Guidance on the Inter-Pollutant Use of Credits for Nonattainment New Source Review Permit Offset Requirements

Contents

Purpose

Title 30 Texas Administrative Code (TAC) §101.306(d) and §101.376(g) allow the use of emission credits (EC) and discrete emission credits (DEC) of one ozone precursor (i.e., nitrogen oxides (NO_X) or volatile organic compounds (VOC)) to meet the nonattainment new source review (NNSR) offset requirements for the other ozone precursor. This inter-pollutant (IP) use of credits requires a photochemical modeling demonstration and approval from the Texas Commission on Environmental Quality (TCEQ) and the United States Environmental Protection Agency (EPA). The TCEQ will evaluate each project-specific demonstration on a case-by-case basis. The EPA must have the opportunity to review and comment on the IP use during the public comment period for the NNSR permitting process (83 FR 63017). EPA approval of the IP use of credits will be presumed unless the EPA disapproves the IP use during this comment period.[1]

The purpose of this document is to provide guidance on the IP use of credits to satisfy the offset requirements for new or modified facilities subject to federal NNSR requirements in 30 TAC Chapter 116. This guidance describes only the procedures for the TCEQ to consider approval of the IP use of credits. The TCEQ encourages applicants to contact the EPA to discuss potential IP use projects. This document provides guidance only and does not take the place of official rules. The guidance reflects current policy and is subject to change.

Administrative Requirements

For the TCEQ to consider approval of the IP use of credits, submit the following information to Emissions Banking and Trading (EBT).

1. Once the NNSR permit application is administratively complete[2], submit a modeling protocol that addresses all the steps described in the *Project-Specific Photochemical Modeling* section (including any verbal or written reconciliation of deviations from this guidance) and contains the modeling input parameters described in the *Documentation* section. Refer to the Inter-Pollutant Modeling Protocol Example for a sample protocol. Contact the TCEQ Air Modeling and Data Analysis Section to discuss any deviations prior to submittal.
2. After receiving approval of the protocol, complete the required photochemical modeling and submit the information described in the *Documentation* section to EBT for consideration. The final photochemical modeling must use the permit emission parameters, rates, and offsets specified by the TCEQ Air Permits Division. The required photochemical modeling must be submitted to EBT at least **30 days** prior to publication of the Notice of Application and Preliminary Decision (NAPD) for the NNSR permit associated with the IP credit use.
3. EBT will notify the applicant if the TCEQ approves or denies the IP photochemical modeling demonstration. If approved, EBT will work with the applicant to make the final IP use demonstration available for EPA review and comment during the NAPD

[1] On December 6, 2018, the EPA addressed IP credit use as part of the Implementation of the 2015 National Ambient Air Quality Standards for Ozone: Nonattainment Area State Implementation Plan Requirements (83 FR 62998). The EPA included technical guidance on IP trading in the docket for this rulemaking (Docket ID: EPA-HQ-OAR-2016-0202).

[2] Applicants are encouraged to submit the protocol once the NNSR application is administratively complete to ensure sufficient time to set-up the attainment baseline case modeling described in the Project-Specific Photochemical Modeling section, receive approval of the protocol, and complete the required modeling within the timeframe specified.

(i.e., second public notice) for the associated NNSR permit. EBT will work with the applicant to address any public comments on the IP use.

4. Submit[3] the appropriate EBT forms to acquire[4] and/or use the specific credits represented in the photochemical modeling. EBT will not approve any forms for the IP use of credits until the required photochemical modeling is approved by the TCEQ and made available to the EPA for review.

Project-Specific Photochemical Modeling

General Requirements

Project-specific photochemical modeling must demonstrate that the IP use of credits will not adversely affect the overall air quality in the nonattainment area or the area's regulatory design value. The general procedure for the photochemical modeling is as follows.

1. **Attainment Baseline Case.** Determine the attainment year baseline ozone concentration by replicating the photochemical modeling in the most recent TCEQ attainment demonstration state implementation plan (AD SIP) for the nonattainment area.[5] Identify the subset of grid cells in the nonattainment area with modeled ozone concentrations greater than or equal to 5 parts per billion (ppb) below the current ozone National Ambient Air Quality Standard (NAAQS).[6]
2. **Credit Baseline Case.** Model the effect of the IP use of credits on the attainment year baseline ozone concentrations in the nonattainment area. Quantify the effect of the IP use of credits on ozone concentrations by summing the change in modeled ozone concentrations across the subset of grid cells identified in the attainment baseline. Determine the credit baseline modeled future design value for each monitor in the nonattainment area.
3. **Project Baseline Case.** Model the effect of the NNSR project emissions on the attainment year baseline ozone concentrations in the nonattainment area. Quantify the effect of the NNSR project emissions on ozone concentrations by summing the change in modeled ozone concentrations across the subset of grid cells identified in the attainment baseline. Determine the project baseline modeled future design value for each monitor in the nonattainment area.
4. **Comparative Analysis.** Calculate the differences between the effect of the IP use of credits and the effect of the NNSR project on ozone concentrations and the modeled future design value for each monitor. Differences greater than or equal to zero[7] are necessary to demonstrate that the IP use of credits will not adversely affect the overall air quality in the nonattainment area or the area's regulatory design value.

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[3] Submit the EBT forms in accordance with the timelines established in the applicable 30 TAC Chapter 101 rules and/or applicable NNSR permit requirements.

[4] TCEQ encourages applicants to acquire the credits represented in the modeling prior to publication of the NAPD. TCEQ approval is for the IP use of the specific credits represented in the photochemical modeling. Additional modeling may be necessary if you cannot acquire the specific credits represented in the photochemical modeling.

[5] Areas without an AD SIP submitted to EPA must use the modeling platform in the most recent AD SIP submitted to the EPA for any nonattainment area in the state.

[6] The threshold is set at 5 ppb less than the current (i.e., most recently issued) ozone NAAQS to limit the analysis of the effect of the IP use of credits to the ozone concentrations that pose a risk to an area's attainment status. Including lower ozone concentrations in the analysis could skew the results since this is a comparative analysis based on cumulative air quality across all modeled days.

[7] Negative numbers cannot be rounded to zero.

5. **Calculate the IP Use of Credits.** Calculate the total amount of IP credits you must surrender to satisfy the NNSR offset requirement for the other ozone precursor based on the photochemical modeling results. The total amount of IP credits necessary to satisfy the NNSR offset requirement for the other ozone precursor are calculated using the IP trading ratio from the project-specific modeling results that demonstrated no adverse impact on air quality and the total amount of NNSR offsets that you are proposing to satisfy through the IP use of credits.

Attainment Baseline (AB) Case

Determine the ozone concentrations for the AB case by replicating the photochemical modeling in the most recent TCEQ AD SIP revision for the nonattainment area where the IP use of credits will occur.

1. Create the AB case model configuration by replicating the photochemical modeling in the TCEQ's current AD SIP revision for the nonattainment area where the IP use of credits will occur. This is the modeling conducted for the attainment year not the base year. *Appendix B* provides information and requirements for adequately replicating TCEQ's current AD SIP on the applicant's computer system. Areas without an AD SIP submitted to EPA must use the modeling platform in the most recent AD SIP submitted to the EPA for any nonattainment area in the state.
2. For each episode day modeled, calculate the Maximum Daily Average Eight-Hour (MDA8)[8] ozone concentration in the AB case (*OA*) for every grid cell in the nonattainment area where the IP use of credits will occur (nonattainment grid cell).[9]
    - Identify each nonattainment grid cell and modeled episode day (nonattainment grid cell-day) where the modeled MDA8 ozone concentration is greater than or equal to 5 ppb[10] below the current ozone NAAQS (*n*). Count each such occurrence once.[11] Calculate *N* as the total number of nonattainment grid cell-days (*n*).

Credit Baseline (CB) Case

To evaluate the effect of the IP use of credits on the ozone concentrations in the nonattainment area, determine the credit baseline (CB) case by modeling the AB case with the IP use of credits as follows.

1. **Model Configuration.** Create the CB case model configuration by modifying the AB case emissions inventory to include the IP use of credits.

[8] The MDA8 concentration is the basis for the eight-hour ozone NAAQS. Calculate the MDA8 value by first creating a running average of ozone concentrations for eight consecutive hours (assigning the average concentration to the first hour in the averaging period) and then determining the maximum eight-hour average value within each day.
[9] A grid cell is in the nonattainment area if the grid cell centroid lies within the borders of one of the counties in the nonattainment area where the proposed project is located.
[10] The threshold is set at 5 ppb less than the current (i.e., most recently issued) ozone NAAQS to verify the project does not increase ozone concentrations in grid cells that are below but near the NAAQS.
[11] For example, if a specific grid cell's modeled MDA8 ozone concentration is greater than or equal to 5 ppb below the current (i.e., most recently issued) ozone NAAQS on three episode days, then count only those three nonattainment grid cell-days.

a. Add a facility with the same stack parameters[12] and chemical speciation[13] as the facility from which the credit originated. Locate the facility within a one-kilometer radius of the NNSR project centroid.[14] If the ECs were generated by more than one facility, represent each facility separately within the same one-kilometer radius. If the DECs were generated by more than one facility, represent one facility using the average stack parameters and average chemical speciation.

b. Only model the emissions (CB_{EI}) associated with the total amount of IP credits you are proposing to use to offset the actual expected NNSR project emissions (i.e., the credits necessary to satisfy the one-to-one portion of the offset requirement).

c. Keep all other AB case model inputs constant.

2. **Overall Air Quality Effect.**

a. Run the model for the CB case and calculate the modeled MDA8 ozone concentration for each nonattainment grid cell-day identified in the AB case (OC_n).

b. Calculate the effect of the CB case on ozone concentrations (E_C) by summing the difference between the modeled MDA8 ozone concentrations in the CB case (OC_n) and the AB case (OA_n) for each nonattainment grid cell-day identified in the AB case.[15] Carry all calculations to at least the nearest 0.1 parts per trillion.

$$E_C = \sum_{n=1}^{N} (OC_n - OA_n)$$

3. **Design Value Effect.** Calculate the CB case modeled future design value[16] for each monitor (m) in the nonattainment area specified in *Appendix A* (DVC_m).

Project Baseline (PB) Case

To evaluate the effect of the NNSR project emissions on the ozone concentrations in the nonattainment area, determine the project baseline (PB) case by modeling the AB case with the NNSR project emissions as follows.

1. **Model Configuration.** Create the PB case model configuration by modifying the AB case emissions inventory to include the NNSR project emissions you are proposing to offset by the IP use of credits.

a. Add a facility with the same physical location, stack parameters, and chemical speciation as the facility proposed in the NNSR project.

b. Only model the amount of NNSR project emissions (PB_{EI}) you are proposing to offset by the IP use of credits. For example, if you are proposing to use NO_x credits to satisfy a portion of the VOC offset requirement, model only the portion

[12] Facility-specific stack parameters are available from the State of Texas Air Reporting System (STARS) by calling (512) 239-DATA or e-mailing orteam@tceq.texas.gov.
[13] For chemical speciation data, contact EBT by calling (512) 239-4900 or emailing ebt@tceq.texas.gov.
[14] It is necessary to locate a virtual facility in the nonattainment area because the emissions represented by the IP use of credits are not tied to a physical location. The NNSR project site is the location where the credits are most likely to compensate for the effects of the project emissions.
[15] Only include the nonattainment grid cell-days identified in the AB case regardless of the MDA8 ozone concentrations values determined for the CB case.
[16] Calculate the modeled design value using the relative-response factor method described in the EPA's *Modeling Guidance for Demonstrating Air Quality Goals for Ozone, PM2.5, and Regional Haze* (EPA-454/R-18-009, November 2018).

of the project VOC emissions being offset by the IP use of credits and do not include any of the project NO_X emissions.

c. Keep all other aspects of the AB case constant.

2. **Overall Air Quality Effect.**

a. Run the model for the PB case and calculate the modeled MDA8 ozone concentration for each nonattainment grid cell-day identified in the AB case (OP_n).

b. Calculate the effect of the PB case on ozone concentrations (E_P) by summing the difference between the modeled MDA8 ozone concentrations in the PB case (OP_n) and the AB case (OA_n) for each nonattainment grid cell-day identified in the AB case.[17] Carry all calculations to at least the nearest 0.1 parts per trillion.

$$E_P = \sum_{n=1}^{N} (OP_n - OA_n)$$

3. **Design Value Effect.** Calculate the PB case modeled future design value for each monitor in the nonattainment area specified in *Appendix A* (DVP_m).

Comparative Analysis

Demonstrate that the proposed IP use of credits will not adversely affect the overall air quality in the nonattainment area or the area's regulatory design value by comparing the modeled ozone concentrations from the CB and PB cases.

1. **Overall Air Quality Analysis for the Nonattainment Area.** Calculate the effect of the IP use of credits (IP_E) in the nonattainment area as the difference between the effect of the CB case on ozone concentrations (E_C) and the effect of the PB case on ozone concentrations (E_P).

$$IP_E = E_C - E_P$$

An IP_E greater than or equal to zero demonstrates that the proposed IP use of credits will not adversely affect the overall air quality in the nonattainment area. An IP_E greater than or equal to zero is required for the TCEQ to consider approval of the IP use of credits. You can increase the IP_E value by increasing the IP use of credits or decreasing the NNSR project emissions.

2. **Design Value Analysis for Each Monitor.** Calculate the monitor-specific effect of the IP use of credits (IP_m) as the difference between the CB case modeled future design value (DVC_m) and the PB case modeled future design value (DVP_m) for each monitor in the nonattainment area (m) specified in *Appendix A*.

$$IP_m = DVC_m - DVP_m$$

An IP_m greater than or equal to zero[18] is necessary to demonstrate that the IP use of credits will not adversely affect the area's regulatory design value. For the TCEQ to consider approval of the IP use of credits, an IP_m greater than or equal to zero[19] is required for each monitor in the AB case with design values greater than or equal to 5

[17] Only include the nonattainment grid cell-days identified in the AB case regardless of the MDA8 ozone concentrations values determined for the PB case.
[18] Negative numbers cannot be rounded to zero.
[19] Negative numbers cannot be rounded to zero.

ppb below the current ozone NAAQS.[20] You can increase the IP_m value by increasing the IP use of credits or decreasing the NNSR project emissions.

Calculate the IP Use of Credits

Calculate the total amount of credits of one ozone precursor (i.e., NO_X or VOC) you must surrender to satisfy the NNSR offset requirement for the other ozone precursor. Calculate the IP trading ratio (IPT_{ratio}) as the amount of emissions from the IP use of credits modeled in the CB case divided by the amount of emissions from the NNSR project modeled in the PB case.

$$IPT_{ratio} = \frac{CB_{EI}}{PB_{EI}}$$

Calculate the total amount of credits you must surrender for the IP use of credits by multiplying the IPT_{ratio} by the total amount of NNSR offsets that you are proposing to satisfy through the IP use of credits.

Documentation

Submit electronic files containing the following information for the project-specific photochemical modeling required for the TCEQ to consider approval of the IP use of credits:

- general information about the requested IP use of credits including descriptions of the NNSR project being offset by the IP use of credits, the type and quantity of emissions required to be offset by the NNSR permit, the type of IP use (NO_X credits for VOC offsets or VOC credits for NO_X offsets), the IP trading ratio (IPT_{ratio}) determined from the results of the modeling, the total amount of IP credits that must be surrendered to satisfy the NNSR offset requirement for the other ozone precursor, and the specific credit(s) you will use in the NNSR project;
- the maximum ozone concentration difference between the AB case and the TCEQ's modeled ozone concentrations for every grid cell for every hour modeled;
- daily maps (contour or tile plots) showing modeled MDA8 ozone concentrations for each grid cell-day in the nonattainment area for the AB case, CB case, and PB case;
- model inputs used to create the CB case model configuration including the physical location, stack parameters, total emissions, and chemical speciation for the facility from which the credit originated;
- model inputs used to create the PB case model configuration including the physical location, stack parameters, total emissions, and chemical speciation for the facility proposed in the NNSR project;
- table of the model outputs from the CB and PB case model configurations including the modeled MDA8 ozone concentration for both cases for each nonattainment grid cell-day identified in the AB case (OC_n and OP_n), the effect of the CB case and PB case on ozone concentrations(E_C and E_P), and the modeled future design value for each monitor in the nonattainment area for both cases (DVC_m and DVP_m);

[20] The threshold is set at 5 ppb less than current (i.e., most recently issued) ozone NAAQS because it is not necessary to consider the effect of the IP use of credits on monitors that pose a negligible risk to an area's attainment status.

- the effect of the IP use of credits in the nonattainment area (IP_E); and
- the effect of the IP use of credits for each monitor in the nonattainment area (IP_m).

Contact Information

Emissions Banking and Trading

For questions regarding this guidance or further information regarding EBT, please contact EBT staff at (512) 239-4900 or email ebt@tceq.texas.gov.

Air Modeling and Data Analysis

For questions or further information regarding photochemical modeling, please contact Air Modeling and Data Analysis (AMDA) staff at (512) 239-1459 or email amda@tceq.texas.gov.

Environmental Protection Agency

For questions regarding the EPA's approval requirements, please contact EPA Region 6 at (800) 887-6063 or write to Environmental Protection Agency Region 6, Main Office, 1445 Ross Avenue, Suite 1200, Dallas, Texas 75202.

Appendix A: List of Regulatory Monitors

Table 1 lists the monitors that you must evaluate for IP use of credits in the Dallas–Fort Worth (DFW)[1] and Houston-Galveston-Brazoria (HGB)[2] 2008 and/or 2015 eight-hour ozone nonattainment areas, and the San Antonio (SAN)[3] 2015 eight-hour ozone nonattainment area.

Table 1: Monitors to Evaluate for the IP Use of Credits

Name	Area	CAMS Number	AIRS Number	Longitude	Latitude	Easting[4] (km)	Northing[4] (km)
Denton Airport South	DFW	C56	481210034	-97.193	33.194	-17.9498	-753.6385
Eagle Mountain Lake	DFW	C75	484390075	-97.477	32.988	-44.4829	-776.4397
Fort Worth Keller	DFW	C17	484392003	-97.282	32.923	-26.3206	-783.7428
Grapevine Fairway	DFW	C70	484393009	-97.064	32.984	-5.9687	-776.9991
Fort Worth Northwest	DFW	C13	484391002	-97.356	32.806	-33.2783	-796.7294
Frisco	DFW	C31	480850005	-96.786	33.132	19.9191	-760.5252
Weatherford	DFW	C76	483670081	-97.906	32.869	-84.6204	-789.3665
Dallas North #2	DFW	C63	481130075	-96.808	32.919	17.9213	-784.2094
Dallas Executive Airport	DFW	C402	481130087	-96.872	32.677	11.9855	-811.1348
Cleburne Airport	DFW	C77	482510003	-97.437	32.353	-41.0924	-847.0984
Arlington Municipal Airport	DFW	C61	484393011	-97.088	32.656	-8.2423	-813.4754
Dallas Hinton Street	DFW	C401	481130069	-96.86	32.82	13.0846	-795.2275
Pilot Point	DFW	C1032	481211032	-96.944	33.411	5.1934	-729.5432
Midlothian Tower	DFW	C94	481390015	-97.024	32.437	-2.2543	-837.8474
Rockwall Heath	DFW	C69	483970001	-96.459	32.936	50.4856	-782.1878
Midlothian OFW	DFW	C52	481390016	-97.027	32.482	-2.5346	-832.8393
Kaufman	DFW	C71	482570005	-96.317	32.565	64.0468	-823.3631
Granbury	DFW	C73	482210001	-97.803	32.442	-75.4202	-836.958
Greenville	DFW	C1006	482311006	-96.115	33.153	82.3516	-757.8135
Bayland Park	HGB	C53	482010055	-95.499	29.696	146.0367	-1142.6225

[1] The DFW 2008 eight-hour ozone nonattainment area includes Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties. The DFW 2015 eight-hour ozone nonattainment area includes Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Tarrant, and Wise Counties.

[2] The DFWHGB 2008 eight-hour ozone nonattainment area includes: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties. The HGB 2015 eight-hour ozone nonattainment area includes: Brazoria, Chambers, Fort Bend, Galveston, Harris, and Montgomery Counties.

[3] The SAN 2015 eight-hour ozone nonattainment area includes Bexar County.

[4] Based on the Lambert Conformal Conic map projection grid system used in the TCEQ AD SIP: First True Latitude = 33˚N; Second True Latitude = 45˚N; Central Longitude = 97˚W; Projection Origin = (97˚W, 40˚N); Spheroid = Perfect Sphere, Radius = 6370 km.

Name	Area	CAMS Number	AIRS Number	Longitude	Latitude	Easting[4] (km)	Northing[4] (km)
Clinton Drive	HGB	C403	482011035	-95.257	29.734	169.4973	-1137.947
Conroe (relocated)	HGB	C78	483390078	-95.425	30.35	151.9673	-1069.3221
Deer Park	HGB	C35	482011039	-95.128	29.67	182.1878	-1144.8643
Houston Aldine	HGB	C08	482010024	-95.362	29.901	158.9508	-1119.4408
Channelview	HGB	C15	482010026	-95.126	29.802	182.0776	-1130.08
Croquet	HGB	C409	482010051	-95.474	29.624	148.6043	-1150.6462
Lang	HGB	C408	482010047	-95.489	29.834	146.7526	-1127.1543
Houston Northwest	HGB	C26	482010029	-95.674	30.039	128.4515	-1104.4904
Houston East	HGB	C01	482011034	-95.221	29.768	172.9231	-1134.0722
Houston Monroe	HGB	C406	482010062	-95.267	29.626	168.7557	-1150.0608
Houston Texas Avenue	HGB	C411	482010075	-95.35	29.753	160.416	-1135.9883
North Wayside	HGB	C405	482010046	-95.284	29.828	166.6733	-1127.4725
Lake Jackson	HGB	C1016	480391016	-95.473	29.044	149.7943	-1215.6652
Lynchburg Ferry	HGB	C1015	482011015	-95.078	29.764	186.8306	-1134.237
Manvel Croix Park	HGB	C84	480391004	-95.393	29.52	156.6974	-1162.1612
Seabrook Friendship Park	HGB	C45	482011050	-95.015	29.583	193.3964	-1154.3752
Houston Westhollow	HGB	C410	482010066	-95.636	29.723	132.6633	-1139.8089
Park Place	HGB	C416	482010416	-95.294	29.686	166.0006	-1143.3905
Galveston	HGB	C1034	481671034	-94.861	29.254	209.2658	-1190.9033
San Antonio Northwest	SAN	C23	480290032	-98.620003	29.514999	-157.9752	-1162.699
Camp Bullis	SAN	C58	480290052	-98.56472	29.631945	-152.3592	-1149.6922
Calaveras Lake	SAN	C59	480290059	-98.311386	29.275278	-128.2704	-1190.0545

Appendix B: Replication of TCEQ's Latest AD SIP Photochemical Modeling

The modeling demonstration must be conducted using the model input files used in the TCEQ's latest AD SIP revision for the nonattainment area in which the IP credits will be used. Modeling files may be downloaded at http://www.tceq.texas.gov/airquality/airmod/data, including the source code for the version of the Comprehensive Air Quality Model with extensions (CAMx) used for each AD SIP demonstration. Contact TCEQ AMDA staff if you have questions regarding the correct files to use for your application.

The CAMx input and job control files supplied by the TCEQ should be used as is, although some exceptions may be allowed. Specifically, use of newer releases of CAMx is allowed, provided that the model comparison test discussed below can be met. Other modifications should be agreed to in advance by AMDA staff. Note that use of different computer systems, system software, CAMx versions, and features such as PiG may result in notable differences in modeled ozone concentrations between the applicant's modeling and the TCEQ's. However, the applicant is required to demonstrate that the applicant's modeling results are substantially similar to the TCEQ's (available at the above web location) so that we may have confidence in the calculation of the project's net ozone effect. This is accomplished by comparing the applicant's modeled MDA8 ozone concentration for every nonattainment grid cell to that of the TCEQ for every modeled day and demonstrating that the maximum difference is no greater than 0.1 ppb. If this cannot be demonstrated, the applicant should contact the TCEQ AMDA staff before proceeding.