

**St. Louis Ozone and PM_{2.5}
Modeling Study:
*Draft - Task 3 Technical Memorandum***

Prepared for

Dr. Calvin Ku

Missouri Department of
Natural Resources
Jefferson City, MO 65101

Prepared by

Alpine Geophysics, LLC
387 Pollard Mine Road
Burnsville, NC 28714

ENVIRON International Corporation
5401 Veterans Memorial Parkway
Suite 201
St. Peters, MO 63376

and

EAE, Inc.
213 English Station Rd.
Knoxville, TN 37922

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INTRODUCTION

ENVIRON International Corporation and its subcontractors, Alpine Geophysics, LLC; Prudent Technologies, Inc.; and Environmental Advisors and Engineers, Inc. (hereafter referred to as the Team), have been retained by the Missouri Department of Natural Resources (MDNR) to provide air quality consulting services for the St. Louis Ozone and PM_{2.5} Air Quality Modeling Study. The main focus of the Team's efforts is to provide technical assistance to the various modeling centers who will be conducting the preponderance of the St. Louis Modeling Study. These modeling centers include the MDNR, Illinois Environmental Protection Agency (IEPA), EPA Region VII and Ameren.

This technical memorandum consists of the draft results of Subtasks 3.1 and 3.2, development of regional and local control strategies. In this document and associated tables, we define specific control factors reviewed and recommended by the Team for purposes of developing a forecasted 2009 base case inventory from various 2002 base year emissions datasets. Tables are provided in formats similar to those prepared for CENRAP's 2018 emissions forecasting for the regional haze modeling analysis. As identified in the project work plan, we have split this task into two components, one examining regional growth and control issues, the other analyzing growth and controls within the greater St. Louis area. The growth factors associated with these subtasks are presented in a separate technical memorandum.

Subtask 3.1 – Regional Control Factors

Through the review of documents, reports, and data prepared by and for CENRAP, MRPO, VISTAS, EPA, and others, we have compiled a list of national and regional measures through which application to a 2002 base year emissions inventory, could be used to develop a base case 2009 emissions inventory for ozone and PM air quality modeling analysis. The tables in the Appendix of this memorandum present originally identified control strategies and associated emission reduction assumptions, comments from the modeling team as to the applicability of the original factors, comparisons to alternate factors obtained through our research and review, and recommendations for final selection of control strategies and associated reduction potential from these strategies. In some cases, references and additional materials are still being checked to ensure the validity of the reduction potentials of assigned strategies. The Team will continue to work towards defining these parameters during the review of the strategies by the MDNR Modeling and Data Analysis Workgroup (MDAW) and Control Strategy Development Workgroup (CSDW).

Included in these tables are the control strategies associated with various Federal Maximum Achievable Control Technology (MACT) standards, VOC Reasonably Achievable Control Technology (RACT) regulations, New Source Performance Standards (NSPS), Stage II regulation at gasoline dispensing facilities, nonroad locomotive, spark ignition, and commercial marine vessel (CMV) regulation, and other non-Missouri State regulations. In the first set of tables, only the programs and their associated reduction potential (by pollutant) are presented. Additional tables are included which identify specific SCCs to which these strategies are recommended to be applied. To date, we have not fully determined which of the regional control

strategies are explicitly applicable to the MDNR modeling domain but will work with the MDAW and the base year 2002 emission inventory to make the final application decisions.

Federal MACT and VOC RACT Standards

Data related to Federal MACT and RACT standards were obtained from CENRAP's 2018 emission projections work, EPA's CAIR rule databases, and review of rules and regulations via EPA websites and personal communications. These data may have similar results in each of the reviewed sources, may differ in percent reduction as a result of incremental market penetration, or may have differing pollutants of coverage depending on the original purpose of the data. Table A-1 of this document's appendix provides a summary of these data and recommended action proposed by the Team to MDNR MDAW and CSDW for review.

New Source Performance Standards

Residential wood combustion and the implementation of cleaner technology wood stoves have been modeled by many of the RPOs and EPA in their emission forecasts. Using data developed for CENRAP and these other agencies, the Team has provided a list of SCCs and associated reductions expected with the implementation of these cleaner technologies implementing NSPS level emission limits. These data can be found in Table A-2 of the appendix.

Stage II Gasoline Distribution

VOC emission reductions associated with Stage II controls is typically calculated using a series of MOBILE model simulations. Using data previously estimated for CENRAP, VISTAS, and MRPO, the Team was able to determine that similar calculations as values have been provided using this methodology for 2018. As a result, the Team felt confident in using same vintage reduction values from the MRPO Round 2 modeling files which contain national Stage II emission reduction, by county and SCC. These values and their associated geographic and source category application can be found in Table A-3 of the appendix.

Nonroad Source Emission Reduction

Various nonroad source emission standards have recently come online as a result of EPA initiatives to reduce emissions from these categories. In particular, regulation assigned to diesel engine locomotive and commercial marine vessels (CMV), and large spark ignition engines will show an emissions decrease in the 2002 through 2009 time frame. Similar to the data obtained for Stage II emission reductions, MRPO Round 2 control factor files were used to develop the 2009 national SCC level application factors provided in Table A-4 of the appendix. The 2018 factors developed for MRPO were comparable to the CENRAP 2018 estimates and therefore were thought to be representative for this analysis.

Onroad Mobile Sources

Via reference in this document, we are submitting the MDNR developed 2002 MOBILE6 input shells in SMOKE-ready format to MDNR for purposes of the onroad sector control strategy review. Since these shells typically include the date by which specific control programs are to incrementally be applied, no adjustments were identified by the Team for this subtask.

Subtask 3.2 – Local Control Factors

In addition to the State and regional information obtained in our review of the control factors for Subtask 3.1, control strategies and expected emission reduction scenarios for the St. Louis 8-hr ozone nonattainment area and immediately surrounding counties were researched, reviewed, and refined to meet the needs of the 2009 base case forecasting application.

Similar to the process involved with the regional control strategy review, we obtained control technology and application strategies from State and local documentation and sources. Under this subtask, the control factors associated with these localized programs are summarized for the MDAW and CSDW review. The tables in the Appendix of this memorandum related to these local factors also present identified control strategies and associated emission reduction assumptions, specific sources to which these reductions apply, comments from the modeling team as to the applicability of the factors, and recommendations for final application of control strategies and associated reduction potential from these strategies.

Missouri NO_x SIP Call

Included as a local strategy are the proposed NO_x SIP Call rule assumptions presented at the April 28, 2005 Missouri Air Commission Hearing. These proposals are a result of the U.S. EPA's decision to reject Missouri's original SIP submittal in response to the NO_x SIP Call rule. The new control factors assigned in this document are consistent with the U.S. EPA's application of the rule to sources within the counties affected by the regulation. In particular, the reductions associated with non-EGU boilers, cement manufacturing facilities, and internal combustion engines. Discussions with MDNR emission inventory staff helped to refine the specific sources to which these newly proposed reductions are to be applied. Table A-5 in the appendix of this document presents the source specific application proposal for this regulation. The NO_x SIP Call reductions associated with the EGU sector are not presented in this document or associated tables as regional modeling of these sources is currently being conducted under another contract to CENRAP and its sister RPOs using ICF's proprietary Integrated Planning Model (IPM®).

Comments

Upon review and comments of these strategies and factors by the MDNR MDAW and CSDW, the Team will revise these factors and prepare SMOKE-ready control packets for application with SMOKE v.2.1.

References

- EPA, 2004, “Technical Memorandum: Control Packet Development and Data Sources,” prepared for U.S. EPA by Alpine Geophysics, LLC., July 14, 2004.
- EPA, 2005a, *Table of Final MACT Rules*, <http://www.epa.gov/ttn/atw/mactfnl.html>.
- EPA, 2005b, personal communication with multiple U.S. EPA MACT engineers and project leads.
- Missouri DNR, 2005, personal communication with Jim Kavanaugh.
- Missouri Register, 2005a, *10 CSR 10-6.360 Control of NOx Emissions From Electric Generating Units and Non-Electric Generating Boilers*, Volume 30, Number 6, page 522, March 15, 2005.
- Missouri Register, 2005b, *10 CSR 10-6.380 Control of NOx Emissions From Portland Cement Kilns*, Volume 30, Number 6, page 549, March 15, 2005.
- Missouri Register, 2005c, *10 CSR 10-6.390 Control of NOx Emissions From Large Internal Combustion Engines*, Volume 30, Number 6, page 553, March 15, 2005.
- OTAG, “OTAG Technical Supporting Document,” Chapter 3, <http://www.epa.gov/ttnnaqs/otag/finalrpt>.
- Pechan, 2004, “Development of Growth and Control Factors for Lake Michigan Air Directors Consortium (LADCO) – Draft Report,” E.H. Pechan & Associates, Inc., October 26, 2004.
- Pechan, 2005, “Development of Growth and Control Inputs for 2018 Emissions,” presentation and associated files for base year and growth and control for CENRAP Emissions Inventory, E.H. Pechan, March 2, 2005.

**Table A-1
Regional Control Strategies - MACT/RACT Standards**

MACT Description	Poll	Control Efficiency	Rule Effectiveness (Level of expected compliance)	Rule Penetration (Fraction of emissions in a source category subject to rule)	Total Control (2009)	NOTES	MACT Control Review Result	Source
Asphalt Processing And Asphalt Roofing Manufacturing	VOC	29	100	100	29%	No existing facilities in the St. Louis Nonattainment area and none expected. Can leave in, but probably won't show any impact since there aren't any facilities.	No Change	CENRAP (2018)
Auto And Light Duty Trucks	VOC	40	100	100	40%	EPA Reg 4/26/2004 - Existing source compliance by 4/26/2007. Est 60% reduction of air toxics from est. 1997 emissions and a VOC emissions reduction between 12,000 to 18,000 TPY. OTAG Technical Supporting Document VOC Control default value is 70%.	No change	CENRAP (2018)
By-product coke - flushing-liquor c	VOC	95	100	100	95%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	No Change	EPA: CAIR (2009i)
By-product coke manufacture - other	VOC	94	100	100	94%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	No Change	EPA: CAIR (2009i)
By-product coke manufacture - oven	VOC	94	100	100	94%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	No Change	EPA: CAIR (2009i)
Chelating agents	VOC	70	100	100	70%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add	EPA: CAIR (2009i)
Coke oven by-product plants	VOC	94	100	100	94%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add	EPA: CAIR (2009i)
Coke Ovens	VOC	43	100	100	43%	EPA Rule 4/14/03. Compliance by 4/14/06. Control estimate agrees with MACT information (i.e., 43 percent reduction from 2002 levels). This rule only applies to pushing, quenching, & battery stacks. Other coke oven emissions were covered by the 93 regulations. <i>Need to determine whether any coke ovens are still operating in the St. Louis Nonattainment Area. There were two, one in each state at one time.</i>	Add	EPA: CAIR (2009i)

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MACT Description	Poll	Control Efficiency	Rule Effectiveness (Level of expected compliance)	Rule Penetration (Fraction of emissions in a source category subject to reg)	Total Control (2009)	NOTES	MACT Control Review Result	Source
Coke ovens - door and topside leaks	VOC	94	100	100	94%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add	EPA: CAIR (2009i)
Combustion Sources at Kraft, Soda and Sulfite Paper Mills	VOC	12	100	100	12%	No facilities in the St. Louis Nonattainment Area.	Add	EPA: CAIR (2009i)
Dry cleaning - other	VOC	70	100	100	70%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document. I discussed the source of this source category with Richard Tripp, the Region VII MACT Contact. He didn't know of any EPA NSPS or MACT reg that had a specific regulation for this category, but as noted, it was included in the OTAG list.	Add	EPA: CAIR (2009i)
Dry cleaning - stoddard	VOC	70	100	100	70%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document. NSPS Reg.	Add	EPA: CAIR (2009i)
EFR crude tanks	VOC	90	100	100	90%	OTAG Technical Supporting Document VOC control default is 72%. <i>Discuss control level with EPA or Greg.</i>	Add	EPA: CAIR (2009i)
EFR gasoline tanks	VOC	95	100	100	95%	EPA MACT Floor Memo dated 6/7/99 designated 95% as MACT floor for EFT Tanks with a capacity of 10,000 gal or greater storing material with a HAP partial pressure of .10 psia or greater. <i>Question, how many gasoline storage tanks remain uncontrolled.</i>	Add	EPA: CAIR (2009i)
Fabric Printing, Coating & Dyeing	VOC	60	100	100	60%	EPA Original Rule 5/29/03. EPA MACT rule preamble estimates 60% reduction from 97 levels.	No Change	CENRAP (2018)
Fixed roof crude tanks	VOC	98	100	100	98%	Control level looks okay. <i>Question how many tanks remain uncontrolled.</i>	Add	EPA: CAIR (2009i)
Fixed roof gasoline tanks	VOC	96	100	100	96%	Control level looks okay. <i>Question how many tanks remain uncontrolled.</i>	Add	EPA: CAIR (2009i)

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Regional Control Strategies - MACT/RACT Standards**

MACT Description	PIIt	Control Efficiency	Rule Effectiveness (Level of expected compliance)	Rule Penetration (Fraction of emissions in a source categ subject to reg)	Total Control (2009)	NOTES	MACT Control Review Result	Source
Flatwood surface coating	VOC	90	100	100	90%	Assumed this MACT category is now called Surface Coating of Wood Building Products. EPA Rule 5/28/03. Compliance by 5/29/06. OTAG Technical Supporting Document default VOC control is 70%. <i>Can't validate this Control Estimate.</i>	Under Review	EPA: CAIR (2009i)
Friction Products Manufacturing	VOC	44	100	100	44%	EPA Reg 10/18/02. Compliance 10/19/05. Preamble to EPA reg supports control estimate.	No Change	CENRAP (2018)
Gas mark. - balanced loading	VOC	87	100	100	87%	Chapter 3, OTAG Technical Supporting Document - Default value is 5%.	Add @ 5%	EPA: CAIR (2009i)
Gas mark. - fixed roof breathing	VOC	5	100	100	5%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add	EPA: CAIR (2009i)
Gas mark. - fixed roof working	VOC	5	100	100	5%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add	EPA: CAIR (2009i)
Gas mark. - floating roof standing	VOC	5	100	100	5%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add	EPA: CAIR (2009i)
Gas mark. - floating roof withdrawa	VOC	5	100	100	5%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add	EPA: CAIR (2009i)
Gas mark. - miscellaneous losses	VOC	5	100	100	5%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add	EPA: CAIR (2009i)
Gas mark. - splash loading	VOC	99	100	100	99%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add @ 5%	EPA: CAIR (2009i)
Gas mark. - submerged loading	VOC	99	100	100	99%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add @ 5%	EPA: CAIR (2009i)
Gas mark. - transit losses	VOC	5	100	100	5%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add	EPA: CAIR (2009i)

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MACT Description	PIIt	Control Efficiency	Rule Effectiveness (Level of expected compliance)	Rule Penetration (Fraction of emissions in a source categ subject to reg)	Total Control (2009)	NOTES	MACT Control Review Result	Source
Gas mark. - underground tank breath	VOC	5	100	100	5%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add	EPA: CAIR (2009i)
Gas mark. - underground tank workin	VOC	5	100	100	5%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add	EPA: CAIR (2009i)
Gas mark. - variable vapor space fi	VOC	5	100	100	5%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add	EPA: CAIR (2009i)
Gas mark. external floating roof	VOC	5	100	100	5%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add	EPA: CAIR (2009i)
Industrial Boiler/Process Heater	PM10	40	100	100	40%	EPA Reg 9/13/04. Compliance 9/14/07. Regulation doesn't provide a speciation breakout for PM reductions nor does it specify the base inventory of PM. Talked to EPA Contact (Jim Eddinger 919-541-5426.) and he said they looked at overall PM as a surrogate for metals. 40% was probably a good number although the MACT group only looked at overall PM control effectiveness.	Add @ boilers of >= 250 MMBtu/hr	EPA: CAIR (2009i)
Industrial Boiler/Process Heater	PM2.5	40	100	100	40%	EPA Reg 9/13/04. Compliance 9/14/07. Regulation doesn't provide a speciation breakout for PM reductions nor does it specify the base inventory of PM. Talked to EPA Contact (Jim Eddinger 919-541-5426.) and he said they looked at overall PM as a surrogate for metals. 40% was probably a good number although the MACT group only looked at overall PM control effectiveness.	Add @ boilers of >= 250 MMBtu/hr	EPA: CAIR (2009i)

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Industrial Boiler/Process Heater	SO2	4	100	100	4%	EPA Reg 9/13/04. Compliance 9/14/07. Regulation doesn't provide a speciation breakout for PM reductions nor does it specify the base inventory of PM. Talked to EPA Contact (Jim Eddinger 919-541-5426.). Mr. Eddinger said they were looking at HCl control by scrubbing for the MACT. HCl is much easier to control than SO2 so the SO2 removal would be low and 4% sounded like a good "ballpark" number to him.	Add @ boilers of >= 250 MMBtu/hr	EPA: CAIR (2009i)
Integrated Iron And Steel	VOC	20	100	100	20%	2/28/03 Fact Sheet - Final Rule 5/20/03. Most of sources are in Region V. Reg targeted at PM (manganese and lead), but organics (polycyclic organic matter, benzene and dioxins and furans), of these only benzene is a VOC. VOC control comes primarily from Sinter Plant Oil Content limits. EPA concluded that organic HAP emission limits weren't practical. Exist source compliance date 5/22/06. Contact Philip Mulrine 919-541-5289. Only plant in the St. Louis nonattainment area is National Steel in Granite City and it doesn't have a sinter plant according to the EPA background document for Proposed Standards dated 3/15/01.	No Change	CENRAP (2018)

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MACT Description	Pilt	Control Efficiency	Rule Effectiveness (Level of expected compliance)	Rule Penetration (Fraction of emissions in a source category subject to rule)	Total Control (2009)	NOTES	MACT Control Review Result	Source
Integrated Iron And Steel	PM-10	20	100	100	20%	2/28/03 Fact Sheet - Final Rule 5/20/03. Most of sources are in Region V. Reg targeted at PM (manganese and lead), but organics (polycyclic organic matter, benzene and dioxins and furans), of these only benzene is a VOC. VOC control comes primarily from Sinter Plant Oil Content limits. EPA concluded that organic HAP emission limits weren't practical. Exist source compliance date 5/22/06. Contact Philip Mulrine 919-541-5289. Only plant in the St. Louis nonattainment area is National Steel in Granite City and it doesn't have a sinter plant according to the EPA background document for Proposed Standards dated 3/15/01.	Add	MRPO (2009)
Integrated Iron And Steel	PM-2.5	20	100	100	20%	2/28/03 Fact Sheet - Final Rule 5/20/03. Most of sources are in Region V. Reg targeted at PM (manganese and lead), but organics (polycyclic organic matter, benzene and dioxins and furans), of these only benzene is a VOC. VOC control comes primarily from Sinter Plant Oil Content limits. EPA concluded that organic HAP emission limits weren't practical. Exist source compliance date 5/22/06. Contact Philip Mulrine 919-541-5289. Only plant in the St. Louis nonattainment area is National Steel in Granite City and it doesn't have a sinter plant according to the EPA background document for Proposed Standards dated 3/15/01.	Add	MRPO (2009)
Large Appliances	VOC	45	100	100	45%	EPA Rule 7/15/02 & Fact Sheet 7/3/02. Estimates 45% Reduction in Air Toxics. There appears to be at least one existing facility in the St. Louis Nonattainment Area.	No Change	CENRAP (2018)

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MACT Description	Poll	Control Efficiency	Rule Effectiveness (Level of expected compliance)	Rule Penetration (Fraction of emissions in a source category subject to reg)	Total Control (2009)	NOTES	MACT Control Review Result	Source
Leather Finishing Operations	VOC	51	100	100	51%	2/1/05 EPA made minor amend. Orig MACT 2/27/02. 2/27/05 compliance date. 50% (375 tons) reduction of air toxics from 97 levels & 750 tons of VOC reduced from 05 levels. Contact William Schrock 919-541-5032.	No Change	CENRAP (2018)
Lime Manufacturing	VOC	0	100	100	0%	EPA Reg 1/5/04. MACT reg specifies only PM controls.	No Change	CENRAP (2018)
Lime Manufacturing	PM-10	0	100	100	0%	EPA Reg 1/5/04. MACT reg specifies only PM controls.	Add	MRPO (2009)
Lime Manufacturing	PM-2.5	0	100	100	0%	EPA Reg 1/5/04. MACT reg specifies only PM controls.	Add	MRPO (2009)
Manufacturing Nutritional Yeast	VOC	10	100	100	10%	EPA Reg 5/21/01. Preamble to EPA MACT reg estimates VOC control efficiency of 10%.	No Change	CENRAP (2018)
Marine vessel loading: petroleum li	VOC	80	100	100	80%	OTAG Technical Supporting Document default for VOC control efficiency is 68%. EPA Rule 9/19/95 - this rule doesn't provide any estimate of total control.	Under Review	EPA: CAIR (2009i)
Metal Can	VOC	70	100	100	70%	EPA Reg 8/14/03. Covers iron can body coating. No existing metal can coating facilities in the St. Louis Area. No new facilities expected for 5 years after the regulation per EPA. Overall reduction of 70% from 1997 baseline per EPA.	No Change	CENRAP (2018)
Metal Coil	VOC	53	100	100	53%	EPA Reg 6/10/02. Compliance 6/11/05. Preamble to MACT reg estimated VOC (total HAP) reduction of 53%.	No Change	CENRAP (2018)
Metal Furniture	VOC	73	100	100	73%	EPA final Reg 3/6/03. Estimates 93% reduction from 97 baseline and expects to achieve 73% reduction by 08. Compliance date 3/6/06. New sources will comply by eliminating air toxics from coatings and will become area sources. Contact Dr. Mohamed Serageldin 919-541-2379.	No Change	CENRAP (2018)
Misc. Coating Manufacturing	VOC	64	100	100	64%	EPA Reg 12/11/03. Total control assumption agrees with Preamble to MACT reg.	No Change	CENRAP (2018)
Misc. Metal Parts And Products	VOC	48	100	100	48%		No Change	CENRAP (2018)

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Misc. Organic Chemical Production And Processes (Mon)	VOC	66	100	100	66%	Appears that CENRAP listed this as an single grouping, whereas the CAIR broke out certain source types. <i>Discuss with Greg or EPA contact in RVII.</i>	No change	CENRAP (2018)
Municipal Solid Waste Landfills	VOC	75	100	100	75%	EPA Reg 1/16/03. Compliance 1/17/06. OTAG Technical Supporting Document default control for Municipal Landfills is 70%	Under Review	EPA: CAIR (2009i)
Municipal Waste Combustors	PM10	30	100	100	30%	Proposed Reg 4/20/04. Compliance 3 years after reg promulgated. Reg offers option of a risk-based demonstration in lieu of meeting emissions limits. <i>I was unable to find any documentation to verify the assumptions.</i>	Under Review	EPA: CAIR (2009i)
Municipal Waste Combustors	PM2.5	30	100	100	30%	Proposed Reg 4/20/04. Compliance 3 years after reg promulgated. Reg offers option of a risk-based demonstration in lieu of meeting emissions limits. <i>I was unable to find any documentation to verify the assumptions.</i>	Under Review	EPA: CAIR (2009i)
Municipal Waste Combustors	SO2	50	100	100	50%	Proposed Reg 4/20/04. Compliance 3 years after reg promulgated. Reg offers option of a risk-based demonstration in lieu of meeting emissions limits. <i>I was unable to find any documentation to verify the assumptions.</i>	Under Review	EPA: CAIR (2009i)
Nylon 6 production	VOC	70	100	100	70%	OTAG Technical Supporting Document default for VOC control is 70%.	Add	EPA: CAIR (2009i)
Oil field - fixed roof breathing	VOC	5	100	100	5%	Control assumption agrees with default value specified in Chapter, 3 OTAG Technical Supporting Document. Don't expect this to be applicable for the St. Louis Nonattainment Area Modeling. No oil fields expected in the St. Louis Nonattainment Area, but <i>check to see if any Southern Ill Oil Fields could impact.</i>	Add	EPA: CAIR (2009i)

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MACT Description	PIIt	Control Efficiency	Rule Effectiveness (Level of expected compliance)	Rule Penetration (Fraction of emissions in a source categ subject to reg)	Total Control (2009)	NOTES	MACT Control Review Result	Source
Oil field - fixed roof working	VOC	5	100	100	5%	Control assumption agrees with default value specified in Chapter, 3 OTAG Technical Supporting Document. Don't expect this to be applicable for the St. Louis Nonattainment Area Modeling. No oil fields expected in the St. Louis Nonattainment Area, but <i>check to see if any Southern III Oil Fields could impact.</i>	Add	EPA: CAIR (2009i)
Oil field - floating roof	VOC	5	100	100	5%	Control assumption agrees with default value specified in Chapter, 3 OTAG Technical Supporting Document. Don't expect this to be applicable for the St. Louis Nonattainment Area Modeling. No oil fields expected in the St. Louis Nonattainment Area, but <i>check to see if any Southern III Oil Fields could impact.</i>	Add	EPA: CAIR (2009i)
Open top degreasing	VOC	63	100	100	63%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add	EPA: CAIR (2009i)
Open top degreasing - halogenated	VOC	63	100	100	63%	Control assumption agrees with default value specified in Chapter 3, OTAG Technical Supporting Document.	Add	EPA: CAIR (2009i)
Paper And Other Web	VOC	80	100	100	80%	EPA Rule 12/4/03. Compl Date 12/4/06. 80% reduction estimate supported by MACT rule preamble.	No Change	CENRAP (2018)
Paper surface coating	VOC	78	100	100	78%	This subcategory is included in Paper and Other Web. OTAG Technical Support Document shows a default value of 70%	Under Review	EPA: CAIR (2009i)
Petroleum mark. - not classified	VOC	5	100	100	5%		Add	EPA: CAIR (2009i)
Petroleum product - balanced loadin	VOC	5	100	100	5%	OTAG Technical Supporting Document default for VOC control efficiency is 5%.	Add	EPA: CAIR (2009i)
Petroleum product - splash loading	VOC	5	100	100	5%	OTAG Technical Supporting Document default for VOC control efficiency is 5%.	Add	EPA: CAIR (2009i)
Petroleum product - submerged loadi	VOC	5	100	100	5%		Add	EPA: CAIR (2009i)

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MACT Description	PIIt	Control Efficiency	Rule Effectiveness (Level of expected compliance)	Rule Penetration (Fraction of emissions in a source categ subject to reg)	Total Control (2009)	NOTES	MACT Control Review Result	Source
Petroleum Refineries	VOC	55	100	100	55%	EPA Rules 4/11/02 & 2/9/05 for cat cracking, cat reforming and sulfur recovery units. Compliance by 4/11/05 for existing sources except there is an extension provision for CCU Regeneration Vents to coordinate with development of Tier 2 Motor Vehicle Emission Stds and Gasoline Sulfur Control Requirements. In no case will refineries be allowed longer than December 2009 to comply with CCU limits. Original final rule estimates 55% reduction for VOCs, PM, and hydrogen sulfide.	No Change	CENRAP (2018)
Petroleum refineries - Blowdown w/o	VOC	78	100	100	78%	Couldn't locate a reference. <i>Discuss with EPA or Greg.</i>		EPA: CAIR (2009i)
Petroleum refineries - other	VOC	72	100	100	72%	Orig MACT for cat cracking, cat reforming, and sulfur recovery on 4/11/02 w/ compl by 4/11/05. Amend to these rules 2/1/05 to add compliance options, clarify test methods. Contact Bob Lucas 919-541-0884. OTAG Technical Supporting Document default value for VOC control is 72%.	Add	EPA: CAIR (2009i)
Petroleum refinery fugitives	VOC	72	100	100	72%	OTAG Technical Supporting Document default value for VOC control is 72%.	Add	EPA: CAIR (2009i)
Petroleum refinery vacuum distillat	VOC	72	100	100	72%	OTAG Technical Supporting Document default value for VOC control is 72%.	Add	EPA: CAIR (2009i)
Petroleum refinery wastewater treat	VOC	72	100	100	72%	OTAG Technical Supporting Document default value for VOC control is 72%.	Add	EPA: CAIR (2009i)
Phenol manufacture	VOC	98	100	100	98%	OTAG Technical Supporting Document default value for VOC control is 79%.	Add	EPA: CAIR (2009i)
Plastic Parts	VOC	80	100	100	80%	EPA MACT Reg 4/19/04. MACT Reg Preamble estimates overall emissions reductions of 80%.	No Change	CENRAP (2018)

**Table A-1
Regional Control Strategies - MACT/RACT Standards**

MACT Description	PIIt	Control Efficiency	Rule Effectiveness (Level of expected compliance)	Rule Penetration (Fraction of emissions in a source categ subject to reg)	Total Control (2009)	NOTES	MACT Control Review Result	Source
Plywood And Composite Wood Products	VOC	54	100	100	54%	EPA rule 7/30/04. Air toxics are VOCs and fact sheet estimated reductions of 46% from 97 levels. <i>Called Mary Tom Kissel regarding location of sources. Contact Mary Tom Kissel 919-541-4516 or Greg Nizich 919-541-3078.</i>	No Change	CENRAP (2018)
Polyester resins	VOC	70	100	100	70%	Included in Misc Organic Mfg NESHAP. The EPA reg info doesn't provide a specific reduction est for polyester resins, but the overall est for the MON is 69% so this one should be okay as is. EPA Rule 11/10/03 and compliance date 11/10/06. OTAG Technical Supporting Document default value for VOC control for Polyesters is 70%	Add	EPA: CAIR (2009i)
Polyesters	VOC	70	100	100	70%	OTAG Technical Supporting Document default value for VOC control for Polyesters is 70%	Add	EPA: CAIR (2009i)
Polyethylene manufacture	VOC	98	100	100	98%	OTAG Technical Supporting Document default VOC control is 98% based on Flare (RACT).	Add	EPA: CAIR (2009i)
Polymers And Resins III	VOC	51	100	100	51%	EPA Rule 1/20/00. Compliance Date 1/20/03. The level of 51% agrees with EPA's overall reduction estimate in the reg for the facility.	No Change	CENRAP (2018)
Polypropylene manufacture	VOC	98	100	100	98%	OTAG Technical Supporting Document default VOC control is 98% based on Flare (RACT).	Add	EPA: CAIR (2009i)
Polyvinylidene chloride	VOC	70	100	100	70%	OTAG Technical Supporting Document VOC control default is 70%.	Add	EPA: CAIR (2009i)
Pulp and Paper Production	VOC	70	100	100	70%	Don't believe there are any facilities in the St. Louis Nonattainment Area.	Under Review	EPA: CAIR (2009i)
Rayon production	VOC	70	100	100	70%	Cellulose Mfg MACT 6/11/02. MACT Preamble states overall reductions for all categories of 20%. OTAG Technical Supporting Document VOC control default is 70%	Add	EPA: CAIR (2009i)
Reciprocating Internal Combustion Engines (RICE)	VOC	13	100	100	13%		No Change	CENRAP (2018)

**Table A-1
Regional Control Strategies - MACT/RACT Standards**

MACT Description	PIIt	Control Efficiency	Rule Effectiveness (Level of expected compliance)	Rule Penetration (Fraction of emissions in a source categ subject to reg)	Total Control (2009)	NOTES	MACT Control Review Result	Source
Reinforced plastics	VOC	70	100	100	70%	Reg 4/11/03. Reduce by air toxics by 65% over 97 and reduce VOCs. Est of 70% for VOC not substantiated, but leave as is. Compliance date 4/11/06. OTAG Technical Supporting Document VOC control default is 70%. Keith Barnett 919-541-5605.	Add	EPA: CAIR (2009i)
Reciprocating Internal Combustion Engines (RICE)	NOX	17	100	100	17%		Add	EPA: CAIR (2009i)
Rubber Tire Manufacturing	VOC	52	100	100	52%		No Change	CENRAP (2018)
Secondary Aluminum Production	VOC	0	100	100	0%	Agree with the CENRAP estimate of VOC reductions, the organic HAP's aren't VOC's.	Drop	CENRAP (2018)
Secondary Aluminum Production	PM10	90	100	100	90%	Final Rules 12/30/02 & 9/3/04 and Fact Sheet 3/23/00. Existing source compliance date 3/24/03. Fact sheet and EPA reg preamble show only PM emissions reduction of approximately 33%. <i>I am contacting EPA regarding any estimates for PM10 or PM2.5. Since there really isn't a conflict between CENRAP and CAIR, use CAIR unless I am told that the CAIR MACT assumption isn't valid.</i> Contacts - Juan Santiago 919-541-1084 & Richard Tripp 913-551-7566.	Drop	EPA: CAIR (2009i)
Secondary Aluminum Production	PM2.5	90	100	100	90%	Final Rules 12/30/02 & 9/3/04 and Fact Sheet 3/23/00. Existing source compliance date 3/24/03. Fact sheet and EPA reg preamble show only PM emissions reduction of approximately 33%. <i>I am contacting EPA regarding any estimates for PM10 or PM2.5.</i>	Drop	EPA: CAIR (2009i)
Site Remediation	VOC	50	100	100	50%	8-22-03 Fact Sheet & 8-20-03 Final Rule. Compliance by 8-20-06. Estimates 50% reduction in VOCs and 50% reduction in air toxics from 97 levels.	No Change	CENRAP (2018)

**Table A-1
Regional Control Strategies - MACT/RACT Standards**

MACT Description	PIIt	Control Efficiency	Rule Effectiveness (Level of expected compliance)	Rule Penetration (Fraction of emissions in a source categ subject to reg)	Total Control (2009)	NOTES	MACT Control Review Result	Source
SOCMI fugitives	VOC	60	100	100	60%	2/23/05 amend to tank req to allow vapor balancing to comply in lieu of floating roof. Displaced vapors from storage tanks to tank trucks or rail cars be controlled to at least 95%. Contact Randy McDonald 919-541-5416.	Under Review	EPA: CAIR (2009i)
Solvent Extraction For Vegetable Oil Production	VOC	25	100	100	25%	EPA MACT Reg 4/12/01. Preamble to MACT rule states VOC emissions reduction of 25%.	No Change	CENRAP (2018)
Stationary Combustion Turbines	VOC	90	100	100	90%	EPA MACT Reg 3/5/04. MACT Reg Preamble specifies an control of 90%.	No Change	CENRAP (2018)
TSDFs	PM10	36	100	100	36%	<i>No reference located.</i>	Add	EPA: CAIR (2009i)
TSDFs	PM2.5	36	100	100	36%	<i>No reference located.</i>	Add	EPA: CAIR (2009i)
TSDFs	VOC	96	100	100	96%	OTAG Technical Supporting Document default for VOC control is 96% based on RCRA reg.	Add	EPA: CAIR (2009i)
Waste disposal - incineration/burning	VOC	82	95	100	78%	No control reference.	Under Review	EPA: CAIR (2009i)
Wet Formed Fiberglass Mat Production	VOC	74	100	100	74%	EPA Rule 4/11/02. Compliance Date 4/12/05. The reduction assumption is supported by the MACT Reg Preamble.	No Change	CENRAP (2018)
Wood Building Products	VOC	63	100	100	63%	Final rule 5/6/03 and compliance approx 5/29/06. No new facilities expected until at least 2008. Est of 63% reduction in air toxics agrees with EPA Fact Sheet and Preamble to reg.	No Change	CENRAP (2018)