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April 27, 2007

Mr. Dan Jamieson
Texas Commission on Environmental Quality
Air Permits Division, MC 163
12100 Park 35 Circle
Austin, TX 78753

**RE: *ConocoPhillips Borger Refinery –
Screening CALPUFF BART Applicability Modeling Analysis
TCEQ Account Regulated Entity Number RN102495884
TCEQ Account Customer Reference Number CN601674351***

Dear Mr. Jamieson:

ConocoPhillips operates the Borger Refinery in Borger, Texas. The ConocoPhillips Borger Refinery is considered eligible to be regulated under the U.S. Environmental Protection Agency's (EPA) Best Available Retrofit Technology (BART) provisions of the Regional Haze Rule.

The enclosed report summarizes ConocoPhillips' BART Applicability Analysis and resulting determination that the Borger Refinery is exempt from BART since the air quality modeling analyses described in this report demonstrate that the plant does not contribute to visibility impairment at federally-protected Class I areas. Accordingly, no BART Determination is required for the Borger Refinery.

If you have any questions about this submittal or require additional information, please feel free to contact me at (972) 661-8100, or Mr. Quarshie Awuah-Okyere at (806) 275-1945. Thank you for your attention to this matter.

Sincerely,

TRINITY CONSULTANTS



Weiping Dai
Managing Consultant

Enclosure

cc: Mr. Erik Snyder, EPA Region 6
Ms. Judith Logan, U.S. Forest Service
Mr. Michael George, National Park Service
Mr. Tim, Allen, U.S. Fish and Wildlife Service

**SCREENING CALPUFF BART APPLICABILITY MODELING ANALYSIS
CONOCOPHILLIPS ▪ BORGER REFINERY**

**TCEQ REGULATED ENTITY NUMBER: RN102495884
TCEQ CUSTOMER REFERENCE NUMBER: CN601674351**

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April 2007

Project 074401.0034

The logo for ConocoPhillips, featuring the company name in white text on a black rectangular background. A small red and white logo is positioned above the 'o' in 'Phillips'.

The logo for Trinity Consultants, with 'Trinity' in a blue serif font above 'Consultants' in a blue sans-serif font. A small red and white logo is positioned above the 'y' in 'Trinity'.

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1. INTRODUCTION

ConocoPhillips operates the Borger Refinery in Borger, Texas. The ConocoPhillips Borger Refinery is considered eligible to be regulated under the U.S. Environmental Protection Agency's (EPA) Best Available Retrofit Technology (BART) provisions of the Regional Haze Rule.

The results of the initial BART Screening performed by TCEQ's contractor determined that the ConocoPhillips Borger Refinery could not be screened out of further analyses as part of a larger collection of sources grouped geographically and by source category. Preliminary analyses showed impacts from the modeled group that included the Borger Refinery was above the threshold for contributing to visibility impairment at five Class I areas. Therefore, a site-specific BART Applicability Analysis was required to be conducted for the Borger Refinery to determine whether the facility is subject to or exempt from BART.

This report summarizes ConocoPhillips' BART Applicability Analysis and resulting determination that the Borger Refinery is exempt from BART since the air quality modeling analyses described in this report demonstrate that the plant does not contribute to visibility impairment at federally-protected Class I areas. Accordingly, no BART Determination is required for the Borger Refinery.

ConocoPhillips' site-specific evaluation of BART-eligibility and the modeling methods used to determine applicability of BART as described in this report are based on the following documents:

- TCEQ, "Final Report, Screening Analysis of Potential BART-Eligible Sources in Texas," Work Order No. 582-04-65563-06-10, September 27, 2006 and "Addendum I, BART Exemption Screening Analysis," December 6, 2006.
- TCEQ, "Best Available Retrofit Technology (BART) Modeling Protocol to Determine Sources Subject to BART in the State of Texas," January 22, 2007.
- Central Region Air Planning Association, *CENRAP BART Modeling Protocol*, December 15, 2005.
- U.S. EPA, *Guidance for Tracking Progress under the Regional Haze Rule* (EPA-454/B-03-004), September 2003.
- U.S. EPA, *Guidance for Estimating Natural Visibility Conditions under the Regional Haze Rule* (EPA-454/B-03-005), October 2003.

The *TCEQ BART Modeling Protocol* is incorporated by reference for ConocoPhillips' source-specific modeling analyses. The *TCEQ BART Modeling Protocol* and related information available at the TCEQ BART website established common technical approaches for quantifying emissions from BART-eligible emission units and conducting screening and refined modeling analyses using the CALPUFF modeling system and common data resources.¹ ConocoPhillips' analyses generally adhere to the recommendations made in the *TCEQ BART Modeling Protocol* as described in this

¹ <http://www.tceq.state.tx.us/implementation/air/sip/bart/haze.html>

report and adapted to the source-specific analysis of visibility impacts attributable to the Borger Refinery. ConocoPhillips has also submitted a BART Modeling Protocol to TCEQ for review.² Appendix A contains a copy of the submitted protocol for documentation purposes.

1.1.1 ASSESSMENT OF CONTRIBUTION TO VISIBILITY IMPAIRMENT AND BART APPLICABILITY

The *TCEQ BART Modeling Protocol* was issued in January 2007 and prescribes modeling techniques and data resources to conduct screening and refined analyses to assess whether a BART-eligible source is subject to BART. Causation is defined as a single-source impact of 1.0 deciviews (dv) or more and contribution is defined as a single-source impact of 0.5 dv or more, each evaluated on a 24-hour average basis. The deciview is a metric used to represent normalized light extinction attributable to visibility-affecting pollutants. To determine whether a BART-eligible plant causes or contributes to visibility impairment, U.S. EPA guidance requires the use of an air quality model, specifically recommending the CALPUFF modeling system, to quantify the impacts attributable to a single BART-eligible source. Because contribution to visibility impairment is sufficient cause to require a BART determination, 0.5 dv is the critical threshold for assessment of BART applicability.

The change in deciviews based on the source and background light extinction is based on the following equation:

$$\Delta dv = 10 * \ln \left[\frac{b_{\text{ext, background}} + b_{\text{ext, source}}}{b_{\text{ext, background}}} \right]$$

The background extinction coefficient $b_{\text{ext, background}}$ is affected by various chemical species and the Rayleigh scattering phenomenon and can be calculated as shown in the following equation:

$$b_{\text{ext, background}} (\text{Mm}^{-1}) = b_{\text{SO}_4} + b_{\text{NO}_3} + b_{\text{OC}} + b_{\text{Soil}} + b_{\text{Coarse}} + b_{\text{ap}} + b_{\text{Ray}}$$

where,

² The protocol document was submitted to Mr. Daniel Jamieson of TCEQ via email on April 20, 2007.

$b_{SO_4} = 3[(NH_4)_2SO_4]f(RH)$	$[(NH_4)_2SO_4]$ denotes the ammonium sulfate concentration
$b_{NO_3} = 3[NH_4NO_3]f(RH)$	$[NH_4NO_3]$ denotes the ammonium nitrate concentration
$b_{OC} = 4[OC]$	$[OC]$ denotes the concentration of organic carbon
$b_{Soil} = 1[Soil]$	$[Soil]$ denotes the concentration of fine soils
$b_{Coarse} = 0.6[Coarse\ Mass]$	$[Coarse\ Mass]$ denotes the concentration of coarse dusts
$b_{ap} = 10[EC]$	$[EC]$ denotes the concentration of elemental carbon
$b_{Ray} = \text{Rayleigh Scattering (10 Mm}^{-1} \text{ by default)}$	Rayleigh Scattering is scattering due to air molecules
$f(RH) = \text{Relative Humidity Function}$	
$[] = \text{Concentration in } \mu\text{g/m}^3$	

Values for the parameters listed above specific to the natural background conditions at the Class I areas considered in this analysis are provided on an annual average basis in the U.S. EPA's *Guidance for Estimating Natural Visibility Conditions under the Regional Haze Rule*.³

The extinction coefficient due to emissions of visibility-affecting pollutants from a BART-eligible source $b_{ext,source}$ is calculated using an air quality model. The extinction due to the BART-eligible source will be calculated as shown in the following equation.

$$b_{ext,source} (\text{Mm}^{-1}) = b_{SO_4} + b_{NO_3} + b_{PMC} + b_{PMF} + b_{SOA} + b_{EC}$$

where,

$b_{SO_4} = 3[(NH_4)_2SO_4]f(RH)$	$[(NH_4)_2SO_4]$ denotes the ammonium sulfate concentration
$b_{NO_3} = 3[NH_4NO_3]f(RH)$	$[NH_4NO_3]$ denotes the ammonium nitrate concentration
$b_{SOA} = 4[SOA]$	$[SOA]$ denotes the concentration of secondary organic aerosols
$b_{PMF} = 1[PMF]$	$[PMF]$ denotes the concentration of fine PM
$b_{PMC} = 0.6[PMC]$	$[PMC]$ denotes the concentration of coarse PM
$b_{EC} = 10[EC]$	$[EC]$ denotes the concentration of elemental carbon
$f(RH) = \text{Relative Humidity Function}$	
$[] = \text{Concentration in } \mu\text{g/m}^3$	

1.1.2 POTENTIALLY AFFECTED CLASS I AREAS

ConocoPhillips used the screening modeling technique described in the *TCEQ BART Modeling Protocol* to determine whether BART-eligible operations at the Borger Refinery contribute to visibility impairment at any Class I areas. The December 2006 addendum to the *TCEQ BART Screening Analysis Report* noted that the preliminary screening analysis only resulted in impacts above 0.5 dv for five Class I areas for the source group or model plant that included the ConocoPhillips' Borger Refinery. Therefore, only those five Class I

³ U.S. EPA, *Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule*, Table 2-1, Attachment A, September 2003, EPA-454/B-03-005.

areas are required to be included in ConocoPhillips' analysis to determine whether the source contributes to visibility impairment.

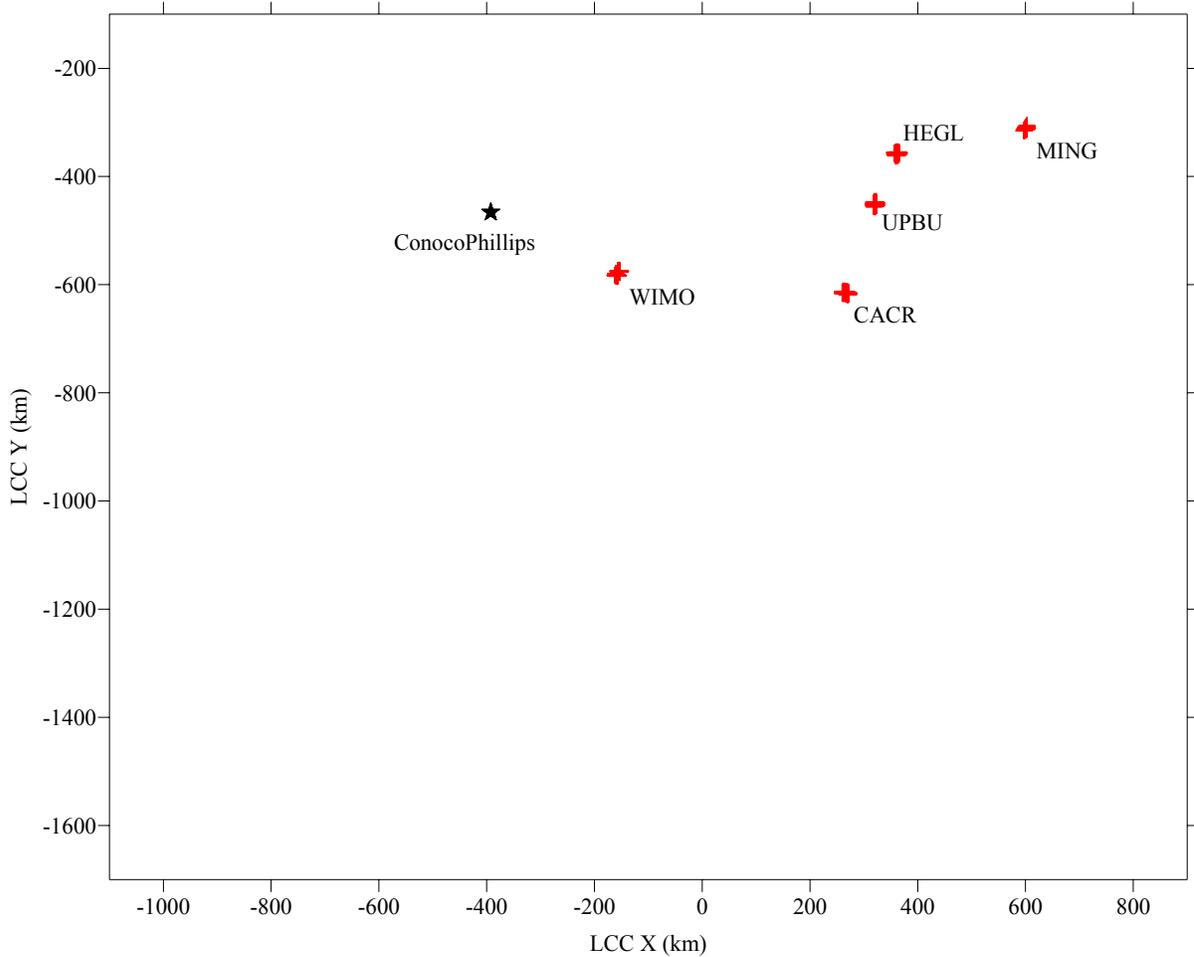
The required Class I areas for the ConocoPhillips' Borger Refinery and the distance to these areas from the plant are provided in Table 1-1. Note that the distances listed in Table 1-1 are the distances between the plant and the closest border of the Class I areas.

TABLE 1-1. DISTANCE FROM BORGER REFINERY TO SURROUNDING CLASS I AREAS

Class I Area	Symbol	Distance (km)
Caney Creek (AR)	CACR	648
Hercules-Glades Wilderness (MO)	HEGL	743
Mingo Wilderness Area (MO)	MING	986
Upper Buffalo Wilderness Area (MO)	UPBU	703
Wichita Mountains (OK)	WIMO	253

A plot of the Class I areas with respect to the Borger Refinery is provided in Figure 1-1.

FIGURE 1-1. PLOT OF CLASS I AREAS REQUIRED BY TCEQ TO BE EVALUATED IN THE BART ANALYSIS



1.1.3 CALPUFF MODELING ANALYSES

As recommended by the U.S. EPA BART guidelines, the CALPUFF modeling system was used to compute the 24-hour average visibility impairment attributable to ConocoPhillips' Borger Refinery to assess whether the 0.5 dv contribution threshold is exceeded, and if so, the frequency, duration, and magnitude of any exceedance events. CALPUFF is a refined air quality modeling system that is capable of simulating the dispersion, chemical transformation, and long-range transport of multiple visibility-affecting pollutant emissions from a single source and is therefore preferred for BART applicability and determination analyses.

2. EMISSION SOURCE INFORMATION

This section of the report describes the emission units that comprise the BART-eligible sources at the ConocoPhillips Borger Refinery. Emissions of SO₂, NO_x, and PM from the 15 BART-eligible sources at ConocoPhillips Borger Refinery are described in the following sections.

2.1 MODELED STACK PARAMETERS AND EMISSIONS

ConocoPhillips reviewed the criteria for BART-eligibility and determined that the emission units described in Appendix B comprise the BART-eligible sources at the Borger Refinery based on the source category and date-in-existence eligibility criteria. Actual stack parameters were input into the CALPUFF model to represent the point of visibility-affecting pollutant emissions. The location of each point source was represented consistently in the Lambert Conformal Coordinate system. Each exhaust discharges vertically without obstruction. Since the nearest Class I area is located more than 300 km from the plant, pursuant to the TCEQ BART modeling protocol, effects of building downwash were not considered.

Emissions of SO₂, NO_x, and PM₁₀ from the 15 BART-eligible sources at ConocoPhillips' Borger Refinery were included in the BART Modeling. Note that all the PM₁₀ was treated as fine particulates in this analysis. Per TCEQ Guidance, the actual maximum 24-hour average pound per hour (lb/hr) emission rates of NO_x, SO₂, and PM from the period of 2002 through 2005 were used in the BART determination screening modeling. The maximum 24-hour emission rates from the period of 2002 through 2005 were determined according to the following prioritization:

- **Continuous Emissions Monitoring (CEMS) Data:** For Units equipped with CEMS, the maximum 24-hour emission rates were obtained using CEMS data. The Unit 28 Charge Heater (28H1) is equipped with NO_x CEMS. The SRU Incinerator (34H1) is equipped with SO₂ CEMS.
- **Fuel Gas Data and Emission Factors:** Heaters/Furnaces at the Borger Refinery are equipped with flow meters that measure the flow rate of fuel gas (MSCF/D) to the heaters/furnaces. The heat content (BTU/SCF) of the fuel gas to the heaters/furnaces is also monitored by refinery personnel. The maximum 24-hour emission rates for the heaters/furnaces were determined using the maximum fuel gas flow rate (MSCF/D) and maximum emission factors [SO₂/PM (lb/MMSCF), NO_x (lb/MMBTU) obtained from stack testing.
- **Stack Testing:** The maximum 24-hour SO₂ emission rate for the H₂S Emergency Flare (66FL6) was obtained from stack testing results.
- **Permit Representation:** The maximum 24-hour emission rates for the Engines (55E1, 55E2, and 55E3) were obtained from permit representation. The maximum 24-hour NO_x emission rate for 66FL6 was obtained from permit representation.

Appendix B summarizes the stack parameters and emission rates for BART-eligible emission units at ConocoPhillips' Borger Refinery.

3. AIR QUALITY MODELING ANALYSES

The BART Modeling Protocol submitted by ConocoPhillips in April 2007 describes the modeling methods, data resources, and technical options used to conduct the screening analysis for the Borger Refinery. The air quality modeling was conducted following the methods described in the *TCEQ BART Modeling Protocol* and the ConocoPhillips Screening BART modeling protocol submitted in April 2007 (refer to Appendix A for details).

4. SCREENING ANALYSIS RESULTS

Screening analyses of visibility impacts attributable to ConocoPhillips' Borger Refinery were conducted to determine whether the plant is subject to BART using a conservative assessment.

4.1 SCREENING ANALYSIS IMPACTS AT CANEY CREEK WA

Table 4-1 summarizes the modeled peak, 24-hour average visibility impacts at Caney Creek Wilderness Area (WA) attributable to ConocoPhillips' Borger Refinery. This table summarizes the results calculated by using the methods described in the Modeling Protocol for representing annual average natural background conditions. Results are presented in terms of the maximum visibility impact and the day at which the maximum visibility impact occurred.

TABLE 4-1. PEAK 24-HOUR AVERAGE VISIBILITY IMPACTS AT CANEY CREEK WA

Year	Maximum Modeled Impact (Δdv)	Julian Day For Maximum Impact
2001	0.087	4
2002	0.052	362
2003	0.016	15 and 42

The results presented in Table 4-1 indicate that refined analyses were not necessary to evaluate visibility impacts at the Caney Creek WA since the screening analysis impacts, based on annual average natural background conditions, are below the impact contribution threshold of 0.5 dv.

4.2 SCREENING ANALYSIS IMPACTS AT HERCULES GLADES WA

Table 4-2 summarizes the modeled peak, 24-hour average visibility impacts at the Hercules Glades WA attributable to ConocoPhillips' Borger Refinery. This table summarizes the results calculated by using the methods described in Modeling Protocol for representing annual average natural background conditions. Results are presented in terms of the maximum visibility impact and the day at which the maximum visibility impact occurred.

TABLE 4-2. PEAK 24-HOUR AVERAGE VISIBILITY IMPACTS AT HERCULES GLADES WA

Year	Maximum Modeled Impact (Δdv)	Julian Day For Maximum Impact
2001	0.038	4
2002	0.048	362
2003	0.035	4

The results presented in Table 4-2 indicate that refined analyses were not necessary to evaluate visibility impacts at Hercules Glades WA since the screening analysis impacts, based on annual average natural background conditions, are below the impact contribution threshold of 0.5 dv.

4.3 SCREENING ANALYSIS IMPACTS AT MINGO WA

Table 4-3 summarizes the modeled peak, 24-hour average visibility impacts at the Mingo Wilderness Area (WA) attributable to ConocoPhillips' Borger Refinery. This table summarizes the results calculated by using the methods described in Modeling Protocol for representing annual average natural background conditions. Results are presented in terms of the maximum visibility impact and the day at which the maximum visibility impact occurred.

TABLE 4-3. PEAK 24-HOUR AVERAGE VISIBILITY IMPACTS AT MINGO WA

Year	Maximum Modeled Impact (Δdv)	Julian Day For Maximum Impact
2001	0.077	4
2002	0.043	362
2003	0.022	8

The results presented in Table 4-3 indicate that refined analyses were not necessary to evaluate visibility impacts at Mingo WA since the screening analysis impacts, based on annual average natural background conditions, are below the impact contribution threshold of 0.5 dv.

4.4 SCREENING ANALYSIS IMPACTS AT UPPER BUFFALO WA

Table 4-4 summarizes the modeled peak, 24-hour average visibility impacts at the Upper Buffalo WA attributable to ConocoPhillips' Borger Refinery. This table summarizes the results calculated by using the methods described in Modeling Protocol for representing annual average natural background conditions. Results are presented in terms of the maximum visibility impact and the day at which the maximum visibility impact occurred.

TABLE 4-4. PEAK 24-HOUR AVERAGE VISIBILITY IMPACTS AT UPPER BUFFALO WA

Year	Maximum Modeled Impact (Δdv)	Julian Day For Maximum Impact
2001	0.062	4
2002	0.033	362
2003	0.021	14

The results presented in Table 4-4 indicate that refined analyses were not necessary to evaluate visibility impacts at Upper Buffalo WA since the screening analysis impacts, based on annual average natural background conditions, are below the impact contribution threshold of 0.5 dv.

4.5 SCREENING ANALYSIS IMPACTS AT WICHITA MOUNTAINS WA

Table 4-5 summarizes the modeled peak, 24-hour average visibility impacts at the Wichita Mountains WA attributable to ConocoPhillips' Borger Refinery. This table summarizes the results calculated by using the methods described in Modeling Protocol for representing annual average natural background conditions. Results are presented in terms of the maximum visibility impact and the day at which the maximum visibility impact occurred.

TABLE 4-5. PEAK 24-HOUR AVERAGE VISIBILITY IMPACTS AT WICHITA MOUNTAINS WA

Year	Maximum Modeled Impact (Δdv)	Julian Day For Maximum Impact
2001	0.121	335
2002	0.189	361
2003	0.080	21

The results presented in Table 4-5 indicate that refined analyses were not necessary to evaluate visibility impacts at Wichita Mountains WA since the screening analysis impacts, based on annual average natural background conditions, are below the impact contribution threshold of 0.5 dv.

4.6 SUMMARY OF SCREENING ANALYSES

Because screening analyses of visibility impacts to ConocoPhillips' Borger Refinery indicated peak 24-hour average impacts are below the 0.5 dv contribution threshold at all Class I areas evaluated, no further BART analysis was required.

5. CONCLUSIONS

Using analysis methods prescribed by the U.S. EPA, CENRAP, and TCEQ, ConocoPhillips conducted BART Applicability Analyses of emissions of visibility-affecting pollutants from BART-eligible emission units at the Borger Refinery. The results of this analysis indicate that ConocoPhillips is not subject to BART; hence, the site is not required to conduct a BART Determination, because the BART-eligible sources do not contribute to visibility impairment at the Caney Creek WA, Hercules Glades WA, Mingo WA, Upper Buffalo WA, and Wichita Mountains WA, as demonstrated by a screening modeling analysis that quantified the maximum 24-hour average visibility impact as being less than the 0.5 dv contribution threshold. Upon review of this BART Applicability Analysis, TCEQ is expected to confirm ConocoPhillips' determination that BART does not apply.

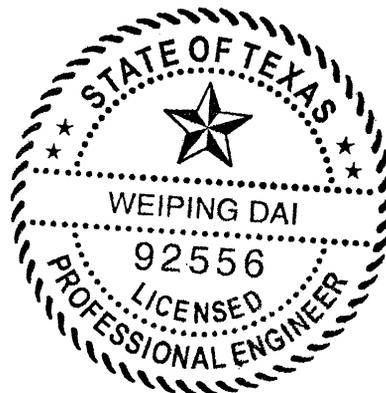
ConocoPhillips reserves the right to revise the applicability analyses and determinations described in this report if new methods are approved for regulatory use by the U.S. EPA and TCEQ.

6. PROFESSIONAL ENGINEER SEAL

PROFESSIONAL ENGINEER SEAL

To the best of my knowledge, the representations made in this modeling demonstration document are true and accurate. The emission source data used in the analysis was provided by the client or determined from the client-provided data. By affixing my seal below, I submit that the engineering work and calculations performed in this application were either performed by myself or under my direct supervision, as defined in Section 131.81 of the Texas Engineering Practice Act.

Place P.E. Seal below this line



Weiping Dai
Signature

04/26/2007
Date

Weiping Dai, Managing Consultant, Trinity Consultants
Printed Name, Title, and Affiliation

**BART SCREEN MODELING PROTOCOL
Submitted to TCEQ on April 20, 2007**

SCREENING CALPUFF BART MODELING PROTOCOL
CONOCOPHILLIPS ▪ BORGER REFINERY

TCEQ REGULATED ENTITY NUMBER: RN102495884
TCEQ CUSTOMER REFERENCE NUMBER: CN601674351

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April 2007

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1. INTRODUCTION

ConocoPhillips operates the Borger Refinery in Borger, Texas. The ConocoPhillips Borger Refinery is considered eligible to be regulated under the U.S. Environmental Protection Agency's (EPA) Best Available Retrofit Technology (BART) provisions of the Regional Haze Rule. This protocol describes the proposed methodology for the Screening CALPUFF BART exemption modeling analysis for the Borger Refinery.

1.1 BEST AVAILABLE RETROFIT TECHNOLOGY RULE BACKGROUND

On July 1, 1999, the U.S. EPA published a final rule regarding Regional Haze Regulations and BART Determinations, known as the Regional Haze Rule (RHR). The objective of the RHR is to improve visibility in 156 specific areas across the United States, known as Class I areas. The Clean Air Act defines Class I areas as certain national parks (over 6000 acres), wilderness areas (over 5000 acres), national memorial parks (over 5000 acres), and international parks that were in existence prior to August 7, 1977.

On July 6, 2005, the EPA published amendments to its 1999 RHR to include guidance for making source-specific Best Available Retrofit Technology (BART) determinations. The BART rule defines BART-eligible sources as sources that meet the following criteria:

- (1) Have potential emissions of at least 250 tons per year of a visibility-impairing pollutant,
- (2) Began operation between August 7, 1962 and August 7, 1977, and
- (3) Are listed in one of the 26 source categories in the guidance.

BART-eligible sources are subject-to-BART if the sources are "reasonably anticipated to cause or contribute to visibility impairment in any federal mandatory Class I area." EPA has determined that sources are reasonably anticipated to cause or contribute to visibility impairment if the visibility impacts from a source are greater than 0.5 deciviews (dv) when compared against a natural background. States have the authority to exempt certain BART-eligible sources from installing BART controls if the results of the dispersion modeling demonstrate that the source cannot reasonably be anticipated to cause or contribute to visibility impairment in a Class I area.

1.2 MODELING PROTOCOL BACKGROUND

To promote consistency between sources in conducting modeling related to BART, TCEQ published a BART modeling protocol (January 2007). TCEQ has indicated that all facilities may use the protocol to determine if their site-specific sources are subject to BART. The modeling methods established by the TCEQ in the BART modeling protocol are based on the use of a CALMET meteorological data set developed under "no-obs" mode by CENRAP. In other words, this data set incorporated only mesoscale meteorological data (i.e., MM5 data for 2001, 2002, and 2003) and did not incorporate surface, upper air, precipitation or over water station observation data.

The Federal Land Managers (FLMs) commented that observations should be used in refined CALPUFF modeling. Thus, TCEQ indicated in their protocol that modeling using the CENRAP data set is considered screen modeling, and that sources may use observational data if they wish to conduct a more refined modeling analysis. It is ConocoPhillips' intent to conduct a Screen CALPUFF modeling analysis to evaluate the applicability of BART to the Borger Refinery.

1.3 OBJECTIVE

The objective of this document is to provide a protocol summarizing the modeling methods and procedures that will be followed in the Screening CALPUFF analysis for the ConocoPhillips Refinery in Borger, Texas. If the highest deciview value predicted by the SCREEN analysis is above EPA's recommended visibility contribution threshold of 0.5 Δ dv, ConocoPhillips will consider using the refined CALPUFF modeling for further analysis.

1.4 LOCATION OF SOURCES AND RELEVANT CLASS I AREAS

The sources listed in Table 1-1 are the sources that have been identified by ConocoPhillips as sources that meet the three criteria for BART-eligible sources.

TABLE 1-1 LIST OF ALL SOURCES IN BART-ELIGIBLE SOURCE GROUP

EPN	Source Description
10H1	Crude Oil Heater
11H1	Ethane Unit Superheater
19H3	19.1 Naphtha HDS Charge Heater
19H4	19.3 Charge Furnace
19H5	19.1 No. 1 and 2 Reboiler
19H6	19.2 Platformer Reheater No. 1
28H1	Unit 28 Charge Heater
34I1	SRU Incinerator
36H1	HDS Unit Charge Heater
40H2	Unit 40 Superheater No.1
55E1	Engine
55E2	Engine
55E3	Engine
9H1	Crude Oil Heater
66FL6	H ₂ S Emergency Flare

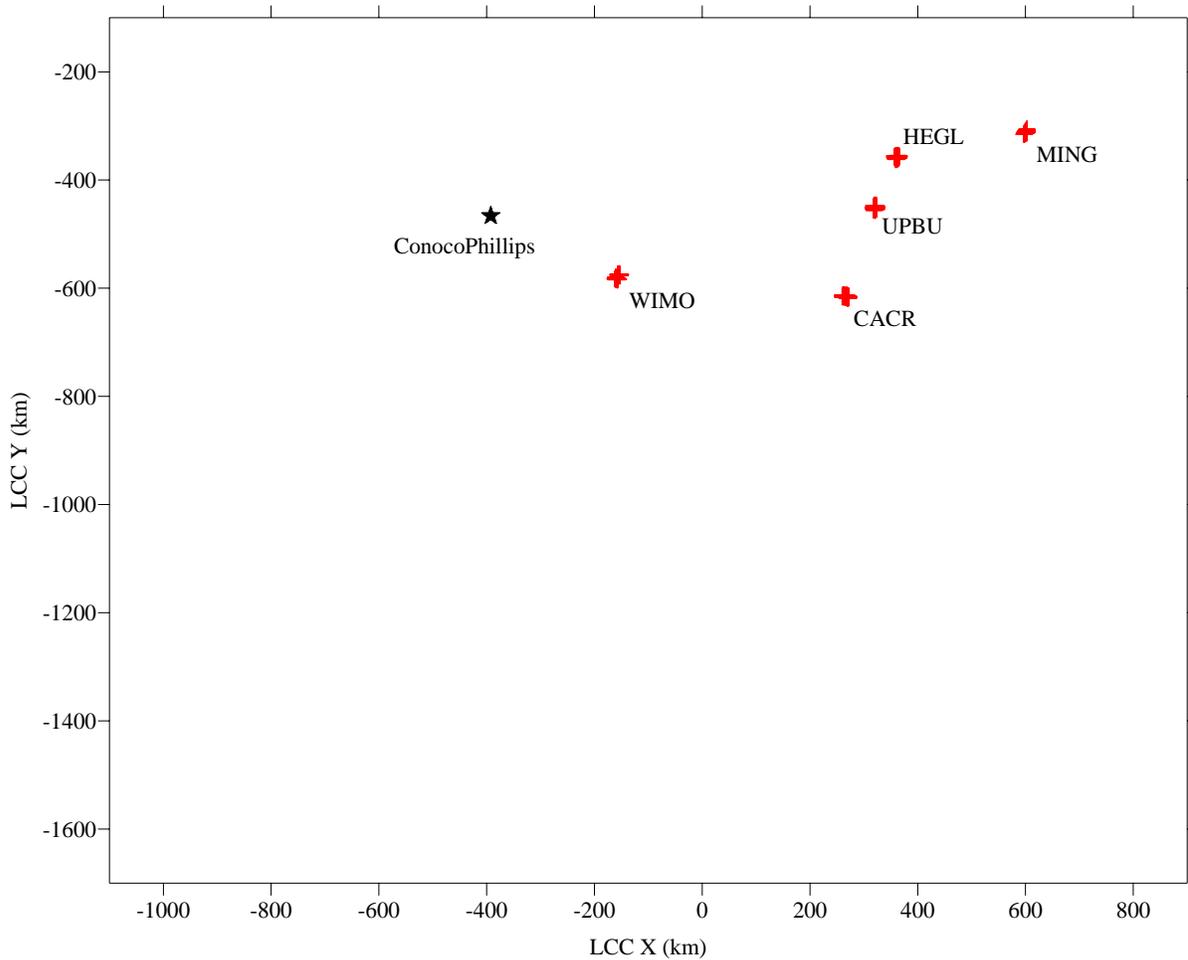
TCEQ provided a list of Class I areas that each facility is required to model in the BART modeling analysis. The required Class I areas for the ConocoPhillips Borger Refinery and the distance to these areas from the plant are provided in Table 1-2. Note that the distances listed in Table 1-2 are the distances between the plant and the closest border of the Class I areas.

TABLE 1-2. DISTANCE FROM BORGER REFINERY TO SURROUNDING CLASS I AREAS

Class I Area	Symbol	Distance (km)
Caney Creek (AR)	CACR	648
Hercules-Glades Wilderness (MO)	HEGL	743
Mingo Wilderness Area (MO)	MING	986
Upper Buffalo Wilderness Area (MO)	UPBU	703
Wichita Mountains (OK)	WIMO	253

A plot of the Class I areas with respect to the Borger Refinery is provided in Figure 1-1.

FIGURE 1-1. PLOT OF CLASS I AREAS REQUIRED BY TCEQ TO BE EVALUATED IN THE BART ANALYSIS



2. CALPUFF MODEL SYSTEM

As recommended by the U.S. EPA BART guidelines, the CALPUFF modeling system will be used to compute the 24-hour average visibility impairment attributable to ConocoPhillips' Borger Refinery to assess whether the 0.5 dv contribution threshold is exceeded, and if so, the frequency, duration, and magnitude of any exceedance events. CALPUFF is a sophisticated air quality modeling system that is capable of simulating the dispersion, chemical transformation, and long-range transport of multiple visibility-affecting pollutants and is therefore preferred for the BART applicability and determination analyses. The CALPUFF modeling system is described in technical detail in the *TCEQ BART Modeling Protocol (January 2007)*.

2.1 MODELING PROGRAM VERSIONS

The versions of the CALPUFF modeling system programs that are proposed for the ConocoPhillips Screening BART modeling analysis are listed in Table 2-1.

TABLE 2-1. CALPUFF MODELING SYSTEM VERSIONS

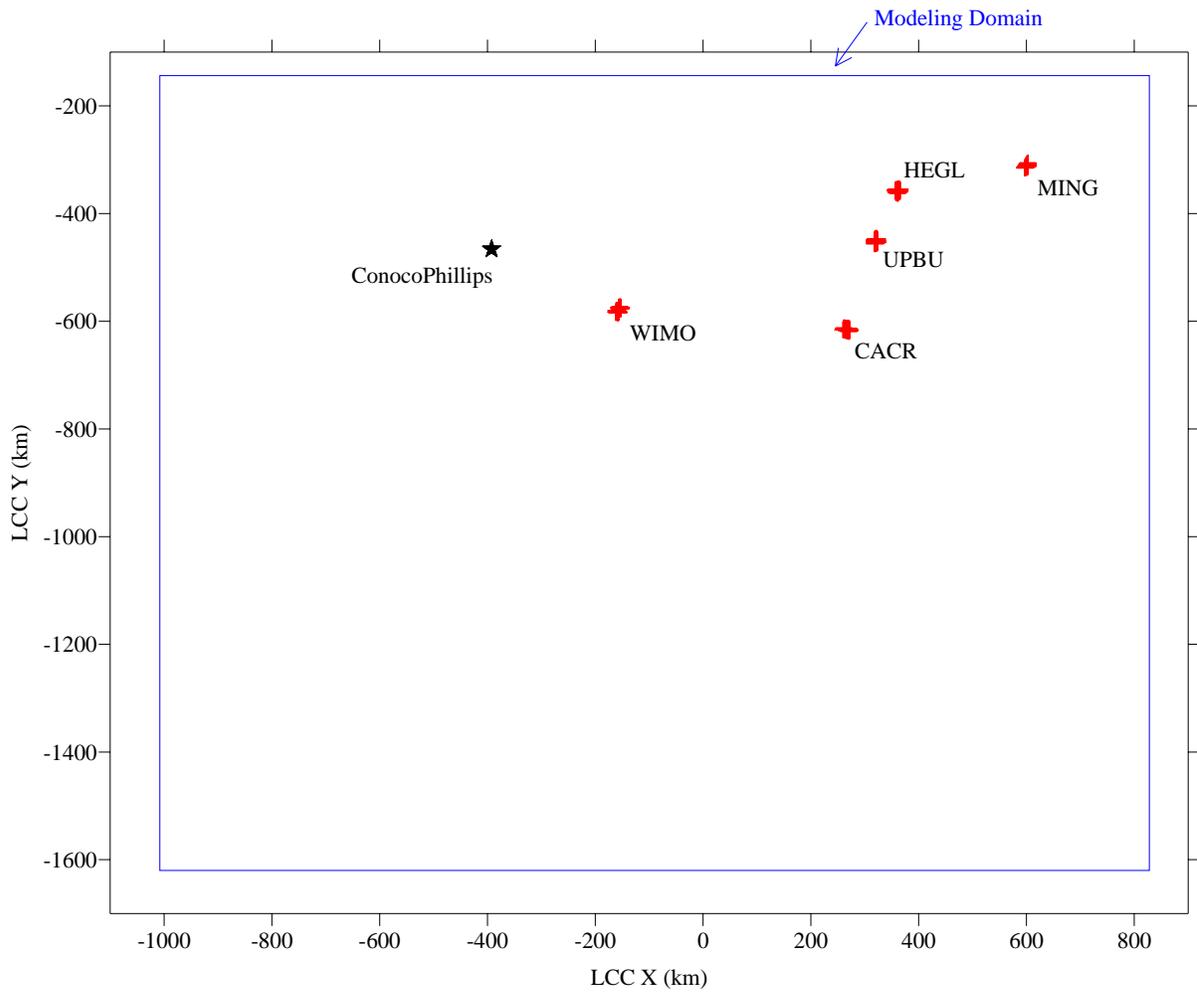
Processor	Description	Version	Level
CALMET	Meteorological data processor used by CENRAP	5.53a	040716
CALPUFF	Plume dispersion model	5.711a	040716
POSTUTIL	Post-processing utility to adjust the partition of HNO ₃ /NH ₄ NO ₃ species with the Ammonia Limiting Method	1.3	030402
CALPOST	Post-processing utility for visibility impact	5.51	030709

2.2 MODELING DOMAIN

The proposed modeling domain for ConocoPhillips' BART modeling analysis is the same as the domain used in the CENRAP meteorological data. The map projection for the modeling domain is in Lambert Conformal Conic (LCC) and the datum will be World Geodetic System 84 (WGS-84). The reference point for the modeling domain is Latitude 40°N, Longitude 97°W (LCC point 0, 0). The meteorological grid spacing will be 6 km, resulting in 306 grid points in the X direction and 246 grid points in the Y direction.

A plot of the proposed modeling domain with respect to the Class I areas being modeled is provided in Figure 2-1. Note that the modeling domain extends at least 50 km in all directions beyond the ConocoPhillips Borger Refinery and the Class I areas of interest.

FIGURE 2-1. CENRAP CALPUFF MODELING DOMAIN



3. CALMET

The CENRAP CALMET meteorological data will be used for the Screening CALPUFF BART modeling analysis. The CENRAP data takes into account geophysical data, including terrain and land use, and Mesoscale Model Meteorological data. CENRAP developed three 6-km CALMET meteorological datasets for three years (2001-2003) to span across all potential BART eligible sources within the southern CENRAP states. USGS 90-meter Digital Elevation Model (DEM) files were used by CENRAP to generate the terrain data at 6-km resolution for input to the southern sub-regional CALMET run. Likewise, USGS 90-meter Composite Theme Grid (CTG) files were used by CENRAP to generate the land use data at 6-km resolution for input to the CALMET run.

It is intended that all of the screening modeling for the ConocoPhillips' Borger Refinery will use the 6-km CENRAP CALMET data. However, if refined CALPUFF modeling is necessary, the meteorological data sets will be updated. The potential refinements to the meteorological data set may include the use of surface/upper air/precipitation observations in conjunction with the MM5 data, a finer grid resolution, and other relevant settings.

The CALPUFF model uses the meteorological data from CALMET together with the emission source, receptor, and chemical reaction information to predict hourly concentrations of modeled species. Trinity will conduct a three-year CALPUFF analysis using data and model settings as described below.

4.1 EMISSION SOURCE DATA

Trinity will include emissions of SO₂, NO_x, and/or PM₁₀ from 15 BART-eligible sources at ConocoPhillips' Borger Refinery. Per TCEQ Guidance, the actual maximum 24-hour average pound per hour (lb/hr) emission rates of NO_x, SO₂, and PM from the period of 2002 through 2005 will be used in the BART determination screening modeling.

4.2 RECEPTOR LOCATIONS

The National Park Service (NPS) has electronic files available on their website that include the discrete locations and elevations of receptors to be evaluated for each Class I area. This receptor information will be incorporated into the CALPUFF model.

4.3 BACKGROUND OZONE AND AMMONIA

Background ozone concentrations are required in order to model the photochemical conversion of SO₂ and NO_x to sulfates (SO₄) and nitrates (NO₃). CALPUFF can use either a single background value representative of an area or hourly ozone data from one or more ozone monitoring stations. Hourly ozone data files provided by the TCEQ will be used in the CALPUFF simulation. In addition, the monthly value will be set to 40 ppb. This value will only be used by the model if there are missing hourly ozone records. Background concentrations for ammonia will be assumed to be temporally and spatially invariant and will be set to 3 ppb.

4.4 CALPUFF MODEL CONTROL PARAMETERS

Appendix A provides a sample CALPUFF input file that will be used in ConocoPhillips' modeling analysis.

Hourly concentration outputs from CALPUFF will be processed through POSTUTIL and CALPOST to determine visibility conditions. A three-year CALPOST analysis will be conducted to determine the visibility change in deciview (dv) caused by the ConocoPhillips' BART-eligible sources when compared to a natural background.

5.1 POSTUTIL PROCESSING METHOD

In the postprocessing of CALPUFF-computed concentrations of visibility-affecting pollutants, the POSTUTIL postprocessing utility will be used to apply the ammonia limiting method (ALM) by re-partitioning the distribution of HNO₃ and NO₃ concentrations at each Class I area as a function of the temperature and relative humidity during each hour. A sample POSTUTIL input file is provided in Appendix B.

5.2 LIGHT EXTINCTION ALGORITHM

The EPA currently approved algorithm will be used for reconstructing light extinction. The light extinction equation is provided below.

$$b_{\text{ext}} = 3 * f(\text{RH}) * [(\text{NH}_4)_2\text{SO}_4] + 3 * f(\text{RH}) * [\text{NH}_4\text{NO}_3] + 4 * [\text{OC}] + 1 * [\text{PM}_f] \\ + 0.6 * [\text{PM}_c] + 10 * [\text{EC}] + b_{\text{Ray}}$$

The algorithm will be used to calculate the daily light extinction attributable to ConocoPhillips' BART-eligible sources and light extinction attributable to a natural background. The change in deciviews based on the source and background light extinction will be evaluated using the equation below.

$$\Delta \text{dv} = 10 * \ln \left[\frac{b_{\text{ext, background}} + b_{\text{ext, source}}}{b_{\text{ext, background}}} \right]$$

5.3 CALPOST PROCESSING METHOD

The CALPOST Method 6 option, which calculates hourly light extinction impacts for the source and background using monthly average relative humidity adjustment factors, will be used in the Screening CALPUFF analysis. Monthly Class I area-specific relative humidity adjustment factors based on the centroid of the Class I areas as included in Table A-3 of EPA's *Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Program* will be employed. Each hour's source-caused extinction is calculated by first using the hygroscopic components of the source-caused concentrations, due to ammonium sulfate and nitrate, and monthly Class I area-specific relative humidity values. The contribution to the total source-caused extinction from ammonium sulfate and nitrate is then added to the other, non-hygroscopic components of the particulate concentration (from

coarse and fine soil, secondary organic aerosols, and from elemental carbon) to yield the total hourly source-caused extinction. The relative humidity factors for the Class I areas listed to be evaluated in the analysis are provided in Table 5-1.

TABLE 5-1. MONTHLY HUMIDITY FACTORS

Class I Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Caney Creek	3.4	3.1	2.9	3.0	3.6	3.6	3.4	3.4	3.6	3.5	3.4	3.5
Hercules-Glades	3.2	2.9	2.7	2.7	3.3	3.3	3.3	3.3	3.4	3.1	3.1	3.3
Mingo	3.3	3.0	2.8	2.6	3.0	3.2	3.3	3.5	3.5	3.1	3.1	3.3
Upper Buffalo	3.3	3.0	2.7	2.8	3.4	3.4	3.4	3.4	3.6	3.3	3.2	3.3
Wichita Mountains	2.7	2.6	2.4	2.4	3.0	2.7	2.3	2.5	2.9	2.6	2.7	2.8

5.4 NATURAL BACKGROUND

The EPA default average annual aerosol concentrations for the U.S. that are included in Table 2-1 of EPA's *Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Program* will be used in CALPOST. These values are also listed in the TCEQ BART Modeling Protocol Table 5. The annual average concentrations are provided in Table 5-2.

TABLE 5-2. DEFAULT AVERAGE ANNUAL NATURAL BACKGROUND LEVELS

Class I Area	Region	SO ₄	NO ₃	OC	EC	Soil	Coarse Mass
Caney Creek	EAST	0.23	0.10	1.40	0.02	0.50	3.00
Hercules-Glades	EAST	0.23	0.10	1.40	0.02	0.50	3.00
Mingo	EAST	0.23	0.10	1.40	0.02	0.50	3.00
Upper Buffalo	EAST	0.23	0.10	1.40	0.02	0.50	3.00
Wichita Mountains	WEST	0.12	0.10	0.47	0.02	0.50	3.00

5.5 EVALUATING BART-EXEMPTION

The highest deciview value output by CALPOST from 2001 through 2003 will be compared to the contribution threshold of 0.5 Δ dv. If the highest daily Δ dv value output by CALPOST for each year (2001-2003) is less 0.5 Δ dv, it will be concluded that the sources are exempt from BART and that no further analysis is necessary. If the highest daily Δ dv value output by CALPOST for any 1-year is greater than 0.5 Δ dv, it will be concluded that further analysis is necessary.

5.6 SUMMARY OF CALPOST CONTROL PARAMETERS

Appendix C provides a sample CALPOST input file that Trinity proposes to use in ConocoPhillips' modeling analysis.

SAMPLE CALPUFF CONTROL FILE

Conoco Phillips BART Screening Analysis
2001 with Ozone Files

----- Run title (3 lines)

CALPUFF MODEL CONTROL FILE

INPUT GROUP: 0 -- Input and Output File Names

Default Name Type File Name

CALMET.DAT input * METDAT = *
 or
ISCMET.DAT input * ISCDAT = *
 or
PLMMET.DAT input * PLMDAT = *
 or
PROFILE.DAT input * PRFDAT = *
SURFACE.DAT input * SFCDAT = *
RESTARTB.DAT input * RSTARTB= *

CALPUFF.LST output ! PUFLST =01PFC1V.LST !
CONC.DAT output ! CONDAT =01PFC1V.DAT !
DFLX.DAT output * DFDAT = *
WFLX.DAT output * WFDAT = *

VISB.DAT output ! VISDAT =01PFC1V.VIS !
RESTARTE.DAT output * RSTARTE= *

Emission Files

PTEMARB.DAT input * PTDAT = *
VOLEMARB.DAT input * VOLDAT = *
BAEMARB.DAT input * ARDAT = *
LNEMARB.DAT input * LNDAT = *

Other Files

OZONE.DAT input ! OZDAT = ozone_2001.dat!
VD.DAT input * VDDAT = *
CHEM.DAT input * CHEMDAT= *
H2O2.DAT input * H2O2DAT= *
HILL.DAT input * HILDAT= *
HILLRCT.DAT input * RCTDAT= *
COASTLN.DAT input * CSTDAT= *
FLUXBDY.DAT input * BDYDAT= *
BCON.DAT input * BCNDAT= *
DEBUG.DAT output * DEBUG = *
MASSFLX.DAT output * FLXDAT= *
MASSBAL.DAT output * BALDAT= *
FOG.DAT output * FOGDAT= *

 All file names will be converted to lower case if LCFILES = T
 Otherwise, if LCFILES = F, file names will be converted to UPPER CASE
 T = lower case ! LCFILES = F !
 F = UPPER CASE

NOTE: (1) file/path names can be up to 70 characters in length

Provision for multiple input files

```

    Number of CALMET.DAT files for run (NMETDAT)
                                Default: 1      ! NMETDAT = 36
!
    Number of PTEMARB.DAT files for run (NPTDAT)
                                Default: 0      ! NPTDAT = 0  !
    Number of BAEMARB.DAT files for run (NARDAT)
                                Default: 0      ! NARDAT = 0  !
    Number of VOLEMARB.DAT files for run (NVOLDAT)
                                Default: 0      ! NVOLDAT = 0  !
  
```

!END!

 Subgroup (0a)

The following CALMET.DAT filenames are processed in sequence if
 NMETDAT>1

Default Name	Type	File Name
none	input	! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0101-0110.SOUTH.DAT		! !END!
none	input	! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0111-0120.SOUTH.DAT		! !END!
none	input	! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0121-0131.SOUTH.DAT		! !END!
none	input	! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0201-0210.SOUTH.DAT		! !END!
none	input	! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0211-0220.SOUTH.DAT		! !END!
none	input	! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0221-0228.SOUTH.DAT		! !END!
none	input	! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0301-0310.SOUTH.DAT		! !END!
none	input	! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0311-0320.SOUTH.DAT		! !END!
none	input	! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0321-0331.SOUTH.DAT		! !END!
none	input	! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0401-0410.SOUTH.DAT		! !END!
none	input	! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0411-0420.SOUTH.DAT		! !END!
none	input	! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0421-0430.SOUTH.DAT		! !END!

```

none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0501-0510.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0511-0520.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0521-0531.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0601-0610.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0611-0620.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0621-0630.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0701-0710.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0711-0720.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0721-0731.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0801-0810.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0811-0820.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0821-0831.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0901-0910.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0911-0920.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.0921-0930.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.1001-1010.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.1011-1020.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.1021-1031.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.1101-1110.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.1111-1120.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.1121-1130.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.1201-1210.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.1211-1220.SOUTH.DAT      ! !END!
none      input      ! METDAT=Z:\CENRAP\CALMET.6KM.SOUTH\2001
\CMET.2001.1221-1231.SOUTH.DAT      ! !END!

```


INPUT GROUP: 1 -- General run control parameters

Option to run all periods found
in the met. file (METRUN) Default: 0 ! METRUN = 0 !

METRUN = 0 - Run period explicitly defined below

METRUN = 1 - Run all periods in met. file

Starting date: Year (IBYR) -- No default ! IBYR = 2001 !
(used only if Month (IBMO) -- No default ! IBMO = 1 !
METRUN = 0) Day (IBDY) -- No default ! IDBY = 1 !
Hour (IBHR) -- No default ! IBHR = 0 !

Base time zone (XBTZ) -- No default ! XBTZ = 0.0 !
PST = 8., MST = 7.
CST = 6., EST = 5.

Length of run (hours) (IRLG) -- No default ! IRLG = 8760 !

Number of chemical species (NSPEC)
Default: 5 ! NSPEC = 6 !

Number of chemical species
to be emitted (NSE) Default: 3 ! NSE = 3 !

Flag to stop run after
SETUP phase (ITEST) Default: 2 ! ITEST = 2 !
(Used to allow checking
of the model inputs, files, etc.)
ITEST = 1 - STOPS program after SETUP phase
ITEST = 2 - Continues with execution of program
after SETUP

Restart Configuration:

Control flag (MRESTART) Default: 0 ! MRESTART = 0

!

0 = Do not read or write a restart file
1 = Read a restart file at the beginning of
the run
2 = Write a restart file during run
3 = Read a restart file at beginning of run
and write a restart file during run

Number of periods in Restart
output cycle (NRESPD) Default: 0 ! NRESPD = 0 !

0 = File written only at last period
>0 = File updated every NRESPD periods

Meteorological Data Format (METFM)
Default: 1 ! METFM = 1 !

METFM = 1 - CALMET binary file (CALMET.MET)
METFM = 2 - ISC ASCII file (ISCMET.MET)
METFM = 3 - AUSPLUME ASCII file (PLMMET.MET)
METFM = 4 - CTDM plus tower file (PROFILE.DAT) and
surface parameters file (SURFACE.DAT)

PG sigma-y is adjusted by the factor (AVET/PGTIME)**0.2
Averaging Time (minutes) (AVET) Default: 60.0 ! AVET = 60. !

PG Averaging Time (minutes) (PGTIME)
Default: 60.0 ! PGTIME = 60. !


```

Puff splitting allowed? (MSPLIT)          Default: 0      ! MSPLIT = 0
!
  0 = no (i.e., puffs not split)
  1 = yes (i.e., puffs are split)

Chemical mechanism flag (MCHEM)          Default: 1      ! MCHEM = 1
!
  0 = chemical transformation not
      modeled
  1 = transformation rates computed
      internally (MESOPUFF II scheme)
  2 = user-specified transformation
      rates used
  3 = transformation rates computed
      internally (RIVAD/ARM3 scheme)
  4 = secondary organic aerosol formation
      computed (MESOPUFF II scheme for OH)

Aqueous phase transformation flag (MAQCHEM)
(Used only if MCHEM = 1, or 3)          Default: 0      ! MAQCHEM = 0
!
  0 = aqueous phase transformation
      not modeled
  1 = transformation rates adjusted
      for aqueous phase reactions

Wet removal modeled ? (MWET)            Default: 1      ! MWET = 1
!
  0 = no
  1 = yes

Dry deposition modeled ? (MDRY)          Default: 1      ! MDRY = 1
!
  0 = no
  1 = yes
      (dry deposition method specified
       for each species in Input Group 3)

Method used to compute dispersion
coefficients (MDISP)                    Default: 3      ! MDISP = 3
!
  1 = dispersion coefficients computed from measured values
      of turbulence, sigma v, sigma w
  2 = dispersion coefficients from internally calculated
      sigma v, sigma w using micrometeorological variables
      (u*, w*, L, etc.)
  3 = PG dispersion coefficients for RURAL areas (computed using
      the ISCST multi-segment approximation) and MP coefficients
in
      urban areas
  4 = same as 3 except PG coefficients computed using
      the MESOPUFF II eqns.
  5 = CTDM sigmas used for stable and neutral conditions.
      For unstable conditions, sigmas are computed as in
      MDISP = 3, described above. MDISP = 5 assumes that
      measured values are read

Sigma-v/sigma-theta, sigma-w measurements used? (MTURBVW)
(Used only if MDISP = 1 or 5)          Default: 3      ! MTURBVW = 3

```

```

!
    1 = use sigma-v or sigma-theta measurements
        from PROFILE.DAT to compute sigma-y
        (valid for METFM = 1, 2, 3, 4)
    2 = use sigma-w measurements
        from PROFILE.DAT to compute sigma-z
        (valid for METFM = 1, 2, 3, 4)
    3 = use both sigma-(v/theta) and sigma-w
        from PROFILE.DAT to compute sigma-y and sigma-z
        (valid for METFM = 1, 2, 3, 4)
    4 = use sigma-theta measurements
        from PLMMET.DAT to compute sigma-y
        (valid only if METFM = 3)

Back-up method used to compute dispersion
when measured turbulence data are
missing (MDISP2)                Default: 3      ! MDISP2 = 3
!
    (used only if MDISP = 1 or 5)
    2 = dispersion coefficients from internally calculated
        sigma v, sigma w using micrometeorological variables
        (u*, w*, L, etc.)
    3 = PG dispersion coefficients for RURAL areas (computed using
        the ISCST multi-segment approximation) and MP coefficients
in
        urban areas
    4 = same as 3 except PG coefficients computed using
        the MESOPUFF II eqns.

PG sigma-y,z adj. for roughness?    Default: 0      ! MROUGH = 0
!
    (MROUGH)
    0 = no
    1 = yes

Partial plume penetration of        Default: 1      ! MPARTL = 1
!
elevated inversion?
(MPARTL)
    0 = no
    1 = yes

Strength of temperature inversion    Default: 0      ! MTINV = 0
!
provided in PROFILE.DAT extended records?
(MTINV)
    0 = no (computed from measured/default gradients)
    1 = yes

PDF used for dispersion under convective conditions?
                                Default: 0      ! MPDF = 0 !
(MPDF)
    0 = no
    1 = yes

Sub-Grid TIBL module used for shore line?
                                Default: 0      ! MSGTIBL = 0
!
(MSGTIBL)
    0 = no

```

1 = yes

Boundary conditions (concentration) modeled?

Default: 0 ! MBCON = 0 !

(MBCON)

0 = no

1 = yes, using formatted BCON.DAT file

2 = yes, using unformatted CONC.DAT file

Analyses of fogging and icing impacts due to emissions from arrays of mechanically-forced cooling towers can be performed using CALPUFF in conjunction with a cooling tower emissions processor (CTEMISS) and its associated postprocessors. Hourly emissions of water vapor and temperature from each cooling tower cell are computed for the current cell configuration and ambient conditions by CTEMISS. CALPUFF models the dispersion of these emissions and provides cloud information in a specialized format for further analysis. Output to FOG.DAT is provided in either 'plume mode' or 'receptor mode' format.

Configure for FOG Model output?

Default: 0 ! MFOG = 0

!

(MFOG)

0 = no

1 = yes - report results in PLUME Mode format

2 = yes - report results in RECEPTOR Mode format

Test options specified to see if they conform to regulatory

values? (MREG)

Default: 1 ! MREG = 1

!

0 = NO checks are made

1 = Technical options must conform to USEPA

Long Range Transport (LRT) guidance

METFM 1 or 2

AVET 60. (min)

PGTIME 60. (min)

MGAUSS 1

MCTADJ 3

MTRANS 1

MTIP 1

MCHEM 1 or 3 (if modeling SOx, NOx)

MWET 1

MDRY 1

MDISP 2 or 3

MPDF 0 if MDISP=3

1 if MDISP=2

MROUGH 0

MPARTL 1

SYTDEP 550. (m)

MHFTSZ 0

!END!

INPUT GROUP: 3a, 3b -- Species list

Subgroup (3a)

The following species are modeled:

```
! CSPEC =          SO2 !          !END!  
! CSPEC =          SO4 !          !END!  
! CSPEC =          NOX !          !END!  
! CSPEC =          HNO3 !         !END!  
! CSPEC =          NO3 !          !END!  
! CSPEC =          PM10 !         !END!
```

OUTPUT GROUP SPECIES NUMBER NAME (0=NONE, (Limit: 12 1=1st CGRUP, Characters 2=2nd CGRUP, in length) 3= etc.)	MODELED (0=NO, 1=YES)	EMITTED (0=NO, 1=YES)	Dry DEPOSITED (0=NO, 1=COMPUTED-GAS 2=COMPUTED-PARTICLE 3=USER-SPECIFIED)
! SO2 =	1,	1,	1,
0 !			
! SO4 =	1,	0,	2,
0 !			
! NOX =	1,	1,	1,
0 !			
! HNO3 =	1,	0,	1,
0 !			
! NO3 =	1,	0,	2,
0 !			
! PM10 =	1,	1,	2,
0 !			

!END!

Subgroup (3b)

The following names are used for Species-Groups in which results for certain species are combined (added) prior to output. The CGRUP name will be used as the species name in output files. Use this feature to model specific particle-size distributions by treating each size-range as a separate species. Order must be consistent with 3(a) above.

INPUT GROUP: 4 -- Map Projection and Grid control parameters

Projection for all (X,Y):

Map projection

(PMAP) Default: UTM ! PMAP = LCC !

UTM : Universal Transverse Mercator
TTM : Tangential Transverse Mercator
LCC : Lambert Conformal Conic
PS : Polar Stereographic
EM : Equatorial Mercator
LAZA : Lambert Azimuthal Equal Area

False Easting and Northing (km) at the projection origin

(Used only if PMAP= TTM, LCC, or LAZA)

(FEAST) Default=0.0 ! FEAST = 0.000 !

(FNORTH) Default=0.0 ! FNORTH = 0.000 !

UTM zone (1 to 60)

(Used only if PMAP=UTM)

(IUTMZN) No Default ! IUTMZN = 0 !

Hemisphere for UTM projection?

(Used only if PMAP=UTM)

(UTMHEM) Default: N ! UTMHEM = N !

N : Northern hemisphere projection

S : Southern hemisphere projection

Latitude and Longitude (decimal degrees) of projection origin

(Used only if PMAP= TTM, LCC, PS, EM, or LAZA)

(RLAT0) No Default ! RLAT0 = 40N !

(RLON0) No Default ! RLON0 = 97W !

TTM : RLON0 identifies central (true N/S) meridian of
projection

RLAT0 selected for convenience

LCC : RLON0 identifies central (true N/S) meridian of
projection

RLAT0 selected for convenience

PS : RLON0 identifies central (grid N/S) meridian of
projection

RLAT0 selected for convenience

EM : RLON0 identifies central meridian of projection

RLAT0 is REPLACED by 0.0N (Equator)

LAZA: RLON0 identifies longitude of tangent-point of mapping
plane

RLAT0 identifies latitude of tangent-point of mapping
plane

Matching parallel(s) of latitude (decimal degrees) for projection

(Used only if PMAP= LCC or PS)

(XLAT1) No Default ! XLAT1 = 33N !

(XLAT2) No Default ! XLAT2 = 45N !

LCC : Projection cone slices through Earth's surface at XLAT1
and XLAT2
PS : Projection plane slices through Earth at XLAT1
(XLAT2 is not used)

Note: Latitudes and longitudes should be positive, and include a
letter N,S,E, or W indicating north or south latitude, and
east or west longitude. For example,
35.9 N Latitude = 35.9N
118.7 E Longitude = 118.7E

Datum-region

The Datum-Region for the coordinates is identified by a character
string. Many mapping products currently available use the model of
the Earth known as the World Geodetic System 1984 (WGS-G). Other
local models may be in use, and their selection in CALMET will make its
output consistent with local mapping products. The list of Datum-Regions
with official transformation parameters is provided by the National
Imagery and Mapping Agency (NIMA).

NIMA Datum - Regions(Examples)

WGS-G WGS-84 GRS 80 Spheroid, Global coverage (WGS84)
NAS-C NORTH AMERICAN 1927 Clarke 1866 Spheroid, MEAN FOR CONUS
(NAD27)
NWS-27 NWS 6370KM Radius, Sphere
NWS-84 NWS 6370KM Radius, Sphere
ESR-S ESRI REFERENCE 6371KM Radius, Sphere

Datum-region for output coordinates
(DATUM) Default: WGS-G ! DATUM = WGS-G !

METEOROLOGICAL Grid:

Rectangular grid defined for projection PMAP,
with X the Easting and Y the Northing coordinate

No. X grid cells (NX)	No default	! NX = 306 !
No. Y grid cells (NY)	No default	! NY = 246 !
No. vertical layers (NZ)	No default	! NZ = 10 !

Grid spacing (DGRIDKM)	No default	! DGRIDKM = 6. !
	Units: km	

Cell face heights (ZFACE(nz+1))	No defaults	
	Units: m	
! ZFACE = 0., 20., 40., 80., 160., 320., 640., 1200., 2000., 3000.,		

4000. !

Reference Coordinates
of SOUTHWEST corner of
grid cell(1, 1):

! X coordinate (XORIGKM) No default ! XORIGKM = -1008.
! Y coordinate (YORIGKM) No default ! YORIGKM = -1620.
! Units: km

COMPUTATIONAL Grid:

The computational grid is identical to or a subset of the MET.
grid.
The lower left (LL) corner of the computational grid is at grid
point
(IBCOMP, JBCOMP) of the MET. grid. The upper right (UR) corner of
the
computational grid is at grid point (IECOMP, JECOMP) of the MET.
grid.
The grid spacing of the computational grid is the same as the MET.
grid.

! X index of LL corner (IBCOMP) No default ! IBCOMP = 1
(1 <= IBCOMP <= NX)
! Y index of LL corner (JBCOMP) No default ! JBCOMP = 1
(1 <= JBCOMP <= NY)
306 ! X index of UR corner (IECOMP) No default ! IECOMP =
(1 <= IECOMP <= NX)
246 ! Y index of UR corner (JECOMP) No default ! JECOMP =
(1 <= JECOMP <= NY)

SAMPLING Grid (GRIDDED RECEPTORS):

The lower left (LL) corner of the sampling grid is at grid point
(IBSAMP, JBSAMP) of the MET. grid. The upper right (UR) corner of
the
sampling grid is at grid point (IESAMP, JESAMP) of the MET. grid.
The sampling grid must be identical to or a subset of the
computational
grid. It may be a nested grid inside the computational grid.
The grid spacing of the sampling grid is DGRIDKM/MESH DN.

Logical flag indicating if gridded
receptors are used (LSAMP) Default: T ! LSAMP = F !
(T=yes, F=no)


```

!      (IMFLX)                      Default: 0          ! IMFLX = 0
!
!      0 = no
!      1 = yes (FLUXBDY.DAT and MASSFLX.DAT filenames
!              are specified in Input Group 0)

```

```

Mass balance for each species
reported hourly?
!      (IMBAL)                      Default: 0          ! IMBAL = 0
!
!      0 = no
!      1 = yes (MASSBAL.DAT filename is
!              specified in Input Group 0)

```

LINE PRINTER OUTPUT OPTIONS:

```

!      Print concentrations (ICPRT)   Default: 0          ! ICPRT = 0
!
!      Print dry fluxes (IDPRT)      Default: 0          ! IDPRT = 0
!
!      Print wet fluxes (IWPRT)     Default: 0          ! IWPRT = 0
!
!      (0 = Do not print, 1 = Print)

```

```

!      Concentration print interval
!      (ICFRQ) in hours              Default: 1          ! ICFRQ = 1

```

```

!      Dry flux print interval
!      (IDFRQ) in hours              Default: 1          ! IDFRQ = 1

```

```

!      Wet flux print interval
!      (IWFRQ) in hours              Default: 1          ! IWFRQ = 1

```

```

!      Units for Line Printer Output
!      (IPRTU)                      Default: 1          ! IPRTU = 3

```

	for	for
	Concentration	Deposition
1 =	g/m**3	g/m**2/s
2 =	mg/m**3	mg/m**2/s
3 =	ug/m**3	ug/m**2/s
4 =	ng/m**3	ng/m**2/s
5 =	Odour Units	

```

!      Messages tracking progress of run
!      written to the screen ?
!      (IMESG)                      Default: 2          ! IMESG = 2
!
!      0 = no
!      1 = yes (advection step, puff ID)
!      2 = yes (YYYYJJJHH, # old puffs, # emitted puffs)

```

SPECIES (or GROUP for combined species) LIST FOR OUTPUT OPTIONS

```

----- WET FLUXES -----   ----- DRY FLUXES -----
----- MASS FLUX -----
SPECIES

```

/GROUP	PRINTED?	SAVED ON DISK?	PRINTED?	SAVED ON DISK?
PRINTED?	SAVED ON DISK?	SAVED ON DISK?	PRINTED?	SAVED ON DISK?
!	SO2 =	0,	1,	0,
0,	0,	0 !	0,	0,
!	SO4 =	0,	1,	0,
0,	0,	0 !	0,	0,
!	NOX =	0,	1,	0,
0,	0,	0 !	0,	0,
!	HNO3 =	0,	1,	0,
0,	0,	0 !	0,	0,
!	NO3 =	0,	1,	0,
0,	0,	0 !	0,	0,
!	PM10 =	0,	1,	0,
0,	0,	0 !	0,	0,

OPTIONS FOR PRINTING "DEBUG" QUANTITIES (much output)

= F !	Logical for debug output (LDEBUG)	Default: F	! LDEBUG
= 1 !	First puff to track (IPFDEB)	Default: 1	! IPFDEB
= 1 !	Number of puffs to track (NPFDEB)	Default: 1	! NPFDEB
1 !	Met. period to start output (NN1)	Default: 1	! NN1 =
10 !	Met. period to end output (NN2)	Default: 10	! NN2 =
!END!			

INPUT GROUP: 6a, 6b, & 6c -- Subgrid scale complex terrain inputs

Subgroup (6a)

0 !	Number of terrain features (NHILL)	Default: 0	! NHILL =
= 0 !	Number of special complex terrain receptors (NCTREC)	Default: 0	! NCTREC
Terrain and CTSG Receptor data for			

```

CTSG hills input in CTDM format ?
(MHILL)                               No Default      ! MHILL =
2  !
    1 = Hill and Receptor data created
      by CTDM processors & read from
      HILL.DAT and HILLRCT.DAT files
    2 = Hill data created by OPTHILL &
      input below in Subgroup (6b);
      Receptor data in Subgroup (6c)

Factor to convert horizontal dimensions Default: 1.0    ! XHILL2M
= 1. !
to meters (MHILL=1)

Factor to convert vertical dimensions  Default: 1.0    ! ZHILL2M
= 1. !
to meters (MHILL=1)

X-origin of CTDM system relative to    No Default      ! XCTDMKM
= 0.0E00 !
CALPUFF coordinate system, in Kilometers (MHILL=1)

Y-origin of CTDM system relative to    No Default      ! YCTDMKM
= 0.0E00 !
CALPUFF coordinate system, in Kilometers (MHILL=1)

! END !

```

Subgroup (6b)

1 **
HILL information

HILL EXPO 2 NO. (m)	XC SCALE 1 (km)	YC SCALE 2 (km)	THETAH AMAX1 (deg.) (m)	ZGRID AMAX2 (m)	RELIEF (m)	EXPO 1 (m)
----	----	----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----

Subgroup (6c)

COMPLEX TERRAIN RECEPTOR INFORMATION

XRCT (km)	YRCT (km)	ZRCT (m)	XHH
-----	-----	-----	-----

1

Description of Complex Terrain Variables:
XC, YC = Coordinates of center of hill
THETAH = Orientation of major axis of hill (clockwise from North)

ZGRID = Height of the 0 of the grid above mean sea level
 RELIEF = Height of the crest of the hill above the grid elevation
 EXPO 1 = Hill-shape exponent for the major axis
 EXPO 2 = Hill-shape exponent for the major axis
 SCALE 1 = Horizontal length scale along the major axis
 SCALE 2 = Horizontal length scale along the minor axis
 AMAX = Maximum allowed axis length for the major axis
 BMAX = Maximum allowed axis length for the major axis

XRCT, YRCT = Coordinates of the complex terrain receptors
 ZRCT = Height of the ground (MSL) at the complex terrain Receptor
 XHH = Hill number associated with each complex terrain receptor

(NOTE: MUST BE ENTERED AS A REAL NUMBER)

**

NOTE: DATA for each hill and CTSG receptor are treated as a separate input subgroup and therefore must end with an input group terminator.

 INPUT GROUP: 7 -- Chemical parameters for dry deposition of gases

SPECIES	DIFFUSIVITY	ALPHA STAR	REACTIVITY
MESOPHYLL RESISTANCE	HENRY'S LAW	COEFFICIENT	
NAME	(cm**2/s)		
(s/cm)	(dimensionless)		
-----	-----	-----	-----
! SO2 =	0.1509,	1000.,	8.,
0.,	0.04 !		
! NOX =	0.1656,	1.,	8.,
5.,	3.5 !		
! HNO3 =	0.1628,	1.,	18.,
0.,	0.00000008 !		

!END!

 INPUT GROUP: 8 -- Size parameters for dry deposition of particles

For SINGLE SPECIES, the mean and standard deviation are used to compute a deposition velocity for NINT (see group 9) size-ranges, and these are then averaged to obtain a mean deposition velocity.

For GROUPED SPECIES, the size distribution should be explicitly

specified (by the 'species' in the group), and the standard deviation for each should be entered as 0. The model will then use the deposition velocity for the stated mean diameter.

SPECIES NAME	GEOMETRIC MASS MEAN DIAMETER (microns)	GEOMETRIC STANDARD DEVIATION (microns)
! SO4 =	0.48,	2. !
! NO3 =	0.48,	2. !
! PM10 =	0.48,	2. !

!END!

INPUT GROUP: 9 -- Miscellaneous dry deposition parameters

Reference cuticle resistance (s/cm)
(RCUTR) Default: 30 ! RCUTR = 30.0 !
Reference ground resistance (s/cm)
(RGR) Default: 10 ! RGR = 10.0 !
Reference pollutant reactivity
(REACTR) Default: 8 ! REACTR = 8.0 !

Number of particle-size intervals used to
evaluate effective particle deposition velocity
(NINT) Default: 9 ! NINT = 9 !

Vegetation state in unirrigated areas
(IVEG) Default: 1 ! IVEG = 1 !
IVEG=1 for active and unstressed vegetation
IVEG=2 for active and stressed vegetation
IVEG=3 for inactive vegetation

!END!

INPUT GROUP: 10 -- Wet Deposition Parameters

Scavenging Coefficient -- Units: (sec)**(-1)

Pollutant	Liquid Precip.	Frozen Precip.
! SO2 =	3.0E-05,	0.0E00 !
! SO4 =	1.0E-04,	3.0E-05 !
! HNO3 =	6.0E-05,	0.0E00 !
! NO3 =	1.0E-04,	3.0E-05 !
! PM10 =	1.0E-04,	3.0E-05 !

!END!

INPUT GROUP: 11 -- Chemistry Parameters

Ozone data input option (MOZ) Default: 1 ! MOZ = 1
!
(Used only if MCHEM = 1, 3, or 4)
 0 = use a monthly background ozone value
 1 = read hourly ozone concentrations from
 the OZONE.DAT data file

Monthly ozone concentrations
(Used only if MCHEM = 1, 3, or 4 and
 MOZ = 0 or MOZ = 1 and all hourly O3 data missing)
(BCKO3) in ppb Default: 12*80.
! BCKO3 = 40.00, 40.00, 40.00, 40.00, 40.00, 40.00, 40.00, 40.00,
40.00, 40.00, 40.00, 40.00 !

Monthly ammonia concentrations
(Used only if MCHEM = 1, or 3)
(BCKNH3) in ppb Default: 12*10.
! BCKNH3 = 3.00, 3.00, 3.00, 3.00, 3.00, 3.00, 3.00, 3.00, 3.00,
3.00, 3.00, 3.00 !

Nighttime SO2 loss rate (RNITE1)
in percent/hour Default: 0.2 ! RNITE1 =
.2 !

Nighttime NOx loss rate (RNITE2)
in percent/hour Default: 2.0 ! RNITE2 =
2.0 !

Nighttime HNO3 formation rate (RNITE3)
in percent/hour Default: 2.0 ! RNITE3 =
2.0 !

H2O2 data input option (MH2O2) Default: 1 ! MH2O2 =
1 !
(Used only if MAQCHEM = 1)
 0 = use a monthly background H2O2 value
 1 = read hourly H2O2 concentrations from
 the H2O2.DAT data file

Monthly H2O2 concentrations
(Used only if MAQCHEM = 1 and
 MH2O2 = 0 or MH2O2 = 1 and all hourly H2O2 data missing)
(BCKH2O2) in ppb Default: 12*1.
! BCKH2O2 = 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00,
1.00, 1.00, 1.00 !

--- Data for SECONDARY ORGANIC AEROSOL (SOA) Option
(used only if MCHEM = 4)

= 19 !

Site characterization parameters for single-point Met data files

(needed for METFM = 2,3,4)

Land use category for modeling domain
(ILANDUIN) Default: 20 !
ILANDUIN = 20 !

Roughness length (m) for modeling domain
(Z0IN) Default: 0.25 ! Z0IN =
.25 !

Leaf area index for modeling domain
(XLAIIN) Default: 3.0 ! XLAIIN
= 3.0 !

Elevation above sea level (m)
(ELEVIN) Default: 0.0 ! ELEVIN
= .0 !

Latitude (degrees) for met location
(XLATIN) Default: -999. ! XLATIN
= -999.0 !

Longitude (degrees) for met location
(XLONIN) Default: -999. ! XLONIN
= -999.0 !

Specialized information for interpreting single-point Met data files -----

Anemometer height (m) (Used only if METFM = 2,3)
(ANEMHT) Default: 10. ! ANEMHT
= 10.0 !

Form of lateral turbulence data in PROFILE.DAT file
(Used only if METFM = 4 or MTURBVW = 1 or 3)
(ISIGMAV) Default: 1 !
ISIGMAV = 1 !
0 = read sigma-theta
1 = read sigma-v

Choice of mixing heights (Used only if METFM = 4)
(IMIXCTDM) Default: 0 !
IMIXCTDM = 0 !
0 = read PREDICTED mixing heights
1 = read OBSERVED mixing heights

Maximum length of a slug (met. grid units)
(XMXLEN) Default: 1.0 ! XMXLEN
= 1.0 !

Maximum travel distance of a puff/slug (in
grid units) during one sampling step
(XSAMLEN) Default: 1.0 !
XSAMLEN = 1.0 !

Maximum Number of slugs/puffs release from

Minimum mixing height (m)
(XMINZI) Default: 50. ! XMINZI
= 20.0 !

Default wind speed classes --
5 upper bounds (m/s) are entered;
the 6th class has no upper limit
(WSCAT(5)) Default :
ISC RURAL : 1.54, 3.09, 5.14, 8.23,
10.8 (10.8+)

	Wind Speed Class	1	2	3	4
5					
---		---	---	---	---

! WSCAT = 1.54, 3.09, 5.14, 8.23,
10.80 !

Default wind speed profile power-law
exponents for stabilities 1-6
(PLX0(6)) Default : ISC RURAL values
ISC RURAL : .07, .07, .10, .15,
.35, .55
ISC URBAN : .15, .15, .20, .25,
.30, .30

	Stability Class	A	B	C	D
E	F				
---	---	---	---	---	---

! PLX0 = 0.07, 0.07, 0.10, 0.15,
0.35, 0.55 !

Default potential temperature gradient
for stable classes E, F (degK/m)
(PTG0(2)) Default: 0.020, 0.035
! PTG0 = 0.020, 0.035 !

Default plume path coefficients for
each stability class (used when option
for partial plume height terrain adjustment
is selected -- MCTADJ=3)
(PPC(6)) Stability Class : A B C D
Default PPC : .50, .50, .50, .50,
.35, .35

---	---	---	---	---
-----	-----	-----	-----	-----

! PPC = 0.50, 0.50, 0.50, 0.50,
0.35, 0.35 !

Slug-to-puff transition criterion factor
equal to sigma-y/length of slug
(SL2PF) Default: 10. ! SL2PF =
10.0 !

Puff-splitting control variables -----

VERTICAL SPLIT

Fractional convergence criterion for numerical AREA
source integration
(EPSAREA) Default: 1.0e-06 ! EPSAREA
= 1.0E-06 !

Trajectory step-length (m) used for numerical rise
integration
(DSRISE) Default: 1.0 ! DSRISE
= 1.0 !

Boundary Condition (BC) Puff control variables

Minimum height (m) to which BC puffs are mixed as they are
emitted
(MBCON=2 ONLY). Actual height is reset to the current mixing
height
at the release point if greater than this minimum.
(HTMINBC) Default: 500. ! HTMINBC
= 500.0 !

Search radius (in BC segment lengths) about a receptor for
sampling
nearest BC puff. BC puffs are emitted with a spacing of one
segment
length, so the search radius should be greater than 1.
(RSAMPBC) Default: 4. ! RSAMPBC
= 10.0 !

Near-Surface depletion adjustment to concentration profile used
when
sampling BC puffs?
(MDEPBC) Default: 1 ! MDEPBC
= 1 !
0 = Concentration is NOT adjusted for depletion
1 = Adjust Concentration for depletion

!END!

INPUT GROUPS: 13a, 13b, 13c, 13d -- Point source parameters

Subgroup (13a)

Number of point sources with
parameters provided below (NPT1) No default ! NPT1 = 15 !

Units used for point source
emissions below (IPTU) Default: 1 ! IPTU = 3 !

1 = g/s
2 = kg/hr
3 = lb/hr

4 = tons/yr
 5 = Odour Unit * m**3/s (vol. flux of odour compound)
 6 = Odour Unit * m**3/min
 7 = metric tons/yr

Number of source-species combinations with variable emissions scaling factors provided below in (13d) (NSPT1) Default: 0 ! NSPT1 = 0 !

Number of point sources with variable emission parameters provided in external file (NPT2) No default ! NPT2 = 0 !

(If NPT2 > 0, these point source emissions are read from the file: PTEMARB.DAT)

!END!

 Subgroup (13b)

a
 POINT SOURCE: CONSTANT DATA

b	c	X	Y	Stack	Base	Stack	Exit	Exit
Bldg.	Emission	Coordinate	Coordinate	Height	Elevation	Diameter	Vel.	Temp.
No.	Rates	(km)	(km)	(m)	(m)	(m)	(m/s)	(deg.
Dwash								K)
1	!	SRCNAM = 49H8400R ! 10H1						
1	!	-392.035,	-465.965,	28.47,	924.8,	2.36,	3.41,	446.9,
0,		1.57,0,6.74,0,0,0.87!						
1	!	FMFAC = 1 !						
1	!	END !						
2	!	SRCNAM = 49H8400S ! 11H1						
2	!	-392.715,	-466.757,	27.43,	933,	1.07,	11.25,	435.93,
0,		0.15,0,10.44,0,0,0.65!						
2	!	FMFAC = 1 !						
2	!	END !						
3	!	SRCNAM = 49H8400T ! 19H3						
3	!	-392.193,	-466.088,	30.5,	918.7,	2.26,	4.94,	533.15,
0,		1.14,0,15.20,0,0,0.70!						
3	!	FMFAC = 1 !						
3	!	END !						
4	!	SRCNAM = 49H8400U ! 19B2/19H4						
4	!	-392.208,	-466.179,	19.66,	919.7,	1.22,	20.57,	438.71,
0,		0.24,0,5.82,0,0,0.64!						
4	!	FMFAC = 1 !						
4	!	END !						

```

5 ! SRCNAM = 49H8400V ! 19H5
5 ! X = -392.194, -466.163,      15,  920.1,   0.82,   6.25, 616.48,
0,
      0.43,0,1.63,0,0,0.24!
5 ! FMFAC = 1 !
5 ! END !
6 ! SRCNAM = 49H8400W ! 19H6
6 ! X = -392.196, -466.049,  33.53,  918.3,   3.03,   4.27, 533.15,
0,
      2.80,0,13.35,0,0,0.62!
6 ! FMFAC = 1 !
6 ! END !
7 ! SRCNAM = 49H8400X ! 28H1
7 ! X = -392.101, -465.932,  29.23,  923.7,   2.73,   4.57, 438.71,
0,
      3.48,0,11.82,0,0,1.94!
7 ! FMFAC = 1 !
7 ! END !
8 ! SRCNAM = 49H8400Y ! 34I1
8 ! X = -392.715, -466.79,  60.96,  933.4,   1.22,   4.94, 726.48,
0,
      2.63,0,1.48,0,0,0.15!
8 ! FMFAC = 1 !
8 ! END !
9 ! SRCNAM = 49H8400Z ! 36H1
9 ! X = -392.071, -465.934,  27.43,  923.9,   1.52,   5.24, 533.15,
0,
      0.06,0,25.60,0,0,0.65!
9 ! FMFAC = 1 !
9 ! END !
10 ! SRCNAM = 49H84010 ! 40H2
10 ! X = -392.489, -466.468,  33.53,  926.7,   1.05,   7.62, 644.26,
0,
      1.33,0,20.51,0,0,0.74!
10 ! FMFAC = 1 !
10 ! END !
11 ! SRCNAM = 49H84011 ! 55E1
11 ! X = -392.457, -466.375,   18,  926.6,   0.46,   4.65, 533.15,
0,
      0.00,0,10.58,0,0,0.06!
11 ! FMFAC = 1 !
11 ! END !
12 ! SRCNAM = 49H84012 ! 55E2
12 ! X = -392.464, -466.374,   18,  926.6,   0.46,   4.65, 533.15,
0,
      0.00,0,10.58,0,0,0.06!
12 ! FMFAC = 1 !
12 ! END !
13 ! SRCNAM = 49H84013 ! 55E3
13 ! X = -392.472, -466.373,   18,  926.7,   0.46,   4.65, 533.15,
0,
      0.00,0,10.58,0,0,0.06!
13 ! FMFAC = 1 !
13 ! END !
14 ! SRCNAM = 49H84014 ! 9H1
14 ! X = -392.134, -465.961,  25.79,  923.5,   2.03,   5.37, 438.71,
0,
      0.33,0,27.39,0,0,1.19!
14 ! FMFAC = 1 !
14 ! END !

```

```

15 ! SRCNAM = 49H84015 ! 66FL6
15 ! X = -393.33, -466.404, 38.1, 904.8, 0.8, 20, 1273,
0,
37.50,0,0.32,0,0,0.00!
15 ! FMFAC = 1 !
15 ! END !
-----

```

a

Data for each source are treated as a separate input subgroup and therefore must end with an input group terminator.

```

SRCNAM is a 12-character name for a source
        (No default)
X      is an array holding the source data listed by the column
headings
        (No default)
SIGYZI is an array holding the initial sigma-y and sigma-z (m)
        (Default: 0.,0.)
FMFAC  is a vertical momentum flux factor (0. or 1.0) used to
represent
that
        the effect of rain-caps or other physical configurations
velocity.
        reduce momentum rise associated with the actual exit
        (Default: 1.0 -- full momentum used)

```

b

0. = No building downwash modeled, 1. = downwash modeled
NOTE: must be entered as a REAL number (i.e., with decimal point)

c

An emission rate must be entered for every pollutant modeled. Enter emission rate of zero for secondary pollutants that are modeled, but not emitted. Units are specified by IPTU (e.g. 1 for g/s).

```

-----
Subgroup (13c)
-----

```

BUILDING DIMENSION DATA FOR SOURCES SUBJECT TO DOWNWASH

Source

a

```

No.      Effective building height, width, length and X/Y offset (in
meters)
        every 10 degrees. LENGTH, XBADJ, and YBADJ are only needed
for
        MBDW=2 (PRIME downwash option)

```

```

-----

```

a

Building height, width, length, and X/Y offset from the source are treated as a separate input subgroup for each source and therefore must end

Units used for area source emissions below (IARU) Default: 1 ! IARU = 1

!

1 = g/m**2/s
 2 = kg/m**2/hr
 3 = lb/m**2/hr
 4 = tons/m**2/yr
 5 = Odour Unit * m/s (vol. flux/m**2 of odour compound)
 6 = Odour Unit * m/min
 7 = metric tons/m**2/yr

Number of source-species combinations with variable emissions scaling factors provided below in (14d) (NSAR1) Default: 0 ! NSAR1 = 0 !

Number of buoyant polygon area sources with variable location and emission parameters (NAR2) No default ! NAR2 = 0 !
 (If NAR2 > 0, ALL parameter data for these sources are read from the file: BAEMARB.DAT)

!END!

 Subgroup (14b)

a
 AREA SOURCE: CONSTANT DATA

Source No.	Effect. Height (m)	Base Elevation (m)	Initial Sigma z (m)	Emission Rates
-----	-----	-----	-----	-----

a
 Data for each source are treated as a separate input subgroup and therefore must end with an input group terminator.

b
 An emission rate must be entered for every pollutant modeled. Enter emission rate of zero for secondary pollutants that are modeled, but not emitted. Units are specified by IARU (e.g. 1 for g/m**2/s).

 Subgroup (14c)

COORDINATES (km) FOR EACH VERTEX(4) OF EACH POLYGON

Source No.	Ordered list of X followed by list of Y, grouped by source
-----	-----

 a

Data for each source are treated as a separate input subgroup and therefore must end with an input group terminator.

Subgroup (14d)

a
AREA SOURCE: VARIABLE EMISSIONS DATA

Use this subgroup to describe temporal variations in the emission rates given in 14b. Factors entered multiply the rates in 14b. Skip sources here that have constant emissions. For more elaborate variation in source parameters, use BAEMARB.DAT and NAR2 > 0.

IVARY determines the type of variation, and is source-specific:
(IVARY) Default: 0

- 0 = Constant
- 1 = Diurnal cycle (24 scaling factors: hours 1-24)
- 2 = Monthly cycle (12 scaling factors: months 1-12)
- 3 = Hour & Season (4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
- 4 = Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12
- 5 = Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

a

Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

INPUT GROUPS: 15a, 15b, 15c -- Line source parameters

Subgroup (15a)

Number of buoyant line sources
with variable location and emission
parameters (NLN2) No default ! NLN2
= 0 !

(If NLN2 > 0, ALL parameter data for
these sources are read from the file: LNEMARB.DAT)

BUOYANT LINE SOURCE: CONSTANT DATA

a

Source Emission No.	Beg. X Coordinate Rates (km)	Beg. Y Coordinate (km)	End. X Coordinate (km)	End. Y Coordinate (km)	Release Height (m)	Base (m)
-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----

a
Data for each source are treated as a separate input subgroup and therefore must end with an input group terminator.

b
An emission rate must be entered for every pollutant modeled. Enter emission rate of zero for secondary pollutants that are modeled, but not emitted. Units are specified by ILNTU (e.g. 1 for g/s).

Subgroup (15c)

a
BUOYANT LINE SOURCE: VARIABLE EMISSIONS DATA

Use this subgroup to describe temporal variations in the emission rates given in 15b. Factors entered multiply the rates in 15b. Skip sources here that have constant emissions.

IVARY determines the type of variation, and is source-specific:
(IVARY) Default: 0

- 0 = Constant
- 1 = Diurnal cycle (24 scaling factors: hours 1-24)
- 2 = Monthly cycle (12 scaling factors: months 1-12)
- 3 = Hour & Season (4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
- 4 = Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12)
- 5 = Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

a
Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

a
Data for each source are treated as a separate input subgroup and therefore must end with an input group terminator.

b
An emission rate must be entered for every pollutant modeled. Enter emission rate of zero for secondary pollutants that are modeled, but not emitted. Units are specified by IVLU (e.g. 1 for g/s).

Subgroup (16c)

a
VOLUME SOURCE: VARIABLE EMISSIONS DATA

Use this subgroup to describe temporal variations in the emission rates given in 16b. Factors entered multiply the rates in 16b. Skip sources here that have constant emissions. For more elaborate variation in source parameters, use VOLEMARB.DAT and NVL2 > 0.

IVARY determines the type of variation, and is source-specific:
(IVARY) Default: 0

- 0 = Constant
- 1 = Diurnal cycle (24 scaling factors: hours 1-24)
- 2 = Monthly cycle (12 scaling factors: months 1-12)
- 3 = Hour & Season (4 groups of 24 hourly scaling factors,
- 4 = Speed & Stab. (6 groups of 6 scaling factors, where first group is DEC-JAN-FEB) where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12
- 5 = Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

a
Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

INPUT GROUPS: 17a & 17b -- Non-gridded (discrete) receptor information

Subgroup (17a)

Number of non-gridded receptors (NREC) No default ! NREC = 338

!

!END!

Subgroup (17b)

a

NON-GRIDDED (DISCRETE) RECEPTOR DATA

Receptor No.	X Coordinate (km)	Y Coordinate (km)	Ground Elevation (m)	Height Above Ground (m)	b
AZI7P00S	! X = 359.82,	-361.999,	274,	0	! !END! HEGL
AZI7P00T	! X = 360.559,	-361.966,	299,	0	! !END! HEGL
AZI7P00U	! X = 361.298,	-361.933,	328,	0	! !END! HEGL
AZI7P00V	! X = 362.037,	-361.9,	365,	0	! !END! HEGL
AZI7P00W	! X = 358.301,	-361.143,	250,	0	! !END! HEGL
AZI7P00X	! X = 359.04,	-361.11,	278,	0	! !END! HEGL
AZI7P00Y	! X = 359.779,	-361.078,	335,	0	! !END! HEGL
AZI7P00Z	! X = 360.518,	-361.045,	307,	0	! !END! HEGL
AZI7P010	! X = 361.257,	-361.011,	345,	0	! !END! HEGL
AZI7P011	! X = 357.521,	-360.255,	261,	0	! !END! HEGL
AZI7P012	! X = 358.26,	-360.222,	271,	0	! !END! HEGL
AZI7P013	! X = 358.999,	-360.189,	274,	0	! !END! HEGL
AZI7P014	! X = 359.738,	-360.156,	331,	0	! !END! HEGL
AZI7P015	! X = 360.477,	-360.123,	327,	0	! !END! HEGL
AZI7P016	! X = 361.215,	-360.09,	304,	0	! !END! HEGL
AZI7P017	! X = 361.954,	-360.057,	335,	0	! !END! HEGL
AZI7P018	! X = 362.693,	-360.024,	312,	0	! !END! HEGL
AZI7P019	! X = 363.432,	-359.99,	340,	0	! !END! HEGL
AZI7P01A	! X = 364.171,	-359.957,	361,	0	! !END! HEGL
AZI7P01B	! X = 364.91,	-359.924,	382,	0	! !END! HEGL
AZI7P01C	! X = 357.48,	-359.334,	274,	0	! !END! HEGL
AZI7P01D	! X = 358.219,	-359.301,	274,	0	! !END! HEGL
AZI7P01E	! X = 358.958,	-359.268,	335,	0	! !END! HEGL
AZI7P01F	! X = 359.696,	-359.235,	294,	0	! !END! HEGL
AZI7P01G	! X = 360.435,	-359.202,	304,	0	! !END! HEGL
AZI7P01H	! X = 361.174,	-359.169,	279,	0	! !END! HEGL
AZI7P01I	! X = 361.913,	-359.136,	304,	0	! !END! HEGL
AZI7P01J	! X = 362.652,	-359.102,	318,	0	! !END! HEGL
AZI7P01K	! X = 363.391,	-359.069,	335,	0	! !END! HEGL
AZI7P01L	! X = 364.13,	-359.036,	347,	0	! !END! HEGL
AZI7P01M	! X = 364.868,	-359.002,	340,	0	! !END! HEGL
AZI7P01N	! X = 358.917,	-358.347,	247,	0	! !END! HEGL
AZI7P01O	! X = 359.655,	-358.314,	271,	0	! !END! HEGL
AZI7P01P	! X = 360.394,	-358.281,	275,	0	! !END! HEGL
AZI7P01Q	! X = 361.133,	-358.248,	274,	0	! !END! HEGL
AZI7P01R	! X = 361.872,	-358.214,	277,	0	! !END! HEGL
AZI7P01S	! X = 362.61,	-358.181,	304,	0	! !END! HEGL
AZI7P01T	! X = 363.349,	-358.148,	330,	0	! !END! HEGL
AZI7P01U	! X = 364.088,	-358.115,	357,	0	! !END! HEGL
AZI7P01V	! X = 364.827,	-358.081,	384,	0	! !END! HEGL
AZI7P01W	! X = 365.565,	-358.048,	372,	0	! !END! HEGL
AZI7P01X	! X = 356.659,	-357.524,	274,	0	! !END! HEGL
AZI7P01Y	! X = 357.398,	-357.491,	293,	0	! !END! HEGL
AZI7P01Z	! X = 358.137,	-357.458,	272,	0	! !END! HEGL
AZI7P020	! X = 358.875,	-357.425,	271,	0	! !END! HEGL

AZI7P021	! X =	359.614,	-357.392,	274,	0 ! !END!	HEGL
AZI7P022	! X =	360.353,	-357.359,	327,	0 ! !END!	HEGL
AZI7P023	! X =	361.092,	-357.326,	316,	0 ! !END!	HEGL
AZI7P024	! X =	361.83,	-357.293,	304,	0 ! !END!	HEGL
AZI7P025	! X =	362.569,	-357.26,	354,	0 ! !END!	HEGL
AZI7P026	! X =	363.308,	-357.227,	346,	0 ! !END!	HEGL
AZI7P027	! X =	364.046,	-357.193,	335,	0 ! !END!	HEGL
AZI7P028	! X =	364.785,	-357.16,	344,	0 ! !END!	HEGL
AZI7P029	! X =	365.524,	-357.126,	364,	0 ! !END!	HEGL
AZI7P02A	! X =	357.357,	-356.57,	243,	0 ! !END!	HEGL
AZI7P02B	! X =	358.096,	-356.537,	335,	0 ! !END!	HEGL
AZI7P02C	! X =	358.834,	-356.504,	324,	0 ! !END!	HEGL
AZI7P02D	! X =	359.573,	-356.471,	335,	0 ! !END!	HEGL
AZI7P02E	! X =	360.312,	-356.438,	341,	0 ! !END!	HEGL
AZI7P02F	! X =	361.05,	-356.405,	333,	0 ! !END!	HEGL
AZI7P02G	! X =	361.789,	-356.372,	306,	0 ! !END!	HEGL
AZI7P02H	! X =	362.527,	-356.339,	304,	0 ! !END!	HEGL
AZI7P02I	! X =	363.266,	-356.305,	365,	0 ! !END!	HEGL
AZI7P02J	! X =	364.005,	-356.272,	304,	0 ! !END!	HEGL
AZI7P02K	! X =	364.743,	-356.239,	309,	0 ! !END!	HEGL
AZI7P02L	! X =	365.482,	-356.205,	307,	0 ! !END!	HEGL
AZI7P02M	! X =	357.316,	-355.648,	270,	0 ! !END!	HEGL
AZI7P02N	! X =	358.055,	-355.616,	274,	0 ! !END!	HEGL
AZI7P02O	! X =	358.793,	-355.583,	301,	0 ! !END!	HEGL
AZI7P02P	! X =	359.532,	-355.55,	274,	0 ! !END!	HEGL
AZI7P02Q	! X =	360.27,	-355.517,	274,	0 ! !END!	HEGL
AZI7P02R	! X =	361.009,	-355.484,	312,	0 ! !END!	HEGL
AZI7P02S	! X =	361.747,	-355.451,	274,	0 ! !END!	HEGL
AZI7P02T	! X =	362.486,	-355.417,	322,	0 ! !END!	HEGL
AZI7P02U	! X =	363.225,	-355.384,	304,	0 ! !END!	HEGL
AZI7P02V	! X =	363.963,	-355.351,	275,	0 ! !END!	HEGL
AZI7P02W	! X =	364.702,	-355.317,	304,	0 ! !END!	HEGL
AZI7P02X	! X =	365.44,	-355.284,	290,	0 ! !END!	HEGL
AZI7P02Y	! X =	362.445,	-354.496,	249,	0 ! !END!	HEGL
AZI7P02Z	! X =	363.183,	-354.463,	274,	0 ! !END!	HEGL
AZI7P030	! X =	596.704,	-315.567,	106,	0 ! !END!	MING
AZI7P031	! X =	598.173,	-315.458,	102,	0 ! !END!	MING
AZI7P032	! X =	597.37,	-314.593,	105,	0 ! !END!	MING
AZI7P033	! X =	598.105,	-314.538,	102,	0 ! !END!	MING
AZI7P034	! X =	598.839,	-314.484,	102,	0 ! !END!	MING
AZI7P035	! X =	597.301,	-313.674,	114,	0 ! !END!	MING
AZI7P036	! X =	598.036,	-313.619,	104,	0 ! !END!	MING
AZI7P037	! X =	598.771,	-313.564,	102,	0 ! !END!	MING
AZI7P038	! X =	599.505,	-313.509,	102,	0 ! !END!	MING
AZI7P039	! X =	600.24,	-313.454,	102,	0 ! !END!	MING
AZI7P03A	! X =	600.975,	-313.399,	103,	0 ! !END!	MING
AZI7P03B	! X =	597.967,	-312.699,	108,	0 ! !END!	MING
AZI7P03C	! X =	598.702,	-312.645,	105,	0 ! !END!	MING
AZI7P03D	! X =	599.437,	-312.59,	102,	0 ! !END!	MING
AZI7P03E	! X =	600.171,	-312.535,	102,	0 ! !END!	MING
AZI7P03F	! X =	600.906,	-312.48,	102,	0 ! !END!	MING
AZI7P03G	! X =	601.64,	-312.424,	102,	0 ! !END!	MING
AZI7P03H	! X =	602.375,	-312.369,	102,	0 ! !END!	MING
AZI7P03I	! X =	603.11,	-312.314,	102,	0 ! !END!	MING
AZI7P03J	! X =	598.633,	-311.725,	121,	0 ! !END!	MING
AZI7P03K	! X =	599.368,	-311.67,	104,	0 ! !END!	MING
AZI7P03L	! X =	600.102,	-311.615,	102,	0 ! !END!	MING
AZI7P03M	! X =	600.837,	-311.56,	102,	0 ! !END!	MING
AZI7P03N	! X =	601.571,	-311.505,	102,	0 ! !END!	MING
AZI7P03O	! X =	602.306,	-311.45,	102,	0 ! !END!	MING

AZI7P03P	!	X =	603.04,	-311.395,	102,	0	!	!	END!	MING
AZI7P03Q	!	X =	599.299,	-310.751,	121,	0	!	!	END!	MING
AZI7P03R	!	X =	600.033,	-310.696,	105,	0	!	!	END!	MING
AZI7P03S	!	X =	600.768,	-310.641,	102,	0	!	!	END!	MING
AZI7P03T	!	X =	601.502,	-310.586,	102,	0	!	!	END!	MING
AZI7P03U	!	X =	602.237,	-310.53,	102,	0	!	!	END!	MING
AZI7P03V	!	X =	602.971,	-310.475,	101,	0	!	!	END!	MING
AZI7P03W	!	X =	599.965,	-309.776,	117,	0	!	!	END!	MING
AZI7P03X	!	X =	600.699,	-309.721,	101,	0	!	!	END!	MING
AZI7P03Y	!	X =	601.433,	-309.666,	101,	0	!	!	END!	MING
AZI7P03Z	!	X =	602.168,	-309.611,	102,	0	!	!	END!	MING
AZI7P040	!	X =	602.902,	-309.556,	101,	0	!	!	END!	MING
AZI7P041	!	X =	600.63,	-308.802,	106,	0	!	!	END!	MING
AZI7P042	!	X =	601.364,	-308.747,	102,	0	!	!	END!	MING
AZI7P043	!	X =	602.098,	-308.692,	102,	0	!	!	END!	MING
AZI7P044	!	X =	602.833,	-308.636,	102,	0	!	!	END!	MING
AZI7P045	!	X =	601.295,	-307.827,	103,	0	!	!	END!	MING
AZI7P046	!	X =	602.029,	-307.772,	102,	0	!	!	END!	MING
AZI7P047	!	X =	602.763,	-307.717,	102,	0	!	!	END!	MING
AZI7P048	!	X =	601.96,	-306.853,	103,	0	!	!	END!	MING
AZI7P049	!	X =	602.694,	-306.798,	102,	0	!	!	END!	MING
AZI7P04A	!	X =	602.625,	-305.878,	103,	0	!	!	END!	MING
AZI7P04B	!	X =	318.327,	-456.068,	555,	0	!	!	END!	UPBU
AZI7P04C	!	X =	319.075,	-456.039,	589,	0	!	!	END!	UPBU
AZI7P04D	!	X =	321.318,	-455.951,	563,	0	!	!	END!	UPBU
AZI7P04E	!	X =	318.291,	-455.146,	549,	0	!	!	END!	UPBU
AZI7P04F	!	X =	319.038,	-455.117,	487,	0	!	!	END!	UPBU
AZI7P04G	!	X =	319.786,	-455.088,	487,	0	!	!	END!	UPBU
AZI7P04H	!	X =	320.534,	-455.058,	490,	0	!	!	END!	UPBU
AZI7P04I	!	X =	318.255,	-454.224,	650,	0	!	!	END!	UPBU
AZI7P04J	!	X =	319.002,	-454.195,	563,	0	!	!	END!	UPBU
AZI7P04K	!	X =	319.75,	-454.166,	540,	0	!	!	END!	UPBU
AZI7P04L	!	X =	320.498,	-454.136,	502,	0	!	!	END!	UPBU
AZI7P04M	!	X =	321.245,	-454.107,	526,	0	!	!	END!	UPBU
AZI7P04N	!	X =	322.74,	-454.048,	534,	0	!	!	END!	UPBU
AZI7P04O	!	X =	323.488,	-454.018,	563,	0	!	!	END!	UPBU
AZI7P04P	!	X =	318.219,	-453.302,	548,	0	!	!	END!	UPBU
AZI7P04Q	!	X =	318.966,	-453.273,	628,	0	!	!	END!	UPBU
AZI7P04R	!	X =	319.714,	-453.243,	623,	0	!	!	END!	UPBU
AZI7P04S	!	X =	320.461,	-453.214,	579,	0	!	!	END!	UPBU
AZI7P04T	!	X =	321.209,	-453.185,	469,	0	!	!	END!	UPBU
AZI7P04U	!	X =	321.956,	-453.155,	457,	0	!	!	END!	UPBU
AZI7P04V	!	X =	322.704,	-453.126,	573,	0	!	!	END!	UPBU
AZI7P04W	!	X =	323.451,	-453.096,	605,	0	!	!	END!	UPBU
AZI7P04X	!	X =	324.199,	-453.066,	588,	0	!	!	END!	UPBU
AZI7P04Y	!	X =	318.183,	-452.38,	608,	0	!	!	END!	UPBU
AZI7P04Z	!	X =	318.93,	-452.351,	660,	0	!	!	END!	UPBU
AZI7P050	!	X =	319.678,	-452.321,	598,	0	!	!	END!	UPBU
AZI7P051	!	X =	320.425,	-452.292,	599,	0	!	!	END!	UPBU
AZI7P052	!	X =	321.172,	-452.263,	639,	0	!	!	END!	UPBU
AZI7P053	!	X =	321.92,	-452.233,	457,	0	!	!	END!	UPBU
AZI7P054	!	X =	322.667,	-452.203,	568,	0	!	!	END!	UPBU
AZI7P055	!	X =	318.147,	-451.458,	730,	0	!	!	END!	UPBU
AZI7P056	!	X =	318.894,	-451.428,	681,	0	!	!	END!	UPBU
AZI7P057	!	X =	319.641,	-451.399,	640,	0	!	!	END!	UPBU
AZI7P058	!	X =	320.389,	-451.37,	625,	0	!	!	END!	UPBU
AZI7P059	!	X =	321.136,	-451.34,	426,	0	!	!	END!	UPBU
AZI7P05A	!	X =	321.883,	-451.311,	555,	0	!	!	END!	UPBU
AZI7P05B	!	X =	322.631,	-451.281,	612,	0	!	!	END!	UPBU
AZI7P05C	!	X =	317.364,	-450.565,	667,	0	!	!	END!	UPBU

AZI7P05D	!	X =	318.111,	-450.536,	580,	0	!	!	END!	UPBU
AZI7P05E	!	X =	318.858,	-450.506,	656,	0	!	!	END!	UPBU
AZI7P05F	!	X =	319.605,	-450.477,	640,	0	!	!	END!	UPBU
AZI7P05G	!	X =	320.353,	-450.448,	487,	0	!	!	END!	UPBU
AZI7P05H	!	X =	321.1,	-450.418,	457,	0	!	!	END!	UPBU
AZI7P05I	!	X =	321.847,	-450.389,	654,	0	!	!	END!	UPBU
AZI7P05J	!	X =	322.594,	-450.359,	548,	0	!	!	END!	UPBU
AZI7P05K	!	X =	323.341,	-450.33,	622,	0	!	!	END!	UPBU
AZI7P05L	!	X =	324.089,	-450.3,	683,	0	!	!	END!	UPBU
AZI7P05M	!	X =	317.328,	-449.643,	579,	0	!	!	END!	UPBU
AZI7P05N	!	X =	318.075,	-449.613,	554,	0	!	!	END!	UPBU
AZI7P05O	!	X =	318.822,	-449.584,	609,	0	!	!	END!	UPBU
AZI7P05P	!	X =	319.569,	-449.555,	622,	0	!	!	END!	UPBU
AZI7P05Q	!	X =	320.316,	-449.526,	427,	0	!	!	END!	UPBU
AZI7P05R	!	X =	321.063,	-449.496,	555,	0	!	!	END!	UPBU
AZI7P05S	!	X =	321.811,	-449.467,	502,	0	!	!	END!	UPBU
AZI7P05T	!	X =	322.558,	-449.437,	639,	0	!	!	END!	UPBU
AZI7P05U	!	X =	323.305,	-449.408,	580,	0	!	!	END!	UPBU
AZI7P05V	!	X =	324.052,	-449.378,	639,	0	!	!	END!	UPBU
AZI7P05W	!	X =	318.786,	-448.662,	548,	0	!	!	END!	UPBU
AZI7P05X	!	X =	319.533,	-448.633,	548,	0	!	!	END!	UPBU
AZI7P05Y	!	X =	320.28,	-448.603,	438,	0	!	!	END!	UPBU
AZI7P05Z	!	X =	321.027,	-448.574,	579,	0	!	!	END!	UPBU
AZI7P060	!	X =	322.521,	-448.515,	620,	0	!	!	END!	UPBU
AZI7P061	!	X =	320.244,	-447.681,	579,	0	!	!	END!	UPBU
AZI7P062	!	X =	320.991,	-447.652,	426,	0	!	!	END!	UPBU
AZI7P063	!	X =	321.738,	-447.622,	611,	0	!	!	END!	UPBU
AZI7P064	!	X =	318.714,	-446.818,	604,	0	!	!	END!	UPBU
AZI7P065	!	X =	319.461,	-446.789,	548,	0	!	!	END!	UPBU
AZI7P066	!	X =	320.208,	-446.759,	488,	0	!	!	END!	UPBU
AZI7P067	!	X =	320.954,	-446.73,	402,	0	!	!	END!	UPBU
AZI7P068	!	X =	321.701,	-446.7,	579,	0	!	!	END!	UPBU
AZI7P069	!	X =	322.448,	-446.671,	573,	0	!	!	END!	UPBU
AZI7P06A	!	X =	323.195,	-446.641,	609,	0	!	!	END!	UPBU
AZI7P06B	!	X =	-159.899,	-584.476,	454,	0	!	!	END!	WIMO
AZI7P06C	!	X =	-159.139,	-584.491,	486,	0	!	!	END!	WIMO
AZI7P06D	!	X =	-158.38,	-584.505,	487,	0	!	!	END!	WIMO
AZI7P06E	!	X =	-157.62,	-584.52,	478,	0	!	!	END!	WIMO
AZI7P06F	!	X =	-156.861,	-584.534,	518,	0	!	!	END!	WIMO
AZI7P06G	!	X =	-156.101,	-584.549,	518,	0	!	!	END!	WIMO
AZI7P06H	!	X =	-161.4,	-583.523,	510,	0	!	!	END!	WIMO
AZI7P06I	!	X =	-160.64,	-583.538,	493,	0	!	!	END!	WIMO
AZI7P06J	!	X =	-159.881,	-583.552,	488,	0	!	!	END!	WIMO
AZI7P06K	!	X =	-159.121,	-583.567,	615,	0	!	!	END!	WIMO
AZI7P06L	!	X =	-158.362,	-583.581,	522,	0	!	!	END!	WIMO
AZI7P06M	!	X =	-157.603,	-583.596,	494,	0	!	!	END!	WIMO
AZI7P06N	!	X =	-156.843,	-583.61,	609,	0	!	!	END!	WIMO
AZI7P06O	!	X =	-156.084,	-583.625,	518,	0	!	!	END!	WIMO
AZI7P06P	!	X =	-162.141,	-582.584,	487,	0	!	!	END!	WIMO
AZI7P06Q	!	X =	-161.382,	-582.599,	518,	0	!	!	END!	WIMO
AZI7P06R	!	X =	-160.622,	-582.614,	609,	0	!	!	END!	WIMO
AZI7P06S	!	X =	-159.863,	-582.628,	554,	0	!	!	END!	WIMO
AZI7P06T	!	X =	-159.104,	-582.643,	578,	0	!	!	END!	WIMO
AZI7P06U	!	X =	-158.344,	-582.658,	557,	0	!	!	END!	WIMO
AZI7P06V	!	X =	-157.585,	-582.672,	571,	0	!	!	END!	WIMO
AZI7P06W	!	X =	-156.826,	-582.686,	670,	0	!	!	END!	WIMO
AZI7P06X	!	X =	-156.066,	-582.701,	518,	0	!	!	END!	WIMO
AZI7P06Y	!	X =	-160.604,	-581.69,	518,	0	!	!	END!	WIMO
AZI7P06Z	!	X =	-159.845,	-581.705,	548,	0	!	!	END!	WIMO
AZI7P070	!	X =	-159.086,	-581.719,	548,	0	!	!	END!	WIMO

AZI7P071	! X = -158.327, -581.734,	518,	0 ! !END! WIMO
AZI7P072	! X = -160.587, -580.766,	517,	0 ! !END! WIMO
AZI7P073	! X = -159.827, -580.781,	579,	0 ! !END! WIMO
AZI7P074	! X = -159.068, -580.795,	613,	0 ! !END! WIMO
AZI7P075	! X = -158.309, -580.81,	548,	0 ! !END! WIMO
AZI7P076	! X = -157.55, -580.824,	523,	0 ! !END! WIMO
AZI7P077	! X = -161.328, -579.827,	542,	0 ! !END! WIMO
AZI7P078	! X = -160.569, -579.842,	545,	0 ! !END! WIMO
AZI7P079	! X = -159.81, -579.857,	552,	0 ! !END! WIMO
AZI7P07A	! X = -152.926, -577.214,	579,	0 ! !END! WIMO
AZI7P07B	! X = -155.944, -576.234,	609,	0 ! !END! WIMO
AZI7P07C	! X = -155.186, -576.248,	654,	0 ! !END! WIMO
AZI7P07D	! X = -154.427, -576.262,	621,	0 ! !END! WIMO
AZI7P07E	! X = -153.668, -576.277,	629,	0 ! !END! WIMO
AZI7P07F	! X = -152.909, -576.291,	579,	0 ! !END! WIMO
AZI7P07G	! X = -152.151, -576.305,	560,	0 ! !END! WIMO
AZI7P07H	! X = -156.686, -575.296,	615,	0 ! !END! WIMO
AZI7P07I	! X = -155.927, -575.31,	641,	0 ! !END! WIMO
AZI7P07J	! X = -155.168, -575.324,	640,	0 ! !END! WIMO
AZI7P07K	! X = -154.41, -575.339,	662,	0 ! !END! WIMO
AZI7P07L	! X = -153.651, -575.353,	618,	0 ! !END! WIMO
AZI7P07M	! X = -152.892, -575.367,	630,	0 ! !END! WIMO
AZI7P07N	! X = -152.134, -575.381,	534,	0 ! !END! WIMO
AZI7P07O	! X = -156.668, -574.372,	606,	0 ! !END! WIMO
AZI7P07P	! X = -155.91, -574.386,	566,	0 ! !END! WIMO
AZI7P07Q	! X = -155.151, -574.401,	633,	0 ! !END! WIMO
AZI7P07R	! X = -154.392, -574.415,	670,	0 ! !END! WIMO
AZI7P07S	! X = -153.634, -574.429,	609,	0 ! !END! WIMO
AZI7P07T	! X = -152.875, -574.443,	579,	0 ! !END! WIMO
AZI7P07U	! X = -152.117, -574.457,	535,	0 ! !END! WIMO
AZI7P07V	! X = -155.134, -573.477,	548,	0 ! !END! WIMO
AZI7P07W	! X = -154.375, -573.491,	518,	0 ! !END! WIMO
AZI7P07X	! X = -153.617, -573.505,	506,	0 ! !END! WIMO
AZI7P07Y	! X = 269.691, -618.618,	365,	0 ! !END! CACR
AZI7P07Z	! X = 270.454, -618.593,	365,	0 ! !END! CACR
AZI7P080	! X = 271.217, -618.568,	368,	0 ! !END! CACR
AZI7P081	! X = 268.136, -617.743,	411,	0 ! !END! CACR
AZI7P082	! X = 268.899, -617.719,	462,	0 ! !END! CACR
AZI7P083	! X = 269.661, -617.694,	431,	0 ! !END! CACR
AZI7P084	! X = 270.424, -617.669,	518,	0 ! !END! CACR
AZI7P085	! X = 271.186, -617.644,	487,	0 ! !END! CACR
AZI7P086	! X = 271.949, -617.619,	396,	0 ! !END! CACR
AZI7P087	! X = 265.056, -616.917,	518,	0 ! !END! CACR
AZI7P088	! X = 265.819, -616.893,	523,	0 ! !END! CACR
AZI7P089	! X = 266.581, -616.868,	548,	0 ! !END! CACR
AZI7P08A	! X = 267.344, -616.844,	579,	0 ! !END! CACR
AZI7P08B	! X = 268.106, -616.819,	547,	0 ! !END! CACR
AZI7P08C	! X = 268.869, -616.795,	538,	0 ! !END! CACR
AZI7P08D	! X = 269.631, -616.77,	640,	0 ! !END! CACR
AZI7P08E	! X = 270.394, -616.745,	608,	0 ! !END! CACR
AZI7P08F	! X = 259.69, -616.162,	335,	0 ! !END! CACR
AZI7P08G	! X = 260.453, -616.138,	431,	0 ! !END! CACR
AZI7P08H	! X = 261.215, -616.114,	457,	0 ! !END! CACR
AZI7P08I	! X = 261.977, -616.09,	414,	0 ! !END! CACR
AZI7P08J	! X = 262.74, -616.066,	426,	0 ! !END! CACR
AZI7P08K	! X = 263.502, -616.042,	426,	0 ! !END! CACR
AZI7P08L	! X = 264.265, -616.017,	388,	0 ! !END! CACR
AZI7P08M	! X = 265.027, -615.993,	388,	0 ! !END! CACR
AZI7P08N	! X = 265.789, -615.969,	365,	0 ! !END! CACR
AZI7P08O	! X = 266.552, -615.944,	386,	0 ! !END! CACR

AZI7P08P	!	X =	267.314,	-615.92,	396,	0	!	!	END!	CACR
AZI7P08Q	!	X =	268.077,	-615.895,	426,	0	!	!	END!	CACR
AZI7P08R	!	X =	268.839,	-615.871,	446,	0	!	!	END!	CACR
AZI7P08S	!	X =	269.601,	-615.846,	441,	0	!	!	END!	CACR
AZI7P08T	!	X =	270.364,	-615.821,	457,	0	!	!	END!	CACR
AZI7P08U	!	X =	271.126,	-615.796,	465,	0	!	!	END!	CACR
AZI7P08V	!	X =	271.889,	-615.772,	442,	0	!	!	END!	CACR
AZI7P08W	!	X =	272.651,	-615.747,	426,	0	!	!	END!	CACR
AZI7P08X	!	X =	259.661,	-615.238,	304,	0	!	!	END!	CACR
AZI7P08Y	!	X =	260.424,	-615.214,	304,	0	!	!	END!	CACR
AZI7P08Z	!	X =	261.186,	-615.19,	319,	0	!	!	END!	CACR
AZI7P090	!	X =	261.948,	-615.166,	334,	0	!	!	END!	CACR
AZI7P091	!	X =	262.711,	-615.142,	370,	0	!	!	END!	CACR
AZI7P092	!	X =	263.473,	-615.118,	405,	0	!	!	END!	CACR
AZI7P093	!	X =	264.235,	-615.093,	409,	0	!	!	END!	CACR
AZI7P094	!	X =	264.998,	-615.069,	450,	0	!	!	END!	CACR
AZI7P095	!	X =	265.76,	-615.045,	518,	0	!	!	END!	CACR
AZI7P096	!	X =	266.522,	-615.02,	609,	0	!	!	END!	CACR
AZI7P097	!	X =	267.285,	-614.996,	534,	0	!	!	END!	CACR
AZI7P098	!	X =	268.047,	-614.971,	517,	0	!	!	END!	CACR
AZI7P099	!	X =	268.809,	-614.947,	575,	0	!	!	END!	CACR
AZI7P09A	!	X =	269.571,	-614.922,	600,	0	!	!	END!	CACR
AZI7P09B	!	X =	270.334,	-614.897,	609,	0	!	!	END!	CACR
AZI7P09C	!	X =	271.096,	-614.873,	609,	0	!	!	END!	CACR
AZI7P09D	!	X =	271.858,	-614.848,	561,	0	!	!	END!	CACR
AZI7P09E	!	X =	260.395,	-614.29,	335,	0	!	!	END!	CACR
AZI7P09F	!	X =	261.157,	-614.266,	432,	0	!	!	END!	CACR
AZI7P09G	!	X =	261.919,	-614.242,	487,	0	!	!	END!	CACR
AZI7P09H	!	X =	262.681,	-614.218,	499,	0	!	!	END!	CACR
AZI7P09I	!	X =	263.444,	-614.194,	514,	0	!	!	END!	CACR
AZI7P09J	!	X =	264.206,	-614.169,	442,	0	!	!	END!	CACR
AZI7P09K	!	X =	264.968,	-614.145,	439,	0	!	!	END!	CACR
AZI7P09L	!	X =	265.73,	-614.121,	395,	0	!	!	END!	CACR
AZI7P09M	!	X =	266.493,	-614.097,	400,	0	!	!	END!	CACR
AZI7P09N	!	X =	267.255,	-614.072,	426,	0	!	!	END!	CACR
AZI7P09O	!	X =	268.017,	-614.047,	487,	0	!	!	END!	CACR
AZI7P09P	!	X =	268.779,	-614.023,	548,	0	!	!	END!	CACR
AZI7P09Q	!	X =	269.541,	-613.998,	548,	0	!	!	END!	CACR
AZI7P09R	!	X =	270.304,	-613.973,	548,	0	!	!	END!	CACR
AZI7P09S	!	X =	271.066,	-613.949,	535,	0	!	!	END!	CACR
AZI7P09T	!	X =	261.128,	-613.342,	304,	0	!	!	END!	CACR
AZI7P09U	!	X =	261.89,	-613.318,	334,	0	!	!	END!	CACR
AZI7P09V	!	X =	262.652,	-613.294,	396,	0	!	!	END!	CACR
AZI7P09W	!	X =	263.414,	-613.27,	457,	0	!	!	END!	CACR
AZI7P09X	!	X =	264.176,	-613.246,	457,	0	!	!	END!	CACR
AZI7P09Y	!	X =	264.939,	-613.221,	426,	0	!	!	END!	CACR
AZI7P09Z	!	X =	265.701,	-613.197,	411,	0	!	!	END!	CACR
AZI7P0A0	!	X =	266.463,	-613.173,	406,	0	!	!	END!	CACR
AZI7P0A1	!	X =	267.225,	-613.148,	396,	0	!	!	END!	CACR
AZI7P0A2	!	X =	267.987,	-613.124,	401,	0	!	!	END!	CACR
AZI7P0A3	!	X =	268.749,	-613.099,	397,	0	!	!	END!	CACR
AZI7P0A4	!	X =	261.099,	-612.418,	322,	0	!	!	END!	CACR
AZI7P0A5	!	X =	261.861,	-612.394,	334,	0	!	!	END!	CACR

a

Data for each receptor are treated as a separate input subgroup and therefore must end with an input group terminator.

b

Receptor height above ground is optional. If no value is entered, the receptor is placed on the ground.

SAMPLE POSTUTIL CONTROL FILE

Conoco Phillips BART Analysis
2001 (Ozone files Included)
----- Run title (3 lines)

POSTUTIL MODEL CONTROL FILE

INPUT GROUP: 0 -- Input and Output File Names

Subgroup (0a)

Output Files

File	Default File Name		
List File	POSTUTIL.LST	! UTLLST =2001.PU.VIS.LST	!
Data File	MODEL.DAT	! UTLDAT =2001.PU.VIS.DAT	!

Input Files

Meteorological data files are needed for the HNO3/NO3 partition option. The met data file is the 'CALMET.DAT' format file used in the CALPUFF simulation. If multiple CALMET files had been used in sequence, you may list all of these files in subgroup 0b. Specify the total number of CALMET files runs you need to use, and provide the filename for each in subgroup 0b.

Number of CALMET data files (NFILES)
Default: 0 ! NMET = 36 !

A number of CALPUFF data files may be processed in this application. The files may represent individual CALPUFF simulations that were made for a specific set of species and/or sources. Specify the total number of CALPUFF runs you wish to combine, and provide the filename for each in subgroup 0b.

Number of CALPUFF data files (NFILES)
Default: 1 ! NFILES = 1 !

All filenames will be converted to lower case if LCFILES = T
Otherwise, if LCFILES = F, filenames will be converted to UPPER CASE

Convert filenames to lower case? Default: T ! LCFILES = T !
T = lower case
F = UPPER CASE

!END!

NOTE: file/path names can be up to 70 characters in length

Subgroup (0b)

NMET CALMET Data Files:

Input File	Default File Name	
-----	-----	
1	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0101-0110.south.dat!		!END!
2	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0111-0120.south.dat!		!END!
3	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0121-0131.south.dat!		!END!
4	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0201-0210.south.dat!		!END!
5	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0211-0220.south.dat!		!END!
6	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0221-0228.south.dat!		!END!
7	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0301-0310.south.dat!		!END!
8	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0311-0320.south.dat!		!END!
9	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0321-0331.south.dat!		!END!
10	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0401-0410.south.dat!		!END!
11	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0411-0420.south.dat!		!END!
12	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0421-0430.south.dat!		!END!
13	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0501-0510.south.dat!		!END!
14	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0511-0520.south.dat!		!END!
15	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0521-0531.south.dat!		!END!
16	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0601-0610.south.dat!		!END!
17	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0611-0620.south.dat!		!END!
18	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0621-0630.south.dat!		!END!
19	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0701-0710.south.dat!		!END!
20	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0711-0720.south.dat!		!END!
21	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0721-0731.south.dat!		!END!
22	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0801-0810.south.dat!		!END!
23	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0811-0820.south.dat!		!END!
24	MET.DAT	! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0821-0831.south.dat!		!END!

```

25          MET.DAT          ! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0901-0910.south.dat! !END!
26          MET.DAT          ! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0911-0920.south.dat! !END!
27          MET.DAT          ! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.0921-0930.south.dat! !END!
28          MET.DAT          ! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.1001-1010.south.dat! !END!
29          MET.DAT          ! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.1011-1020.south.dat! !END!
30          MET.DAT          ! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.1021-1031.south.dat! !END!
31          MET.DAT          ! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.1101-1110.south.dat! !END!
32          MET.DAT          ! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.1111-1120.south.dat! !END!
33          MET.DAT          ! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.1121-1130.south.dat! !END!
34          MET.DAT          ! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.1201-1210.south.dat! !END!
35          MET.DAT          ! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.1211-1220.south.dat! !END!
36          MET.DAT          ! UTLMET = Z:\CENRAP\calmet.6km.south
\2001\cmet.2001.1221-1231.south.dat! !END!

```

```

Input File      Default File Name
-----
1              CALPUFF.DAT      ! MODDAT = 01PFC1V.DAT ! !END!

```

```

-----
Note: provide NMET lines of the form      * UTLMET = name * *END*
      and NFILES lines of the form      * MODDAT = name * *END*
      where the * should be replaced with an exclamation point,
      the special delimiter character.

```

```

-----
INPUT GROUP: 1 -- General run control parameters
-----

```

```

Starting date:   Year  (ISYR) --      No default   ! ISYR  = 2001 !
                 Month (ISMO) --      No default   ! ISMO  = 1    !
                 Day   (ISDY) --      No default   ! ISDY  = 1    !
                 Hour  (ISHR) --      No default   ! ISHR  = 0    !

Number of periods to process
                        (NPER) -- No default   ! NPER  = 8760
!

Number of species to process from CALPUFF runs
                        (NSPECINP) -- No default   ! NSPECINP = 6 !

Number of species to write to output file
                        (NSPECOUT) -- No default   ! NSPECOUT = 6 !

Number of species to compute from those modeled
(must be no greater than NSPECOUT)

```

(NSPECCMP) -- No default ! NSPECCMP = 0 !

When multiple files are used, a species name may appear in more than one file. Data for this species will be summed (appropriate if the CALPUFF runs use different source groups). If this summing is not appropriate, remove duplicate species from the file(s).

Stop run if duplicate species names
are found? (MDUPLCT) Default: 0 ! MDUPLCT = 0 !
0 = no (i.e., duplicate species are summed)
1 = yes (i.e., run is halted)

Data for each species in a CALPUFF data file may also be scaled as they are read. This can be done to alter the emission rate of all sources that were modeled in a particular CALPUFF application. The scaling factor for each species is entered in Subgroup (2d), for each file for which scaling is requested.

Number of CALPUFF data files that will be scaled
(must be no greater than NFILES)
(NSCALED) Default: 0 ! NSCALED = 0 !

Option to recompute the HNO3/NO3 concentration partition prior to performing other actions. This option will NOT alter any deposition fluxes contained in the CALPUFF file(s). Two partition selections are provided. The first (MNITRATE=1) computes the partition for the TOTAL (all sources) concentration fields (SO4, NO3, HNO3; NH3), and the second (MNITRATE=2) uses this partition (from a previous application of POSTUTIL) to compute the partition for individual source groups.

Required information for MNITRATE=1 includes:
species NO3, HNO3, and SO4
NH3 concentration(s)
met. data file for RH and T

Required information for MNITRATE=2 includes:
species NO3 and HNO3 for a source group
species NO3ALL and HNO3ALL for all source groups, properly partitioned

Recompute the HNO3/NO3 partition for concentrations?
(MNITRATE) Default: 0 ! MNITRATE = 1 !
0 = no
1 = yes, for all sources combined
2 = yes, for a source group

Ammonia concentrations may be available as a modeled species in the CALPUFF files. When NH3 is listed as a processed species in Subgroup (2a) (as one of the NSPECINP ASPECI entries), the modeled values will be used in the chemical equilibrium calculation.

If NH3 is not on this list, the default background value listed below will be used.
Default ammonia concentration (ppb) used for HNO3/NO3 partition:
(BCKNH3) in ppb Default: 10. ! BCKNH3 = 3. !

!END!

INPUT GROUP: 2 -- Species Processing Information

Subgroup (2a)

The following NSPECINP species will be processed:

```
! ASPECI =          SO2 !          !END!  
! ASPECI =          SO4 !          !END!  
! ASPECI =          NOX !          !END!  
! ASPECI =          HNO3 !         !END!  
! ASPECI =          NO3 !          !END!  
! ASPECI =          PM10 !         !END!
```

Subgroup (2b)

The following NSPECOUT species will be written:

```
! ASPECO =          SO2 !          !END!  
! ASPECO =          SO4 !          !END!  
! ASPECO =          NOX !          !END!  
! ASPECO =          HNO3 !         !END!  
! ASPECO =          NO3 !          !END!  
! ASPECO =          PM10 !         !END!
```

Subgroup (2c)

The following NSPECCMP species will be computed by scaling and summing one or more of the processed input species. Identify the name(s) of the computed species and provide the scaling factors for each of the NSPECINP input species (NSPECCMP groups of NSPECINP+1 lines each):

Subgroup (2d)

Each species in NSCALED CALPUFF data files may be scaled before being processed (e.g., to change the emission rate for all sources modeled in the run that produced a data file). For each file, identify the file name and then provide the name(s) of the scaled species and the corresponding scaling factors (A,B where $x' = Ax+B$).

A(Default=1.0) B(Default=0.0)

```
* MODDAT =NOFILES.DAT            *  
*     SO2   =     1,                      0.0   *  
*     SO4   =     1,                      0.0   *  
*     HNO3   =     1,                      0.0   *
```

* NO3 = 1, 0.0 *
END

SAMPLE CALPOST CONTROL FILE

Conoco Phillips BART Analysis - Caney Creek CALPOST
2001 (Ozone files Included)
----- Run title (3 lines)

CALPOST MODEL CONTROL FILE

INPUT GROUP: 0 -- Input and Output File Names

Input Files

File	Default File Name	
Conc/Dep Flux File	MODEL.DAT	! MODDAT =2001.PU.VIS.DAT
!		
Relative Humidity File	VISB.DAT	! VISDAT =01PFC1V.VIS !
Background Data File	BACK.DAT	*BACKDAT = *
Transmissometer/ Nephelometer Data File	VSRN.DAT	*VSRDAT = *

Output Files

File	Default File Name	
List File	CALPOST.LST	! PSTLST =CACR.vis.01.lst
!		

Pathname for Timeseries Files (blank) * TSPATH = *
(activate with exclamation points only if
providing NON-BLANK character string)

Pathname for Plot Files (blank) * PLPATH = *
(activate with exclamation points only if
providing NON-BLANK character string)

User Character String (U) to augment default filenames
(activate with exclamation points only if
providing NON-BLANK character string)

Timeseries TSttUUUU.DAT * TSUNAM = *

Top Nth Rank Plot RttUUUUU.DAT * TUNAM = *
or RttiiUUU.GRD

Exceedance Plot XtUUUUU.DAT * XUNAM = *
or XtUUUUU.GRD

Echo Plot jjjtthhU.DAT * EUNAM = *
(Specific Days) or jjjtthhU.GRD

Visibility Plot V24UUUUU.DAT * VUNAM = *
(Daily Peak Summary)

All file names will be converted to lower case if LCFILES = T
Otherwise, if LCFILES = F, file names will be converted to UPPER CASE
T = lower case ! LCFILES = T !
F = UPPER CASE

NOTE: (1) file/path names can be up to 70 characters in length
NOTE: (2) Filenames for ALL PLOT and TIMESERIES FILES are constructed
using a template that includes a pathname, user-supplied
character(s), and fixed strings (tt,ii,jjj, and hh), where
tt = Averaging Period (e.g. 03)
ii = Rank (e.g. 02)
jjj= Julian Day
hh = Hour(ending)
are determined internally based on selections made below.
If a path or user-supplied character(s) are supplied, each
must contain at least 1 non-blank character.

!END!

INPUT GROUP: 1 -- General run control parameters

Option to run all periods found
in the met. file(s) (METRUN) Default: 0 ! METRUN = 0 !

METRUN = 0 - Run period explicitly defined below
METRUN = 1 - Run all periods in CALPUFF data file(s)

Starting date: Year (ISYR) -- No default ! ISYR = 2001
!
(used only if Month (ISMO) -- No default ! ISMO = 1 !
METRUN = 0) Day (ISDY) -- No default ! ISDY = 1 !
 Hour (ISHR) -- No default ! ISHR = 0 !

Number of hours to process (NHRS) -- No default ! NHRS = 8760
!

Process every hour of data?(NREP) -- Default: 1 ! NREP = 1 !
(1 = every hour processed,
2 = every 2nd hour processed,
5 = every 5th hour processed, etc.)

Species & Concentration/Deposition Information

Species to process (ASPEC) -- No default ! ASPEC = VISIB
!
(ASPEC = VISIB for visibility processing)

Layer/deposition code (ILAYER) -- Default: 1 ! ILAYER = 1 !
'1' for CALPUFF concentrations,
'-1' for dry deposition fluxes,
'-2' for wet deposition fluxes,
'-3' for wet+dry deposition fluxes.

Scaling factors of the form: -- Defaults: ! A = 0.0 !
X(new) = X(old) * A + B A = 0.0 ! B = 0.0 !

(NOT applied if A = B = 0.0) B = 0.0

Add Hourly Background Concentrations/Fluxes?

(LBACK) -- Default: F ! LBACK = F !

Receptor information

Gridded receptors processed? (LG) -- Default: F ! LG = F !

Discrete receptors processed? (LD) -- Default: F ! LD = T !

CTSG Complex terrain receptors processed?
(LCT) -- Default: F ! LCT = F !

--Report results by DISCRETE receptor RING?

(only used when LD = T) (LDRING) -- Default: F ! LDRING = F !

--Select range of DISCRETE receptors (only used when LD = T):

Select ALL DISCRETE receptors by setting NDRECP flag to -1;
OR

Select SPECIFIC DISCRETE receptors by entering a flag (0,1) for each

0 = discrete receptor not processed

1 = discrete receptor processed

using repeated value notation to select blocks of receptors:

416*0, 1048*1, 1482*0

Flag for all receptors after the last one assigned is set to 0

(NDRECP) -- Default: -1

! NDRECP = 258*0, 80*1!

--Select range of GRIDDED receptors (only used when LG = T):

X index of LL corner (IBGRID) -- Default: -1 ! IBGRID = -1 !
(-1 OR 1 <= IBGRID <= NX)

Y index of LL corner (JBGRID) -- Default: -1 ! JBGRID = -1 !
(-1 OR 1 <= JBGRID <= NY)

X index of UR corner (IEGRID) -- Default: -1 ! IEGRID = -1 !
(-1 OR 1 <= IEGRID <= NX)

Y index of UR corner (JEGRID) -- Default: -1 ! JEGRID = -1 !
(-1 OR 1 <= JEGRID <= NY)

Note: Entire grid is processed if IBGRID=JBGRID=IEGRID=JEGRID=-1

--Specific gridded receptors can also be excluded from CALPOST processing by filling a processing grid array with 0s and 1s. If the processing flag for receptor index (i,j) is 1 (ON), that receptor will be processed if it lies within the range delineated by IBGRID, JBGRID, IEGRID, JEGRID and if LG=T. If it is 0 (OFF), it will not be processed in the run. By default, all array values are set to 1 (ON).

Number of gridded receptor rows provided in Subgroup (1a) to identify specific gridded receptors to process

(NGONOFF) -- Default: 0 ! NGONOFF = 0

!

!END!

Subgroup (1a) -- Specific gridded receptors included/excluded

Specific gridded receptors are excluded from CALPOST processing by filling a processing grid array with 0s and 1s. A total of NGONOFF lines are read here. Each line corresponds to one 'row' in the sampling grid, starting with the NORTHERNMOST row that contains receptors that you wish to exclude, and finishing with row 1 to the SOUTH (no intervening rows may be skipped). Within a row, each receptor position is assigned either a 0 or 1, starting with the westernmost receptor.

0 = gridded receptor not processed
1 = gridded receptor processed

Repeated value notation may be used to select blocks of receptors:
23*1, 15*0, 12*1

Because all values are initially set to 1, any receptors north of the first row entered, or east of the last value provided in a row, remain ON.

(NGXRECP) -- Default: 1

INPUT GROUP: 2 -- Visibility Parameters (ASPEC = VISIB)

Maximum relative humidity (%) used in particle growth curve
(RHMAX) -- Default: 98 ! RHMAX = 95.0

!

Modeled species to be included in computing the light extinction

Include SULFATE? (LVSO4) -- Default: T ! LVSO4 = T !
Include NITRATE? (LVNO3) -- Default: T ! LVNO3 = T !
Include ORGANIC CARBON? (LVOC) -- Default: T ! LVOC = F !
Include COARSE PARTICLES? (LVPMC) -- Default: T ! LVPMC = F !
Include FINE PARTICLES? (LVPMF) -- Default: T ! LVPMF = T !
Include ELEMENTAL CARBON? (LVEC) -- Default: T ! LVEC = F !

And, when ranking for TOP-N, TOP-50, and Exceedance tables,

Include BACKGROUND? (LVBK) -- Default: T ! LVBK = T !

Species name used for particulates in MODEL.DAT file

COARSE (SPECPMC) -- Default: PMC ! SPECPMC = PMC !
FINE (SPECPMF) -- Default: PMF ! SPECPMF = PM10

!

Extinction Efficiency (1/Mm per ug/m**3)

MODELED particulate species:

PM COARSE (EETPMC) -- Default: 0.6 ! EETPMC = 0.6 !
PM FINE (EETPMF) -- Default: 1.0 ! EETPMF = 1.0 !

BACKGROUND particulate species:

PM COARSE (EETMCBK) -- Default: 0.6 ! EETMCBK = 0.6 !

Other species:

AMMONIUM SULFATE (EESO4) -- Default: 3.0 ! EESO4 = 3.0 !
AMMONIUM NITRATE (EENO3) -- Default: 3.0 ! EENO3 = 3.0 !
ORGANIC CARBON (EEOC) -- Default: 4.0 ! EEOC = 4.0 !
SOIL (EESOIL)-- Default: 1.0 ! EESOIL = 1.0 !
ELEMENTAL CARBON (EEEC) -- Default: 10. ! EEEC = 10.0 !

Background Extinction Computation

Method used for background light extinction
(MVISBK) -- Default: 2 ! MVISBK = 6 !

1 = Supply single light extinction and hygroscopic fraction
- IWAQM (1993) RH adjustment applied to hygroscopic
background
and modeled sulfate and nitrate

2 = Compute extinction from speciated PM measurements (A)
- Hourly RH adjustment applied to observed and modeled
sulfate
and nitrate
- RH factor is capped at RHMAX

3 = Compute extinction from speciated PM measurements (B)
- Hourly RH adjustment applied to observed and modeled
sulfate
and nitrate
- Receptor-hour excluded if RH>RHMAX
- Receptor-day excluded if fewer than 6 valid receptor-
hours

4 = Read hourly transmissometer background extinction
measurements
- Hourly RH adjustment applied to modeled sulfate and
nitrate
- Hour excluded if measurement invalid (missing,
interference,
or large RH)
- Receptor-hour excluded if RH>RHMAX
- Receptor-day excluded if fewer than 6 valid receptor-
hours

5 = Read hourly nephelometer background extinction
measurements
- Rayleigh extinction value (BEXTRAY) added to measurement
- Hourly RH adjustment applied to modeled sulfate and
nitrate
- Hour excluded if measurement invalid (missing,
interference,
or large RH)
- Receptor-hour excluded if RH>RHMAX
- Receptor-day excluded if fewer than 6 valid receptor-
hours

6 = Compute extinction from speciated PM measurements
- FLAG RH adjustment factor applied to observed and
modeled sulfate and nitrate

Additional inputs used for MVISBK = 1:

Background light extinction (1/Mm)
(BEXTBK) -- No default ! BEXTBK = 12.0 !
Percentage of particles affected by relative humidity
(RHFRAC) -- No default ! RHFRAC = 10.0 !

Additional inputs used for MVISBK = 6:

Extinction coefficients for hygroscopic species (modeled and background) are computed using a monthly RH adjustment factor in place of an hourly RH factor (VISB.DAT file is NOT needed). Enter the 12 monthly factors here (RHFAC). Month 1 is January.

(RHFAC) -- No default ! RHFAC = 3.4, 3.1, 2.9, 3.0, 3.6, 3.6, 3.4, 3.4, 3.6, 3.5, 3.4, 3.5!

Additional inputs used for MVISBK = 2,3,6:

Background extinction coefficients are computed from monthly CONCENTRATIONS of ammonium sulfate (BKSO4), ammonium nitrate (BKNO3), coarse particulates (BKPMC), organic carbon (BKOC), soil (BKSOIL), and elemental carbon (BKEC). Month 1 is January. (ug/m**3)

(BKSO4) -- No default ! BKSO4 = 0.23, 0.23, 0.23, 0.23, 0.23, 0.23, 0.23, 0.23, 0.23, 0.23, 0.23, 0.23 !
(BKNO3) -- No default ! BKNO3 = 0.10, 0.10, 0.10, 0.10, 0.10, 0.10, 0.10, 0.10, 0.10, 0.10, 0.10, 0.10 !
(BKPMC) -- No default ! BKPMC = 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0 !
(BKOC) -- No default ! BKOC = 1.4, 1.4, 1.4, 1.4, 1.4, 1.4, 1.4, 1.4, 1.4, 1.4, 1.4, 1.4 !
(BKSOIL) -- No default ! BKSOIL= 0.50, 0.50, 0.50, 0.50, 0.50, 0.50, 0.50, 0.50, 0.50, 0.50, 0.50, 0.50 !
(BKEC) -- No default ! BKEC = 0.02, 0.02, 0.02, 0.02, 0.02, 0.02, 0.02, 0.02, 0.02, 0.02, 0.02, 0.02 !

Additional inputs used for MVISBK = 2,3,5,6:

Extinction due to Rayleigh scattering is added (1/Mm)
(BEXTRAY) -- Default: 10.0 ! BEXTRAY = 10.0!

!END!

INPUT GROUP: 3 -- Output options

Documentation

Documentation records contained in the header of the CALPUFF output file may be written to the list file. Print documentation image?

(LDOC) -- Default: F ! LDOC = F !

Output Units

Units for All Output	(IPRTU) -- Default: 1	! IPRTU = 3	!
for	for		
Concentration	Deposition		
1 = g/m**3	g/m**2/s		
2 = mg/m**3	mg/m**2/s		
3 = ug/m**3	ug/m**2/s		
4 = ng/m**3	ng/m**2/s		
5 = Odour Units			

Visibility: extinction expressed in 1/Mega-meters (IPRTU is ignored)

Averaging time(s) reported

1-hr averages	(L1HR) -- Default: T	!	L1HR = F	!
3-hr averages	(L3HR) -- Default: T	!	L3HR = F	!
24-hr averages	(L24HR) -- Default: T	!	L24HR = T	!
Run-length averages	(LRUNL) -- Default: T	!	LRUNL = F	!

User-specified averaging time in hours - results for
an averaging time of NAVG hours are reported for
NAVG greater than 0:

(NAVG) -- Default: 0	!	NAVG = 0	!
----------------------	---	----------	---

Types of tabulations reported

- 1) Visibility: daily visibility tabulations are always reported for the selected receptors when ASPEC = VISIB. In addition, any of the other tabulations listed below may be chosen to characterize the light extinction coefficients.
[List file or Plot/Analysis File]
- 2) Top 50 table for each averaging time selected
[List file only]
(LT50) -- Default: T ! LT50 = F !
- 3) Top 'N' table for each averaging time selected
[List file or Plot file]
(LTOPN) -- Default: F ! LTOPN = F !

-- Number of 'Top-N' values at each receptor selected (NTOP must be <= 4)
(NTOP) -- Default: 4 ! NTOP = 4 !

-- Specific ranks of 'Top-N' values reported (NTOP values must be entered)
(ITOP(4) array) -- Default: ! ITOP = 1, 2, 3, 4

!

1,2,3,4

A plotting and analysis file can also be created for the daily peak visibility summary output, in DATA format only.

Generate Plot file output in addition to writing tables to List file?

(LPLT) -- Default: F ! LPLT = F !

Use GRID format rather than DATA format, when available?

(LGRD) -- Default: F ! LGRD = F !

Additional Debug Output

Output selected information to List file for debugging?

(LDEBUG) -- Default: F ! LDEBUG = F !

!END!

MODELED STACK PARAMETERS AND EMISSION RATES

Conoco Phillips - BART Screening Analysis Modeling Parameters

EPN	FIN	Description	UTM X (m)	UTM Y (m)	LCC X (km)	LCC Y (km)	Stack Height (m)	Elevation (m)	Diameter (m)	Exit Velocity (m/s)	Temperature (K)	SO2 (lb/hr)	SO4 (lb/hr)	NOx (lb/hr)	HNO3 (lb/hr)	NO3 (lb/hr)	PM10 (lb/hr)
10-1	10H1	heater	286439	3953334	-392.035	-465.965	28.47	924.8	2.36	3.41	446.9	1.57		6.74			0.87
11-1	11H1	heater	285774	3952524	-392.715	-466.757	27.43	933	1.07	11.25	435.93	0.15		10.44			0.65
19-3	19H3	heater	286283	3953207	-392.193	-466.088	30.5	918.7	2.26	4.94	533.15	1.14		15.20			0.70
19-4	19B2/19H4	heater	286270	3953115	-392.208	-466.179	19.66	919.7	1.22	20.57	438.71	0.24		5.82			0.64
19-5	19H5	heater	286284	3953131	-392.194	-466.163	15	920.1	0.82	6.25	616.48	0.43		1.63			0.24
19-6	19H6	heater	286279	3953246	-392.196	-466.049	33.53	918.3	3.03	4.27	533.15	2.80		13.35			0.62
28-1	28H1	heater	286372	3953365	-392.101	-465.932	29.23	923.7	2.73	4.57	438.71	3.48		11.82			1.94
34I1	34I1	U34 SRU Incinerator	285775	3952491	-392.715	-466.79	60.96	933.4	1.22	4.94	726.48	2.63		1.48			0.15
36-1	36H1	heater	286402	3953364	-392.071	-465.934	27.43	923.9	1.52	5.24	533.15	0.06		25.60			0.65
40-2	40H2	heater	285994	3952819	-392.489	-466.468	33.53	926.7	1.05	7.62	644.26	1.33		20.51			0.74
55-1	55E1	U55 Clark compressor	286024	3952913	-392.457	-466.375	18	926.6	0.46	4.65	533.15	0.00		10.58			0.06
55-2	55E2	U55 Clark compressor	286017	3952914	-392.464	-466.374	18	926.6	0.46	4.65	533.15	0.00		10.58			0.06
55-3	55E3	U55 Clark compressor	286009	3952914	-392.472	-466.373	18	926.7	0.46	4.65	533.15	0.00		10.58			0.06
9-1	9H1	heater	286339	3953335	-392.134	-465.961	25.79	923.5	2.03	5.37	438.71	0.33		27.39			1.19
66FL6	66FL6	H2S Emergency Flare	285147	3952863	-393.33	-466.404	38.1	904.8	0.8	20	1273	37.50		0.32			0.00

¹ All Parameters and Emission rates are from Client. Per call with Quarshie on 03/08/07 emission rates are provided in lb/day.

² UTM coordinates are in Zone 14 and Nad 27 per phone call between Quarshie and Christine Otto on 3/7/07.

³ Lat/Long were converted to LCC using the following coordinates:

Ref. Latitude -97
 Ref. Longitude 40
 Std. Parallel 33
 Std. Parallel 45

ELECTRONIC MEDIA DATA AND FILE INDEX

CALPUFF FILES

01PFC1V.*fff*
02PFC1V.*fff*
03PFC1V.*fff*

fff = **inp** denotes CALPUFF input files

fff = **lst** denotes CALPUFF output summary files

fff = **dat** denotes CALPUFF output concentration files

fff = **vis** denotes CALPUFF output relative humidity data files

Ozone Data Files

Ozone_YYYY. dat

YYYY = denotes data analysis years 2001, 2002, and 2003

POSTUTIL FILES

2001.PU.VIS.*fff*
2002.PU.VIS.*fff*
2003.PU.VIS.*fff*

fff = **inp** denotes POSTUTIL input files

fff = **lst** denotes POSTUTIL output summary files

fff = **dat** denotes POSTUTIL output concentration files

CALPOST FILES

Caney Creek

CACR.VIS.01.*fff*
CACR.VIS.02.*fff*
CACR.VIS.03.*fff*

Hercules-Glades

HEGL.VIS.01.*fff*
HEGL.VIS.02.*fff*
HEGL.VIS.03.*fff*

Mingo

MING.VIS.01.*fff*
MING.VIS.02.*fff*
MING.VIS.03.*fff*

Upper Buffalo

UPBU.VIS.01.*fff*
UPBU.VIS.02.*fff*
UPBU.VIS.03.*fff*

Wichita Mountains

WIMO.VIS.01.*fff*
WIMO.VIS.02.*fff*
WIMO.VIS.03.*fff*

fff = **inp** denotes CALPOST input files

fff = **lst** denotes CALPOST output summary files