

Summary of E-Check Replacement Measures and Request for Section 211 (c)(4) Preemption Waiver

The Ohio EPA is requesting a pre-exemption waiver pursuant to Section 211 (c)(4) of the Clean Air Act from the U.S. EPA to utilize 7.8 psia low Reid vapor pressure (hereinafter low RVP) fuel in eight counties located in the Cincinnati and Dayton, Ohio metropolitan areas. Specifically, the Dayton area includes Montgomery, Miami, Greene and Clark counties; and the Cincinnati area includes Hamilton, Butler, Warren and Clermont counties. This fuel choice is a necessary part of our effort to replace emission reductions associated with E-Check in these two metropolitan areas.

Background

Automobile emissions testing is required in all or part of 33 states to help maintain the federal air quality standard. Areas that were in moderate non-attainment or worse for ozone in 1990 are included in Ohio's emissions check (i.e., E-Check) program. Specifically, the state of Ohio requires E-Check inspections to be conducted in fourteen counties in Ohio that have been designated moderate non-attainment for ozone, including the eight aforementioned counties specified above.

Rule-making

Currently, Ohio EPA is proposing rule-making that would move the E-Check program in the eight non-attainment counties located in Cincinnati and Dayton, Ohio to the contingency measures in the one-hour maintenance plans for these two areas.

By rescinding the E-Check program, reductions of 5.2 tons of VOC emissions/day and 4.4 tons of NO_x emissions/day would be lost in the Cincinnati area and reductions of 1.89 tons of VOC emissions/day and 1.7 tons of NO_x emissions/day would be lost in the Dayton area.

In order to off-set these emission losses the Ohio EPA has evaluated alternative emission control strategies to replace those lost by proposed termination of the E-check program at the end of the 2005 ozone season. Several alternative emission control strategies were evaluated primarily on feasibility, cost effectiveness, and the ability to implement them in a short time frame (i.e., the next ozone season beginning May 1, 2006). Of all the control strategies evaluated, three control strategies are being proposed as alternative replacements for rescinding the E-Check program.

As can be seen from Tables 1 and 2, the total estimated emission reductions achieved from employing these three control strategies is higher than the estimated emissions lost from rescinding the E-Check program in both Cincinnati and Dayton. This is necessary since the emission calculations, while representing good estimates, are just that, "estimates", and not absolute figures. Therefore, this "buffer" will account for minor discrepancies in the emission reduction estimates. In addition, any excess (surplus) reduction of NO_x and VOC in the Cincinnati and Dayton area, will contribute to the additional reduction of ozone formation during the summer season and will assist the

area towards achieving the 8-hour ozone and PM 2.5 standards.

The table in attachment 2 represents a summary of the various control options that were evaluated. The list of controls evaluated includes the major source categories being evaluated by the Midwest Regional Planning Organization ("MRPO") as well as several that have been adopted in the northeast regional transport region as well as California. The emission reduction potential as well as the ability to implement the reductions by the 2006 ozone season necessitated the choices identified, including the choice of a 7.8 rvp fuel. We believe that this choice is justified and, based on several conversations with the petroleum industry, that the fuel can be supplied by the petroleum marketers.

It appears some additional reductions in NOx emissions will be realized in the Cincinnati area for the next 2006 ozone season as the result of a recent non-EGU facility shut-down of its 4 coal-fired boilers and the installation of low NOx burners on a EGU's unit before the start of the 2006 season. Based on emissions data for 2003, the NOx emissions will be reduced by approximately .5 TPD as a result of the 4 non-EGU boilers shut-down. The NOx emission reduction from the installation of the low NOx burner to the EGU's' unit before the 2006 ozone season is estimated at 3.1 TPD. The reductions as a result of these actions have not been finalized at this time and this rule package does not contain of the regulatory language or mechanisms that would enforce these reductions.

Proposal for RVP fuel in Cincinnati and Dayton

As can be seen from Table 1, employing the use of low RVP fuel is one of the emissions control strategies proposed. By employing low RVP fuel in the Cincinnati area emission reductions are estimated to be 4.6 tons of VOC/day and 0.186 ton of NOx emissions/day. Emission reductions in the Dayton area are estimated to be 4.2 tons of VOC/day and 0.2 ton of NOx emissions/day. The emission reductions were calculated by using the MOBILE6 computer model. Any additional NOx reductions will be addressed in a separate rule making or permit action.

The use of low RVP fuel is both feasible and cost effective, and a vital component for maintaining the National Ambient Air Quality Standards (NAAQS) in Cincinnati and Dayton, Ohio non-attainment counties and in meeting U.S. EPA requirements contained in the anti-backsliding provisions of the eight-hour ozone implementation rule. In addition, the Ohio EPA is proposing three other emission control measures be adopted along with the use of RVP fuel in order to achieve the full emissions off-set.

In order to utilize low RVP fuel Ohio EPA request that U.S. EPA grant the agency a pre-exemption waiver that will authorize the sale and use of low RVP fuel in the eight non-attainment counties located in Cincinnati and Dayton, Ohio. The preemption waiver is needed so these counties may begin using low RVP by the next ozone season. We believe that the intent of Section 211 has been satisfied and this request does not represent an unreasonable burden on the gasoline marketer.

Table 1

Projected E-Check Emission Reductions for 2006 [Cincinnati Nonattainment Area]

2006

**VOC: 5.2 tons/day
NOx: 4.4 tons/day**

**NOx/VOC ratio of 2.1 : 1
[See Attachment 1]**

Emission Reduction Options Cincinnati Nonattainment Area							
	Control Option	2002 Baseline Emissions (tons/day)	2006 Growth Baseline Emissions * (tons/day)	Control Efficiency	2006 Estimated VOC Emissions Reduction (tons/day)	2006 Estimated NOx Emissions Reduction (tons/day)	Comment
1.	Vapor pressure limit for cold cleaning degreasing operations (see attachment 3)	4.26	4.75	54%	2.57	-	This strategy is being used for the northern KY SIP to compensate for emissions reductions lost from removal of the VET program (reduce VOC emissions by 67% with 80% rule effectiveness in affected area).
2.	Mobile equipment refinishing emission reduction via high transfer efficiency spray guns. (see attachment 3)	1.42	1.56	28%	0.44	-	This strategy is being used for the northern KY SIP to compensate for emissions reductions lost from removal of the VET program (reduce VOC emissions by 35% (OTC Pechan report) with 80% rule effectiveness in affected area).
3.	Low Reid Vapor Pressure Fuels [7.8 RVP]	61.50	-	-	4.602	0.186	This VOC emissions reduction estimations are based on Mobile 6 computer model run for the year 2006.
4.	Portable Fuel Containers	34.77 "Statewide" estimate for the year 2002.	N/A	Assume 75% control efficiency, a 10% per year turnover rate starting in 2007, and an 80% rule effectiveness.	N/A	N/A	The 2002 baseline VOC emission estimate and the 2009 VOC emission reduction calculation was obtained from data analysis found in the "Interim White Paper - Midwest RPO" and is a "statewide" estimate. 2002 Baseline: 12,694 tons/year/365 days = 34.77 TPD 2009 Estimated Reduction: 1,730 tons/year/365 days = 6.26 TPD
Total					7.612	0.186	These totals represent the total emission reductions for the chosen control options. (i.e., control options 1, 2, and 3,)

Table 2

Projected E-Check Emission Reductions for 2006 [Dayton Nonattainment Area]

2006

VOC: 1.89 tons/day
NOx: 1.7 ton/day

NOx/VOC ratio of 1.2 : 1]
[See Attachment 1]

Emission Reduction Options - Dayton Nonattainment Area							
	<i>Control Option</i>	<i>2002 Baseline Emissions</i> - <i>(tons/day)</i>	<i>2006 Growth Baseline Emissions *</i> - <i>(tons/day)</i>	<i>Control Efficiency</i>	<i>2006 Estimated VOC Emissions Reduction</i> - <i>(tons/day)</i>	<i>2006 Estimated NOx Emissions Reduction</i> - <i>(tons/day)</i>	<i>Comment</i>
1.	Vapor pressure limit for cold cleaning degreasing operations (see attachment 3)	2.91	3.24	54%	1.75	-	This strategy is being used for the northern KY SIP to compensate for emissions reductions lost from removal of the VET program (reduce VOC emissions by 66% with 80% rule effectiveness in affected area).
2.	Mobile equipment refinishing emission reduction via high transfer efficiency spray guns (see attachment 3)	0.98	1.08	28%	0.30	-	This strategy is being used for the northern KY SIP to compensate for emissions reductions lost from removal of the VET program (reduce VOC emissions by 35% (OTC Pechan report) with 80% rule effectiveness in affected area).
3.	Low Reid Vapor Pressure Fuels [7.8 RVP]	44.50	-	-	4.20	0.20	This VOC emissions reduction estimations are based on Mobile 6 computer model run for the year 2006.
Total					6.25	0.20	These totals represent the total emission reductions for the chosen control options. (i.e., control options 1, 2 and 3)

* The 2006 growth baseline emission values specified in the above tables were obtained via the PECHAN final report entitled "Development of Growth and Control Factors for Lake Michigan Air Directors Consortium (LADCO)".

Attachment 1

NOx/VOC Ratio for the Cincinnati Area:

The increased emissions in the Cincinnati area due to the possible termination of the E-Check program are projected to be 5.2 tons/day of VOC and 4.4 tons/day of NOx during the ozone season. If all the replacement emission reductions are only NOx emissions, we would need to estimate how many tons of NOx reductions are equivalent to one ton of VOC reductions. The total VOC and NOx emission numbers in the following table are based upon the proposed approval of the maintenance plan for the Cincinnati area:

Source	2002 (tons/day)			2005 Projected (tons/summer day)*		
	VOC	NOx	NOx/VOC	VOC	NOx	NOx/VOC
Point	7.19	189.24		81.4	277.6	
Area	87.09	24.73		73.1	32.2	
Mobile	97.03	185.21		36.8	65.5	
Total	191.31	399.18	2.08	191.3	375.3	1.96

**Federal Register/Vol.65, No. 15/ Monday, January 24, 2000/ Proposed Rule*

From the table above, we estimate that 2.1 tons of NOx emission reductions are equivalent to 1.0 ton of VOC emission reduction.

NOx/VOC Ratio for the Dayton Area:

The increased emissions in the Dayton area due to the possible termination of the E-Check program are projected to be 1.89 tons/day of VOC and 1.7 tons/day of NOx during the ozone season. If all the replacement emission reductions are only NOx emissions, we would need to estimate how many tons of NOx reductions are equivalent to one ton of VOC reductions. The total VOC and NOx emission numbers in the following table are based upon the approved maintenance plan for the Dayton area:

Source	2002 (tons/day)			2005 Projected (tons/summer day)*		
	VOC	NOx	NOx/VOC	VOC	NOx	NOx/VOC
Point	3.25	21.71		97.4	38.2	
Area	58.27	5.24		64.4	41.7	
Mobile	60.31	113.3		31.7	39.4	
Total	121.83	140.25	1.2	193.5	119.3	.62

**Federal Register/Vol.60, No. 87/ Friday, May 5, 1995 Final Rule*

From the table above, we estimate that approximately 1.2 tons of NOx emission reductions are equivalent to 1.0 ton of VOC emission reduction.

Attachment 2

CONTROL MEASURE EVALUATION

Source Category	Emission Reduction Measure(s)	Percent reduction by 2009 from 2002 emissions	Ability to Implement for 2006 Ozone Season	Cost Effectiveness in \$/ton
ICI Boilers -data used from MRPO white paper (3/29/05)	60% NOx reduction to all medium and large ICI boilers	24 (NOx)	Difficult, except for possible specific sources via permit changes	\$280 - \$1399
	80% for boilers subject to BART	6 (NOx)		\$536 - \$4493
Portland Cement Plants -data used from MRPO white paper (3/29/05)	Apply RACT-level controls for 50% NOx reduction of cement kilns	50 (NOx)	Difficult as sources given 2 - 4 year phase-in to comply with new rules	\$-310 - \$2,500
	Apply controls for 80% NOx reductions to kilns subject to BART requirements	23 (NOx)		\$1500 - \$2000
Industrial Surface Coating -data used from MRPO white paper (2/25/05)	Point sources, adopt more stringent RACT regulations (90% from uncontrolled), lower applicability	83 (VOC)	Difficult as states generally provide a 2-year period for compliance with RACT rules	\$100 - \$5000
	Area sources (same)	72 (VOC)		\$100 - \$5000
Industrial Solvent Cleaning (degreasing) -data used from MRPO white paper (3/14/05)	Adopt Chicago/Metro East cold cleaning regulations, 66 % reduction similar to OTC model rules	65 (VOC)	Fairly easy to amend existing OAC rules for solvent vapor pressure limitation before "06" ozone season	\$1,400.00
AIM Coatings - data used from MRPO white paper (2/9/05)	Adopt more stringent VOC limits (21% reduction beyond Feds Part 59 limits) based on OTC model rule	37 (VOC)	Difficult, as model rule includes 3 year "sell through" period after rules effective for more stringent VOC limits	\$6,400.00
	Adopt S. California Phase III VOC limits in addition to OTC model rule	45 (VOC)		\$20,000.00

Portable Fuel Containers -data used from MRPO white paper (2/9/05)	Newly designed spill proof containers as per OTC model rule with 10% annual turnover	18 (VOC)	May take up to 10 years for complete phase in of new tanks, Ohio rules effective early 2007	\$250 - \$450
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CONTROL MEASURE EVALUATION (Continued)

Source Category	Emission Reduction Measure(s)	Percent reduction by 2009 from 2002 emissions	Ability to Implement for 2006 Ozone Season	Cost Effectiveness in \$/ton
Auto Refinishing (non-OEMs) -data used from MRPO white paper (3/28/05)	Extend use of existing RACT rules in IL/IN/WI similar to OTC model rule, use of HVLP spray guns	24 (VOC)	Fairly easy to add new rule in OAC to require use of HVLPs and work practices before	\$1,354.00
Consumer and Commercial Solvents -data used from MRPO white paper (2/9/05)	Adopt OTC Model rule with additional product coverage and more stringent VOC limits beyond Federal requirements (already successfully implemented in several northeastern	14(VOC)	Good potential to implement but would need at least 2 year "sell-through" period after rule adoption, but occurring in NE states already	\$800.00
Gasoline Dispensing Facilities -data used from MRPO white paper (4/8/05)	Increase the required control efficiency of Stage I systems from 90 to 98% (requires PV valves) with existing programs and require Stage I in areas in areas	66 (VOC)	No major reductions expected in Cinci/Dayton areas as PV valves in widespread use already	\$0 to \$2120 to upgrade existing system \$100 to \$4742 for new system
Asphalt Paving -data used from MRPO white paper (3/28/05)	Reduce VOC content of emulsified asphalt as S. Calif. limit of 3%	40 (VOC)	Ohio's VOC limit already similar to California's so no addition reduction	

<p>Fuels Gasoline</p>	<p>Lowering the Reid vapor pressure (RVP) of gasoline from 9.0 to 7.8 or 7.0 to reduce vehicle VOC and NOx emissions</p>	<p>Cincinnati (7.8 RVP): 4.6 tpd of VOC emissions 0.186 tpd of NOx emissions</p> <p>Dayton (7.8 RVP): 4.2 tpd of VOC emissions 0.20 tpd of NOx emissions</p> <p>These emission reductions are estimates for the 2006 ozone season using Mobile 6 model run.</p>	<p>Easy to implement as OAC Chapter 72 on books already and regional refineries require only 6 month lead time for production</p>	<p>Approximately \$.03 (max) additional cost per gallon or \$2 to \$14 per vehicle per year. Only in summer months, additional off-road VOC benefits would also be realized</p>
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Attachment 3

Determination of VOC reductions via area source control strategies in the Cincinnati/Dayton area counties

1. **Cold Cleaning degreasing** - VOC emission reductions from cold cleaning degreasing area source emission in counties of Butler, Clark, Clermont, Greene, Hamilton, Miami, Montgomery and Warren Counties via adoption of rules to lower the solvent vapor pressure
 - a. 2002 baseline emissions for VOC (tons/day) was determined from the Cincinnati and Dayton MSA, 2002 EIS Data sheets for area sources, "Solvent Utilization, Degreasing: Cold Cleaning. The summation of the emissions of the various SIC codes within in this source were 4.26 tons/day and 2.91 tons/day respectively. Using a growth factor of 1.199 to the 2002 baseline emissions for this source, resulted in a 2009 baseline emissions of 5.11 tons/day and 3.49 tons/day and interpolating back to 2006 resulted in a baseline emissions of 4.75 tons/day in Cincinnati and 3.24 tons/day in Dayton ("Development of Growth and Control Factors for LADCO", Pechan, 12/14/2004).
 - b. It was then determined that this control strategy will reduce VOC emissions in the Cincinnati non-attainment area by 2.3 tons/day (TPD) based on 2002 baseline emissions and 2.57 TPD based on 2006 baseline emissions during the ozone season (April-October). The Dayton area reductions were determined to be 1.57 TPD and 1.75 TPD respectively. These reductions were calculated based on a 66 per cent reduction of the above 2002/2006 baseline emissions for this source type. This reduction was based on similar regulations previously promulgated in the Chicago/Metro East areas of Illinois which was also used as a basis for the OTC model rule as discussed in "Industrial Solvent Cleaning", Midwest RPO (LADCO) white paper dated 3/14/05). EPA's default 80 per cent rule effectiveness was also applied. The estimated cost per ton of VOC reduced for this control measure is \$1400.
2. **Mobile equipment refinishing** - VOC emission reductions from mobile equipment refinishing area source emission in counties of Butler, Clark, Clermont, Greene, Hamilton, Miami, Montgomery and Warren Counties via adoption of rules requiring the use of high transfer efficiency spray guns and clean-up practices
 - a. 2002 baseline emissions for VOC (tons/day) was determined from the Cincinnati and Dayton MSA, 2002 EIS Data sheets for area sources, "Solvent Utilization, Surface Coating, Auto Refinishing: SIC 7532. The emissions for this SIC code for this source were 1.42 tons/day and 0.98 tons/day respectively. Using a growth factor of 1.175 to the 2002 baseline emissions for this source resulted in a 2009 baseline emissions of 1.67 tons/day and 1.15 tons/day and interpolating back to 2006 resulted in a baseline emissions of 1.56 tons/day in Cincinnati and 1.08 tons/day in Dayton ("Development of Growth and Control Factors for LADCO", Pechan, 12/14/2004).
 - b. It was then determined that this control strategy will reduce VOC emissions in the Cincinnati non-attainment area by .40 tons/day (TPD) based on 2002 baseline emissions and .44 TPD based on 2006 baseline emissions during the ozone season (May-October). The Dayton area reductions were determined to be .27 TPD and .30 TPD respectively. These reductions were calculated based on a 35 per cent reduction of the above 2002/2006 baseline emissions for this source type according to the OTC Pechan Report, dated March 2001, with the implementation of high transfer efficiency spray gun

Attachment 3 (cont.)

technology. This reduction was also referenced in the Midwest RPO (LADCO) white paper dated 3/28/05, "Auto Body Refinishing. EPA's default 80 per cent rule effectiveness was also applied. The estimated cost per ton of VOC reduced based on the use of HVLP spray guns and a gun cleaning system is \$1354.

Supporting Emission Inventory Documentation

The VOC rule to control emissions from cold cleaning degreasing operations and solvent utilization from auto refinishing is based on emission information that is included in EPA's National Emission Inventory (NEI) Preliminary Inventory.

The inventory is provided in an Access database format (OH02CritArDV3_0_032004.mdb) and interested parties can use the following criteria to research for the appropriate records in the Cincinnati and Dayton four county areas.

Source Classification Codes: Codes that describe the process

Degreasing Cold Cleaning Codes

2415365000
2415360000
2415355000
2415345000
2415335000
2415330000
2415320000
2415320000
2415310000
2415305000

Solvent Utilization-Auto Refinishing

2401005000

FIPS Codes: Codes that identify the respective counties

Cincinnati Region

Butler County 39017
Clermont 39025
Hamilton 39061
Warren 39165

Dayton Region

Clark 39023
Greene 39057
Miami 39109
Montgomery 39113

Ohio EPA has used EPA's preliminary inventory because it is a complete account of processes and industrial codes. The emission calculation for each process is an estimate using a surrogate such as employment or county population times an emission factor. Although EPA's inventory for degreasing and auto refinishing operations is preliminary, Ohio EPA used it for rule development to meet the time constraints of the rule and expects the numbers to be the same or very close in the final inventory.

The reports that summarize emissions for the Cincinnati and Dayton four county region are provided in pdf format and they are part of this attachment as additional documentation.

NOx to VOC Equivalency Methodology for Cincinnati, Ohio

The increased emissions in the Cincinnati area due to the termination of the E-Check program are projected to be 5.2 tons/day of VOC and 4.4 tons/day of NOx during the ozone season.

Following N. Kentucky's SIP revision (and US EPA guidance) the following equation was utilized to determine the equivalent amount of VOC to substitute for the NOx emissions increase in the Cincinnati 1-hour ozone maintenance area:

$$\frac{\text{NOx Increase}}{\text{Total NOx Emissions}^*} \times \text{Total VOC Emissions}^* = \text{Additional VOC Reduction}$$

$$\frac{4.4 - .19^{**}}{375.3} \times 191.3 = 2.15 \text{ tons per summer day (tpsd)}$$

Therefore:

NOx Increase = 4.21 tpsd**

NOx Increase converted to VOC = 2.15 tpsd

VOC Increase = 5.2 tpsd

Total emissions increase as VOC to be replaced; 2.15 + 5.2 = 7.35 tpsd ***

* 2005 projected tpsd (Federal Register/Vol.65, No.15/Monday, January 24, 2000/Proposed rule)

** In addition, one of these proposed emission control strategies, "low Reid vapor pressure fuel", will reduce NOx emissions by 0.186 tpsd, therefore the NOx increase of 4.4 tons/day from the termination of E-check was reduced by .19 tpsd resulting in a net increase of 4.21 tpsd.

*** The three proposed control strategies are estimated to reduced VOC emissions by 7.30 tpsd (2002 baseline emissions) and 7.61 tpsd (2006 baseline emissions) beginning the 2006 ozone season.

NOx to VOC Equivalency Methodology for Dayton, Ohio

The increased emissions in the Dayton, Ohio area due to the termination of the E-Check program are projected to be 1.89 tons/day of VOC and 1.7 tons/day of NOx during the ozone season.

Following N. Kentucky's SIP revision (and US EPA guidance) the following equation was utilized to determine the equivalent amount of VOC to substitute for the NOx emissions increase in the Dayton, Ohio 1-hour ozone maintenance area:

$$\frac{\text{NOx Increase}}{\text{Total NOx Emissions}^*} \times \text{Total VOC Emissions}^* = \text{Additional VOC Reduction}$$

$$\frac{1.7 - .20^{**}}{119.3} \times 193.5 = 2.43 \text{ tons per summer day (tpsd)}$$

Therefore:

$$\text{NOx Increase} = 1.5 \text{ tpsd}^{**}$$

$$\text{NOx Increase converted to VOC} = 2.43 \text{ tpsd}$$

$$\text{VOC Increase} = 1.89 \text{ tpsd}$$

$$\text{Total emissions increase as VOC to be replaced; } 2.43 + 1.89 = 4.32 \text{ tpsd}^{***}$$

* 2005 projected tpsd (Federal Register/Vol.65, No.15/Monday, January 24, 2000/Proposed rule)

**In addition, one of these proposed emission control strategies, "low Reid vapor pressure fuel", will reduce NOx emissions by 0.20 tpsd, therefore the NOx increase of 1.7 tons/day from the termination of E-check was reduced by .20 tpsd resulting in a net increase of 1.5 tpsd.

*** The three proposed control strategies are estimated to reduced VOC emissions by 6.05 tpsd (2002 baseline emissions) and 6.25 tpsd (2006 baseline emissions) beginning the 2006 ozone season.