UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
AIR QUALITY

Northern Wasatch Front

Area Source

Reasonable Available Control Measures (RACM) Analysis for Ozone Control

Technical Supporting Document (TSD)

2023

Introduction

The Clean Air Act section 172(c)(6) requires nonattainment SIPs to include enforceable emission limitations, and such other control measures, means or techniques to reach attainment. This reasonably available control measures (RACM) analysis for the Wasatch Front Area, Utah, provides the mechanism to determine what control measures of area sources are available to this end. The Wasatch Front Area nonattainment area includes Davis, Salt Lake, Tooele and Weber counties.

The anthropogenic inventories from each county have been aggregated for this analysis. The inventory has been seasonally adjusted for a typical summer day.

RACM Analysis Process

EPA defines RACM as any potential control measure that is technologically feasible, economically feasible, can be reasonably implemented and enforceable. This analysis provides a review of control measures that have already been implemented as part of the Salt Lake PM2.5 Serious State Implementation Plan (SIP), which have been deemed by UDAQ to be best available control measures (BACM) and approved by EPA. BACM are more stringent than RACM thus, we anticipate that the RACM analysis will conclude that current control measures are sufficient to meet the requirements for the ozone SIP. Nonetheless, we will ascertain whether additional enhancements would be helpful for the ozone state implementation plan.

Further, this analysis evaluates whether additional control measures are available that were not included in the Salt Lake PM2.5 serious SIP that could be helpful in advancing attainment of the ozone standard.

The RACM analysis was conducted based on:

- Literature review of EPA guidance documents and regulations including:

- Control Techniques Guidelines (CTG)
- Alternative Control Techniques
- Ozone Transport Commission (OTC) model rules
- A comparison of the UDAQ rules to the EPA SIP approved rules of the 3 western air districts that were moderate nonattainment for the 2008 ozone standard that have similar climatic conditions to Utah. The rationale for this comparison is those air districts would have already implemented ozone controls approved by EPA. The 3 air districts are; Imperial County, CA, Mariposa County, CA and Phoenix-Mesa (Maricopa County), AZ; and
- An evaluation of technological and economically feasible newly identified controls or enhancement of existing controls.

VOC RACM Assessment Summary

Source Category Code	Source Category	Utah Existing Rules/Statute and Federal Rules	Comments	Tons/Day
24601 24602 24605 24606 246029 24601 246019	Solvent, Consumer/commercial Use Products	R307-357 Consumer Products	R307-357 is the most current OTC model rule, no further action warranted	23.4
2425	Solvent, Graphic Arts	R307-351 Graphic Arts	UDAQ worked closely with the national printing trade association to derive a BACM rule that would keep the cost below $7000/ton VOC removed and be in line with printing rules found in the most stringent California air districts. No further analysis warranted.	5.4

Source Category Code	Source Category	Utah Existing Rules/Statute and Federal Rules	Comments	Tons/Day
24011	Surface Coating, Industrial Maintenance*	Surface coating rules R307-343,344, 345,346, 347,348,349,350,352,353,354 and 355. Surface Coatings, Traffic Markings – R307-361 Architectural Coatings	Most current control strategies for surface coating and deemed to be BACM by UDAQ. R307-361 is the most current OTC model rule and deemed to be BACM by UDAQ.	4.9
2402	Chemical Stripper	R307-304 Solvent Cleaning R307-335 Degreasing	UDAQ created the new rule R07-304 by removing sections of R307-335, in which the applicability was dramatically lowered and a low vapor pressure solvent option was added. UDAQ determined that R307-304 was BACM. No further analysis warranted.	4.1
2401001	Surface Coatings, Architectural	R307-361 Architectural Coatings	R307-361 is the most current OTC model rule, no further action warranted	3.5
2505040120	Gas Pipelines	40 CFR 49 Subtitle B	U.S. Dept. of Transportation is responsible for pipeline safety and spill prevention. No further action warranted.	2.6
2461022 2461021	Asphalt	R307-341	Refer to discussion below	1.4
230205	Industrial Bakery		UDAQ issued a proposed rule for public comment in 2016. Commenters submitted documentation that the estimated cost would be at least $19,000/ton, requiring double-walled stainless-steel stack plus catalytic oxidation of ethanol. High capitol cost would require a rule with high applicability threshold that would preclude regulating most bakeries that comprise these emissions. No further action warranted.	0.86

Source Category Code	Source Category	Utah Existing Rules/Statute and Federal Rules	Comments	Tons/Day
2501011011 2501011012 2501011013 2501011014 2501011015 2501012011 2501012012 2501012013 2501012014 2501011015	Residential & Commercial Portable Gas Cans Evaporation/Spillage etc.	40 CFR Part 59, Subpart F, Control of Evap. Emission from New & In-use Portable Fuel Containers	No further action warranted.	0.78
2501060201	Gas Under Ground Storage Tank		DAQ enforces Federal UST regulation. No further action warranted.	0.76
2680003	Waste Disposal, Treatment, and Recovery; Composting;100% Green Waste	R315-312. Recycling and Composting Facility Standards	Composting operations are managed by the Utah Solid Waste Division. R315-312 includes facility and material management requirements to reduce air, soil and groundwater impairment. The 3 comparative air districts do not have air quality rules for compost operations. No further action warranted.	0.74
2660	Leaking Underground Storage Tanks	Title 19 Chapter 6 Part 4, Underground Storage Tank Act	UDEQ enforces the EPA UST regulation, no further action warranted.	0.54
24618 246185	Pesticide Application, Commercial/Consumer (FIFRA)	R307-357 Consumer Products	R307-357 is the most current OTC model rule, no further action warranted	0.42
2501050120 2501055120	Fuel Gas/Gasohol Bulk Plants	R307-328 Gasoline Transfer and Storage	Further analysis conducted in next section	0.35
262003	Landfills	R307-221. Emission Standards: Emission Controls for Existing Municipal Solid Waste Landfills	No further action warranted.	0.35
2104006	Combustion, Natural Gas, Residential	R307-356 Appliance Pilot Light	R307-356 prohibits appliance from utilizing a pilot light thereby reducing VOC's. No further action warranted.	0.31
2501060053	Gas Stage 1	R307-328 Gasoline Transfer and Storage	Further analysis conducted in next section	0.23

Source Category Code	Source Category	Utah Existing Rules/Statute and Federal Rules	Comments	Tons/Day
2302002200 2302003000 2302003100 2302003200	Commercial Cooking		Researchers in California have been unable to identify cost effective technology for this emission source. Known control measures have a high capitol cost (>$50k) and demanding maintenance such that the removal cost would likely exceed $20K/ton. Prohibitive cost would shutter most sources. No further action warranted.	0.24
2805010100 2805020000 2805025000 2805030000 2805035000 2805040000 2805045000	Livestock Production		According to local USDA representatives, most Utah producers use National Resource Service best management practices to protect soil, water and air. No further action warranted.	0.12
263002	Sewer Treatment in Publicly Owned Treatment Works (POTW)	Clean Water Act: all POTW's have to report to EPA VOC concentrations in discharges.	All major POTW's meet Best Available Technology, no further action warranted.	0.09
24609	Consumer and Commercial, Miscellaneous Products	R307-357 Consumer Products	R307-357 is the most current OTC model rule, no further action warranted	0.09
2103006	Combustion, Natural Gas, Commercial & Institutional Boilers and Internal Combustion Engines		May be subject to air quality permitting. R307-401-4(3).	0.08
2501080050	Fuel, Jet, Stage 1 (storage)	Regulated under 40 CFR Subpart Kb		0.08
281003	Fires, Structural		Uncontrollable, no further action warranted.	0.07
2810025	Backyard BBQ		Statutory Exemption, no further action warranted.	0.06
2805018 2805002	Dairy and Beef Cattle Composite		According to local USDA representative, most Utah producers use Natural Resources Conservation Service best management practices	0.06
2505030120	Gas Tank Truck Transport	R307-328 Gasoline Transfer and Storage	Further analysis conducted in next section	0.04

Source Category Code	Source Category	Utah Existing Rules/Statute and Federal Rules	Comments	Tons/Day
2420	Solvent, Dry Cleaning		Solvent dry cleaners use no transfer machines that eliminate vapor loss during transfer from washing to drying. Additional built-in controls include refrigerated condensers. Some units also include built-in stills to further recover vapors. No further controls would be feasible. No further analysis warranted.	0.04
28050091 28050071	Poultry		According to the Utah Farm Bureau, operations apply best management practices to maintain healthy stock.	0.04
25010801	Fuel, Jet, Stage 2 (dispensing)	Regulated under 40 CFR Subpart CC or Subpart R		0.02
2302002100	Commercial Cooking - Conveyorized Charbroiling	R307-303 Commercial Cooking	R307-303 requires all units to utilize catalytic oxidizers. UDAQ and a nonprofit environmental group worked together to fund and install catalysts in all units in the Wasatch Front. No further action warranted.	0.01
2102007 2102008	Industrial Boiler Liquefied Petroleum Gas (LPG)		No known control measures. May be subject to air quality permitting with permit conditions.	0.008
2104007 2103007	LPG Fuel		No known control, no further action warranted	0.008
281005	Fires, Vehicle		Uncontrollable, no further action warranted.	0.005
2102006	Combustion, Natural Gas, Industrial Boilers and Internal Combustion (IC) Engines		No known controls. May be subject to air quality permitting R307-401-4(3).	0.003
2103008	Commercial/institutional wood Fuels		There are no reasonably cost-effective control strategies for this de minimis emission. No further action warranted.	0.002
2104004	Residential Oil Fuel		No known control, no further action warranted	0.0003
28100601 28100602	Cremation, Human and animal		Catalytic oxidizer control cost would readily exceed $15k/ton, an unreasonable cost for a de minimis emission. No further action warranted.	0.0001
2103011 2104011	Commercial/institutional Kerosene Combustion		No known control, no further action warranted	2.9 x 10-5

Source Category Code	Source Category	Utah Existing Rules/Statute and Federal Rules	Comments	Tons/Day
2810040	Aircraft/Rocket Engine Firing and Testing		Uncontrollable event for aircraft maintenance/testing (no rocket engine). No further action warranted.	9.3 x 10-5

*Surface Coating, Industrial Maintenance: EPA has aggregated coatings of the following surfaces; wood furniture, paper, film, foil, fabric, vinyl, metal furniture, large appliances, magnet wire, wood panel, metal parts, metal containers, plastic parts, autobody and aerospace parts.

Retained VOC Source Category Analysis

This section is intended to review control strategies for emission sources listed above that warrant further evaluation.

Liquid Fuel Storage and Transport: R307-328 Gasoline Transfer and Storage establishes emission controls for gasoline vapors during filling of gasoline cargo tank and storage tanks statewide. The rule is based on the federal stage I vapor recovery guidance (Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals).

Comparison of Other Air District Rules: Maricopa County is the only air district of the 3 comparator air districts that has EPA SIP approved rules for this source type. Maricopa County has 2 rules; Rule 351, Loading of Organic Liquids limits emissions of VOC's from the loading of organic liquids and Rule 352, Gasoline Delivery Vessels.

Rule 351 applies to the transfer of organic liquids having a true vapor pressure of 1.5 psia (77.5 mm Hg) or greater under actual loading conditions. It regulates transfers at bulk terminals and bulk plants from stationary storage tanks to delivery vessels and from delivery vessels to stationary storage tanks. R307-208 also applies to bulk terminal, bulk plants that store gasoline and include service stations that dispense 10,000 gallon or more per month, as well as tank and rail cars and other transport vehicles.

Rule 351 requires all bulk terminals and plants to have submerged fill pipes in all tanks over 250 gallons. R307-208 is more stringent requiring submerged fill pipes without exempting small tanks.

Rule 351 requires bulk terminal transfers to vessels that only bear a current pressure-test decal and the terminal must use a vapor collection/processing system. R307-208 has the same requirement but Utah does not have a decal identification system. Instead, R307-208 requires routine testing and record keeping to verify compliance.

Rule 351 and R307-208 have the same vapor loss control device specifications. Likewise, leak detection and connection coupling etc. are similar in nature between the two rules.

Maricopa County Rule 352, Gasoline Delivery Vessels; limits VOC emission during gasoline delivery. The rule requires annual pressure testing of the delivery vessel and repair requirement if it fails, to display a valid decal and only purge using EPA Method 27. With the exception of the decal requirement in Rule 352, these requirements are mirrored in Utah rule R307-208.

RACM Conclusion: Maricopa County was the only air district of the 3 comparator air districts that regulates gasoline storage and transfer. The Maricopa County rule appears to also be based on EPA's stage I vapor recovery guidance, therefore, there are no opportunities to enhance Utah's R307-208. R307-208 was also deemed as BACM in the PM2.5 serious nonattainment SIPs.

Asphalt: Liquefied asphalt is prepared by blending cement with petroleum distillate, known as cutback, or by emulsifying asphalt cement with water and an emulsifying agent, thereby called emulsified asphalt. The VOC in cutback can be as high as 45% by volume. VOC content in emulsified asphalt is dramatically lower because the petroleum distillate is substituted by water and an emulsifier. EPA issued a CTG (EPA-450/2-77-037, December 1977) for cutback asphalt in which EPA recommended the reduction of use of cutback in favor of emulsified asphalt. The use of cutback asphalt has declined since the 1990's. Utah Department of Transportation maintains a small supply of cutback during the winter months for pothole repair.

UDAQ has requires VOC reduction in cutback and emulsified asphalt to 7% in rule R307-341 between October 1 and April 30. In doing so, R307-341 meets RACM by significantly reducing VOC in line with the CTG recommendation for winter time periods.

Imperial County rule 426 limits organic solvent for cutback at 0.5% and 3% by volume for emulsified asphalt. The two other comparator counties do not regulate asphalt. UDAQ is concerned that substantially lowering the VOC content will cause the asphalt to lose its malleability, which in-turn will require increased heating of the asphalt. Higher temperatures will add a safety risk in that the solvent may flash. Further, additional heating will require more fuel usage emissions possibly negating the VOC reduction in the asphalt.

RACM Conclusion: Given EPA's preference for enhanced use of emulsified asphalt and that further VOC daily emissions reductions from asphalt would be relatively low in comparison to other sources, UDAQ believes that minimal emission reductions can be achieved, while safety issues may arise.

NO_x BACM Assessment

Source Category Code	Source Category	Utah Existing Rules and Federal Rules	Comments	Tons/Day
2104006	Combustion, Natural Gas	R307-356 Appliance Pilot Light: R307-230 NOx Emission Limits for Natural Gas-Fired Water Heaters	Prohibits the sale of appliance pilot lights (with the exception of water heaters) after January 1, 2014. A Canadian study determined that a gas fireplace pilot light accounts for 48% of the annualized gas usage for the appliance. Reduced gas consumption translates to a reduction in $PM_{2.5}$, VOC, NO_x, SO_x and NH_3. We are not aware of other comparable rules. Ultra-low NOx water heaters reduce emissions to 10 ng/Joule for residential units and slightly higher limits for commercial units. R307-230 is consistent with the most stringent California rules. No further action warranted.	5.3
2103006	Combustion, Natural Gas, Commercial & Institutional Boilers and IC Engines		May be subject to air quality permitting. R307-401-4(3) may apply requiring low-NOx burners	1.4
2102007 2102008	Industrial Boiler LPG		No Known control. May be subject to air quality permitting	0.17
2102004002	Combustion, Industrial, Distillate Oil, All IC Engines		No Known control. May be subject to air quality permitting	0.15
2103007	Combustion, Commercial, Institutional LPG		No known control. No further action warranted.	0.12
2102004001	Combustion, Industrial, Distillate Oil, All Boilers		May be subject to air quality permitting. R307-401-4(3) may apply requiring low-NOx burners	0.11
2104007	Residential LPG Fuel		No known control, no further action warranted	0.09
2102006	Combustion, Natural Gas, Industrial Boilers and IC Engines		May be subject to air quality permitting. R307-401-4(3) may apply requiring low-NOx burners	0.05
2103008	Commercial, institutional wood Fuels		There are no reasonably cost-effective control strategies for this de minimis emission. No further action warranted.	0.03

Source Category Code	Source Category	Utah Existing Rules and Federal Rules	Comments	Tons/Day
2810025	Backyard BBQ		Statutory Exemption. No further action warranted.	0.02
281003	Structural fires		Uncontrollable	0.009
2104004	Residential Oil Fuel		No known control, no further action warranted	0.008
26100001 26100004	Waste Disposal, Open Burning, Yard Waste and Household Waste	R307-202, General Burning regulates yard waste burning by permit and prohibits household waste burning by homeowners.	No further action warranted.	0.005
28100601 28100602	Cremation, Human and animal		Catalytic oxidizer control cost would readily exceed $15k/ton, an unreasonable cost for a de minimis emission. No further action warranted.	0.001
2103011 2104011	Combustion, Kerosene		No known control, no further action warranted.	0.001
281004	Aircraft/Rocket Engine Firing and Testing		Uncontrolled event for aircraft maintenance/testing (no rocket engine). No further action warranted.	6.6 x 10-4
281005	Motor vehicle fires		Uncontrollable	5.6 x 10-4