

Technical Memorandum #6

Development of a List of BART-Eligible Sources in the MANE-VU Region: Interim Report

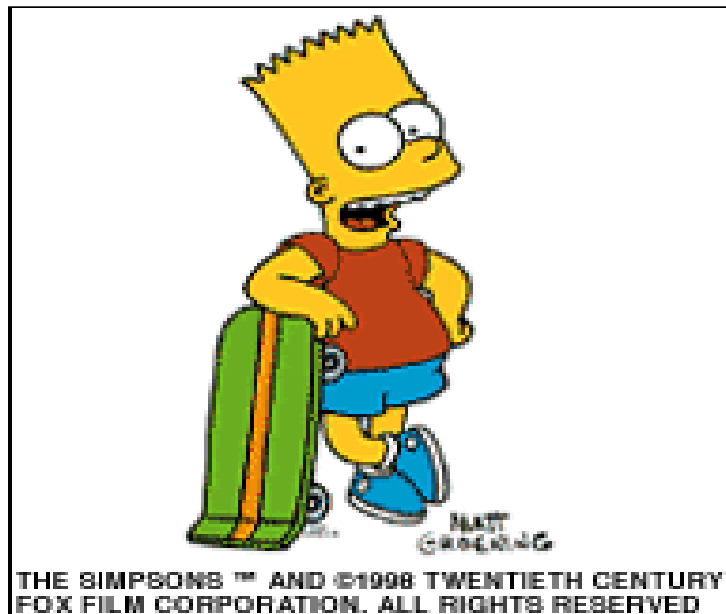
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For the:

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Dedication to Charlie Mentos

This report is dedicated to the memory of our friend and colleague Charlie Mentos from the Massachusetts DEP who died earlier this year after a long battle with cancer. Charlie participated in this project and dedicated 25 years of his professional life to improving air quality and protecting public health. He will be missed.

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Executive Summary

BART provisions of the 1999 Regional Haze Rule call for “Retrofit” control technology on a specific class of emission sources that were unlikely to have been controlled under other CAA requirements. Theoretically, BART would impose controls on these units to assist states in improving visibility at Class I areas throughout the region. While some uncertainties exist regarding the implementation and timing of a future program of BART controls, it is likely that States and Tribes will need to consider a program of controls similar in scope and magnitude to the proposed BART program in order to achieve reasonable progress during the first compliance period (2008-2018). In order to effectively achieve the results required under the regional haze program, states should develop a control program that focuses on the population of emission units that have not been regulated under other provisions of the CAA and lack modern pollution control equipment.

In this memorandum, NESCAUM has developed a preliminary listing of those sources which may be eligible for Best Available Retrofit Technology based on a methodology for identifying those sources that meet the BART eligibility criteria. This process involves the use of Title V permit information, including final permit, applications, and technical reviews. The interim listing of BART-eligible sources resulting from this process addresses only the 25 non-EGU source categories and details on BART eligible power plants can be found elsewhere (NESCAUM, 2001). In addition, this study was limited to only 9 of the 14 MANE-VU jurisdictions since Pennsylvania and the District of Columbia are developing their own BART-eligible source lists¹ and we believe that no (non-EGU) BART-eligible sources exist in Vermont or on the St. Regis Mohawk or Penobscot reservations.

Before this interim listing becomes final, the inventory of sources must be completed and the lists must be carefully reviewed by each individual state agency to ensure their satisfaction with the results. The development of this list has determined 66 non-EGU sources that are eligible for subsequent BART analyses and 87 additional sources that may be eligible. States will need to verify the accuracy of the identifications made by NESCAUM and conduct additional research to determine the eligibility of those sources determined as “MAYBE eligible” by the NESCAUM survey.

Preliminary results suggest that of the 66 BART-eligible non-EGU sources, 26% are industrial boilers and 21% are kraft pulp mills. The remaining 53% are in a variety of source categories but account for only 8% and 34% of BART-eligible SO₂ and NO_x emissions from the non-EGU sectors, respectively (excluding a single refinery that emits 64% and 37% of these emissions by itself!). The reader is cautioned, however, that these numbers are likely to change as further research clarifies the eligibility status of the 87 sources classified as “Maybe BART-eligible” here.

¹ The District of Columbia has identified two BART-eligible sources, both boilers. Pennsylvania’s list of BART-eligible sources is not yet available.

Before states and tribes proceed with the subsequent steps of determining which of these sources are subject to BART and conducting BART determinations, a number of recommendations have been generated as a result of this project. These include:

- States and Tribes may want to consider expanding the date range of BART eligible units to include pre-1962 units that have not otherwise been controlled to achieve visibility goals under the regional haze rule.
- MANE-VU should gather updated actual emissions information (as opposed to potential emissions) for BART-eligible sources and inventory existing controls on these units to determine the efficacy of imposing controls on these units.
- MANE-VU should conduct a detailed examination of the interaction of BART with other control programs so the states and tribes charged with carrying out BART determinations can fully evaluate the effect of BART.
- MANE-VU should conduct an analysis of all BART-eligible categories and the emissions reduction potential from each to understand the likely visibility impacts of potential control programs.
- MANE-VU should conduct an analysis of haze-related emission reduction potential from source categories outside the scope of the BART to identify additional options for state and tribal compliance options.
- MANE-VU should assess the need for additional data analysis and modeling to develop contribution assessments that can be applied as ‘subject to BART’ criteria as well as to fulfill those requirements of the engineering analysis of the BART determination process.

I. Introduction

In 1999, the U.S. Environmental Protection Agency (US EPA) issued a regulation aimed at restoring natural visibility conditions to 153 Federal Class I areas across the country. This regulation, termed the Regional Haze Rule (64 Fed. Reg. 35,714, July 1, 1999; hereafter referred to as the “Haze Rule”), requires states and tribes to develop plans for achieving reasonable progress toward the national visibility goals. Initial plans were to be submitted one year after the designation of attainment areas or three years after designation of nonattainment areas for fine particulate matter (PM_{2.5}) under the National Ambient Air Quality Standard (NAAQS). Given the regional nature of the causes and extent of visibility impairment in rural Class I areas, interested states and tribes were invited to participate in a regional planning process and extend their SIP submissions until 3 years after attainment designations, but no later than December 31, 2008. States and tribes that elected to take advantage of the regional planning options were compelled to submit a “regional planning” or “committal” SIP one year after attainment or nonattainment designations were made to ensure participation and demonstrate that a regional planning process was in place.

This so called committal SIP has few substantive requirements, but one element of significance – for which little information existed – was an inventory of sources within each state or tribal jurisdiction that would be eligible for controls under the Best Available Retrofit Technology (BART) provisions of the Haze Rule. BART provisions were included in the Haze Rule to provide a mechanism for achieving visibility improvements in haze SIPs. These provisions call for “Retrofit” controls on a specific class of emission units within a source that were unlikely to have been controlled under other CAA requirements.

We note that there is a distinction within the Haze Rule between facilities that are *eligible* for BART controls and those *subject* to BART controls. BART eligibility requirements are the subject of this technical memorandum and are discussed in detail throughout the subsequent chapters. A BART “eligible” facility generally refers to a source from one of twenty-six identified source categories that has the potential to emit 250 tons or more of any visibility impairing pollutant and went into operation during the 15 years prior to adoption of the 1977 CAA amendments. Under §169A of the Clean Air Act (CAA) each BART-eligible source must then be deemed *subject* to BART by individual states or tribes after consideration of the following five factors: the cost of compliance, the energy and non-air quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology.

Industry groups challenged the Haze Rule as it relates to the method by which it directs states to the degree of visibility improvement resulting from application of BART controls. Under EPA’s interpretation of the statute, a state would deem sources subject to BART if they emitted emissions into a geographic area or region that likely transports pollutants downwind into a protected area. This is consistent with an earlier National

Academy of Sciences assessment that the alternative *source-by-source* consideration of visibility impacts was prohibitively costly and time consuming, and “doomed to failure,” (NAS, 1993). Nevertheless, on May 24, 2002, the D.C. Circuit Court of Appeals agreed in the majority with industry petitioners and vacated those portions of the Haze Rule dealing with BART. EPA is considering options for revising the rule appropriately. In addition, another decision by the D.C. circuit released on May 24, 2003 – may affect the timing of SIP submissions and potentially eliminate the regional planning or committal SIP.

Regardless of uncertainties over the implementation and timing of a future program of BART controls, it seems likely that States and Tribes will need to consider a program of controls similar in scope and magnitude to the proposed BART program in order to achieve reasonable progress during the first compliance period (2008-2018). It is sensible to focus a control program on the population of sources that has not been regulated under other provisions of the CAA, given the likelihood of cost-effective emissions reduction potential. However, States and Tribes may also want to consider including sources older than the BART-eligibility cutoff of 1962 in addition to the BART-Eligible pool identified in this document. Analysis completed under this project identified a significant number of major emission units that pre-date the BART period.

In this technical memoranda, NESCAUM has developed a methodology for identifying those sources that meet the BART eligibility criteria involving the use of Title V permit information, including final permit, applications, and technical reviews. That methodology is then applied to sources in the Mid-Atlantic/Northeast Visibility Union (MANE-VU) region² to develop an interim listing of BART-eligible sources from the 25 non-EGU source categories identified by statute.³ Before this interim listing becomes final, the inventory of sources must be completed and the lists must be carefully reviewed by each individual state agency to ensure their satisfaction with the results. A brief

² NESCAUM did not develop BART-Eligible source lists for the State of Vermont or any of the member Tribes in MANE-VU. None of these jurisdictions have any BART-eligible sources to our knowledge. The state of Pennsylvania has also not been included in the development of these lists and plans to develop its own BART-eligible source lists independently. The District of Columbia developed a BART-Eligible source list following its own methodology and identified two eligible sources.

³ A previous analysis has developed a draft inventory of BART-eligible fossil-fuel power plants across a broader 29-state region thought to potentially affect visibility in MANE-VU class I areas. See NESCAUM 2001 (<http://64.2.134.196/regionalhaze/basis.pdf>) for a complete description of these results. States may use this report as a guideline for final determination of sources from this category.

review of the findings and their implications is presented in the memorandum and actual listings of sources are presented in the Appendices.

II. Bart Methodology

Three criteria must be met for a source to be “eligible” for consideration under the BART provisions of the Haze rule. Applicability is limited to those sources which:

1. Are in one of 26 specific source categories as identified in the Clean Air Act (see Table 2.1 for a list of these categories);
2. Have units that were in existence on August 7, 1977,⁴ but had not been in operation for more than fifteen years as of that date (prior to August 7, 1962);
3. Have a potential to emit (PTE) 250 tons per year (TPY) or more of any single visibility impairing pollutant from units that satisfy criterion #2. These pollutants include SO₂, NO_x, VOCs, PM₁₀ and ammonia.

NESCAUM has developed a top-down evaluation process for determining BART eligibility within 25 non-EGU major point source categories.⁵ This process is similar to EPA’s suggested approach to determining BART-eligible facilities⁶ but includes an additional step to eliminate facilities that are obviously ineligible on an emissions basis. Steps include: the identification of sources within the 25 eligible source categories, elimination of obvious ineligible sources to develop a “short-list”, determination of unit installation dates and emission potentials, and final determination of BART-eligibility. Each of these steps is described in detail below.

A. Determination of Facilities within the 25 BART-Eligible Source Categories

To identify units that will ultimately be examined under the BART provisions of the Haze Rule, NESCAUM used a variety of information sources. EPA’s draft 1999 National Emissions Inventory (NEI)⁷ and the state’s list of Title V sources were used to determine if a facility operated under a pertinent source category. The NEI is a database of criteria and hazardous air emissions data for stationary, mobile, and area sources, developed with data from State and Local air agencies, tribes, and industry. A draft inventory is prepared by EPA and reviewed by states for accuracy and completion. When this project commenced, the Draft Version 2 inventory for 1999 was the most recent inventory available, and was used for this project. Title V sources are sources whose potential to emit is over “major” thresholds.

From the NEI, SIC (Standard Industry Classification) codes and SCC (Subject Category Codes) numbers were obtained. A SIC code describes the industrial classification that a facility uses to describe its operations, and an SCC number describes

⁴August 7, 1977 is the date that Congress adopted the 1977 Clean Air Act Amendments.

⁵ See footnote 3.

⁶ US EPA, 2001.

⁷ <http://www.epa.gov/ttn/chief/eidocs/nei.html>

a piece of equipment, including its fuel use. A single unit may have several SCC numbers to indicate the range of different fuels it can use. A list of SIC and SCC codes that correspond to the 26 BART categories in the Haze Rule is included in the report *Assessment of Emissions Inventory Needs for Regional Haze Plans* (MARAMA, 2001). In the course of performing this work, NESCAUM identified additional applicable codes for some of these categories. Table II-1 provides the final list of codes that NESCAUM used to identify potential BART facilities.

Having obtained a list of BART-eligible SIC and SCC numbers, those sources in the NEI database and the States' Title V lists that did not have BART-eligible SICs or SCCs were eliminated. The Envirofacts and AIRS/AFS website was then used to identify any potential boiler or ammonia sources that may have been missed in the NEI or Title V databases. These databases pull data from a variety of EPA information sources and thus may include SIC designations that would not have been included in air-specific databases. Additionally, emissions data in the AIRS/AFS database is based inspection data and could include units absent from the NEI. This ensured that we identified any boiler source that may not have been captured by the Title V or NEI data. Finally, state air toxics programs were contacted to identify any ammonia sources that may have been absent from the other data sources. By using multiple data sources, this process is likely to have developed a complete list of BART-eligible facilities.

Table II-1: BART-eligible Categories and their SIC and SCC Codes

Source Category Name	Principal SIC	Principal SCC(s)	Bart Category
Fossil Fuel-Fired Steam Electric Plants (250 MM BTU heat input per hour)	4911	101xxxxx	1
Coal Cleaning Plants (thermal dryers)	1100, 2999	305010xx	2
Kraft Pulp Mills	2611, 2621	307001xx	3
Portland Cement Plants	3241	305006xx, 305007xx	4
Primary Zinc Smelters	33xx, 3339	30303002	5
Iron and Steel Mill Plants	3312, 332X	303015xx	6
Primary Aluminum Ore Reduction Plants	3334	303001xx	7
Primary Copper Smelters	3331	303005xx	8
Municipal Incinerators (>25 tons refuse per day)	4953	501001xx, 502005xx	9
Hydrofluoric, Sulfuric, and Nitric Acid Plants	2819, 2899	301070xx	10
Petroleum Refineries	2911	306xxxxx	11
Lime Plants	3274	305016xx	12
Phosphate Rock Processing Plants	1429, 1475	305019xx	13
Coke Oven Batteries	3312	303003xx	14
Sulfur Recovery Plants	2819	30603301, 31000208	15
Carbon Black Plants (furnace process)	2895	30100503, 30100509	16
Primary Lead Smelters	3339	303010xx	17
Fuel Conversion Plants	NA	NA	18
Sintering Plants	NA	NA	19
Secondary Metal Production Facilities	3341, 334X	304xxxxx	20
Chemical Process Plants	28XX, 2899	301xxxxx	21
Fossil Fuel-Fired Boilers (250 MM BTU heat input per hour)	NA	102001xx through 102007xx 103001xx through 103007xx	22
Petroleum Storage and Transfer Facilities (capacity > 300,000 barrels)	5171	306xxxxx	23
Taconite Ore Processing Plants	1011, 3295	303023xx	24
Glass Fiber Processing Plants	32xx	305012xx	25
Charcoal Production Facilities	2819, 2861	301006xx	26

After MARAMA (2001), Table 2.1. SCC code 501001xx for municipal incinerators was added to the list after consultation with MARAMA and Pacific Environmental Services. SIC codes for Coal Cleaning Plants; Kraft Pulp Mills; Primary Zinc Smelters; Iron and Steel Mill Plants; Hydrofluoric, Sulfuric, and Nitric Acid Plants; Secondary Metal Production Facilities; Chemical Process Plants; Taconite Ore Processing Plants; and Charcoal Production Facilities were added from the Prevention of Significant Deterioration (PSD) program's descriptors of these categories.

B. Creating a “short list” of eligible facilities

After identifying sources that may be eligible for BART based on SIC or SCC code, NESCAUM used the Title V source list from each state to narrow the number of facilities that required further examination. If a facility was captured by the NEI database for SIC or SCC code and had emissions from criteria pollutants (VOC, PM, NO_x and SO₂) but was not on the state’s Title V list, the facility was eliminated from further consideration. The Title V Program captures sources whose potential emissions are greater than “major” source level. Major emission levels vary given the attainment status of the pollutant but major levels are never greater than 250 tons PTE and are usually well below this level.⁸ NESCAUM assumed that sources with BART SIC’s or SCC’s in the NEI that were not included on a state’s Title V list must have a PTE less than the 250 TPY required for BART-eligibility.⁹ NESCAUM kept facilities that the NEI data identified as having ammonia emissions on the short list, regardless of whether or not they were included in the Title V Program. These facilities were kept on the short list because the Title V programs only incorporate federal programs, which regulate criteria pollutants and MACT/NESHAP¹⁰ sources. Ammonia emissions do not fall into this category. Therefore, the short list of sources subject to an in-depth review included sources from the appropriate SIC and SCC codes that were subject to the Title V program and any facility included in the NEI data with ammonia emissions.

C. Determining Unit Installation Dates and Potential Emissions

In most cases, installation dates and potential emissions data were found in each facility’s Title V application. NESCAUM staff reviewed the applications in each state’s offices, or when possible, at EPA New England’s Boston office, and collected data for all of the facilities on the “short list.” This data was entered into an Excel spreadsheet where dates were recorded for all units, but potential emissions were recorded only for units that may be BART-eligible in order to minimize the workload for the project.¹¹ We have included a description of the spreadsheet layout and the results for a sample in section E.2 below.

⁸ Major source emission thresholds in the MANE-VU region can vary from a PTE of 10 tons to 250 tons.

⁹ Some sources may have had calculated PTEs over the 250 TPY BART requirements but took caps that limited their emissions to below major levels. These sources are known as “synthetic minors”. Synthetic minors are sources whose potential emissions are over major thresholds but have taken a cap to avoid inclusion in the Title V program. Since these caps are federally enforceable, this cap becomes the new PTE, and this designation renders these facilities ineligible for the BART program under the requirements of the Haze Rule.

¹⁰ MACT stands for Maximum Available Control Technology. NESHAP stands for National Emissions Standards for Hazardous Air Pollutants.

¹¹ Determining the potential to emit for one or more units can be a time consuming process requiring a detailed examination of a Title V permit which can be hundreds of pages in length. This process was only performed once dating criteria had established that at least one unit at a facility may have been BART-Eligible.

Few states have converted the “hardcopy” Title V applications to their electronic state data systems, thus NESCAUM had to manually review application files for each facility on the “short list.” This step constituted the bulk of the work for this project, requiring extensive travel to state environmental department offices and considerable time reviewing Title V files from their archives.¹²

The terms “in existence” and “in operation” are important in the second criterion for BART-eligibility listed above. These terms and the implication of various definitions are described below.

C.1 Complex Definitions of Installation and Operation Dates

The BART program applies to units that were in existence on August 7, 1977 but were not in operation before August 7, 1962 (henceforth “the BART window”). This seems, at first glance, to be a straightforward criterion. However, determining the eligibility of a unit with a date outside the window can be more complex than is apparent. Applications generally require an installation date for each unit, but no date for commencing operation. Without a clear definition of “installation date” it is conceivable that each Title V applicant may have had a different interpretation of the term when gathering information for the application. These concerns must be addressed before an accurate determination can be made.

Definition of “in existence”

Large units can be constructed over a matter of weeks or years, and installation date could refer to anything between the groundbreaking and completion of construction. The BART Guidance attempts to clarify installation date by broadening the term, stating:

The owner or operator has obtained all necessary preconstruction approvals or permits required by Federal, State or local air pollution emissions and air quality laws or regulations and either has (1) begun, or caused to begin, a continuous program of physical on-site construction of the facility or (2) entered into binding agreements or contractual obligations, which cannot be canceled or modified without substantial loss to the owner or operator, to undertake a program of construction of the facility to be completed in a reasonable time.... Thus, the term “in existence” means the same as “commence construction” in the PSD regulations.

This definition of “in existence” is extremely broad. A facility which obtained construction permits – or even contracted design and construction during the BART window – could be BART-eligible. Consider the following example. A facility obtained construction permits for a new boiler on June 3, 1977. Construction of the unit commenced in January of 1978 and was completed in January of 1979. The boiler was used the following month. An application may list the date of installation as 1978 or

¹² The project benefited, to a great extent, from the central collection of many Title V applications at the EPA Region I offices and the extensive use of interns.

1979, making the unit appear ineligible for BART controls, even though it should be eligible because its permits were obtained within the BART window. Additionally, it is impossible to determine the precise date of installation (pre- or post-August 7) for units that list only “1977” as the installation date in Title V permit information.

NESCAUM’s solution to these problems was to examine units with installation dates as late as 1979. Units with installation dates in 1977, 1978, and 1979 were marked as “uncertain for eligibility” and their potential emissions were recorded.

Definition of “in operation”

The other term relevant to the BART window is “in operation.” Similar to “in existence” this term can be ambiguous. The “in operation” date refers to the date a unit actually began operations and not the date it was installed. Thus determining BART eligibility often depends on how a Title V applicant interpreted “installation date.” Subject to that interpretation, a unit that is listed on a state’s Title V list with an installation date of 1961 may or may not be eligible. For example, if 1961 was the year that construction commenced, regardless of when construction (installation) was complete, and the unit did not commence operation until after August 7, 1962, then the unit would be eligible. If construction commenced and installation was completed in 1961, it is still possible, though unlikely, that the unit commenced operation after August 7, 1962, and it may be eligible. Finally, if 1961 was interpreted as the installation date based on the unit commencing operation during that year, it would not be eligible. As was the case with “in existence,” Title V installation dates are also not sufficient to determine the precise date of installation (pre- or post-August 7) for units with 1962 listed as the installation date.


In order to deal with these ambiguities, units with installation dates as early as 1960 were reviewed. Units with installation dates of 1960, 1961 or 1962 were also marked as “uncertain for eligibility” and potential emissions were recorded.

Summary of NESCAUM’s BART-Eligible Date Range

In order to make accurate assessments of BART-eligibility, two questions must be answered. First, how did a Title V applicant interpret “installation” (i.e. what does the date on the form represent)? Second, how may this interpretation have affected the unit’s eligibility? Depending on the answers to these questions, units with installation dates between 1960 and 1979 could be found BART-eligible. Units with installation dates between 1960-1962 and 1977-1979 were marked as uncertain. Some sources with these units have been marked as “potentially” eligible and individual state agencies will be required to make a final determination.

Units with installation dates within the BART window were marked as “date-certain,” meaning that these units were clearly to be included in the determination of eligibility and their potential emissions were recorded. Units with installation dates in 1960, 1961, 1962, 1977, 1978, or 1979 were marked as “date-uncertain,” meaning that these units may have been included in the determination of eligibility, and their potential emissions were also recorded. Units with installation dates outside of this range were not

Figure II-1: Strategy for Determining Eligible Sources by Date



Dates	Before 1960	1960-1962	1963-1976	1977-1979	After 1979
Installation Date Recorded?	Yes	Yes	Yes	Yes	Yes
Potential Emissions Recorded?	<i>No</i>	Yes	Yes	Yes	<i>No</i>
Classification	<i>None</i>	Date-Uncertain	Date-Certain	Date-Uncertain	<i>None</i>

included in the eligibility determination and their potential emissions were not recorded. Figure II-1 describes this strategy schematically.

C.2 Determining Potential Emissions

The final step before determining BART-eligibility was to establish the potential emissions for each unit at facilities on the short list. Potential emissions of the visibility-impairing pollutants (SO₂, NO_x, VOCs, PM₁₀, and ammonia) were recorded for each unit with an installation date between 1960 and 1979. In general, NESCAUM recorded potential emissions directly from Title V applications, but when possible, NESCAUM staff also reviewed final permit data to ensure agreement between application and final permit data. NESCAUM staff attempted to record all data pertinent to BART eligibility but in some instances, this was not feasible.¹³

The first challenge in determining potential emissions stems from the fact that ammonia emissions are rarely listed in Title V files. Because ammonia is not a criteria pollutant, it is seldom required for a Title V permit application. States with requirements for HAPs are more likely to incorporate ammonia emissions information in the state requirement section of the permit. Therefore, NESCAUM had to work with state air toxics programs to determine if any large ammonia emitting sources existed in the state.¹⁴ Recent atmospheric studies have shown that ammonia is a very important, but relatively poorly understood component of regional haze.¹⁵ More accurate information about

¹³ In some applications, some values were missing. In addition, difficulties with ammonia records and certain state-specific idiosyncrasies relating to applications and permit requirements complicated determinations and are described later.

¹⁴ It is unlikely that any large stationary source emitters of ammonia are not also major sources of PM, SO₂, NO_x or VOC emissions. For this reason, it is unlikely, though not impossible, that any potentially BART-eligible sources have been missed as a result of the inadequacy of available ammonia emissions data.

¹⁵ In fact, atmospheric ammonia is the subject of the National Acid Deposition Program's (NADP) annual conference this year. This interest, in part, stems from the conference recommendation that we strive to

ammonia emissions is needed and potential large emitters of ammonia should be revisited when better data is available.

Additionally, NESCAUM faced two primary challenges related to the available emissions data. The first problem is that some states only required emissions information for regulated pollutants. While this was not necessarily a problem for determining BART eligibility, it will be more problematic when determining BART controls.¹⁶ The second data issue encountered relates to units deemed insignificant. Emissions data is not usually available for these units, but it is sometimes included in supplements to a Title V application. In many cases insignificant units do not change BART status; however, in instances where a facility has a large number of small boilers, the cumulative emission from these units may be sufficient to trigger a BART determination for the facility. During this project, NESCAUM uncovered at least one source where these units made a facility eligible for BART when included in emissions totals.

C.3 Making BART-Eligibility Determinations

A flow chart describing the process for making BART-eligibility determinations is displayed in Figure II-2 and described below.

1. In the first step, sources were selected from the appropriate categories with the NEI database and state Title V facility lists.
2. In step two, units installed between 1960 and 1979 were identified and their potential emissions recorded.

The check of the last criterion, whether these units had the potential to collectively emit 250 or more tons of any visibility-impairing pollutant, involved three further steps. Facilities could only be positively identified as BART-eligible if they met the category, date, and emissions criteria listed above. However, because of the additional dates considered, some missing potential emissions data, and some missing installation dates, NESCAUM also identified facilities that *may* be BART-eligible if more data can be acquired.

3. In step three of the flow chart, the emissions from units between 1963 and 1976 were summed. If these emissions exceeded 250 tons, the facility was certainly eligible for BART and was marked “**YES.**”
4. If the emissions from step three were less than 250 tons, the emissions from units in the additional years considered by NESCAUM were added.

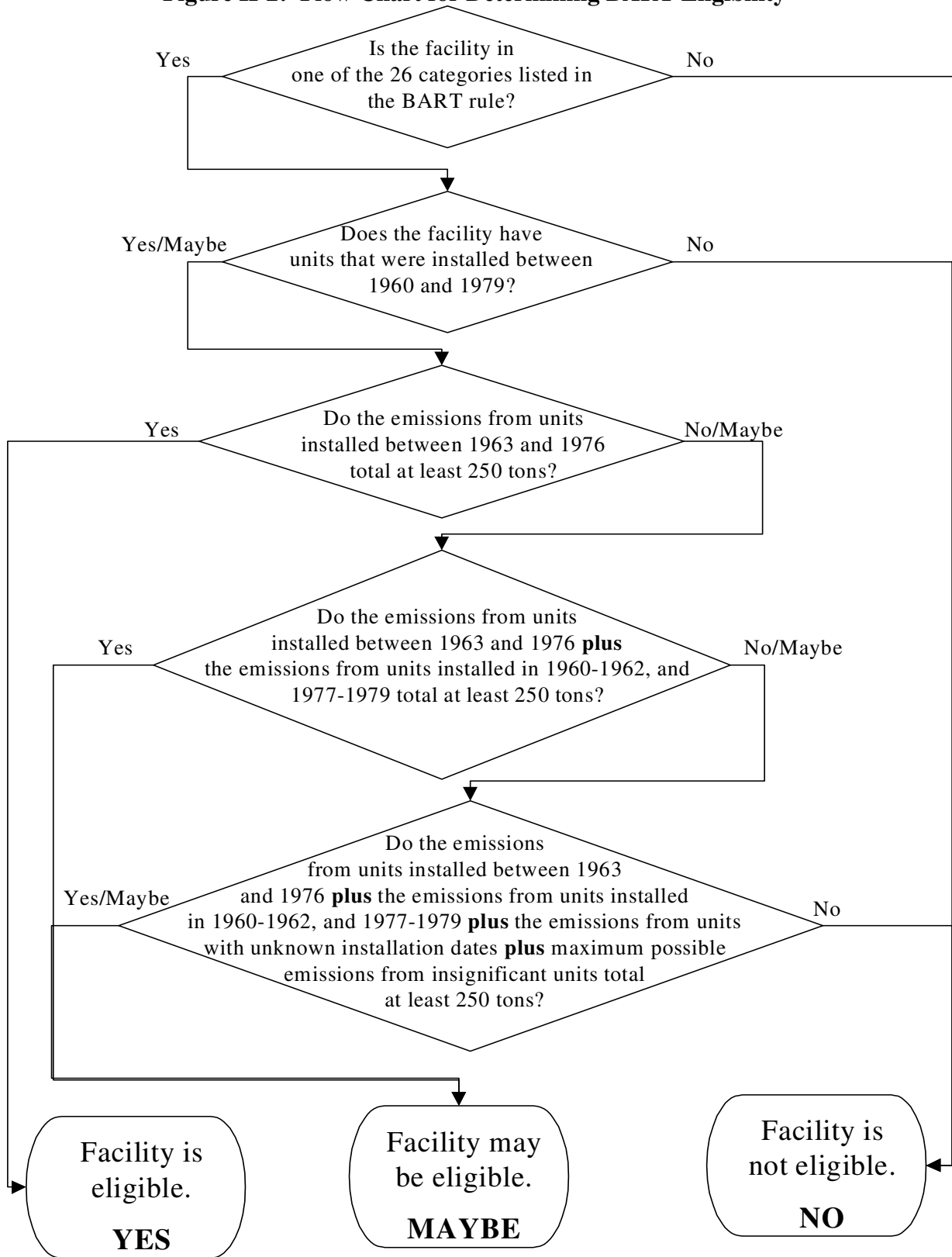
improve our understanding of atmospheric ammonia which emerged from the 2nd International Nitrogen Conference held October 2001 in Potomac, MD. Information about the upcoming NADP conference can be found online at: <http://nadp.sws.uiuc.edu/announce/washdc/>

¹⁶ Once BART-eligibility is triggered for a single pollutant, all units at the facility constructed within the BART window are subject to a BART review for each visibility impairing pollutant regardless, of the PTE for non-triggering pollutants.

If these emissions exceeded 250 tons, the facility may be eligible for BART controls and was marked “**MAYBE.**”

5. If the emissions from step four were less than 250 tons, the emissions from any units whose installation dates were unknown were added. If these emissions exceeded 250 tons, the facility also may be eligible for BART controls and was marked “**MAYBE.**” If the emissions still did not exceed 250 tons, the facility was not eligible and was marked “**NO.**”

Figure II-2: Flow Chart for Determining BART Eligibility



D. Collecting and Organizing the Data

D.1 Collecting the Data

Collecting installation dates and emissions data for facilities comprised the bulk of the work for this project. The installation dates and emissions data could generally be found in Title V applications for each facility. The Title V applications for facilities on the “short list” were searched for appropriate equipment, installation dates, and potential emissions for each unit. Few states have transferred data from the paper applications to their electronic state data systems. Thus, NESCAUM obtained data by manually inspecting the application files. Because of the length of most application files, it was not feasible for the states to copy the files and submit them to NESCAUM; therefore NESCAUM staff traveled to, or hired interns at, state environmental agency offices to complete this work. In New England, most states required facilities to submit Title V applications to both the state and to EPA New England, and NESCAUM reviewed as many applications as possible at EPA New England’s Boston office. NESCAUM staff traveled to state offices in New England to review applications not held at EPA for all other facilities, and to other states to review applications for their facilities.

D.2 Sample Results Sheet

All data was collected in Excel spreadsheets. One file was established for each state, and one sheet was used for each facility. A template was developed for the work, and included the facility’s name, the reason it was researched, its BART category (as numbered in Table II-1), its eligibility status, and any notes about the status. The units were then listed by descriptor and permit ID number, and installation date, boiler capacity, and potential emissions for each pollutant were recorded. At the bottom of each sheet, a table was created in which emissions from units installed between 1963 and 1976 were summed (for step 3 of the flow chart), emissions from units installed in 1960-1962 and 1977-1979 were summed (for step 4 of the flow chart), and emissions from units with unknown installation dates were summed (for step 5 of the flow chart). An annotated picture of the sheet is shown in Figure II-3.

Figure II-3: Annotated Sample Data Collection Spreadsheet

Company Name		Facility Category		Eligibility Determination and Reason									
A	B	C	D	E	F	G	H	I	J	K	L	M	
Company ABC		sic	21		NO	<250 tons							
Unit Info		Installation Dates		Capacity	Restricted Capacity	PTE (tons/year)			Unit Emissions Data and Notes				
Unit	Description	Year(s)	Capacity (mmBTU/hr)	Capacity (mmBTU/hr)	NOx	PM10	SO2	VOC					
P001	Aerosol Propellant Filling	unknown			0	0	0	133.27	see attached summary, found no summary				
P002	Booster Pumps	1/6/1962			N/A	N/A	N/A	26.28	installation and construction date				
P003	Scrap Can Shredder	1/6/1986			N/A	N/A	N/A	2.13	installation and construction date				
P004	Concentrate Filling	1/6/1962			N/A	N/A	N/A	2.13	installation and construction date				
P005	Ethanol Flush								process, no equipment				
P006	Spray Testers								process, no equipment				
B001	cleaver brooks boiler	1960	17.3		21.22 ppm		29.00	0.14					
B002	cleaver brooks boiler	1960	8.4		16.27 ppm		38.01	0.28					
Total for units that might meet date requirements**				25.7		50	0	117.59	0.42				
Total for units that might meet date requirements*						0	0	0	28.41				
Total for units with unknown dates						0	0	0	133.27				
									162.1	Emissions Totals			

Notes: This is a typical results sheet for a small facility. The top row contains the facility name, BART-eligible category and eligibility status with explanation. A table follows in which the information for each unit is displayed. The purple box highlights installation dates. Excel’s conditional formatting feature was used to highlight the years, with date-certain units in blue, date-uncertain units in yellow, date-unknown units in green, and insignificant units in red (not shown here). Boiler capacity and any restrictions on capacity are identified, and potential emissions are tabulated, along with any notes about the unit. Finally, the emissions for each color category are totaled. In this example, the emissions from the date-certain units at the facility are less than 250 tons per year, and adding the emissions from date-uncertain and date-unknown units still fail to meet the BART-eligibility requirement. The facility is therefore not BART-eligible.

III. Summary of Results

A. Non-Utility BART Determination Results

This report provides results from the nine states for which NESCAUM developed BART-eligible source lists. NESCAUM closely examined 897 facilities (the short list). Of those 897, 66 are eligible for BART, 87 may be eligible for BART and 744 are not eligible. Additionally, the District of Columbia identified two BART-eligible sources in its jurisdiction. Appendix A includes facility information relating to BART, including BART status, BART category, and potential emissions information.¹⁷

A.1 “BART-Eligible” Facilities

NESCAUM deemed facilities as eligible for BART, if the facility installed units between 1963 and 1976 that collectively have the potential to emit 250 tons per year of a visibility-impairing pollutant. These facilities may have additional units that will be subject to BART, depending on confirmation of installation dates for units dated between 1960 and 1962 and 1977 and 1979. Any additional units would increase the potential emissions attributed to these facilities. States will need to make final determinations of BART-eligibility for these units. There are sixty-eight non-utility sources that are unambiguously eligible for BART control, including:¹⁸

- Seventeen facilities with SIC or SCC codes corresponding to the fossil-fuel fired boilers (250 MMBTU heat input) category,
- Fourteen facilities with SIC or SCC codes corresponding to the kraft pulp mill category,
- Ten facilities with SIC or SCC codes corresponding to the chemical process plant category,
- Five facilities with SIC or SCC codes corresponding to the Portland cement plant category,
- Five facilities with SIC or SCC codes corresponding to the glass fiber processing plant category,

¹⁷ As described in Section II.D above, potential emissions for each facility were totaled for date-certain (1963-1976) units, date-uncertain units (1960-1962 and 1977-1979) units, and units with unknown installation dates. However, New Jersey’s and New York’s Title V records did not describe potential emissions by unit (see Section III.B.2, below). In order to provide non-zero results for New Jersey and New York, calculated emissions also include potential emissions from units with unknown installation dates.

¹⁸ The sources listed total seventy-two (not sixty-six) because four sources were captured by two categories and one source was captured by three categories.

- Four facilities with SIC or SCC code corresponding to the iron and steel plant category, and
- Three facilities with SIC or SCC code corresponding to the hydrofluoric, sulfuric, and nitric acid plants category,
- Three facilities with SIC or SCC code corresponding to the coke oven battery category,
- Two facilities with SIC or SCC code corresponding to the petroleum refineries category,
- Two facilities with SIC or SCC code corresponding to municipal incinerators (250 tons refuse per day) category,
- One facility with SIC or SCC code corresponding to the lime plant category,
- One facility with SIC or SCC code corresponding to the sulfur recovery plant category,
- One facility with SIC or SCC code corresponding to the taconite ore processing plant category,
- One facility with SIC or SCC code corresponding to the primary aluminum ore reduction plant category,
- One facility with SIC or SCC code corresponding to the zinc smelter category,
- One facility with SIC or SCC code corresponding to the charcoal production facility category, and
- One facility with SIC or SCC code corresponding to the coal cleaning plant category.

The geographic distribution of the facilities was as follows:

- Fifteen facilities are located in New York,
- Fifteen facilities are located in Massachusetts,
- Eleven facilities are located in Maine,
- Nine facilities are located in New Jersey,
- Eight facilities are located in Maryland,
- Three facilities are located in Delaware,

- Two facilities are located in New Hampshire,
- Two facilities are located in Rhode Island,
- One facility is located in Connecticut.

Total potential emissions from these facilities include: 229,562 tons of SO₂, 90,352 tons of NO_x, 15,347 tons of VOC, and 24,142 tons of PM₁₀. Emissions by category are shown in Figures IV-1 and IV-2 and a map of the eligible sources is shown in figure IV-5 in Section IV.C, below.

A.2 “Maybe BART-Eligible” Facilities

Facilities for which NESCAUM could not make a definitive determination were deemed “maybe BART-eligible.” Facilities were given this designation for a number of reasons. The most common reason for placing facilities in this category occurred when units installed between 1963 and 1976 did not collectively have the potential to emit 250 tons per year of at least one visibility-impairing pollutant, but additional units (installed in 1960 - 1962 and 1977 - 1979, or with no installation dates) increased total potential emissions over BART thresholds. The second most common reason for including facilities in this category was lack of sufficient potential emissions data to allow for clear inclusion or exclusion. Facilities may also have been placed into this category when Title V permit documentation was not available or when analyzing the necessary data was beyond the expertise of NESCAUM staff.

NESCAUM identified eighty-seven facilities that may be BART-eligible. These facilities fall into seventeen of the BART source categories, including:¹⁹

- Twenty-five with SIC or SCC codes corresponding to the chemical process plant category,
- Twenty facilities with SIC or SCC codes corresponding to the fossil-fuel fired boilers (250 MMBTU heat input) category,
- Nine facilities with SIC or SCC codes corresponding to the petroleum storage and transfer facilities category,
- Eight facilities with SIC or SCC code corresponding to the glass fiber processing plants category,
- Six facilities with SIC or SCC codes corresponding to the municipal incinerator category,
- Four facilities with SIC or SCC code corresponding to the kraft pulp mill category.

¹⁹ The sources listed total ninety-one (not eighty-seven) because one source was captured by two categories and two sources were captured by three categories.

- Three facilities with SIC or SCC codes corresponding to the primary zinc smelter category,
- Three facilities with SIC or SCC code corresponding to the hydrofluoric, sulfuric, and nitric acid plants category,
- Three facilities with SIC or SCC code corresponding to the petroleum refineries category,
- Two facilities with SIC or SCC codes corresponding to the Portland cement category,
- Two facilities with SIC or SCC code corresponding to the charcoal production facilities category,
- Two facilities with SIC or SCC code corresponding to the sulfur recover plants category,
- One facility with SIC or SCC code corresponding to the primary lead smelters category,
- One facility with SIC or SCC code corresponding to the secondary metal production facilities category,
- One facility with SIC or SCC code corresponding to the iron and steel mill plants category,
- One facility with SIC or SCC code corresponding to the lime plants category, and
- One facility with SIC or SCC code corresponding to the coal cleaning plant category.

Of the eighty-seven facilities:

- Twenty-eight are located in New York,
- Twenty-six are located in New Jersey,
- Nineteen are located in Massachusetts,
- Seven are located in Delaware,
- Four located in Connecticut,
- One located in Maine,
- One located in new Hampshire, and

- One located in Maryland.

Total known emissions from all units at facilities that may be BART-eligible (exclusive of the emissions from facilities that are unambiguously BART-eligible) include: 21,408 tons of SO₂, 19,676 tons of NO_x, 35,960 tons of VOC, 6,009 tons of PM₁₀, and no ammonia. Total potential emissions from these facilities may be significantly higher, however, since emissions from many units remain unknown. Emissions by category, when available, are shown in Figures IV-3 and IV-4, and a map of the “maybe” eligible sources is shown in Figure IV-6 in Section IV.C, below.²⁰

A.3 Additional Statistics from the BART Research

The BART determination process allowed NESCAUM to collect information regarding a variety of units at a wide range of facilities in the MANE-VU region. In addition to the units targeted by the rule, NESCAUM collected data from pre-1960 (“pre-BART”) and post-1979 (“post-BART”) units at many facilities. Although data collection for these non-BART sources was minimized in order to make best use of the resources allocated for this project, we were able to take note of some interesting statistics.

Pre-BART Units

A surprising fraction of facilities (172 of 897, or 19%) had at least one unit that was installed before 1960. In fact, twenty-one facilities had only units installed before 1960. For most facilities (485), pre-1960 emission units may exist, but installation dates were not completely documented in the Title V permits. Potential emissions data was generally not recorded for these units, but it was interesting to note the large number of facilities that have older units in use, suggesting that a substantial emissions reduction potential exists among pre-1962 sources. In fact, under the BART project, NESCAUM identified boilers that had been in use since 1918. This finding contradicts the expectation of the Clean Air Act that older units would be retired and clouds the rationale for the 15-year BART Window.

Post-BART Units

Not surprisingly, many of the sources (397 of 897, or 44%) had units installed after the BART applicable period. In fact, the majority of facilities were determined to be ineligible for BART controls because most of their emission units were installed after 1979. Of the sixty-six facilities identified as BART-eligible, 43 had units installed after 1979. Significant ramifications for BART-eligible units at these facilities may exist due to the netting process of NSR. This program and its implications are further discussed in Section IV.

Ineligible Boiler Facilities

At least 18 facilities in the boiler category had units installed between 1960 and 1979 that did not have the required 250 MMBTU capacity, but did collectively emit more than 250 tons of a visibility-impairing pollutant. Because emissions were not always

²⁰ See footnote 17.

collected in cases where it was clear that a facility did not meet the boiler capacity requirement, it is possible that there are other facilities in this category. Secondly, in some cases where emissions data was collected about pre-BART units, a handful of facilities were recorded that have older boilers with approximately 250 MMBTU of capacity that emit more than 250 tons of a visibility-impairing pollutant. This fact points again to the emissions reduction potential that exists for pre-1962 units in the 26 BART categories.

B. Individual State Issues and Idiosyncrasies

Given the slightly different requirements for individual states' Title V applications and different procedures for collecting the information and issuing permits, it came as no surprise that the information collected from each state varied with respect to data format and storage procedures. These differences occasionally led to challenges in obtaining the information necessary to complete BART eligibility determinations. Some of these challenges are outlined below.

B.1 EPA New England - Region 1

In New England, many state permitting agencies required facilities to submit copies of their Title V applications to EPA New England's Boston office. This made review of information for these states easier since it allowed NESCAUM interns and staff to complete considerable portions of the determinations before traveling to a state to review their files. An additional key to completing BART eligibility determinations in New England states was that most required a complete equipment list at the beginning of the application. This simplified identification of appropriate units for research and helped to ensure that no pieces of equipment were skipped in the analysis.

Maine and New Hampshire

The review of information in Maine and New Hampshire was straightforward. Both states required facilities to submit installation dates and potential emissions in their Title V applications. When a final permit had been developed, NESCAUM reviewed this information to ensure that no new emission limits had been placed on the facility.

Rhode Island

Rhode Island's permit applications were straightforward. A number of facilities were eliminated from consideration because state staff confirmed that those facilities' boilers totaled less than 250 MMBTU.

Massachusetts

Data from Massachusetts posed some complications for BART review. In some cases, facilities reported emissions for only a few pollutants. NESCAUM staff assumed that these facilities did not have significant emissions of the pollutants that were not listed. NESCAUM suggests that the state review the emissions from facilities on their "short list" to ensure that no BART-eligible sources were missed as a result of this

assumption. In addition, NESCAUM found at least one Massachusetts facility that listed a large number of insignificant units. These units consisted of boilers whose capacity was less than 10MMBTU. It is possible that these units would make this facility a BART-eligible source, if complete installation dates for insignificant units could be obtained.

Connecticut

Connecticut permit applications often include multiple “operating scenarios” for boilers that use fuel switching, which complicated the determination process. Potential emissions were reported for each fuel, calculating the emissions as if the boiler had used that fuel for the whole year. If no composite potential emissions calculation existed, the maximum PTE was used to determine eligibility. When potential emissions for a composite fuel scenario were available, NESCAUM used this figure to determine BART eligibility. In some cases, a composite fuel scenario required calculations for multiple fuels since the state capped the use of certain fuels and would not allow their use for an entire year.

B.2 EPA Region 2

New Jersey

With 179 facilities to review and the knowledge that many of them would be quite large (one facility had approximately 800 units), performing BART determination for New Jersey was a significant challenge. However, New Jersey’s database (NJEMS) provided most of the information needed to make BART determinations. Given the type of data available in NJEMS, NESCAUM modified their strategy for eliminating facilities. Rather than begin to review installation dates and pare the list from this information, NESCAUM staff reviewed each facility’s total PTE of visibility-impairing pollutants. NESCAUM eliminated all facilities whose facility-wide emissions for visibility-impairing pollutants were less than 250 tons per year. This reduced the list that required detailed review to only 65 facilities. New Jersey’s database allowed easy collection of most unit descriptors, as well as some data for dates and potential emissions by pollutant. Three main problems with the database complicated determinations. First, the database is continuously updated as engineers enter data to review applications and develop permits, so the database is dynamic and is not complete for some facilities. Second, the database mainly captured modification dates for emission units, not installation dates. NESCAUM staff had to examine Sub 8 files²¹ for each emission unit to determine their installation dates. Finally, potential emissions were sometimes available only for processes, not for individual units. When necessary, NESCAUM staff reviewed major NSR permits, minor NSR permits, and Sub 8 files to find unit-specific potential emissions and complete BART eligibility determinations.

²¹ Sub 8 files include permit data for major and minor New Source Review permits. These permits are the original permits that determined limits and applicability for inclusion in the Title V permits.

New York

New York had the longest “short list,” with 336 facilities. As with New Jersey, NESCAUM eliminated facilities whose total potential emissions of visibility-impairing pollutants were less than 250 tons per year, leaving 109 facilities for review. Completing BART determinations for New York was challenging due to New York’s methods for compiling information in their database, the location and availability of data (e.g., certain specific information is only available on paper files located in each of New York’s nine regional offices), and differences in New York’s Title V application.

Regarding the differences in New York’s Title V application and data system relative to other states in the MANE-VU region, one of the major obstacles faced was a terminology issue. While most states refer to a piece of equipment as a unit, New York calls it a source. In most states, a collection of units makes up a process. In New York, a collection of sources makes up a unit. “Units” in New York’s electronic database, therefore, rarely had installation dates, because equipment in a process may have been installed at different times. These differences required significant modifications to the BART results spreadsheet that NESCAUM developed. For this reason, the New York spreadsheets vary from those of other MANE-VU states.

Additionally, installation dates and equipment-specific potential emissions were not required fields in New York’s Title V applications. This resulted in many facilities that chose not to provide this information. In some cases, it was possible to find this data in older “AIR 100” permits, which could only be examined in the regional offices. Since each regional office had its own requirements and methods for storing and reviewing Title V information, data completeness, and therefore ability to determine BART eligibility, varied by region.

B.3 EPA Region 3

Delaware

Delaware graciously volunteered to be our “test state” so that we could “ground-truth” our research process. The aim of this “ground truthing” exercise was to record the data necessary to determine eligibility and to gain a sense of size of the undertaking. Total BART-eligible potential emissions data are therefore not necessarily complete, as research on each eligible facility was stopped when the 250-ton minimum was met. Because of the desire to examine every facility on the short list, NESCAUM did not spend a lot of time with difficult facilities. Delaware had the most complicated facility that NESCAUM examined: a petroleum refinery that is sited in both Delaware and Pennsylvania. Given the complexity of the source and the inability of NESCAUM to determine which state had jurisdiction over different units, NESCAUM left this facility for the state to review.

Maryland

Review of Maryland’s data was simple since the state had input all the Title V application data into an electronic database. All of the necessary information was printed from the database before the arrival of NESCAUM staff, and was easily transferred into

NESCAUM records. The only drawback to the system was a lack of unit descriptor. Broad categories such as “Fuel burning equipment – coal, wood, solid fuel” make the results more difficult to read.

IV. Issues and Priorities

Once states have reviewed the findings of this memorandum and have completed the identification of BART-eligible sources in the MANE-VU region, states and tribes will have to consider which of these facilities should be *subject* to BART, and carry out BART determinations to identify proper controls for each source. It is anticipated that USEPA will issue guidelines for these steps following re-proposal and finalization of the BART provisions in the Haze Rule. Depending on how EPA deals with BART in future rulemakings, there are several issues that emerge from the MANE-VU BART inventory which should be considered prior to establishing sources subject to BART or the determination processes.

A. Potential vs. Actual Emissions in the Northeast

The July 2001 BART Guidance selects facilities for control technologies based on potential emissions, a calculated estimate of the maximum amount of pollution a piece of equipment could emit. Potential emissions are generally calculated with the assumption that the equipment is operated 24 hours per day, 365 days per year, at maximum capacity, unless capped by a permit limit. If a facility uses the equipment less often or under a lighter load, actual emissions may be much less than the hypothetical potential. Even under a cap, a facility’s actual emissions tend to be significantly lower than actual emissions. This is especially true in the Northeast, where the gap between actual and potential emissions is often vast. For instance, one facility has a permit condition that limits its potential NO_x emissions to 1600 tons per year; however, their actual emissions have never exceeded 700 tons per year. Therefore, we cannot base the actual level of emission reductions (and therefore, the degree of visibility improvement) BART will achieve on potential emissions alone. In order to understand likely effects of BART application, MANE-VU should gather actual emissions information for BART-eligible sources.

B. Effect of Other Programs on BART Control Decisions

Two critical factors to consider when determining BART controls are the impact and interaction of other regulatory programs that may result in controls on BART sources. Programs likely to affect BART-eligible units at a source are the New Source Review (NSR) Program, the MACT program, or Title IV (the acid rain program).

Under the New Source Review program, facilities can “net” out of major NSR by calculating contemporaneous emission increases and decreases in a process known as a “netting calculation.” In some cases, it may be more cost effective for a facility to put controls on an older emission unit and claim the contemporaneous decrease to avoid

triggering the major NSR permit process. In fact, NESCAUM staff noted that in many cases sources had already put controls or caps on BART-eligible emission units.

Another regulatory program that could impact BART units is the MACT program. The MACT program regulates toxic air emissions for 174 source categories. Most of the BART source categories are also regulated by a MACT. In some instances, the MACT standards have yet to be promulgated; however, we can assume that the MACT program may have already imposed controls on some BART units, especially those that emit VOCs.

Additionally, many of the Electrical Generating Unit (EGU) BART-eligible sources identified previously (NESCAUM, 2001) are subject to national SO₂ emission caps under the Title IV program. EPA has not previously proposed any regulation that addresses the interaction of BART and Title IV, suggesting that Title IV compliance can be achieved, in large part, through the rigorous application of BART controls to BART-eligible facilities. Depending on the extent of Title IV compliance that can be achieved at BART-eligible facilities, relatively few additional emissions reductions would result from the BART program.

A detailed examination of the interaction of BART with other control programs would benefit the states and tribes charged with carrying out BART determinations.

C. Utility vs. Non-Utility BART Emissions

NESCAUM evaluated utility sector BART eligibility previously (NESCAUM, 2001) and reported actual emissions for these facilities for 1999. Table III-1 compares the *actual* utility sector BART emissions to *potential* emissions from non-utility sources that are or may be BART-eligible. This comparison suggests that power plants have a greater impact on total regional BART-eligible SO₂ and NO_x emissions than the remaining 25 BART categories, even when the “MAYBE” eligible facilities are included in the analysis. Note, however, that this is not always the case. Maine non-EGU emissions outweigh EGU emissions and are located closer to Class I areas protected under the Haze Rule. This demonstrates that a careful analysis of all BART-eligible categories and the emissions reduction potential from each will be required to understand the likely visibility impacts of potential control programs. When considering the impacts of a sector or facility, factors beyond total emissions should be considered, including their proximity to Class I areas, the type of emissions (i.e. primary versus precursor), and the actual emission reductions that could be realized from implementing BART controls.

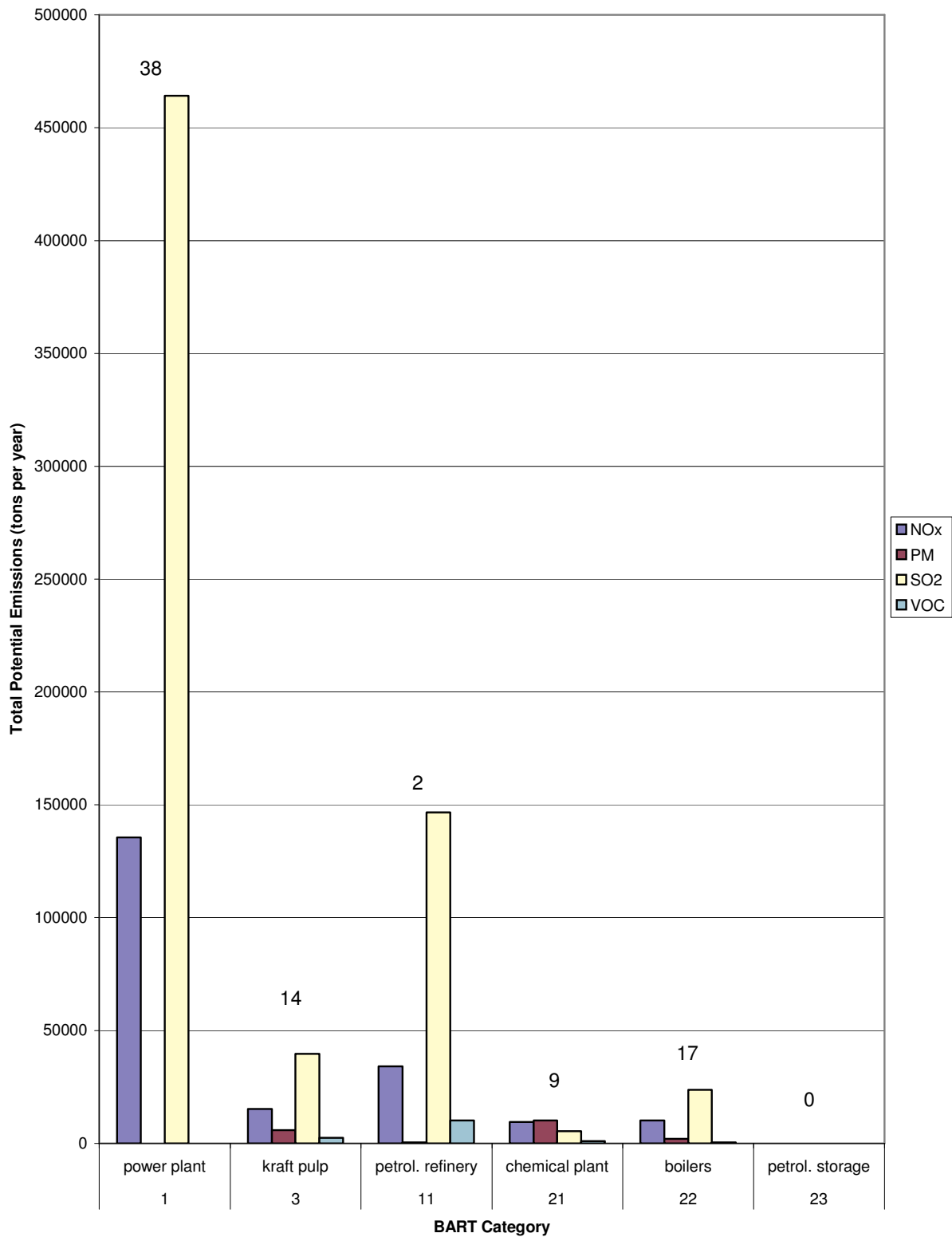
An additional consideration that states and tribes may want to consider when designing control strategies is the impact of source categories not covered by the BART provisions of the Haze Rule. For example, while Vermont has no BART-eligible sources, they do have sources that emit significant amounts of regional haze pollutants. The largest NO_x emitters in the state are the diesel generators that run snowmaking operations. A recent trend toward small, distributed electrical generation via diesel internal combustion engines across the Northeast has significantly boosted the population of these sources

Table IV-1: Emissions from Utility BART-Eligible and Non-Utility BART-Eligible and Maybe BART-Eligible Facilities

State	ACTUAL <i>NO_x</i> <i>Emissions</i> <i>from</i> <i>BART</i> <i>EGU</i> <i>sources</i> <i>(tons/year)</i>	ACTUAL <i>SO₂</i> <i>Emissions</i> <i>from</i> <i>BART</i> <i>EGU</i> <i>sources</i> <i>(tons/year)</i>	POTENTIAL <i>NO_x</i> <i>Emissions</i> <i>from</i> <i>BART</i> <i>non-EGU</i> <i>sources</i> <i>(tons/year)</i>	POTENTIAL <i>SO₂</i> <i>Emissions</i> <i>from</i> <i>BART</i> <i>non-EGU</i> <i>sources</i> <i>(tons/year)</i>	POTENTIAL <i>PM</i> <i>Emissions</i> <i>from</i> <i>BART</i> <i>non-EGU</i> <i>sources</i> <i>(tons/year)</i>	POTENTIAL <i>VOC</i> <i>Emissions</i> <i>from</i> <i>BART</i> <i>non-EGU</i> <i>sources</i> <i>(tons/year)</i>	POTENTIAL <i>Ammonia</i> <i>Emissions</i> <i>from</i> <i>BART</i> <i>non-EGU</i> <i>sources</i> <i>(tons/year)</i>
CT	8126.6	30,786.7	605.7	1,152.0	77.4	483.0	0
DC	447.1	1432.3	N/A	N/A	N/A	N/A	N/A
DE	4466.1	10,490.8	2,215.6	2,369.0	7,585.0	367.5	0
ME	879.4	6406.2	15,290.6	32,251.7	5,857.0	2,516.3	0
MD	44,039.6	177,681.7	8,602.8	17,608.6	1,244.4	301.9	0
MA	27,867.9	97,866.7	10,330.1	14,973.6	1,779.7	184.4	0
NH	7043.4	37,834.5	1,238.7	4,949.4	371.8	63.9	0
NJ	12,738.7	37,834.5	48,857.9	160,864.3	2,893.1	45,113.4	0
NY	30,366.1	69,416.4	22,118.3	15,455.7	10,229.4	2,169.2	0
PA	143,801.9	734,014.5	N/A	N/A	N/A	N/A	N/A
RI	0	0	768.2	1,375.0	112.9	106.8	0
VT	0	0	0	0	0	0	0

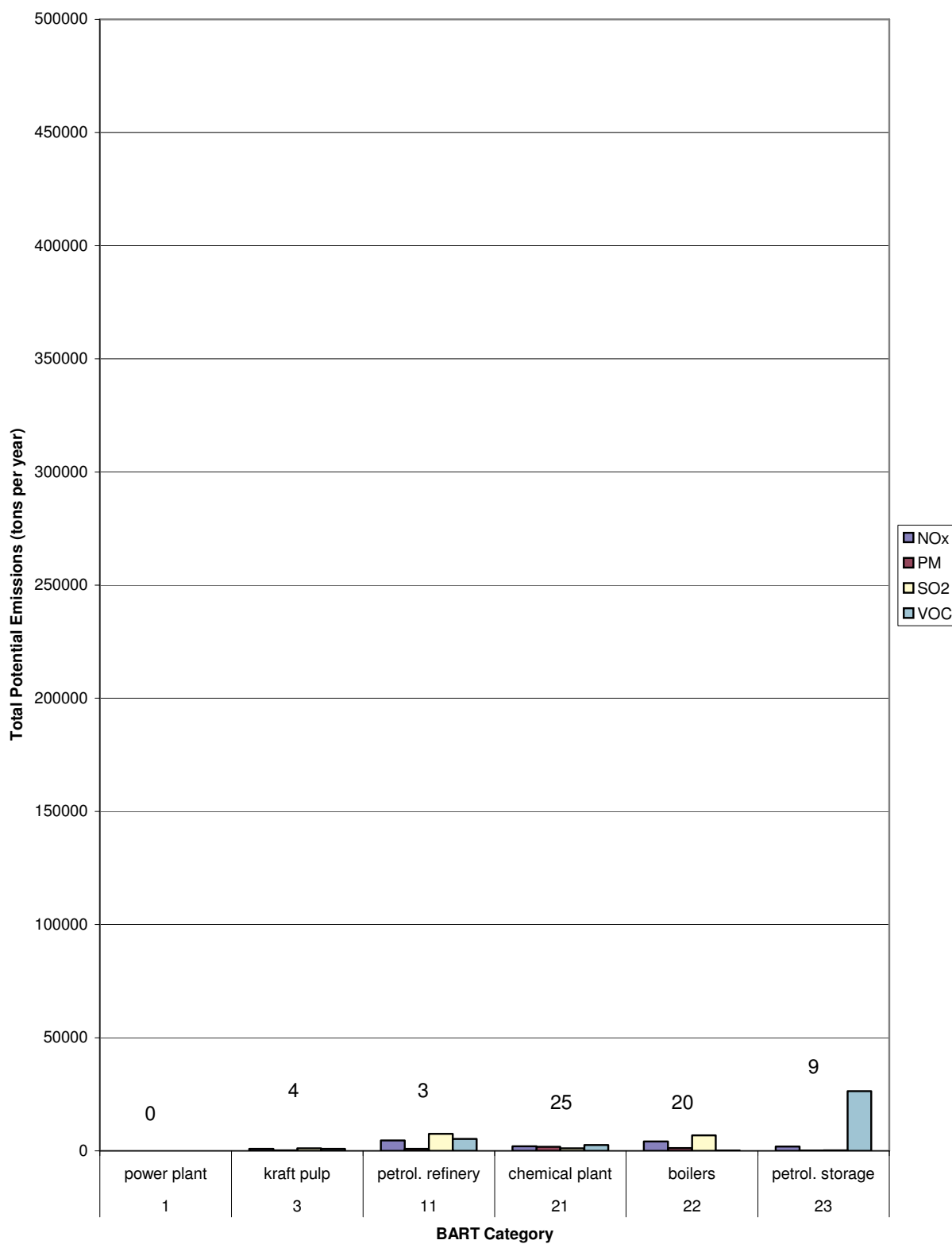
(NESCAUM, 2003). While the individual emissions from these units may seem insignificant compared to some of the BART-eligible source categories, the lack of regulation and increasing popularity of this category of sources may warrant further examination of the emission reduction potential.

Figure IV-1: Total Emissions from Sources in the Six Largest Categories that are BART-Eligible



Note: Numbers above each set of potential emissions represent the number of facilities contributing to the potential emissions in each BART category.

Figure IV-2: Total Potential Emissions from Sources in the Six Largest Categories that May Be BART-Eligible



Note: Numbers above each set of potential emissions represent the number of facilities contributing to the potential emissions in each BART category.

Figure IV-3: Total Potential Emissions from Sources in Other Categories that are BART-Eligible

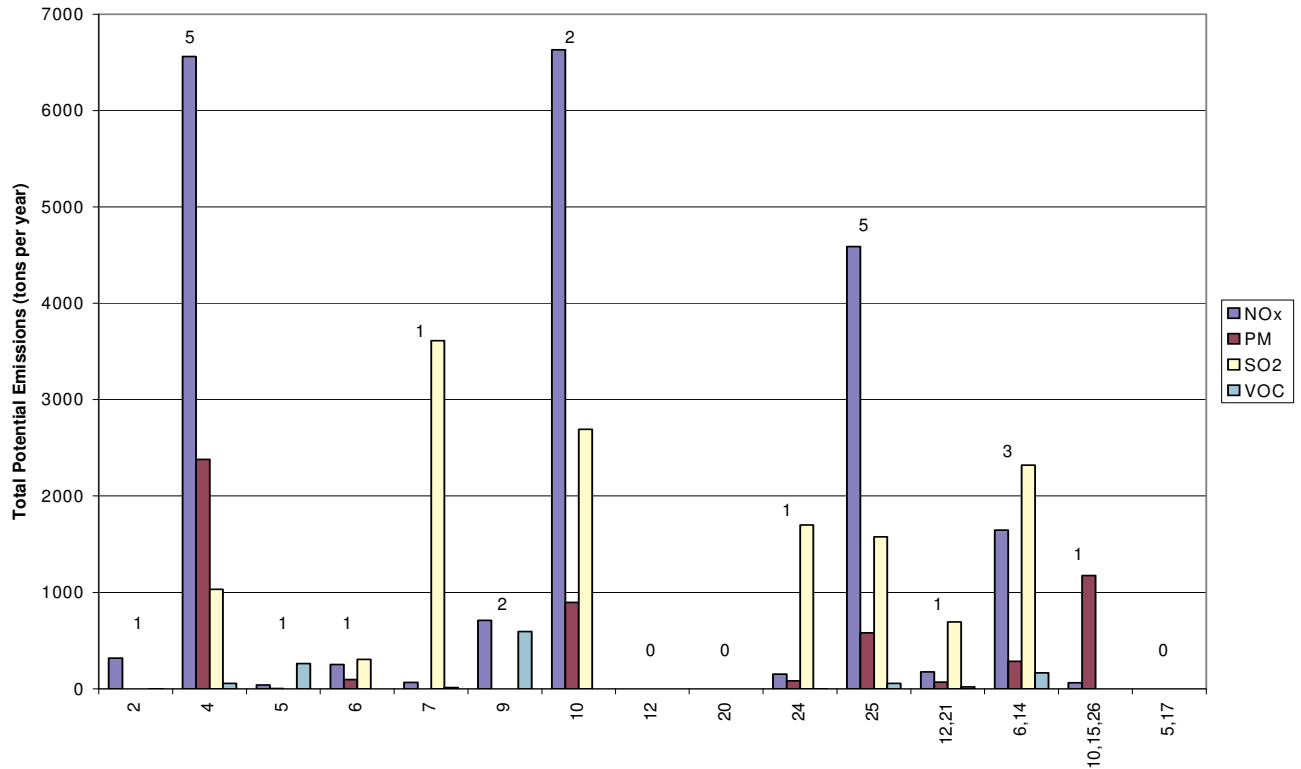
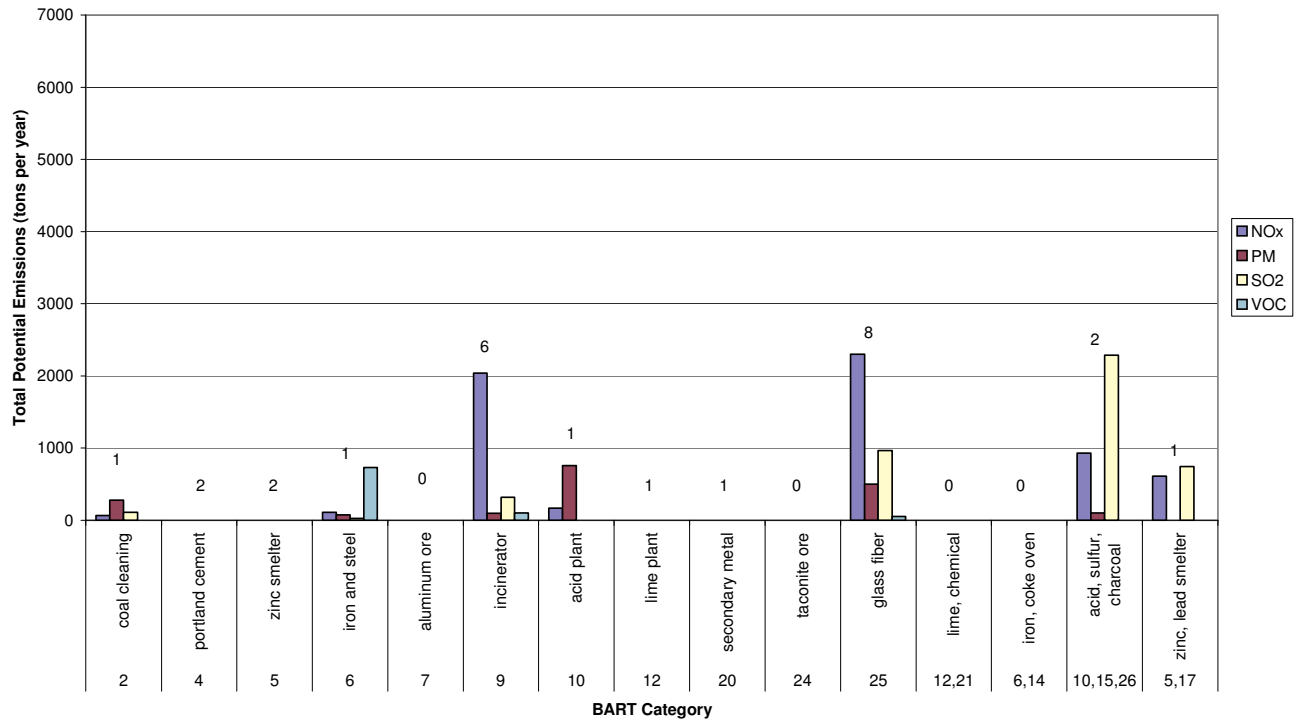


Figure IV-4: Total Potential Emissions from Sources in Other Categories that May Be BART-Eligible



Note: Numbers above each set of potential emissions represent the number of facilities contributing to the potential emissions in each BART category.

Figure IV-5: Map of BART Eligible Sources

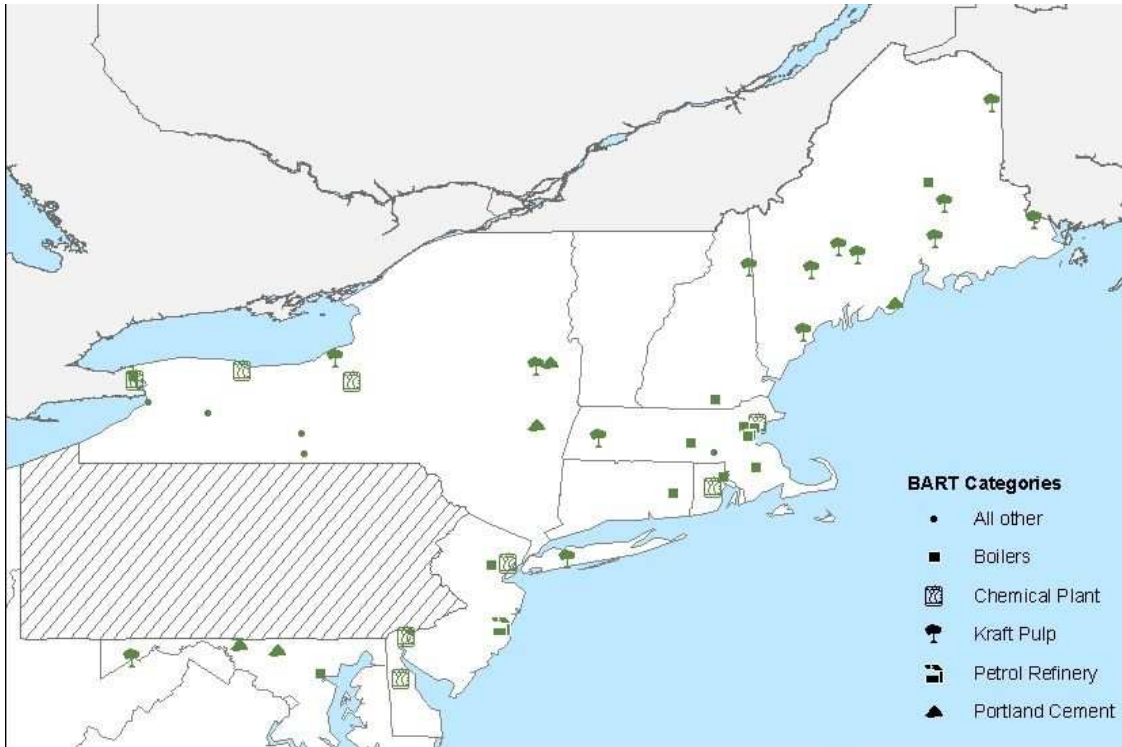
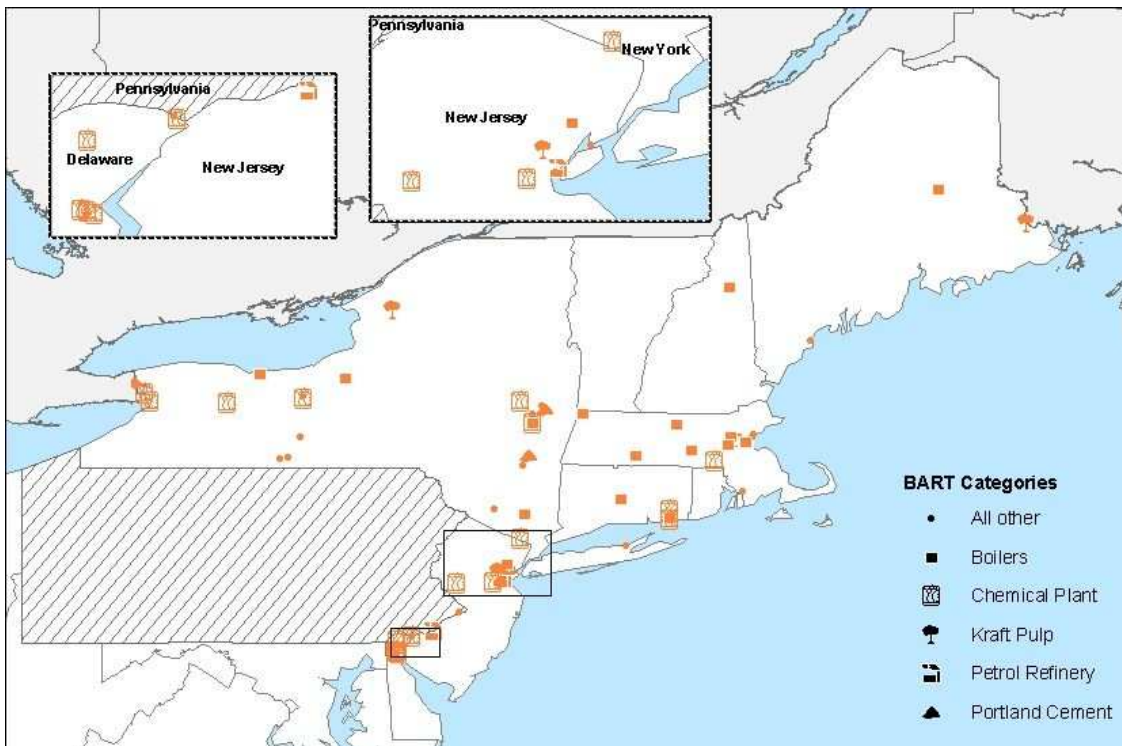


Figure IV-6: Map of Sources that May Be BART-Eligible



The state of Pennsylvania was not included in the development of these lists and plans to develop its own BART-eligible source lists independently.

D. Degree of Improvement Reasonably Anticipated from BART

As part of the BART engineering analysis, states and tribes must determine the degree of improvement reasonably anticipated from the installation of BART controls. Whether these improvements must be analyzed on a source by source basis, or whether similar sources can be grouped for these analyses, is dependent on how USEPA deals with this issue in the Haze Rule. Sources may be grouped with respect to geographic similarity (e.g. all sources in a state or region) or by control type (e.g. all scrubbers collectively are anticipated to result in the following improvement...), however until USEPA issues detailed guidance on how these groupings can be performed, it would appear likely that states and tribes will have to treat each source individually for assessment purposes.

This implies a tremendous need for additional data analysis and modeling to develop contribution assessments that can be applied as ‘subject to BART’ criteria as well as to fulfill those requirements of the engineering analysis of the BART determination process.

V. Conclusion

In response to anticipated requirements under the Regional Haze Rule for controlling BART-eligible sources in the MANE-VU region, NESCAUM has prepared a preliminary listing of these sources in 9 of the 12 MANE-VU jurisdictions. It is believed that no BART-eligible sources exist in Vermont or on the St. Regis Mohawk and the Penobscot reservations. Pennsylvania is independently developing its own listing of BART-eligible sources in that state. The District of Columbia developed its own listing of BART-eligible sources in its jurisdiction but did not use the NESCAUM method.

The development of this list has identified 66 non-EGU sources that are eligible for subsequent BART analyses and 87 additional sources that may be eligible. States will need to verify the accuracy of the identifications made by NESCAUM and conduct additional research to determine the eligibility of those sources determined as “MAYBE eligible” by the NESCAUM survey.

Preliminary results suggest that of the unambiguously BART-eligible non-EGU sources, 26% are industrial boilers and 21% are kraft pulp mills. The remaining 53% are in a variety of source categories but account for only 8% and 34% of BART-eligible SO₂ and NO_x emissions from the non-EGU sectors, respectively (excluding a single refinery that emits 64% and 37% of the non-EGU BART-eligible SO₂ and NO_x by itself). However, the reader is cautioned that these numbers are likely to change as further research clarifies the eligibility status of sources that may be BART-eligible.

Before states and tribes proceed with the subsequent steps of determining which of these sources are subject to BART and conducting BART determinations, a number of recommendations have been generated as a result of this project. These include:

- States and Tribes may want to consider expanding the date range of BART eligible units to include pre-1962 units that have not otherwise been controlled to achieve visibility goals under the regional haze rule.
- MANE-VU should gather updated actual emissions information (as opposed to potential emissions) for BART-eligible sources and inventory existing controls on these units to determine the efficacy of imposing controls on these units.
- MANE-VU should conduct a detailed examination of the interaction of BART with other control programs so the states and tribes charged with carrying out BART determinations can fully evaluate the effect of BART.
- MANE-VU should conduct an analysis of all BART-eligible categories and the emissions reduction potential from each to understand the likely visibility impacts of potential control programs.
- MANE-VU should conduct an analysis of haze-related emission reduction potential from source categories outside the scope of the BART to identify additional options for state and tribal compliance options.
- MANE-VU should assess the need for additional data analysis and modeling to develop contribution assessments that can be applied as ‘subject to BART’ criteria as well as to fulfill those requirements of the engineering analysis of the BART determination process.

References

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MARAMA, *Assessment of Inventory Needs for Regional Haze Plans*, Mid-Atlantic Regional Air Management Association, Baltimore, MD, 2001.

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Appendix A

State-by-State Listing of BART-Eligible and Potentially BART-Eligible Sources

Appendix Notes

The tables on the following pages contain a listing of BART-eligible sources, potentially BART-eligible sources (pending further research) and BART-ineligible sources for each state, respectively. Columns contain the facility name and BART category. Potential emissions are then listed in two sets of columns. The first set of columns list the potential emissions from “date certain” emission units (i.e. units with installation dates between 1963 and 1976) and the second set of columns lists potential emissions, when known,²² from emission units with installation dates between 1960-1962 and 1977-1979. Individual notes are described below.

- 1 Further research on installation dates is required.
- 2 Further research on potential emissions is required.
- 3 Further research on unit capacities is required.
- 4 No Title V application was available.
- 5 Fugitive emissions may make this source eligible.
- 6 Eligibility determination was too complex for NESCAUM to complete.
- 7 Ammonia emissions may make this source eligible.
- 8 Further research into insignificant units is required.
- 9 This source may be part of another source.
- 10 This source does may meet the boiler capacity requirement with research on installation dates.
- 11 This source has units installed prior to 1960.
- 12 This source has units installed after 1979.
- 13 This source has no units that were installed between 1960 and 1979.
- 14 Potential emissions are less than 250 tons per year.
- 15 Boiler capacity is less than 250 MMBTU.
- 16 This facility has no boilers.
- 17 NESCAUM is uncertain of the correct SIC code for this facility.
- 18 This facility has closed.

No lists are available for the State of Vermont or any of the member Tribes in MANE-VU. None of these jurisdictions have any BART-eligible sources to our knowledge. No list is available for the state of Pennsylvania; Pennsylvania plans to develop its own BART-eligible source lists independently. The District of Columbia developed a BART-Eligible source list following its own methodology and identified two eligible sources.

²² See footnote 17

Table MA-3: Non-BART-Eligible Sources in MA (cont.)

State	Company Name	City	BART Category	Potential emissions from date-eligible units				Potential emissions from 1960-1962, 1977-1979 units				Notes
				NOx	PM	SO2	VOC	NOx	PM	SO2	VOC	
MA	HARVARD UNIVERSITY CAMBRIDGE	Cambridge	boilers	unknown	unknown	unknown	unknown	75.21	16.65	30.36	2.65	12,15
MA	HAVERHILL PAPERBOARD CORP.	Haverhill	boilers	n/a	n/a	n/a	n/a	unknown	unknown	unknown	unknown	11,13
MA	HAZEN PAPER COMPANY	Holyoke	boilers	unknown	unknown	unknown	unknown	unknown	unknown	4.69	unknown	15
MA	HOLLINGSWORTH & VOSE CO., GROTON	Groton	kraft pulp	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	11,12,13
MA	HOLLINGSWORTH & VOSE COMPANY, WALPOLE	Walpole	kraft pulp	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	11,12,14
MA	IDEAL TAPE COMPANY	Lowell	boilers	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	16
MA	IRVING OIL TERMINALS (IRVING/BP OIL - REVERE TERMINAL)	Revere	petrol. storage	unknown	unknown	unknown	23.59	unknown	unknown	unknown	unknown	11,14
MA	ITW DEVCON (ITW ADHESIVES)	Danvers	chemical plant	unknown	unknown	unknown	unknown	3.31	0.1653	0.0199	0.528	12,15
MA	IVEX CORPORATION	Newton	boilers	unknown	unknown	unknown	unknown	n/a	n/a	n/a	n/a	15
MA	KANZAKI SPECIALTY PAPERS	Ware	boilers	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	12,13
MA	LISTA INTERNATIONAL	Holliston	boilers	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	15
MA	LUCENT TECHNOLOGIES	North Andover	boilers	n/a	n/a	n/a	n/a	unknown	unknown	unknown	unknown	11,13
MA	Macdermid Graphic AR (Polyfibon Technologies Inc.)	Adams	boilers	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	11,15
MA	MADISON CABLE CORP	Worcester	boilers	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	16
MA	MAJILITE MANUFACTURING INC.	Lowell	boilers	unknown	unknown	unknown	unknown	n/a	n/a	n/a	n/a	15
MA	MALDEN MILLS INDUSTR (MALDEN MILLS IND INC)	Lawrence	boilers	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	12,13
MA	MERRIMAC PAPER CO	Lawrence	kraft pulp	0	0	0	12.55	unknown	0.5	unknown	0.01	11,12,14
MA	MILLIPORE CORP	Bedford	boilers	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	12,13
MA	MILLIPORE CORP. (AMICON)	Danvers	boilers	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	15
MA	MOBIL OIL CORP	Sprinfild	petrol. storage	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	14
MA	MUNKSJO PAPER DECO (PWA DÉCOR INC/MUNKSJO DÉCO	Fitchburg	kraft pulp	137	9.3	48	unknown	unknown	unknown	unknown	unknown	11,15
MA	MWRA DEER ISLAND TREATMENT	Winthrop	boilers	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	12,13
MA	MY BREAD BAKING COMPANY	New Bedford	boilers	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	12,13
MA	NATICK PAPERBOARD CORP.	Natick	boilers	unknown	unknown	unknown	unknown	123.25	unknown	unknown	unknown	12,13,15
MA	NEWARK ATLANTIC PAPE (NEWARK ATLANTIC PAPERBOAR	Lawrence	boilers	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	11,13
MA	OGDEN MARTIN OF HAVE (OGDEN MARTIN - MASS BURN)	Haverhill	incinerator	unknown	unknown	unknown	unknown	17.6	1.2	1.2	1.4	12,14
MA	PIANTEDOSI BAKING CO.	Malden	boilers	2	unknown	unknown	unknown	unknown	unknown	unknown	unknown	15
MA	PLAINVILLE LANDFILL (PLAINVILLE SANITARY)	Plainville	incinerator	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	12,14
MA	PLYMOUTH RUBBER CO.	Canton	boilers	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	15
MA	POLAROID CORPORATION	Waltham	boilers	unknown	unknown	unknown	unknown	n/a	n/a	n/a	n/a	15
MA	PROMA TECHNOLOGIES	Franklin	boilers	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	12,13
MA	REX FINISHING INC.	Peabody	boilers	8.287	2.9	62.153	0.083	n/a	n/a	n/a	n/a	15
MA	REXAM DSI	West Springfield	kraft pulp	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	11,13
MA	SAMUEL BENT LLC (S. BENT & BROS./FURNITURE)	Gardner	boilers	n/a	n/a	n/a	n/a	unknown	unknown	unknown	unknown	11,12,13
MA	SCHWEITZER MAUDIT - MILL ST. (KIMBERLY-CLARK CORP.)	Lee	kraft pulp	49.8	2.4	52.3	0.92	unknown	0.021	unknown	0.037	16
MA	SEAMAN PAPER COMPANY	Templeton	kraft pulp	unknown	unknown	unknown	unknown	47	12.6	134	0.24	16
MA	SEMASS PARTNERSHIP (SEMASS RESOURCE RECOVERY	Rochester	incinerator	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	12,13
MA	SHELL OIL PRODUCTS CO	Fall River	petrol. storage	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	12,13
MA	SMITH COLLEGE	Northampton	boilers	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	11,15
MA	SOUTHBRIDGE POWER & T	Southbridge	boilers	unknown	unknown	unknown	unknown	216.6	2.6	0.26	3.1	15

Table NJ-1: BART-Eligible Sources in NJ

State	Company Name	City	BART Category	Potential emissions from date-eligible units				Potential emissions from 1960-1962, 1977-1979 units				Notes
				NOx	PM	SO2	VOC	NOx	PM	SO2	VOC	
NJ	ANCHOR GLASS CONTAINER CORP 65499	Salem	glass fiber	890.4	182.11	483.904	28.46	n/a	n/a	n/a	n/a	12
NJ	ANHEUSER-BUSCH INC 07551	Newark	chemical plant	756.45	50	551.8	59.86	unknown	unknown	unknown	unknown	11,12
NJ	Bell Laboratories, Div. Of Lucent Technologies (41682)	Murray Hill	boilers	397.8	54.6	430.8	15	unknown	unknown	unknown	unknown	12
NJ	CHEVRON PRODUCTS CO 18058	Perth Amboy	petrol. refinery	635.4	59.48	138.19	862.13	unknown	unknown	unknown	unknown	11,12
NJ	CO-STEEL RARITAN 18045	Perth Amboy	iron, coke oven	348.92	5.39	0.67	1.84	94.56	71.45	7.84	23.5	12
NJ	Co-Steel Sayerville (18052)	Sayerville	iron, coke oven	337.5	85.4	142.9	132.9	unknown	unknown	unknown	unknown	12
NJ	KIMBLE GLASS INC 75503	Vineland	glass fiber	722	38.48	14.9	2.73	unknown	unknown	unknown	unknown	12
NJ	REVERE IND LLC EKCO PRODUTS DIV 55796	Clayton	zinc smelter	39.208	4.71	0	261.45	unknown	unknown	unknown	unknown	12
NJ	VALERO REFINING CO OF NJ 55829	Paulsboro	petrol. refinery	133	32.7	475	8.5	33425	336.2	146096	9357.4	1,2,11,12

Table NJ-2: Potentially BART-Eligible Sources in NJ

State	Company Name	City	BART Category	Potential emissions from date-eligible units				Potential emissions from 1960-1962, 1977-1979 units				Notes
				NOx	PM	SO2	VOC	NOx	PM	SO2	VOC	
NJ	AFG IND INC. 45982	Cinnaminson	glass fiber	n/a	n/a	n/a	n/a	1152.2	29.467	184.88	12.06	1
NJ	AMERADA HESS CORP PORT READING 17996	Woodbridge	petrol. refinery	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	1,2,12
NJ	BAYWAY REFINING CO 41805	Linden	petrol. refinery	unknown	unknown	unknown	unknown	4235.9	820.7	7382.7	4922.5	1,2,12
NJ	CHAMBERS WORKS 65491	Deepwater	chemical plant	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	1,2,12
NJ	COASTAL EAGLE POINT OIL COMPANY 55781	Westville	petrol. refinery	0	0	0	5.9	319.5	27.16	115.1	373.52	1,2,11,12
NJ	COLORITE SPECIALTY RESINS 45940	Burlington	chemical plant	208.48	59.516	118.26	23.39	60.07	130.518	32.375	287.1585	1,2,12
NJ	CURTIS SPECIALTY PAPER 80351	Milford	kraft pulp	209.94	11.57	164.17	66.34	0	16.55	0	518.4	1,2,12
NJ	FIBERMARK WARREN GLEN 80354	Bloomsbury	kraft pulp	unknown	unknown	unknown	unknown	360.47	55.712	731.77	53.05	1,12
NJ	FORD MOTOR CO EDISON ASSEMBLY PLANT 18069	Edison	chemical plant	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	1,2,12
NJ	GATX TERMINALS CORP CARTERET FACILITY 18010	Carteret	petrol. storage	unknown	unknown	unknown	unknown	39.41	21.33	28.62	25855.63	1,2,12
NJ	GENERAL CHEMICAL CORP 07369	Newark	acid, sulfur, charc	0	0.838	0.004	0	0.802	13.9	2279.221	0.019	1,2,11,12
NJ	GM LINDEN ASSEMBLY DIVISION OF GENERAL MOTORS 41805	Linden	chemical plant	0	0	0	0	239.39	29.6	202.5	505.15	1,2,12
NJ	GREEN TREE CHEMICAL TECHNOLOGIES INC 18185	Parlin	chemical plant	unknown	unknown	unknown	unknown	276.62	11.28	0.87	18.49	1,2,12
NJ	Griffin Pipe Products (45954)	Florence	iron and steel	unknown	unknown	unknown	unknown	112.358	75.55	24.388	731.15	1,12
NJ	HOFFMANN-LA ROCHE 07167	Nutley	chemical plant	2.5	0.088	0.009	2.777	652.9	63.948	144.711	172.783	1,2,12
NJ	IMTT BAYONNE 12194	Bayonne	petrol. storage	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	2,11,12
NJ	Infineum USA LP- Bayway Chemical Plant (41767)	Linden	chemical plant	0	0.2	0	23.243	unknown	unknown	unknown	unknown	1,2,11,12
NJ	NOVARTIS PHARMACEUTICALS SUMMIT 41782	Summit	chemical plant	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	4
NJ	REPAUNO PRODUCTS LLC 55800	Gibbstown	acid, sulfur, charc	unknown	unknown	unknown	unknown	928.03	89.81	7.09	1.06	1,2
NJ	SAINT-GOBAIN CONTAINERS 18070	Carteret	glass fiber	unknown	unknown	unknown	unknown	411.92	69.029	243.601	17.693	1,2,12
NJ	SHELL OIL PRODUCTS CO SEWAREN PLANT 18051	Sewaren	petrol. storage	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	1,11,12
NJ	TEKNI PLEX INC 80361	Raritan	chemical plant	unknown	unknown	unknown	unknown	46.35	1.836	8.74	326.8334	1,2,12
NJ	TRANSCO COMPRESSOR STATION 35742	Branchburg Twp.	petrol. storage	197.96	1.76	0	94.89	199.66	1.76	0	94.8	1,12
NJ	UNIVERSITY OF MEDICINE AND DENTISTRY 07726	Newark	boilers	unknown	unknown	unknown	unknown	448.54	15.3	36.6	36.8	1,2,11,12
NJ	US GYPSUM COMPANY 41642	Clark	kraft pulp	0	4	0	23.773	240	151.4	250	166.5	1,12
NJ	WHEATON INC 75505	Millville	glass fiber	unknown	unknown	unknown	unknown	734.63	269.761	536.66	25.678	1,2,11,12

