Appendix 2: Point Source Inventory Projection Methodology

Updated 2002 Base Year Inventory

For emissions inventory purposes, point sources are defined as industrial, commercial, or institutional sites that meet the reporting requirements of 30 Texas Administrative Code, §101.10. The reporting requirements depend on the attainment status of the county and the site's actual and potential emissions levels. For the 2002 base year, eight Houston/Galveston/Brazoria (HGB) area counties were designated as nonattainment for ozone: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller. The actual emissions reporting thresholds for sites located in the eight HGB nonattainment counties were: 10 tons per year (tpy) of VOC, 25 tpy of NO_x, or 100 tpy of any other criteria pollutant (CO, SO_2, PM_{10}, $PM_{2.5}$, or lead). Any site that emits or has the potential to emit at least 10 tpy of any single Hazardous Air Pollutant (HAP) or 25 tpy of aggregate HAPs is also required to complete an emissions inventory questionnaire (EIQ). For 2002, the potential emissions reporting thresholds for sites located in the eight HGB nonattainment counties were: 25 tpy of VOC, 25 tpy of NO_x, or 100 tpy of any other criteria pollutant. The following TCEQ web page contains point source emissions inventory guidance documents and a listing of the 2002 and other historical point source inventories of criteria pollutants:
http://www.tceq.state.tx.us/implementation/air/industei/psei/psei.html.

The commission mails EIQs to point sources which have been identified as meeting the reporting requirements. These sources are required to report emissions data for all emissions generating units and emissions points, and to provide representative samples of calculations used to estimate the emissions. Information is also required on process equipment, operating schedules, emission control devices, abatement device control efficiencies, and emission point discharge parameters such as location, height, and exhaust gas flow rates. All EIQ data are quality assured.and then stored in the State of Texas Air Reporting System (STARS) database.

The 2002 baseline year inventory was retrieved from STARS on June 20, 2006. The inventory includes data from all sites that submitted inventories in the HGB area, and reflects revisions made on or before that date. County-level VOC emissions were revised to account for nonreported VOCs discovered in the Texas Air Quality Study (TexAQS) of 2000. TexAQS 2000 measured ambient VOC concentrations in the Houston Ship Channel to be several times greater than estimates reported in the TCEQ's emissions inventory. Additional information is available in appendixes A.1 and A.2.

Updated Uncontrolled 2008 Milestone Year Inventory

The TCEQ used the 2002 base year inventory to develop the uncontrolled 2008 future year point source inventory. The 2002 inventory was grown by applying growth factors and adding both emissions credits and nonreported VOCs from TexAQS 2000. The emissions growth was determined by multiplying the baseline inventory by growth factors that represent the projection of industrial expansion to the year 2008. Emissions were then added to account for the unused banking and trading emissions credits. Additional adjustments were made to county level VOC emissions to account for nonreported VOC emissions discovered during TexAQS 2000.

The emissions were projected from 2002 to 2008 using factors derived from the following sources: the Texas Industrial Production Index (TIPI) factors, the Economic Growth Analysis System (EGAS) 5.0, the Regional Economic Modeling, Inc. (REMI) Texas model, and Moody's Economy, Inc. factors. Factors sets from each source were obtained for each Standard Industrial

Classification (SIC) at the county level. The 2002 and 2004 reported emissions inventories were compared to obtain actual growth factors by SIC, county, and pollutant. This reported growth was then compared to the different projection factors for growth between 2002 and 2004. The factor that most closely corresponded to reported growth was then used to project the 2002 base inventory to 2008. In limited circumstances, reported growth was unable to be obtained. For these cases, Moody's Economy factors were used because this factor set most often corresponded to overall reported growth.

Moody's Economy, Inc. factors were contracted by the commission in August 2005. These factors are based on a variety of trends data including employment, demographics, and construction activity. For more information on this forecasting and analysis method, please visit the http://www.economy.com web site. These projection factors matched the reported growth from 2002 to 2004 more frequently than the other factor sets. Accordingly, these factors were used in the few cases where reported growth could not be obtained.

EGAS factors corresponded to reported growth less frequently than the Moody's Economy, Inc. factor set. The EGAS factor set was obtained from the most recent EGAS model, dated March 2006, available at: http://www.epa.gov/ttn/ecas/egas5.htm. According to the Version 5.0 user's manual, the Economic Growth Analysis System is "an economic activity forecast tool designed by EPA that generates credible growth factors used in the development of emissions inventories. This tool is intended for use by States, Regional Planning Organizations, local governments, and the EPA, so these entities may project air pollution emissions and design appropriate policies to control them."

TIPI factors corresponded to the reported growth slightly less frequently than EGAS factors. TIPI data from January 1967 through April 2007 were used in a linear regression analysis to project certain emissions in the 2002 base inventory from 2002 to 2008. According to the Federal Reserve Bank of Dallas, the TIPI is a value-added index based on a weighted average of employment, man hours, and certain production data. The index measures the output of the manufacturing, mining, and utility sectors of the Texas economy. These sectors are of special interest because of their sensitivity to business cycles and because of the size of the Texas mining sector. The Federal Reserve Bank of Dallas has published the index since 1958, and revisions are implemented when new data sources are available or when methodological improvements are devised. See the http://www.dallasfed.org/data/index.html for more information.

The REMI factors corresponded least often to reported growth from 2002 to 2008. The REMI factors used were developed specifically for Texas on a county level. Although several EGAS projection factors are based on REMI data, certain EGAS factors are only available on a state level; therefore, the commission contracted REMI to obtain factors more specific to all Texas counties in August 2005.

Growth in NO_x and VOC emissions in the HGB area was partially accounted for by adding the emissions credits banked in the Emissions Banking and Trading (EBT) database to the projected inventory, since these banked emissions are able to return to the airshed in the future as companies elect to use them. These emissions were added to the inventory after the growth factors were applied. Emission Reduction Credits (ERC) and Discrete Emission Reduction Credits (DERC) totals as of July 2006 were used. For ERCs and DERCs, a new source review (NSR) permitting offset ratio of 1.15:1 was applied. This adjustment presumes that all of the credits will be used within one year for the ERCs. For the DERCs, the VOC credits were assumed to be used over seven years, but due to the large number of NO_x DERCs, the yearly

maximum of 2500 tons per year was used. For the banked ERCs and DERCs, 0.98 tpd of NO_x and 0.92 tpd of VOC were added to the 2008 HGB projected inventory. The ERC and DERC transactions from 2002 to 2006 were also considered. An offset ratio of 1.3:1 was used for these transactions due to the 8-hour ozone nonattainment designations in 2004. The ERC transactions added 2.45 tpd of NO_x and 1.70 tpd of VOC to the 2008 uncontrolled inventory. Since DERCs are used for short-term emission increases, the DERC transactions between 2002 and 2006 were not included.

Updated Controlled 2008 Milestone Year Inventory

The controlled 2008 inventory was obtained by applying future controls to the uncontrolled 2008 inventory. The 2008 controlled projected inventory accounted for emission reductions from regulations in effect between 2002 and 2008.

The 2008 Mass Emissions Cap and Trade (MECT) program allowances reflect all future NO_x controls in the HGB are, including the 30 Texas Administrative Code, §117 NO_x rules. These rules regulate electric generating units (EGU) and non-electric generating units (NEGUs) in the HGB area; specifically, the regulated NEGU equipment includes industrial boilers larger than 40 MMBtu/hr that were placed into service prior to 1992 and industrial engines larger than 300 horsepower (hp) that were placed into service prior to 1992.

The total emissions allotted under the 2008 NOx emissions cap were used as the emissions for sources regulated by the MECT program in the 2008 controlled inventory. The commission adopted the MECT program under 30 Texas Administrative Code, §101, Subchapter H, Division 3 on December 6, 2000. This program is mandatory for stationary facilities in the HGB nonattainment area with a collective design capacity of 10 tons or more per year of NO_x and subject to the NO_x State Implementation Plan rules under 30 Texas Administrative Code, §117 . Facilities subject to this program were required to certify their levels of activity with the Emissions Banking and Trading Program by June 30, 2001, for use in determining their annual NO_x allowances. These allowances are then reduced several times between 2002 and 2008. The MECT program began on January 1, 2002, and the final reduction to the emissions cap will occur in 2007.

The non-capped NO_x and VOC emissions were projected from 2002 to 2008 using factors derived from the TIPI, EGAS 5.0, the REMI Texas model, and Moody's Economy, Inc. The 2008 uncontrolled inventory method described above was used to project these emissions.

Additional adjustments were made to county level VOC emissions to account for nonreported VOC emissions discovered during TexAQS 2000. These VOC emissions did not contribute as much to the controlled projected 2008 inventory as in the 2002 baseline and uncontrolled projected 2008 inventories due to the highly reactive VOC (HRVOC) emissions cap program that will be implemented on January 1, 2007. This program will establish a mandatory annual HRVOC emissions cap on all sites located in the HGB area that have the potential to emit more than ten tpy of HRVOC and that are subject to the HRVOC control requirements of 30 Texas Administrative Code, §115, Subchapter H, Division 1, Vent Gas Control, or Division 2, Cooling Tower Heat Exchange Systems.

For controlled sources in the HGB area, potential future NO_x and VOC emissions growth is accounted for by adding emissions credits banked in the EBT database to the 2008 controlled inventory. For banked ERCs and DERCs, the 2008 uncontrolled inventory method described above was used to account for these emissions. The ERC transactions from 2002 to 2006 were also considered. Only the VOC transactions were included, since the NO_x transactions were

already reflected in the MECT 2008 cap. An offset ratio of 1.3:1 was used for these transactions due to the 8-hour ozone nonattainment designations in 2004. Since DERCs are for short term emission increases, the DERC transactions between 2002 and 2006 were not included.