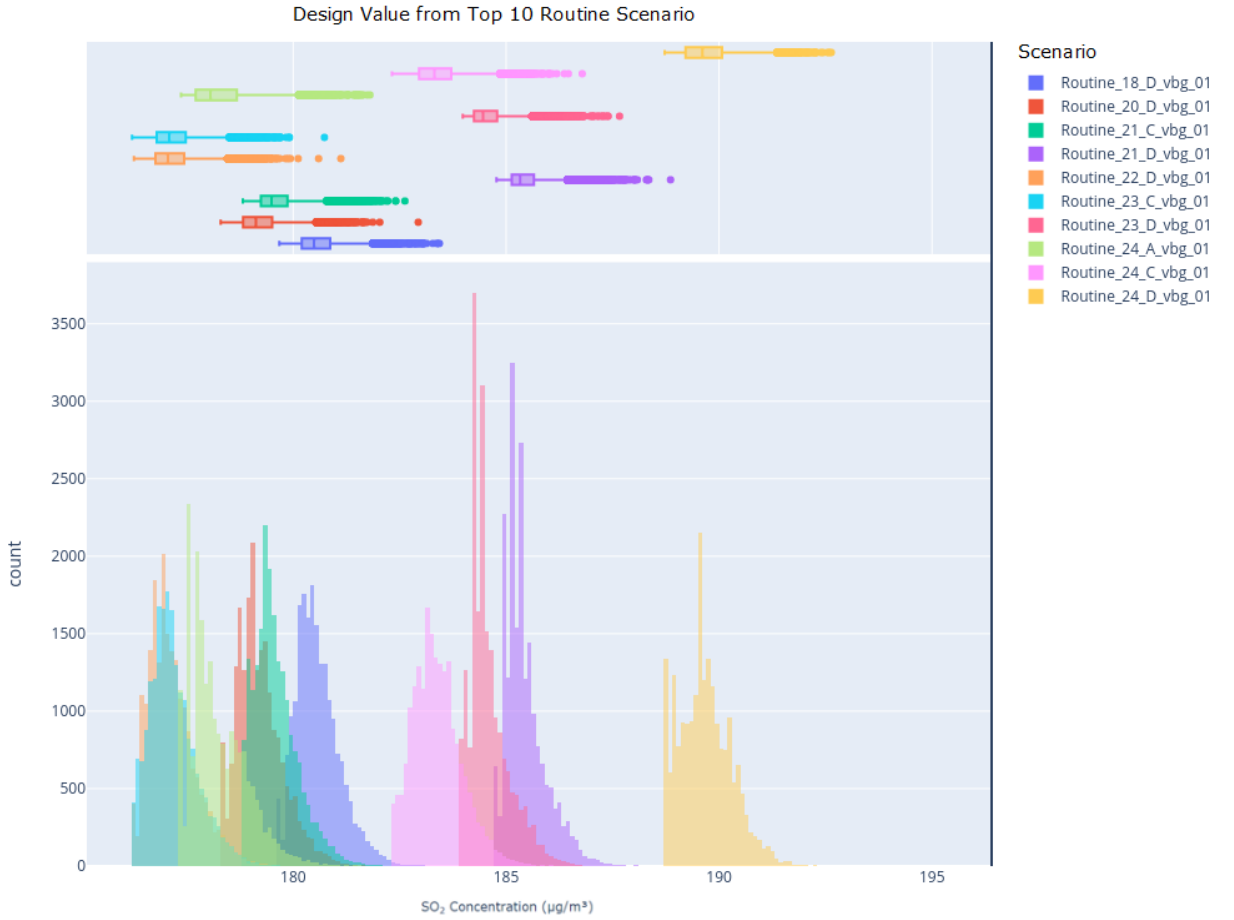

Figure 4-8: Histogram of Monte Carlo DVs from Top 10 Routine Scenarios

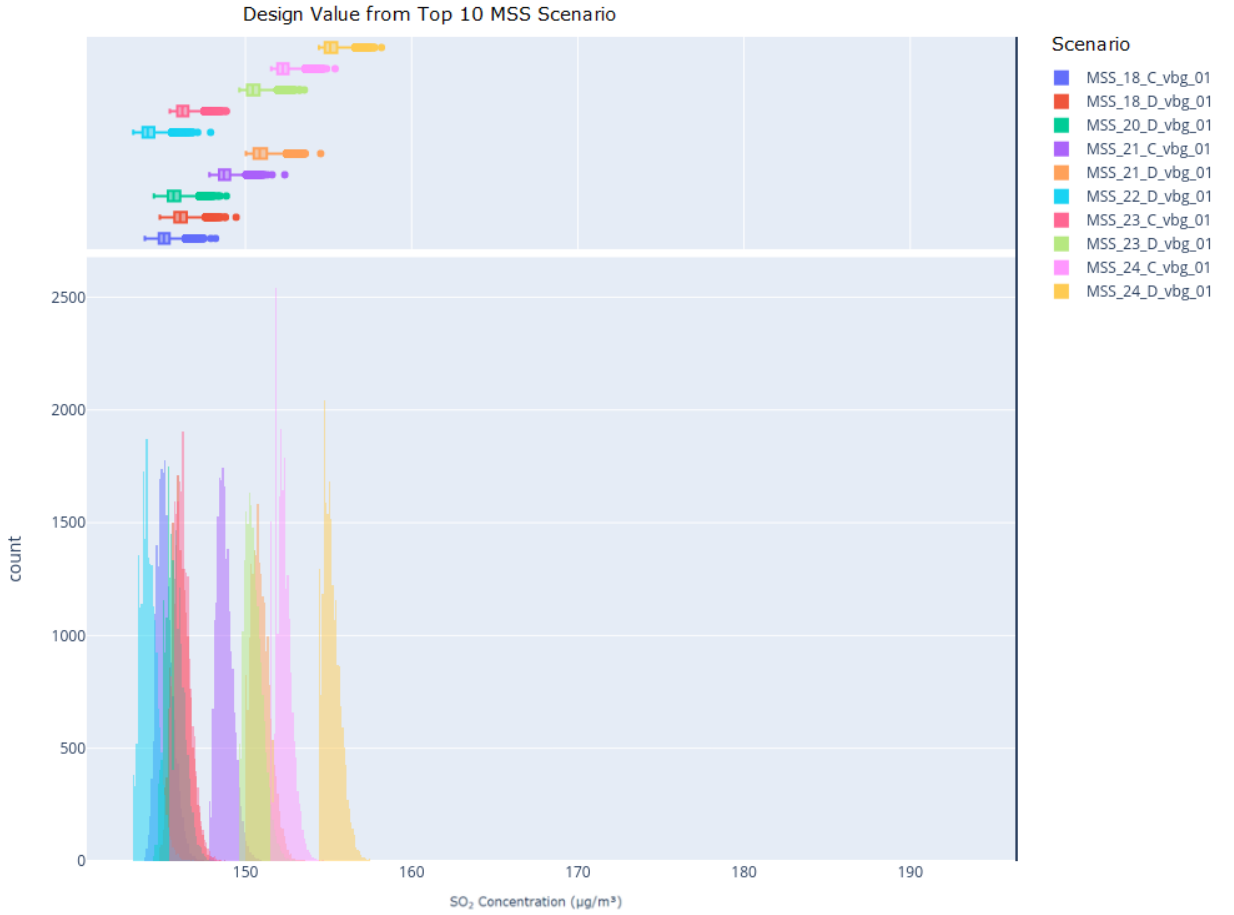

Figure 4-9: Histogram of Monte Carlo DVs from Top 10 MSS Scenarios

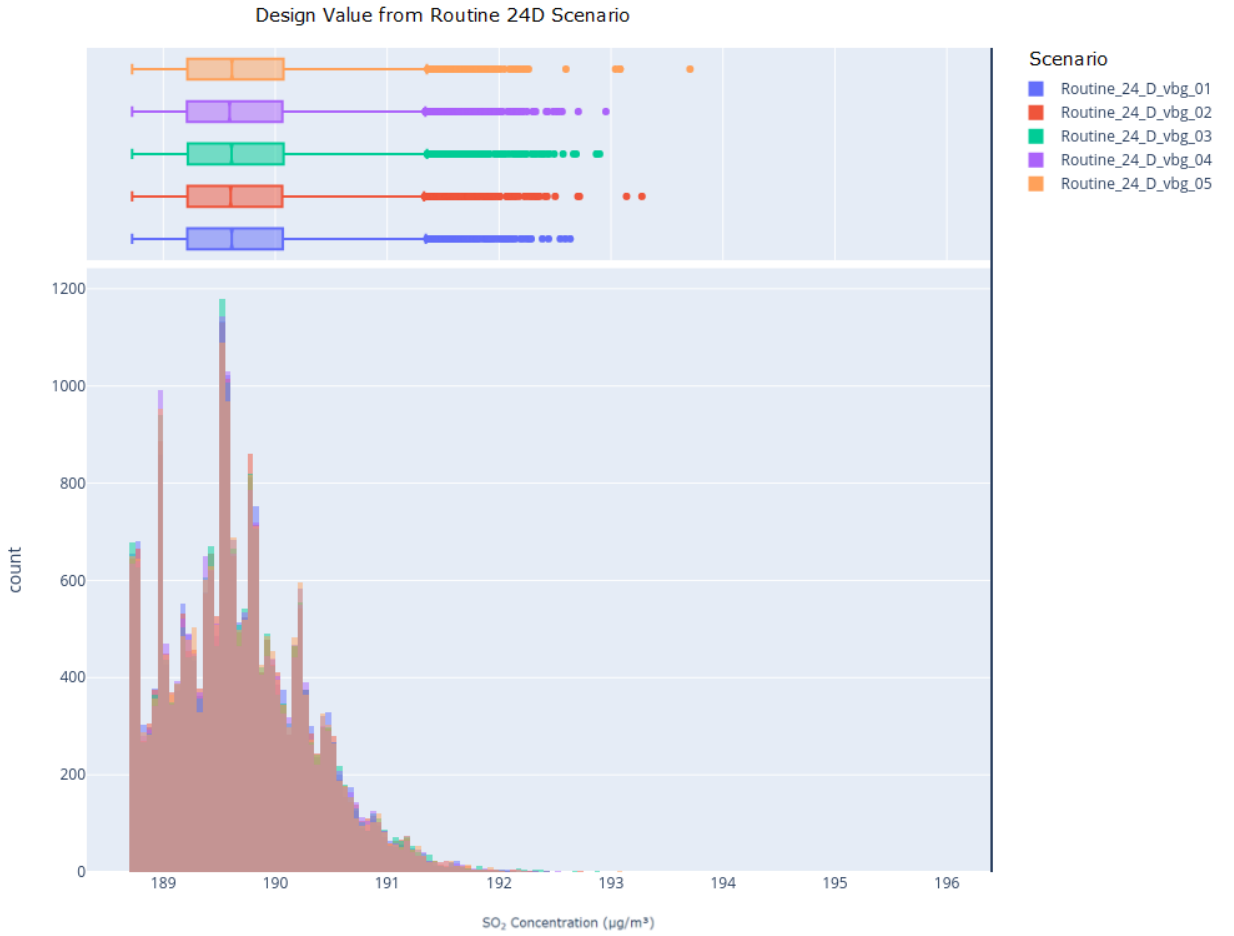

Figure 4-10: Histogram of Monte Carlo DVs from Routine Scenario 24D

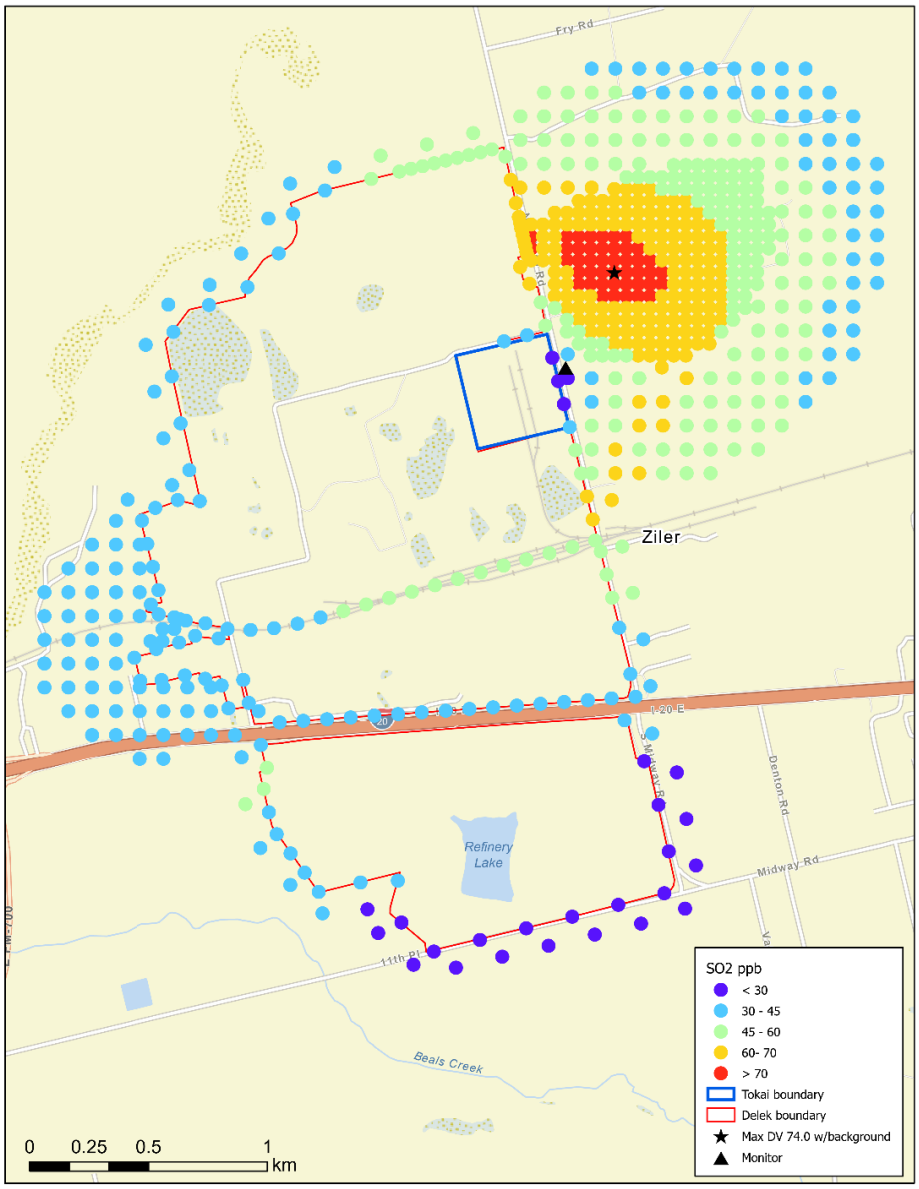

Figure 4-11: Design Value Concentration at Critical Receptors

The maximum design value across the approximately 2.5 million MC simulations is 193.7 µg/m^3 or 74.0 ppb. Therefore, the one-hour SO_2 standard was not exceeded in any simulation for any scenario at any receptor.

4.5.2 Site Ambient Scenarios

In addition to the MC simulations, the TCEQ also modeled a set of site ambient scenarios. The site ambient runs were done to demonstrate that no sites in the nonattainment area will result in NAAQS exceedance within the boundary of neighboring sites. In the site ambient scenarios, receptors are placed within each site's modeled boundaries and impacts from sources other than the site's own sources are determined. Since there are three sites in the Howard County 2010 SO_2 nonattainment area, three sets of site ambient scenarios were conducted – BHER C R Wing

Cogeneration Plant site ambient scenarios, Delek Big Spring Refinery site ambient scenarios, and the Tokai Big Spring Carbon Black Plant site ambient scenarios.

For the BHER C R Wing Cogeneration Plant site ambient scenarios, receptors were placed within the BHER C R Wing Cogeneration Plant site, emissions from BHER C R Wing Cogeneration Plant and Delek Big Spring Refinery sources were zeroed out and the 192 Tokai Big Spring Carbon Black Plant scenarios were modeled. The Delek Big Spring Refinery sources were zeroed out because BHER C R Wing Cogeneration Plant leases the property from Delek Big Spring Refinery. Due to the lessee-lessor relationship, the geographic area within the BHER C R Wing Cogeneration Plant fence line is considered non-ambient to Delek Big Spring Refinery as outlined in the EPA guidance memo from *Interpretation of "Ambient Air" In Situations Involving Leased Land Under the Regulations for Prevention of Significant Deterioration (PSD)* (EPA 2007). The controlling scenario resulted in a modeled DV of 104.22 µg/m^3 or 39.8 ppb. The modeled concentrations within BHER C R Wing Cogeneration Plant for the controlling case are shown in Figure 4-12*: Maximum DV within BHER C R Wing Cogeneration Plant Site Boundary.*

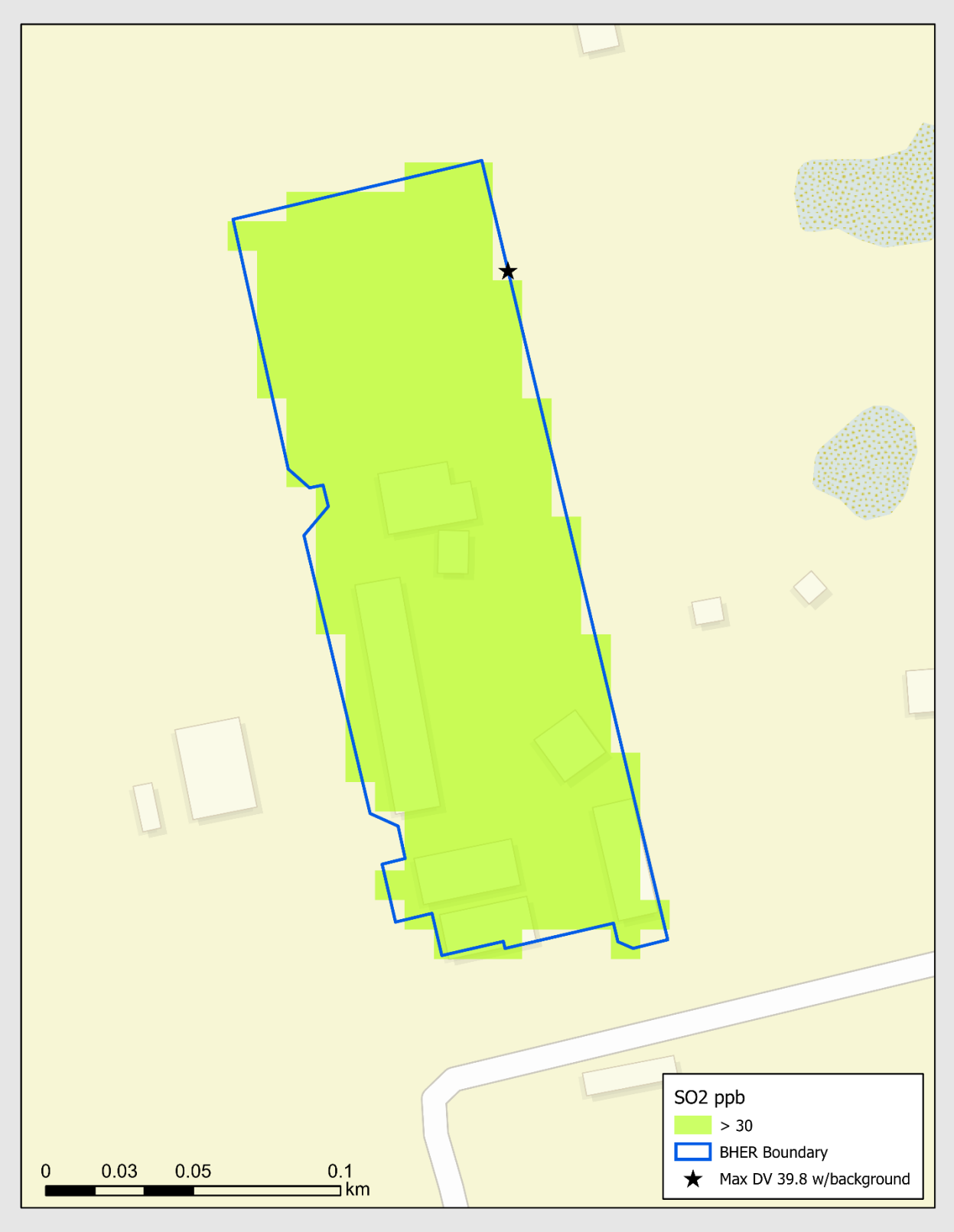

Figure 4-12: Maximum DV within BHER C R Wing Cogeneration Plant Site Boundary

For the Delek Big Spring Refinery site ambient scenarios, receptors were placed within the Delek Big Spring Refinery site, emissions from Delek Big Spring Refinery sources were zeroed out and the 192 Tokai Big Spring Carbon Black Plant scenarios were modeled with emissions from BHER C R Wing Cogeneration Plant and Tokai Big Spring Carbon Black Plant sources. The controlling scenario resulted in a modeled DV of 182.52 µg/m^3 or 69.7 ppb. The modeled concentrations within Delek *Big Spring Refinery* for the controlling case are shown in Figure 4-13*: Maximum DV within Delek Big Spring Refinery Site Boundary.*

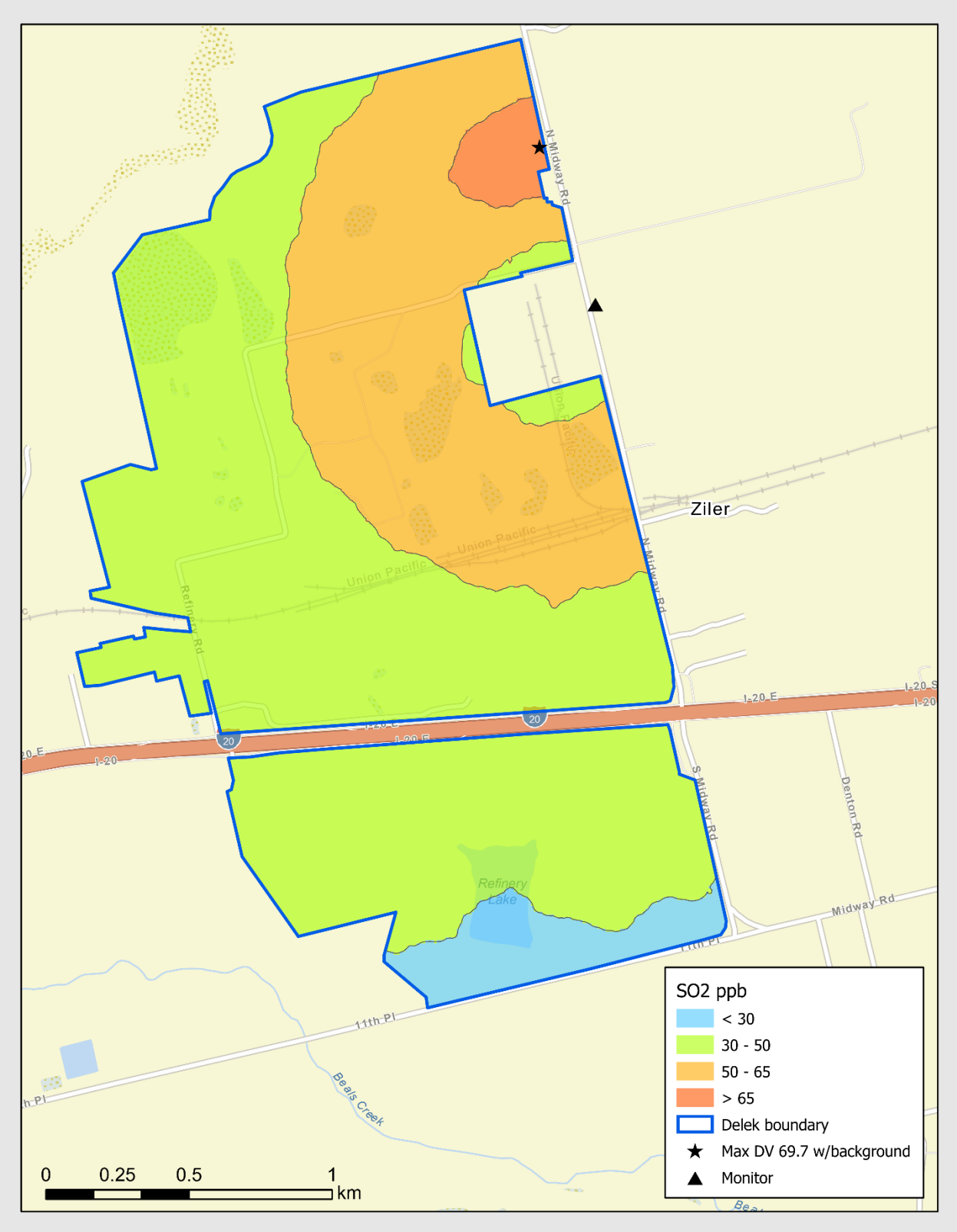

Figure 4-13: Maximum DV within Delek Spring Refinery Site Boundary

For the Tokai Big Spring Carbon Black Plant site ambient scenarios, a set of 10,000 MC simulations with only Delek Big Spring Refinery and BHER C R Wing Cogeneration Plant emissions was conducted to ensure that those emissions do not adversely impact the geographic area within the Tokai Big Spring Carbon Black Plant site boundary. The resultant maximum modeled DV was 54.3 µg/m^3 or 20.73 ppb. The modeled concentrations within Tokai Big Spring Carbon Black Plant for the MC simulation with the highest modeled DV are shown in Figure 4-14: *Maximum DV within Tokai Big Spring Carbon Black Plant Site Boundary*.

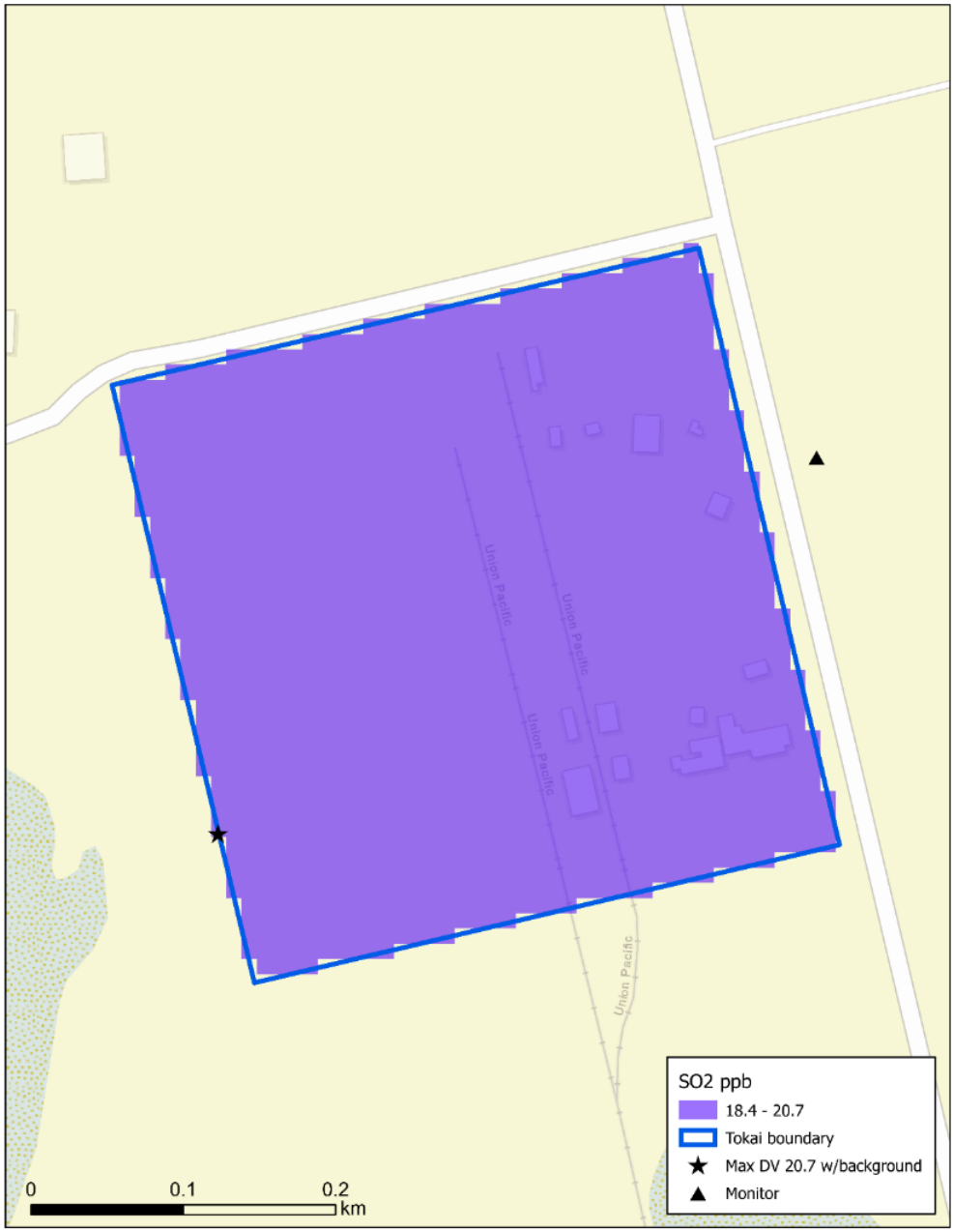

Figure 4-14: Maximum DV within Tokai Big Spring Carbon Black Plant Site Boundary

4.6 CONCLUSION

The TCEQ conducted a modeling analysis that included dispersion modeling following EPA guidance for the proposed Howard County Attainment Demonstration SIP Revision for the 2010 One-Hour SO_2 NAAQS. This analysis included use of the MC method. The TCEQ modeled the control measures for Howard County described in Chapter 3. The TCEQ considered possible operating scenarios and modeled attainment in each case, thereby ensuring that under the proposed controls Howard County sources will remain protective of the NAAQS under all operating conditions. Based on the TCEQ's modeling, it is expected that the Howard County 2010 SO_2 NAAQS nonattainment area will meet the 2010 one-hour SO_2 NAAQS by the attainment date.

4.7 REFERENCES

EPA, 2007. Interpretation of 'Ambient Air' In Situations Involving Leased Land Under the Regulations for Prevention of Significant Deterioration (PSD), accessed at https://www.epa.gov/sites/default/files/2015-07/documents/leaseair.pdf, July 8.

EPA, 2014. Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions, accessed at https://www.epa.gov/sites/production/files/2016-06/documents/20140423guidance_nonattainment_sip.pdf, April 23.

EPA, 2017. 40 CFR Part 51 Appendix W: Revisions to the Guideline on Air Quality Models: Enhancements to the AERMOD Dispersion Modeling System and Incorporation of Approaches to Address Ozone and Fine Particulate Matter. 82 FR 5182, accessed at https://www.epa.gov/sites/production/files/2020-09/documents/appw_17.pdf, January 17.

CHAPTER 5: REASONABLE FURTHER PROGRESS

5.1 INTRODUCTION

Federal Clean Air Act (FCAA), §171(c) defines the reasonable further progress (RFP) state implementation plan (SIP) requirement as "such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date." The United States Environmental Protection Agency's (EPA) *Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions* (2014 SO_2 SIP guidance) indicates that this definition is most appropriate for pollutants emitted by numerous and diverse sources where inventory-wide reductions are necessary to attain a standard, but that this definition of RFP is "generally less pertinent to pollutants like sulfur dioxide (SO_2) that usually have a limited number of sources affecting areas which are relatively well defined, and emissions controls for such sources result in swift and dramatic improvement in air quality." Therefore, the 2014 SO_2 SIP guidance indicates that for SO_2 nonattainment areas, RFP is best construed as "adherence to an ambitious compliance schedule."

5.2 RFP DEMONSTRATION

On March 26, 2021, the EPA published a designation for a portion of Howard County as nonattainment for the 2010 SO_2 National Ambient Air Quality Standard (NAAQS), effective April 30, 2021 (86 FR 16055). Consistent with the EPA's 2014 SO_2 SIP guidance document, the Howard County 2010 SO_2 NAAQS nonattainment area includes three sites housing multiple SO_2 emissions sources from two of the three sites, as explained in Chapter 3 of this proposed SIP revision, with well-defined emissions, such that emissions controls for this source should result in "swift and dramatic improvement in air quality." As detailed in Chapter 3: *Control Strategy and Required Elements* of this state implementation plan (SIP) revision, enforceable emission limitations would be implemented for the emissions sources at the two sites in this area, as detailed in Section 5.3: Compliance Schedule. This compliance schedule therefore fulfills the RFP requirement for the Howard County 2010 SO_2 NAAQS nonattainment area.

5.3 COMPLIANCE SCHEDULE

The EPA's 2014 SO_2 SIP guidance indicates that RFP for the 2010 one-hour SO_2 NAAQS requires only such reductions in emissions that are necessary to attain the NAAQS. Given the relationship between SO_2 emissions and air quality and the immediate effect of air quality improvements, RFP is best construed as "adherence to an ambitious compliance schedule" (74 FR 13547, April 16, 1992). The EPA maintains its interpretation that the source(s) of SO_2 emissions implement appropriate control measures as expeditiously as practicable to ensure attainment of the standard by the applicable attainment date.

The compliance deadline for both Delek US and Tokai Carbon CB Ltd. in the associated proposed 30 Texas Administrative Code Chapter 112, Subchapter E rulemaking (Rule Project No. 2021-035-112-AI) is January 1, 2025. The attainment date for the Howard County 2010 SO_2 NAAQS nonattainment area is April 30, 2026.

Appendices Available Upon Request

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