

2014

Utah's Fine Particulate Air Pollution Problem

Arnold W. Reitze Jr.

S.J. Quinney College of Law, University of Utah, arnold.reitze@law.utah.edu

Follow this and additional works at: <http://dc.law.utah.edu/onlaw>

Recommended Citation

Reitze, Arnold W. Jr. (2014) "Utah's Fine Particulate Air Pollution Problem," *Utah OnLaw: The Utah Law Review Online Supplement*: Vol. 2014 , Article 9.

Available at: <http://dc.law.utah.edu/onlaw/vol2014/iss1/9>

This Article is brought to you for free and open access by Utah Law Digital Commons. It has been accepted for inclusion in Utah OnLaw: The Utah Law Review Online Supplement by an authorized editor of Utah Law Digital Commons. For more information, please contact valeri.craigle@law.utah.edu.

UTAH'S FINE PARTICULATE AIR POLLUTION PROBLEM

Arnold W. Reitze, Jr.*

Abstract

For those living along Utah's Wasatch Front, the air quality problem is visibly obvious. The air pollution, especially in the winter when inversions trap pollutants between the surrounding mountains, is hazardous to people's health. Several counties along the Wasatch Front violate the Clean Air Act's air quality standard for particulate matter and are currently designated as "nonattainment" areas. The Environmental Protection Agency requires that affected areas take action to reduce the levels of pollution. This Article will discuss the Clean Air Act and the state's role in ensuring compliance. This Article then examines some of the reasons for the Wasatch Front's poor air quality. Finally, this Article proposes solutions and identifies issues that demand further study in order to combat the area's air pollution problem.

I. INTRODUCTION

In 1970, the Clean Air Act (CAA) Amendments authorized the administrator of the Environmental Protection Agency (EPA) to promulgate primary and secondary National Ambient Air Quality Standards (NAAQS).¹ Primary standards are to protect the public health; secondary standards are to protect public welfare.²

The EPA subsequently promulgated NAAQS at 40 C.F.R. §§ 50.4–50.12 for six ambient air pollutants—called “criteria pollutants”³—pursuant to CAA § 109.⁴ The original criteria pollutants were particulate matter (PM), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), photochemical oxidants (now ozone (O₃)), and hydrocarbons.⁵ However, the 1971 hydrocarbon regulation⁶ was

* © 2014 Arnold W. Reitze, Jr., Professor of Law, University of Utah, S.J. Quinney College of Law. The Author wishes to thank Kerry Kelly, PE, for her helpful comments.

¹ Pub. L. No. 91-604, § 109, 84 Stat. 1676, 1679–80 (1970) (codified as amended at 42 U.S.C. § 7409 (2012)).

² Clean Air Act § 109(b)(1)–(2), 42 U.S.C. § 7409 (b)(1)–(2); *see also id.* § 7602(h) (defining welfare to include effects on soils, water, crops, vegetation, man-made materials, animals, wildlife, weather, visibility, and climate).

³ *What Are the Six Common Air Pollutants?*, U.S. EPA, <http://www.epa.gov/airquality/urbanair/>, archived at <http://perma.cc/56JF-G9TP> (last updated Apr. 20, 2012) [hereinafter *Six Common Air Pollutants*].

⁴ 40 C.F.R. §§ 50.4–50.12 (1972); Clean Air Act § 109.

⁵ *Six Common Air Pollutants*, *supra* note 3.

revoked in 1983,⁷ and lead was added in 1978.⁸ In spite of the deregulation of hydrocarbons, the EPA does continue to regulate emissions of volatile organic compounds (VOCs) (a subset of hydrocarbons) because they can trigger ozone formation or transform into particulate matter.⁹ Most primary standards were to be met by May 31, 1975, while secondary standards were to be achieved within a reasonable time,¹⁰ although, except for SO₂, secondary standards are the same as primary standards.¹¹

The criteria pollutant of primary concern in the Salt Lake area is particulate matter. The NAAQS for particulate matter, expressed in terms of total suspended particulates (TSP), were promulgated in 1971.¹² In 1987, the EPA changed the particulate standard to regulate only particulate matter with an aerodynamic diameter of 10 micrometers or smaller (PM₁₀).¹³ On October 17, 1997, the EPA established an additional PM_{2.5} NAAQS to regulate particles less than or equal to 2.5 micrometers.¹⁴ The PM_{2.5} annual standard was set at 15 µg/m³, based on the annual three-year average of PM_{2.5} concentrations and a twenty-four-hour PM_{2.5} standard of 65 µg/m³, which is based on a three-year average of the ninety-eighth percentile of the twenty-four-hour PM_{2.5} concentrations at each monitoring site within a geographic area.¹⁵ Thus, an area must be below 65 µg/m³ for 358 days per year or it violates the short-term standard. The twenty-four-hour PM₁₀ standard was also revised to 150 µg/m³ using the ninety-ninth percentile of the twenty-four-hour PM₁₀ concentration at each monitor within an area.¹⁶ The secondary standards were revised to make them identical to the new primary standards.¹⁷

⁶ National Primary and Secondary Ambient Air Quality Standards, 36 Fed. Reg. 22,384, 22,385 (Nov. 25, 1971).

⁷ National Primary and Secondary Ambient Air Quality Standards, 48 Fed. Reg. 628 (Jan. 5, 1983) (to be codified at 40 C.F.R. pt. 50).

⁸ National Primary and Secondary Ambient Air Quality Standards for Lead, 43 Fed. Reg. 46,246, 46,258 (Oct. 5, 1978).

⁹ See, e.g., 40 C.F.R. § 51.165(a)(1)(iv)(A)–(B) (2012) (outlining the sources regulated for ozone pollution).

¹⁰ Bunker Hill Co. v. EPA, 572 F.2d 1286, 1290 n.1 (9th Cir. 1977).

¹¹ See 40 C.F.R. pt. 50 (2013).

¹² National Primary and Secondary Ambient Air Quality Standards, 36 Fed. Reg. 8,186 (proposed Apr. 30, 1971).

¹³ Revisions to the National Ambient Air Quality Standards for Particulate Matter, 52 Fed. Reg. 24,634 (July 1, 1987) (to be codified at 40 C.F.R. pt. 50).

¹⁴ National Ambient Air Quality Standards for Particulate Matter, 62 Fed. Reg. 38,652, 38,654 (July 18, 1997) (to be codified at 40 C.F.R. pt. 50); 40 C.F.R. pt. 50 app. L § 1.1 (specifying that PM_{2.5} refers to particles with an aerodynamic diameter less than or equal to 2.5 micrometers).

¹⁵ National Ambient Air Quality Standards for Particulate Matter, 62 Fed. Reg. at 38,652; see 40 C.F.R. § 50.7.

¹⁶ National Ambient Air Quality Standards for Particulate Matter, 62 Fed. Reg. at 38,679.

¹⁷ *Id.* at 38,652.

The EPA continued to use the 1997 PM₁₀ standard with a new statistical approach as an indicator of PM less than or equal to 2.5 µg.¹⁸ This part of the 1997 rule was vacated by the D.C. Circuit in 1999.¹⁹ The EPA subsequently removed the vacated portion of the 1997 PM₁₀ standard from the Code of Federal Regulations.²⁰

On October 17, 2006, the EPA's 1997 PM_{2.5} standard became more stringent.²¹ The annual average was left at 15µg/m³ but the twenty-four-hour standard was lowered from 65µg/m³ to 35 µg/m³ based on the ninety-eighth percentile concentration.²² The Agency revoked the primary PM₁₀ annual standard. The twenty-four-hour PM₁₀ standard of 150 µg/m³ was not changed from the 1997 NAAQS revision.²³ On February 24, 2009, the D.C. Circuit upheld the revocation of the annual PM₁₀ standard and approved the twenty-four-hour standard; but the court remanded the annual fine particulate standard because the EPA failed to adequately explain why the 15 µg/m³ standard for PM_{2.5} is sufficient to protect public health with an adequate margin of safety while providing an adequate margin of safety from the risk of short-term exposure and from morbidity affecting vulnerable subpopulations.²⁴ The court also remanded the secondary NAAQS for fine PM because the EPA unreasonably concluded the NAAQS were adequate to protect public welfare from adverse effects on visibility.²⁵

On January 15, 2013, the EPA promulgated revised PM NAAQS. The primary annual PM_{2.5} primary standard was lowered to 12 µg/m³; the twenty-four-hour PM_{2.5} standard of 35 µg/m³, the twenty-four-hour PM₁₀ primary standards; and the secondary standards were not changed.²⁶ The EPA's 2013 PM_{2.5} regulations were challenged in the D.C. Circuit in *National Association of Manufacturers, et al. v. EPA*.²⁷ The industry petitioners claimed the regulations are more stringent than is needed to protect public health and the mandated monitoring overstates the

¹⁸ *Id.* at 38,714 (codified at 40 C.F.R. pt. 50, App. L))

¹⁹ *Am. Trucking Ass'ns v. EPA*, 175 F.3d 1027, 1057 (D.C. Cir. 1999), *aff'd in part, rev'd in part sub nom.* *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 485–86 (2001); *see also* *Am. Trucking Ass'ns v. EPA*, 283 F.3d 355, 380 (D.C. Cir. 2002) (denying all remaining petitions for review).

²⁰ National Ambient Air Quality Standards for Particulate Matter, 69 Fed. Reg. 45,592, 45,592–93 (July 30, 2004) (to be codified at 40 C.F.R. pts. 50, 58).

²¹ *See* National Ambient Air Quality Standards for Particulate Matter, 71 Fed. Reg. 61,144 (Oct. 17, 2006) (to be codified at 40 C.F.R. pt. 50).

²² *Id.* at 61,165; 40 C.F.R. § 50.7 & app. N (2013).

²³ National Ambient Air Quality Standards for Particulate Matter, 71 Fed. Reg. 61,165–66.

²⁴ *Am. Farm Bureau Fed'n v. EPA*, 559 F.3d 512, 524 (D.C. Cir. 2009).

²⁵ *Id.* at 528.

²⁶ National Ambient Air Quality Standards for Particulate Matter, 78 Fed. Reg. 3,086, 3086 (Jan. 15, 2013) (to be codified at 40 C.F.R. pts. 50–53, 58).

²⁷ *Nat'l Ass'n of Mfrs. v. EPA*, 750 F.3d 921, 924–25 (D.C. Cir. 2014).

area-wide concentrations of PM_{2.5}.²⁸ However, the D.C. Circuit denied the petition.²⁹

A. Nonattainment Areas

To achieve the goals of the NAAQS, each state must develop a state implementation plan (SIP). But before a state can develop its SIP, it must determine which areas within its boundaries do not comply with the NAAQS because the stringency of the CAA's requirements are based on the quality of an area's ambient air.³⁰ CAA section 107(d) requires the EPA to designate areas as "attainment," "nonattainment," or "unclassifiable," depending on their compliance with the relevant NAAQS.³¹ A nonattainment area is designated if the NAAQS are exceeded or the area contributes to NAAQS violations in a nearby area.³² An "unclassifiable" area is one with data that is inadequate to allow a determination to be made.³³ In nonattainment areas, states must implement controls that will achieve attainment "as expeditiously as practicable."³⁴

In April 2003, the EPA issued a guidance document, known as the Holmstead Memo, initiating the PM_{2.5} designation process.³⁵ The memo says that if any area within a metropolitan area exceeds the annual PM_{2.5} NAAQS, then all areas within the metropolitan area are presumed to contribute to that violation and warrant nonattainment designations.³⁶ However, the EPA may designate urban nonattainment areas as areas larger or smaller than the Office of Management and

²⁸ Stuart Parker, *Industry Faults EPA Data, Monitoring Mandates in Suit Over PM2.5 NAAQS*, RISK POL'Y REP., Sept. 3, 2013, at 36; Chris Knight & Stuart Parker, *Industry Groups Sue EPA Over Rule Tightening Particulate Matter NAAQS*, INSIDE EPA'S CLEAN AIR REP., Mar. 28, 2013, at 41.

²⁹ *Nat'l Ass'n of Mfrs.*, 750 F.3d at 927.

³⁰ *Catawba Cnty., N.C. v. EPA*, 571 F.3d 20, 26 (D.C. Cir. 2009).

³¹ 42 U.S.C. § 7407(d) (2012).

³² *Id.* § 7407(d)(1)(A)(i)–(iii).

³³ *Id.*

³⁴ *Id.* § 7502(a)(2), (c)(1).

³⁵ Memorandum from Jeffrey R. Holmstead, Assistant Administrator, EPA for Air & Radiation, to Regional Administrators, Regions I–X (Apr. 1, 2003), available at http://www.epa.gov/airquality/particlepollution/designations/1997standards/documents/pm25_desig_guidance_final.pdf, archived at <http://perma.cc/92TS-S5L2>.

³⁶ The Holmstead Memo lists nine factors to guide that case-by-case analysis: (1) emissions in the potentially contributing areas; (2) air quality in those areas; (3) population density and degree of urbanization in those areas; (4) traffic and commuting patterns; (5) expected growth; (6) meteorology; (7) geography and topography; (8) jurisdictional boundaries; and (9) level of control of emissions sources. *Id.* at 7. The memo encourages states submitting designations that depart from the metropolitan presumption to justify such designations by reference to all nine factors. *Id.*

Budget (OMB)-defined metropolitan area.³⁷ The EPA promulgated the PM_{2.5} designations for the nation on January 5, 2005.³⁸

B. Utah's Air Quality Status

Salt Lake and Utah Counties are nonattainment areas for PM₁₀. Salt Lake and eastern Tooele counties are nonattainment areas for sulfur dioxide. Salt Lake and Davis counties are maintenance areas for ozone.³⁹ Counties in northeastern Utah, however, may soon be designated as nonattainment areas for ozone because of the emissions from expanded oil and gas operations.⁴⁰ Utah's major problem is the failure to meet the short-term PM_{2.5} NAAQS along the Wasatch Front and Cache Valley. Utah's Division of Air Quality (DAQ) has created three twenty-four-hour PM_{2.5} nonattainment areas: Cache Valley, which includes Cache and Utah counties, and Franklin County, Idaho; Provo, which includes Utah County; and Salt Lake, which includes Salt Lake and Davis counties and parts of Weber, Box Elder, and Tooele counties.⁴¹

Utah submitted its proposed PM_{2.5} designations for the Salt Lake nonattainment area on December 18, 2007, which included recommendations that Box Elder County, to the north of the Great Salt Lake, be designated as an attainment area and Tooele County, to the west of Salt Lake County, be designated as unclassifiable.⁴² The EPA, however, determined that portions of Box Elder and Tooele counties are nonattainment areas because emissions contribute to nearby violations of the PM_{2.5} standard in the greater Salt Lake City area.⁴³ Based on its

³⁷ *Catawba Cnty., N.C. v. EPA*, 571 F.3d 20, 28 (D.C. Cir. 2009).

³⁸ Air Quality Designations and Classifications for the Fine Particles (PM_{2.5}) National Ambient Air Quality Standards, 70 Fed. Reg. 944 (Jan. 5, 2005) (to be codified at 40 C.F.R. pt. 81).

³⁹ UTAH DIV. OF AIR QUALITY, 2013 ANNUAL REPORT 7–8 (2014) [hereinafter DAQ 2013 ANNUAL REPORT], available at http://www.airquality.utah.gov/docs/2013AnnualReport_FINAL.pdf, archived at <http://perma.cc/AK6Z-7JS9>.

⁴⁰ *Cracking the Ozone Code*, UTAH DEP'T OF ENVTL. QUALITY, <http://www.deq.utah.gov/locations/U/uintahbasin/ozonocode.htm>, archived at <http://perma.cc/8YU7-QB5A> (last visited Sept. 21, 2014).

⁴¹ *Utah's Environment 2013: Planning and Analysis: PM_{2.5} State Implementation Plan Completed*, UTAH DEP'T OF ENVTL. QUALITY, <http://www.deq.utah.gov/NewsNotices/annualreport/Planning/s11.htm>, archived at <http://perma.cc/3355-9624> (last updated July 10, 2014).

⁴² See UTAH DEP'T OF ENVTL. QUALITY, UTAH AREA DESIGNATION RECOMMENDATION FOR THE 2006 PM_{2.5} NAAQS 39, 40 fig.13 (Dec. 18, 2007), available at http://www.airquality.utah.gov/Public-Interest/about_pollutants/PM25_Area_Designations_2006.pdf, archived at <http://perma.cc/LE3B-KLQY>.

⁴³ U.S. ENVTL. PROTECTION AGENCY, UTAH AND UTAH/IDAHO AREA DESIGNATIONS FOR THE 24-HOUR FINE PARTICLE NATIONAL AMBIENT AIR QUALITY STANDARDS 53, available at http://www.epa.gov/pmdesignations/2006standards/final/TSD/tsd_4.0_4.8_4.8

analysis, the EPA defined the boundaries of the air shed as the Wasatch Mountains to the east, the Promontory and North Promontory Mountains to the west (for eastern Box Elder County), and the Stansbury Mountains to the west (for eastern Tooele County).⁴⁴

The EPA designated the Salt Lake area as a nonattainment area for the PM_{2.5} twenty-four-hour NAAQS in 2009 and identified the boundaries of the nonattainment area.⁴⁵ However, there is no violation of the 2006 annual PM_{2.5} standard or the more stringent 2013 annual PM_{2.5} standard of 12 µg/m³.⁴⁶ The controversy over the area included in the nonattainment designation for the PM_{2.5} twenty-four-hour NAAQS led to litigation. On February 24, 2012, the D.C. Circuit upheld the Agency's decision to designate the eastern portions of both Box Elder County and Tooele County as a nonattainment area because they contributed to nearby violations of the twenty-four-hour PM_{2.5} standard in and around Salt Lake City.⁴⁷ This decision was consistent with the court's earlier decision upholding the EPA's designation process in *Catawba County, North Carolina v. EPA*.⁴⁸

The Salt Lake City area's topography and meteorology play a significant role in its PM_{2.5} problem. The area is a valley almost completely bounded by mountain ranges. Under normal meteorological conditions, air temperature decreases as altitude increases. In the Salt Lake City area, wintertime high-pressure systems cause temperature inversions, and high-altitude warm air traps cold air below, with an inversion layer at about 1,500 feet. The surrounding mountains, which extend above the inversion layer, trap the ground level cold air and prevent dispersion. Pollution then accumulates in the stagnant air mass, sometimes for weeks at a time. The air quality worsens gradually until the high-pressure system lifts, at which point the polluted air can disperse over the mountains.⁴⁹

Because the Salt Lake area's air quality fails to meet EPA standards for fine particulates (PM_{2.5}), Utah must revise its SIP for the three nonattainment areas to reduce emissions of PM_{2.5} and other gaseous pollutants that are converted to PM_{2.5} in the atmosphere. During the winter inversions, most of the PM_{2.5} comes from

.2_r08_UT.pdf, archived at <http://perma.cc/P4S7-W3DW> (last visited November 21, 2014).

⁴⁴ *Id.* at 47–49; *ATK Launch Sys., Inc. v. EPA*, 669 F.3d 330, 336 (D.C. Cir. 2012).

⁴⁵ Air Quality Designations for the 2006 24-Hour Fine Particle (PM_{2.5}) National Ambient Air Quality Standards, 74 Fed. Reg. 58,688, 58,696 (Nov. 13, 2009) (to be codified at 40 C.F.R. pt. 81).

⁴⁶ UTAH AIR QUALITY BD., UTAH STATE IMPLEMENTATION PLAN 11 (2013) [hereinafter UTAH PM_{2.5} SIP], available at http://www.airquality.utah.gov/Pollutants/ParticulateMatter/PM25/docs/2013/12Dec/SIPIX.A.21_Adopted_12-4-13.pdf, archived at <http://perma.cc/9373-S958>.

⁴⁷ *ATK Launch Sys.*, 669 F.3d at 334.

⁴⁸ *Catawba Cnty., N.C. v. EPA*, 571 F.3d 20, 39 (D.C. Cir. 2009) (holding that any area contributing to the ambient air quality in a nearby area that does not meet the NAAQS should be designated as a nonattainment area).

⁴⁹ *ATK Launch Sys.*, 669 F.3d at 335.

secondary emissions. The mean contributions to PM_{2.5} are nitrate, 41%; organic mass, 19%; ammonium, 17%; sulfate, 6%; crustal material, 3%; elemental carbon, 3%; and all other substances, 11%.⁵⁰ Directly emitted PM_{2.5} is important because these emissions have a linear relation to atmospheric concentrations.⁵¹ Secondary emissions do not have the same potential to promote PM_{2.5} formation, but the quantity emitted makes secondary emissions, such as volatile organic compounds (VOCs) and nitrogen oxides (NO_x), important contributors to high PM_{2.5} concentrations. Sulfur oxides (SO_x) also are secondary contributors to PM_{2.5} formation. Moreover, ammonium nitrate may be a factor in the area's air pollution problem because ammonia emissions react with nitric acid formed from NO_x to form this particulate.⁵² However, Utah's DAQ takes the position that controlling ammonia emissions will have little or no effect on PM_{2.5} concentrations,⁵³ but research on the role of ammonia continues.

C. State Implementation Plans

The CAA's sections 107 and 110 require each state to develop a SIP to bring nonattainment areas into compliance with the NAAQS and to prevent deterioration of ambient air quality in areas that meet the NAAQS (a.k.a. prevention of significant deterioration (PSD) areas).⁵⁴ The SIP process begins with an emissions inventory of air pollution sources. Emission requirements in the CAA that are imposed by the federal government are usually incorporated by reference into the Utah regulations and become part of the inventory process.⁵⁵ The state then uses mathematical models to determine the number of tons of the various pollutants that must be eliminated in order to attain the NAAQS for each criteria pollutant. Plans are then developed to allocate the needed reductions to transportation and stationary point sources as well as area source categories, which results in each source category being assigned an emissions budget. The emissions budget for source categories is then used to impose limits on emissions from specific sources in the nonattainment area.

In nonattainment areas, each nonattainment plan is to provide for the implementation of reasonably available control measures (RACM), and existing stationary sources are subject to a subset of RACM, which is reasonably available

⁵⁰ UTAH PM_{2.5} SIP, *supra* note 46, at 21.

⁵¹ *Id.* at 42.

⁵² See Kerry E. Kelly et al., *Receptor Model Source Attributions for Utah's Salt Lake City Airshed and the Impacts of Wintertime Secondary Ammonium Nitrate and Ammonium Chloride Aerosol*, 63 J. AIR & WASTE MGMT. ASS'N 575, 575 (2013); see also Brian Maffly, *Scientists Tackle Utah's Particulate Pollution Puzzle*, SALT LAKE TRIB., Dec. 22, 2013, at A1 (stating that when ammonia and nitric acid combine it forms ammonium nitrate, which accounts for most of the secondary PM_{2.5} pollution).

⁵³ UTAH PM_{2.5} SIP, *supra* note 46, at 14.

⁵⁴ Clean Air Act §§ 107, 110, 42 U.S.C. §§ 7407, 7410 (2012).

⁵⁵ See e.g., UTAH ADMIN. CODE r. 307-110-10, -17 (2014).

control technology (RACT).⁵⁶ Implementing RACT requires identification of potential measures that are reasonable; modeling to determine an attainment date that is as expeditious as practicable; and selection of a RACT technology that is technologically and economically feasible.⁵⁷ The EPA's review of Utah's SIP modifications included criticism of the state for allowing major polluters to do their own RACT analysis.⁵⁸

Section 110 delegates to the states the responsibility to determine which sources are regulated and to what extent.⁵⁹ A state's SIP may include programs that are economically or technologically infeasible; the CAA gives the EPA no authority to question the wisdom of a state's choice.⁶⁰ The federal government, however, plays an important role because it regulates emissions from new stationary sources,⁶¹ major sources of hazardous air pollutants,⁶² and new motor vehicles and engines.⁶³ Moreover, the federal government administers a complex preconstruction permit program for new or modified major stationary sources, although the program may be delegated to the states.⁶⁴

The United States is divided into air quality control regions (AQCRs), and they are divided into compliance and nonattainment areas for each criteria pollutant. Nonattainment areas for some criteria pollutants are further classified according to the severity of pollution. Nonattainment areas for PM₁₀, for example, are classified as moderate or serious.⁶⁵ After a new or revised NAAQS is promulgated, states must submit the air quality classification for all areas within their borders to the EPA.⁶⁶ The EPA must then approve the submitted designations or take prescribed steps to modify the submission.⁶⁷

In Utah, SIP development is the responsibility of the DAQ.⁶⁸ After the DAQ completes a SIP revision it is submitted to the EPA, which is required to review

⁵⁶ Clean Air Act § 172, 42 U.S.C. § 7502.

⁵⁷ UTAH PM_{2.5} SIP, *supra* note 46, at 51.

⁵⁸ Brian Moench, Op-Ed., *Big Utah Polluters Can Cut Their Emissions*, SALT LAKE TRIB., May 26, 2013, at O4.

⁵⁹ *Union Elec. Co. v. EPA*, 427 U.S. 246, 269 (1976).

⁶⁰ *Train v. Natural Res. Def. Council, Inc.*, 421 U.S. 60, 79 (1975). However, the U.S. Department of Transportation requires long-range transportation plans to demonstrate that resources are reasonably expected to be available to carry out the plan. 23 U.S.C. § 134(i) (2012).

⁶¹ 42 U.S.C. § 7411.

⁶² *Id.* § 7412.

⁶³ *Id.* §§ 7521–7554.

⁶⁴ *See id.* § 7475(a), (e).

⁶⁵ *Id.* § 7513.

⁶⁶ *Id.* § 7407(d)(1)(A).

⁶⁷ *Id.* § 7407(d)(1)(B).

⁶⁸ *See Utah Air Quality Board*, UTAH DEP'T ENVTL. QUALITY, <http://www.deq.utah.gov/boards/airquality/index.htm>, archived at <http://perma.cc/EJZ7-2UZH> (last visited Nov. 12, 2014). The DAQ had a fiscal year 2012 budget of \$12,033,600, which includes \$4,273,600 of federal funds. UTAH GOVERNOR'S OFFICE OF PLANNING & BUDGET, BUDGET

each SIP and fully approve the plan, partially approve and partially disapprove the plan, conditionally approve the plan, or reject the plan.⁶⁹ The EPA's role is limited to the ministerial function of reviewing a SIP for consistency with the Act's requirements.⁷⁰ The EPA must disapprove a state proposed SIP if it would interfere with the state's attainment and maintenance of the NAAQS.⁷¹

On November 21, 2013, the EPA proposed a revised implementation rule for PM_{2.5} in response to the D.C. Circuit remand in January 2013.⁷² The proposed rule gives states until December 31, 2014, to submit SIP revisions, if needed, to comply with 40 C.F.R. Part 51 to include the need to satisfy the requirements of CAA Part 1, Subpart 4.⁷³ Environmentalists are claiming the proposed rule is too weak.⁷⁴ On October 25, 2013, the EPA promulgated a final rule partially approving and partially disapproving Utah's SIP submission needed to comply with the PM_{2.5} NAAQS of July 18, 1997, and October 17, 2006.⁷⁵ This required Utah's DAQ to revise its proposed SIP revisions, and on December 4, 2013, it adopted another SIP revision.⁷⁶ Utah's PM_{2.5} SIP revision was approved by Utah's Air Quality Board on January 8, 2014, although it appears to be unacceptable to the EPA.⁷⁷

SUMMARY: FISCAL YEAR 2012, at 73 tbl.20 (2011), available at http://governor.utah.gov/Budget/Budget/Budget%20Summaries/FY%202012_SumBk.pdf, archived at <http://perma.cc/R7CF-E4FT>. The DAQ has eighty-nine employees. See *Cracking the Ozone Code*, *supra* note 40.

⁶⁹ 42 U.S.C. § 7410(c), (k)(3); *Ass'n of Irrigated Residents v. EPA*, 686 F.3d 668, 671 (9th Cir. 2012).

⁷⁰ *Luminant Generation Co. v. EPA*, 714 F.3d 841, 846 (5th Cir. 2013); see also *Ala. Env'tl. Council v. EPA*, 711 F.3d 1277, 1287, 1289–90 (11th Cir. 2013) (stating that the EPA may correct an error in a prior SIP approval, but it must clearly express the reason for the error).

⁷¹ See *Luminant Generation Co. v. EPA*, 675 F.3d 917, 926 (5th Cir. 2012) (citing 42 U.S.C. § 7410(l)).

⁷² Identification of Nonattainment Classification and Deadlines for Submission of SIP Provisions for the 1997 PM_{2.5} NAAQS and 2006 PM_{2.5} NAAQS, 78 Fed. Reg. 69,806 (proposed Nov. 21, 2013) (to be codified at 40 C.F.R. pt. 51).

⁷³ *Id.* at 69,807.

⁷⁴ Chris Knight, *Environmentalists Claim Weak EPA Response to PM2.5 Policy Remand*, INSIDE EPA'S CLEAN AIR REP., Dec. 5, 2013, at 16; Chris Knight, *EPA Faulted for Giving States 'Free Pass' on Exceeding PM2.5 Air Limits*, INSIDE EPA'S ENVTL. POL'Y ALERT, Jan. 22, 2014, at 15.

⁷⁵ Promulgation of State Implementation Plan Revisions, 78 Fed. Reg. 63,883, 63,885 (Oct. 25, 2013) (to be codified at 40 C.F.R. pt. 52). The EPA issued draft guidance to help states estimate PM_{2.5} emissions from new or modified facilities on March 4, 2013. See *EPA Guidance Aims to Improve Accuracy of PM2.5 Emissions Estimates*, INSIDE EPA'S CLEAN AIR REP., Mar. 14, 2013, at 12.

⁷⁶ UTAH PM_{2.5} SIP, *supra* note 46 at .

⁷⁷ See Brian Maffly, *Utah's Air Plan Too Soft on Industry, EPA Says*, SALT LAKE TRIB., Jan. 9, 2014, at A1. Recently, the EPA partially approved and partially disapproved two relatively minor submittals made on September 20, 1999. 79 Fed. Reg. 11,325 (Feb. 28, 2014) (to be codified at 40 C.F.R. pt. 52).

II. CONTROLLING EMISSION SOURCES

Meeting SIP requirements to improve atmospheric concentrations of criteria pollutants ultimately is dependent on controlling emissions from sources.⁷⁸ The Salt Lake nonattainment area needs to reduce PM_{2.5} emissions by 123.05 tons per day (t/d) from 2008 emissions of 365.96 t/d; Cache County needs a reduction of 5.94 t/d from 2008 emissions of 26.7 t/d; and Utah County needs a reduction of 29.07 t/d from its 2008 emissions of 83.19 t/d.⁷⁹

A. Mobile Sources

Utah's DAQ reports that about half the PM_{2.5} air pollution in the Salt Lake area is from mobile road sources.⁸⁰ Mobile source emissions are controlled almost entirely by the federal government, which means the emissions reductions in the SIP are dominated by mandatory reductions imposed by the EPA's regulation of the automotive industry.⁸¹ Since 1970, the EPA's regulatory program has dramatically reduced new motor vehicle emissions.⁸²

For the Salt Lake City nonattainment area, winter PM_{2.5} the DAQ projects an 11.9% reduction by 2019 from the 2010 base year, but 76.5% of this reduction is to come from road and nonroad mobile sources.⁸³ NO_x is to be reduced 29.9%, but the reductions from road and nonroad mobile sources exceeds the overall reduction; VOC is to be reduced 34.3%, with 74.2% of the reduction projected to come from road and nonroad mobile sources.⁸⁴ Utah's DAQ is depending on federally mandated emission reductions from current and future motor vehicles to lower emissions from mobile road sources in the Salt Lake nonattainment area, which will minimize the reductions needed from stationary sources that are Utah's responsibility.⁸⁵ Moreover, the emissions inventory is a critical factor in

⁷⁸ UTAH DEP'T OF ENVTL. QUALITY, IT'S UP TO ALL OF US: THE UTAH DIVISION OF AIR QUALITY PM_{2.5} STATE IMPLEMENTATION PLAN INFORMATION BOOKLET 8 (2012) [hereinafter IT'S UP TO ALL OF US], available at <http://www.airquality.utah.gov/Pollutants/ParticulateMatter/PM25/docs/2012/10Oct/DAQPM25BookletLow.pdf>, archived at <http://perma.cc/7WNQ-PMF3>.

⁷⁹ *Id.* at 8.

⁸⁰ *Id.* at 4; see UTAH PM_{2.5} SIP, *supra* note 46, at 26.

⁸¹ See generally Arnold W. Reitze, Jr., *Mobile Source Air Pollution Control*, 6 ENVTL. LAW. 309 (2000) (describing reductions in motor vehicle emissions following introduction of EPA regulatory measures).

⁸² See generally *id.* (same).

⁸³ See UTAH PM_{2.5} SIP, *supra* note 46, at 26.

⁸⁴ *Id.*

⁸⁵ The most important new regulation is the Tier 3 regulations announced by the EPA on March 3, 2014. See U.S. ENVTL. PROTECTION AGENCY, EPA SETS TIER 3 MOTOR VEHICLE EMISSION AND FUEL STANDARDS 1–2 (2014), available at <http://www.epa.gov/otaq/documents/tier3/420f14009.pdf>, archived at <http://perma.cc/C6G2-F9PP>.

determining the stringency of the SIP-based requirements. The lower the percentage of total emissions from area and point sources, the less control Utah's DAQ will need to impose.

B. Area Sources

Air pollution is categorized based on its source. In Utah, stationary sources that exceed an emissions threshold, commonly one hundred tons per year of a pollutant, are considered major sources. Sources below the threshold are considered area sources and are subject to less stringent regulation.⁸⁶ Major sources are also known as point sources.⁸⁷ Area sources in the Salt Lake area are the second most important source of emissions with 25.6% of the PM_{2.5}, 35.6% of the VOCs, and 12.9% of the NO_x in the winter of 2014.⁸⁸ Utah's DAQ lists twenty-two categories of area sources.⁸⁹ The Salt Lake nonattainment area's area sources have higher PM_{2.5} emissions and much higher emissions of VOCs than point sources, but NO_x emissions from area sources are 13.72% lower than from point sources in the 2010 base year.⁹⁰ VOCs are an important pollutant emitted by area sources because they account for more than one-third of the Salt Lake Area's emissions of this pollutant, which can transform into PM. The six most significant area source categories are solid fuel burning, architectural coatings, degreasing, consumer products, metal parts coating, and auto body refinishing, and they account for 81.8% of the Salt Lake area's VOC emissions.⁹¹ Utah's DAQ SIP revision projects that area sources will decrease VOC emissions in 2019 from the 2010 base by 28.0%; NO_x emissions will essentially be unchanged; and PM_{2.5} emissions will decrease by 23.5%.⁹²

Area sources are controlled by requirements applicable to specific industrial classifications. For example, wood manufacturers and graphic arts businesses are subject to control technologies or management practices appropriate to their classification.⁹³ Area sources have been subject to controls since 1981 and controls often are based on the EPA's control technique guidelines (CTGs) that have been adopted into Utah's air quality rules.⁹⁴ Utah adopted twenty-three new rules in 2013 for area sources in the Salt Lake nonattainment area, and most became effective by January 1, 2014.⁹⁵ The DAQ expects these new rules to impose costs

⁸⁶ UTAH ADMIN. CODE r. 307-415-3(2)(k)(a)–(b) (2014).

⁸⁷ DAQ 2013 ANNUAL REPORT, *supra* note 39, at 22–23.

⁸⁸ See UTAH PM_{2.5} SIP, *supra* note 46, at 26.

⁸⁹ *Id.* at 57.

⁹⁰ *Id.* at 26.

⁹¹ See *id.* at 25, 57.

⁹² *Id.* at 26.

⁹³ UTAH ADMIN. CODE r. 307-343, -351 (2014).

⁹⁴ UTAH PM_{2.5} SIP, *supra* note 46, at 44.

⁹⁵ *Id.* at 57 tbl.6.5.

of \$3,000 to \$10,000 per ton of emissions reduced.⁹⁶ The 2013 area source rules include restrictions on commercial cooking, consumer products, printing, and publishing.⁹⁷ Other area sources include “[h]ome heating, agricultural burning and harvesting, construction, residential and commercial energy generation, wildfires, and biogenics (emissions from vegetation).”⁹⁸

Among the new area source regulations are controls on wood burning, which are based on research pointing to this source being an important contributor to winter pollution.⁹⁹ Along the Wasatch Front, wood burning contributes 5–15% of the direct PM_{2.5} during inversions.¹⁰⁰ The Utah DAQ lists solid fuel burning as the most important area source of pollution in 2014 with emissions of 71.1% of the NO_x, 95.8% of the PM_{2.5}, and 35.4% of the VOCs from area sources.¹⁰¹ Two regulations that went into effect January 1, 2014, target the burning of solid fuel. Rule R307-207 establishes emission standards for residential fireplaces and solid fuel burning devices.¹⁰² A second rule, R307-302, applies to solid fuel burning devices in the PM₁₀ and PM_{2.5} nonattainment and maintenance areas in seven counties.¹⁰³ Residential wood burning is restricted when PM_{2.5} levels reach 25 µg/m³, which occurred thirty-three times in the winter of 2012–2013. However, about 207 homes are exempted in the Utah nonattainment areas because wood is their sole source of heat.¹⁰⁴ During times when solid fuel burning devices and fireplaces may be used, R307-302-5 imposes opacity limits on visible emissions. There are also provisions for no-burn periods when carbon monoxide reaches levels specified in R307-302-4.¹⁰⁵

Enforcement of the rule limiting the use of wood as a source of residential heat is difficult and is unlikely to occur. There are an estimated 36,822 wood-burning stoves and fireplaces in the seven nonattainment counties.¹⁰⁶ While fines are \$25 for a first offense, \$150 for a second offense, and can be as high as \$299,

⁹⁶ IT’S UP TO ALL OF US, *supra* note 78, at 5.

⁹⁷ *Id.*

⁹⁸ DAQ 2013 ANNUAL REPORT, *supra* note 39, at 22.

⁹⁹ Judy Fahys, *Wood Stoves Taking Heat as a Top Cause of Winter Pollution*, SALT LAKE TRIB., June 8, 2013, at B1.

¹⁰⁰ K. E. Kelly et al., Univ. of Utah, Contribution of Woodsmoke to PM_{2.5} During Wasatch Front Inversions (Jan. 15, 2014) (PowerPoint Presentation on file with the Utah Law Review).

¹⁰¹ See UTAH PM_{2.5} SIP, *supra* note 46, at 57.

¹⁰² UTAH ADMIN. CODE r. 307-207-3 (2014).

¹⁰³ *Id.* r. 307-302-2 (extending rule 307-302 to all of Salt Lake and Davis Counties and portions of Box Elder, Cache, Tooele, Utah, and Weber Counties).

¹⁰⁴ See *id.* r. 307-302-3.

¹⁰⁵ *Local Burning Guidelines*, WHENTOBURN.COM, <http://www.whentoburn.com/utah-air-quality-monitoring-no-burn-days#voluntary>, archived at <http://perma.cc/BMV9-CAP5> (last visited Sept. 2, 2014) (providing information on no-burn days).

¹⁰⁶ Christopher Smart, *Can SLC Smoke Out Burning Violators?*, SALT LAKE TRIB., Jan. 25, 2014, at B1.

there are few inspectors, and they do not work after 5 p.m., when most of the burning takes place.¹⁰⁷ In the winter of 2012–2013, there were sixteen citations issued; from 2013 to mid-January 2014 there were twenty-eight citations issued in the seven counties.¹⁰⁸ On March 12, 2014, the Utah Senate acted on H.B. 154 that aimed to lower emissions from wood burning. It made the program completely voluntary and removed two-thirds of the money approved by the House and sent the bill back to the House.¹⁰⁹ Thus, the program is largely irrelevant at this time.

Emissions from stationary sources are primarily controlled through permits issued by Utah's DAQ.¹¹⁰ The permitting branch's New Source Review (NSR) section issues permits to new and modified sources of air emissions. Utah requires an air quality permit to build, own, or operate a facility that releases pollution into the atmosphere. The permit is called an approval order. New or modified sources, if not exempted, must obtain approval orders.¹¹¹ Utah's air pollution laws track the CAA closely and do not add additional requirements that are not federally mandated.

Utah has a small source exemption for sources of less than five tons per year (tpy) of a criteria pollutant or VOCs, less than 500 pounds per year of a hazardous air pollutant (HAP), or two thousand pounds per year of any combination of HAPs.¹¹² Utah's DAQ is to maintain a registry of sources claiming a small source exemption.¹¹³

Small sources having emissions that exceed the small source exemption need to obtain an approval order if they seek to construct, modify or relocate a facility.¹¹⁴ Since 1969, an approval order has been required for most new or modified facilities. The approval order may include limits on both construction and operations. The approval order process begins with an applicant submitting a notice of intent (NOI) using DAQ forms that contains the information required by the division. The regulation lists ten requirements that must be met, including the need to comply with any requirements in the SIP.¹¹⁵ Utah's DAQ reviews the NOI and, if it is satisfactory, issues an approval order that requires the application of the

¹⁰⁷ *Id.*

¹⁰⁸ *Id.*

¹⁰⁹ Topher Webb, *Senate Cuts, Then Passes Clean-Air Bills*, SALT LAKE TRIB., Mar. 13, 2014, at B3.

¹¹⁰ DAQ 2013 ANNUAL REPORT, *supra* note 39, at 44.

¹¹¹ *Id.*

¹¹² UTAH ADMIN. CODE r. 307-401-9 (2014).

¹¹³ *Id.* r. 307-401-9(3).

¹¹⁴ *Id.* r. 307-401-5, -19.

¹¹⁵ *Id.* r. 307-401-8(1)(b).

best available control technology (BACT).¹¹⁶ Utah's DEQ lists about one thousand approval orders that have been issued since July 1, 2007.¹¹⁷

On January 3, 2014, the EPA's Administrator signed a proposed rule that applies to new wood stoves and other wood combustion devices.¹¹⁸ The proposed rule would replace the 1988 new source performance standard for PM of 7.5 grams per hour (g/hr) for noncatalytic stoves and PM of 4.1g/hr for stoves with catalysts. A 4.5 g/hr standard will apply to all new wood stoves and pellet heaters. Five years after the rule is finalized, the standard would become 1.3 g/hr.¹¹⁹ Federal standards do not remove the need for state regulation because up to two-thirds of the existing woodstoves were manufactured prior to the 1988 standards.¹²⁰

C. Point Sources

Point sources are usually sources with emissions of 100 tpy or more of a regulated pollutant.¹²¹ They are also often known as "major sources," which is defined at CAA § 302(j).¹²² Utah follows the federal law and defines major source as a source with the potential to emit more than 100 tpy of a regulated pollutant, 10 tpy of a hazardous air pollutant, or 25 tpy of aggregated hazardous air pollutants.¹²³ The definition of major source was changed by the 1990 CAA Amendments to include many additional facilities because the amendments lowered the usual 100 tpy of a pollutant threshold for the imposition of major source requirements to a lower threshold based on the pollutants the source emits and the degree of nonattainment in the area where it is located. For example, in areas designated as serious for PM₁₀, a major source is one with the potential to emit at least 70 tpy of PM₁₀.¹²⁴ Fugitive emissions are counted only from a list of twenty-six industrial classifications plus any sources regulated on August 7, 1980, under CAA §§ 111 or 112.¹²⁵ New major sources and major modifications of sources that are major for the pollutant for which the area is designated nonattainment are required to obtain

¹¹⁶ *Utah DEQ Permit Wizard*, UTAH DEP'T OF ENVTL. QUALITY, <http://permitwizard.deq.utah.gov>, archived at <http://perma.cc/B8L4-YUNY> (last updated July 17, 2014).

¹¹⁷ *Approval Orders Issued*, UTAH DEP'T OF ENVTL. QUALITY, http://168.178.6.8/DAQ_NOI/AOsIssued.aspx, archived at <http://perma.cc/QF95-QEDZ> (last visited Sept. 4, 2014).

¹¹⁸ Anthony Adragna, *EPA Proposes Revised Performance Standards for New Wood Stoves, Heaters*, 45 Env't Rep. (BNA) 77 (Jan. 10, 2014).

¹¹⁹ Stuart Parker, *EPA Wood Heater Air Rule Seen As Achievable Despite Industry's Doubts*, INSIDE EPA'S CLEAN AIR REP., Jan. 16, 2014, at 20.

¹²⁰ *Id.*

¹²¹ DAQ 2013 ANNUAL REPORT, *supra* note 39, at 22.

¹²² Clean Air Act § 302(j), 42 U.S.C. § 7602(j) (2012).

¹²³ UTAH ADMIN. CODE r. 307-415-3 (2012); 42 U.S.C. § 7412(a)(1) (defining major source as a source of 10 tpy of a HAP or 25 tpy of a combination of HAPs).

¹²⁴ Clean Air Act § 188(b)(3), 42 U.S.C. § 7513a(b)(3) (2012).

¹²⁵ 40 C.F.R. § 70.2 (2014).

a nonattainment area construction permit.¹²⁶ Major sources are also required to obtain operating permits required by Title V of the CAA.¹²⁷

The Salt Lake nonattainment area's point source category in 2014 is responsible for 23.2% of the winter PM_{2.5}, 7.6% of the VOCs, and 16.0% of the NO_x.¹²⁸ Point sources in 2019 are projected to increase emissions from the 2010 base year by 21.3% for PM_{2.5}, 45.5% for VOCs, and 28.2% for NO_x.¹²⁹ Total PM_{2.5} in 2010 was 19.6 tons per day (tpd), and is projected to be 17.3 tpd in 2019, which is an 11.7% reduction from the 2010 baseline.¹³⁰ VOC emissions from point sources are projected to increase 45.5%, but overall VOCs will decrease 34.3%. Reductions from mobile and area sources are being used by Utah's DAQ to allow point source PM_{2.5} and VOC emissions to increase. Point source emissions are dominated by a small number of sources. Kennecott's weekday winter operations in 2014, for example, account for 41.1% of the PM_{2.5}, 57.2% of the NO_x, 9.07% of the VOC, and 41.9% of the SO₂ in the Salt Lake nonattainment area.¹³¹ Hill Air Force Base is responsible for more than 10% of the VOC emissions from point sources in 2014.¹³²

The SIP is being crafted to allow some of the largest point sources to increase their emissions. Winter emissions of PM_{2.5} from Kennecott's Mine Concentrator will increase from 0.65 tpd to 0.85 tpd, and PM_{2.5} emissions from its smelter will increase from 0.61 to 0.96 tpd; Nucor Steel will more than double its PM_{2.5} emissions and double its VOC emissions, and Proctor & Gamble Paper Products Co. will increase its PM_{2.5} emissions by over 600% and increase its VOC emissions by over 1000%.¹³³ Some of the petroleum refineries, discussed *infra*, also will be allowed to increase emissions.

In Utah, the EPA's authority to issue operating permits has been delegated to the DAQ, and its operating permits section issues the permits for major stationary sources. Utah has issued seventy-one operating permits to major sources,¹³⁴ and there are forty-two sources with operating permits in Utah's three PM_{2.5} nonattainment areas.¹³⁵ In the Salt Lake nonattainment area there are twenty-eight stationary sources that emit 100 tpy of PM_{2.5} or its precursors.¹³⁶ Operating permits

¹²⁶ UTAH ADMIN. CODE r. 307-403-2 (2014); *see also* 42 U.S.C. § 7503(a) (outlining the requirements for obtaining a nonattainment area construction permit).

¹²⁷ Clean Air Act §§ 501–507, 42 U.S.C. §§7661–7661f.

¹²⁸ *See* UTAH PM_{2.5} SIP, *supra* note 46, at 26 tbl.4.2.

¹²⁹ *Id.*

¹³⁰ *Id.*

¹³¹ *See id.* at 53.

¹³² *Id.*

¹³³ *Id.* at 53–54.

¹³⁴ *See Title V Operating Permits Issued*, UTAH DEP'T OF ENVTL. QUALITY, http://168.178.6.8/DAQ_NOI/OPS_Issued.aspx, archived at <http://perma.cc/9B37-YV8D> (last visited Sept. 21, 2014).

¹³⁵ *Id.*

¹³⁶ UTAH PM_{2.5} SIP, *supra* note 46, at 53–54.

usually impose emission limits but may include limits on production rates, hours of operation, fuel consumption, and other requirements.¹³⁷ Utah's regulations do not usually establish any control requirements beyond those established by applicable federal requirements but may establish new monitoring, recordkeeping, and reporting requirements.¹³⁸ The regulations provide a list of minor emission generating activities that do not require operating permit applications.¹³⁹ The regulations also provide a procedure for modifying or revising a permit.¹⁴⁰ All operating permit terms and conditions are enforceable by the EPA and citizens unless the conditions are specifically designated as state requirements that are not federally enforceable.¹⁴¹ Utah regulations provide a "synthetic minor" provision that allows a source to avoid regulation as a major source by obtaining an approval order under R307-401 that reduces the potential to emit below the trigger amount under federally enforceable conditions.¹⁴²

D. Salt Lake Area Refineries

There are five refineries in the Salt Lake PM_{2.5} nonattainment area.¹⁴³ In 2010 the five refineries were responsible for 39.6% of the winter inversion PM_{2.5} and 58% of the winter VOCs released from point sources, which are the two most important pollutants associated with the PM_{2.5} nonattainment status.¹⁴⁴ In 2010, the winter inversion emissions from the refineries was 1.54 tpd for PM_{2.5} and 3.77 tpd for VOCs; in 2019, PM_{2.5} is projected to decrease to 0.68 tpd, but VOC emissions are expected to increase to 4.16 tpd.¹⁴⁵ Both refinery and point source VOC emissions are projected to increase, and, in 2019, the local refineries are projected to be the source of half of the winter inversion emissions of VOCs from point sources.¹⁴⁶

The normal practice is for the SIP requirements applicable to major sources, as well as other requirements imposed by the CAA, to be incorporated into a Title V operating permit.¹⁴⁷ However, none of the Salt Lake area refineries have such

¹³⁷ *See id.* at 43.

¹³⁸ UTAH ADMIN. CODE r. 307-415-4(5) (2014).

¹³⁹ *See id.* r. 307-415-5e.

¹⁴⁰ *See id.* r. 307-415-7f, -7g.

¹⁴¹ *Id.* r. 307-415-6b.

¹⁴² *Id.* r. 307-415-4(6).

¹⁴³ *See* UTAH PM_{2.5} SIP, *supra* note 46, at 53 (identifying Big West Refinery, Chevron Refinery, Holly Refining Marketing, Silver Eagle Refinery, and Tesoro Refinery as the five refineries in the Salt Lake nonattainment area).

¹⁴⁴ *See id.*

¹⁴⁵ *See id.* at 54.

¹⁴⁶ The SIP shows no emissions from the Silver Eagle Refinery for 2014 and thereafter, which means all post-2010 data for refineries is based on four local refinery emissions. *See id.* at 53–54.

¹⁴⁷ *See* Clean Air Act §§ 501–507, 42 U.S.C. §§ 7661–7661f (2012).

permits because of a quarrel that has gone on since 1994 between Utah's Division of Air Quality and the EPA's Region 8.¹⁴⁸ Both of the organizations agree that this has not had an adverse impact on air quality because both the refineries and regulatory agencies understand the applicable requirements.¹⁴⁹ However, the failure to issue operating permits to the refineries may increase the difficulty of successfully enforcing the law; it makes it more difficult for citizens to know what requirements are being imposed on sources, and it makes it more difficult for citizens to use the citizen suit provision of the CAA.¹⁵⁰ On December 23, 2013, WildEarth Guardians filed a lawsuit against the EPA for its failure to grant the Bonaza power plant's permit application filed back in 2012.¹⁵¹ On May 13, 2014, the EPA promulgated a proposed consent decree that would require the Agency to issue a final Title V permit by August 29, 2014.¹⁵² This decision may be applicable to facilities without operating permits in the Salt Lake nonattainment area. On October 30, 2014, a complaint and petition for injunctive and declaratory relief was filed by Utah Physicians for a Healthy Environment and Friends of Great Salt Lake against Utah Division of Air Quality in an effort to force the state to take final action on an operating permit application filed about May 6, 1998 that was submitted for the Tesoro Salt Lake City refinery.¹⁵³

The five refineries process oil brought by pipeline and by truck from Utah, Wyoming, Colorado, and Canada. Pipelines deliver refined products to Idaho, eastern Oregon, eastern Washington, Las Vegas, and Nevada; they bring refined products to the Salt Lake area from Wyoming and Montana.¹⁵⁴ Three of the refineries, Tesoro, Holly, and Chevron, are seeking construction permits to modify their facilities in order to expand their capacity to process the black wax and yellow wax crude oil feedstock that is trucked about 175 miles from the Uintah Basin in eastern Utah.¹⁵⁵

¹⁴⁸ Judy Fahys, *Green Groups: Rein in Refineries*, SALT LAKE TRIB., May 29, 2013, at B1.

¹⁴⁹ *Id.*

¹⁵⁰ *See id.*; Clean Air Act § 304, 42 U.S.C. § 7604.

¹⁵¹ Lisa Schencker, *Advocates Sue EPA over Lack of Action on Permit for Utah Coal-Fired Plant*, SALT LAKE TRIB., Dec. 23, 2013, at B3.

¹⁵² Proposed Consent Decree, Clean Air Act Citizen Suit, 79 Fed. Reg. 27,304 (proposed May 13, 2014).

¹⁵³ Complaint and Petition for Review Seeking Injunctive and Declaratory Relief, Utah Physicians for a Healthy Environment, et al. v. Director of Utah Division of Air Quality, Case No. 140907493 (3d Dist. Ct., Salt Lake Cnty., State of Utah, filed Oct. 30, 2014).

¹⁵⁴ U.S. ENERGY INFO. ADMIN., *Utah State Energy Profile*, <http://www.eia.gov/state/print.cfm?sid=UT>, archived at <http://perma.cc/5ELF-YQ32> (last visited Oct. 12, 2014).

¹⁵⁵ Dawn House, *Drill Baby, Drill But at a Cost*, SALT LAKE TRIB., June 3, 2012, at A1.

In 2010, Tesoro's refinery in North Salt Lake was Utah's largest source of direct PM_{2.5} emissions.¹⁵⁶ By 2014, Tesoro will be required to reduce its direct winter PM_{2.5} emissions of 0.71 tpd in 2010 to 0.28 tpd.¹⁵⁷ In 2019, when Utah is projected to attain the PM_{2.5} NAAQS, Tesoro is projected to have a PM_{2.5} cap of 0.27 tpd.¹⁵⁸ However, its VOC emissions will increase from 0.81 tpd in 2010 to 1.01 tpd in 2019—nearly a 25% increase.¹⁵⁹ On September 13, 2013, Utah's DAQ approved Tesoro's modification to increase its throughput capacity by 7%,¹⁶⁰ which is expected to result in a 16% increase in VOC emissions and an 8% reduction in sulfur emissions.¹⁶¹ In February 2014, Tesoro proposed a 135-mile pipeline from the Uinta Basin to the Salt Lake City area, which will carry up to sixty thousand barrels a day and would replace many of the trucks carrying waxy crude oil on U.S. Route 40 and Interstate 80.¹⁶² This pipeline will allow the refineries to further expand.¹⁶³

The Holly refinery ("Holly") is projected to increase its winter PM_{2.5} emissions from 0.15 tpd in 2010 to 0.22 tpd in 2017 and its VOC emissions from 0.66 tpd to 0.67 tpd.¹⁶⁴ However, Holly seeks to expand its Utah facility's present ability to process 10,000 bbl/d of Uintah waxy crudes by adding capacity to process an additional 24,000 bbl/d in Phase I and an additional 30,000 bbl/d in Phase II, which will increase the refinery's total capacity from 31,000 to 60,000 bbl/d.¹⁶⁵ Holly claims there will be a 378.5 tpy decrease in sulfur dioxide (SO₂) emissions, a decrease in PM₁₀ of 22.6 tpy, and a decrease of 3.2 tpy for PM_{2.5}, but NO_x emissions will increase 37.7 tpy, VOCs will increase 5.8 tpy, CO will increase 500.7 tpy, lead will increase 0.002 tpy, and HAPs will increase 19.7 tpy, with 8.8

¹⁵⁶ UTAH PM_{2.5} SIP, *supra* note 46, at 53.

¹⁵⁷ *Id.*

¹⁵⁸ *Id.* at 54.

¹⁵⁹ *Id.*

¹⁶⁰ *Tesoro Refining and Marketing: Black Wax and Yellow Wax Processing Project*, UTAH DEP'T OF ENVTL. QUALITY, <http://www.airquality.utah.gov/Public-Interest/tesoro/>, archived at <http://perma.cc/5M8F-X5KF> (last visited Nov. 12, 2014); Vicki Vaughan, *Tesoro Secures Oil Supply for Utah Refinery*, SAN ANTONIO EXPRESS-NEWS, (Dec. 5, 2011), available at <http://www.mysanantonio.com/business/article/Tesoro-secures-oil-supply-for-Utah-refinery-2346666.php>, archived at <http://perma.cc/P2L9-CLL8>.

¹⁶¹ Judy Fahys, *Tesoro Refinery Expansion OK'd after Long Review*, SALT LAKE TRIB., Sept. 14, 2012, at C6.

¹⁶² Brian Maffly, *Pipeline Proposed for Uinta Crude Oil*, SALT LAKE TRIB., Feb. 5, 2014, at B1.

¹⁶³ *Id.*

¹⁶⁴ UTAH PM_{2.5} SIP, *supra* note 46, at 53–54.

¹⁶⁵ See Letter from Michael S. Astin, Env'tl. Manager at Holly Ref. & Mktg. Co., to Bryce Bird, Director, Utah Div. of Air Quality (Mar. 21, 2013) (on file with the Utah Law Review); *Woods Cross Refinery*, HOLLYFRONTIER CORP., http://hollyfrontier.com/media/files/files/108d2ba0/Woods_Cross_Phase_1_Expansion_Update.pdf, archived at <http://perma.cc/U7AM-27B7> (last visited Sept. 21, 2014).

typy of the increase coming from hexane releases.¹⁶⁶ To achieve these reductions, Holly's Phase I program includes upgrading existing pollution controls, installing a second fluid catalytic cracking unit (which would be dismantled and moved from a New Mexico facility), and replacing gas-fired compressors with other compressors powered by electricity.¹⁶⁷

Opponents of the expansion claim that Holly is seeking credit for the emissions reduction it is required to achieve under an existing consent decree with the EPA.¹⁶⁸ Moreover, there appears to be an inconsistency between Utah's DAQ SIP projections for winter emissions and Holly's annual projections. However, the EPA and Utah's DAQ, on November 18, 2013, granted Holly permission to expand, meaning Holly's claimed emissions reductions are considered legally sufficient.¹⁶⁹ It is expected that the Utah DAQ's approval will be the subject of litigation.¹⁷⁰ On December 20, 2013, the Western Resource Associates, which represents Utah environmental organizations, filed a petition with Utah's DEQ claiming that the state is using unproven formulas to predict emissions from the expanded facility that results in volumes fifteen times lower than the standard formula.¹⁷¹ Other environmental groups are insisting that the oil refineries install wet-gas scrubbers and use selective catalytic reduction.¹⁷²

A larger refinery in Utah is Chevron's North Salt Lake refinery, which can process 45,000 bbl/d.¹⁷³ Chevron plans an \$83 million modification to its facility in order to handle a wider range of crude products (including waxy Utah crude), but it does not plan to increase the facility's capacity.¹⁷⁴ Chevron will be required to reduce PM_{2.5} winter emissions from 0.50 to 0.10 tpd by 2019, but VOC emissions will increase from 0.66 tpd to 1.23 tpd in 2019.¹⁷⁵

Big West Oil, a subsidiary of FJ Management Inc., operates a refinery in North Salt Lake with a capacity of 35,000 bbl/d.¹⁷⁶ It refines Utah, Wyoming, and

¹⁶⁶ Letter from Michael S. Astin to Bryce Bird, *supra* note 165.

¹⁶⁷ Brian Maffly, *Utah Groups Move to Block Holly Refinery Expansion*, SALT LAKE TRIB., Dec. 27, 2013, at B1.

¹⁶⁸ Judy Fahys, *Holly Refinery Cuts Pollution in Updated Expansion Proposal*, SALT LAKE TRIB., May 23, 2013, at B5.

¹⁶⁹ See *Utah Approves HollyFrontier's Refinery Expansion*, OIL & GAS J. (Nov. 19, 2013), <http://www.ogj.com/articles/2013/11/utah-approves-hollyfrontier-s-refinery-expansion.html>, archived at <http://perma.cc/AD4Q-KZWL>.

¹⁷⁰ Amy Joi O'Donoghue, *Critics Vow to Fight Expansion of HollyFrontier Refinery*, KSL.COM (Nov. 19, 2013, 7:23 PM), <http://www.ksl.com/?sid=27704874>, archived at <http://perma.cc/56D6-XVNP>.

¹⁷¹ Maffly, *supra* note 167, at B1.

¹⁷² Maffly, *supra* note 77, at A1.

¹⁷³ Steven Oberbeck, *Chevron to Upgrade Refinery*, SALT LAKE TRIB. Mar. 17, 2012, at E1.

¹⁷⁴ *Id.*

¹⁷⁵ See UTAH PM_{2.5} SIP, *supra* note 46, at 53–54.

¹⁷⁶ Big West Oil, LLC, LINKEDIN.COM, <http://www.linkedin.com/company/big-west-oil-llc>, archived at <http://perma.cc/XHM2-U6CW> (last visited Nov. 12, 2014).

Canadian crude oils into fuels and specialty chemicals that are supplied to customers in seven western states.¹⁷⁷ On August 23, 2013, Big West, the U.S. Department of Justice, and the EPA entered into a consent decree, filed in the U.S. District Court for the District of Utah, which requires the North Salt Lake refinery to reduce its air emissions.¹⁷⁸ The government alleged violations of the CAA, including the Prevention of Significant Deterioration and New Source Performance standards.¹⁷⁹ Big West Oil LLC agreed to pay a \$175,000 penalty and to spend about \$18 million to reduce air pollution.¹⁸⁰ The implementation of this consent decree will reduce SO₂ emissions by approximately 158 tpy, NO_x by approximately 32 tpy, and PM by about 36 tpy.¹⁸¹ VOCs and hazardous air pollutants, including benzene, will be reduced because of the leak detection and repair requirements.¹⁸² Utah's DAQ projects Big West's PM_{2.5} 2010 winter emissions of 0.17 tpd will drop to 0.09 tpd in 2019 and its VOC emissions will go from 1.28 tpd to 1.26 tpd.¹⁸³

The Silver Eagle Refinery, an independent petroleum refiner, operates two refineries in Woods Cross, Utah and Evanston, Wyoming, that supply gasoline and diesel to independent marketers in the Intermountain West.¹⁸⁴ The Woods Cross refinery has a capacity of 11,000 bbl/day.¹⁸⁵ Utah's PM_{2.5} SIP does not show emissions after 2010 for the Silver Eagle refinery because the source has qualified for a synthetic minor permit and is no longer considered a point source.¹⁸⁶

¹⁷⁷ *North Salt Lake Refinery*, BIG WEST OIL LLC, <http://www.bigwestoil.com/wordpress/about-us/north-salt-lake-refinery>, archived at <http://perma.cc/BJ5R-YDZL> (last visited Nov. 12, 2014).

¹⁷⁸ Press Release, U.S. Env'tl. Protection Agency, Big West Oil to Spend \$18M on Emission Controls to Resolve Clean Air Act Violations at North Salt Lake Refinery (Aug. 23, 2013), available at <http://yosemite.epa.gov/opa/admpress.nsf/0/FBB5CC1E2BAD86B285257BD000623C2B>, archived at <http://perma.cc/HN6H-MCQN>.

¹⁷⁹ *Id.*

¹⁸⁰ *Id.*

¹⁸¹ *Id.*

¹⁸² U.S. Env'tl. Protection Agency, *supra* note 178. The consent decree can be found at www.justice.gov/enrd/Consent_Decrees.html. Archived at <http://perma.cc/Y8BC-7JL5>.

¹⁸³ UTAH PM_{2.5} SIP, *supra* note 46, at 53–54.

¹⁸⁴ *About Silver Eagle Refining*, SILVER EAGLE REF., <http://silvereaglerefining.net/about>, archived at <http://perma.cc/C9QK-WWXE> (last visited Nov. 12, 2014).

¹⁸⁵ Joseph M. Dougherty, *Safety Board Offers Video of Silver Eagle Refining Explosion*, DESERET NEWS (Nov. 18, 2009, 12:00 AM), <http://www.deseretnews.com/article/705345229/Safety-board-offers-video-of-Silver-Eagle-Refining-explosion.html?pg=all>, archived at <http://perma.cc/LU7W-7TS7>.

¹⁸⁶ Letter from Jerry G. Lockie, Manager of Ref., Silver Eagle Ref., Inc., to Bryce Bird, Director, Utah Div. of Air Quality (Oct. 31, 2013), available at http://www.airquality.utah.gov/Public-Interest/Public-Commen-Hearings/pdf-files/SummaryPublic/2013/11Nov/Silver_Eagle_Comments.pdf, archived at <http://perma.cc/5JAC-WC93>.

III. CONCLUSION AND ISSUES FOR FURTHER STUDY

If the Salt Lake area is to actually achieve the NAAQS for PM_{2.5}, more stringent controls than those proposed in the SIP revisions will probably be needed. The SIP process discussed above aims to achieve the atmospheric air quality goals by reducing emissions from mobile and stationary source categories. A share of the total emissions reduction is allocated to each of the emission source categories and then to the sources within a category. Emissions from motor vehicles compete with stationary sources to use the finite capacity of the atmosphere to transport and disperse pollution emissions. The failure to adequately control a source category or an industrial classification within a source category increases the pressure on other source categories or industrial classifications to reduce emissions to meet the NAAQS. Nevertheless, affected sources frequently attempt to shift the responsibility for reducing air pollution to other emission sources. This leads to a failure to meet prescribed goals, followed by more stringent statutory or regulatory requirements. SIP revisions are produced and emissions are reduced, but for many nonattainment areas, the goal of reaching NAAQS remains elusive. This problem is exacerbated by the increasing stringency of the NAAQS as they are revised. Some of the issues that need additional study are discussed below.

First, Utah's SIP revision identifies mobile sources as the most significant source of emissions leading to the violation of the PM_{2.5} NAAQS.¹⁸⁷ This places much of the responsibility for reducing Utah's PM_{2.5} emissions on the federal government, which establishes the emission standards for new motor vehicles. Thus, Utah is depending on the federal government to provide much of the reduction needed to meet the PM_{2.5} standard. However, improved vehicle emissions will be nullified if people drive more miles. States have the power to regulate vehicles after they are sold to consumers, but efforts to control vehicle use are difficult to implement because of the large number of vehicles and the public opposition to control measures. Little effort has been made in Utah to reduce driving. Utah should be making greater efforts to reduce the use of motor vehicles and should be working to encourage motorists to purchase vehicles with lower environmental impacts.

Second, Utah's DAQ has identified area sources as the second most important source of emissions responsible for violating the PM_{2.5} NAAQS.¹⁸⁸ Utah's DAQ identifies solid fuel burning as the most significant area wide source of air pollutants.¹⁸⁹ Regulations applicable to wood stoves and fireplaces in the nonattainment areas went into effect January 1, 2014.¹⁹⁰ However, because there

¹⁸⁷ See UTAH PM_{2.5} SIP, *supra* note 46, at 25 tbl.4.1.

¹⁸⁸ See *id.*

¹⁸⁹ *Id.* at 57.

¹⁹⁰ *Id.*

are over thirty-six thousand sources,¹⁹¹ regulation will be resource intensive, expensive, and unpopular. This may make it difficult to achieve the projected 2019 emission reductions.¹⁹²

Third, Salt Lake's point source category in 2014 is responsible for 23.2% of the PM_{2.5}, 7.6% of the VOCs, and 16.0% of the NO_x.¹⁹³ Point sources in 2019 are projected to increase emissions by 21.3% for PM_{2.5}, 45% for VOCs, and 28.2% for NO_x from the 2010 base year.¹⁹⁴ The EPA's mandated reductions in mobile source emissions are used by Utah to allow point source emissions to increase.¹⁹⁵ Utah's forty-one major stationary sources located in the three PM_{2.5} nonattainment areas have less stringent emission reduction requirements than mobile sources. Utah's petroleum refineries, one of the most important sources of point source emissions, are operating under state permits that have not been approved by the EPA because of disagreement over the terms of the permits.¹⁹⁶ Moreover, the pending expansion of several refineries will add to the valley's emissions. In addition, the permits may not be sufficiently stringent.

Fourth, PM_{2.5} emissions can include emissions of HAPs, which have potential public health impacts that are more serious than generic particulate emissions. It is not clear whether the public is being adequately protected from HAP emission sources. Moreover, reporting requirements appear to be lax.

Fifth, more research is needed concerning the extent to which transportation planning is being integrated with the SIP. Expanded mass transit is necessary if VMTs are to be reduced, and the public appears to be willing to support such efforts.¹⁹⁷ Alternative transportation measures individually produce only small reductions in emissions, but every ton of PM_{2.5} and its precursors that can be eliminated moves the region closer to the quality of life that most residents desire. Moreover, transportation planning should be integrated with land use planning in order to increase population density and minimize suburban sprawl because higher population densities leads to less energy use per capita.

Sixth, CAA § 116 allows states to impose more stringent emission standards.¹⁹⁸ Utah's air quality problem is exacerbated by its topography that leads to extended winter inversions as well as a population growth rate of 1.6%, which is more than double the nation's growth rate of 0.7%.¹⁹⁹ Moreover, in Utah 90% of the population lives on 1% of the land, and the population is expected to grow 67%

¹⁹¹ Smart, *supra* note 106, at B1.

¹⁹² See UTAH PM_{2.5} SIP, *supra* note 46, at 26 tbl.4.2.

¹⁹³ See *id.*

¹⁹⁴ See *id.*

¹⁹⁵ See *id.* at 53–54.

¹⁹⁶ Fahys, *supra* note 148, at B1.

¹⁹⁷ See Lee Davidson, *Poll: Utahns Send Mixed Message on Gas/Transit Taxes to Legislature*, SALT LAKE TRIB., Jan. 27, 2014, at A1.

¹⁹⁸ 42 U.S.C. § 7416 (2012).

¹⁹⁹ Lee Davidson, *Oil Boom Triggers Growth*, SALT LAKE TRIB., Mar. 27, 2014, at A1.

in the next thirty years.²⁰⁰ Utah needs an air quality solution. But Utah law generally prohibits Utah's DAQ from imposing any air pollution control requirements that are more stringent than federal regulations.²⁰¹ Utah's air quality can be improved using the CAA, including SIP revisions. But air quality improvement could benefit from approaches that are unlikely to occur unless the Utah legislature gives Utah's DAQ and other state agencies more authority to create a Utah solution.²⁰² This would include improvements to mass transit, limitations on highway construction, discouragement of urban sprawl, tightened building codes, and efforts to support energy conservation and the use of nonfossil fuel. Depending solely on the EPA's requirements to improve our air quality will not solve our problem.²⁰³

Finally, the overall challenge is to deal with what the ecologist Garrett Hardin called the Tragedy of the Commons.²⁰⁴ Each individual, acting rationally, will use shared resources until the resource is depleted, even if the larger society is seriously harmed. Whether it is idling automobiles or burning wood during inversions, the challenge for the legal system is to devise ways to protect the common need for an atmosphere that is safe while having the minimum adverse impact on the economy and personal freedom.

²⁰⁰ Lee Davidson, *Cutting Urban Sprawl Could Help Residents' Health, Wealth*, SALT LAKE TRIB. Apr. 3, 2014, at A1.

²⁰¹ UTAH CODE ANN. § 19-2-106 (West 2014).

²⁰² The governor supports this legislation. Such legislation has been introduced, but Utah's manufacturing and petroleum associations oppose it. *See* Robert Gehrke, *Guv, Hill Headed for Clash over Dirty Air?*, SALT LAKE TRIB., Feb. 11, 2014, at A1.

²⁰³ In the spring of 2014, S.B.164S1 was introduced in the Utah legislature. This bill would have allowed the state to create air pollution laws more stringent than the federal laws, but it failed to pass the Senate. *See 2014 Air Quality Bills*, HEALTHY ENV'T ALLIANCE OF UTAH (Feb. 27, 2014), <http://healutah.org/blog/2014AQbills>, archived at <http://perma.cc/R7XK-7XST>.

²⁰⁴ *See* Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 3859, 1243–48 (1968).