State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Alan Matheson
Acting Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-020-15a

UTAH AIR QUALITY BOARD MEETING

FINAL AGENDA

Wednesday, June 3, 2015
195 North 1950 West, Salt Lake City, Utah 84116

Board Working Lunch – noon
Four Corners Conference Rooms (4th Floor)

Staff will conduct a board member orientation.

Board Meeting – 1:30 p.m.
Conference Room 1015 (1st Floor)

I. Call-to-Order

II. Date of the Next Air Quality Board Meeting: July 1, 2015

III. Approval of the Minutes for May 6, 2015, Board Meeting.

IV. Final Adoption: Amend R307-214. National Emission Standards for Hazardous Air Pollutants. Presented by Mark Berger.

V. Final Adoption: Amend R307-210. Stationary Sources. Presented by Mark Berger.

VI. Final Adoption: Amend Utah State Implementation Plan Section XX.D.6. Regional Haze. Long-Term Strategy for Stationary Sources. Best Available Retrofit Technology (BART) Assessment for NOx and PM; Add New Utah State Implementation Plan Subsections IX.H.21 and 22. General Requirements: Control Measures for Area and Point Sources, Emission Limits and Operating Practices, Regional Haze Requirements; and Source Specific Emission Limitations: Regional Haze Requirements, Best Available Retrofit Technology. Presented by Colleen Delaney.

VII. Final Adoption: Amend R307-110-17. General Requirements: State Implementation Plan. Section IX, Control Measures for Area and Point Sources, Part H, Emissions Limits; and R307-110-28. General Requirements: State Implementation Plan. Regional Haze. Presented by Mark Berger.

VIII. Informational Items.

A. Progress Report for Utah's State Implementation Plan for Regional Haze. Presented by Colleen Delaney.

B. Air Toxics. Presented by Robert Ford.

C. Compliance. Presented by Jay Morris and Harold Burge.

D. Monitoring. Presented by Bo Call.

E. Other Items to be Brought Before the Board.

In compliance with the American with Disabilities Act, individuals with special needs (including auxiliary communicative aids and services) should contact Dana Powers, Office of Human Resources at (801) 536-4413 (TDD 536-4414).

ITEM 3

State of Utah
GARY R. HERBERT
Governor
SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

UTAH AIR QUALITY BOARD MEETING
May 6, 2015 – 1:30 p.m.
195 North 1950 West, Room 1015
Salt Lake City, Utah 84116

DRAFT MINUTES

I. Call-to-Order

Steve Sands called the meeting to order at 1:30 p.m.

Board members present: Steve Sands, Kerry Kelly, Erin Mendenhall, Kathy Van Dame, and Robert Paine

Excused: Tammie Lucero, Michael Smith, Amanda Smith, and Karma Thomson

Executive Secretary: Bryce Bird

II. Date of the Next Air Quality Board Meeting: June 3, 2015

A new Board member working lunch orientation is tentatively scheduled for June 3, 2015, at noon.

III. Approval of the Minutes for March 4, 2015, Board Meeting.

Ms. Van Dame suggested language be added to better clarify Ms. Delaney's response to a question on page 3 of the minutes.

- Kathy Van Dame motioned to approve the minutes as amended. Erin Mendenhall seconded. The Board approved unanimously.

IV. Propose for Public Comment: Amend R307-101-3. General Requirements. Version of Code of Federal Regulations Incorporated by Reference. Presented by Mark Berger.

Mark Berger, Air Quality Policy Section Manager at DAQ, stated that this rule incorporates by reference the version of the Code of Federal Regulations (CFR) used in many of the rules adopted by the Board. By having a rule that does this, it enables rules that reference the version of the CFR incorporated in R307-101-3 to all be updated with one single rule amendment. This amendment will update the version of 40 CFR from the July 1, 2013, version to the July 1, 2014, version. A table was included that shows what rules currently incorporate by reference the version of 40 CFR referenced in this rule and what changes have been made in the CFR that affect each rule. Staff recommends the Board propose R307-101-3 for public comment as amended.

- Kathy Van Dame motioned that the Board propose amended R307-101-3, General Requirements, Version of Code of Federal Regulations Incorporated by Reference, for public comment. Robert Paine seconded. The Board approved unanimously.

V. Propose for Public Comment: Amend R307-121. General Requirements: Clean Air and Efficient Vehicle Tax Credit. Presented by Mark Berger.

Mark Berger, Air Quality Policy Section Manager at DAQ, stated that R307-121 is the air quality rule that establishes criteria used to determine eligibility to participate in the clean air and efficient vehicle tax credit. In the latest legislative session, the Legislature passed Senate Bill 156, which revised the statute governing the tax credit. The revision to the statute provided for a new tax credit for qualifying electric motorcycles. Therefore, R307-121 should be amended to include electric motorcycles as vehicles eligible for the credit. Staff recommends the Board propose R307-121 for public comment.

- Erin Mendenhall motioned that the Board propose R307-121 for public comment. Robert Paine seconded. The Board approved unanimously.

VI. Propose for Public Comment: New Rule R307-122. General Requirements: Heavy Duty Vehicle Tax Credit. Presented by Mark Berger.

Mark Berger, Air Quality Policy Section Manager at DAQ, stated that House Bill 406, which provides an income tax credit for the purchase of a natural gas heavy duty vehicle, was passed during the 2015 legislative session. The bill gave authority to the Board to make rules specifying the requirements and procedures for the tax credit. This proposed rule is the air quality rule that would do this as it outlines the process for reserving and qualifying for the heavy duty vehicle tax credit. Staff recommends the Board propose R307-122 for public comment.

In response to questions, staff responded that one of the requirements to qualify for the tax credit is that the taxpayer certifies that over 50 percent of the miles that the heavy duty vehicle will travel annually will be within the state. It is not known at this time how many requests DAQ will receive for this credit.

- Robert Paine motioned that the Board propose new rule R307-122, General Requirements, Heavy Duty Vehicle Tax Credit, for public comment. Kathy Van Dame seconded. The Board approved unanimously.

VII. Propose for Public Comment: New Rule R307-230. NOx Emission Limits for Natural Gas-Fired Water Heaters. Presented by Mark Berger.

Mark Berger, Air Quality Policy Section Manager at DAQ, stated that on February 4, 2015, Envision Utah petitioned the Board to propose a rule to require ultra-low NO_x water heaters throughout the state. The nitrogen oxide (NO_x) limits they proposed came from a Bay Area Air Quality Management District regulation. As proposed, most residentially sized water heaters would be limited to 10 ng/Joule, larger commercial units would have a limit of 14 ng/Joule, and mobile homes and pools would be limited to 40 ng/Joule. This will result in a 65% to 75% reduction of NO_x emissions from water heaters, which is significant to us as NO_x is a precursor to the formation of $PM_{2.5}$. Because these limits are already being enforced in California, qualifying units are already available to Utah residence through online purchases and the cost for residential units is comparable to those currently in Utah markets. Staff recommends the Board propose new rule R307-230 for public comment.

In response to questions, staff responded that people will be informed of this rule through public notification, as well as notification to the large plumbing houses, main box stores, and industry trade associations such as the Air-Conditioning, Heating, and Refrigeration Institute (AHRI). The Association of General Contractors will also be added as a group to be notified as requested. The units in new construction would have the greatest impact first versus replacement units. If the rule is approved, the DAQ compliance inspectors will do compliance follow-up on distributors. There is a potential for increase of carbon monoxide (CO) predominately because of the way to reduce NO_x from this is to control the fuel to air ratio to which the AHRI has made assurance that no manufacturer is anywhere near the American National Standards Institute Z21 standard for CO.

- Kathy Van Dame motioned that the Board propose new rule R307-230, NOx Emission Limits for Natural Gas-Fired Water Heaters, for public comment. Kerry Kelly seconded. The Board approved unanimously.

VIII. Five-Year Review: R307-302. Solid Fuel Burning Devices in Box Elder, Cache, Davis, Salt Lake, Tooele, Utah, and Weber Counties. Presented by Mark Berger.

Mark Berger, Air Quality Policy Section Manager at DAQ, stated that Utah Code requires that each rule be reviewed every five years to determine if the rule is still necessary and to determine if the rule is still allowed under state and federal rule. This analysis is done by completing a Five-Year Notice of Review and Statement of Continuation Form that is filed with the Division of Administrative Rules. The five-year review process is not a time to amend a rule, but is simply a time to determine if the rule is still allowed and necessary. DAQ has completed the five-year review for R307-302 and have determined that the rule is both allowed under federal and state statute as well as necessary because it reduces pollution during winter temperature inversions and is part of Utah's State Implementation Plan. Staff recommends the Board continue R307-302 by approving the Five-Year Notice of Review and Statement of Continuation form to be filed with the Division of Administrative Rules. It was added that the Utah Legislature's Natural Resources, Agriculture, and Environment Interim Committee has been assigned wood burning to study and they well be taking testimony as they conduct its study.

- Erin Mendenhall motioned that the Board continue R307-302, Solid Fuel Burning Devices in Box Elder, Cache, Davis, Salt Lake, Tooele, Utah, and Weber Counties by approving the forms with the Division of Administrative Rules. Kerry Kelly seconded. The Board approved unanimously.

IX. Informational Items.

A. White Mesa Uranium Mill Radon Emissions. Presented by Sarah Fields, Uranium Watch.

Sarah Fields, Program Director at Uranium Watch, presented information regarding EPA radon emission standards for operating uranium mills, specifically in regard to the cells at the White Mesa Uranium Mill. In her presentation she stated the EPA regulates radon emissions from operating uranium mill tailings under the Clean Air Act national emission standards for hazardous air pollutants at 40 CFR Part 61 Subpart W to which the DAQ has administered and enforces for Utah since 1995. EPA proposed revisions to Subpart W in

2014 and they developed site-specific formulas for determining radon emissions from liquid effluents. In May 2009 EPA requested data from the White Mesa Mill licensee which they did not submit. The licensee, Energy Fuels Resources (USA) Inc. (Energy Fuels) submitted data on the gross radium alpha from the liquid effluents to the Division of Radiation Control (DRC) in their annually monitoring reports but the EPA did not use this data. Uranium Watch and the Ute Mountain Ute Tribe did their own calculations of EPA's formula and feel that EPA's formula needs to be reviewed. If Energy Fuels had included the radon flux from the water cover on cell 3, rather than assuming it as zero, the annual radon flux would exceed the standard. DAQ must order Energy Fuels to include the calculated radon flux from cell 3 liquid cover to determine the annual Subpart W compliance. Energy Fuels should be ordered to take corrective actions to keep the liquid affluent radon emission below the standard for cells 1, 3, 4A and 4B. This issue to regulate radon emissions from liquid effluent impoundments will not go away and is a concern for the citizens and organizations that oversee the regulatory process in the vicinity of White Mesa. It should be a concern for DAQ, DRC, and the EPA and these agencies need to take a hard look at this situation. Ms. Fields and DAQ staff addressed questions from the Board. After discussion, the Board is requesting that DAQ review the math to be sure the formulas are being used correctly and report back to the Board.

B. Air Toxics. Presented by Robert Ford.

C. Compliance. Presented by Jay Morris and Harold Burge.

D. Monitoring. Presented by Kimberly Kreykes.

Kimberly Kreykes, Environmental Scientist at DAQ, updated and answered questions from the Board on the monitoring graphs. Ms. Kreykes also reported the total number of $PM_{2.5}$ exceedances by monitor from January 2015 and noted that the exceedance on April 14 was due to a large dust storm that came through.

E. Other Items to be Brought Before the Board.

DAQ's lawnmower exchange event was mentioned in which 408 lawnmowers were successfully exchanged. The funding for this event came through the clean air retrofit, replacement, and off-road technology program which was funded by the Legislature. This year the Legislature increased funding for the next fiscal year to $700,000 and DAQ will be looking for different methods such as this event to reduce emissions.

Kathy Van Dame was congratulated and recognized for her time and effort in representing the citizens of the state over the past eight years as a member of the Air Quality Board. She has been active in the air quality community for 18 years and has dedicated a lot of her time to understand the issues. She had valuable insights and comments which was beneficial to the Air Quality Board.

Finally, it is being requested to reappointment Erin Mendenhall and Michael Smith for a second term on the Board. This will be acted on by the Utah Senate on May 20, 2015. In addition, it is being requested that Arnold Reitze fill the current vacancy on the Board.

Meeting adjourned at 2:45 p.m.

ITEM 4

State of Utah

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Department of
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Amanda Smith
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-022-15

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Steven Packham, Toxicologist

DATE: May 20, 2015

SUBJECT: FINAL ADOPTION: Amend R307-214. National Emission Standards for Hazardous Air Pollutants.

On March 4, 2014, the Board proposed for public comment an amendment to R307-214 to incorporate by reference changes to the National Emission Standards for Hazardous Air Pollutants as published in July 1, 2014, version of Title 40 of the Code of Federal Regulations (CFR), Parts 61 and 63. A summary of the changes made to 40 CFR, Parts 61 and 63 that affect R307-214 is attached. A public comment period was held from April 1 to May 1, 2015. No comments were received and a hearing was not requested.

Staff Recommendation: Staff recommends that the Board adopt R307-214 as proposed.

R307. Environmental Quality, Air Quality.

R307-214. National Emission Standards for Hazardous Air Pollutants.

R307-214-1. Pollutants Subject to Part 61.

The provisions of Title 40 of the Code of Federal Regulations (40 CFR) Part 61, National Emission Standards for Hazardous Air Pollutants, effective as of July 1, 2014, are incorporated into these rules by reference. For pollutant emission standards delegated to the State, references in 40 CFR Part 61 to "the Administrator" shall refer to the director.

R307-214-2. Sources Subject to Part 63.

The provisions listed below of 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants for Source Categories, effective as of July 1, 2014, are incorporated into these rules by reference. References in 40 CFR Part 63 to "the Administrator" shall refer to the director, unless by federal law the authority is specific to the Administrator and cannot be delegated.

(1) 40 CFR Part 63, Subpart A, General Provisions.

(2) 40 CFR Part 63, Subpart B, Requirements for Control Technology Determinations for Major Sources in Accordance with 42 U.S.C. 7412(g) and (j).

(3) 40 CFR Part 63, Subpart F, National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry.

(4) 40 CFR Part 63, Subpart G, National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater.

(5) 40 CFR Part 63, Subpart H, National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks.

(6) 40 CFR Part 63, Subpart I, National Emission Standards for Organic Hazardous Air Pollutants for Certain Processes Subject to the Negotiated Regulation for Equipment Leaks.

(7) 40 CFR Part 63, Subpart J, National Emission Standards for Polyvinyl Chloride and Copolymers Production.

(8) 40 CFR Part 63, Subpart L, National Emission Standards for Coke Oven Batteries.

(9) 40 CFR Part 63, Subpart M, National Perchloroethylene Air Emission Standards for Dry Cleaning Facilities.

(10) 40 CFR Part 63, Subpart N, National Emission Standards for Chromium Emissions From Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks.

(11) 40 CFR Part 63, Subpart O, National Emission Standards for Hazardous Air Pollutants for Ethylene Oxide Commercial Sterilization and Fumigation Operations.

(12) 40 CFR Part 63, Subpart Q, National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers.

(13) 40 CFR Part 63, Subpart R, National Emission Standards for Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations).

(14) 40 CFR Part 63, Subpart T, National Emission Standards

for Halogenated Solvent Cleaning.

(15) 40 CFR Part 63, Subpart U, National Emission Standards for Hazardous Air Pollutant Emissions: Group I Polymers and Resins.

(16) 40 CFR Part 63, Subpart AA, National Emission Standards for Hazardous Air Pollutants for Phosphoric Acid Manufacturing.

(17) 40 CFR Part 63, Subpart BB, National Emission Standards for Hazardous Air Pollutants for Phosphate Fertilizer Production.

(18) 40 CFR Part 63, Subpart CC, National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries.

(19) 40 CFR Part 63, Subpart DD, National Emission Standards for Hazardous Air Pollutants from Off-Site Waste and Recovery Operations.

(20) 40 CFR Part 63, Subpart EE, National Emission Standards for Magnetic Tape Manufacturing Operations.

(21) 40 CFR Part 63, Subpart GG, National Emission Standards for Aerospace Manufacturing and Rework Facilities.

(22) 40 CFR Part 63, Subpart HH, National Emission Standards for Hazardous Air Pollutants for Oil and Natural Gas Production.

(23) 40 CFR Part 63, Subpart JJ, National Emission Standards for Wood Furniture Manufacturing Operations.

(24) 40 CFR Part 63, Subpart KK, National Emission Standards for the Printing and Publishing Industry.

(25) 40 CFR Part 63, Subpart MM, National Emission Standards for Hazardous Air Pollutants for Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-Alone Semichemical Pulp Mills.

(26) 40 CFR Part 63, Subpart OO, National Emission Standards for Tanks - Level 1.

(27) 40 CFR Part 63, Subpart PP, National Emission Standards for Containers.

(28) 40 CFR Part 63, Subpart QQ, National Emission Standards for Surface Impoundments.

(29) 40 CFR Part 63, Subpart RR, National Emission Standards for Individual Drain Systems.

(30) 40 CFR Part 63, Subpart SS, National Emission Standards for Closed Vent Systems, Control Devices, Recovery Devices and Routing to a Fuel Gas System or a Process (Generic MACT).

(31) 40 CFR Part 63, Subpart TT, National Emission Standards for Equipment Leaks- Control Level 1 (Generic MACT).

(32) 40 CFR Part 63, Subpart UU, National Emission Standards for Equipment Leaks-Control Level 2 Standards (Generic MACT).

(33) 40 CFR Part 63, Subpart VV, National Emission Standards for Oil-Water Separators and Organic-Water Separators.

(34) 40 CFR Part 63, Subpart WW, National Emission Standards for Storage Vessels (Tanks)-Control Level 2 (Generic MACT).

(35) 40 CFR Part 63, Subpart XX, National Emission Standards for Ethylene Manufacturing Process Units: Heat Exchange Systems and Waste Operations.

(36) 40 CFR Part 63, Subpart YY, National Emission Standards for Hazardous Air Pollutants for Source Categories: Generic MACT.

(37) 40 CFR Part 63, Subpart CCC, National Emission Standards for Hazardous Air Pollutants for Steel Pickling-HCl Process Facilities

and Hydrochloric Acid Regeneration Plants.

(38) 40 CFR Part 63, Subpart DDD, National Emission Standards for Hazardous Air Pollutants for Mineral Wool Production.

(39) 40 CFR Part 63, Subpart EEE, National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors.

(40) 40 CFR Part 63, Subpart GGG, National Emission Standards for Hazardous Air Pollutants for Pharmaceuticals Production.

(41) 40 CFR Part 63, Subpart HHH, National Emission Standards for Hazardous Air Pollutants for Natural Gas Transmission and Storage.

(42) 40 CFR Part 63, Subpart III, National Emission Standards for Hazardous Air Pollutants for Flexible Polyurethane Foam Production.

(43) 40 CFR Part 63, Subpart JJJ, National Emission Standards for Hazardous Air Pollutants for Group IV Polymers and Resins.

(44) 40 CFR Part 63, Subpart LLL, National Emission Standards for Hazardous Air Pollutants for Portland Cement Manufacturing Industry.

(45) 40 CFR Part 63, Subpart MMM, National Emission Standards for Hazardous Air Pollutants for Pesticide Active Ingredient Production.

(46) 40 CFR Part 63, Subpart NNN, National Emission Standards for Hazardous Air Pollutants for Wool Fiberglass Manufacturing.

(47) 40 CFR Part 63, Subpart OOO, National Emission Standards for Hazardous Air Pollutants for Amino/Phenolic Resins Production (Resin III).

(48) 40 CFR Part 63, Subpart PPP, National Emission Standards for Hazardous Air Pollutants for Polyether Polyols Production.

(49) 40 CFR Part 63, Subpart QQQ, National Emission Standards for Hazardous Air Pollutants for Primary Copper Smelters.

(50) 40 CFR Part 63, Subpart RRR, National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production.

(51) 40 CFR Part 63, Subpart TTT, National Emission Standards for Hazardous Air Pollutants for Primary Lead Smelting.

(52) 40 CFR Part 63, Subpart UUU, National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units.

(53) 40 CFR Part 63, Subpart VVV, National Emission Standards for Hazardous Air Pollutants: Publicly Owned Treatment Works.

(54) 40 CFR Part 63, Subpart AAAA, National Emission Standards for Hazardous Air Pollutants for Municipal Solid Waste Landfills.

(55) 40 CFR Part 63, Subpart CCCC, National Emission Standards for Manufacturing of Nutritional Yeast.

(56) 40 CFR Part 63, Subpart DDDD, National Emission Standards for Hazardous Air Pollutants for Plywood and Composite Wood Products.

(57) 40 CFR Part 63, Subpart EEEE, National Emission Standards for Hazardous Air Pollutants for Organic Liquids Distribution (non-gasoline).

(58) 40 CFR Part 63, Subpart FFFF, National Emission Standards for Hazardous Air Pollutants for Miscellaneous Organic Chemical Manufacturing.

(59) 40 CFR Part 63, Subpart GGGG, National Emission Standards

for Vegetable Oil Production; Solvent Extraction.

(60) 40 CFR Part 63, Subpart HHHH, National Emission Standards for Wet-Formed Fiberglass Mat Production.

(61) 40 CFR Part 63, Subpart IIII, National Emission Standards for Hazardous Air Pollutants for Surface Coating of Automobiles and Light-Duty Trucks.

(62) 40 CFR Part 63, Subpart JJJJ, National Emission Standards for Hazardous Air Pollutants for Paper and Other Web Surface Coating Operations.

(63) 40 CFR Part 63, Subpart KKKK, National Emission Standards for Hazardous Air Pollutants for Surface Coating of Metal Cans.

(64) 40 CFR Part 63, Subpart MMMM, National Emission Standards for Hazardous Air Pollutants for Surface Coating of Miscellaneous Metal Parts and Products.

(65) 40 CFR Part 63, Subpart NNNN, National Emission Standards for Large Appliances Surface Coating Operations.

(66) 40 CFR Part 63, Subpart OOOO, National Emission Standards for Hazardous Air Pollutants for Fabric Printing, Coating and Dyeing Surface Coating Operations.

(67) 40 CFR Part 63, Subpart PPPP, National Emissions Standards for Hazardous Air Pollutants for Surface Coating of Plastic Parts and Products.

(68) 40 CFR Part 63, Subpart QQQQ, National Emission Standards for Hazardous Air Pollutants for Surface Coating of Wood Building Products.

(69) 40 CFR Part 63, Subpart RRRR, National Emission Standards for Hazardous Air Pollutants for Metal Furniture Surface Coating Operations.

(70) 40 CFR Part 63, Subpart SSSS, National Emission Standards for Metal Coil Surface Coating Operations.

(71) 40 CFR Part 63, Subpart TTTT, National Emission Standards for Leather Tanning and Finishing Operations.

(72) 40 CFR Part 63, Subpart UUUU, National Emission Standards for Cellulose Product Manufacturing.

(73) 40 CFR Part 63, Subpart VVVV, National Emission Standards for Boat Manufacturing.

(74) 40 CFR Part 63, Subpart WWWW, National Emissions Standards for Hazardous Air Pollutants for Reinforced Plastic Composites Production.

(75) 40 CFR Part 63, Subpart XXXX, National Emission Standards for Tire Manufacturing.

(76) 40 CFR Part 63, Subpart YYYY, National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines.

(77) 40 CFR Part 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.

(78) 40 CFR Part 63, Subpart AAAAA, National Emission Standards for Hazardous Air Pollutants for Lime Manufacturing Plants.

(79) 40 CFR Part 63, Subpart BBBBB, National Emission Standards for Hazardous Air Pollutants for Semiconductor Manufacturing.

(80) 40 CFR Part 63, Subpart CCCCC, National Emission Standards

for Hazardous Air Pollutants for Coke Ovens: Pushing, Quenching, and Battery Stacks.

(81) 40 CFR Part 63, Subpart DDDDD, National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters.

(82) 40 CFR Part 63, Subpart EEEEE, National Emission Standards for Hazardous Air Pollutants for Iron and Steel Foundries.

(83) 40 CFR Part 63, Subpart FFFFF, National Emission Standards for Hazardous Air Pollutants for Integrated Iron and Steel Manufacturing.

(84) 40 CFR Part 63, Subpart GGGGG, National Emission Standards for Hazardous Air Pollutants for Site Remediation.

(85) 40 CFR Part 63, Subpart HHHHH, National Emission Standards for Hazardous Air Pollutants for Miscellaneous Coating Manufacturing.

(86) 40 CFR Part 63, Subpart IIIII, National Emission Standards for Hazardous Air Pollutants for Mercury Emissions from Mercury Cell Chlor-Alkali Plants.

(87) 40 CFR Part 63, Subpart JJJJJ, National Emission Standards for Hazardous Air Pollutants for Brick and Structural Clay Products Manufacturing.

(88) 40 CFR Part 63, Subpart KKKKK, National Emission Standards for Hazardous Air Pollutants for Clay Ceramics Manufacturing.

(89) 40 CFR Part 63, Subpart LLLLL, National Emission Standards for Hazardous Air Pollutants for Asphalt Processing and Asphalt Roofing Manufacturing.

(90) 40 CFR Part 63, Subpart MMMMM, National Emission Standards for Hazardous Air Pollutants for Flexible Polyurethane Foam Fabrication Operations.

(91) 40 CFR Part 63, Subpart NNNNN, National Emission Standards for Hazardous Air Pollutants for Hydrochloric Acid Production.

(92) 40 CFR Part 63, Subpart PPPPP, National Emission Standards for Hazardous Air Pollutants for Engine Test Cells/Stands.

(93) 40 CFR Part 63, Subpart QQQQQ, National Emission Standards for Hazardous Air Pollutants for Friction Materials Manufacturing Facilities.

(94) 40 CFR Part 63, Subpart RRRRR, National Emission Standards for Hazardous Air Pollutants for Taconite Iron Ore Processing.

(95) 40 CFR Part 63, Subpart SSSSS, National Emission Standards for Hazardous Air Pollutants for Refractory Products Manufacturing.

(96) 40 CFR Part 63, Subpart TTTTT, National Emission Standards for Hazardous Air Pollutants for Primary Magnesium Refining.

(97) 40 CFR Part 63, Subpart UUUUU, National Emission Standards for Hazardous Air Pollutants for Coal- and Oil-Fired Electric Utility Steam Generating Units.

(98) 40 CFR Part 63, Subpart WWWWW, National Emission Standards for Hospital Ethylene Oxide Sterilizers.

(99) 40 CFR Part 63, Subpart YYYYY, National Emission Standards for Hazardous Air Pollutants for Area Sources: Electric Arc Furnace Steelmaking Facilities.

(100) 40 CFR Part 63, Subpart ZZZZZ, National Emission Standards for Hazardous Air Pollutants for Iron and Steel Foundries Area Sources.

(101) 40 CFR Part 63 Subpart BBBBBB National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities

(102) 40 CFR Part 63 Subpart CCCCCC National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities.

(103) 40 CFR Part 63, Subpart DDDDDD, National Emission Standards for Hazardous Air Pollutants for Polyvinyl Chloride and Copolymers Production Area Sources.

(104) 40 CFR Part 63, Subpart EEEEEE, National Emission Standards for Hazardous Air Pollutants for Primary Copper Smelting Area Sources.

(105) 40 CFR Part 63, Subpart FFFFFF, National Emission Standards for Hazardous Air Pollutants for Secondary Copper Smelting Area Sources.

(106) 40 CFR Part 63, Subpart GGGGGG, National Emission Standards for Hazardous Air Pollutants for Primary Nonferrous Metals Area Sources--Zinc, Cadmium, and Beryllium.

(107) 40 CFR Part 63, Subpart JJJJJJ, National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources.

(108) 40 CFR Part 63, Subpart LLLLLL, National Emission Standards for Hazardous Air Pollutants for Acrylic and Modacrylic Fibers Production Area Sources.

(109) 40 CFR Part 63, Subpart MMMMMM, National Emission Standards for Hazardous Air Pollutants for Carbon Black Production Area Sources.

(110) 40 CFR Part 63, Subpart NNNNNN, National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources: Chromium Compounds.

(111) 40 CFR Part 63, Subpart OOOOOO, National Emission Standards for Hazardous Air Pollutants for Flexible Polyurethane Foam Production and Fabrication Area Sources.

(112) 40 CFR Part 63, Subpart PPPPPP, National Emission Standards for Hazardous Air Pollutants for Lead Acid Battery Manufacturing Area Sources.

(113) 40 CFR Part 63, Subpart QQQQQQ, National Emission Standards for Hazardous Air Pollutants for Wood Preserving Area Sources.

(114) 40 CFR Part 63, Subpart RRRRRR, National Emission Standards for Hazardous Air Pollutants for Clay Ceramics Manufacturing Area Sources.

(115) 40 CFR Part 63, Subpart SSSSSS, National Emission Standards for Hazardous Air Pollutants for Glass Manufacturing Area Sources.

(116) 40 CFR Part 63, Subpart VVVVVV, National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources.

(117) 40 CFR Part 63, Subpart TTTTTT, National Emission Standards for Hazardous Air Pollutants for Secondary Nonferrous Metals Processing Area Sources.

(118) 40 CFR Part 63, Subpart WWWWWW, National Emission Standards for Hazardous Air Pollutants: Area Source Standards for Plating and Polishing Operations.

(119) 40 CFR Part 63, Subpart XXXXXX, National Emission Standards for Hazardous Air Pollutants Area Source Standards for Nine Metal Fabrication and Finishing Source Categories.

(120) 40 CFR Part 63, Subpart YYYYYY, National Emission Standards for Hazardous Air Pollutants for Area Sources: Ferroalloys Production Facilities.

(121) 40 CFR Part 63, Subpart ZZZZZZ, National Emission Standards for Hazardous Air Pollutants: Area Source Standards for Aluminum, Copper, and Other Nonferrous Foundries.

(122) 40 CFR Part 63, Subpart AAAAAAA, National Emission Standards for Hazardous Air Pollutants for Area Sources: Asphalt Processing and Asphalt Roofing Manufacturing.

(123) 40 CFR Part 63, Subpart BBBBBBB, National Emission Standards for Hazardous Air Pollutants for Area Sources: Chemical Preparations Industry.

(124) 40 CFR Part 63, Subpart CCCCCCC, National Emission Standards for Hazardous Air Pollutants for Area Sources: Paints and Allied Products Manufacturing.

(125) 40 CFR Part 63, Subpart DDDDDDD, National Emission Standards for Hazardous Air Pollutants for Area Sources: Prepared Feeds Manufacturing.

(126) 40 CFR Part 63, Subpart EEEEEEE, National Emission Standards for Hazardous Air Pollutants: Gold Mine Ore Processing and Production Area Source Category.

KEY: air pollution, hazardous air pollutant, MACT, NESHAP
Date of Enactment or Last Substantive Amendment: 2015
Notice of Continuation: November 8, 2012
Authorizing, and Implemented or Interpreted Law: 19-2-104(1)(a)

Changes to 40 CFR Parts 61 and 63 – July 1, 2014, to June 30, 2014

Part 61 Rules and Regulations Changes July 1, 2013 – June 30, 2014

Revisions to Test Methods and Testing Regulations - *Pages 11227 - 11294* [FR DOC # 2014-02704]

Summary: This action promulgated technical and editorial corrections for source testing of emissions and operations. Some testing provisions contained inaccuracies and outdated procedures, and new alternatives that have been approved were added. These revisions improved the quality of data and gave testers additional flexibility to use the newly approved alternative procedures.

Part 63 Rules and Regulations Changes July 1, 2013 – June 30, 2014

National Emissions Standards for Hazardous Air Pollutants from Secondary Lead Smelting - *Pages 367 - 372* [FR DOC # 2013-31267]

Summary: The Environmental Protection Agency (EPA) is taking direct final action to promulgate amendments to a final rule that revised national emission standards for hazardous air pollutants for existing and new secondary lead smelters. The final rule was published on January 5, 2012. This direct final action amends certain regulatory text to clarify compliance dates. Additionally, we are making amendments to clarify certain provisions in the 2012 final rule related to monitoring of negative pressure in total enclosures. This action also corrects typographical errors in a table listing congeners of dioxins and furans and the testing requirements for total hydrocarbons.

Revisions to Test Methods and Testing Regulations - *Pages 11227 - 11294* [FR DOC 2014-02704]

Summary: This action promulgated technical and editorial corrections for source testing of emissions and operations. Some testing provisions contained inaccuracies and outdated procedures, and new alternatives were added. These revisions improved the quality of data and will give testers additional flexibility to use the newly approved alternative procedures.

National Emission Standards for Hazardous Air Pollutant Emissions: Group IV Polymers and Resins; Pesticide Active Ingredient Production; and Polyether Polyols Production - *Pages 17339 - 17382* [FR DOC # 2014-04305]

Summary: This action finalized the residual risk and technology review conducted for nine source categories regulated under the National Emission Standards for Hazardous Air Pollutant Emissions: Group IV Polymers and Resins; Pesticide Active Ingredient Production; and Polyether Polyols Production.

ITEM 5

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-023-15

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Martin Gray, Major New Source Review Section Manager

DATE: May 21, 2015

SUBJECT: FINAL ADOPTION: Amend R307-210. Stationary Sources.

On March 4, 2015, the Board proposed for public comment an amendment to R307-210 to incorporate by reference New Source Performance Standards (NSPS) from 40 CFR Part 60 promulgated by the EPA from July 2, 2011, to July 1, 2014, for groups of stationary sources that have been identified as significant contributors of air pollution.

A list of the substantive changes to 40 CFR Part 60 that were proposed to be adopted by reference to R307-210, along with their summaries, is attached. Upon completion of this rulemaking, the new incorporation date will be July 1, 2014.

A public comment period was held from April 1 to May 1, 2015. No comments were received and a hearing was not requested.

Staff Recommendation: Staff recommends that the Board adopt R307-210 as proposed.

R307. Environmental Quality, Air Quality.

R307-210. Stationary Sources.

R307-210-1. Standards of Performance for New Stationary Sources (NSPS).

The provisions of 40 Code of Federal Regulations (CFR) Part 60, effective on July 1, 2014, except for Subparts Cb, Cc, Cd, Ce, BBBB, DDDD, and HHHH, are incorporated by reference into these rules with the exception that references in 40 CFR to "Administrator" shall mean "director" unless by federal law the authority referenced is specific to the Administrator and cannot be delegated.

KEY: air pollution, stationary sources, new source review
Date of Enactment or Last Substantive Amendment: 2015
Notice of Continuation: April 6, 2011
Authorizing, and Implemented or Interpreted Law: 19-2-104(3)(q); 19-2-108

Final Standards of Performance for Stationary Sources (NSPS) for Adoption
From July 1, 2011, to July 1, 2014

FR Info (Title, Volume, Pages)	CFR Reference	Summary
01/18/2012 FR Vol. 77, No. 11 Pages 2456 - 2466 [FR DOC # 2012-712]	40 CFR Part 60, Appendix A	This final rule incorporates the most recent versions of ASTM International (ASTM) standards into EPA regulations that provide flexibility to use alternatives to mercury-containing industrial thermometers. This final rule allows the use of alternatives in field and laboratory applications previously impermissible as part of compliance with EPA regulations. The older embedded ASTM standards unnecessarily impede the use of effective, comparable, and available alternatives to mercury-containing industrial thermometers. Due to mercury's high toxicity, EPA seeks to reduce potential mercury exposures by reducing the overall use of mercury-containing products, including mercury-containing industrial thermometers.
02/16/2012 FR Vol. 77, No. 32 Pages 9303 - 9513 [FR DOC # 2012-806]	40 CFR Part 60, Subpart A, B, D, Da, Db, Dc	The EPA revised standards of performance in response to a voluntary remand of a final rule. Specifically, they amended new source performance standards (NSPS) after analysis of the public comments. The EPA also finalized several minor amendments, technical clarifications, and corrections to existing NSPS provisions for fossil fuel-fired EGUs and large and small industrial-commercial-institutional steam generating units.
04/19/2012 FR Vol. 77, No. 76 Pages 23399 - 23409 [FR DOC # 2012-8703]	40 CFR Part 60, Subpart Da	This document corrects certain preamble and regulatory text. This action corrects typographical errors, such as cross-reference errors and certain preamble text that is not consistent with the final regulatory text, which published in the Federal Register on Thursday, February 16, 2012.
7/30/2012 FR Vol. 77, No. 146 Pages 44488 - 44494 [FR DOC # 2012-18513]	40 CFR Part 60, Appendix A	This action promulgates Method 16C for measuring total reduced sulfur (TRS) emissions from stationary sources. Method 16C offers the advantages of real-time data collection and uses procedures that are already in use for measuring other pollutants. Method 16C will be a testing option that is used at the discretion of the tester.

Final Standards of Performance for Stationary Sources (NSPS) for Adoption
From July 1, 2011, to July 1, 2014

FR Info (Title, Volume, Pages)	CFR Reference	Summary
08/14/2012 FR Vol. 77, No. 157 Pages 48433 - 48448 [FR DOC # 2012-19691]	40 CFR Part 60, Subpart A, Ga	New source performance standards (NSPS) for nitric acid plants. Nitric acid plants include one or more nitric acid production units (NAPUs). These revisions include a change to the nitrogen oxides (NOx) emission limit, which applies to each NAPU commencing construction, modification, or reconstruction after October 14, 2011. These revisions also include additional testing and monitoring requirements.
8/16/2012 FR Vol. 77, No. 159 Pages 49489 – 49600 [FR DOC # 2012-16806]	40 CFR Part 60, Subparts KKK, LLL, OOOO	This action finalizes the review of new source performance standards for certain oil and natural gas source sources. In this action the EPA revised the new source performance standards for volatile organic compounds from leaking components at onshore natural gas processing plants and new source performance standards for sulfur dioxide emissions from natural gas processing plants. The rule also establishes standards for certain oil and gas operations not covered by the existing standards. In addition to the operations covered by the existing standards, the newly established standards will regulate volatile organic compound emissions from gas wells, centrifugal compressors, reciprocating compressors, pneumatic controllers and storage vessels. This action also finalizes the residual risk and technology review for the Oil and Natural Gas Production source category and the Natural Gas Transmission and Storage source category. This action includes revisions to the existing leak detection and repair requirements. This action finalizes revisions to the regulatory provisions related to emissions during periods of startup, shutdown and malfunction. This final rule became effective on October 15, 2012.
09/12/2012 FR Vol. 77, No. 177 Pages 56421 - 56480 [FR DOC # 2012-20866]	40 CFR Part 60, Subpart A, J, Ja,	On June 24, 2008, the EPA promulgated amendments to the Standards of Performance for Petroleum Refineries and new standards of performance for petroleum refinery process units constructed, reconstructed or modified after May 14, 2007. The EPA subsequently received three petitions for reconsideration of these final rules. On September 26, 2008, the EPA granted reconsideration and issued a stay for the issues raised in the petitions regarding process heaters and flares. On December 22,

FR Info (Title, Volume, Pages)	CFR Reference	Summary
		2008, the EPA addressed those specific issues by proposing amendments to certain provisions for process heaters and flares and extending the stay of these provisions until further notice. The EPA also proposed technical corrections to the rules for issues that were raised in the petitions for reconsideration. In this action, the EPA finalized those amendments and technical corrections and lifted the stay of all the provisions granted on September 26, 2008, and extended until further notice on December 22, 2008.
01/30/2013 FR Vol. 78, No. 20 Pages 6673 - 6724 [FR DOC # 2013-01288]	40 CFR Part 60 Subpart A, IIII, JJJJ	Final amendments to the national emission standards for hazardous air pollutants for stationary reciprocating internal combustion engines. The final amendments include alternative testing options for certain large spark ignition (generally natural gas-fueled) stationary reciprocating internal combustion engines, management practices for a subset of existing spark ignition stationary reciprocating internal combustion engines in sparsely populated areas and alternative monitoring and compliance options for the same engines in populated areas. The EPA established management practices for existing compression ignition engines on offshore vessels. The EPA also finalized limits on the hours that stationary emergency engines may be used for emergency demand response and establishing fuel and reporting requirements for certain emergency engines used for emergency demand response. The final amendments also correct minor technical or editing errors in the current regulations for stationary reciprocating internal combustion engines.
02/07/2013 FR. Vol. 78, No. 26 Pages 9111 – 9113 [FR DOC # 2012-31632]	40 CFR Part 60, Subpart CCCC, and DDDD	This action implemented the final decision on the issues for which EPA granted reconsideration in December 2011, which pertain to certain aspects of the March 21, 2011, final rule titled ‘‘Standards of Performance for New Stationary Sources and Emissions Guidelines for Existing Sources: Commercial and Industrial Solid Waste Incineration Units’’ (CISWI rule). This final action establishes effective dates for the standards and makes technical corrections to the final rule to clarify definitions, references, applicability, and compliance

FR Info (Title, Volume, Pages)	CFR Reference	Summary
		issues. The purpose of these amendments is to clarify several provisions in order to implement the non-hazardous secondary materials rule as the agency originally intended.
02/12/2013 FR Vol. 78, No. 29 Pages 10005 - 10054 [FR DOC #2012-31633]	40 CFR Part 60, Subpart F	The EPA amended the new source performance standard for particulate matter for the Portland cement industry. These amendments promote flexibility, reduce costs, ease compliance and preserve health benefits. The EPA set the date for compliance with the existing source national emission standards for hazardous air pollutants to be September 9, 2015.
03/06/2013 FR Vol. 78, No. 44 Pages 14457 - 14457 [FR DOC # C1-2013-01288]	40 CFR Part 60 Subpart A, IIII, JJJJ	In rule document 2013–01288, appearing on pages 6674–6724 in the issue of Wednesday, January 30, 2013, changes were made to Table 2c of Subpart ZZZZ.
04/24/2013 FR Vol. 78, No. 79 Pages 24073 – 24094 [FR DOC # 2013-07859]	40 CFR Part 60 Subpart Da	The EPA took final action on its reconsideration of certain issues in the final MATS NESHAP issued pursuant to CAA section 112, and the New Source Performance Standards rule issued pursuant to CAA section 111which is referred to as the Utility NSPS. The Administrator received petitions for reconsideration of certain aspects of the MATS NESHAP and the Utility NSPS. On November 30, 2012, the EPA granted reconsideration of, proposed, and requested comment on a limited set of issues. The EPA is now taking final action on the revised new source numerical standards in the MATS NESHAP and the definitional and monitoring provisions in the Utility NSPS that were addressed in the proposed reconsideration rule. As part of this action, the EPA is also making certain technical corrections to both the MATS NESHAP and the Utility NSPS. The EPA is not taking final action on requirements applicable during periods of startup and shutdown in the MATS NESHAP or on startup and shutdown provisions related to the PM standard in the Utility NSPS.
05/13/2013 FR Vol. 78, No. 92 Pages 28051 – 28078	40 CFR Part 60 Subpart Ec	This action finalizes amendments to the federal plan and the new source performance standards for hospital/medical/infectious waste incinerators. These final actions implement national

FR Info (Title, Volume, Pages)	CFR Reference	Summary
[FR DOC # 2013-09427]		standards promulgated in the 2009 amendments to the hospital/medical/infectious waste incinerator emissions guidelines that results in reductions in emissions of certain pollutants from all affected units. This rule became effective June 12, 2013.
07/07/2013 FR Vol. 78, No. 26 Pages 9111 - 9213 [FR DOC # 2012-31632]	40 CFR Part 60, Subpart CCCC	This action sets forth the EPA's final decision on the issues for which it granted reconsideration in December 2011, which pertain to certain aspects of the March 21, 2011, final rule titled ''Standards of Performance for New Stationary Sources and Emissions Guidelines for Existing Sources: Commercial and Industrial Solid Waste Incineration Units'' (CISWI rule). This action also includes the final decision to deny the requests for reconsideration with respect to all issues raised in the petitions for reconsideration of the final commercial and industrial solid waste incineration rule for which reconsideration was not granted. Among other things, this final action establishes effective dates for the standards and makes technical corrections to the final rule to clarify definitions, references, applicability, and compliance issues. In addition, the EPA issued final amendments to the regulations that were codified by the Non-Hazardous Secondary Materials rule (NHSM rule). The purpose of these amendments is to clarify several provisions in order to implement the non-hazardous secondary materials rule as the agency originally intended. This subpart took effect on August 7, 2013.
09/23/2013 FR Vol. 78, No. 184 Pages 58415 – 58448 [FR DOC # 2013-22010]	40 CFR Part 60 Subpart OOOO	This action finalized the amendments to new source performance standards for the oil and natural gas sector. The Administrator received petitions for reconsideration of certain aspects of the August 12, 2012, final standards. These amendments are a result of reconsideration of certain issues raised by petitioners related to implementation of storage vessel provisions. The final amendments provide clarity of notification and compliance dates, ensure control of all storage vessel affected facilities and update key definitions. This action also corrects technical errors that were inadvertently included in the final standards. This final rule was effective on September 23, 2013.

FR Info (Title, Volume, Pages)	CFR Reference	Summary
12/19/2013 FR Vol. 78, No. 244 Pages 76753 – 76756 [FR DOC # 2013-29731]	40 CFR Part 60, Subpart Ja	The Environmental Protection Agency (EPA) took direct final action to amend the Standards of Performance for Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After May 14, 2007. This direct final rule amends the definition of ‘‘delayed coking unit’’ by removing process piping and associated equipment (pumps, valves, and connectors) from the definition. This final rule also removes a redundant definition of ‘‘delayed coking unit’’ from the rule text.
02/27/2014 FR Vol. 79, No. 39 Pages 11227 – 11294 [FR DOC # 2014-02704]	40 CFR Part 60, Subparts and Appendices	This action promulgated technical and editorial corrections for source testing of emissions and operations. Some current testing provisions contain inaccuracies and outdated procedures, and new alternatives are being added. These revisions will improve the quality of data and will give testers additional flexibility to use the newly approved alternative procedures. This rule became effective on February 27, 2014.
4/4/2014 FR Vol. 79, No. 65 Pages 18951 – 18972 [FR DOC # 2014-06719]	40 CFR Part 60, Subparts A, BBa	This action finalizes revisions to the new source performance standards for kraft pulp mills. These revised standards include particulate matter emission limits for recovery furnaces; smelt dissolving tanks and lime kilns, and opacity limits for recovery furnaces and lime kilns equipped with electrostatic precipitators. These revised standards apply to emission units commencing construction, reconstruction or modification after May 23, 2013. This final rule removes the General Provisions exemption for periods of startup, shutdown and malfunction resulting in a standard that applies at all times. This final rule also includes additional testing requirements and updated monitoring, recordkeeping and reporting requirements for affected sources, including electronic reporting of performance test data. These revisions to the testing, monitoring, recordkeeping and reporting requirements are expected to ensure that control systems are properly maintained over time, ensure continuous compliance with standards and improve data accessibility for the Environmental Protection Agency (EPA), states, tribal governments and communities. This final action is effective on April 4, 2014.

Final Standards of Performance for Stationary Sources (NSPS) for Adoption
From July 1, 2011, to July 1, 2014

FR Info (Title, Volume, Pages)	CFR Reference	Summary
05/06/2014 FR Vol. 79, No. 87 Pages 25681 - 25682 [FR DOC # C1-2012-19691]	40 CFR Part 60 Subpart A, Ga	In rule document 2012–19691 appearing on pages 48433 through 48448 in the issue of Tuesday, August 14, 2012, this action makes a change to a calculation.
14 FR VOL. 79, No. 95 Pages 28439 – 28444 [FR DOC # 2014-11226]	40 CFR Part 60, Appendix F	This action promulgated quality assurance and quality control (QA/QC) procedures (referred to as Procedure 3) for continuous opacity monitoring systems (COMS) used to demonstrate continuous compliance with opacity standards specified in new source performance standards (NSPS) issued by the EPA pursuant to section 111(b).

ITEM 6

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-021-15

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Colleen Delaney, Environmental Scientist

DATE: May 21, 2015

SUBJECT: FINAL ADOPTION: Amend Utah State Implementation Plan Section XX.D.6. Regional Haze. Long-Term Strategy for Stationary Sources. Best Available Retrofit Technology (BART) Assessment for NOx and PM; Add New Utah State Implementation Plan Subsections IX.H.21 and 22. General Requirements: Control Measures for Area and Point Sources, Emission Limits and Operating Practices, Regional Haze Requirements; and Source Specific Emission Limitations: Regional Haze Requirements, Best Available Retrofit Technology.

On March 4, 2015, the Board proposed a revision to Utah's Regional Haze State Implementation Plan (SIP) to address the Environmental Protection Agency's partial disapproval of the Best Available Retrofit Technology (BART) provisions for nitrogen oxides (NOx) and particulate matter (PM).

1. Particulate Matter. The proposed BART determination for PM was based on a 5-factor analysis of available control technologies for PM. The Division of Air Quality (DAQ) analysis concluded that the most stringent PM controls were already required; therefore, the emission limits established in 2008 met the BART requirement for PM.

2. Nitrogen Oxides. The proposal outlined an alternative to BART for NOx that maintained the requirements established in 2008 for PacifiCorp Hunter 1 and 2 and PacifiCorp Huntington 1 and 2 (installation of low-NOx burners with overfire air with an emission limit that is more stringent than EPA's presumptive BART limits); makes enforceable the expected closure of PacifiCorp Carbon 1 and 2; and takes credit for the installation of low-NOx burners at PacifiCorp Hunter 3 in 2008.

3. Enforceable requirements for PM and NOx were included in new SIP Subsections IX.H.21 and 22.

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A public comment period was held from April 1 through May 1, 2015, and a number of public comments were received. A hearing was not requested. A summary of comments received and DAQ's response to those comments is attached to this memo. The proposed SIP and the staff review that includes the 5-factor analysis for PM and the demonstration that the alternative measures provides greater reasonable progress than BART for NOx were both modified in response to comments and the revised documents are also attached to this memo.

Staff Recommendation: Staff recommends that the Board adopt the revision to SIP Section XX, Part D.6 and new SIP Sections IX, Part H.21 and H.22 as amended.

Response to Comments

General Comments

1. [National Park Service (hereinafter NPS] On an annual basis millions of people come from around the world to visit Utah's national parks and to experience the iconic, scenic views that are among the most spectacular in the country. These views are degraded on many days by industrial haze that impairs visibility. The NPS Organic Act of 1916 and the Wilderness Act of 1964 address the importance of protecting these areas. The goal of the PSD provisions in the Clean Air Act is to preserve, protect and enhance the air quality in national parks. Together these laws required that NPS, EPA, and the State work together to reduce regional haze.

Response: The current proposal before the Board is the last piece of a comprehensive strategy developed to address regional haze. Utah has been working for decades to address this important issue because it is important to the State and to the citizens of Utah. Utah's Visibility Protection Program (SIP Section XVII and R307-406) and Utah's Prevention of Significant Deterioration Program (SIP Section VII and R307-405) were adopted in the early 1980s to address the visibility goals established in the 1977 Clean Air Act. In the mid-1980s Utah's Governor appointed the Task Force on Visibility Protection to determine the appropriate level of protection for Utah's Class I areas and to determine the sources of impairment of visibility in those areas. After more than a year of investigation, the Task Force recommended that all Utah Class I areas need protection, and that the biggest cause of visibility impairment is not individual industrial source, but rather regional haze from a multitude of sources that is transported over long distances. In 1991, EPA established the Grand Canyon Visibility Transport Commission (GCVTC) as required by the 1990 Clean Air Act. Utah's Governor was vice-chair of the Commission and Utah was an active participant in the process. In 1996 the Commission finalized a comprehensive series of recommendations that addressed the multiple emission sources and pollutants that contribute to regional haze on the Colorado Plateau.   These recommendations were the basis of Utah's SIP. Utah was an active participant in the Western Regional Air Partnership (WRAP) that was the follow-up organization to the GCVTC. Utah's Governor Co-chaired the WRAP and Utah representatives were co-chairs or members of many of the WRAP's Forums. The WRAP established an extensive stakeholder-based process to further develop the GCVTC's Recommendations and to improve the technical understanding of the causes of regional haze in the western states and the development of effective strategies to improve visibility in Class I areas throughout the West. Throughout this process Utah has worked with the National Park Service, EPA, and other western states as recommended by the commenter.

Utah's SIP was focused on reducing emissions of SO_2 from stationary sources because SO_2 is the most significant anthropogenic pollutant contributing to haze on the Colorado Plateau. The SIP was adopted 5 years earlier than was required for the rest of the country due to the significant work that had been completed to address visibility on the Colorado Plateau.

DAQ is in the process of finalizing the first 5-year progress report to evaluate progress under the RH SIP. Utah's Class I areas are showing improvement in visibility on the most impaired days and no degradation on the least impaired days between baseline and current monitoring data. The first 5-year progress period covers the 2005-2009 timeframe, as it represents the most recent successive 5-year averaging period. The most recent 5-year average indicates that visibility at Utah's Class I areas is improving on both the 20% worst and 20% best days, and has already achieved better visibility improvement than the preliminary reasonable progress (PRP) projections for 2018.

Table 3.28. Utah Class I Area IMPROVE Sites Visibility conditions – 20% Most and Least Impaired Days Including 2010 to 2012 data

Class I Area	Baseline (2000-2004) (dv)	First Progress Period (2005-2009) (dv)	(2009-2013) (dv)	2018 Preliminary Reasonable Progress Case (PRP18a) (dv)
20% Worst Days				
Arches NP (CANY1)	11.2	11.0	10.8	10.9
Bryce Canyon NP (BRCA1)	11.6	11.9	10.6	11.2
Canyonlands NP (CANY1)	11.2	11.0	10.8	10.9
Capitol Reef NP (CAPI1)	10.9	11.3	10.2	10.5
Zion NP (ZICA1)	12.5	12.3	10.8	N/A[1]
20% Best Days				
Arches NP (CANY1)	3.7	2.8	3.1	3.5
Bryce Canyon NP (BRCA1)	2.8	2.1	1.8	2.6
Canyonlands NP (CANY1)	3.7	2.8	3.1	3.5
Capitol Reef NP (CAPI1)	4.1	2.7	2.6	3.9
Zion NP (ZICA1)	5.0	4.3	4.2	N/A (see footnote 15)

The current control strategies in the state's Regional Haze SIP have improved visibility at Federal Class I areas in the state and have also benefitted Class I areas outside of Utah that might be impacted by emissions from Utah during the first planning period. The emission reduction strategies in Utah's RH SIP have been implemented and have been effective.

- The State of Utah has developed *The Utah Smoke Management Plan (SMP)* which provides operating procedures for federal and state agencies that use prescribed fire, wildfire, and wildland fire on federal, state and private wildlands in Utah.
- Mobile NO_x emissions in the four main urban counties (Weber, Davis, Salt Lake, and Utah) were projected to decrease 42,000 tons/yr or 61% between 2002 and 2018. Even greater emission reductions will be achieved by 2018 than had been anticipated in Utah's RH SIP due to federal Tier 3 fuel and vehicle standards that were adopted in 2014.

[1] There is no PRP18a established for the new ZICA1 monitor. The PRP18a was originally established for the original ZIONI IMPROVE monitor, which was discontinued on July 29, 2004.

- The alternative to BART measures included in the proposed revision to Utah' SIP will have decreased SO_2 emissions by 27,947 tons and NO_X emissions by 15,258 tons from the 2002 inventory by 2015.
- The GCVTC set a goal of achieving 10 percent of generation from renewable resources in 2005 and 20 percent in 2015. Significant progress has been achieved towards meeting this regional goal. Thirteen percent of electricity generation in Utah was from renewable resources in 2012 and significant new resources are currently under construction.

Utah's Regional Haze SIP reflects the state's commitment to improve visibility and is focused on strategies that will provide the greatest benefit for Utah's Class I areas.

2. [NPS] The importance of scenic values was integral to the creation of the national parks in Utah. Clear clean air is essential to this purpose. Visibility at the parks is impaired (range varies across the 5 Class I areas from 70% of the days at Bryce Canyon National Park to 83% of the days at Arches National Park) We ask that DAQ carefully consider the implications for millions of park visitors as the agency considers whether to proceed with implementation of its SIP amendments.

Response: See response to comment 1. As described in the proposed alternative to BART, DAQ has confidence that the SO_2 emission reductions from stationary sources that were the focus of Utah's SIP will be effective to further improve visibility in Utah's Class I areas throughout the year, including the high visitation period of March - November. The significant NOx emission reductions that have already occurred have not resulted in reductions in ammonium nitrate during the low visitation period of December – February and further research is needed to better understand why visibility has not improved. During the rest of the year ammonium nitrate levels are generally low and are not a significant contributor to visibility impairment. The alternative measure proposed in Utah's SIP includes further reductions in SO_2 leading to a more certain improvement in visibility than would occur due to the installation of further NOx controls on the four electric generating units (EGUs) and these benefits would occur year round.

3. [Wasatch Clean Air Coalition] A particularly valuable part of the regional haze SIP process has been development of relationships with tribes, regulators in other states and federal agencies as well as many other stakeholders. These relationships are a valuable asset that will serve as we address other regional problems.

Response: DAQ agrees with the commenter. The stakeholder-based, consensus process of the GCVTC and the WRAP led to a workable and comprehensive strategy to address regional haze on the Colorado Plateau.

4. [HEAL Utah, National Parks Conservation Association, and Sierra Club (hereinafter Conservation Organizations)] Utah's latest RH SIP proposes a Best Available Retrofit Technology ("BART") alternative that would exempt Utah's only BART-eligible sources, Hunter Units 1 and 2 and Huntington Units 1 and 2, from any emission reductions whatsoever. Should this proposal move forward, it will result in the outright deprivation of Clean Air Act-mandated cleaner, clearer air at the region's treasured Class I national parks and wilderness areas.

Response: The commenter's contention that Hunter Units 1 and 2 and Huntington Units 1 and 2 were exempted from any emissions reductions whatsoever is incorrect. The emission reduction requirements for these EGUs were established in 2008 and have been fully implemented providing visibility benefits for the last nine years. Under the alternative to BART program for SO_2, PacifiCorp installed an SO_2 scrubber on Huntington Unit 2 and upgraded the scrubbers on the other 3 EGUs. As a result, SO_2 emissions from the four EGUs decreased by 18,707 tons/yr between 2002 and 2014[2]. The alternative measures for NOx outlined in the proposed rule require the installation of low-NOx burners with overfire air at all 4 EGUs and emissions of NOx decreased by 11,988 tons/yr between 2002 and 2014[2]. The BART determination for PM in the proposed rule requires the replacement of electrostatic precipitators with baghouses leading to significant reductions in PM and mercury emissions. The total combined capital cost for these controls was over $588,000,000 with an annualized operating cost of $71,000,000/yr.

5. [Conservation Organizations] The Conservation Organizations object to the State's failure to respond to our previous comments prior to re-proposing its latest RH SIP. The Conservation Organizations also object to the State's failure to formally retract its previous RH SIP proposal before re-proposing its latest proposal.

Response: The Regional Haze SIP was re-proposed to allow for public comment on the extensive revisions that had been made to the October 2014 proposal in response to public comments, including those from the commenter. Improvements were made to the modeling analysis, also in response to comments, and these changes are reflected in the revised modeling protocol. DAQ did not summarize and respond formally to the comments because so many of the comments that were directly related to the 5-factor analysis were no longer relevant. In addition, many of the comments received were addressed and resolved by the revised analysis. With modern word processing programs it is a simple matter for commenters to copy and resubmit any relevant comments that had not been addressed.

Under the provisions of R15-4, Administrative Rulemaking Procedures, the October proposal automatically expired on March 2, 2015, 120 days after the proposal was published on November 1, 2014. Therefore there was no need to retract the previous proposal. The Board proposed the new revision on March 4, 2105.

6. [Conservation Organizations] The Conservation Organizations request that all correspondence with EPA and/or PacifiCorp regarding Utah's withdrawal of its prior proposal and submission of its latest reproposal be made publicly available and be posted to its website for public review and comment.

Response: R15-4, Administrative Rulemaking Procedures, does not require that all correspondence related to a rulemaking be posted to an agencies web site. DAQ has followed the required rulemaking procedures: the proposed rule was published in the State Bulletin with a rule analysis form as required, and a 30-day public comment period was provided. The Staff Review and the proposed SIP are thoroughly documented to describe the legal requirements, technical analysis, and justification for the proposal. Other documents are available through a request under Utah's Government Records Access

[2] 2003 for Huntington Unit 2 because 2002 was not representative of normal plant operations.

and Management Act (GRAMA). Information about GRAMA requests and the procedures for making a request are posted on DEQ's web page at http://www.deq.utah.gov/ProgramsServices/services/grama/GRAMA.htm.

7. [Numerous individuals] I understand that Utah's Regional Haze plan will not require any pollution cuts from two big Rocky Mountain Power coal plants in central Utah. I would like to urge state officials to reconsider that -- and specifically to require significant reductions in smog-producing nitrogen oxides consistent with industry-standard pollution control upgrades, as has been done for coal plants in Colorado, Arizona, and New Mexico. In Utah, this would reduce an additional 14,000 tons of nitrogen oxide emissions per year from our air. Please require the best possible reductions in air pollution from Rocky Mountain Power's coal plants. I believe that investing in cleaner energy generation is vital for our families' health and to protect our parks' iconic views and the tourism and recreation dollars they help generate.

Response: The commenters did not provide any data or documentation to support this comment. As explained in the response to comment 4, the alternative measures for NOx outlined in the proposed rule require the installation of low-NOx burners with overfire air at all 4 EGUs. These controls have already been installed on all four EGUs and have been providing visibility benefits for the past nine years. Emissions of NOx from the four EGUs decreased by 11,988 tons/yr between 2002 and 2014. As explained in the response to comment 1, visibility impairment at Utah's Class I areas is the result of multiple sources and pollutants, including natural sources such as wildfire and windblown dust. Utah's SIP is a comprehensive strategy that reflects this complexity. Utah's SIP has focused on reducing SO_2, the most significant anthropogenic pollutant at Utah's Class I areas. As described in the proposed alternative to BART, DAQ has confidence that the SO_2 emission reductions will be effective to further improve visibility in Utah's Class I areas. DAQ has less confidence that NOx reductions will provide a real benefit. The significant NOx reductions that have already occurred have not resulted in reductions in wintertime ammonium nitrate. During the rest of the year ammonium nitrate levels are generally low and are not a significant contributor to visibility impairment. Further research is needed to better understand the visibility benefits of NOx reductions and DAQ anticipates that regional modeling for the next RH SIP that is due in 2018 will improve our understanding of this important issue.

8. [Numerous individuals] The commenters did not provide any data or documentation to support this comment. Clean air is necessary for the well-being of Utah's national parks and their nine million annual visitors from around the world. The Hunter and Huntington coal plants have heavily polluted the air in the Four Corners region for decades. Because of the pollution from these coal plants, a visitor to Canyonlands National Park sees only a third of the scenic vista they would see if the air was cleaned up. This same pollution that affects visibility is also harmful to our lungs, especially those of children. Please take this opportunity to cut nitrogen oxide pollution by over 14,000 tons per year at Hunter and Huntington coal plants and invest in the future of our national parks, our economy and our health.

Response: The Four Corners Region, where Utah's Class I areas are located, is currently designated attainment for all national ambient air quality standards. Utah's PSD program, promulgated in SIP

Section VII and R307-405 and NSR permitting program, promulgated in SIP Section II and R307-401, ensure that new stationary sources do not cause or contribute to a violation of the NAAQS. When new NAAQS are promulgated, Utah reviews and updates its SIP as necessary to address the impact of emissions in Utah on nonattainment areas in downwind states. Emissions from the four EGUs that are subject to BART have not been determined to cause or contribute to nonattainment for any criteria pollutant through these regulatory processes.

As explained in the response to comment 1, visibility impairment at Utah's Class I areas is the result of multiple sources and pollutants, including natural sources such as wildfire and windblown dust. Utah's SIP is a comprehensive strategy that reflects this complexity. Utah's SIP has focused on reducing SO_2, the most significant anthropogenic pollutant at Utah's Class I areas. As described in the proposed alternative to BART, DAQ has confidence that the SO_2 emission reductions will be effective to further improve visibility in Utah's Class I areas. DAQ has less confidence that NOx reductions will provide a real benefit. The significant NOx reductions that have already occurred have not resulted in reductions in wintertime ammonium nitrate. During the rest of the year ammonium nitrate levels are generally low and are not a significant contributor to visibility impairment. Further research is needed to better understand the visibility benefits of NOx reductions and DAQ anticipates that regional modeling for the next RH SIP that is due in 2018 will improve our understanding of this important issue.

9. [Individual] Utah is the last state in the union to comply with the haze regulations of the Clean Air Act.

Response: Utah's Regional Haze SIP was submitted in 2003, five years earlier than required, and has been providing visibility benefits for the last 12 years. Significant emission reductions were required in 2008 to address BART for NOx and PM. These reductions have been fully implemented and have provided visibility benefits for the last nine years.

10. [Individual] What is the cost of non-action on the part of DEQ and RMP? What are the long-term costs of the negative impacts of haze and pollution on Utah's tourism industries and the respiratory health of Utah's citizens?

Response: The alternative to BART measures included in the proposed revision to the RH SIP will have decreased SO_2 emissions by 27,947 tons and NO_X emissions by 15,258 tons from the 2002 inventory by 2015. EPA has fully approved the reasonable progress demonstration in Utah's RH SIP (77 FR 74355, December 14, 2012). The most stringent PM controls have been installed on the 4 subject to BART EGUs and the alternative measures for both SO2 and NOx provide greater reasonable progress than BART. The SIP does not represent non-action as claimed by the commenter. As described in the response to comment 1, Utah has been working for decades to address visibility impairment at Utah's Class I areas, but it is a complex problem resulting from multiple emission sources and pollutants, including natural emissions from wildfires and windblown dust. Utah's SIP is focused on reductions in SO_2, the most significant anthropogenic pollutant and those reductions have led to improvements in visibility. These improvements have had a positive impact on the experience of visitors to the Class I areas. As addressed in the response to comment 8, the emissions from the four EGUs that are subject to BART have not been demonstrated to cause or contribute to nonattainment for any criteria pollutant.

11. [UAMPS] UAMPS supports the SIP Revision as the SIP Revision is consistent with the Regional Haze regulations and best meets the main objective of the Regional Haze Program to return visibility conditions in Class I areas to natural conditions by 2064. UAMPS adopts PacifiCorp's comments supporting the SIP Revision.

Response: Comment noted.

PM BART Determination

12. [PacifiCorp and UAMPS (hereinafter PacifiCorp)] In its Guidelines for BART Determinations Under the Regional Haze Rule found at 40 CFR §51, Appendix Y ("BART Guidelines"), EPA states in part at Section IV.D.9: "If you find that a BART source has controls already in place which are the most stringent controls available…, then it is not necessary to comprehensively complete each step of the BART analysis in this section. As long as these most stringent controls available are made federally enforceable for the purpose of implementing BART for that source, you may skip the remaining analyses in this section…." The SIP Revision reiterates and concludes, based on Utah's review and approval of PacifiCorp's PM BART analyses, that the "baghouse technology required…is still the most stringent technology available and 0.015 lb PM/MMBtu represents the most stringent emission limit." (Staff Review, p. 5). In addition, by including the emission limits in amended Section IX.H.21 and 22, the SIP Revision makes the PM BART limits federally enforceable. As a result, Utah properly skipped the remaining BART analyses steps consistent with the BART Guidelines and properly determined PM BART for the Units.

Response: Comment noted.

13. [PacifiCorp] Utah's conclusion is further supported by SIP approvals offered by EPA in surrounding states, which PacifiCorp requests that Utah specifically rely on in making its final decision to approve the proposed PM BART determinations for the Units.

    a. In Colorado, with regard to similar electric generating units (EGU), EPA explained that "[f]abric filter baghouses are the most stringent control technology for controlling PM emissions." 77 Fed. Reg. 18,052, 18,066 (Mar. 26, 2012). EPA further explained, "consistent with the BART Guidelines, the State did not provide a full five-factor analysis because the State determined BART to be the most stringent control technology and limit" and "assumes the BART limit can be met with the operation of the existing fabric filter baghouses." *Id.* Significantly, EPA concluded that it "agree[d] with the State's conclusions and we are proposing to approve its PM BART determinations." *Id.*

    b. In Wyoming, EPA approved the State's conclusions that "fabric filters represent the most stringent PM control technology" and that "[c]onsistent with the BART Guidelines, the State did not provide a five-factor analysis because the State determined BART to be the most stringent control technology and limit." 77 Fed. Reg. 33,022, 33,035. (*citing* 70 Fed. Reg. at 39,165 (Appx. Y)). EPA also has approved or proposed to approve in numerous other actions, including Wyoming, the same 0.015 lb/MMBtu PM BART emissions limit adopted in the prior Utah RH SIP and in this SIP Revision. *See, e.g.*, 79 Fed. Reg. 5,032, 5,220. *See also* EPA's approval of PM BART in Arizona (77 Fed. Reg. at 72,523 (December 5, 2012)) and for the Four Corners Power Plant (77 Fed. Reg. 51, 620, 51, 636 (August 24, 2012)).

c. In other actions, EPA has approved PM BART limits that are twice as high as those included for the Units in the SIP Revision. For example, EPA approved a RH SIP with a PM BART emissions limit of 0.03 lb/MMBtu for nine EGUs in Colorado. *See, e.g.*, 77 Fed. Reg. 18,051,18,066 (Mar. 26, 2012); 77 Fed. Reg. at 76,872 . EPA approved PM BART emissions limits of 0.03 and 0.04 lb/MMBtu for certain EGUs in Wyoming, where the most stringent limit was 0.015 lb/MMBtu. 79 Fed. Reg. at 5,220. EPA also approved PM limits of 0.07 lb/MMBtu for four EGUs in North Dakota. 76 Fed. Reg. at 58,585; 77 Fed. Reg. at 20,930. In addition, EPA also adopted a PM limit of 0.26 lb/MMBtu for Corette in its FIP for Montana. 77 Fed. Reg. at 57,911.

Response: The information has been added as footnotes in Section III of the Staff Review as part of the record supporting the conclusion that the emission limit for PM represents the most stringent technology available.

Alternative To BART Analysis vs Case-by-Case Review

14. [NPS] DAQ has determined that Hunter Units 1 and 2 and Huntington Units 1 and 2 are subject to BART. Yet in the proposal DAQ has proposed to claim emission reductions due to the planned closure of the Carbon plant as an acceptable alternative to BART installation and emission reductions from the Hunter and Huntington Plants. The State of Utah appears unprepared to fulfill its legal requirements under the Clean Air Act to protect and enhance the views that attract millions of visitors to the parks each year.

Response: The regional haze rule provides two pathways to address the regional haze BART requirements. The first, outlined in 40 CFR 51.308(e)(1), is a case-by-case review that must meet the criteria established in 40 CFR Part 51, Appendix Y. The second, outlined in 40 CFR 51.308(e)(2), provides the criteria for an alternative program. Either pathway is equally acceptable under the rule. The proposed RH SIP addresses BART for NOx using the second pathway, an alternative program, and the Staff Review demonstrates that the alternative program meets the requirements of 40 CFR 51.308(e)(2). The commenter does not explain how the proposal that establishes alternative measures that provide greater reasonable progress than BART, as fully allowed by the RH rule, does not fulfil the requirements under the Clean Air Act.

15. [PacifiCorp] The National Park Service mischaracterized the nature of the Alternative Measure. As clearly explained in the SIP Revision, the Alternative Measure does not rely solely on emission reductions from the Carbon power plant. Instead, it consists of: (i) substantial emission reductions associated with the closure of the Carbon plant (non-BART eligible); (ii) early NO_x emission

reductions due to upgraded LNB/OFA at Hunter Unit 1 and Unit 2 (BART eligible); (iii) early NO_x emission reductions due to upgraded LNB/OFA at Huntington Unit 1 and Unit 2 (BART eligible); and (iv) substantial NO_x emission reductions due to upgraded LNB/OFA at Hunter Unit 3 (non-BART eligible). It is unfair and improper to characterize the entirety of the Alternative Measure as merely reductions associated with the Carbon power plant closure. Moreover, given the extensive explanation in the letter of the importance of improved visibility at Utah's national parks, the National Park Service should be pleased with – not critical of – the Alternative Measure because it provides even greater reasonable progress than would be achieved by assuming the most stringent NO_x controls (SCR) and limits. In other words, Utah is proposing the very "strong action" that the National Park Service is asking Utah to do. What Utah cannot do, of course, is require both the Alternative Measure and also the most stringent NO_x controls and limits as BART on the Units.

Response: Comment noted.

16. [PacifiCorp] 40 C.F.R. 51.308(e)(2) allows a state to implement an "other alternative measure" ("Alternative Measure") in lieu of BART so long as the Alternative Measure meets certain regulatory requirements and can be demonstrated to "achieve greater reasonable progress than would be achieved through the installation and operation of BART." Greater reasonable progress can be demonstrated using one of two methods: (i) "greater emission reductions" than under BART (40 C.F.R. §51.308(e)(3)); or (ii) "based on the clear weight of evidence" (40 C.F.R. §51.308(e)(2)(E)). As the U.S. Circuit Court of Appeals for the 10th Circuit recently observed, the state is free to choose one method or the other. *WildEarth Guardians v. E.P.A.*, 770 F.3d 919, 935-37 (10th Cir. 2014). The court characterized the former approach as a "quantitative" and the later as "qualitative," and specifically sanctioned the use of qualitative factors under the clear weight of evidence.

Response: A reference to the *WildEarth Guardians v. E.P.A.* decision has been added as a footnote in Section IV of the Staff Review to provide further support to the ability of the state to choose to use an alternative measure. As the use of multiple metrics is an important aspect of the weight of evidence, the citation has also been added to Section VIII.5 of the Staff Review. There it serves as additional support that the alternative approach provides greater reasonable progress than the most stringent available NO_x controls.

17. [PacifiCorp] Some parties have expressed the view, because PacifiCorp considered certain planning scenarios in PacifiCorp's 2015 Integrated Resource Plan ("PacifiCorp IRP") that include the installation of SCR at one or more of the Units, that Utah also should require SCR at the Units under the Utah SIP Revision. By its nature, however, the PacifiCorp IRP is a general planning document that is intended to assess a variety of potential future generation resource portfolio scenarios across PacifiCorp's generating system. It does not represent a commitment to install SCR at the Units, nor does it indicate that SCR represents BART at the Units. In addition, although the PacifiCorp IRP includes remaining life and cost assumptions for the Units in regard to SCR installation across the planning scenarios assessed, those assumptions do not directly relate to the SIP Revision.

Response: Comment noted.

Alternative to BART Analysis Sources Covered

18. [PacifiCorp] ***§51.308(e)(2)(i)(A)*** – Utah properly listed all of the BART-eligible sources. *See* SIP Section XX.D.6.b(1), Table 3, page 21; and Staff Review, Section V, page 7. ***§51.308(e)(2)(i)(B)*** – Utah properly listed all of the BART-eligible sources which are covered by the Alternative Measure. *See* SIP Section XX.D.6.c; and Staff Review, Section V, page 7.

Response: Comment noted.

19. [NPS] The BART alternative does not comply with the intent of the 1999 regional haze rule. States have demonstrated an alternative either through other sources/pollutants within the fence line of the source or through a trading program. The UT DAQ BART Alternative is unique in that it is not a pre-existing state program (like CO, MA, MD and NC) and goes beyond the fence line of the BART-eligible Hunter and Huntington facilities to include a facility (Carbon Power Plant) not subject to BART and a pollutant (SO_2) already covered under a separate BART trading program. For these reasons, it is our understanding that the UT DAQ approach is more similar to the trading programs previously cited than the BART Alternatives listed above. To conform to the intent of the 1999 Regional Haze Rule, it seems the UT trading program should include all significant sources within a source category (EGUs) in a trading region (UT). We compared 2014 emissions (Q in tons-per-year) from CAMD to distances (d in km) from the 100 ton-per-year sources (the Q/d greater than 10 approach recommended by the BART Guidelines) and found two additional EGUs that should have been included in UT DAQ's BART Alternative—Intermountain Power Unit 1 & Unit 2 (IPP). This satisfies the 2006 recommendation that we "…include all [significant] sources within a source category in a trading region…"

Response: The regional haze rule, 40 CFR 51.308(e)(2)(B) establishes the criteria for determining which sources to include in an alternative program. The rule states, "The State is not required to include every BART source category or every BART-eligible source within a BART source category in an alternative program, but each BART-eligible source in the State must be subject to the requirements of the alternative program, have a federally enforceable emission limitation determined by the State and approved by EPA as meeting BART in accordance with section 302(c) or paragraphs (e)(1) or (e)(4) of this section." During the development of the rule EPA had considered the need to include all sources within a category in order to prevent emission shifting, but ultimately rejected that approach. The preamble to the 2006 regional haze rule revision states,

> "having carefully considered the comments and the relationship between the requirement for category-wide participation of BART-eligible sources and the requirements for the State to address emission shifting, we are adopting final provisions that maximize the flexibility of the States while ensuring that the BART-eligible sources are addressed in some fashion by States…States are not required to include each BART-eligible source in a source category in an alternative program; however, any BART-eligible sources not included in an alternative program would remain subject to the general requirements governing BART sources." (71 FR 60619)

Intermountain Power Units 1 & 2 is therefore not required to be included in the alternative program. The units at Intermountain Power are not BART-eligible and are therefore not required to meet BART provisions independently. The plant is included in the SO_2 milestone and backstop trading program and the overall reasonable progress analysis in Utah's SIP.

20. [Conservation Organizations] For any alternative measure, "[t]he State is not required to include every BART source category or every BART-eligible source within a BART source category in an alternative program, but *each BART-eligible source in the State must be subject to the requirements of the alternative program, [or] have a federally enforceable emission limitation determined by the State and approved by EPA as meeting BART*." This requirement ensures that the sources with the greatest share of the contribution to the regional haze problem do not escape statutorily mandated emission reductions. In fact, the alternative excludes all BART sources in the state, exempting Hunter Units 1 and 2 and Huntington Units 1 and 2 from emission reductions under both the alternative program and BART-derived emission limits.

Response: The comment is factually incorrect, and provides no basis for the claim it makes. Utah has identified only four BART-eligible sources in the state: PacifiCorp Hunter Units 1 and 2 and PacifiCorp Huntington Units 1 and 2. All four of these EGUs are included in the alternative program. As described in the response to comment 4, the alternative program required the installation of low-NOx burners on all four BART-eligible EGUs that resulted in substantial emission reductions of NOx in addition to emission reductions measures at three EGUs that are not BART-eligible. The required emission controls were installed early and have been improving visibility at Utah's Class I areas since 2006.

21. [Conservation Organizations] Importantly, EPA's BART alternative regulations are intended to allow future emission reductions to serve as a substitute for BART. For example, the regulations require a state to demonstrate that its program "will achieve greater reasonable progress…" indicating that BART alternative emission reductions must occur in the future. Moreover, the regulations also require "an analysis of the projected emission reductions achievable through the trading program or other alternative measure, again requiring that emission reductions occur in the future. Utah's proposed alternative does not satisfy these requirements. In fact, the alternative relies exclusively on past emission reductions.

Response: 40 CFR 51.308(e)(2)(iv) establishes the criteria for when emission reductions due to other requirements may be included as part of an alternative measure. This section requires "a demonstration that the emission reductions resulting from the alternative measure will be surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP," which is defined as 2002 for regional haze purposes. The commenter is taking language out of context in the rule while ignoring the very clear language that references the baseline date of the SIP for determining which reductions may be considered. The commenter is also not considering the long process that has occurred in the development of Utah's SIP. The SIP was originally adopted in 2003 requiring significant emission reductions of SO_2 from stationary sources and was amended in 2008 to require significant emission reductions of NOx and PM under the BART requirements. These emission reductions have been fully implemented and have been providing visibility benefits since 2003. Any revision to the BART determination, such as the alternative measures addressed in the proposal, must fully include the emission reductions that have already been required as BART.

22. [Conservation Organizations] While the April 2015 retirement of the Carbon Plant and 2008 NOx emission reductions from Hunter Unit 3 no doubt improved visibility at these parks to some degree, they will remain unlawfully impaired by NOx emissions from the BART-subject units under Utah's alternative. Without adequate BART controls for emissions of NOx, Utah fails to make reasonable progress toward the national visibility goal of *eliminating* human-caused visibility impairment in these lands.

Response: Visibility at the Class I areas is not unlawfully impaired - on December 14, 2012, EPA determined that Utah's SIP had met the reasonable progress requirements of the regional haze rule. EPA determined that "States adopting the requirements of 40 CFR 51.309 are deemed to have met the requirements for reasonable progress for the Class I areas on the Colorado Plateau. 40 CFR 51.309(a)…All of the Class I areas in Utah are on the Colorado Plateau. Therefore, the State met all reasonable progress requirements for the Class I areas in Utah." (77 FR 74367) As explained in earlier responses (14, 16, 19, and 21), the alternative process is fully allowed under the regional haze rule and is therefore not "unlawful" as claimed by the commenter.

23. [Conservation Organizations] Utah's alternative program does not meet the precedent established by the CAIR program in the eastern US. CAIR required future emission reductions. Further, in finding that CAIR satisfied the "greater reasonable progress" requirement for alternative programs, EPA noted specifically that BART, if implemented, would not be additive and achieve emission reduction over and above those achieved by CAIR, because CAIR and BART covered the same sources of haze emissions. Such source specific control requirements would simply result in a redistribution of emission reductions, as other EGUs could buy the excess allowances generated by the installation of controls at BART units. The net result would be the same level of emission reductions, but at a higher total cost, because the ability of the market to find the most cost effective emission reductions would be constrained. In contrast, because Utah's alternative program does not require emission reductions from BART sources, emission reductions under BART would be additive to the emission reductions already achieved through the Carbon closure and Hunter 3 emissions reductions. This fundamental difference alone nulls the Utah alternative. EPA's replacement rule for CAIR, CSAPR, has similar requirements. The 309 SO_2 Trading program was also designed to require emission reductions from all EGUs.

Response: First, the commenter's contention that Utah's alternative program does not require emission reductions from BART sources is incorrect. Utah's 2008 SIP required installation of low-NOx burners with overfire air on all four EGUs that are subject to BART. As described in the response to comment 4, NOx emissions from the four EGU's decreased 11,988 tons/year between 2002[3] and 2014 due to these controls. The NOx emission limits in the 2008 SIP also met the presumptive BART emission rates established in 40 CFR Part 51, Appendix Y. These NOx emission reductions have been fully implemented

[3] 2003 for Huntington Unit 2 because 2002 did not represent normal operations.

and have been providing visibility benefits since 2006. Second, 40 CFR 51.301(e)(2)(iv) allows inclusion of emission reductions due to control requirements adopted since 2002. The rule does not require "future" emission reductions, instead it requires "reductions that are surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP." Third, the comment misunderstands what EPA was saying in this discussion of additive benefits. Because some sources are subject to both CAIR and BART, you would not get double the emission reductions by requiring case-by-case BART in addition to CAIR. Instead, that approach would achieve the same reductions but would force those reductions to occur at specific plants, thereby losing the ability of the trading program to find the most cost-effective emissions reductions. The result would be the same level of emission reductions at a higher cost. While the proposed alternative measures in Utah's SIP is not a trading program there is a similar logic. The alternative does not mandate that the emission reductions occur at the higher cost source and instead takes advantage of the emission reductions required by the MATS rule to achieve even greater reductions at a lower cost.

24. [Conservation Organizations] EPA has approved several "BART alternatives" for certain power plant units in the western United States. However, unlike Utah's proposal, these BART alternatives required future emission reductions at the same power plant as an alternative to BART, rather than exclusively past emission reductions at other non-BART sources. Thus, Utah's proposed BART alternative deviates not only from EPA's regulations but also from EPA practice and precedent. Specifically, unlike Utah's proposal, each of the power plants with EPA approved BART alternative emission reductions have units that are subject to BART. Utah relies solely on past, unrelated emission reductions that occurred separate from and before the adoption of its regional haze SIP.

Response: Utah's RH SIP was adopted in 2003 and the base year of the SIP is 2002. The commenter's contention that the emission reductions in the alternative program occurred before the adoption of the SIP is incorrect. As described in the response to comment 21, 40 CFR 51.308(e)(2)(iv) fully allows credit for emission reductions due to measures adopted after the 2002 baseline date of the SIP. The regional haze rule does not limit inclusion in an alternative program to sources with units that are subject to BART. The fact that alternative programs cited by the commenter occurred at the same power plant or include only BART source is irrelevant and does not change the requirements of the rule.

25. [Conservation Organizations] Under EPA regulations, plans must show that any BART-alternative emission reductions are "resulting from" and "achievable through" the "trading program or alternative measure." Utah's BART alternative fails to meet these requirements. Utah points to no evidence in the administrative record indicating that 2008 NOx emission reductions at Hunter 3 were "resulting from" or "achievable under" Utah's BART alternative. Nor could they be. Utah did not even propose its BART alternative program until 2015—seven years after the Hunter 3 emission reductions. Likewise, the emission reductions at Carbon 1 and 2 were achieved on April 15, 2015—prior to the promulgation of Utah's BART alternative. The reductions were the result of the MATS rule. Thus, it is impossible that these emission reductions "resulted from" or were "achieved under" a program that had yet to be promulgated.

Response: The commenter is taking the terms "resulting from" and "achievable through" out of context. The rule does not require that the alternative program establish new requirements. EPA specifically envisioned allowing states the flexibility to rely on emission reductions from other CAA requirements as part of an alternative program. The preamble to the proposed rule states, "In some cases, emission reductions required to fulfill CAA requirements other than BART (or to fulfill requirements of a State law or regulation not required by the CAA) may also apply to some or all BART eligible sources. In such a situation a State may wish to determine whether the reductions thus obtained would result in greater reasonable progress than BART." (70 FR 44161) 40 CFR 51.308(e)(2)(iv) specifically allows the inclusion of measures adopted after the baseline date of the SIP (2002) to be included in the alternative program. In Utah's case, the alternative program is relying on the emission reductions "resulting from" and "achievable through" the closure of the Carbon Plant and the installation of low-NOx burners on Hunter Unit 3, as well as the installation of low-NOx burners with overfire air on the 4 BART-eligible EGUs and these reductions are made enforceable through emission limits in Section IX.H.22 and 23 of Utah's SIP.

Alternative To BART – Most Stringent NOx Controls Comparison

26. [PacifiCorp] Utah properly analyzed the Alternative Measure by comparing it against the most stringent, potential BART controls and limits (by assuming the installation of selective catalytic reduction ("SCR") at a 0.05 lb/MMBtu limit to control NO_X at the Units). *See* Staff Report, Section VI, page 8. This allowed Utah properly to determine that the Alternative Measure provides greater reasonable progress against the most stringent, potential BART controls and limits. It is worth noting that several environmental groups agreed, in comments to the September 2014 proposed amendment by Utah to its regional haze SIP, that SCR with a NO_X emission rate of 0.05 lb/MMBtu is appropriate as BART. *See* December 22, 2015 letter to Utah by HEAL Utah, National Parks Conservation Association, and Sierra Club at Section V.D. (pages 27 – 30). EPA has used a 0.05 lb/MMBtu NO_X emissions rate for SCR for other regional haze SIP analyses, recently in New Mexico and Arizona. *See e.g.*, 79 Fed. Reg. 60,978, 60, 984 (New Mexico, Oct. 9 2014)("In promulgating the FIP, we evaluated the performance of both new and retrofit SCRs and determined that 0.05 lb/MMBtu on a 30-boiler-operating-day average was the appropriate emission limit for SCR at the San Juan Generating Station units. See 76 FR 491 and 76 FR 52388. New Mexico appropriately used this same rate in their cost and visibility analyses for the four-SCR scenario as part of its BART evaluation."); 79 Fed. Reg. 52,420, 52,431 (Arizona, Sept. 3, 2014)("We agree that our use of a 0.05 lb/MMBtu annual average design value for SCR is consistent with other BART determinations for coal-fired power plants."). EPA has agreed that even higher NO_X emission rates can qualify as the most stringent emission rate for modeling visibility impacts. For example, EPA accepted state-mandated SCR emission rates of 0.07 and 0.08 in Colorado, as well as its SCR related analyses based on 0.07. 77 Fed. Reg. 76,871 (Colorado, Dec. 21, 2012). EPA also used 0.083 to 0.098 for the Reid Gardner Station in Nevada. 77 Fed. Reg. 50,936, 50,942 (Nevada, Aug. 23, 2012).

Response: DAQ agrees with the commenter that 0.05 lb/MMBtu is the appropriate emission rate for evaluating the emission reductions due to the most stringent potential NOx control for BART. The citations provided by the commenter have been added as a footnote in section VI of the report to provide further support for the emission rate used in the analysis.

27. [PacifiCorp] Assuming, as Utah concluded in its prior RH SIP, that NOx BART for each Unit is Low NOx Burner/Over-fire Air (LNB/OFA) with an emission limit of 0.26 lb/MMBtu, the Alternative Measure also results in greater reasonable progress than that assumption. This is because achieving greater reasonable progress as against the most stringent NOx technology and limits, by definition, demonstrates even greater reasonable progress as compared against less stringent technology and limits. The same is true by comparing the Alternative Measure against presumptive NOx limits in Appendix Y, and PacifiCorp's BART analyses referenced in Footnote 1 and included in SIP record.

Response: As noted in the Staff review, DAQ's use of SCR as a benchmark is not a determination that this technology is BART, it is merely a conservative approach to evaluate the effectiveness of the alternative program. When evaluating an alternative to BART under the RHR it is not necessary to make a final determination of BART. Instead the most stringent technology available is used as a benchmark.

28. [PacifiCorp] Utah properly conducted an analysis of the projected emission reductions achievable through the Alternative Program. *See* Staff Report, Section VII, page 9.

Response: Comment noted.

29. [NPS] UT DAQ's approach to comparing its BART Alternative to its "Most Stringent NO_X" scenario is not consistent with our understanding of the intent of the applicable regulations. Instead of creating a scenario that reflects application of the most stringent NO_X controls to all EGUs (Hunter Units 1 – 3, Huntington Units 1 & 2, and Carbon Units 1 & 2) "covered" in the trading population, only the BART-eligible EGUs are assumed to get the most stringent NO_X controls—Selective Catalytic Reduction (SCR)—even though other non-BART EGUs are included ("covered") in UT DAQ's Most Stringent NO_X trading population. This appears to be inconsistent with the intent of the 2006 rule requirement that the BART Alternative "trading program or other alternative measure achieves greater reasonable progress than would be achieved through the installation and operation of BART at the *covered sources."* If the application of the UT BART Alternative is expanded beyond just BART sources, it seems appropriate to use UT DAQ's "Most Stringent" nomenclature and apply that approach to all "covered sources."

Response: The commenter has neglected to include the full text in the regional haze rule when referring to the term "covered sources." The full text says "each source within the State subject to BART and covered by the program." The most stringent NOx scenario assumes the installation of SCR on each source within the State subject to BART and covered by the program: Hunter Units 1 and 2, and Huntington Units 1 and 2.

30. [NPS] UT DAQ's conclusion that "…the alternative method may be deemed to achieve greater reasonable progress than BART" is based upon a significant deviation from accepted procedures. UT

DAQ used CAMD emissions from 2001 – 2003 to establish baseline emission rates for the Hunter and Huntington EGUs, but used 2012 – 2013 for the Carbon EGUs. According to UT DAQ, "This approach provides a more accurate representation of the effectiveness of this "control" option, as well as being in line with federal and state permitting guidelines under Title I (NSR)." In this case, the combined 2012 – 2013 average SO_2 and NO_X emissions used by UT DAQ were 25% higher than the appropriate 2001 – 2003 emissions.

Response: DAQ used current emissions from the Carbon Plant because these emissions are more representative of the reductions that will be achieved due to the closure of the plant. The difference in emissions referenced by the commenter is primarily due to increased SO_2 emissions from the plant during this time period. The Carbon Plant was built in the 1950s and was grandfathered under Utah's permitting rules. The plant was equipped with ESPs to control particulate, but had no controls for SO_2. The increasing SO_2 emissions are therefore the direct result of increased sulfur content in the coal that is combusted in the plant. Use of 2001-2003 emissions would underestimate today's benefit. In either case the emission year used would not have affected the overall conclusion because emissions under the alternative would still be lower than the most stringent NOx scenario even if 2001—2003 average emissions were used for the Carbon Plant.[4]

The modeled emission rate for the Carbon Plant is not based on annual emissions. Instead, it is based on the highest daily emissions in the time period. Because there are day to day fluctuations in the sulfur content of the coal the effect of increasing sulfur is not a factor because the highest days are comparable. The SO_2 emissions on the highest day in 2001-2003 were 19.024 tons (highest day for each unit averaged) while the emissions on the highest day in 2012-13 were 18.957 tons. If the approach suggested by the commenter were used, the model would have shown slightly greater visibility benefits due to the closure of the Carbon Plant.

31. [NPS] It is generally assumed that a modern SCR can achieve at least 90% NO_x reduction, and at least seven recent retrofits are meeting 0.04 lb/mmBtu (or lower) on an annual average basis. Considering that PacifiCorp's BART EGUs are already achieving less than 0.30 lb/mmBtu on an annual average, it is realistic to assume that addition of SCR could reduce those emissions to not more than 0.04 lb/mmBtu (annual average).

Response: DAQ disagrees with this comment. While the commenter is correct that a modern SCR can achieve a 90% reduction in NOx emissions, there are two errors in the commenter's presented logic. The first error is in the use of historical actual emission data to simply set an emission limit. This is not the proper approach toward setting a best available retrofit technology (BART) emission limit.

BART, as defined by §169A [42 USC 7491]:

> *in determining best available retrofit technology the State (or the Administrator in determining emission limitations which reflect such technology) shall take into*

[4] Combined SO_2 and NOx average emissions in 2001-3 were 9,102 tons and in 2012-13 were 11,352 tons. The 2,250 ton difference between these time periods is less than the 2,283 ton difference between the alternative and the most stringent NOx scenario (PM reductions not included).

consideration the costs of compliance, the energy and non-air quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology;

Therefore, simply setting a limit based upon an arbitrary fraction of past performance ignores the very process defined within the CAA.

The second error in the comment is in the selection of averaging periods. The commenter has specifically chosen to present the emission limit on an "annual average basis." However, the values used within DAQ's analysis were presented using a 30-day rolling average basis. This is a much shorter time frame, and simply lowering the limit without taking this averaging period into account can greatly affect the stringency of the limit. Typically in the permitting realm, the longer the averaging period, the lower the limit can be set. This is because the longer data collection period tends to lessen the impact of outliers on the overall average.

EPA itself has used a 0.05 lb/MMBtu NOx emissions rate for SCR for other regional haze SIP analyses, recently in New Mexico and Arizona. See e.g., 79 Fed. Reg. 60,978, 60, 984 (New Mexico, Oct. 9 2014)("In promulgating the FIP, we evaluated the performance of both new and retrofit SCRs and determined that 0.05 lb/MMBtu on a 30-boiler-operating-day average was the appropriate emission limit for SCR at the San Juan Generating Station units. See 76 FR 491 and 76 FR 52388. New Mexico appropriately used this same rate in their cost and visibility analyses for the four-SCR scenario as part of its BART evaluation."); 79 Fed. Reg. 52,420, 52,431 (Arizona, Sept. 3, 2014)("We agree that our use of a 0.05 lb/MMBtu annual average design value for SCR is consistent with other BART determinations for coal-fired power plants.") EPA has agreed that even higher NOx emission rates can qualify as the most stringent emission rate for modeling visibility impacts. For example, EPA accepted state-mandated SCR emission rates of 0.07 and 0.08 in Colorado, as well as its SCR related analyses based on 0.07. 77 Fed. Reg. 76,871 (Colorado, Dec. 21, 2012). EPA also used 0.083 to 0.098 for the Reid Gardner Station in Nevada. 77 Fed. Reg. 50,936, 50,942 (Nevada, Aug. 23, 2012).

32. [NPS] NPS provided modeling based on their determination of the correct comparison. The modeling for the most stringent NOx scenario included the IPP units 1 and 2, used a lower emission rate for SCR and applied that rate to all of the EGUs (Hunter, Huntington, Carbon, IPP). Using these assumptions and adding up the additional improvement that would occur at all 9 Class I areas resulted in 7.1 dV greater improvement that what was modeled by DAQ under the alternative.

Response: The results of the NPS modeling are not relevant because that modeling was performed using incorrect emission rates. The following errors with the NPS modeling are noted: 1, IPP was included in the analysis even though this plant is not part of the alternative program (see response to comment 19). 2. The SCR emission rate was incorrectly used for all EGUs, rather than those subject to BART (see response to comment 29). 3. Finally, where an SCR emission rate was applied, an incorrect emission value was chosen (see response to comment 31). The modeling result were not relevant to the proposal and were therefore not considered.

33. [Conservation Organizations] Utah's projected emission reduction analysis wrongly assumes that Carbon Units 1 and 2 could, in perpetuity, continue to emit NOx, SO2, and PM at the same rate the plant emitted these pollutants in 2012-2013. More specifically, Utah's so-called "Most Stringent NOx" scenario—purportedly reflecting the emissions from Hunter, Huntington and Carbon if BART were implemented—has Carbon Units 1 and 2 emitting NOx (3,348 tpy total), SO2 (8,005 tpy total), and PM (573 tpy total) at 2012-2013 emission rates through at least 2064. This emission scenario is arbitrary and both factually and legally incorrect.

Response: The comment is factually incorrect and is not supported by the requirements of the regional haze rule. The proposal does not contain a projection of emissions for any of the EGUs to 2064 as implied by the commenter. The emission rates evaluated are based on current actual emissions and therefore reflect conditions as they exist today, not at some future date. The regional haze rule does not require an emission projection to 2064 for this analysis, and EPA has not required such a projection for other alternative programs, including CAIR/CSAPR. Baseline emissions for the Hunter and Huntington plants are based on 2001-2003 actual emissions, consistent with the modeling requirements of 40 CFR Part 51 Appendix Y. As discussed in the response to comment 30, current emissions for the Carbon plant were used in the baseline to better represent the emission reductions that would occur due to the closure of the plant. The most recent available actual emissions (2012-13 at the time the analysis was completed) were used for emissions under the alternative. The creditable emission reductions since the 2002 baseline inventory were included in the alternative analysis, consistent with 40 CFR 51.308(e)(2)(iv).

34. [Conservation Organizations] The Carbon Plant was permanently closed on April 15, 2015 and is in the process of being dismantled (April 15, 2015 Newspaper Article). Thus, Utah's assumption that these units could continue to emit pollutants at 2012-2013 emission rates is arbitrary, factually inaccurate, and defies reality.

Response: The regional haze rule allows emission reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP (2002). The reductions due to the closure of the Carbon Plant are due to a measure adopted under the CAA since 2002 and are clearly creditable under those criteria. The Staff Review notes that the Carbon Plant was closed due to the high expense of complying with the MATS rule. A challenge to this rule is currently under consideration by the Supreme Court. If the Supreme Court overturned or stayed the MATS rule, PacifiCorp could reopen the Carbon Plant under its existing operating permit and continue operating indefinitely. For this reason enforceable measures were included in the SIP to lock in the substantial emission reductions that were relied upon in the alternative program.

35. [Conservation Organizations] Utah arbitrarily assumed that if BART, and not the alternative program, were required at Hunter and Huntington, PacifiCorp would somehow remove the most recently installed LNB from Hunter Unit 3 and emit NOx rates higher than its currently permitted limit. As a result, Utah significantly overstated the overall haze-causing emissions that would occur under the BART benchmark scenario.

Response: Utah never assumed that the emission controls installed on Hunter Unit 3 would be removed as implied by the commenter. The emission limits for Hunter Unit 3 are enforceable under the approval order and operating permit for the unit. The regional haze rule allows credit for emission reductions resulting from measures adopted after the baseline date of the SIP (2002). The installation of low-NOx burners at this unit in 2008 is clearly creditable. Allowing credit for emission reductions due to other measures does not mean that those measures would disappear as implied by the commenter.

36. The Conservation Organizations again employed the services of professional air quality dispersion modeler Dr. Andrew Gray to assess whether the corrected BART scenario would achieve greater reasonable progress than would Utah's BART alternative. Dr. Gray's latest visibility modeling largely used the same emission inputs as Utah. The only major difference between Dr. Gray's modeling and Utah's was the SO2 emission inputs for Carbon Units 1 and 2. Instead of adopting Utah's assumption of uncontrolled SO2 emissions from these units into the future in the Most Stringent NOx scenario, Dr. Gray used SO2 emissions that reflected compliance with MATS (Gray modeling scenario MATS#1 and MATS#2) The only difference between the two scenario's run by Dr. Gray is that the MATS#1 scenario does not allow for a NOx emission reduction credit at Hunter 3 resulting from installation of LNB in 2008. Dr. Gray's modeling results clearly show that Utah's BART alternative will not achieve greater reasonable progress than would operation of SCR. Additionally, visibility actually declines under Utah's BART alternative and thus is in violation of 40 C.F.R. § 51.308(e)(3)(i).

Response: The modeling analysis provided by the commenter did not use the correct emission rate for Carbon Units 1 and 2 to compare the alternative measures to the most stringent NOx controls available. 40 CFR 51.308(e)(2)(i)(C) requires an "analysis of the best system of continuous emission control technology available and associated emission reductions achievable for each source within the State subject to BART and covered by the alternative program." DAQ's analysis complied with this requirement by modeling the emission reductions that would be achieved due to the most stringent NOx controls available, SCR, on the four EGUs that are subject to BART. The commenter included additional emission reductions at Carbon 1 and 2 due to the MATS rule that go beyond BART and therefore significantly overestimated the emission reductions achievable for each source within the State subject to BART. The modeling results were therefore not relevant to the proposal and were not considered.

Alternative to BART Weight of Evidence Standard

37. [Wasatch Clean Air Coalition] We strongly support the current proposed amendment, with the better than BART analysis for NOx that acknowledges the early investment & installation of pollution control at the Hunter Units 1 & 2 and Huntington Units 1 & 2. Utah & the entire region have benefited from the early emission reductions of mercury, PM, SO2 and NOx. These early reductions allowed the discovery that the visibility model over-predicts visibility improvements from NOx reductions. This finding is very important to future regional haze planning.

Response: DAQ agrees that the early reductions have highlighted uncertainties regarding the effect of NOx emission reductions on ammonium nitrate levels during the winter. To improve our understanding of the role of ammonia in formation of ammonium nitrate, DAQ has funded ammonia monitoring at Canyonlands beginning in May, 2014, and we anticipate that this data will be useful in future visibility analyses. The western states are already beginning planning for the next regional haze SIP that is due in 2018, and this issue will be one of many addressed through that process as the states evaluate progress that occurred during the first planning period and develop strategies to achieve progress during the 2018-2028 planning period.

38. [PacifiCorp] EPA described the clear weight of evidence standard as follows: ‘‘Weight of evidence" demonstrations attempt to make use of all available information and data which can inform a decision while recognizing the relative strengths and weaknesses of that information in arriving at the soundest decision possible. Factors which can be used in a weight of evidence determination in this context may include, but not be limited to, future projected emissions levels under the program as compared to under BART, future projected visibility conditions under the two scenarios, the geographic distribution of sources likely to reduce or increase emissions under the program as compared to BART sources, monitoring data and emissions inventories, and sensitivity analyses of any models used. (Emphasis added.) See 71 Fed. Reg. 60,612, 60,622 (Oct. 13, 2006). EPA recently confirmed the availability of the "other alternative measure" based on the "clear weight of evidence" approach in approving a "BART Alternative" under the Arizona regional haze state implementation plan. 80 Fed. Reg. 19220 (April 10, 2015).

Response: The referenced language from EPA's 2006 revisions to the regional haze rule and the Arizona SIP has been added to Section VIII of the Staff Review to further support the use of this approach when evaluating the alternative measures.

39. [PacifiCorp] The Alternative Measure is projected to reduce overall NO_X, SO_2 and PM emissions by 2,856 more tons per year than would be reduced assuming the installation of the most stringent NO_X technology at the most stringent potential NO_X emission limit. EPA has approved, or proposed approval, of other BART Alternatives that included "inter-pollutant trading" when SO_2 levels were lowered. 79 Fed. Reg. 33,438, 33,440-41 (Washington, June 11, 2014); 79 Fed. Reg. 56,322, 56,328 (Arizona, Sept. 19, 2014).

Response: The reference to other EPA approvals has been added as a footnote in Section VII of the Staff Review to provide further support for using a similar approach when evaluating the alternative measures.

40. [PacifiCorp] Based on extensive dispersion modeling using CALPUFF, Utah determined that the Alternative Measure projects better visibility conditions using a number of different metrics, including: (i) better visibility improvement because of the focus on SO_2; (ii) more days of visibility improvement; (iii) better average deciview improvement across Class 1 Areas; and (iii) better 90th percentile average deciview improvement across Class 1 Areas. EPA has proposed approval of an Alternative Measure for the Apache Generating Station in Arizona on similar "weight of evidence" grounds. 79 Fed. Reg. 56,322, 56,327 (Sept. 19, 2014). EPA has also approved a similar Alternative

Measure in Washington based, in part, on a reduction in the number of days of impairment greater than 0.5 dv and 1.0 dv. 79 Fed. Reg. 33,438, 33,440-42 (June 11, 2014).

Response: The citations to EPA's approval of a similar weight of evidence approach has been added as a footnote in Section VIII.B.5 of the Staff Review.

41. [PacifiCorp] Because the BART-eligible Units and the Units covered under the Alternative Program are the same, and because Hunter Unit 3 and Carbon Unit 1 and Unit 2 are in the same general geographic location as the Units, Utah properly concluded that emissions under the Alternative Measure impact "the same general area" as would be impacted by the application of the most stringent NO_X BART surrogate.

Response: Comment noted.

42. [PacifiCorp] The Alternative Program provides emission reductions earlier than required, "providing a corresponding early and on-going visibility improvement." *See* Staff Review, Section VII, page 9. The U.S. Circuit Court of Appeals for the 10th Circuit explicitly acknowledged that the consideration of early reductions was proper as part of a qualitative or clear weight of evidence approach to determining greater reasonable progress. *WildEarth Guardians v. E.P.A.*, 770 F.3d 919, 938 (10th Cir. 2014).

Response: A reference to the Court opinion has been added as a footnote to Section VII.

43. [PacifiCorp] The Alternative Program provides "greater reductions of SO_2, the most significant anthropogenic pollutant affecting Class I areas on the Colorado Plateau that affects visibility year-round…." *See* Staff Review, Section VII, page 9. EPA has approved, or proposed approval, of BART Alternatives on similar grounds. 79 Fed. Reg. at 56,327-28; 79 Fed. Reg. at 33,440-42.

Response: The suggested citations have been added as a footnote to Section VII.

44. [PacifiCorp] In addition, PacifiCorp encourages Utah to specifically recognize that the Alternative Measure includes "non-BART sources" (i.e., Carbon Unit 1 and Unit 2 (PM, NO_X and SO_2) and Hunter Unit 3 (NO_X)). The Tenth Circuit Court recognized non-BART sources as a legitimate factor to consider in a "weight of the evidence" analysis. *WildEarth Guardians v. E.P.A.*, 770 F.3d 919, 935-36 (10th Cir. 2014).

Response: The requested language has been added to section V of the Staff Review.

45. [EPA] In Section VIII.C states that PacifiCorp did not quantify the energy penalty associated with SCR. However, PacifiCorp did quantify the energy penalty in terms of both power (kW) and cost ($/yr) in Appendix A of its August 4, 2014 five factor analysis. Also, it would be helpful if Utah could quantify or, at least expand on, the solid wastes that would be eliminated from the Carbon plant when shutdown.

Response: The following information from PacifiCorp's August 4, 2014 BART Analysis Update has been added to the Section VIII in response to this comment.

PacifiCorp quantified the energy penalty associated with SCR in their August 4, 2014 BART Analysis Update, Appendix A. The energy penalty was included as part of the total cost for installing SCR on each of the units.

	Energy Penalty	
	kW	$/yr
Hunter Unit 1	2,090	$494,247
Hunter Unit 2	2,090	$494,247
Huntington Unit 1	2,182	$516,098
Huntington Unit 2	2,182	$516,098
Total	**8,544**	**$2,020,690**

The Carbon Plant, like most coal-fired power plants, produces solid wastes in the form of fly ash from the ESPs controlling both units, as well as the bottom ash conveyors which clean the residuals from both boilers. This ash is currently being landfilled. The plant also runs water through both steam generating units (the boilers), as well as a pair of cooling towers. This uses water, and has an associated wastewater discharge. Hauling the ash to landfill requires additional fuel use and water or chemical dust suppression for minimization of fugitive dust. Finally, for maintenance and emergency purposes, the plant has a number of emergency generators, fire pumps, and ancillary equipment - all of which must be periodically operated, tested and maintained - with associated air emissions, fuel use, painting, and the like. All of these non-air quality impacts are reduced as the result of the closure of the Carbon Plant.

Modeling Results

46. [EPA] We suggest clarifying in the text that accompanies the data in Table 6 of the staff review, Average Δdeciview across all Class I areas, what it represents and how it was calculated.

Response: The following information has been added to the description of Table 6 in response to this comment. The average impact was calculated by averaging all modeling results for each year and then calculating a three year average from the annual average. The average deciview metric shows the benefit that will be achieved day in and day out in the Class I areas. This information is valuable as part of the overall weight of evidence because reductions in SO_2 and reductions in NOx improve visibility at different times of year. Ammonium sulfate is an issue year round while ammonium nitrate is primarily an issue in the winter. This means that the benefits of SO_2 reductions are more apparent when looking at longer averaging periods while the benefits of NOx reductions are more apparent when looking at the worst days. The average monitoring data shown earlier in this document in Figure 1 illustrates this difference. As can be seen in the figure, ammonium sulfate is the most significant visibility impairing pollutant on average. As explained in Section VIII.A, DAQ has less confidence in the modeled results in the winter when the worst days occur because emission reductions have not led to the expected improvements during that time period.

47. [EPA] Table 8 of the staff review, Average 98th percentile (24th High) across all three years, should show the 22nd high as opposed to the 24th high for the three-year period.

Response: Table 8 has been modified to show the 22nd high as requested.

48. [EPA] Table 9 of the staff review should also include the 98th percentile in the highest year for the base case.

Response: The information has been added to Table 9 as requested.

49. [EPA] Utah should clarify in Section XI that the state has chosen to use a weight of evidence approach under 40 CFR 51.308(e)(2)(i)(E), as described in section VIII of the staff review. We understand that the separate visibility analysis described in section VIII is part of the weight-of-evidence demonstration, and is not intended to provide the type of modeling demonstration that would otherwise be required under 40 CFR 51.308(e)(3).

Response: The following language has been added to Section XI in response to this comment. Utah has chosen to use a weight of evidence approach under 40 CFR 51.308(e)(2)(i)(E), as described in section VIII of the staff review. The separate visibility analysis described in section VIII is part of the weight-of-evidence demonstration, and is not intended to provide the type of modeling demonstration that would otherwise be required under 40 CFR 51.308(e)(3).

50. [NPS] In its 2/13/2015 "Review of 2008 PM Determination and Recommended Alternative to BART for NO_X," UT DAQ presented CALPUFF modeling results in the form of several different metrics. Only Tables 8 and 9 use model results for the 98th percentile (8th highest impact) as required by Appendix Y of the BART Guidelines; the metrics presented in Tables 4-7 do not conform to EPA Guidance.

Response: The comment is incorrect. The alternative to BART is not evaluated through a 5-factor analysis as would occur for a case-by-case BART determination under 40 CFR 51.308(e)(1) using the methodology described in Appendix Y of the BART Guidelines. Instead, a weight of evidence approach is used, as allowed under 40 CFR 51.308(e)(2). The weight of evidence approach allows a broader analysis that is more appropriate for this circumstance where different pollutants that affect visibility at different times of year are compared. EPA further described the weight of evidence approach in the preamble to the 2006 revisions to the regional haze rule. "Weight of evidence demonstrations attempt to make use of all available information and data which can inform a decision while recognizing the relative strengths and weaknesses of that information in arriving at the soundest decision possible." (71 FR 60622)

51. [NPS] Tables 4 & 5 showed that there would be fewer days across the nine Class I areas evaluated when the impact of its BART Alternative exceeded 1.0 and 0.5 deciview (dv), respectively, compared to the impacts of its "Most Stringent NO_x" control scenario. However, this metric does not accurately compare improvements to visibility. For example, if the results of hypothetical Scenario A

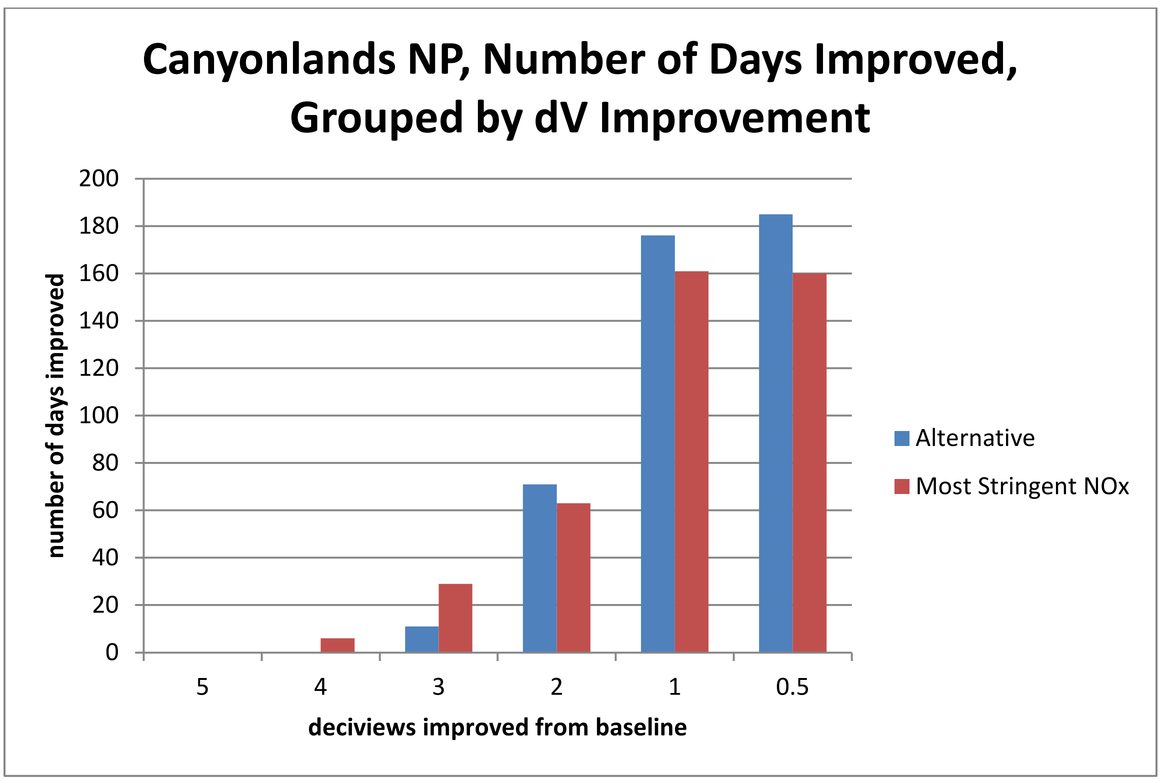
show ten days at 0.9 dv and hypothetical Scenario B show ten days at 0.6 dv, there would be no change in the number of days exceeding either 1.0 or 0.5 dv, even though visibility has improved by 0.3 dv. On the other hand, if the results of Scenario A show ten days at 0.6 dv and Scenario B show ten days at 0.4 dv, the metric would show a greater reduction of ten days above the 0.5 dv metric, even though the amount of visibility improvement is less (0.2 dv versus 0.3 dv). This method cannot be used to compare control strategies because it is too sensitive to the model result versus the metric threshold.

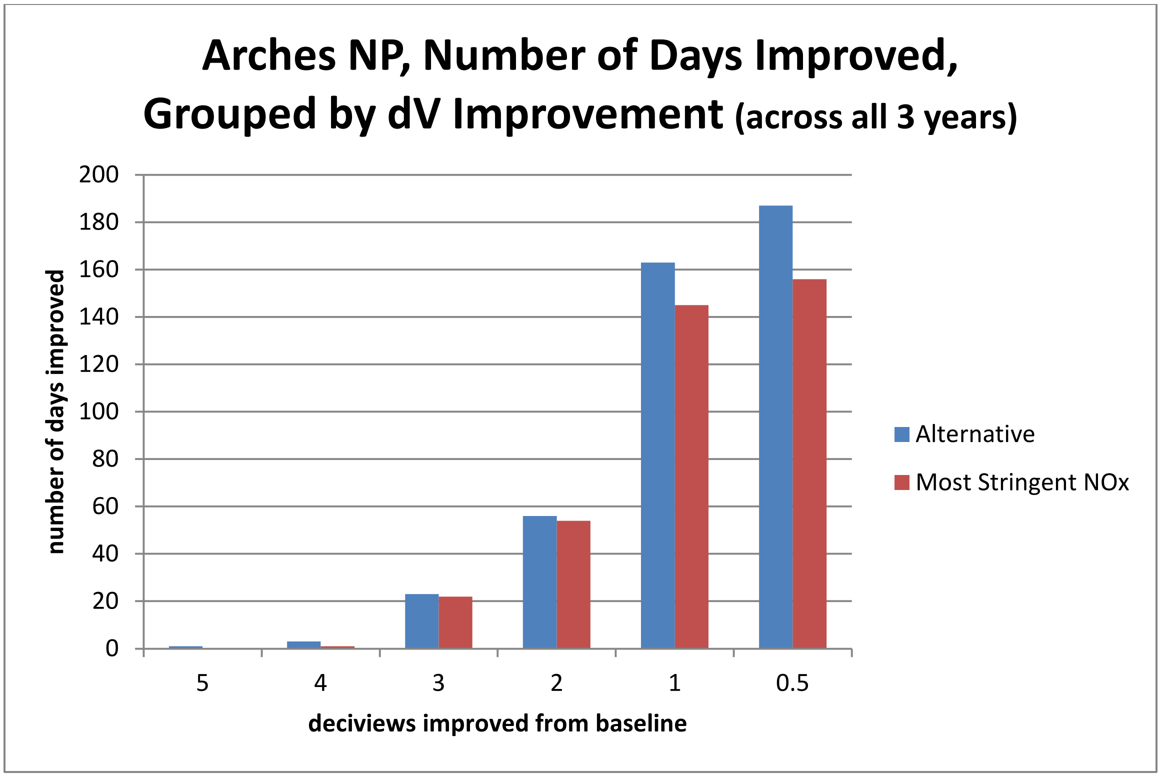
Response: The number of days with an impact of greater than 1.0 dV and 0.5 dV is one of the standard outputs from CALPOST and has been commonly referenced in other BART determinations. However, to address the concerns raised in this comment, DAQ staff evaluated the number of days improved using a different methodology. Instead of focusing on the result (number of days with an impact above a certain threshold) the analysis focused on the improvement (number of days that are improved by a specific amount). The visibility impairment in deciviews for each alternative was subtracted from the basecase impairment for each day in the three year modeling period. The results were then grouped by deciview improvement (any improvement greater than or equal to 4 dV and less than 5 dV was included in the 4 dV category and so on). The following groups were used: 5, 4, 3, 2, 1, 0.5 dV. The following summary tables were added to the Staff Review in response to this comment.

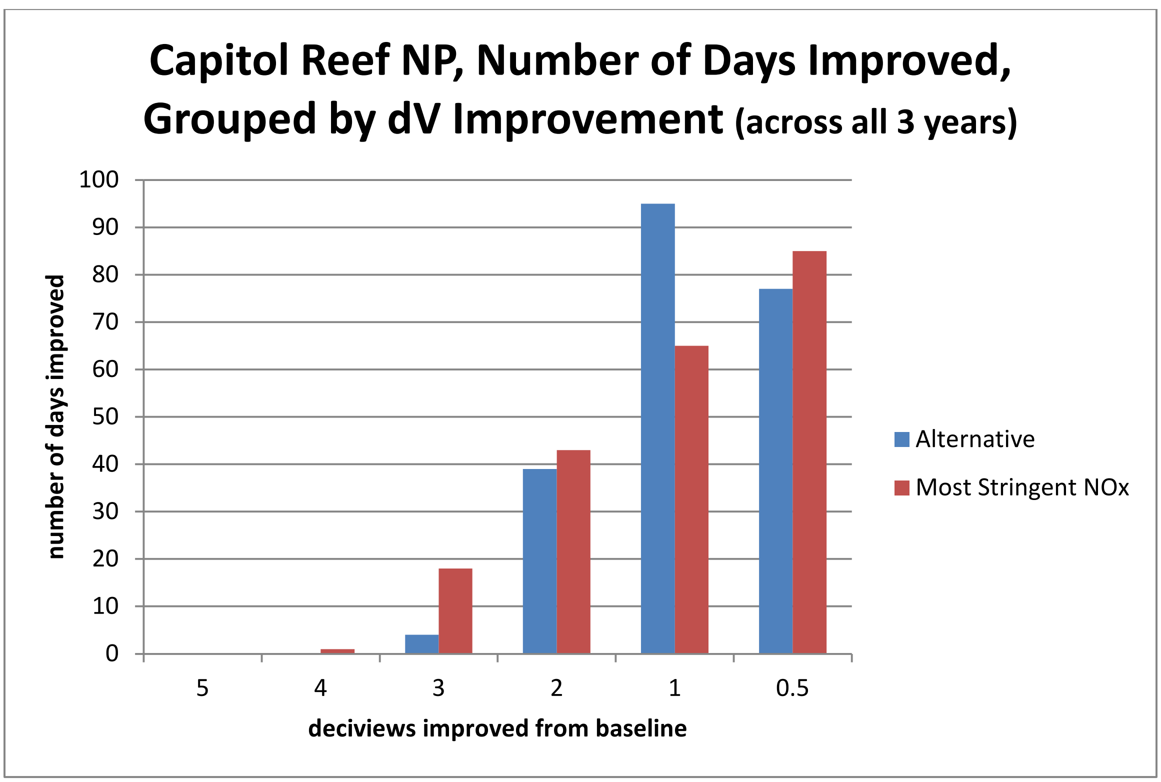
Number of Days that Improved ≥ 0.5 dV impact (across all 3 years)		
	Alternative	Most Stringent NOx Control
Arches	433	378
Black Canyon	138	116
Bryce Canyon	66	62
Canyonlands	443	419
Capitol Reef	215	212
Flat Tops	181	144
Grand Canyon	78	78
Mesa Verde	138	132
Zion	37	34
Total	1729	1575
Number of Days that Improved ≥ 1.0 dV impact (across all 3 years)		
	Alternative	Most Stringent NOx Control
Arches	246	222

Black Canyon	51	43
Bryce Canyon	27	28
Canyonlands	258	259
Capitol Reef	138	127
Flat Tops	63	51
Grand Canyon	33	35
Mesa Verde	51	53
Zion	18	19
Total	885	837

The results are presented in more detail in the following figures for the three most impacted Class I areas: Canyonlands, Arches, and Capitol Reef. Similar figures for the other Class I areas are included in the TSD. The groupings showing dV improvement of 3 or greater are almost all days during the winter months of December – February. The largest number of days improved are found in the 1 dV group and the .5 dV group and contain days throughout the year, including the high visitation period of March – November.







52. [NPS] Table 6 uses an average delta-dv across all Class I areas. This approach has been consistently rejected by EPA because it does not capture the magnitude of the impacts, but, instead, simply dilutes the impact by spreading it across the Class I area. Under this approach, for example, the 4.1

dv (98th percentile) impact at Capitol Reef NP becomes a 0.4 dv impact averaged across Capitol Reef NP. In effect, UT DAQ has artificially diluted an impact that would be clearly perceptible to an impact that is considered imperceptible.

Response: The commenter did not provide references to EPA actions that rejected the use of average visibility values. The alternative to BART was not evaluated through a 5-factor analysis as would occur for a case-by-case BART determination under 40 CFR 51.308(e)(1) using the methodology described in Appendix Y of the BART Guidelines. DAQ used a weight of evidence approach, as allowed under 40 CFR 51.308(e)(2). The weight of evidence approach allows a broader analysis that is more appropriate for this circumstance where different pollutants that affect visibility at different times of year are compared. EPA further described the weight of evidence approach in the preamble to the 2006 revisions to the regional haze rule. "Weight of evidence demonstrations attempt to make use of all available information and data which can inform a decision while recognizing the relative strengths and weaknesses of that information in arriving at the soundest decision possible." (71 FR 60622)

The average impact is only one metric evaluated as part of the broader weight of evidence evaluation. The average deciview metric shows the benefit that will be achieved day in and day out in the Class I areas. This information is valuable as part of the overall weight of evidence because reductions in SO_2 and reductions in NOx improve visibility at different times of year and at different Class I areas. Ammonium sulfate is an issue year round while ammonium nitrate is primarily an issue in the winter. This means that the benefits of SO_2 reductions are more apparent when looking at longer averaging periods while the benefits of NOx reductions are more apparent when looking at the worst days. As described in the response to comment 46, additional text has been added to better describe how the average values were calculated and why they are important.

53. [NPS] Table 7 presents 90th percentile values which have been consistently rejected by EPA. For example, this approach converts a perceptible 1.3 dv (98th percentile) impact at Mesa Verde NP to an imperceptible 0.4 dv impact.

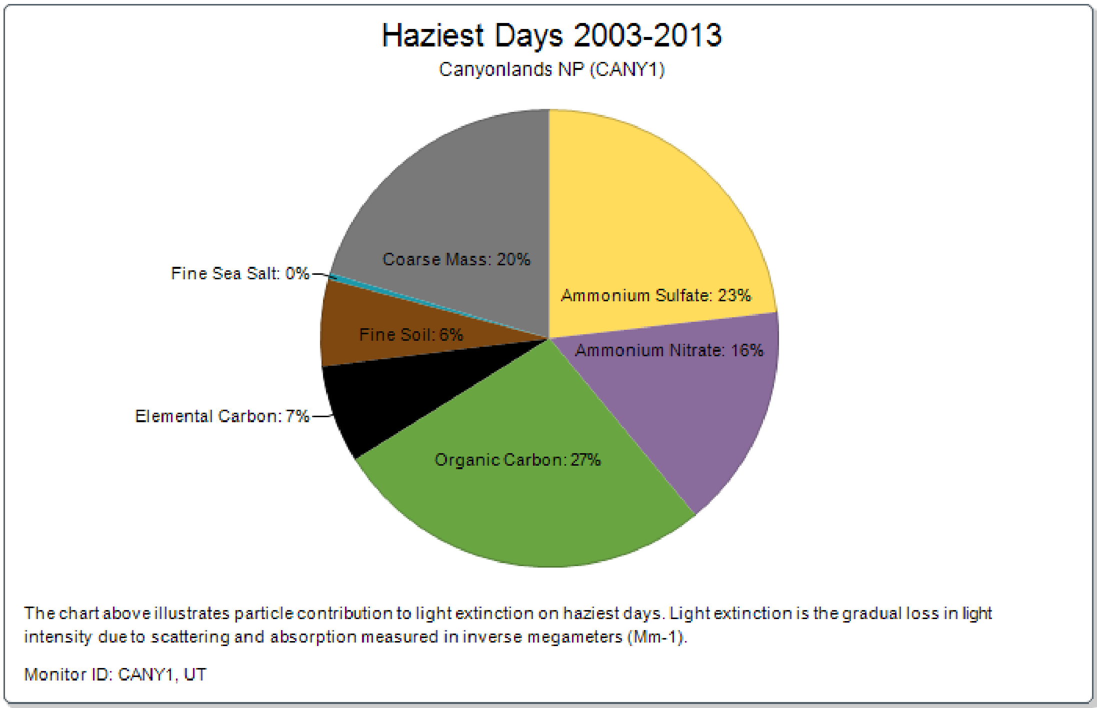
Response: The 90th percentile is only one metric evaluated as part of the broader weight of evidence evaluation. The following text has been added to the document to better describe the usefulness of this metric. "This metric shows that even on higher impact days the benefits of the alternative are comparable to the most stringent NOx scenario. Ammonium sulfate affects visibility year round and also impacts visibility on days with greater impairment. The alternative scenario that contains greater SO_2 reductions achieves comparable results to the most stringent NOx scenario that contains greater NOx reductions on these impaired days.

54. [NPS] The most appropriate comparative statistical metrics consistently used by other states and EPA are the 98th percentile values presented in Tables 8 & 9, both of which show that the cumulative impact of UT DAQ's BART Alternative does not make more reasonable progress than the Most Stringent NO_x scenario. Furthermore, Table 8 shows that UT DAQ's BART Alternative fails this test at seven of nine Class I areas, while Table 9 shows failure at five of nine Class I areas. Thus the UT DAQ BART Alternative does not meet current regulatory "clear weight of evidence" requirements.

Response: The 98th percentile value is only one metric evaluated as part of the broader weight of evidence evaluation. As the commenter noted, this metric shows greater visibility improvement under the most stringent NOx scenario. The weight of evidence analysis is not based on just one metric and instead takes a broader approach to consider multiple metrics, monitoring results, and other factors. The 98th percentile modeled values show greater improvement under the most stringent NOx scenario, while other metrics such as the number of days improved, annual average, and 90th percentile modeled values show greater improvement under the alternative scenario.

The ammonium nitrate impacts are greatest in the winter and therefore the 98th percentile metric is weighted towards wintertime impacts. The Staff Review notes that there is greater uncertainty regarding the effect of NOx reductions on wintertime nitrate values because past emission reductions have not resulted in corresponding reductions in monitored nitrate values during the winter months. Further research is needed to better understand the visibility benefits of NOx reductions and DAQ anticipates that regional modeling for the next RH SIP that is due in 2018 will improve our understanding of this important issue. DAQ has greater confidence in the visibility improvement due to reductions of SO_2 because past reductions have resulted in corresponding reductions in monitored sulfate values throughout the year. The following language has been added to the Staff Review to further explain that the highest impact modeled days do not necessarily correspond to the highest impact monitored days because the model does not include other significant sources of visibility impairing pollutants.

The CALPUFF modeling that is summarized in this document does not include impacts from other significant sources such as wildfire, windblown dust, other stationary sources, and mobile sources. As can be seen in Figure 9, organic carbon (fire) and coarse mass (windblown dust) are greater contributors to haze than ammonium nitrate on the 20% worst days. So, the modeled results do not give a complete picture of the visibility improvements that will be seen by visitors to Class I areas, especially on the worst days that are impacted by other emission sources.



55. [Conservation Organizations] In the table, "98th Percentile in Highest Year", the delta-dV for Capitol Reef under the Most Stringent NO_x scenario was incorrectly listed as 3.39. The correct value should be 4.12. The average delta-dV for all Class I areas was also therefore incorrectly computed for this scenario to be 2.61; the correct average for all Class I areas should be 2.70.

Response: The table has been corrected.

56. [Conservation Organizations] In the final table in Appendix D (showing the 98th percentile delta-dV for all three modeled scenarios for each year and at each Class I area), the modeled 2003 average delta-dV for all Class I areas under the Baseline scenario was incorrectly computed to be 4.156; the correct "Class I Average" delta-dV for 2003 Baseline should be 3.823. The visibility improvements (relative to Baseline) for the Alternative and Most Stringent NO_x scenarios, which are computed as the difference between those scenarios and the Baseline were also therefore incorrectly computed in the table.

Response: The table has been corrected.

Monitoring

57. [NPS] UT DAQ argues that past emission reductions at the four BART EGUs have not resulted in corresponding reductions in monitored nitrate values at Canyonlands NP. Figure 6 in the TSD illustrates that ammonium sulfate levels have decreased in winter months, while ammonium nitrate is trending up in winter months. These nitrate trends do not necessarily lead to the conclusion that additional NO_X controls for the BART sources will not be effective. UT DAQ has not accounted for more ammonium being available to form ammonium nitrate in winter months due to decreases in ammonium sulfate, nor the increase in NO_X emissions (e.g. oil and gas development adjacent to Canyonlands NP) that offset emission reductions. Such an increase in emissions from this source category is all the more reason to obtain NO_X reductions wherever they are technically and economically feasible.

Response: DAQ agrees with the commenter that reductions in available SO_2 will free up ammonium to react with available NOx. This issue was discussed in the 5-factor analysis that was presented to the Board in October 2014. The shift from the formation of ammonium sulfate to ammonium nitrate is important because in ammonia-limited conditions emission reductions may not lead to visibility improvement because there is not enough ammonia available to react with all of the SO_2 and NOx available in the area. The ammonia levels in Southern Utah are very low in the winter as can be seen from ammonia monitoring data from Canyonlands and Navajo Lake in New Mexico. Ammonium nitrate levels are low most of the year and are only significant during the winter months, so if NOx emission reductions do not lead to visibility improvements in the winter, the overall effect may not be as great as expected. Ammonium sulfate, on the other hand, is an issue year round. For this reason, DAQ has more confidence that reductions in SO_2 will lead to real visibility improvement. The improvements due to NOx reductions are more uncertain. To better explain the issue, information from the proposed 5-factor analysis has been added to the Staff Review in response to this comment.

DAQ also considered the effect of changes in NOx emission from other sources in the region as a possible explanation for the increase in ammonium nitrate levels. A discussion about regional NOx emissions was included in the 5-factor analysis that was presented to the Board in October 2014 and has been added to the Staff Review in response to this comment. NOx emissions are decreasing significantly at other EGUs in the area. Mobile source NOx emissions are decreasing nationwide due to implementation of the Tier 1 and Tier 2 emission standards and should continue to be reduced through the implementation of Tier 3 emission standards. Oil and gas emissions are increasing in some areas, and this was considered as a possible impact, but the overall scale of the emission increase is small when compared to the decrease in emissions from EGUs in the region.

The largest increase in NOx emissions is occurring in the Uinta Basin, located to the north of Utah's Class I areas. It is worth noting that during the winter months when ammonium nitrate levels are increasing at Canyonlands, a significant portion of the Uinta Basin emissions are trapped under a tight inversion layer throughout much of the winter. Extensive research through the multi -year Uinta Basin Ozone Study (UBOS) has indicated that there is little exchange between the air below and above the inversion layer when an inversion is in place. The emissions are transported out of the Uinta Basin during significant storm events that break up the inversion. These storm events affect the entire region and are unlikely to transport significant emissions to nearby Class I areas. DAQ is currently working with EPA, the Ute Tribe, and producers in the Uinta Basin to improve the oil and gas inventory.

The fact that ammonium nitrate levels are decreasing during most of the year, but are increasing during the winter is the best indication that the increase in ammonium nitrate is not due to changes in emissions because the emission changes are not seasonal. If emissions were increasing the effect should be seen year round.

58. [EPA] We understand that Utah may consider additional ammonia monitoring information and conduct further analysis. As that information and analysis are not available, we have not included comments on these issues; and we welcome the opportunity to provide comments in the future.

Response: DAQ has added additional information regarding the potential effects of ammonia limiting conditions to the Staff Review in response to comment 57. The purpose of the discussion of ammonia is to explain why DAQ has more confidence in the effect of SO_2 reductions. Regional photochemical modeling for the next regional haze SIP that is due in 2018 will provide a more in depth opportunity to examine the effect of NOx reductions during the winter. DAQ looks forward to working with EPA in the future to better understand this issue.

Alternative to BART – Timing of Reductions

59. [PacifiCorp] Utah properly included in the SIP Revision a requirement that the emissions reductions associated with the Alternative Measure "take place during the period of the long-term strategy for regional haze." Noting that the end of the period of the long-term strategy will take place in 2018, Utah concludes that the Alternative Measure "will be fully implemented prior to 2018" in satisfaction of this requirement. By including the Alternative Program requirements in SIP Section IX, Parts H.21 and H.22, Utah also assured that enforceable emission limits, administrative and technical procedures for implementing the Alternative Measure, and rules for accounting and monitoring emissions, and procedures for enforcement are included in the SIP Revision.

Response: Comment noted.

60. [PacifiCorp] Because the applicable rule requires that emission reductions associated with the Alternative Measure "take place during the period of the long-term strategy for regional haze" which does not end until 2018, PacifiCorp questions whether the August 15, 2015 closure deadline proposed by Utah is appropriate. Instead, PacifiCorp believes that it is more appropriate for Utah to require closure of the Carbon Plant for purposes of the Revised SIP on a date that is no later than the end of "the period of the long-term strategy for regional haze." This approach is consistent with PacifiCorp's December 22, 2014 comment letter (pages 6 – 7).

Response: DAQ has carefully considered when to make the closure of the Carbon Plant enforceable in light of the possibility that the Supreme Court could overturn or stay the MATS rule later this year. The Carbon Plant was closed on April 14, 2015 due to the difficulty and expense of complying with the MATS rule, but the plant could legally be reopened under its existing operating permit if the MATS rule were overturned. DAQ recommended making the closure effective under the RH SIP on August 15, 2015. This date was chosen because it was shortly after the date when the rule would become effective and the requirement could not be retroactive under Utah's rules. After considering PacifiCorp's comment, DAQ still recommends making the closure enforceable on August 15, 2015. The alternative measures were determined to provide greater reasonable progress than BART in part based on the early reductions that have been achieved under Utah's RH SIP. No change has been made to the proposal as a result of this comment.

Alternative to BART – Emission Reductions Surplus

61. [PacifiCorp] ***§51.308(e)(2)(vi)*** – Utah properly concluded that the NO_X, SO_2 and PM emissions reductions resulting from the retirement of Carbon Unit 1 and Unit 2, and the NO_X emission reductions resulting from Hunter Unit 3, "are surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP." Because Utah determined the baseline date of the SIP to be 2002, and because the emission reductions associated with Carbon Unit 1 and Unit 2, and Hunter Unit 3, will occur after that date, the resulting emission reductions satisfy the surplus requirement. *See* Staff Review, Section X, pages 20 - 22. Utah's actions here are consistent with EPA's actions in other states. *See e.g.,* 79 Fed. Reg. at 33,441-42; 79 Fed. Reg. at 56,328.

Response: The references to EPA's actions in other states have been added as footnote in section X of the Staff Review.

62. [EPA] Include in the documentation whether or not reductions at the Carbon power plant are necessary for other states' Class I areas to meet their reasonable progress goals. That is, describe whether or not the WRAP assumed any reductions from Carbon for the 2018 preliminary reasonable progress inventory.

Response: The following information has been added to the Staff Review. The WRAP compiled regional inventories and completed regional modeling to support the development of RH SIPs in the western states. For all of these analyses, WRAP assumed continued operation of the Carbon plant. There were two projected inventories that were used by western states depending on when their SIPs were completed: PRP18a and PRP18b. These inventories assumed BART emission reductions from Hunter Units 1 and 2 and Huntington Units 1 and 2 based on the presumptive BART emission rate established in 40 CFR Part 51 Appendix Y, or actual emissions if lower. As can be seen in the following table, the NOx emissions from the Carbon plant (shown as reductions in the 4th column) are comparable to the WRAP projected inventories while the SO_2 emissions were about 1,200 tons higher than the WRAP projected inventory. However, current SO_2 emissions for the Hunter and Huntington Plant are lower than had been projected so when SO_2 emissions from all 3 plants are combined the total is less than had been projected by the WRAP. The last column in the table shows that even if the emission reductions from the Carbon Plant and Hunter 3 are excluded, the NOx, SO_2, and PM_{10} emissions are lower than the WRAP projected inventories. The emission reductions from the Carbon Plant and Hunter 3 were not necessary for other states to meet their reasonable progress goals and therefore provide an added benefit for other states.

NOx	PRP18a	PRP18b	Alternative	Reductions Carbon and Hunter 3	Alternative with Reductions Excluded
Carbon	3,366	3,366	0	3,348	3,348
Hunter	15,331	16,503	11,446	1,908	13,354
Huntington	8,251	8,559	7,437		7,437
Total	26,947	28,429	18,883	5,256	24,139

SO_2	PRP18a	PRP18b	Alternative	Reductions Carbon and Hunter 3	Alternative with Reductions Excluded
Carbon	6,824	6,824	0	8,005	8,005
Hunter	6,109	6,350	4,091		4,091
Huntington	3,811	3,955	2,355		2,355
Total	16,744	17,129	6,446	8,005	14,451

PM_{10}	PRP18a	PRP18b	Alternative	Reductions Carbon and Hunter 3	Alternative with Reductions Excluded
Carbon	221	221	0	573	573
Hunter	1,049	1,049	460		460
Huntington	654	654	376		376
Total	1,924	1,924	836	573	1,409

Combined	PRP18a	PRP18b	Alternative	Reductions Carbon and Hunter 3	Alternative with Reductions Excluded
Carbon	10,411	10,411	0	11,926	11,926
Hunter	22,489	23,903	15,997	1,908	17,905
Huntington	12,716	13,169	10,168	0	10,168
Total	45,615	47,482	26,165	13,834	39,999

63. [EPA] We suggest further clarification regarding the state's intent regarding regional haze SIP shut down requirements for the Carbon power plant. We suggest such clarification in light of the discussion included in this section related to the challenges to the EPA's MATS rule before the Supreme Court.

Response: Section X of the staff review has been revised to include the following language: "An enforceable requirement is included in Section IX.H.22 of the SIP to make enforceable the permanent closure of the Carbon Plant by August 15, 2015. This provision will ensure that the substantial emission reductions that are relied upon as part of the alternative strategy will occur if the MATS rule is overturned or delayed."

64. [Conservation Organizations] It is worth noting that each SIPs long-term strategy already must account for emissions reductions expected to be achieved under other CAA requirements. EPA requires that, in developing reasonable progress goals, States should include all air quality improvements that will be achieved by other programs and activities under the CAA and any State air pollution control requirements. Therefore, any reasonable progress goal for a Class I area should reflect at least the rate of visibility improvement expected from the implementation of other 'applicable requirements' under the CAA during the period covered by the long-term strategy." 1999 Regional Haze Rule, 64 Fed. Reg. at 35,733. Allowing state to take credit for any such "applicable requirements" under the CAA in lieu of BART would effectively nullify any reasonable progress requirements over and above BART.

Response: BART is an independent requirement that must be evaluated according to the provisions established in the regional haze rule. The reasonable progress demonstration then accounts for the emission reductions due to BART as well as all other known emission reductions at the time of the demonstration. As described in the response to comment 62, the significant emission reductions due to Utah's 2008 BART determination were included in WRAP's PRP18 and PRP 18b inventories. As further described in the response to comment 62, the additional emission reductions due to the closure of the Carbon Plant and the installation of low-NOx burners on Hunter Unit 3 were not included in those inventories and will provide an even greater reduction in emissions.

The commenter also fails to consider the specific language in 40 CFR 51.308(e)(2)(iv) that allows measures adopted after the baseline date of the SIP (2002 for regional haze purposes) to be accounted for in the alternative measure.

65. [NPS, Conservation Organizations] In modeling the impacts of the "Most Stringent NOx" control scenario and the UT BART Alternative for NOx, UT DAQ had to include SO_2 and PM emissions in addition to NOx emissions from each facility to account for interactions among pollutants and total impacts. However, SO_2 reductions statewide are already being credited under Utah's 2003 Regional Haze SIP and the 40 CFR 51.309 SO_2 Milestone program. Crediting the same SO2 emissions under UT DAQ's NOx BART Alternative appears to be double-counting.

Response: As described in the Staff Review, Utah met the BART requirement for SO_2 as provided under 40 CFR 51.309(d)(4) through the establishment of SO_2 emission milestones with a backstop regulatory trading program to ensure that SO_2 emissions in the three-state region of Utah, Wyoming, and New Mexico decreased substantially between 2003 and 2018. The final SO_2 milestone in 2018 was determined to provide greater reasonable progress than BART and the overall RH SIP was deemed to meet the reasonable progress requirements for Class I areas on the Colorado Plateau and for other Class I areas. The modeling supporting the RH SIP included regional SO_2 emissions based on the 2018 SO_2 milestone and also included NOx and PM emissions from the Carbon Plant. Actual emissions in the three-state region are calculated each year and compared to the milestones. The 2018 milestone was met seven years early in 2011, and SO_2 emissions have continued to decline. The most recent milestone report for 2013 demonstrates that SO_2 emissions are currently 26% (36,765 tons) lower than the 2018 milestone. For comparison purposes, SO_2 emissions from the Carbon Plant are around 8,000 tons SO_2.

Since 2013 (the most recent year evaluated in the milestone reports), DAQ has not issued any new approval orders that would significantly increase SO_2 emissions, and the Utah $PM_{2.5}$ SIP that was adopted in December 2013 requires further reductions in $PM_{2.5}$ precursors, including SO_2. DAQ is not aware of any significant new sources of SO_2 in Wyoming or New Mexico since 2013 that would increase SO_2 emissions and the commenter has not provided any information that would indicate that SO_2 emissions will increase between now and 2018. The Carbon Plant was fully operational in the years 2011-2013 when the 2018 milestone was initially achieved for those years. Therefore the SO_2 emission reductions from the closure of the Carbon Plant are surplus to what is needed to meet the 2018 milestone established in Utah's RH SIP.

66. [NPS, Conservation Organizations] DAQ modeled the Carbon Plant (which is not BART-eligible) in its Most Stringent NO_X scenario with no additional SO_2 controls despite the Mercury and Air Toxics Standard (MATS) that requires that the Carbon Plant meet an SO_2 limit of 0.2 lb/mmBtu (on a 30-day rolling average) by 4/15/2015 in lieu of controlling hydrochloric acid emissions. The Most Stringent NOx scenario and the BART Alternative should have been modeled as conforming to the MATS rule (using the same emissions for both scenarios). Modeling the current regulatory requirements would result in about 450 lb SO_2/hr emitted instead of the 3,000+ lb SO_2/hr modeled by UT DAQ in its Most Stringent NO_x scenario. Had UT DAQ modeled the allowable MATS SO_2 emissions for the Carbon Plant, for both scenarios to eliminate the double-crediting of SO_2 reductions, the impacts of its Most Stringent NO_x scenario would have been significantly lower, and the impacts of the BART Alternative would have been higher, thus shifting the weight of evidence even more in favor of the Most Stringent NO_x scenario and away from the UT DAQ NO_X BART Alternative.

Response: 40 CFR 51.308(e)(2)(iv) establishes the criteria for when emission reductions due to other requirements may be included as part of an alternative measure. This section requires "a demonstration that the emission reductions resulting from the alternative measure will be surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP. " EPA discussed this issue when the alternative to BART requirements were proposed on August 1, 2005.

> "In some cases, emission reductions required to fulfill CAA requirements other than BART…may also apply to some or all BART eligible sources. In such a situation, a State may wish to determine whether the reductions thus obtained would result in greater reasonable progress than would the installation and operation of BART at all sources subject to BART which are covered by the program." One prominent example is CAIR. " CAIR would result in emission reductions surplus to CAA requirements as of the baseline date of the SIP defined as 2002 for regional haze purposes), we determined that it was appropriate to treat participation in this program as a potential means of satisfying BART requirements for that source sector." "EPA is…simply allowing States, at their option, to utilize the CAIR cap and trade program as a means to satisfy BART for affected EGUs. This same reasoning would be applicable whenever any requirement other than BART defines the emission reductions requited by the alternative program." (70 FR 44161)

The MATS rule was proposed on May 3, 2011 and finalized on December 21, 2011. Because this requirement occurred well after the 2002 base year for Utah's regional haze SIP, it is clearly surplus and may be credited as part of the alternative program in the same way that CAIR (and later CSPAR) was credited as an alternative to BART. The following language has been added to section X of the Staff Review to provide a more complete explanation: "To make a valid comparison that the "alternative measure will be surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP" as required by 40 CFR 51.308(e)(2)(iv) the most stringent NOx scenario includes measures required before the baseline date of the SIP, but does not include later measures that are credited as part of the alternative scenario."

67. [Conservation Organizations] Utah admits that "PacifiCorp could choose to meet the MATS requirements through other measures…" than retirement. Thus, Utah admits that: 1) had PacifiCorp continued to operate the Carbon plant, it would have had to meet MATS requirements; and 2) PacifiCorp would have had to implement "other measures" (i.e., SO_2 pollution controls) to continue operating. Despite these admissions, Utah's emission reduction analysis and visibility modeling use false and inflated SO_2 emission data from 2012-2013 that ignores the admitted SO_2 emission reductions that would have to occur for Carbon to operate into the future. As such, Utah's emission reduction analysis and visibility modeling is inaccurate, and has no basis in reality.

Response: As described in the response to comment 66, the MATS rule was adopted after the 2002 base year of Utah's RH SIP and therefore any emission reductions due to the implementation of the MATS rule are fully creditable under an alternative program. The discussion regarding PacifiCorp's options under the MATS rule addresses the need to make the closure of the Carbon Plant enforceable. The plant is currently closed, but there are no enforceable requirements under Utah's rules that would prevent PacifiCorp from reopening the plant. If the Carbon Plant were to reopen, then PacifiCorp would be required to fully comply with the MATS rule. If the MATS rule is overturned or delayed by the Supreme Court, PacifiCorp could reopen the plant without any changes to their operation. This is why the enforceable requirement has been added to Section IX, Part H.22. Language has been added to section X.B of the Staff Review to further clarify the need for an enforceable requirement to permanently close the Carbon plant.

68. [Conservation Organizations] Utah incorrectly states that PacifiCorp was under no enforceable requirement to permanently close and retire the Carbon units. This statement is factually inaccurate for a number of reasons. First, the requirement to permanently retire Carbon Units 1 and 2 by April 15, 2015 was made enforceable through public service commission filings in several states. The commenter cites several PSC filings. Accordingly, the Carbon retirement (and corresponding emission reductions) is currently enforceable and statements to the contrary in Utah's latest RH SIP are factually and legally erroneous.

Response: PSC filings and orders address cost recovery and are not enforceable under Utah air quality statutes. The closure of the Carbon Plant must be made enforceable through Utah's SIP and through the rescission of the operating permit for the facility before Utah can rely on this closure as part of the alternative program. The enforceable requirement is therefore retained in Section IX.H.22 of the SIP.

69. [Conservation Organizations] Even if PacifiCorp had elected to operate the Carbon units in violation of MATS, the CAA authorizes either EPA or citizens to seek injunctive relief requiring closure of the units or compliance with the MATS emission limits. Thus, Utah's assumption that these units could have defied the law in perpetuity is arbitrary and capricious.

Response: The process outlined by the commenter could occur but has not yet occurred. DAQ could not rely on the possibility of a citizen challenge that would potentially be successful at some uncertain date in the future. The closure of the Carbon Plant must be made enforceable through Utah's SIP and through the rescission of the operating permit for the facility before Utah can rely on this closure as part of the alternative program. The enforceable requirement is therefore retained in Section IX.H.22 of the SIP.

70. [PacifiCorp] Hunter Unit 3 installed LNB/OFA in 2008. Although the 1990 Clean Air Act Amendments include provisions for reducing NO_x emissions, no specific actions were required at Hunter Unit 3. Under the 1990 CAA, Hunter Unit 3 was classified as a "Phase II" unit and required to meet an annual 0.46 lb/MMBtu emission rate by 2000.

Response: DAQ agrees. The Phase II emission limit of 0.46 lb/MMBtu was an enforceable requirement in the approval order for Hunter Unit 3 prior to the modification in 2008 that allowed installation of low NOx burners with the current NOx emission limit of 0.26 lb/MMBtu heat input for a 30-day rolling average.

71. [Conservation Organizations] Similar to the Carbon plant, Utah's projected emission reduction analysis assumes, under the Most Stringent NOx scenario, that Hunter Unit 3 could emit NOx emissions without operating its 2008 low-NOx burners and the corresponding permitted emission limit. There is no evidence supporting Utah's assumption that PacifiCorp plans to, or could, remove its 2008 LNBs and defy the corresponding already-permitted NOx emission limit. Accordingly, the assumptions used in Utah's projected emission reduction analysis have no factual support in the

> administrative record, are arbitrary, capricious, and contrary to law. In fact, when the proper post-2008 Hunter 3 NOx emission reductions are included in the "Most Stringent NOx" scenario, it becomes clear that Utah's BART alternative does not result in greater emission reductions, or greater reasonable progress, than would installation of SCR BART controls on the Hunter and Huntington BART units.

Response: The commenter is incorrect. DAQ does not assume that Hunter 3 could operate in violation of its permit. DAQ does account for creditable emission reductions as allowed by the regional haze rule. 40 CFR 51.308(e)(2)(iv) establishes the criteria for when emission reductions due to other requirements may be included as part of an alternative measure. This section requires "a demonstration that the emission reductions resulting from the alternative measure will be surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP. " EPA discussed this issue when the alternative to BART requirements was proposed on August 1, 2005.

> "In some cases, emission reductions required to fulfill CAA requirements other than BART…may also apply to some or all BART eligible sources. In such a situation, a State may wish to determine whether the reductions thus obtained would result in greater reasonable progress than would the installation and operation of BART at all sources subject to BART which are covered by the program. " One prominent example is CAIR. " CAIR would result in emission reductions surplus to CAA requirements as of the baseline date of the SIP defined as 2002 for regional haze purposes), we determined that it was appropriate to treat participation in this program as a potential means of satisfying BART requirements for that source sector." "EPA is…simply allowing States, at their option, to utilize the CAIR cap and trade program as a means to satisfy BART for affected EGUs. This same reasoning would be applicable whenever any requirement other than BART defines the emission reductions required by the alternative program." (70 FR 44161)

The installation of low-NOx burners with an emission limit of 0.26lb/MMBtu heat input for a 30-day rolling average was included in the approval order for Hunter Unit 3 in 2008. Because this requirement occurred well after the 2002 base year for Utah's regional haze SIP it is clearly surplus and may be credited as part of the alternative program in the same way that CAIR (and later CSPAR) was credited as an alternative to BART. The following language has been added to section X of the Staff Review to provide a more complete explanation. "To make a valid comparison that the "alternative measure will be surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP" as required by 40 CFR 51.308(e)(2)(iv) the Most Stringent NOx scenario includes measures required before the baseline date of the SIP, but does not include later measures that are credited as part of the alternative scenario." Further clarifying language stating that the emission reductions at Hunter Unit 3 are clearly surplus under 40 CFR 51.308(e)(2)(vi) has been added to Section X.C of the Staff Review.

Cost

72. [PacifiCorp] PacifiCorp also notes that the Alternative Measure not only produces greater reasonable progress, including lower emissions and improved visibility, but it does so at a capital cost savings to PacifiCorp and its customers of over $700 million as compared to the most stringent NO_X technology and limits. The importance of this cannot be overstated. In other words, the Alternative Measure achieves better visibility improvements than would be achieved by requiring SCR as BART at the Units, and at a significantly lower cost. This presents a classic "win/win" scenario – visibility proponents win because the Alternative Measure results in greater reasonable progress and PacifiCorp customers win because that greater reasonable progress is achieved at a much lower price compared to SCR.

Response: The following discussion of the cost savings has been added to the weight of evidence discussion in the Staff Review in response to this comment.

PacifiCorp noted in their comments on the proposed SIP revision that the Alternative Measure not only produces greater reasonable progress, including lower emissions and improved visibility, but it does so at a significant capital cost savings to PacifiCorp and its customers as compared to the most stringent NO_X technology and limits. While DAQ has not officially determined the cost of installing SCR on the four units, it is clear that it would be a significant cost. On the other hand, the Carbon Plant has already been closed due to the high cost of complying with the MATS rule. The costs to Utah rate payers (and those in other states served by PacifiCorp) to replace the power generated by the Carbon Plant have already occurred; there will be no additional cost to achieve the co-benefit of visibility improvement. In other words, the Alternative Measure achieves better visibility improvements than would be achieved by requiring SCR as BART at the four EGUs, and at a significantly lower cost. This presents a classic "win/win" scenario –the Alternative Measure results in greater reasonable progress and that greater reasonable progress is achieved at a much lower price compared to SCR. Cost is one of the factors listed in section 169A(g)(2) that should be considered when determining BART.

73. [PacifiCorp] Some of the information contained in PacifiCorp's July 12, 2012 letter to EPA regarding system-wide impacts, which also is included among the Technical Support documents, is no longer current, and as such PacifiCorp requests that the Division not rely on that letter for purposes of the SIP Revision.

Response: The July 12, 2012 letter has been removed from the TSD as requested. DAQ notes, however, that the broader issue of system-wide impacts is still valid and would be a consideration in a 5-factor analysis. Because Utah has chosen to use an alternative to BART approach under 40 CFR 51.308(e)(2), the 5-factor analysis that was proposed in October 2014 was not finalized.

74. [Individual] Rocky Mountain Power complains that it would cost $170M/unit to upgrade these two plants and that the upgrades would result in "substantial expense to consumers". Not true! The $340M cost to upgrade those two plants would result in a one-time charge to each of RMP's 1.7M customers of only $200! If spread over time - 10 years, for example - the charges would be insignificant and unnoticed by RMP's ratepayers.

Response: Because Utah has chosen to use an alternative to BART approach under 40 CFR 51.308(e)(2) the 5-factor analysis that was proposed in October 2014 was not finalized. Therefore a final cost was not determined. However, while there may be different estimates of the final cost of installing SCR, all of the estimates show that there is a significant cost to install these controls. As noted by PacifiCorp in comment 72, the alternative provides a win/win situation because the benefits are achieved without the additional expense of post-combustion controls. The costs to Utah rate payers and those in other states served by PacifiCorp to replace the power generated by the Carbon Plant have already occurred; there will be no additional cost to achieve the co-benefit of visibility improvement.

75. [NPS] In its August 2014 BART update submittal, PacifiCorp noted that SCR can achieve 0.05 lb/mmBtu on an annual average basis, but used 0.07 lb/mmBtu in its cost-effectiveness calculations; underestimation of the potential emission reductions biases the cost-effectiveness analysis against SCR. UT DAQ assumed that these EGUs would meet 0.05 lb/mmBtu on an annual average.

Response: Because Utah has chosen to use an alternative to BART approach under 40 CFR 51.308(e)(2) the 5-factor analysis that was proposed in October 2014 was not finalized. Therefore a final cost/ton of NOx reduced was not finalized. This comment is not relevant to the current proposal.

76. [NPS] The commenter disagreed with the cost assumptions that PacifiCorp provided regarding the cost of installing SCR. The commenter cited a number of instances in the analysis where they believed the costs were overestimated. The commenter estimated the average cost-effectiveness of LNB/OFA + SCR = $2,800 - $3,000/ton of NO_x removed, and the incremental cost of adding SCR to LNB/OFA = $4,300 - $5,300/ton. These estimates are in the range of cost-effectiveness values accepted by many states and by EPA. BART is not necessarily the most cost-effective solution. Instead, it represents a broad consideration of technical, economic, energy, and environmental (including visibility improvement) factors. It appears that $4,000 - $8,000/ton represents the typical range of cost/ton thresholds. In this context, both the PacifiCorp and NPS cost estimates for SCR appear cost-effective.

Response: Because Utah has chosen to use an alternative to BART approach under 40 CFR 51.308(e)(2) the 5-factor analysis that was proposed in October 2014 was not finalized. Therefore a final cost/ton of NOx reduced was not finalized. However, while there may be different estimates of the final cost of installing SCR, all of the estimates show that there is a significant cost to install these controls. As noted by PacifiCorp in comment 72, the alternative provides a win/win situation because the benefits are achieved without the additional expense of post-combustion controls. The costs to Utah rate payers and those in other states served by PacifiCorp to replace the power generated by the Carbon Plant have already occurred; there will be no additional cost to achieve the co-benefit of visibility improvement.

77. [Conservation Organizations] Our previous comment letter provided cost estimates for Hunter Units 1 and 2 and Huntington Units 1 and 2 demonstrating that SCR on these units would be very cost effective. The control costs are also significantly lower than those EPA has found reasonable in other states. Specifically, the cost effectiveness of SCR on these units is in the range of $2,222-2,276/ton of NOx removed[5]. The cost effectiveness for SCR on these units is much less than at other coal units in the west where EPA has required SCR as BART.

Response: Because Utah has chosen to use an alternative to BART approach under 40 CFR 51.308(e)(2) the 5-factor analysis that was proposed in October 2014 was not finalized. Therefore a final cost/ton of NOx reduced was not finalized. However, while there may be different estimates of the final cost of installing SCR, all of the estimates show that there is a significant cost to install these controls. As noted by PacifiCorp in comment 72, the alternative provides a win/win situation because the benefits are achieved without the additional expense of post-combustion controls. The costs to Utah rate payers and those in other states served by PacifiCorp to replace the power generated by the Carbon Plant have already occurred; there will be no additional cost to achieve the co-benefit of visibility improvement.

Section XX.D.6 SIP Language

78. [PacifiCorp] PacifiCorp suggests that Utah remove the word "existing" from SIP Section XX.D.6.c because the "existing" technology referred to by Utah no longer exists. This is because, as noted in the Staff Review at page 4, the first generation LNB technology already has been replaced with Alstom TSF 2000TTM LNBs, including the installation of two elevations of separated overfire air, which results in even greater NO_x emission reductions.

Response: The word existing has been removed.

79. [EPA] Section 6.d., BART Summary, p. 25-26: BART emission "rates" should be referred to as emission "limits" in the discussion preceding Table 5 and in the Table 5 title. Also the averaging period for each emission limit included in Table 5 should be specified. In Section 6.e., BART emission "rates" should be referred to as emission "limits."

Response: The correction has been made as requested.

80. [EPA] The discussion in Section 6.d. and the information in Table 5 includes information about the four Hunter and Huntington units meeting the presumptive limits; and since it is not germane to SIP analysis and demonstration, we recommend removing it.

Response: DAQ disagrees with the commenter. The fact that the four EGUs meet the presumptive limits for NOx established by EPA in 40 CFR Part 51, Appendix Y, independently of the alternative measures is important because the alternative was not intended to exempt these units from any emission reduction requirements, as implied by other commenters. Instead, the alternative achieves

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[5] The cost estimates included in the commenter's previous letter regarding the October 2014 proposal were average costs that include the installation of low-NOx burners with overfire air that has already been installed on the four EGUs rather than the incremental cost to install SCR.

the presumptive emission rate and also achieves greater reasonable progress than the most stringent NOx technology. DAQ believes that meeting both requirements strengthens the alternative approach for both NOx and SO_2.

Part H Enforceable Limitations

81. [PacifiCorp, EPA] The NOx emission limit associated with Hunter Unit 3 appears to have been inadvertently left out of SIP Section IX.H.22.a.

Response: DAQ agrees with this comment. The missing NOx emission limit will be included in SIP Section IX.H.22.a. For reference, this limit is as follows:

iii NOx Limitation on Unit #3

A. Emissions of NOx shall not exceed 0.34 lb/MMBtu heat input for a 30-day rolling average.
B. Measuring of all NOx emissions shall be performed by CEM.

82. [EPA] H.21.f.i.A., B., and C., p. 2: Please replace "or other EPA-approved methods acceptable to the Director" in all three places with "or the most recent version of the EPA-approved test method if approved by the Director."

Response: DAQ agrees with this comment with reservations. The original intent of the language quoted by the commenter was to allow for the use of an alternative testing method in the event that such proved necessary to obtain more accurate emissions data for a particular pollutant. For example, the current reference method for determination of back-half condensable particulate emissions is Method 202. This method cannot be used when a source has a "wet stack" or one is which water droplets are present. The fallback testing method is typically to use reference Method 5 and estimate condensable emissions based on emission factors. Yet this methodology comes with an obvious loss of accuracy.

Although DAQ does not anticipate or expect that any alternatives to the testing methods listed in SIP Section IX.H.21 will be required for the limited number of sources listed in Section IX.H.22, the original intent remains the same. While it could be argued that a larger list of alternative test methods could be included in Section IX.H.21, DAQ cannot anticipate every possible alternative or new testing methodology that might be developed over the lifetime of the SIP. Through the removal of the word "other" in its suggested language, the commenter does not allow for alternatives to the existing choices listed in IX.H.21. Instead, the suggested language only allows for the most recently approved version of those same test methods already listed in Section IX.H.21.

However, given that the sources listed in Section IX.H.22 of the SIP represent only one type of source (coal-fired boilers), all owned and operated by a single entity; and given that these sources have existed for a number of years, with a long history of established emission testing using those methods already listed in Section IX.H.21 – DAQ agrees to the language change requested by the commenter. Paragraphs H.21.f.i.A., B., and C. will all be changed as follows:

f. Stack Testing:

i. As applicable, stack testing to show compliance with the emission limitations for the sources in Subsection IX.H.22 shall be performed in accordance with the following:

A. Sample Location: The testing point shall be designed to conform to the requirements of 40 CFR 60, Appendix A, Method 1, or the most recent version of the EPA-approved test method if approved by the Director.

B. Volumetric Flow Rate: 40 CFR 60, Appendix A, Method 2 or the most recent version of the EPA-approved test method if approved by the Director.

C. Particulate (PM): 40 CFR 60, Appendix A, Method 5B, or the most recent version of the EPA-approved test method if approved by the Director. A test shall consist of three runs, with each run at least 120 minutes in duration and each run collecting a minimum sample of 60 dry standard cubic feet. The back half condensables shall also be tested using Method 202. The back half condensables shall not be used for compliance demonstration but shall be used for inventory purposes.

83. [EPA] To ensure clarity and enforceability, we suggest revising H.22.c.i.A. to state "The owner/operator shall permanently cease operation of Carbon…".

Response: DAQ agrees with this comment. The addition of the suggested language adds clarification that the Carbon plant is being permanently shut down. SIP Section IX.H.22.c.i.A shall be revised to say the following:

c. PacifiCorp Carbon

i. Conditions on Units #1 and #2

A. The owner/operator shall permanently close and cease operation of Carbon Units #1 and #2 by August 15, 2015.

84. [EPA] Please revise H.22.c.i.B. to clearly describe the procedure that will be followed. The procedure should indicate that the owner/operator shall request recission of the Operating Permit by a date specified in the SIP and that the state will rescind the permit by no later than a reasonable date, which is also specified in the SIP, after the request is received.

Response: DAQ agrees with this comment. The commenter suggests revising SIP Section IX.H.22.c.i.B to describe the procedure that will be followed in the rescission of the Operating Permit. Specifically, the suggestion is that a timeline be established whereby the owner/operator shall request rescission[sic] by a specific listed date, and that the state shall then rescind the permit by a second listed date.

This comment is directly related to comment #85, which requested that the owner/operator notify the state when it ceased operations at the Carbon Plant. In keeping with the dates already outlined in the existing language of SIP Section IX.H.22.c.i.A. and B. the following changes will be made:

c. PacifiCorp Carbon

i. Conditions on Units #1 and #2

A. The owner/operator shall permanently close and cease operation of Carbon units #1 and #2 by August 15, 2015. The owner/operator shall notify the Director of the permanent closure of the Carbon Plant by no later than September 15, 2015.

B. The owner/operator shall request a rescission of Operating Permit # 700002004 and Approval Order DAQE-AN0100810005-08 by no later than September 15, 2015.

C. *Operating Permit # 700002004 and Approval Order DAQE-AN0100810005-08 shall be rescinded by no later than December 15, 2015.*

85. [EPA] Specify whether the owner/operator [of Carbon] is required to notify the state when they cease operations.

Response: DAQ agrees with this comment. This comment requests that the owner/operator be required to notify the state when it ceases operations at the Carbon Plant. Please see the response to comment #84 for additional details, as comment #84 also addresses the same change to Section H.22.c.i.B.

86. [EPA] It appears that the Carbon power plant has at least one AO DAQE-01000810005-08, which is referenced in the Title V permit on page 3. Provisions should be added to the SIP that specify that all approval orders for the Carbon power plant must also be rescinded, including the procedures and associated deadlines.

Response: DAQ agrees with this comment, with one correction. The commenter notes that the Carbon Power Plant has one active AO, which must also be rescinded as part of the plant closure process. This AO is referenced in the current Operating Permit for the Carbon Plant. However, the referenced AO is misidentified by the Operating Permit. The correct AO identifier is DAQE-AN0100810005-08. As part of the plant closure and permit rescission process, the AO will be included with the Operating Permit in the revised language of SIP Section IX.H.22.c.i. This revised language is included below:

c. PacifiCorp Carbon

i. Conditions on Units #1 and #2

A. The owner/operator shall permanently close and cease operation of Carbon units #1 and #2 by August 15, 2015. The owner/operator shall notify the Director of the permanent closure of the Carbon Plant by no later than September 15, 2015.

B. *The owner/operator shall request a rescission of Operating Permit # 700002004 and Approval Order DAQE-AN0100810005-08 by no later than September 15, 2015.*

C. *Operating Permit # 700002004 and Approval Order DAQE-AN0100810005-08 shall be rescinded by no later than December 15, 2015.*

Utah State Implementation Plan

Section XX

Regional Haze

Addressing Regional Haze Visibility Protection for the Mandatory Federal Class I Areas Required Under 40 CFR 51.309

Adopted by the Air Quality Board
[~~April 6, 2011~~]June 3, 2015

6. Best Available [~~Control~~]Retrofit Technology (BART) Assessment for NO_x and PM.

a. Regional Haze Rule BART Requirements

Pursuant to 40 CFR 51.309(d)(4)(vii), certain major stationary sources are required to evaluate, install, operate and maintain BART technology or an approved BART alternative for NO_x and PM emissions. [~~BART requirements can be addressed through a case-by-case review under 40 CFR 51.308(e)(1) or through an alternative program under 40 CFR 51.308(e)(2).~~]The State of Utah has chosen to evaluate BART for [~~NO_x and~~]PM under the case-by-case provisions of 40 CFR 51.308(e)(1) and BART for NOx through alternative measures under 40 CFR 51.308(e)(2). BART for SO_2 is addressed through an alternative program under 40 CFR 51.309 that is described in Part E of this plan.

b. BART for Particulate Matter

EPA issued guidelines for case-by-case BART determinations on July 6, 2005 that are codified in Appendix Y to 40 CFR Part 51. These guidelines establish a three step process.

- States identify sources which meet the definition of BART eligible
- States determine which BART eligible sources are "subject to BART"
- For each source subject to BART States identify the appropriate control technology.

[~~The determination of NO_x limits for fossil-fuel fired power plants having a total generating capacity greater than 750 megawatts must be made pursuant to the guidelines in 40 CFR 51 Appendix Y, Section E.5. [1]~~]

[~~CFR Part 51 Appendix Y Guidelines for BART Determinations under the Regional Haze Rule (70 FR 39158)~~]

(1) BART-Eligible Sources.

BART-eligible sources are those sources that fall within one of 26 specific source categories, were built during the 15-year window of time from 1962 to 1977, and have potential emissions of at least 250 tons per year of any visibility impairing air pollutant (40 CFR 51.301). Pursuant to 40 CFR 51.308 (e)(1)(i) a State is required to list all BART-eligible sources within the State.

Four BART-eligible electric generating units have been identified in the State of Utah: PacifiCorp's Hunter Units 1 and 2 and Huntington Units 1 and 2. The units are located at fossil-fuel fired steam electric plants of more than 250 million Btu per hour heat input, one of the 26 specific BART source categories. The units have potential emissions greater than 250 tons per year of a visibility impairing pollutant. The units had commenced construction within the BART time frame of August 7, 1962 to August 7, 1977.

Table 3. BART-Eligible Sources in Utah.

SOURCE	UNIT ID	SERVICE DATE	NET DEPENDABLE CAPACITY (MWn)	BART CATEGORY	COAL TYPE	BOILER TYPE
Hunter	1	1978	430	Fossil fuel fired	Bituminous	Tangential
Hunter	2	1980	430	Fossil fuel fired	Bituminous	Tangential
Huntington	1	1977	430	Fossil fuel fired	Bituminous	Tangential
Huntington	2	1974	430	Fossil fuel fired	Bituminous	Tangential

Note: Hunter Unit 3 commenced construction after 1977 and is therefore not BART-eligible.

(2) Sources Subject to BART

Pursuant to 40 CFR 51.308(e)(1)(ii) the State is required to determine which BART-eligible sources are also "subject to BART." BART-eligible sources are subject to BART if they emit any air pollutant that may reasonably be anticipated to cause or contribute to any impairment of visibility in any mandatory Class I Federal area.

PacifiCorp's Hunter Units 1 and 2 and Huntington Units 1 and 2 were determined by the State to be subject to BART. The State utilized the technical modeling services of the WRAP Regional Modeling Center (RMC). Modeling was performed according to the RMC modeling protocols[2]. For the WRAP BART exemption screening modeling, the RMC followed the EPA BART Guidelines in 40 CFR 51, Appendix Y and the applicable CALMET/CALPUFF modeling guidance (e.g., IWAQM, 1998; FLAG, 2000; EPA,

[2] CALMET/CALPUFF Protocol for BART Exemption Screening Analysis for Class I Areas in the Western United States

2003c) including EPA's March 16, 2006 memorandum: "Dispersion Coefficients for Regulatory Air Quality Modeling in CALPUFF".[3]

The basic assumptions of the WRAP BART CALMET/CALPUFF modeling protocols are as follows:

- Three years of modeling (2001, 2002 and 2003) were used.
- Visibility impacts due to emissions of SO_2, NO_x and primary PM emissions were calculated
- Visibility was calculated using the Original IMPROVE equation and Annual Average Natural Conditions.
- The effective range of CALPUFF modeling was set at 300km from the sources
- For pre-control modeling, maximum 24-hour average actual emissions from the Acid Rain database were used in CALPUFF model.
- ~~[For post-control modeling, expected New Source Review (NSR) permitted limits were used in the CALPUFF model.~~]

According to 40 CFR Part 51, Appendix Y, a BART-eligible source is considered to "contribute" to visibility impairment in a Class I area if the modeled 98th percentile change in deciviews is equal to or greater than the "contribution threshold." The State of Utah evaluated BART exemption screening modeling results at the EPA-suggested contribution threshold of 0.5 deciviews within a 300 Km radius of the BART-eligible sources.[4] BART-eligible sources Hunter Unit 1, Hunter Unit 2, Huntington Unit 1, and Huntington Unit 2 had a modeled impact greater than the threshold level of 0.5 change in deciviews in at least one of the seven Class I areas within a 300 km radius of the sources.

[3] Atkinson and Fox, 2006

[4] WRAP RMC BART Modeling for Utah Draft #6 April 21, 2007

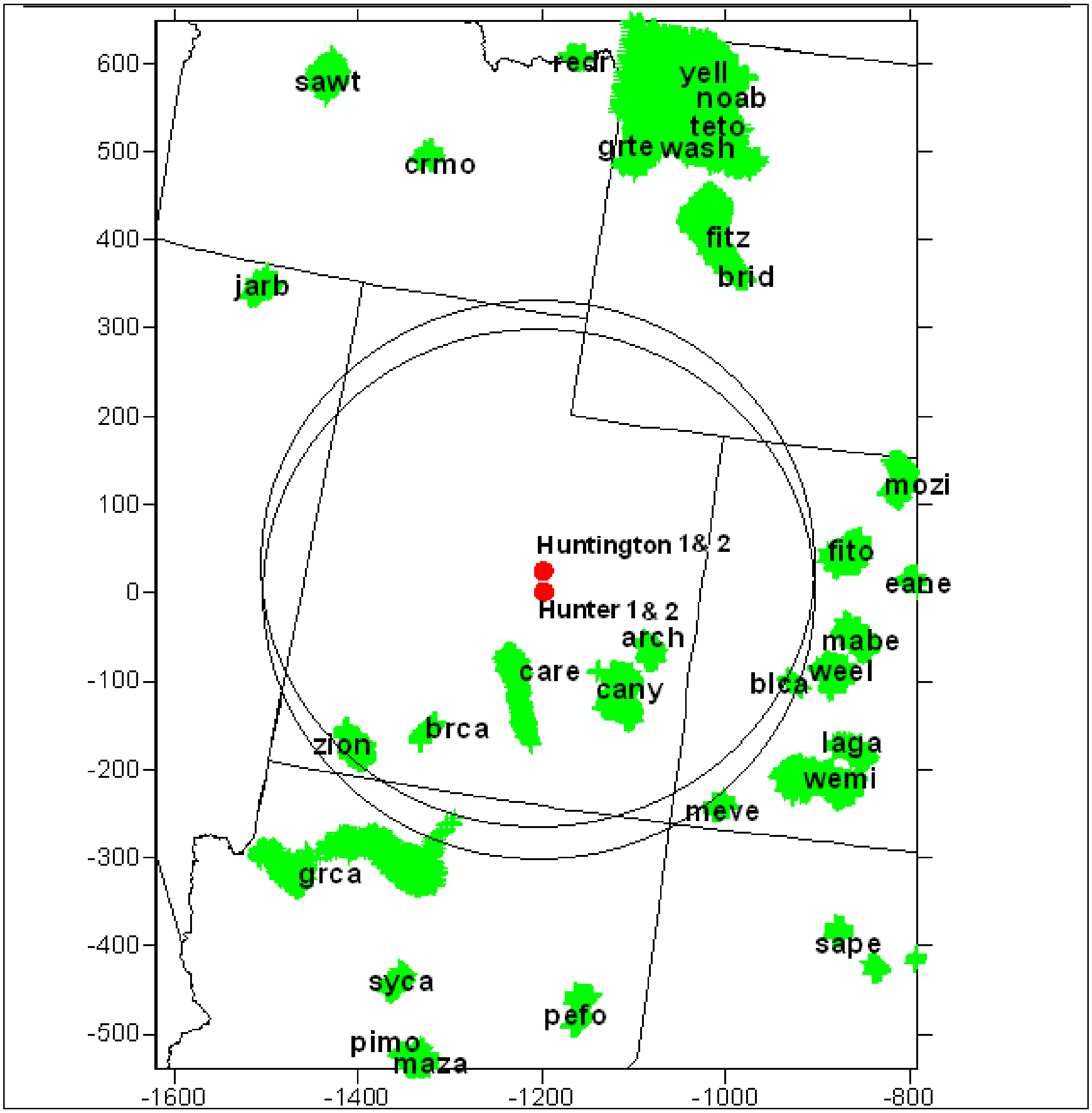


Figure 4. Relationship between Utah potential BART-eligible sources and Class I areas. Hunter Units 1 and 2 and Huntington Units 1 and 2 modeled separately at maximum 300 km.

Table 4. Subject to BART Modeling

	Subject to BART Modeling - 98th Percentile 3 year average Delta Deciview							
	Capitol Reef	Canyonlands	Arches	Bryce Canyon	Zion	Grand Canyon	Black Canyon Gunnison	Mesa Verde
Hunter 1	2.13	1.87	1.53	0.55	0.46	0.59	0.60	0.53
Hunter 2	1.89	1.62	1.36	0.47	0.41	0.52	0.53	0.47
Huntington 1	1.92	1.64	1.39	0.48	0.43	0.55	0.56	0.48
Huntington 2	2.43	2.26	1.89	.091	.078	.099	1.14	0.91

(3) BART [~~Determination~~] Analysis

As required under 51.308 (e)(1)(A) the determination of BART must be based on an analysis of the best system of continuous emission control technology available. In the analysis the State must take in to account five factors:

- Available technology
- Costs of compliance
- Energy and non-air quality environmental impacts
- Existing control equipment and the remaining useful life of the facility
- The degree of improvement in visibility reasonably anticipated to result from the use of such technology

In 2008, Utah determined that BART for PM was the replacement of existing electrostatic precipitators with pulse-jet fabric filter baghouses with a PM emission ~~rate~~ limit of 0.015 lb/MMBtu at all four EGUs that were subject-to-BART. PacifiCorp installed the control technology, as required, and significant emission reductions of PM were achieved. On December 12, 2012, the EPA disapproved Utah's BART determination for PM after concluding that Utah did not submit an adequate 5-factor analysis as required by the BART Rule. In June 2012, PacifiCorp provided a new 5-factor analysis for each of the four subject to BART EGUs. On August 4, 2014, PacifiCorp provided additional information to supplement that analysis. DAQ reviewed the analysis, and determined that the required controls for PM were the most stringent controls available.

(4) BART Determination for PM

Appendix Y allows a streamlined 5-factor analysis when the most stringent controls are already required.

> "If you find that a BART source has controls already in place which are the most stringent controls available (note that this means that all possible improvements to any control devices have been made), then it is not necessary to comprehensively complete each following step of the BART analysis in this section. As long as these most stringent controls available are made federally enforceable for the purpose of implementing BART for that source, you may skip the remaining analyses in this section, including the visibility analysis in step 5. Likewise, if a source commits to a BART determination that consists of the most stringent controls available, then there is no need to complete the remaining analyses in this section." (40 CFR Part 51, Appendix Y, Section D.9)

Because the most stringent technology is in place and the PM emission ~~rates~~ limits have been made enforceable in SIP Section IX Part H.21 and H.22, no further analysis is required.

c. BART for NOx

BART for NOx is addressed through alternative measures as provided under 40 CFR 51.308(e)(2). The following emission reduction measures are required, and are made enforceable through emission limits established in Section IX, Part H.21 and H.22 of the State Implementation Plan.

- PacifiCorp Hunter Units 1 and 2 and Huntington Units 1 and 2: The replacement of existing, first generation low-NO_x burners with Alstom TSF 2000TM low-NO_x firing system and installation of two elevations of separated overfire air with an emission limit of 0.26 lb/MMBtu.

- PacifiCorp Hunter Unit 3 (not subject-to-BART): The replacement of existing, first generation low-NOx burners with improved low-NOx burners with overfire air with an emission limit of 0.34 lb/MMBtu.

- PacifiCorp Carbon Units 1 and 2 (not subject-to-BART): PacifiCorp shall permanently retire Carbon Units 1 and 2 by August 15, 2015.

40 CFR 51.308(e)(2) requires an analysis to demonstrate that the alternative measures achieve greater reasonable progress than would be achieved through the installation and operation of BART. This demonstration is included in the TSD[5]. Combined emissions of NOx, SO_2, and PM_{10} will be 2,876 tons/yr lower under the alternative than the most-stringent BART scenario for NOx, visibility will improve on a greater number of days under the alternative, and the average deciview impairment and 90th percentile deciview impairment will be better under the alternative.

d. BART Summary

The BART emission rates limits for NOx and PM are summarized in Table 5. While Utah has chosen to meet the NOx BART requirement through alternative measures established in Section XX Part D.6 of the SIP, and the SO_2 BART requirement through an alternative to BART program established in Section XX Part E of the SIP, the enforceable emission rates limits for both NOx and SO_2 established in the approval orders and in the SIP for the four EGUs also meet the presumptive emission rates for both NOx and SO_2 established in Appendix Y independently of the alternative programs.

[5] Review of 2008 BART Determination and Recommended Alternative to BART for NOx, Utah Division of Air Quality, February 13, 2015.

Table 5. Emission ~~Rates~~ Limits for the Retrofitted Hunter and Huntington Units

Units	Utah Permitted ~~Rates~~Limits[6]			Presumptive BART ~~Limits~~Rates[7]	
	SO_2 lb/MMBtu	NOx lb/MMBtu	PM lb/MMBtu	SO_2 lb/MMBtu	NO_x lb/MMBtu
Hunter 1	0.12	0.26	0.015	0.15	0.28
Hunter 2	0.12	0.26	0.015	0.15	0.28
Hunter 3		0.34			
Huntington 1	0.12	0.26	0.015	0.15	0.28
Huntington 2	0.12	0.26	0.015	0.15	0.28

[~~PacifiCorp has installed or has received permits to install the following retrofit control equipment at the Hunter Unit 1, Hunter Unit 2, Huntington Unit 1, and Huntington Unit 2 fossil fuel fired electric generating units (EGU):~~]

~~Hunter Units 1 and 2:~~

- ~~Conversion of existing electrostatic precipitators to pulse jet fabric filter bag-houses~~
- ~~The replacement of existing, first generation low-NO_x burners with Alstom TSF 2000TM low-NO_x firing system and installation of two elevations of separated overfire air.~~
- ~~Upgrade of existing flue gas desulfurization system to > 90% sulfur dioxide removal.~~

~~Huntington Units 1 and 2:~~

- ~~Conversion of existing electrostatic precipitators to pulse jet fabric filter bag-houses~~
- ~~The replacement of existing, first generation low-NO_x burners with Alstom TSF 2000TM low-NO_x firing system and installation of two elevations of separated overfire air.~~
- ~~Installation of a new wet-lime, flue gas de-sulfurization system at Unit 2 (FGD).~~
- ~~Upgrade of existing flue gas desulfurization system to > 90% sulfur dioxide removal at Unit 1.~~]

[6] Utah Division of Air Quality Approval Orders: Huntington Unit 2 - AN0238012-05, Huntington Unit 1 - DAQE-AN0102380019-09 (note – on January 19, 2010 an administrative amendment was made to the 2009 AO), Hunter Units I and 2 - DAQE-AN0102370012-08, and Section IX Part H.21 and H.22 of the SIP.

[7] 40 CFR Part 51 Appendix Y Guidelines for BART Determinations under the Regional Haze Rule (70 Federal Register 39135)

~~**Table 5.Emissions Rates (lb/MMBtu) for the Retrofitted Hunter and Huntington Units**~~

~~Units~~	~~Utah [Permitted Rates]BART Emission Rate[8]~~			~~Presumptive BART Limits[9]~~	
~~Rate: lb/MMBtu~~	~~SO_2 lb/MMBtu~~	~~NOx lb/MMBtu~~	~~PM lb/MMBtu~~	~~SO_2 lb/MMBtu~~	~~NO_x lb/MMBtu~~
~~Hunter 1~~	~~0.12~~	~~0.26~~	~~0.05~~	~~0.15~~	~~0.28~~
~~Hunter 2~~	~~0.12~~	~~0.26~~	~~0.05~~	~~0.15~~	~~0.28~~
~~Huntington 1~~	~~0.12~~	~~0.26~~	~~0.05~~	~~0.15~~	~~0.28~~
~~Huntington 2~~	~~0.12~~	~~0.26~~	~~0.05~~	~~0.15~~	~~0.28~~

~~**Table 6. Change in Emissions (tons/yr) for Retrofitted BART Units**~~

~~Unit~~	~~Pre-Control SO_2~~	~~Pre-Control NOx~~	~~Pre-Control PM_{10}~~	~~Post-Control SO_2~~	~~Post-Control NO_x~~	~~Post-Control PM_{10}~~	~~Delta SO_2~~	~~Delta NO_x~~	~~Delta PM_{10}~~
~~**Hunter 1**~~	~~2741~~	~~6833~~	~~533~~	~~2239~~	~~4851~~	~~280~~	~~-502~~	~~-1981~~	~~**-253**~~
~~**Hunter 2**~~	~~2425~~	~~5922~~	~~533~~	~~2185~~	~~4734~~	~~273~~	~~-240~~	~~-1187~~	~~**-260**~~
~~**Huntington 1**~~	~~2538~~	~~5676~~	~~444~~	~~2052~~	~~4445~~	~~256~~	~~-486~~	~~-1231~~	~~**-188**~~
~~**Huntington 2**~~	~~13703~~	~~5582~~	~~443~~	~~1743~~	~~3776~~	~~218~~	~~-11960~~	~~-1806~~	~~**-225**~~
~~**TOTALS**~~	~~**21,407**~~	~~**24,013**~~	~~**1,953**~~	~~**8,219**~~	~~**17,807**~~	~~**1,027**~~	~~**-13,189**~~	~~**-6,206**~~	~~**-926**~~

]

e. Schedule for Installation of Controls

Pursuant to 51.308(e)(1)(C)(iv) each source subject to BART is required to install and operate BART no later than 5 years after approval of the implementation plan, and pursuant to 51.308(e)(2)(E)(3) all alternative measures must take place within the first planning period. Table 6 shows that the required schedule will be met for all units.[~~The PacifiCorp schedule for the four EGUs at Huntington and Hunter sources is as follows.~~]

Table 6. Installation Schedule

Source	**Notice of Intent Submitted**	**Permit Issued**	**[~~Estimated~~]In Service Date**
Hunter 1	June 2006	March 2008	Spring 2014
Hunter 2	June 2006	March 2008	Spring 2011
Hunter 3			Summer 2008
Huntington 1	April 2008	August 2009	Fall 2010
Huntington 2	October 2004	April 2005	Dec 2006

Carbon 1			Shut down August 2015
Carbon 2			Shut down August 2015

[EPA under the BART Rule requires coal-fired electric generating plants of greater than 750 MW to meet BART presumptive limits. While EPA considers presumptive limits to be appropriate for all coal-fired power plants greater than 750 MW, the State may establish different requirements if the State can demonstrate that an alternative is justified based on a consideration of the five BART factors.

> "States, as a general matter, must require owners and operators of greater than 750 MW power plants to meet these BART emission limits… a State may establish different requirements if the State can demonstrate that an alternative determination is justified based on a consideration of the five statutory factors."[10]

> "For Coal-fired EGU's greater than 200 MW located at greater than 750 MW power plants and operating without post-combustion controls (i.e. SCR or SNCR), we have provided presumptive NOx limits, differentiated by boiler design and type of coal burned. You may determine that an alternative control level is appropriate based on careful consideration of the statutory factors." (Appendix Y Part 51 – IV (E)(5).[11]

EPA determined presumptive limits for SO_2 and NO_x for EGUs based on a methodology equivalent to that required in 50 CFR 51 Appendix Y for BART Rule. The EPA determination of presumptive limits included:

- Identification of all potential BART-eligible EGUs (all BART-eligible EGU's were assumed to be Subject to BART)
- Technical analyses and industry research to determine applicable and appropriate SO_2 and NO_x control options,
- Economic analysis to determine cost effectiveness for each potentially BART-eligible EGU
- Evaluation of historical emissions and forecast emission reductions for each potentially BART-eligible EGU[12].
- NOx and SO_2 CALPUFF modeling of emission impacts at model Class I area.

The analysis included 491 potential BART EGUs including Hunter Units 1 and 2 and Huntington Units 1 and 2. The technical analysis conducted by EPA to

[10] Ibid. (70 Federal Register 39131).

[11] 70 Federal Register 39171

[12] Ibid. (70 Federal Register 39134)

determine presumptive BART limits for SO_2 and NO_x is in effect a BART determination analysis for 419 EGUs including Hunter Units 1 and 2 and Huntington Units 1 and 2.[13]

Section IV (E) (5) of Appendix Y Part 51 clearly requires the implementation of presumptive NOx limits for coal-fired EGU's greater than 200 MW located at greater than 750 MW power plants. Under Appendix Y, states are given the discretion to challenge presumptive limits through a five factor analysis, but presumptive limits were developed by EPA as a reasonable, equivalent and mandated substitution for a five factor analysis.[14]

]

Utah's long-standing Prevention of Significant Deterioration (PSD) permitting program (SIP Section VII and R307-405), New Source Review permitting program (SIP Section II and R307-401) and Visibility program (SIP section XVII and R307-406) will continue to protect Class I area visibility by ensuring that the BART emission rateslimits established in Part H.21 and H.22 of this plan are maintained, requiring best available control technology for new sources, and assuring that there is not a significant degradation in visibility at Class I areas due to new or modified major sources.

[13] "Methodology for Developing BART NOx Presumptive Limits" EPA Clean Air Market Division June 15, 2005 HQ-OAR-2002-0076-0445 and "Technical Support Document for BART NOx Limits for Electric Generating Units Excel Spreadsheet, Memorandum April 15, 2005 HQ-OAR-2002-0076-0369

[14] CFR Part 51 Appendix Y Guidelines for BART Determinations under the Regional Haze Rule (70 Federal Register 39171)

Utah State Implementation Plan

Emission Limits and Operating Practices

Section IX, Part H

Adopted by the Air Quality Board [December 3, 2014]June 3, 2015

H.21. General Requirements: Control Measures for Area and Point Sources, Emission Limits and Operating Practices, Regional Haze Requirements

a. Except as otherwise outlined in individual conditions of this Subsection IX.H.21 listed below, the terms and conditions of this Subsection IX.H.21 shall apply to all sources subsequently addressed in Subsection IX.H.22. Should any inconsistencies exist between these two subsections, the source specific conditions listed in IX.H.22 shall take precedence.

b. The definitions contained in R307-101-2, Definitions and R307-170-4, Definitions, apply to Section IX, Part H. In addition, the following definition also applies to Section IX, Part H.21 and 22:
Boiler operating day means a 24-hour period between 12 midnight and the following midnight during which any fuel is combusted at any time in the boiler. It is not necessary for fuel to be combusted for the entire 24-hour period.

c. The terms and conditions of R307-107-1 and R307-107-2 shall apply to all sources subsequently addressed in Subsection IX.H.22.

d. Any information used to determine compliance shall be recorded for all periods when the source is in operation, and such records shall be kept for a minimum of five years. All records required by IX.H.21.c shall be kept for a minimum of five years. Any or all of these records shall be made available to the Director upon request.

e. All emission limitations listed in Subsections IX.H.22 shall apply at all times, unless otherwise specified in the source specific conditions listed in IX.H.22.

f. Stack Testing:

i. As applicable, stack testing to show compliance with the emission limitations for the sources in Subsection IX.H.22 shall be performed in accordance with the following:

A. Sample Location: The testing point shall be designed to conform to the requirements of 40 CFR 60, Appendix A, Method 1, or the most recent version of the EPA-approved test method if approved by the Director.~~or other EPA-approved methods acceptable to the Director.~~

B. Volumetric Flow Rate: 40 CFR 60, Appendix A, Method 2, or the most recent version of the EPA-approved test method if approved by the Director.~~or other EPA-approved testing methods acceptable to the Director.~~

C. Particulate (PM): 40 CFR 60, Appendix A, Method 5B, or the most recent version of the EPA-approved test method if approved by the Director.~~or other EPA approved testing methods acceptable to the Director.~~ A test shall consist of three runs, with each run at least 120 minutes in duration and each run collecting a minimum sample of 60 dry standard cubic feet. The back half condensables shall also be tested using Method 202. The back half condensables shall not be used for compliance demonstration but shall be used for inventory purposes.

D. Calculations: To determine mass emission rates (lb/hr, etc.) the pollutant concentration as determined by the appropriate methods above shall be multiplied by the volumetric flow rate and any necessary conversion factors to give the results in the specified units of the emission limitation.

E. A stack test protocol shall be provided at least 30 days prior to the test. A pretest conference shall be held if directed by the Director.

g. Continuous Emission and Opacity Monitoring.

i. For all continuous monitoring devices, the following shall apply:

A. Except for system breakdown, repairs, calibration checks, and zero and span adjustments required under paragraph (d) 40 CFR 60.13, the owner/operator of an affected source shall continuously operate all required continuous monitoring systems and shall meet minimum frequency of operation requirements as outlined in R307-170 and 40 CFR 60.13.

B. The monitoring system shall comply with all applicable sections of R307-170; 40 CFR 13; and 40 CFR 60, Appendix B – Performance Specifications.

C. For any hour in which fuel is combusted in the unit, the owner/operator of each unit shall calculate the hourly average NOx concentration in lb/MMBtu.

D. At the end of each boiler operating day, the owner/operator shall calculate and record a new 30-day rolling average emission rate in lb/MMBtu from the arithmetic average of all valid hourly emission rates from the CEMS for the current boiler operating day and the previous 29 successive boiler operating days.

E. An hourly average NOx emission rate in lb/MMBtu is valid only if the minimum number of data points, as specified in R307-170, is acquired by the owner/operator for both the pollutant concentration monitor (NOx) and the diluent monitor (O_2 or CO_2).

H.22. Source Specific Emission Limitations: Regional Haze Requirements, Best Available Retrofit Technology

a. PacifiCorp Hunter

i. Particulate Limitations on Units #1 and #2

A. Emissions of particulate (PM) shall not exceed 0.015 lb/MMBtu heat input from each boiler based on a 3-run test average.

B. Stack testing for the emission limitation shall be performed each year on each boiler.

C. Monitoring for PM shall be conducted in accordance with the compliance assurance monitoring requirements of 40 CFR 64 as detailed in the source's operating permit.

ii. NOx Limitations on Units #1 and #2

A. Emissions of NOx from each boiler shall not exceed 0.26 lb/MMBtu heat input for a 30-day rolling average.

B. Measuring of all NOx emissions shall be performed by CEM.

iii. NOx Limitation on Unit #3

A. Emissions of NOx shall not exceed 0.34 lb/MMBtu heat input for a 30-day rolling average.

B. Measuring of all NOx emissions shall be performed by CEM.

b. PacifiCorp Huntington

i. Particulate Limitations on Units #1 and #2

A. Emissions of particulate (PM) shall not exceed 0.015 lb/MMBtu heat input from each boiler based on a 3-run test average.

B. Stack testing for the emission limitation shall be performed each year on each boiler.

C. Monitoring for PM shall be conducted in accordance with the compliance assurance monitoring requirements of 40 CFR 64 as detailed in the source's operating permit.

ii. NOx Limitations on Units #1 and #2

A. Emissions of NOx from each boiler shall not exceed 0.26 lb/MMBtu heat input for a 30-day rolling average.

B. Measuring of all NOx emissions shall be performed by CEM.

c. PacifiCorp Carbon

i. Conditions on Units #1 and #2

A. The owner/operator shall permanently close and cease operation of Carbon units #1 and #2 by August 15, 2015. The owner/operator shall notify the Director of the permanent closure of the Carbon Plant by no later than September 15, 2015.

B. The owner/operator shall request a rescission of Operating Permit # 700002004 and Approval Order DAQE-AN0100810005-08 by no later than September 15, 2015.

C. Operating Permit # 700002004 and Approval Order DAQE-AN0100810005-08 shall be rescinded by no later than December 15, 2015.

~~c. PacifiCorp Carbon~~

~~i. Conditions on Units #1 and #2~~

~~A. The owner/operator shall permanently close Carbon units #1 and #2 by August 15, 2015.~~

~~B. The owner/operator shall rescind Operating Permit # 700002004 by no later than December 31, 2015.~~

Staff Review

2008 PM BART Determination and

Recommended Alternative to BART for NOx

Utah Division of Air Quality

May 13, 2015

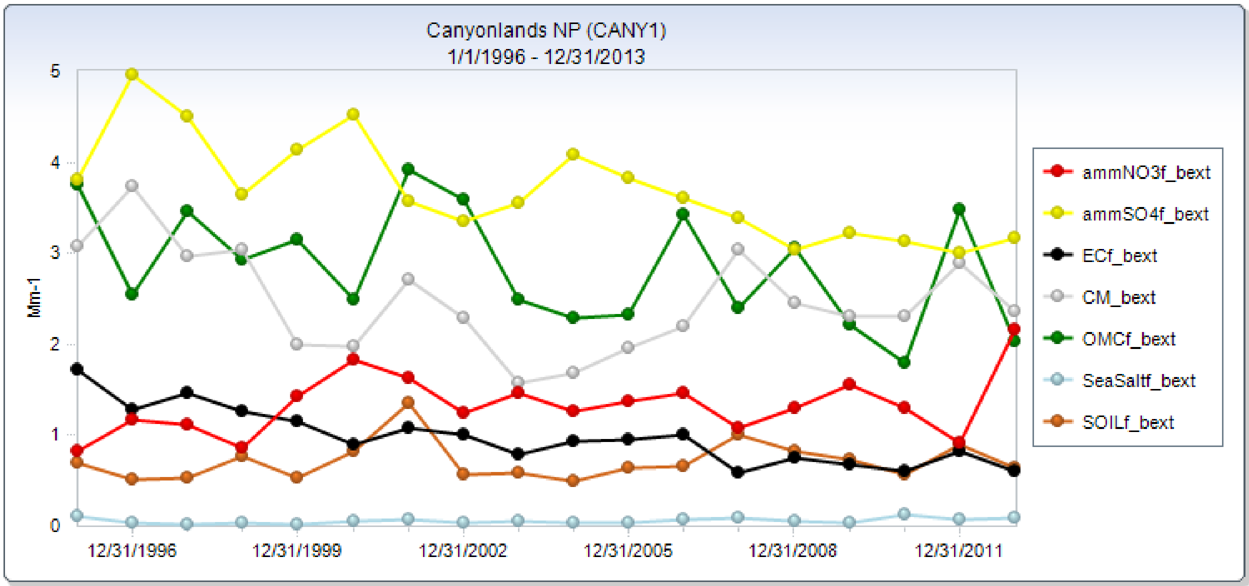
I. Purpose

On December 14, 2012, the Environmental Protection Agency (EPA) disapproved the Best Available Retrofit Technology (BART) determination for nitrogen oxides (NOx) and particulate matter (PM) that was adopted in Utah's 2008 Regional Haze State Implementation Plan (RH SIP). The purpose of this analysis is to provide additional documentation to support the 2008 BART determination for PM and to recommend an alternative to BART for NOx that will provide greater visibility improvement than would be achieved through the installation of the most stringent NOx controls on the four electrical generating units (EGU) that are subject to BART.

II. History

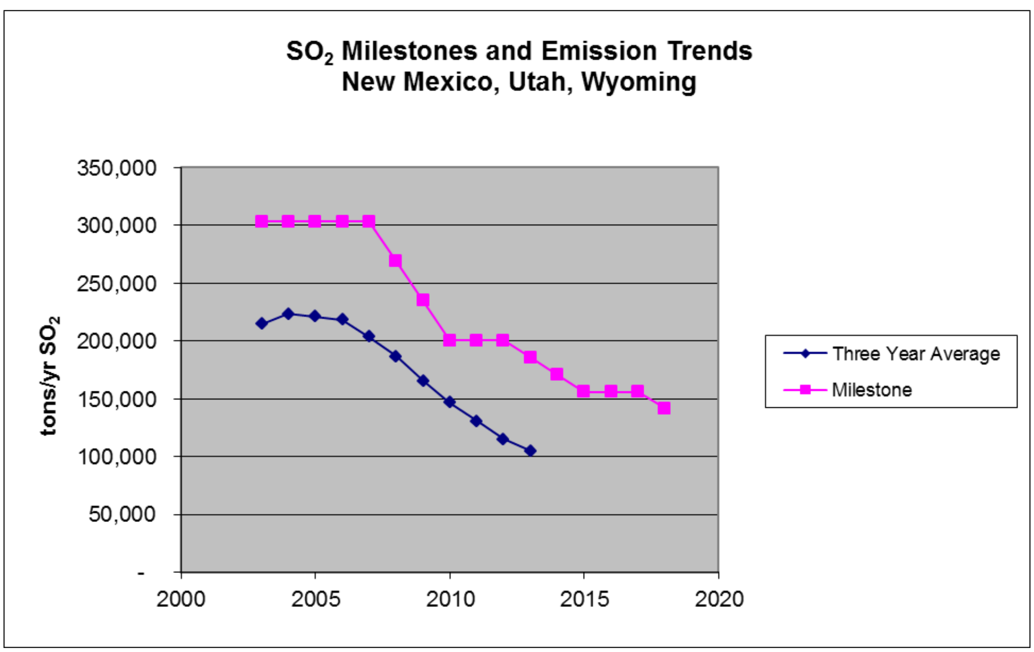
Utah's RH SIP, originally adopted in 2003, was based on the recommendations of the Grand Canyon Visibility Transport Commission (GCVTC). The GCVTC evaluated haze at Class I Areas on the Colorado Plateau, and determined that stationary source reductions should be focused on sulfur dioxide (SO_2) because it is the pollutant that has the most significant impact on haze on the Colorado Plateau. Utah's 2008 BART determination was developed within the context of the overall SIP and reflected this focus on SO_2. Figure 1 shows the contributions of various species to visibility impairment at Canyonlands National Park. As can be seen, sulfate (ammSO4) is the most significant contributor to haze. Fire (OMC) and dust (CM) are also a significant components but the impact is variable from year to year.

Figure 1. Speciated Annual Average Light Extinction at Canyonlands.



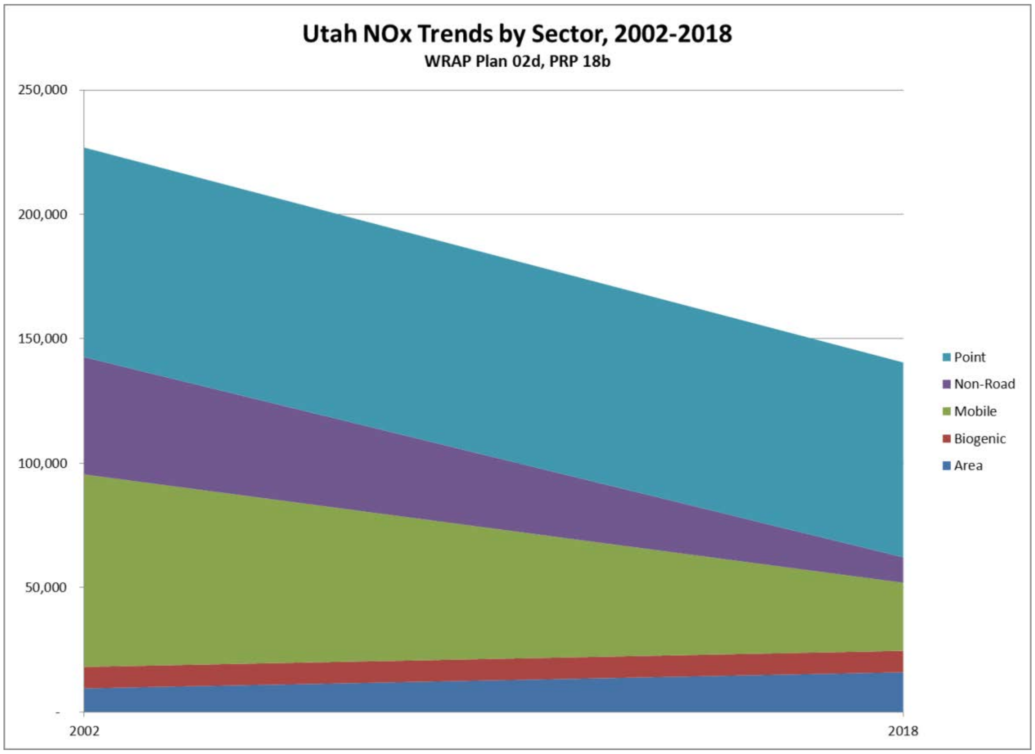
Utah's 2003 RH SIP included SO_2 emission milestones with a backstop regulatory trading program to ensure that SO_2 emissions in the transport region decreased substantially between 2003 and 2018. The milestones were adjusted in 2008 and 2011 to reflect changes in the number of states participating in the regional program. Actual SO_2 emissions decreased by 51% between 2003 and 2013 in the current 3-state region, and in 2013 were significantly below the 2018 milestone in Utah's RH SIP (See Figure 2).

Figure 2. SO_2 Milestones and Emission Trends



While Utah's RH SIP is focused on achieving SO_2 reductions from stationary sources, substantial reductions in nitrogen oxide (NOx) emissions will also occur from stationary sources as well as mobile and non-road sources. Figure 3 shows the projected decrease in NOx emissions between 2002 and 2018 as documented in Section K of Utah's 2008 RH SIP.[1]

Figure 3. Utah RH SIP Expected NOx Reductions 2002-2018.



A. BART Determination in 2008 RH SIP

On September 3, 2008, the Utah Air Quality Board adopted a revision to Utah's RH SIP to include Best Available Retrofit Technology (BART) requirements for NO_x and particulate matter (PM) as required by 40 CFR 51.309(d)(4)(vii). PacifiCorp's Hunter Unit 1, Hunter Unit 2, Huntington Unit 1, and Huntington Unit 2 fossil fuel fired electric generating units (EGUs) were determined to be subject to BART. The 2008 RH SIP required PacifiCorp to install the following BART controls at these EGUs:

Hunter Units 1 and 2:

- Conversion of electrostatic precipitators to pulse jet fabric filter bag-houses.
- The replacement of first generation low-NO_x burners with Alstom TSF 2000TM low-NO_x firing system and installation of two elevations of separated overfire air.
- Upgrade of flue gas desulfurization system to > 90% sulfur dioxide removal.

[1] WRAP Plan 02d and PRP 18b inventory (PRP 18a mobile) http://vista.cira.colostate.edu/TSS/Results/Emissions.aspx

Huntington Units 1 and 2:

- Conversion of electrostatic precipitators to pulse jet fabric filter bag-houses.
- The replacement of first generation low-NO_x burners with Alstom TSF 2000TM low-NO_x firing system and installation of two elevations of separated overfire air.
- Installation of a new wet-lime, flue gas de-sulfurization system at Unit 2 (FGD).
- Upgrade of flue gas desulfurization system to > 90% sulfur dioxide removal at Unit 1.

The emission rates established in the 2008 RH SIP for Hunter Units 1 and 2 and Huntington Units 1 and 2 were more stringent than the presumptive BART emission rates for SO_2 and NO_x established in 40 CFR Part 51 Appendix Y, Guidelines for BART Determinations under the Regional Haze Rule as shown in Table 1. (Note, Table 1 corrects a typographical error in Table 5 of the RH SIP where the permitted rate for PM was listed as 0.05 lb/MMBtu when it should have been 0.015 lb/MMBtu, the limit established in the approval orders for each of the units.)

Table 1. BART Emission Rates in Utah's 2008 SIP

Units	Utah Permitted Rates[2]			Presumptive BART Limits[3]		Year of Installation
Rate: lb/MMBtu	SO_2[a]	NOx[a]	PM	SO_2	NOx	
Hunter 1	0.12	0.26	0.015	0.15	0.28	2014
Hunter 2	0.12	0.26	0.015	0.15	0.28	2011
Huntington 1	0.12	0.26	0.015	0.15	0.28	2010
Huntington 2	0.12	0.26	0.015	0.15	0.28	2006

[a]30-day rolling average

[2] Utah Division of Air Quality Approval Orders: Huntington Unit 2 - AN0238012-05, Huntington Unit 1 - DAQE-AN0102380019-09 (note – on January 19, 2010 an administrative amendment was made to the 2009 AO), Hunter Units I and 2 - DAQE-AN0102370012-08.

[3] 40 CFR Part 51 Appendix Y Guidelines for BART Determinations under the Regional Haze Rule (70 Federal Register 39135)

B. Partial Approval, Partial Disapproval of Utah's Regional Haze SIP

On December 14, 2012, EPA approved the majority of Utah's Regional Haze SIP but disapproved Utah's BART determinations for NOx and PM for PacifiCorp's Hunter Unit 1, Hunter Unit 2, Huntington Unit 1, and Huntington Unit 2[4]. EPA determined that the SIP did not contain a full 5-factor analysis as required by the rule. Prior to EPA's disapproval, Utah's BART determination was in place and enforceable under state law and state permits. The required controls were installed and operating on three of the four EGUs prior to EPA's proposed disapproval, and were installed on the 4th EGU in 2014 as required by Utah's SIP under state law.

III. BART for Particulate Matter

In June 2012, after EPA had proposed to disapprove Utah's BART determination, PacifiCorp prepared a new 5-factor BART analysis to satisfy the requirements of the BART rule. PacifiCorp submitted an update to that analysis on August 5, 2014 to address issues that EPA had raised with other regional haze SIPs.

PacifiCorp's 5-Factor analysis identified three available technologies: upgraded electrostatic precipitator (ESP) and flue gas conditioning (0.040 lb PM_{10}/MMBtu); polishing fabric filter (0.015 lb PM10/MMBtu); and replacement fabric filter (0.015 lb PM_{10}/MMBtu). The 2008 BART determination had required PacifiCorp to install a fabric filter baghouse with a PM emission limit of 0.015 lb/MMBtu at Hunter Units 1 and 2 and Huntington Units 1 and 2[5]. DAQ staff have reviewed PacifiCorp's 2012 analysis and determined that the baghouse technology required in 2008 is still the most stringent technology available and 0.015 lb PM/MMBtu represents the most stringent emission limit. The PM emission limit has been added to SIP Section IX, Part H.21 and H.22 to ensure that it is federally enforceable.

40 CFR Part 51, Appendix Y, *Guidelines for BART Determinations Under the Regional Haze Rule*, allows a streamlined 5-factor analysis when the most stringent controls are already required.

> "If you find that a BART source has controls already in place which are the most stringent controls available (note that this means that all possible improvements to any control devices have been made), then it is not necessary to comprehensively complete each following step of the BART analysis in this section. As long as these most stringent controls available are made federally enforceable for the purpose of implementing BART for that source, you may skip the remaining analyses in this section, including the visibility analysis in step 5. Likewise, if a source commits to a BART determination that consists of the most stringent controls available, then there is no need to complete the remaining analyses in this section." (40 CFR Part 51, Appendix Y, Section D.9)

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[4] 77 FR 74355

[5] The AOs established a PM_{10} emission limit of 74 lb/hr at Huntington Unit 1; and a PM emission limit of 70 lb/hr at Huntington Unit 2. The pound per hour emission limit for the Huntington units was based on a 0.015 lb/MMBtu emission rate and a maximum hourly heat input.

Because the most stringent technology is in place and the SIP contains a federally enforceable emission limit for PM of 0.015 lb/MMBtu, no further analysis is required[6,7,8].

IV. Alternative to BART for NOx

> *40 CFR 51.308(e)(2) A State may opt to implement or require participation in an emissions trading program or other alternative measure rather than to require sources subject to BART to install, operate, and maintain BART. Such an emissions trading program or other alternative measure must achieve greater reasonable progress than would be achieved through the installation and operation of BART. For all such emission trading programs or other alternative measures, the State must submit an implementation plan containing the following plan elements and include documentation for all required analyses:*

Utah has opted to establish an alternative measure for NOx as provided in 40 CFR 51.308(e)(2).[9] The alternative measure requires the installation of low-NOx burners with overfire air with an emission limit

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[6] In Colorado, with regard to similar electric generating units (EGU), EPA explained that "[f]abric filter baghouses are the most stringent control technology for controlling PM emissions." 77 Fed. Reg. 18,052, 18,066 (Mar. 26, 2012). EPA further explained, "consistent with the BART Guidelines, the State did not provide a full five-factor analysis because the State determined BART to be the most stringent control technology and limit" and "assumes the BART limit can be met with the operation of the existing fabric filter baghouses." *Id.* Significantly, EPA concluded that it "agree[d] with the State's conclusions and we are proposing to approve its PM BART determinations." *Id.*

[7] In Wyoming, EPA approved the State's conclusions that "fabric filters represent the most stringent PM control technology" and that "[c]onsistent with the BART Guidelines, the State did not provide a five-factor analysis because the State determined BART to be the most stringent control technology and limit." 77 Fed. Reg. 33,022, 33,035. (*citing* 70 Fed. Reg. at 39,165 (Appx. Y)). EPA also has approved or proposed to approve in numerous other actions, including Wyoming, the same 0.015 lb/MMBtu PM BART emissions limit adopted in the prior Utah RH SIP and in this SIP Revision. *See, e.g.*, 79 Fed. Reg. 5,032, 5,220. *See also* EPA's approval of PM BART in Arizona (77 Fed. Reg. at 72,523 (December 5, 2012)) and for the Four Corners Power Plant (77 Fed. Reg. 51, 620, 51, 636 (August 24, 2012)).

[8] In other actions, EPA has approved PM BART limits that are twice as high as those included for the Units in the SIP Revision. For example, EPA approved a RH SIP with a PM BART emissions limit of 0.03 lb/MMBtu for nine EGUs in Colorado. *See, e.g.*, 77 Fed. Reg. 18,051,18,066 (Mar. 26, 2012); 77 Fed. Reg. at 76,872 . EPA approved PM BART emissions limits of 0.03 and 0.04 lb/MMBtu for certain EGUs in Wyoming, where the most stringent limit was 0.015 lb/MMBtu. 79 Fed. Reg. at 5,220. EPA also approved PM limits of 0.07 lb/MMBtu for four EGUs in North Dakota. 76 Fed. Reg. at 58,585; 77 Fed. Reg. at 20,930. In addition, EPA also adopted a PM limit of 0.26 lb/MMBtu for Corette in its FIP for Montana. 77 Fed. Reg. at 57,911.

[9] Greater reasonable progress can be demonstrated using one of two methods: (i) "greater emission reductions" than under BART (40 C.F.R. §51.308(e)(3)); or (ii) "based on the clear weight of evidence" (40 C.F.R. §51.308(e)(2)(E)). As the U.S. Circuit Court of Appeals for the 10th Circuit recently observed, the state is free to choose one method or the other. *WildEarth Guardians v. E.P.A.*, 770 F.3d 919, 935-37 (10th Cir. 2014). The court characterized the former approach as a "quantitative" and the later as "qualitative," and specifically sanctioned the use of qualitative factors under the clear weight of evidence.

more stringent than the presumptive BART emission limit at the four EGUs that are subject-to-BART, and additional reductions of visibility impairing pollutants from three EGUs that are not subject to BART: PacifiCorp Hunter Unit 3, PacifiCorp Carbon Unit 1, and PacifiCorp Carbon Unit 2.

> **PacifiCorp Hunter Units 1 and 2 and PacifiCorp Huntington Units 1 and 2**: the replacement of first generation low-NO_x burners with Alstom TSF 2000TM low-NO_x firing system and installation of two elevations of separated overfire air.
>
> **PacifiCorp Hunter Unit 3** (not subject-to-BART): the replacement of first generation low-NOx burners with upgraded low-NOx burners with overfire air.
>
> **PacifiCorp Carbon Units 1 and 2** (not subject-to-BART): permanent closure of both units by August 15, 2015 and rescission of the plant's operating permit by December 31, 2015.

PacifiCorp has announced plans to shut down the Carbon Power Plant in 2015[10] due to the high cost to control mercury to meet the requirements of EPA's Mecury and Air Toxics Standards (MATS). The MATS rule was finalized in 2011, well after the 2002 base year for Utah's RH SIP, and therefore any reductions required to meet the MATS rule may be considered as part of an alternative strategy under 40 CFR 51.308(e)(2)(vi). This plant is located about 30 miles northeast of the Huntington Plant and about 40 miles northeast of the Hunter Plant and its emissions impact the same general area as the Hunter and Huntington Plants. Average SO_2 emissions from the Carbon Plant in 2012-13 were 8,005 tons/yr, and average NOx emissions were 3,342 tons /yr. PacifiCorp and ultimately Utah rate payers must pay the cost to replace the electricity generated by this plant, but there will also be a visibility benefit due to the emission reductions. Overall emission reductions of SO_2 and NOx due to the closure of this plant will be greater than the NOx reductions that could be achieved by installing the most stringent NOx control, SCR, on the four subject-to-BART EGUs and the emission reductions will occur close to the location of the Hunter and Huntington plants.

While PacifiCorp has announced plans to shut down the Carbon Plant, this decision is not enforceable, and PacifiCorp could choose to meet the MATS requirements through other measures. On November 25, 2014, the Supreme Court agreed to consider challenges to the MATS rule, so there is a possibility that the mercury control requirements could be overturned or delayed. An enforceable requirement in the RH SIP to permanently close the Carbon Plant as part of an alternative to BART would lock in substantial emission reductions.

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[10] "PacifiCorp continues to plan for retirement of its Carbon facility in early 2015 as the least-cost alternative to comply with MATS and other environmental regulations. Implementation of the transmission system modifications necessary to maintain system reliability following disconnection of the Carbon facility generators from the grid are underway." 2013 Integrated Resource Plan Update Redacted, PacifiCorp, March 21, 2014, page 16.

V. BART-eligible Sources Covered by Alternative Measure for NOx

40 CFR 51.308(e)(2)(i)(A) A list of all BART-eligible sources within the state.
40 CFR 51.308(e)(2)(i)(B) A list of all BART-eligible sources and all BART source categories covered by the alternative program. The state is not required to include every BART source category or every BART-eligible source with a BART source category in an alternative program, but each BART-eligible source in the state must be subject to the requirements of the alternative program, have a federally enforceable emission limitation determined by the state and approved by EPA as meeting BART in accordance with section 302(c) or paragraph (e)(1) of this section, or otherwise addressed under paragraphs (e)(1) or (e)(4) of this section.

Four EGUs were the only BART-eligible sources identified in Utah's 2008 RH SIP. All four of these EGUs are covered by the alternative program.

- PacifiCorp Hunter, Unit 1
- PacifiCorp Hunter, Unit 2
- PacifiCorp Huntington, Unit 1
- PacifiCorp Huntington, Unit 2

The Alternative Measure includes "non-BART sources" (i.e., Carbon Unit 1 and Unit 2 (PM, NO_X and SO_2) and Hunter Unit 3 (NO_X)). The Tenth Circuit Court recognized non-BART sources as a legitimate factor to consider in a "weight of the evidence" analysis. *WildEarth Guardians v. E.P.A.*, 770 F.3d 919, 935-36 (10th Cir. 2014).

VI. NOx emission reductions achievable

40 CFR 51.308(e)(2)(i)(C) An analysis of the best system of continuous emission control technology available and associated emission reductions achievable for each source within the state subject to BART and covered by the alternative program. This analysis must be conducted by making a determination of BART for each source subject to BART and covered by the alternative program as provided for in paragraph (e)(1) of this section, unless the emissions trading program or other alternative measure has been designed to meet a requirement other than BART (such as the core requirement to have a long-term strategy to achieve the reasonable progress goals established by the states). In this case, the state may determine the best system of continuous emission control technology and associated emission reductions for similar types of sources within a source category based on both source-specific and category-wide information, as appropriate.

In June 2012, PacifiCorp prepared a new 5-factor BART analysis to satisfy the requirements of the BART rule. PacifiCorp submitted an update to that analysis on August 5, 2014 to address issues that EPA had raised with other regional haze SIPs. The technologies identified in the analysis range from the currently required low NOx burners with overfire air (presumptive BART) to the most-stringent NOx technology (SCR + low NOx burners with overfire air). DAQ reviewed PacifiCorp's analysis and agreed that SCR + low NOx burners with overfire air with an annual emission rate of 0.05 lb/MMBtu was the most stringent technology available to reduce NOx emissions from the four subject-to-BART EGUs.[11] This technology is very expensive to install on the subject-to-BART EGUs considering their current configuration and the unique characteristics of Utah's coal and would require careful consideration through a case-by-case 5-factor analysis before determining if it was cost effective. However, this technology can be used as a stringent benchmark for comparison with an alternative program. DAQ's use of this technology as a benchmark is not a determination that this technology is BART, it is merely a conservative approach to evaluate the effectiveness of the alternative program (see Table 2).

[11] EPA has used a 0.05 lb/MMBtu NOx emissions rate for SCR for other regional haze SIP analyses, recently in New Mexico and Arizona. *See e.g.*, 79 Fed. Reg. 60,978, 60, 984 (New Mexico, Oct. 9 2014)("In promulgating the FIP, we evaluated the performance of both new and retrofit SCRs and determined that 0.05 lb/MMBtu on a 30-boiler-operating-day average was the appropriate emission limit for SCR at the San Juan Generating Station units. See 76 FR 491 and 76 FR 52388. New Mexico appropriately used this same rate in their cost and visibility analyses for the four-SCR scenario as part of its BART evaluation."); 79 Fed. Reg. 52,420, 52,431 (Arizona, Sept. 3, 2014)("We agree that our use of a 0.05 lb/MMBtu annual average design value for SCR is consistent with other BART determinations for coal-fired power plants."). EPA has agreed that even higher NOx emission rates can qualify as the most stringent emission rate for modeling visibility impacts. For example, EPA accepted state-mandated SCR emission rates of 0.07 and 0.08 in Colorado, as well as its SCR related analyses based on 0.07. 77 Fed. Reg. 76,871 (Colorado, Dec. 21, 2012). EPA also used 0.083 to 0.098 for the Reid Gardner Station in Nevada. 77 Fed. Reg. 50,936, 50,942 (Nevada, Aug. 23, 2012).

VII. Projected Emission Reductions from Alternative Measures

40 CFR 51.308(e)(2)(i)(D) An analysis of the projected emissions reductions achievable through the trading program or other alternative measure.

Table 2 shows the estimated annual emissions for NOx, SO_2, and PM_{10} for the most stringent NOx scenario and the alternative measure. As can be seen, NOx emissions are higher under the alternative measure, but emissions of SO_2 and PM_{10} are both lower under the alternative measure. Combined emissions of all three pollutants are 2,856 tons/yr lower under the alternative measure.[12]

Table 2. Estimated emissions under the most stringent NOx scenario and the alternative scenario

Units	NOx emissions (tons/yr)		SO_2 emissions (tons/yr)		PM_{10} emissions (tons/yr)[d]		Combined	
	Most Stringent NOx[b]	Alternative[c]	Most Stringent NOx[b]	Alternative[c]	Most Stringent NOx	Alternative	Most Stringent NOx	Alternative
Carbon 1	1,408	0	3,388	0	221	0	5,016	0
Carbon 2	1,940	0	4,617	0	352	0	6,909	0
Hunter 1[a]	775	3,412	1,529	1,529	169	169	2,473	5,100
Hunter 2	843	3,412	1,529	1,529	169	169	2,541	5,110
Hunter 3	6,530	4,622	1,033	1,033	122	122	7,685	5,777
Huntington 1	809	3,593	1,168	1,168	176	176	2,153	4,937
Huntington 2	856	3,844	1,187	1,187	200	200	2,243	5,231
Total	13,161	18,882	14,451	6,446	1409	836	29,020	26,164

[a] Hunter 1 controls were installed in the spring of 2014, therefore Hunter 2 actual emissions are used as a surrogate

[b] Most stringent NOx rate for BART-eligible units (see spreadsheet BART Analysis.pdf in the TSD), 2012-13 actual emissions Carbon, 2001-3 actual emissions Hunter 3 (EPA Acid Rain Program)

[c] Average actual emissions 2012-13 for Hunter and Huntington units, EPA Acid Rain Program

[d] Actual emissions for 2012, DAQ annual inventory

[12] EPA has approved, or proposed approval, of other BART Alternatives that included "inter-pollutant trading" when SO_2 levels were lowered. 79 Fed. Reg. 33,438, 33,440-41 (Washington, June 11, 2014); 79 Fed. Reg. 56,322, 56,328 (Arizona, Sept. 19, 2014).

VIII. Greater Reasonable Progress than BART

40 CFR 51.308(e)(2)(i) Demonstration that the emissions trading program or other alternative measure will achieve greater reasonable progress than would have resulted from the installation and operation of BART at all sources subject to BART in the state and covered by the alternative program.

40 CFR 51.308(e)(2)(i)(E) A determination under paragraph (e)(3) if this section or otherwise based on the clear weight of evidence that the trading program or other alternative measure achieves greater reasonable progress than would be achieved through the installation and operation of BART at the covered sources.

EPA described the clear weight of evidence standard as follows: ‘‘Weight of evidence” demonstrations attempt to make use of all available information and data which can inform a decision while recognizing the relative strengths and weaknesses of that information in arriving at the soundest decision possible. Factors which can be used in a weight of evidence determination in this context may include, but not be limited to, future projected emissions levels under the program as compared to under BART, future projected visibility conditions under the two scenarios, the geographic distribution of sources likely to reduce or increase emissions under the program as compared to BART sources, monitoring data and emissions inventories, and sensitivity analyses of any models used. (Emphasis added.) See 71 Fed. Reg. 60,612, 60,622 (Oct. 13, 2006).[13]

The weight of evidence shows that the alternative program will provide greater reasonable progress than BART. The DAQ used a number of different metrics to reach this conclusion. First, as outlined in section VI, combined emissions of NOx, SO_2, and PM will be 2,856 tons/yr lower under the alternative scenario. The NOx reductions at Huntington 1 and 2 and Hunter 2 and 3 occurred between 2006 and 2011, earlier than was required by the rule, providing a corresponding early and on-going visibility improvement[14]. Second, as outlined in section VIII.A, the alternative provides greater reductions of SO_2, the most significant anthropogenic pollutant affecting Class I Areas on the Colorado Plateau that affects visibility year-round, including the high visitation seasons of Spring, Summer, and Fall. Finally, as outlined in section VIII.B, visibility modeling shows that the alternative will provide greater visibility improvement.

[13] EPA recently confirmed the availability of the “other alternative measure” based on the “clear weight of evidence” approach in approving a “BART Alternative” under the Arizona regional haze state implementation plan. 80 Fed. Reg. 19220 (April 10, 2015).

[14] The U.S. Circuit Court of Appeals for the 10th Circuit explicitly acknowledged that the consideration of early reductions was proper as part of a qualitative or clear weight of evidence approach to determining greater reasonable progress. WildEarth Guardians v. E.P.A., 770 F.3d 919, 938 (10th Cir. 2014).

DAQ conducted dispersion modeling using the CALPUFF model to compare the visibility improvement anticipated under the alternative measure with the visibility improvement under the most stringent NOx technology for the four subject-to-BART EGUs. The seven EGUs shown in Table 3 were included in the modeling. Detailed information regarding the modeling inputs, emission scenarios, and methods are described in the February 13, 2014 modeling protocol.[15]

Table 3. Emission units and Class I areas modeled

Company Name	Plant Name	Units
PacifiCorp	Hunter	Boilers #1,2,3
PacifiCorp	Huntington	Boilers #1,2
PacifiCorp	Carbon	Boilers #1,2

Source	Class I Areas to be Evaluated
PacifiCorp Hunter Plant, PacifiCorp Huntington Plant, PacifiCorp Carbon Plant	Arches National Park, Canyonlands National Park, Capitol Reef National Park, Bryce National Park, Zion National Park, Mesa Verde National Park, Black Canyon of the Gunnison National Park, Grand Canyon National Park, Flat Tops Wilderness

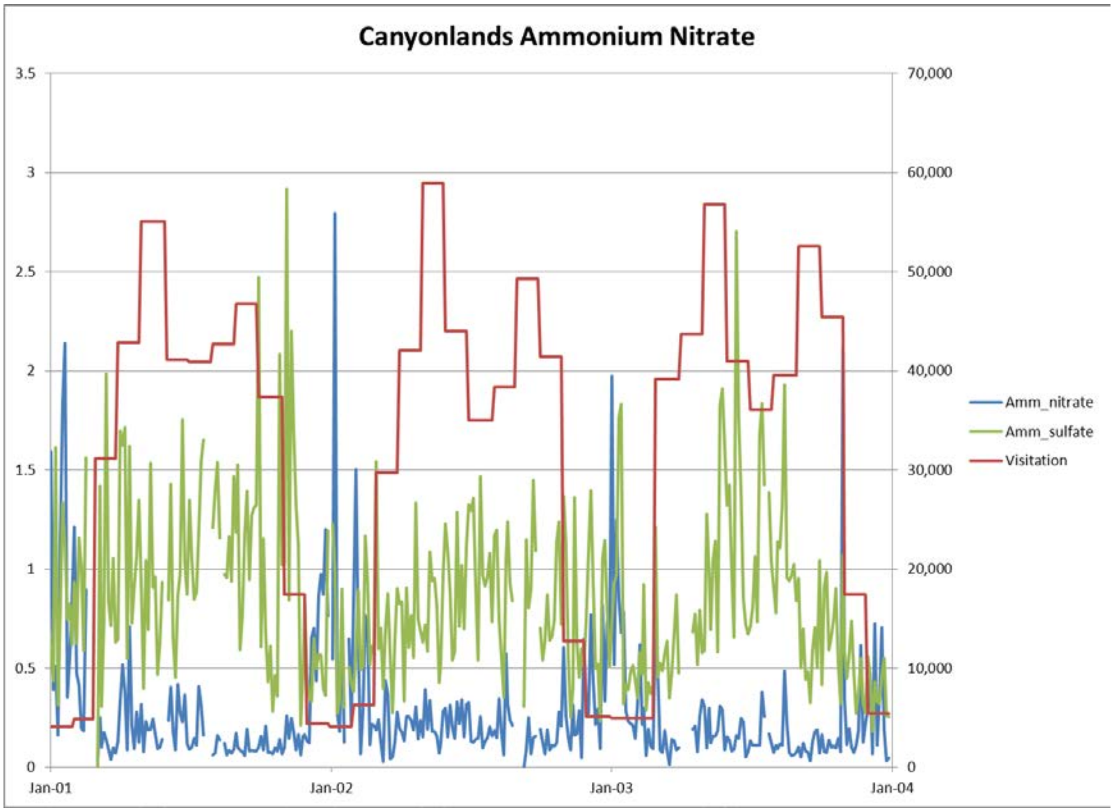
Because the emission reductions under the alternative included reductions of SO_2 in addition to reductions of NOx, visibility improvement under the two scenarios could occur during different episodes and during different times of the year. For this reason, a number of different metrics were evaluated to compare the two scenarios.

A. Continued Focus on SO_2 Reductions

Utah's 2003 RH SIP focused on SO_2 reductions because SO_2 has the greatest overall impact at Class I areas on the Colorado Plateau and revisions in 2008 and 2011 continued this focus. The alternative measures enhance that approach through additional, significant emission reductions of over 8,000 tons/yr SO_2 due to the closure of the Carbon Plant. Figure 1 shows that sulfates are the dominant visibility impairing pollutant at Canyonlands, the Class I area with the greatest overall impact from the four subject-to-BART sources. Figure 4 shows that sulfates affect visibility throughout the year and are the dominant visibility impairing pollutant from anthropogenic sources during the high visitation period of March through November. Similar results are seen at the other Class I areas and are documented in the TSD.

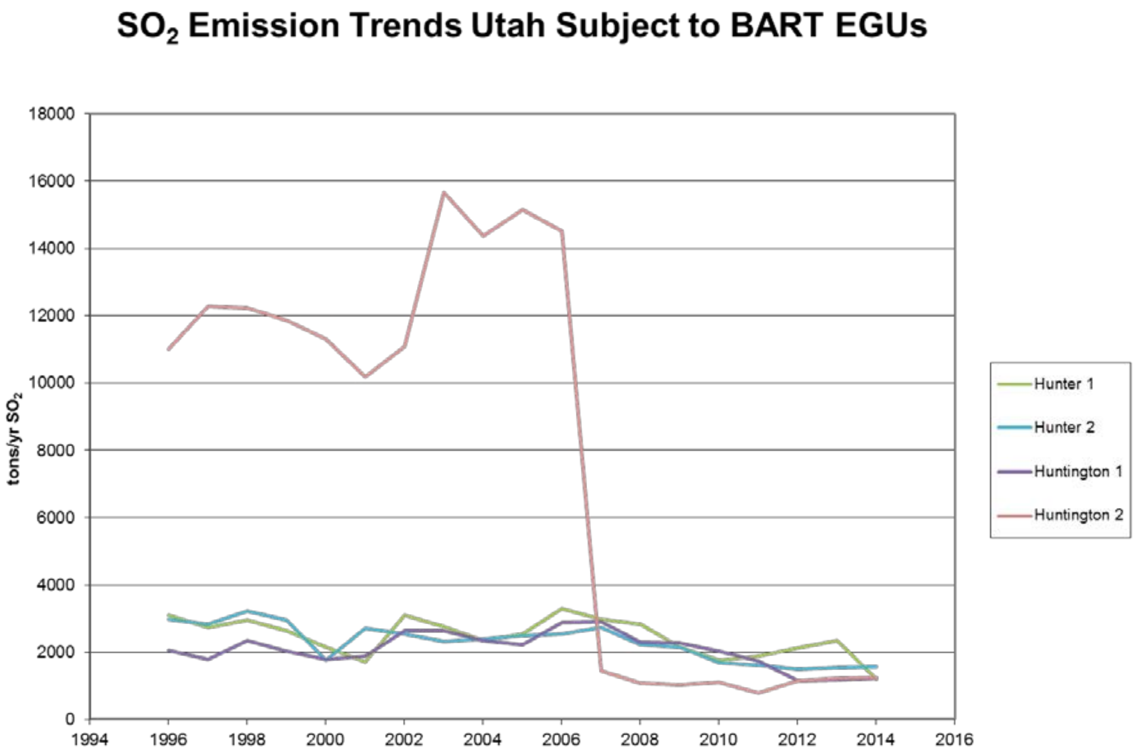
[15] Air Quality Modeling Protocol: Utah Regional Haze State Implementation Plan, Utah Division of Air Quality, February 13, 2015

Figure 4. Canyonlands ammonium sulfate and ammonium nitrate



DAQ has confidence that SO_2 reductions will achieve meaningful visibility improvement. The visibility improvement during the winter months due to NOx reductions is much more uncertain. Figure 5 shows the significant emission reductions of both SO_2 and NOx that have occurred from the four subject-to-BART EGUs over the last 15 years. Figure 6 shows corresponding improvements in ammonium sulfate values at Canyonlands throughout the year. However, ammonium nitrate values do not show similar improvement in the winter months, despite a 50% reduction in NOx over this time period.

Figure 5. SO_2 and NOx Emission Trends



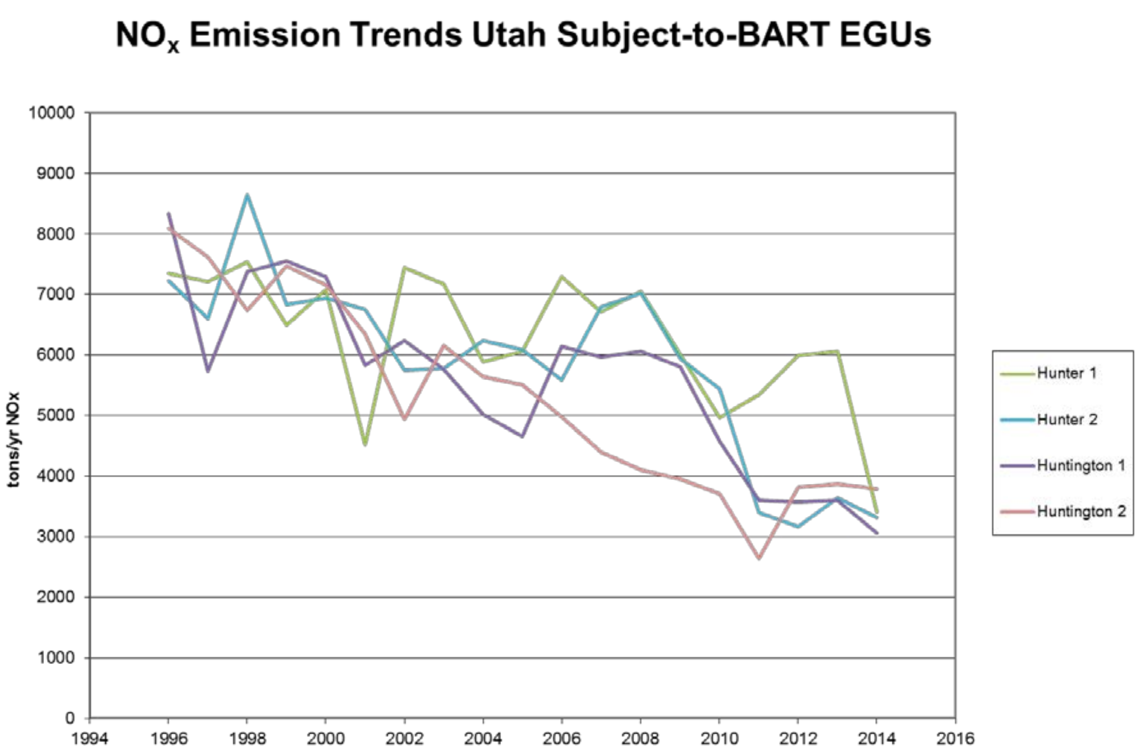
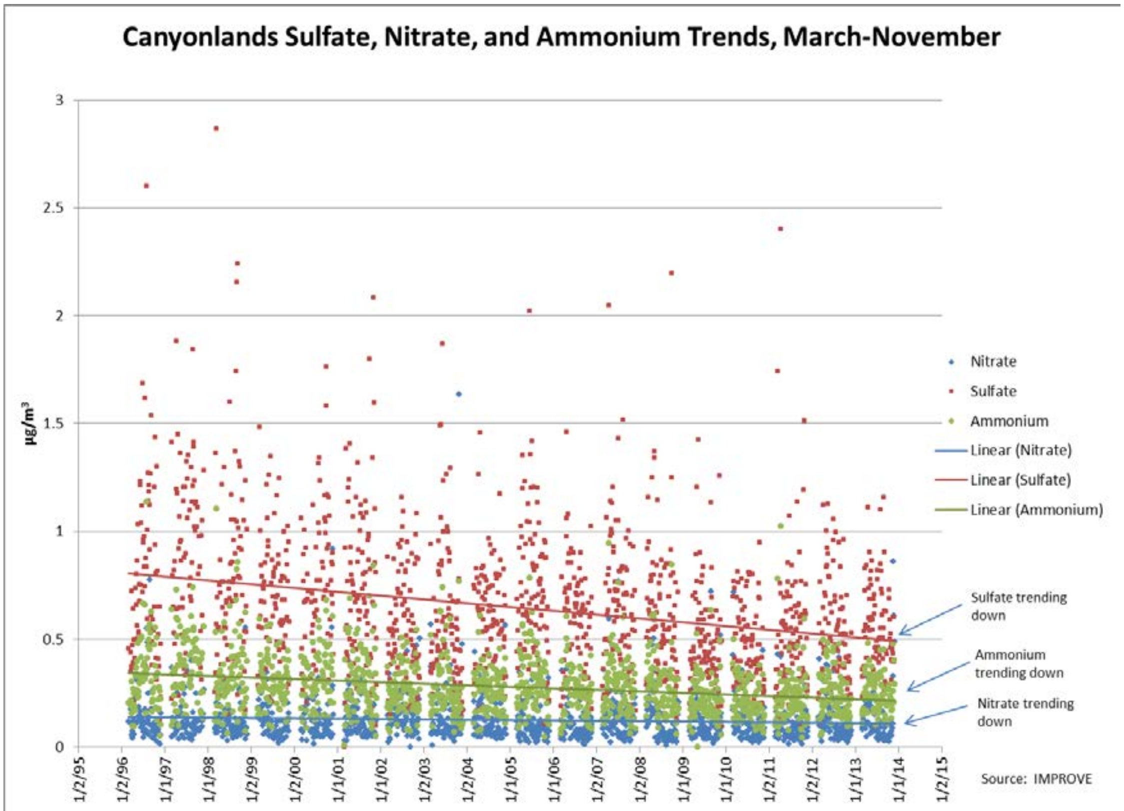
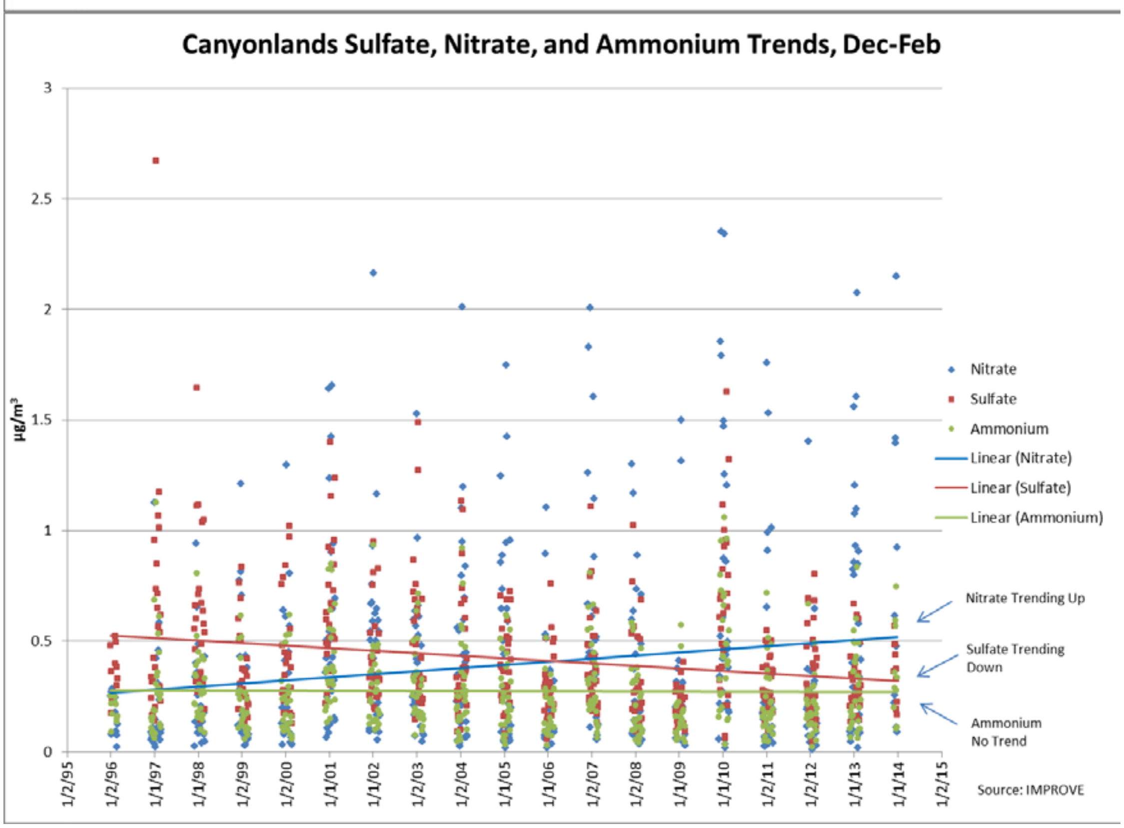


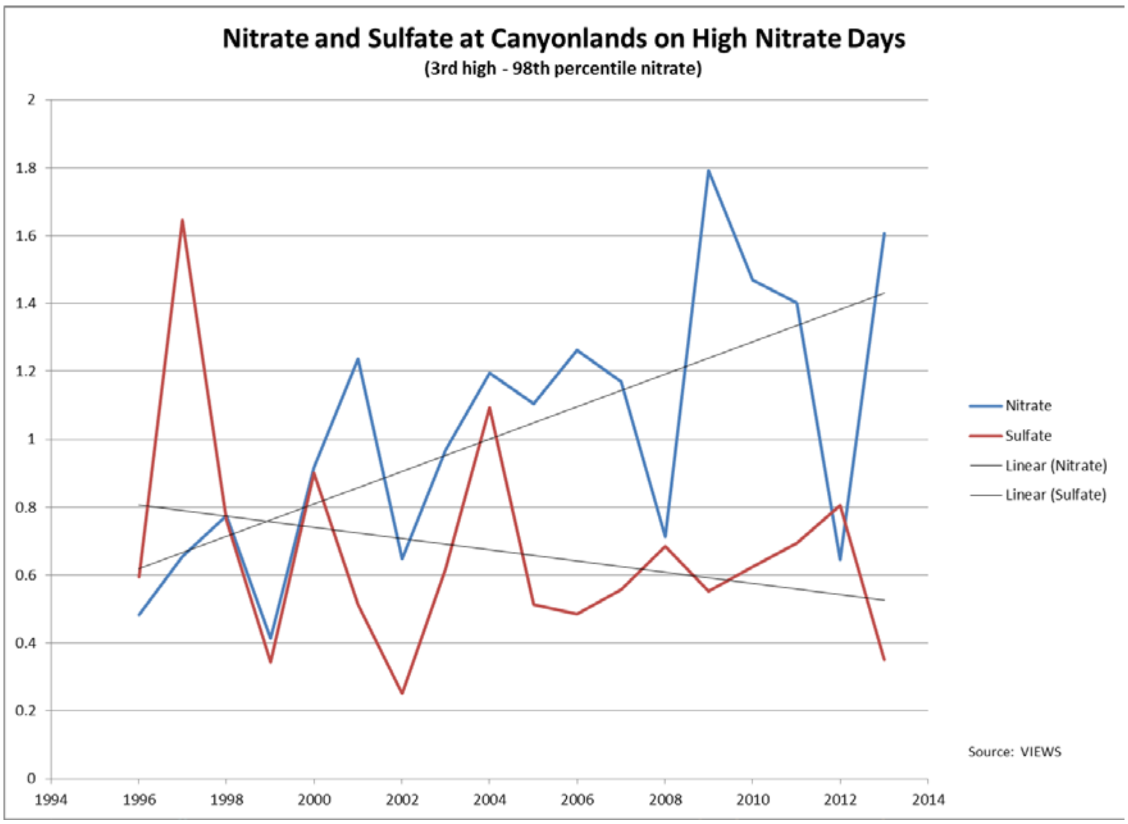
Figure 6. Sulfate and Nitrate Trends at Canyonlands





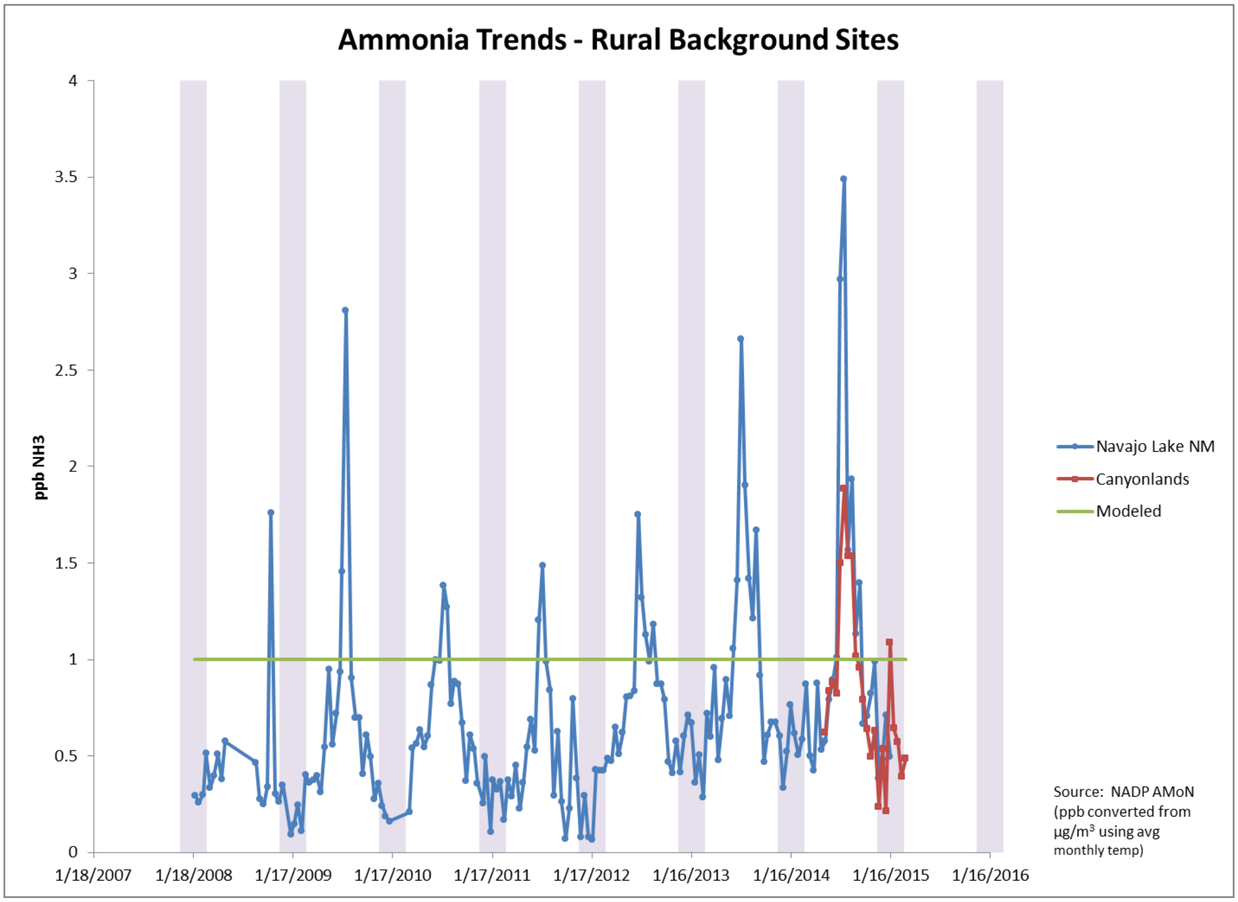
The explanation for the lack of improvement in winter nitrate levels may lie in the chemical reactions that lead to the formation of ammonium sulfate and ammonium nitrate. Ammonium sulfate forms more readily than ammonium nitrate when both SO_2 and NOx are available to react with ammonia. As SO_2 emissions decline and SO_2 is no longer available, the reaction shifts to form ammonium nitrate from available NOx. Figure 7 shows the nitrate and sulfate mass on the 98th percentile (3rd high) nitrate day showing the possible shift from formation of sulfate to nitrate. Figure 6 on the previous page shows that the decreases in sulfate are offset by increases in nitrate during the winter while ammonium levels show little change. This would make sense if ammonia is limiting the reaction because two molecules of ammonium nitrate (NH4)NO3 would be created for every molecule of ammonium sulfate (NH4)2SO4 that was decreased. During the summer sulfate, nitrate, and ammonium are all decreasing, indicating that ammonia is not limiting the reaction.

Figure 7. Nitrate and Sulfate on High Nitrate Days



The overall result is that emission reductions may not lead to visibility improvement in the winter because there is not enough ammonia available to react with all of the SO2 and NOx available in the area. Figure 8 shows ammonia monitoring data from Canyonlands National Park and Navajo Lake in New Mexico. Ammonia levels at these two sites are very low during the winter.

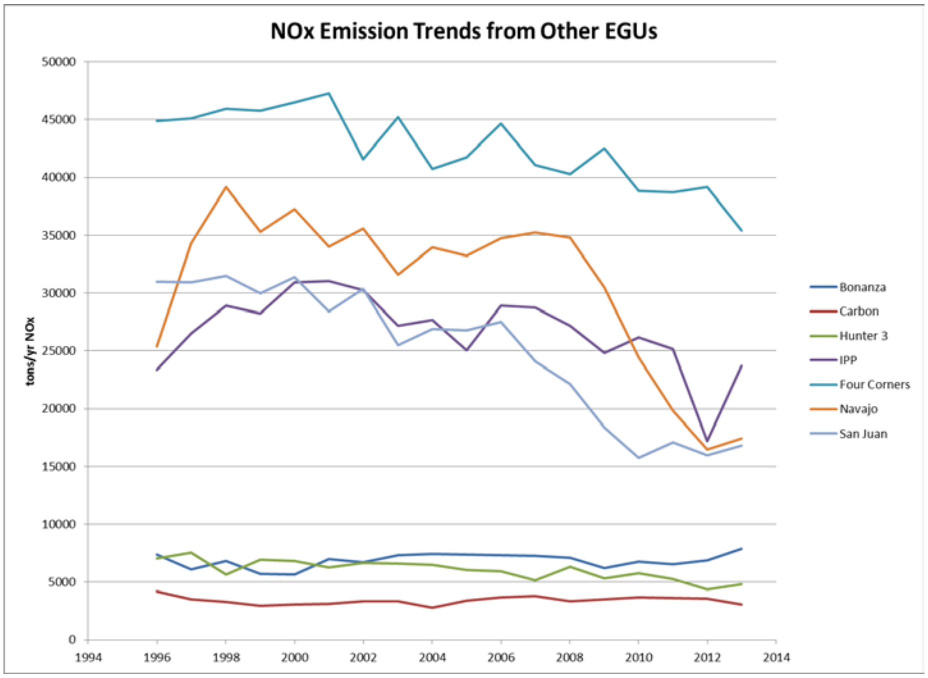
Figure 8. Ammonia Trends at Rural Background Sites



Ammonium nitrate levels are low most of the year and are only significant during the winter months (see figure4) so if NOx emission reductions do not lead to visibility improvements in the winter the overall effect may not be a great as expected. Ammonium sulfate, on the other hand, is an issue year round. For this reason, DAQ has greater confidence that modeled improvements due to reductions in SO_2 will be reflected in improved visibility for visitors to the Class I areas, while reductions in NOx will have a more uncertain benefit.

DAQ also considered the effect of changes in NOx emission from other sources in the region as a possible explanation for the increase in ammonium nitrate levels. Figure 9 shows that NOx emissions are decreasing at other EGUs in the area. Mobile source NOx emissions are decreasing nationwide due to implementation of the Tier 1 and Tier 2 emission standards and should continue to be reduced through the implementation of Tier 3 emission standards.

Figure 9. NOx Emission Trends from EGUs



Oil and gas NOx emissions in the surrounding basins may be increasing as shown in Table 4, but the overall scale of the emission increase is small when compared to the decrease in emissions from EGUs and mobile sources in the region.

Table 4. NOx Emissions from the Oil and Gas Industry

Oil and Gas Inventory

	2006	2012	Change
Uinta Basin	13,093	19,801	6,708
Northern San Juan	5,700	4,195	(1,505)
Southern San Juan	42,075	43,050	975
Piceance	12,390	9,951	(2,439)
Total	73,258	73,747	3,739

Source: WRAP Phase III Inventory 2012 projection. Uinta Basin – 2011 NEI inventory area sources and state permitted, WRAP 2012 Indian Country permitted.

The largest increase in NOx emissions is occurring in the Uinta Basin, located to the north of Utah's Class I areas. It is worth noting that during the winter months when ammonium nitrate levels are increasing at Canyonlands, a significant portion of the Uinta Basin emissions are trapped under a tight inversion layer throughout much of the winter. Extensive research through the multi -year Uinta Basin Ozone Study (UBOS) has indicated that there is little exchange between the air below and above the inversion layer when an inversion is in place. The emissions are transported out of the Uinta Basin during significant storm events that break up the inversion. These storm events affect the entire region and are unlikely to transport emissions to nearby Class I areas. The DAQ is currently working with EPA, the Ute Tribe, and producers in the Uinta Basin to improve the oil and gas inventory.

The fact that ammonium nitrate levels are decreasing during most of the year, but are increasing during the winter is the best indication that the increase in ammonium nitrate is not due to changes in emissions because the emission changes are not seasonal. If emissions were increasing, the effect should be seen year round.

B. Comparison of Modeled Results

The visibility modeling demonstrated greater visibility improvement across all Class I areas. The results of this modeling are described in sections VIII.B.1 through 4. The detailed modeling results are included in the TSD.[16]

1. Improvement in number of days with significant visibility impairment.

Modeled visibility improved more often under the alternative scenario leading to an average of six fewer days with a deciview impact greater than 1.0 dV per year and 58 fewer days with a deciview impact greater than 0.5 dV per year. The number of days improved is shown using two different methodologies. The first, shown in Tables 5 and 6, shows the 3-year average number of days at each Class I area with an impact of greater than 1.0 dv and 0.5 dv. The 3-year average is then totaled for all Class I areas to show the total number of days across all Class I areas /year.

Table 5. Average Number of Days > 1.0 dV Impact

	Basecase	Alternative	Most Stringent NOx Control
Arches	128	68	77
Black Canyon of the Gunnison	36	10	9
Bryce Canyon	19	9	8
Canyonlands	141	87	87
Capitol Reef	68	42	41
Flat Tops	46	13	15
Grand Canyon	22	11	10
Mesa Verde	40	13	12
Zion	11	6	6
Total	511	258	264

[16] Technical Support Document for Regional Haze SIP

Table 6. Average Number of Days > 0.5 dV Impact

	Basecase	Alternative	Most Stringent NOx Control
Arches	176	109	130
Black Canyon of the Gunnison	75	27	34
Bryce Canyon	36	17	19
Canyonlands	178	131	140
Capitol Reef	96	63	65
Flat Tops	93	34	44
Grand Canyon	38	19	20
Mesa Verde	71	32	37
Zion	21	10	10
Total	784	441	499

The second methodology focuses on the improvement rather than the results. In this case the improvement in visibility from the baseline for each scenario was calculated for each day in the 3-year period. The number of days was then totaled across all Class I areas showing the total days across the 3-year period. Tables 7 and 8 show the number of days improved by ≥ 1.0 dV and ≥ 0.5 dV across the 3-year period.

Table 7. Number of Days that Improved 1.0 dV impact (across all 3 years)

	Alternative	Most Stringent NOx Control
Arches	246	222
Black Canyon	51	43
Bryce Canyon	27	28
Canyonlands	258	259
Capitol Reef	138	127
Flat Tops	63	51
Grand Canyon	33	35
Mesa Verde	51	53
Zion	18	19
Total	885	837

Table 8. Number of Days that Improved > 0.5 dV impact (across all 3 years)

	Alternative	Most Stringent NOx Control
Arches	433	378
Black Canyon	138	116
Bryce Canyon	66	62
Canyonlands	443	419
Capitol Reef	215	212
Flat Tops	181	144
Grand Canyon	78	78
Mesa Verde	138	132
Zion	37	34
Total	1729	1575

The results are presented in more detail in Figures 10-12 for the three most impacted Class I areas, Canyonlands, Arches, and Capitol Reef. Similar figures for the other Class I areas are included in the TSD. The groupings showing dV improvement of 3 or greater are almost all days during the winter months of December – February. The largest number of days improved are found in the 1 dV group and the .5 dV group and contain days throughout the year, including the high visitation period of March – November.

Figure 10. Days Improved at Canyonlands

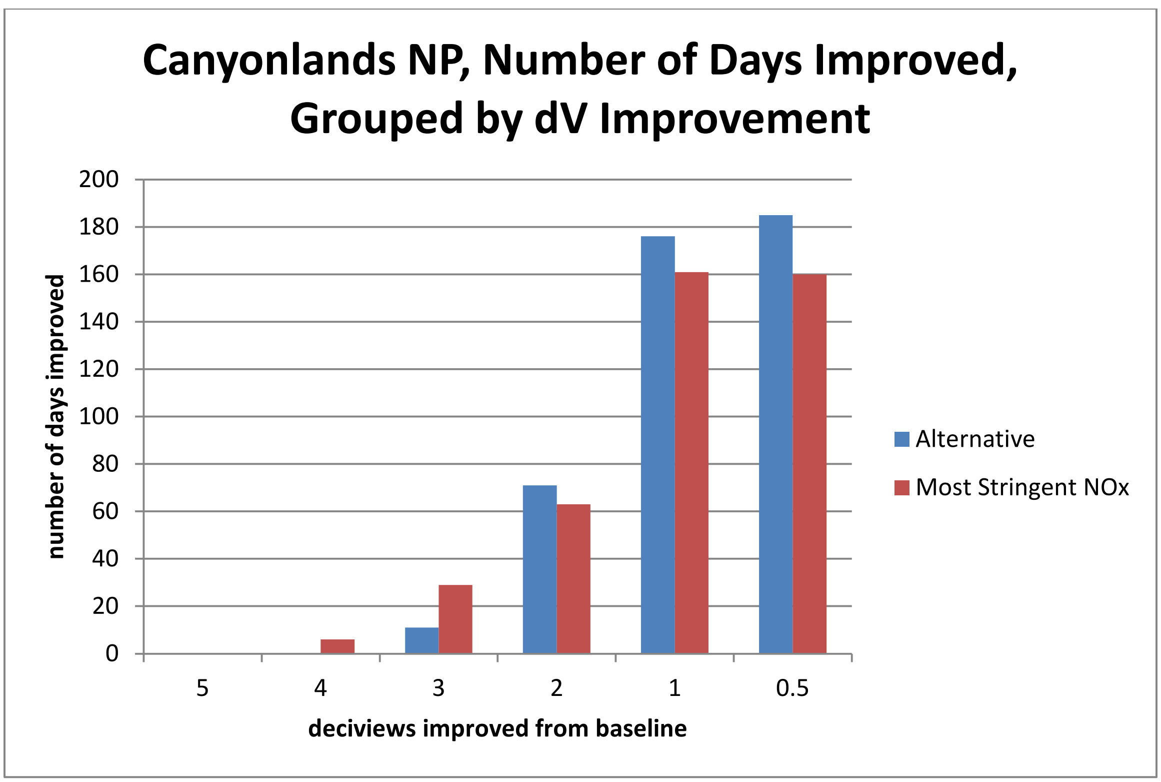


Figure 11. Days Improved at Arches

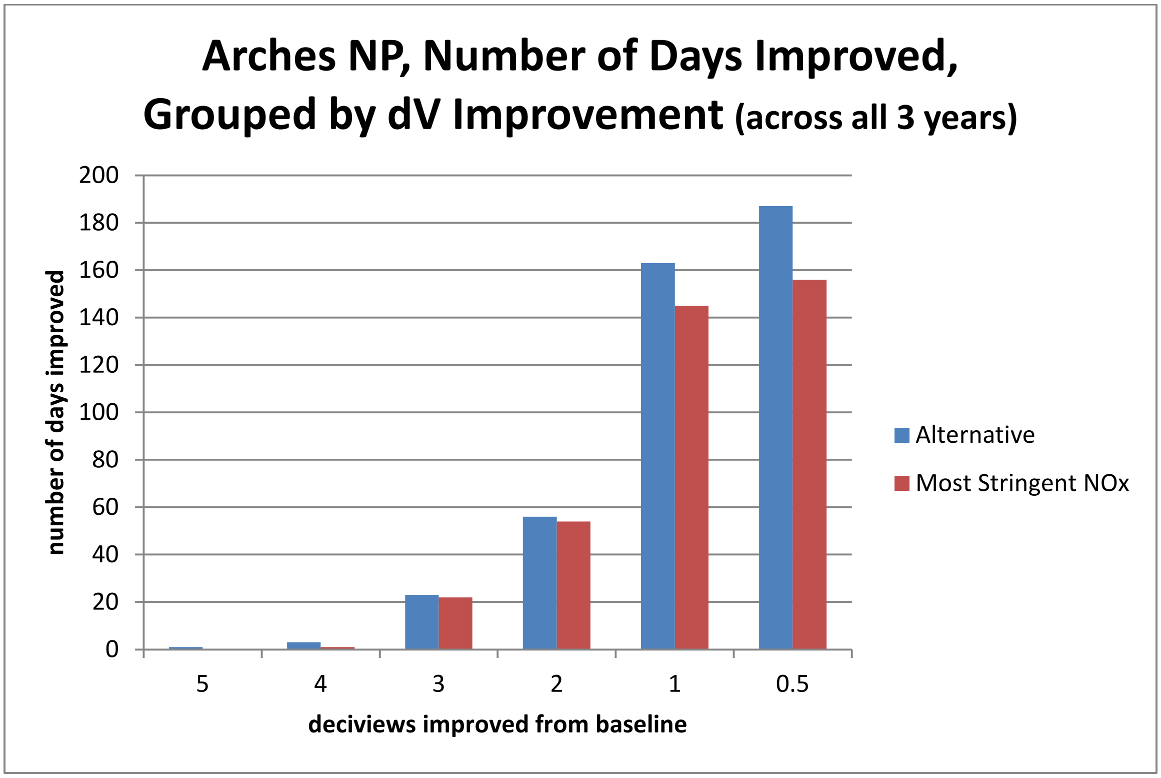
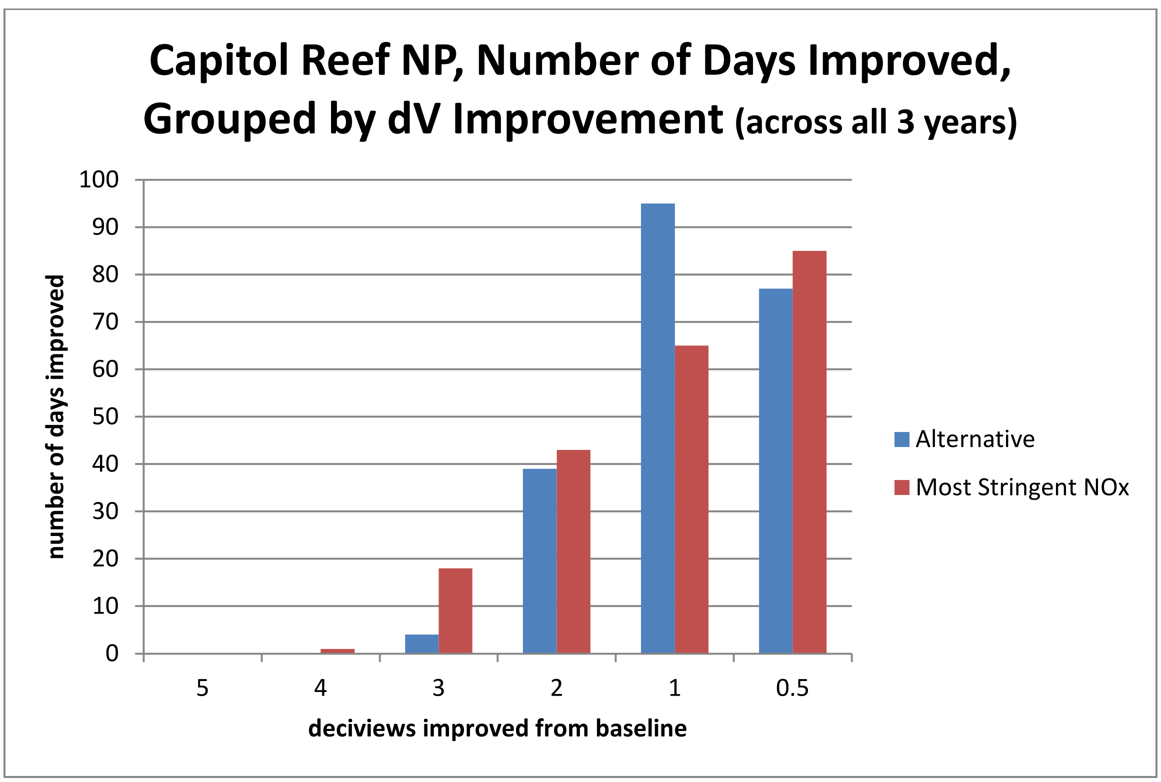


Figure 12. Days Improved at Capitol Reef



2. Average deciview impact

The average deciview impact at all Class I areas is better or the same under the alternative at six of the nine Class I areas, and is better on average across all the Class I areas. The average impact was calculated by averaging all modeling results for each year and then calculating a 3-year average from the annual average. The average deciview metric shows the benefit that will be achieved day in and day out in the Class I areas. This information is valuable as part of the overall weight of evidence because reductions in SO_2 and reductions in NOx improve visibility at different times of year and at different Class I areas. Ammonium sulfate is an issue year round while ammonium nitrate is primarily an issue in the winter. This means that the benefits of SO_2 reductions are more apparent when looking at longer averaging periods while the benefits of NOx reductions are more apparent when looking at the worst days. The average monitoring data shown earlier in this document in Figure 1 illustrates this difference. As can be seen in the figure, ammonium sulfate is the most significant visibility impairing pollutant on average. As explained in Section VIII.A, the DAQ has less confidence in the modeled results in the winter when the worst days occur because emission reductions have not led to the expected improvements during that time period.

Table 9. Average ∆dV across all Class I Areas

	Basecase	Alternative	Most Stringent NOx
Arches	1.236	0.616	0.688
Black Canyon of the Gunnison	0.334	0.137	0.158
Bryce Canyon	0.192	0.089	0.090
Canyonlands	1.389	0.791	0.760
Capitol Reef	0.719	0.398	0.367
Flat Tops	0.427	0.167	0.210
Grand Canyon	0.211	0.102	0.100
Mesa Verde	0.338	0.148	0.154
Zion	0.119	0.056	0.056
Average	0.552	0.278	0.287

3. 90th percentile deciview impact

The 90th percentile deciview impact is better or the same under the alternative at seven of the nine Class I areas, and is slightly better on average across all Class I areas. This metric shows that even on higher impact days the benefits of the alternative are comparable to the most stringent NOx scenario. Ammonium sulfate affects visibility year round and also impacts visibility on days with greater impairment. The alternative scenario that contains greater SO_2 reductions achieves comparable results to the most stringent NOx scenario that contains greater NOx reductions on these impaired days.

Table 10. 90th Percentile (110th highest) across all 3 years

	Basecase	Alternative	Most Stringent NOx
Arches	3.721	1.859	1.999
Black Canyon of the Gunnison	0.977	0.400	0.465
Bryce Canyon	0.495	0.189	0.227
Canyonlands	4.183	2.447	2.148
Capitol Reef	2.416	1.234	1.150
Flat Tops	1.221	0.466	0.555
Grand Canyon	0.559	0.222	0.241
Mesa Verde	1.124	0.430	0.501
Zion	0.183	0.067	0.089
Average	1.653	0.813	0.819

4. 98th percentile deciview impact

The only metric evaluated that showed greater improvement under the most stringent NOx scenario was the visibility impact on the most impaired days. Because high nitrate values occur primarily in the winter months, the most stringent NOx scenario achieved greater modeled visibility improvement on these high nitrate days. As discussed earlier, there is greater uncertainty regarding the effect of NOx reductions on wintertime nitrate values because past emission reductions have not resulted in corresponding reductions in monitored nitrate values during the winter months. DAQ has greater confidence in the visibility improvement due to reductions of SO_2 because past reductions have resulted in corresponding reductions in monitored sulfate values throughout the year.

Table 11. Average 98th Percentile (22nd High) Across 3 Years

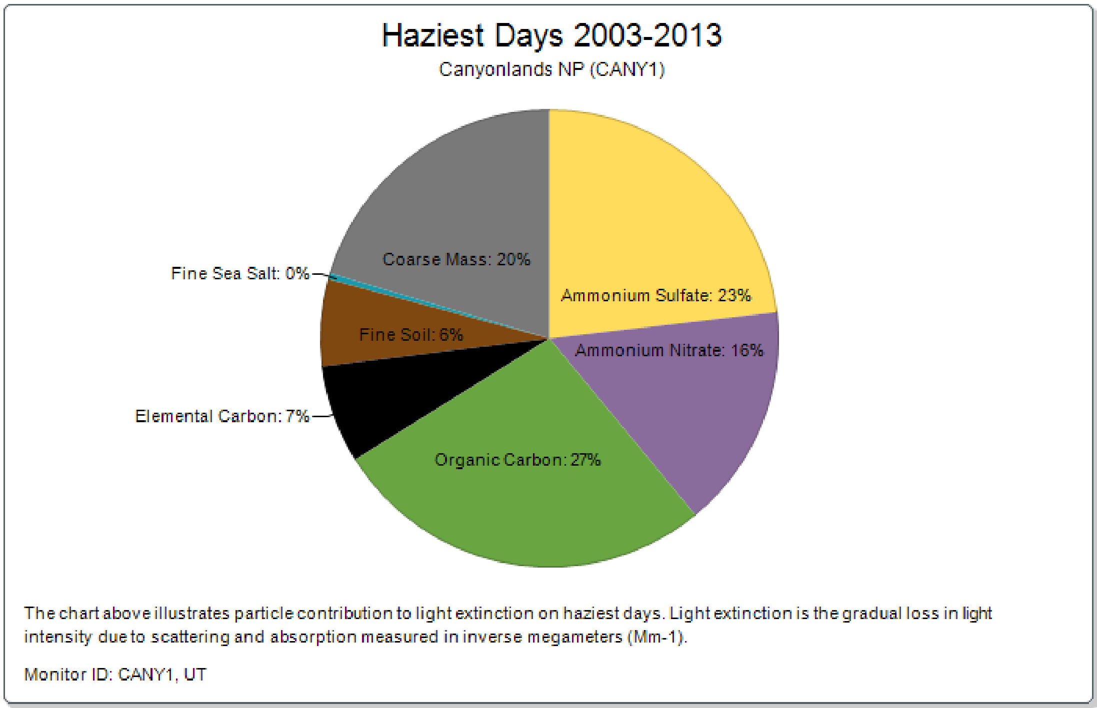
	Basecase	Alternative	Most Stringent NOx
Arches	7.25	4.43	4.57
Black Canyon of the Gunnison	2.40	1.16	1.07
Bryce Canyon	2.47	1.24	1.14
Canyonlands	8.43	6.08	5.14
Capitol Reef	6.53	4.26	3.76
Flat Tops	2.80	1.27	1.33
Grand Canyon	2.90	1.49	1.33
Mesa Verde	2.91	1.39	1.29
Zion	1.50	0.74	0.73
Average	**4.13**	**2.45**	**2.26**

Table 12. 98th Percentile (8th High) in Highest Year

	Basecase	Alternative	Most Stringent NOx
Arches	7.80	4.92	4.87
Black Canyon of the Gunnison	2.74	1.32	1.36
Bryce Canyon	4.03	1.89	1.96
Canyonlands	8.56	6.32	5.56
Capitol Reef	7.61	4.78	4.21
Flat Tops	3.20	1.37	1.81
Grand Canyon	3.64	1.98	1.81
Mesa Verde	3.08	1.52	1.48
Zion	2.61	1.14	1.22
Average	4.81	2.81	2.70

The CALPUFF modeling that is summarized in this document does not include impacts from other significant sources such as wildfire, windblown dust, other stationary sources, and mobile sources. As can be seen in Figure 13, organic carbon (fire) and coarse mass (windblown dust) are greater contributors to haze than ammonium nitrate on the 20% worst days. So, the modeled results do not give a complete picture of the visibility improvements that will be seen by visitors to Class I areas, especially on the worst days that are impacted by other emission sources.

Figure 13. Particle Contribution on Haziest Days



C. Energy and non-air quality benefits

Energy and non-air quality environmental impacts are one of the factors listed in section 169A(g)(2) that must be considered when determining BART. The alternative would avoid the energy penalty due to operating an SCR unit. PacifiCorp quantified the energy penalty associated with SCR in their August 4, 2014 BART Analysis Update, Appendix A. The energy penalty was included as part of the total cost for installing SCR on each of the units.

Table 13. SCR Energy Penalty

	Energy Penalty	
	kW	$/yr
Hunter Unit 1	2,090	$494,247
Hunter Unit 2	2,090	$494,247
Huntington Unit 1	2,182	$516,098
Huntington Unit 2	2,182	$516,098
Total	**8,544**	**$2,020,690**

The Carbon Plant, like most coal-fired power plants, produces solid wastes in the form of fly ash from the ESPs controlling both units, as well as the bottom ash conveyors which clean the residuals from both boilers. This ash is currently being landfilled. The plant also runs water through both steam generating units (the boilers), as well as a pair of cooling towers. This uses water, and has an associated wastewater discharge. Hauling the ash to landfill requires additional fuel use and water or chemical dust suppression for minimization of fugitive dust control. Finally, for maintenance and emergency purposes, the plant has a number of emergency generators, fire pumps, and ancillary equipment - all of which must be periodically operated, tested and maintained - with associated air emissions, fuel use, painting, and the like. All of these non-air quality impacts are reduced as the result of the closure of the Carbon Plant.

D. Cost

PacifiCorp noted in their comments on the proposed SIP revision that the Alternative Measure not only produces greater reasonable progress, including lower emissions and improved visibility, but it does so at a significant capital cost savings to PacifiCorp and its customers as compared to the most stringent NOx technology and limits. While DAQ has not officially determined the cost of installing SCR on the four units, it is clear that it would be a significant cost. On the other hand, the Carbon Plant has already been closed due to the high cost of complying with the MATS rule. The costs to Utah rate payers (and those in other states served by PacifiCorp) to replace the power generated by the Carbon Plant have already occurred; there will be no additional cost to achieve the co-benefit of visibility improvement. In other words, the Alternative Measure achieves better visibility improvements than would be achieved by requiring SCR as BART at the four EGUs, and at a significantly lower cost. This presents a classic "win/win" scenario –the Alternative Measure results in greater reasonable progress and that greater reasonable progress is achieved at a much lower price compared to SCR. Cost is one of the factors listed in section 169A(g)(2) that should be considered when determining BART.

E. Summary of Weight of Evidence

The weight of evidence shows that the alternative program will provide greater reasonable progress than BART. Combined emissions of NOx, SO_2, and PM will be 2,856 tons/yr lower under the alternative scenario. Reductions were achieved earlier than was required by the rule, providing a corresponding early and on-going visibility improvement. The alternative program provides greater reductions of SO_2, the most significant anthropogenic pollutant affecting Class I Areas on the Colorado Plateau that affects visibility year-round, including the high visitation seasons of spring, summer, and fall. Finally, visibility modeling shows that the alternative will provide visibility improvement on a greater number of days, greater average improvement, and greater improvement on the 90th percentile deciviews across all Class I areas.[17,18]

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[17] Greater reasonable progress can be demonstrated using one of two methods: (i) "greater emission reductions" than under BART (40 C.F.R. §51.308(e)(3)); or (ii) "based on the clear weight of evidence" (40 C.F.R. §51.308(e)(2)(E)). As the U.S. Circuit Court of Appeals for the 10th Circuit recently observed, the state is free to choose one method or the other. *WildEarth Guardians v. E.P.A.*, 770 F.3d 919, 935-37 (10th Cir. 2014). The court characterized the former approach as a "quantitative" and the later as "qualitative," and specifically sanctioned the use of qualitative factors under the clear weight of evidence.

[18] EPA has proposed approval of an Alternative Measure for the Apache Generating Station in Arizona on similar "weight of evidence" grounds. 79 Fed. Reg. 56,322, 56,327 (Sept. 19, 2014). EPA has also approved a similar Alternative Measure in Washington based, in part, on a reduction in the number of days of impairment greater than 0.5 dv and 1.0 dv. 79 Fed. Reg. 33,438, 33,440-42 (June 11, 2014).

IX. Timing of NOx Emission Reductions under Alternative Measure and Monitoring, Recordkeeping, and Reporting

40 CFR 51.308(e)(2)(iii) A requirement that all necessary emission reductions take place during the period of the first long-term strategy for regional haze. To meet this requirement, the state must provide a detailed description of the emission trading program or other alternative measure, including schedules for implementation, the emission reductions required by the program, all necessary administrative and technical procedures for implementing the program, rules for accounting and monitoring emissions, and procedures for enforcement.

The schedule for installation of the NOx controls required by the alternative measure is shown in Table 14. The alternative measure will be fully implemented prior to 2018, the end of the first long term strategy for regional haze.

Table 14. Implementation Schedule

Unit	Year Installed or Required
PacifiCorp Hunter Unit 1	2014
PacifiCorp Hunter Unit 2	2011
PacifiCorp Hunter Unit 3	2008
PacifiCorp Huntington Unit 1	2010
PacifiCorp Huntington Unit 2	2006
PacifiCorp Carbon Unit 1	2015
PacifiCorp Carbon Unit 2	2015

The enforceable emission limits, administrative and technical procedures for implementing the program, rules for accounting and monitoring emissions, and procedures for enforcement are addressed in SIP Section IX, Parts H.21 and 22.

X. Emission Reductions are Surplus

40 CFR 51.308(e)(2)(vi) A demonstration that the emission reductions resulting from the emissions trading program or other alternative measure will be surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP.

A. Baseline Date of the SIP

When the regional haze rule was promulgated in 1999, EPA explained that the "baseline date of the SIP" in this context means "the date of the emissions inventories on which the SIP relies."[19] The baseline inventory for the regional SO_2 milestones and backstop trading program in Utah's 2003 SIP was 1990 while the inventory for the remaining elements in the 2003 SIP, including enhanced smoke management, mobile sources, and pollution prevention, was 1996. When the RH SIP was updated in 2008, a new baseline inventory of 2002 was established for regional modeling, evaluating the impact on Class I areas outside of the Colorado Plateau, and BART as outlined in EPA Guidance[20] and the July 6, 2005 BART Rule.[21] For purposes of evaluating an alternative to BART, the later baseline date of 2002 is therefore most appropriate. 2002 is the baseline inventory that was used by other states throughout the country when evaluating BART under the provisions of 40 CFR 51.308. Any measure adopted after 2002 is considered "surplus" under 40 CFR 51.308(e)(2)(iv)[22]. To make a valid comparison that the "alternative measure will be surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP" as required by 40 CFR 51.308(e)(2)(iv), the Most Stringent NOx scenario includes measures required before the baseline date of the SIP but does not include later measures that are credited as part of the alternative scenario.

B. SO_2, NOx, and PM Reductions from the Closure of the PacifiCorp Carbon Plant

Utah met the BART requirement for SO_2 as provided under 40 CFR 51.309(d)(4) through the establishment of SO_2 emission milestones with a backstop regulatory trading program to ensure that SO_2 emissions in the 3-state region of Utah, Wyoming, and New Mexico decreased substantially between 2003 and 2018. The final SO_2 milestone in 2018 was determined to provide greater reasonable progress than BART and the overall RH SIP was deemed to meet the reasonable progress requirements for Class I areas on the Colorado Plateau and for other Class I areas[23]. The modeling supporting the RH SIP included regional SO_2 emissions based on the 2018 SO_2 milestone and also included NOx and PM

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[19] 64 FR 35742, July 1, 1999

[20] Memorandum from Lydia Wegman and Peter Tsirigotis, 2002 Base Year Emission Inventory SIP Planning: 8-hr Ozone, PM2.5, and Regional Haze Programs, November 8, 2002.

[21] 70 FR 39143, July 6, 2005

[22] Utah's actions here are consistent with EPA's actions in other states. *See e.g.*, 79 Fed. Reg. at 33,441-42; 79 Fed. Reg. at 56,328.

[23] 77 FR 74355, December 14, 2012

emissions from the Carbon Plant. Actual emissions in the 3-state region are calculated each year and compared to the milestones. As can be seen in Table 15, the 2018 milestone was met seven years early in 2011 and SO_2 emissions have continued to decline. The most recent milestone report for 2013 demonstrates that SO_2 emissions are currently 26% lower than the 2018 milestone. The Carbon Plant was fully operational in the years 2011-2013 when the 2018 milestone was initially achieved for those years. Therefore the SO_2 emission reductions from the closure of the Carbon Plant are surplus to what is needed to meet the 2018 milestone established in Utah's RH SIP.

Table 15. SO_2 Milestone Trends

	Milestone	Three Year Average SO_2 Emissions (tons/yr)	Carbon Plant SO_2 Emissions (tons/yr)
2003	303,264	214,780	5,488
2004	303,264	223,584	5,642
2005	303,264	220,987	5,410
2006	303,264	218,499	6,779
2007	303,264	203,569	6,511
2008	269,083	186,837	5,057
2009	234,903	165,633	5,494
2010	200,722	146,808	7,462
2011	200,722	130,935	7,740
2012	200,722	115,115	8,307
2013	185,795	105,084	7,702
2014	170,868		
2015	155,940		
2016	155,940		
2017	155,940		
2018	141,849		

The Carbon Plant was built in the 1950s and is therefore grandfathered under Utah's permitting rules. The plant is equipped with an electrostatic precipitator for PM control and has no SO_2 or NOx controls. PacifiCorp shut down the Carbon Power Plant on April 14, 2015 due to the high cost to control mercury to meet the requirements of EPA's new Mecury and Air Toxics Standards (MATS) rule. The MATS rule was finalized in 2011, well after the 2002 base year for Utah's RH SIP, and therefore any reductions required to meet the MATS rule are clearly surplus and may be considered as part of an alternative strategy under 40 CFR 51.308(e)(2)(vi). While PacifiCorp has shut down the Carbon Plant, this decision is not enforceable, and PacifiCorp could choose to meet the MATS requirements through other measures. On November 25, 2014, the Supreme Court agreed to consider challenges to the MATS rule, so there is a possibility that the mercury control requirements could be overturned or delayed. An enforceable requirement is included in Section IX.H.22 of the SIP to make the permanent closure of the Carbon Plant enforceable by August 15, 2015. This provision will ensure that the substantial emission reductions that are relied upon as part of the alternative strategy will occur if the MATS rule is overturned or delayed.

C. PacifiCorp Hunter Unit 3

PacifiCorp upgraded the low-NOx burners on Hunter Unit 3 in 2008. This upgrade was not required under the requirements of the Clean Air Act as of the 2002 baseline date of the SIP and is therefore clearly considered surplus and may be credited in the alternative program under 40 CFR 51.308(e)(2)(vi). Prior to the 2008 upgrade, the emission rate for Hunter Unit 2 was 0.46 lb/MMBtu heat input for a 30-day rolling average as required by Phase II of the Acid Rain Program.

XI. Visibility Analysis

> *40 CFR 51.308(e)(3) A State which opts under 40 CFR 51.308(e)(2) to implement an emissions trading program or other alternative measure rather than to require sources subject to BART to install, operate, and maintain BART may satisfy the final step of the demonstration required by that section as follows: If the distribution of emissions is not substantially different than under BART, and the alternative measure results in greater emission reductions, then the alternative measure may be deemed to achieve greater reasonable progress. If the distribution of emissions is significantly different, the State must conduct dispersion modeling to determine differences in visibility between BART and the trading program for each impacted Class I area, for the worst and best 20% of days. The modeling would demonstrate "greater reasonable progress" if both of the following two criteria are met:*
>
> *(i) Visibility does not decline in any Class I area, and*
>
> *(ii) There is an overall improvement in visibility, determined by comparing the average differences between BART and the alternative over all affected Class I areas.*

The Hunter, Huntington, and Carbon plants are all located within 40 miles of each other in Central Utah. Because of the close proximity of the three plants, the distribution of emissions will not be substantially different under the alternative program. As described in section VII, combined emissions of all three pollutants are 2,856 tons/yr lower under the alternative measure . Therefore, the alternative measure may be deemed to achieve greater reasonable progress than BART.

Utah has chosen to use a weight-of-evidence approach under 40 CFR 51.308(e)(2)(i)(E), as described in section VIII of the staff review. The separate visibility analysis described in section VIII is part of the weight-of-evidence demonstration and is not intended to provide the type of modeling demonstration that would otherwise be required under 40 CFR 51.308(e)(3).

XII. Reasonable Progress

The WRAP compiled regional inventories and completed regional modeling to support the development of RH SIPs in the western states. For all of these analyses, WRAP assumed continued operation of the

Carbon plant. There were two projected inventories that were used by western states depending on when their SIPs were completed: PRP18a and PRP18b. These inventories assumed BART emission reductions from Hunter Units 1 and 2 and Huntington Units 1 and 2 based on the presumptive BART emission rate established in 40 CFR Part 51 Appendix Y, or actual emissions if lower. As can be seen in Table 16, the NOx emissions from the Carbon plant (shown as reductions in the 4th column) are comparable to the WRAP projected inventories while the SO_2 emissions were about 1,200 tons higher than the WRAP projected inventory. However, current SO_2 emissions for the Hunter and Huntington Plant are lower than had been projected, so when SO_2 emissions from all three plants are combined, the total is less than had been projected by the WRAP. The last column in the table shows that even if the emission reductions from the Carbon plant and Hunter 3 are excluded, the NOx, SO_2, and PM_{10} emissions are lower than the WRAP projected inventories. The emission reductions from the Carbon plant and Hunter 3 were not necessary for other states to meet their reasonable progress goals and therefore provide an added benefit for other states.

Table 16. Comparison of Alternative Measures to Reasonable Progress Inventories

NOx	PRP18a	PRP18b	Alternative	Reductions Carbon and Hunter 3	Alternative with Reductions Excluded
Carbon	3,366	3,366	0	3,348	3,348
Hunter	15,331	16,503	11,446	1,908	13,354
Huntington	8,251	8,559	7,437		7,437
Total	26,947	28,429	18,883	5,256	24,139

SO_2	PRP18a	PRP18b	Alternative	Reductions Carbon and Hunter 3	Alternative with Reductions Excluded
Carbon	6,824	6,824	0	8,005	8,005
Hunter	6,109	6,350	4,091		4,091
Huntington	3,811	3,955	2,355		2,355
Total	16,744	17,129	6,446	8,005	14,451

PM_{10}	PRP18a	PRP18b	Alternative	Reductions Carbon and Hunter 3	Alternative with Reductions Excluded
Carbon	221	221	0	573	573
Hunter	1,049	1,049	460		460
Huntington	654	654	376		376
Total	1,924	1,924	836	573	1,409

Combined	PRP18a	PRP18b	Alternative	Reductions Carbon and Hunter 3	Alternative with Reductions Excluded
Carbon	10,411	10,411	0	11,926	11,926
Hunter	22,489	23,903	15,997	1,908	17,905
Huntington	12,716	13,169	10,168	0	10,168
Total	45,615	47,482	26,165	13,834	39,999

XIII. Future Planning

The regional haze program is designed to achieve a long-term goal and updated SIPs are required every 10 years to ensure continued progress. The DAQ is beginning work on a RH SIP that will address the next planning period of 2018 – 2028. This next RH SIP is due in 2018, and the DAQ anticipates that this SIP will be completed in parallel with planning efforts to meet the new ozone standard that will be finalized in October, 2015. Both regional haze and ozone are affected by regional NOx emissions, and the DAQ anticipates that common emission strategies will lead to improvements in both areas. Significant technical work must be completed before these common benefits can be quantified in the next RH and ozone SIP.

ITEM 7

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-024-15

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Mark Berger, Air Quality Policy Section Manager

DATE: May 21, 2015

SUBJECT: FINAL ADOPTION: Amend R307-110-17. General Requirements: State Implementation Plan. Section IX, Control Measures for Area and Point Sources, Part H, Emissions Limits; and R307-110-28. General Requirements: State Implementation Plan. Regional Haze.

On March 4, 2015, the Board proposed amendments to R307-110-17 and R307-110-28 to incorporate by reference the newest versions of the State Implementation Plan (SIP) for Regional Haze, along with the new emission limits added to Part H. The proposed rules update the version of the SIP incorporated into the rules to be the version adopted by the Air Quality Board. A 30-day public comment period was held from April 1 to May 1, 2015. No comments were submitted regarding incorporating the SIP into the rules and no public hearing was requested.

<u>Staff Recommendation</u>: Staff recommends that the Board adopt R307-110-17 and R307-110-28 as proposed.

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R307. Environmental Quality, Air Quality.
R307-110. General Requirements: State Implementation Plan.
R307-110-17. Section IX, Control Measures for Area and Point Sources, Part H, Emissions Limits.

The Utah State Implementation Plan, Section IX, Control Measures for Area and Point Sources, Part H, Emissions Limits, as most recently amended by the Utah Air Quality Board on June 3, 2015, pursuant to Section 19-2-104, is hereby incorporated by reference and made a part of these rules.

R307-110-28. Regional Haze.

The Utah State Implementation Plan, Section XX, Regional Haze, as most recently amended by the Utah Air Quality Board on June 3, 2015, pursuant to Section 19-2-104, is hereby incorporated by reference and made a part of these rules.

KEY: air pollution, PM10, PM2.5, ozone
Date of Enactment or Last Substantive Amendment: 2015
Notice of Continuation: February 1, 2012
Authorizing, and Implemented or Interpreted Law: 19-2-104(3)(e)

ITEM 8

Informational Items

Progress Report for Utah's State Implementation Plan for Regional Haze

PROGRESS REPORT FOR UTAH'S STATE IMPLEMENTATION PLAN FOR REGIONAL HAZE

May 18, 2015

Prepared by staff of the:

Utah Division of Air Quality
Utah Department of Environmental Quality
195 North 1950 West
Salt Lake City, Utah 84116

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Tables

Figures

1.0 INTRODUCTION

On December 12, 2003, the State of Utah submitted a Regional Haze State Implementation Plan (RH SIP) to meet the requirements of 40 CFR 51.309 (309 SIP) to improve visibility in Utah's five Federal Class I Areas. The 2003 version of the 309 SIP and subsequent revisions to it addressed the first phase of requirements, with an emphasis on stationary source sulfur dioxide (SO_2) emission reductions, smoke management, and a focus on improving visibility on the Colorado Plateau.

On December 14, 2012, the EPA approved the majority of Utah's RH SIP, but disapproved several SIP provisions, which included the BART determination for nitrogen oxide (NOx) and particulate matter (PM)[1]. The Utah Air Quality Board proposed a revision to the RH SIP on March 4, 2015 to address EPA's concerns and is expected to take final action on the proposal in June, 2015. The previous BART determination has been fully implemented and significant emission reductions of NOx, SO_2, and PM have already been achieved.

1.1 State Implementation Plan Requirements for the 5-Year Progress Report

Provisions of the Regional Haze (RH) rule contained in 40 CFR §51.309(d)(10) require that each state submit a progress report five years after the submittal of their initial RH SIP. The progress report must be in the form of a SIP revision and must include a determination regarding the adequacy of the existing regional haze SIP. This report has been prepared to fulfill all applicable requirements pertaining to the first five-year progress report.

The progress report SIP must include 1) the status for implementation of control measures included in the original regional haze SIP, 2) a summary of emission reductions achieved through the implementation of control measures, 3) an assessment of visibility conditions, 4) an analysis of the changes in emission pollutants, 5) an assessment of significant changes in emissions that may have limited or impeded progress in improving visibility, 6) an assessment of whether the current SIP elements and strategies are sufficient to meet reasonable progress goals and 7) a review of the State's visibility monitoring strategy.

The technical data included in this progress report are from the "*Western Regional Air Partnership Regional Haze Rule Reasonable Progress Summary Report*" (Appendix A) developed by the Western Regional Air Partnership (WRAP)[2] in June of 2013 and the WRAP Technical Support System (TSS). The WRAP progress report technical support document (TSD) was prepared on behalf of the 15 western state members in the WRAP region. It serves as the technical basis for use by states to develop the first of their individual reasonable progress reports for the 116 Federal Class I areas located in the western states. Data are presented in this report on a regional, state, and Class I area-specific basis that characterize the difference between 2000-2004 baseline conditions and current conditions, represented here by the most recent successive 5-year average. The WRAP progress report TSD was focused on the first 5-year period, 2005-2009, and therefore the monitoring and emission inventory data reflect that time period. Changes in visibility impairment are characterized using aerosol measurements form the IMPROVE network (the

[1] 77 FR 74355, December 14, 2012.

[2] The WRAP is a collaborative effort of tribal governments, state governments and various federal agencies representing the western states that provides technical and policy tools for the western states and tribes to comply with the EPA's RH regulations. Detailed information regarding WRAP support of air quality management issues for western states is provided on the WRAP website, www.wrapair2.org. Data summary descriptions and tools specific to RHR support are available on the WRAP Technical Support System website, http://vista.cira.colostate.edu/tss/.

primary monitoring network for regional haze, both nationwide and in Utah), and the differences between emissions inventory years represent both the baseline and current progress period.

The State of Utah intends to consult with federal land managers as required under 40 CFR §51.308(i) during the development of the RH SIP for the next planning period that is due in 2018. The State of Utah reaffirms its commitment to participate in a regional planning process with Alaska, Arizona, California, Colorado, Idaho, Montana, New Mexico, North Dakota, Oregon, South Dakota, Washington, Wyoming, the United States Department of Interior (USDI) Fish and Wildlife Services (FWS) and National Park Services (NPS), and the United States Department of Agriculture (USDA) Forest Service (FS).

Pursuant to the Tribal Authority Rule, any tribe whose lands are within the boundaries of the State of Utah has the option to develop a RH Tribal Implementation Plan (TIP) for their lands to assure reasonable progress in the five Class I areas in Utah. Accordingly, no provisions of this periodic report shall be construed as being applicable to Indian Country.

2.0 UTAH CLASS I AREAS

Utah has five Federal Class I areas within its borders: Arches National Park, Bryce Canyon National Park, Canyonlands National Park, Capitol Reef National Park, and Zion National Park. All five of Utah's Federal Class I areas are located on the Colorado Plateau (Figure 2.1).

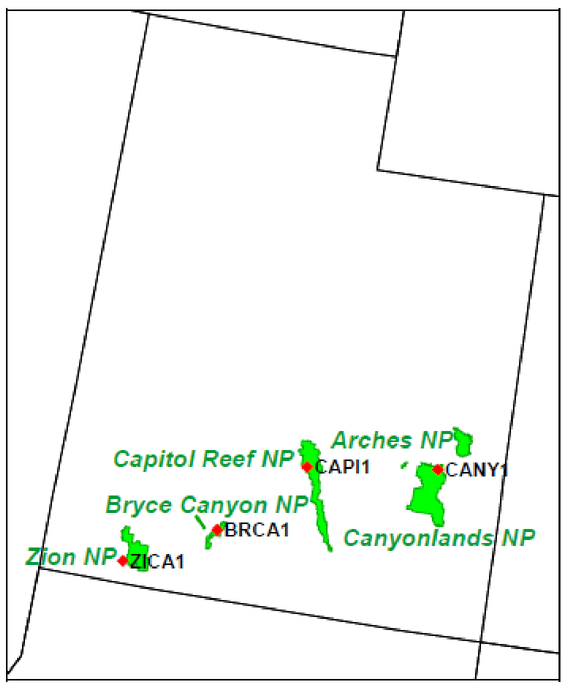

Figure 2.1. Map Depicting Federal Class I Areas and Representative IMPROVE Monitors in Utah

Utah's Department of Environmental Quality's (DEQ) Division of Air Quality (DAQ) is responsible for developing the RH progress report. This progress report compares the current visibility conditions at each of these Class I areas to the 2018 reasonable progress goals to determine if Utah is on track to reach these goals. The progress report also reviews the long-term strategy to determine if there have been any changes that need to be addressed.

In developing the initial RH SIP, DAQ also considered that emission sources outside of Utah may affect the visibility at Utah's Class I areas, and that emission sources within Utah may affect the visibility at Class I areas in neighboring states. Through WRAP, the western states worked together to assess state-by-state contributions to visibility impairment in specific Class I areas, including those in Utah and those affected by emissions from Utah. The sources identified in the initial RH SIP either impacting Utah's Class I areas or Class I areas outside Utah will be reviewed as part of this progress report.

2.1 Progress Towards Reasonable Progress Goals (40 CFR §51.309(d)(10(i))

Based on IMPROVE monitoring data for the first progress period 2005-2009, all of Utah's Class I areas show visibility improvement on the 20% least impaired days, while on the 20% most impaired days, three areas (Arches, Canyonlands and Zion National Parks) show visibility improvement and two areas (Bryce Canyon and Capitol Reef National Parks) do not. The largest contributor to increases at these sites was particulate organic mass which was associated with large fire events in July and August of 2009. These increases were offset by decreases in ammonium nitrate and ammonium sulfate. The most recent 5-year average 2009-2013 shows visibility improvement at all five Class I areas on both the 20% best and the 20% worst days.

The baseline and current visibility conditions as well as the reasonable progress goals for 2018 for the 20% worst and 20% best days are displayed in Table 2.1.

Table 2.1. Utah Class I Area IMPROVE Sites Visibility Conditions for the 20% Most and Least Impaired days.

Class I Area	Baseline (2000-2004) (dv)	Current (2005-2009) (dv)	(2011-2013) (dv)	2018 Preliminary Reasonable Progress Case (PRP18a) (dv)
20% Worst Days				
Arches NP (CANY1)	11.2	11.0	10.8	10.9
Bryce Canyon NP (BRCA1)	11.6	11.9	10.6	11.2
Canyonlands NP (CANY1)	11.2	11.0	10.8	10.9
Capitol Reef NP (CAPI1)	10.9	11.3	10.2	10.5
Zion NP (ZICA1)	12.5[3]	12.3	10.8[4]	N/A[5]
20% Best Days				
Arches NP (CANY1)	3.7	2.8	3.1	3.5
Bryce Canyon NP (BRCA1)	2.8	2.1	1.8	2.6
Canyonlands NP (CANY1)	3.7	2.8	3.1	3.5
Capitol Reef NP (CAPI1)	4.1	2.7	2.6	3.9
Zion NP (ZICA1)	5.0[3]	4.3	4.2 [4]	N/A[5]

3.0 REGIONAL HAZE PROGRESS REPORT

The requirements for regional haze progress reports are outlined in 51.309(d)(10)(i). The progress report for Section 309 RH SIPs must be in the form of a formal SIP submittal and at a minimum must contain the following elements:

3.1 40 CFR § 51.309(D)(10)(i) Progress Report Requirements

(A) A description of the status of implementation of all measures included in the SIP for achieving reasonable progress goals for mandatory Class I Federal areas both within and outside the state.

(B) A summary of the emission reductions achieved throughout the state through implementation of the measures described in (A) above.

(C) For each mandatory Class I Federal area within the state, an assessment of the following: the current visibility conditions for the most impaired and least impaired days; the difference between current visibility conditions for the most impaired and least impaired days and baseline visibility conditions; and the change in visibility impairment for the most impaired and least impaired days over the past 5 years.

[3] The monitor originally intended to represent Zion National Park was the ZION1 IMPROVE monitor, which began operation in 2000. In 2003, a second site, ZICA1, was established approximately 19 miles from the original ZION1 monitor. The second site was installed in part because elevated ammonium nitrate at the original site was influenced by mobile sources from the interstate highway that were not representative of park conditions. Section 6.13.1.1 in the WRAP Report (Appendix A) describes how the baseline for the ZICA1 was determined.

[4] Includes 2009-10 and 2012-13 data only; there were no results available for 2011.

[5] There is no PRP18a established for the new ZICA1 monitor. The PRP18a was originally established for the original ZIONI IMPROVE monitor, which was discontinued on July 29, 2004.

(D) An analysis tracking the change over the past 5 years in emissions of pollutants contributing to visibility impairment from all sources and activities with the state. Emissions changes should be identified by type of source or activity. The analysis must be based on the most recent updated emissions inventory, with estimates projected forward as necessary and appropriate, to account for emissions changes during the applicable 5-year period.

(E) An assessment of any significant changes in anthropogenic emissions within or outside the state that have occurred over the past 5 years that have limited or impeded progress in reducing pollutant emissions and improving visibility.

(F) An assessment of whether the current SIP elements and strategies are sufficient to enable the state, or other states with mandatory Federal Class I areas affected by emissions from the state, to meet all established reasonable progress goals.

(G) A review of the state's visibility monitoring strategy and any modifications to the strategy as necessary.

In the sections to follow, the Utah DAQ will address the various periodic review requirements as outlined above.

3.2 Status of Implementation Control Measures: 40 CFR §51.309(d)(10)(i)(A)

40 CFR §51.309(d)(10)(i)(A) requires "a description of the status of implementation of all measures included in the implementation plan for achieving reasonable progress goals for mandatory Class I Federal areas both within and outside the State."

This section provides a description of the emission reduction measures that were included in the State of Utah's Section 309 RH SIP. A summary of the most significant emission reduction strategies and the status of controls is provided below.

Utah has been and continues to be committed to implementing the long-term strategies adopted into the state's Section 309 RH SIP. The implementation status of these emission reduction measures are described below.

SO_2 Milestone and Backstop Trading Program

As a 309 state, Utah continues to participate in the Regional SO_2 Milestone and Backstop Trading Program. Utah has been participating in this program since 2003, and in March of 2015, submitted the annual Regional SO_2 Emissions and Milestone Report for 2013. The report shows that the regional SO_2 emissions of 105,402 tons were below the 2013 milestone of 185,795 tons. Further information on emissions reductions from this program are summarized in Section 3.3 of this report.

The Regional SO_2 Emissions and Milestone Report for 2012 contained the year 2013 assessment as required by Section XX.E.1.d of Utah's SIP. The report determined that it was not necessary to trigger the backstop trading program early because the 2018 milestone had already been met by 2011.

Prevention of Significant Deterioration (PSD); New Source Review (NSR) Permitting; and Visibility Programs

Utah's PSD program, promulgated in SIP Section VII and R307-405; NSR permitting program, promulgated in SIP Section II and R307-401; and Visibility program, promulgated in SIP Section XVII and R307-406 continue to protect Class I area visibility by requiring best available control technology for new sources and assuring that there is not a significant degradation in visibility at Class I areas due to new or modified major sources.

BART

Utah has four BART-eligible sources that are subject to BART. They are PacifiCorp Hunter Units 1 and 2 and PacifiCorp Huntington Units 1 and 2.

Utah's 2008 BART determination for Hunter Units 1 and 2 included conversion of existing electrostatic precipitators to pulse jet fabric filter bag-houses; the replacement of existing, first generation low-NOx burners with Alstom TSF 2000TM low-NOx firing system and installation of two elevations of separated overfire air; and the upgrading of the existing flue gas desulfurization system to >90% sulfur dioxide removal. These controls were installed on Hunter Unit 2 in 2011 and Hunter Unit 1 in 2014. Annual emissions decreased by 2,905 tons SO_2 and 6,459 tons NOx for these two units between 2002 and 2014.

For Huntington Units 1 and 2, the 2008 BART determination included converting existing electrostatic precipitators to pulse jet fabric filter bag-houses; the replacement of existing, first generation low-NOx firing system and installation of two elevations of separated overfire air; the installation of a new wet-lime, flue gas de-sulfurization system at Unit 2 (FGD); and upgrading existing flue gas desulfurization system to >90% sulfur dioxide removal at Unit 1. These controls were installed on Huntington Unit 1 in 2010 and Huntington Unit 2 in 2006. Annual emissions decreased by 15,802 tons SO_2 and 5,529 tons NOx for these two units between 2002[6] and 2014.

EPA disapproved Utah's BART determination for NOx and PM on December 14, 2012, because they determined that Utah did not perform an adequate 5-factor analysis as required by 40 CFR Part 51, Appendix Y. On March 4, 2015, Utah's Air Quality Board proposed a revision to Utah's RH SIP to establish an alternative to BART for NOx. The proposal demonstrates that the alternative, permanently closing PacifiCorp Carbon Units 1 and 2 and installing low NOx burners with overfire air on Hunter Unit 3, provides greater reasonable progress than installation of the most stringent control technology available. 1,804 tons of NOx were reduced from Hunter Unit 3 between 2002 and 2014 and an additional 3,269 tons NOx and 9,240 tons SO_2 (2014 emissions) will be reduced when the Carbon plant closes in 2015. The proposal also contains additional documentation that the baghouses installed as required by the 2008 BART determination are the most stringent technology available and therefore meet the criteria of BART.

The total reductions due to BART between 2002[6] and 2014 from PacifiCorp Hunter, Huntington, and Carbon plants will be 27,947 tons SO_2 and 15,258 tons NOx when the Carbon plant closes in 2015.

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[6] 2003 for Huntington Unit 2 because 2002 was not a representative year.

Enhanced Smoke Management Program

The State of Utah has developed *The Utah Smoke Management Plan (SMP)* which provides operating procedures for federal and state agencies that use prescribed fire, wildfire, and wildland fire on federal, state and private wildlands in Utah. The SMP includes the program elements listed in 40 CFR 51.309(d)(6)(i), with the exception of alternatives to fire. The SMP was certified by the EPA on November 8, 1999 under EPA's April 1998 *Interim Air Quality Policy on Wildland and Prescribed Fires (Policy).* The requirements of the SMP were also codified into Utah's Air Quality Rule R307-204, which applies to all persons using prescribed fire or wildland fire on land they own or manage, including federal, state, and private wildlands.

Section XX.G.3 of Utah's RH SIP outlines the requirements for an emission tracking system. This system addressed three types of fire.

1. Wildfire Inventory. The National Interagency Fire Center, an organization that includes the federal land managers in Utah, reports information about wildfires to the WRAP Fire Emissions Tracking System (FETS) on a daily basis. The information can be accessed by the public through a mapping tool that shows current fires (or fires from a selected time period) throughout the west. WRAP uses this detailed information to prepare emission inventories, as needed, for regional modeling efforts.
2. Prescribed Fire. The Utah Smoke Management Plan (SMP) was developed to identify the responsibilities of the Utah Division of Air Quality (DAQ) and Federal, and State land managers (Land Managers) to coordinate procedures that mitigate the impacts of prescribed fire used for resource benefits on public health, public safety and visibility. The plan was designed to meet the requirements of R307-204, Utah's smoke management air quality rule, and the policies of the U.S. Environmental Protection Agency's (EPA) Interim Air Quality Policy on Wildland and Prescribed Fires (Interim Policy). On November 8, 1999, the EPA certified the plan under the Interim Policy.

   The goals of the SMP are:

   - To use prescribed fire for resource benefits to accomplish land management objectives of wildland fuel hazard reduction, vegetative management, natural ecological practices, and wildlife habitat improvement
   - To develop an emission inventory for pollutants of interest based on reports of prescribed fire used for resource benefits
   - To develop a system for reporting and coordinating burning operations on all forest and range lands in the State
   - To minimize or prevent smoke impacts to such a degree as possible to protect public health, public, safety and visibility
   - To encourage the development and use of alternative methods to burning for disposing of or reducing the amount of wildland fuels on lands in the State.

In order to execute the SMP, federal and state land managers and the DAQ entered into a Memorandum of Understanding (MOU). Signatories to the MOU formed a management group called the Utah Airshed Oversight Group, whose function is to manage, oversee and evaluate the SMP. The Utah Airshed Oversight Group meets at least annually in order to conduct necessary business, to discuss SMP issues and to recommend necessary amendments to the SMP. In 2014, the Utah Airshed Oversight Group recommended a budgetary expenditure to develop a web-based burn permitting program to replace the labor intensive paper-based permitting system. The web-based permitting tool will be launched in 2015.

The SMP was designed to provide a mechanism to use prescribed fire for resource benefits to accomplish land management objectives of wildland fuel hazard reduction, vegetative management, natural ecological practices, and wildlife habitat improvement in a way that mitigates smoke impact.

The SMP originated on July 20, 1999 and was revised on January 16, 2006 and again on January 24, 2014 in accordance with the evaluations conducted by Utah Airshed Oversight Group. EPA approved the rule on January 18, 2013. The 5-Year review of the SMP is included in Appendix B of this report.

Since 2003 Utah has required fire agencies to submit information about prescribed fires as part of the SMP. Table 3.1 summarizes the prescribed fire emission inventory in Utah during 2011, the most recent triennial inventory year.

Table 3.1, Prescribed Fire Emissions

Prescribed Fire Emissions Table 2011					
Agency	Projects Implemented	Black Acres	Tons Consumed	Tons of PM10	%
BIA	2	3900	56550	707	2
BLM	21	1621	11722	134	19
FS	44	10484	194837	2385	40
FWS	4	2505	7453	39	4
NPS	9	429	5024	67	8
UDFFSL	29	3074	28570	333	27
Totals	109	22013	304156	3665	100

Alternative Treatment Methods to Fire

Burning has long been a cost effective and efficient treatment method. However, burning can cause adverse air quality impacts on a surrounding community. Consequently, alternative methods must be considered. The use of a specific alternatives are dependent on a variety of factors, including, but not limited to, access and associated safety reaching a wildland area, the season, weather conditions, possible environmental impacts and cost-effectiveness. The Utah Airshed Oversight Group has not identified any administrative barriers to the use of non-burning alternatives. During the review period, more acres were managed using alternative treatments to prescribed burning.

3. Agricultural Burning. As outlined in Section XX.G.2.b of Utah's RH SIP, agricultural fire is a small portion of the overall fire inventory in Utah (less than 0.25%). The amount of farm acreage in Utah has decreased from 11,600,000 acres in 2002 to 11,000,000 acres in 2013[7] and emissions have likely decreased correspondingly. Because the total acres of farmland are steadily decreasing, and due to limited resources, Utah has not updated the survey that was completed as part of the 2003 RH SIP. DAQ estimates emissions from agricultural burning every three years as part of the triennial NEI inventory. This inventory is based on national default emission factors, not the survey that was completed as part of the 2003 RH SIP.

Clean Air Corridor

Utah's RH SIP identified an area covering major portions of Nevada, southern Utah, eastern Oregon and southwestern Idaho as a "clean air corridor," which was intended to represent a region from which clean air transport influences many of the clean air days at Grand Canyon National Park. Visibility has improved for the best days at all of the Class I area sites on the Colorado Plateau, so emissions specific to the "clean air corridor" counties are not presented separately here. Figure 3.1 shows the emission trends for all western states of the most significant anthropogenic pollutants, SO_2 and NOx. As can be seen, emissions have decreased in all states that are part of the clean air corridor.

[7] U.S. Department of Agriculture, National Agricultural Statistics Service, Quick Stats, Farm Operations – acres operated (http://quickstats.nass.usda.gov/)

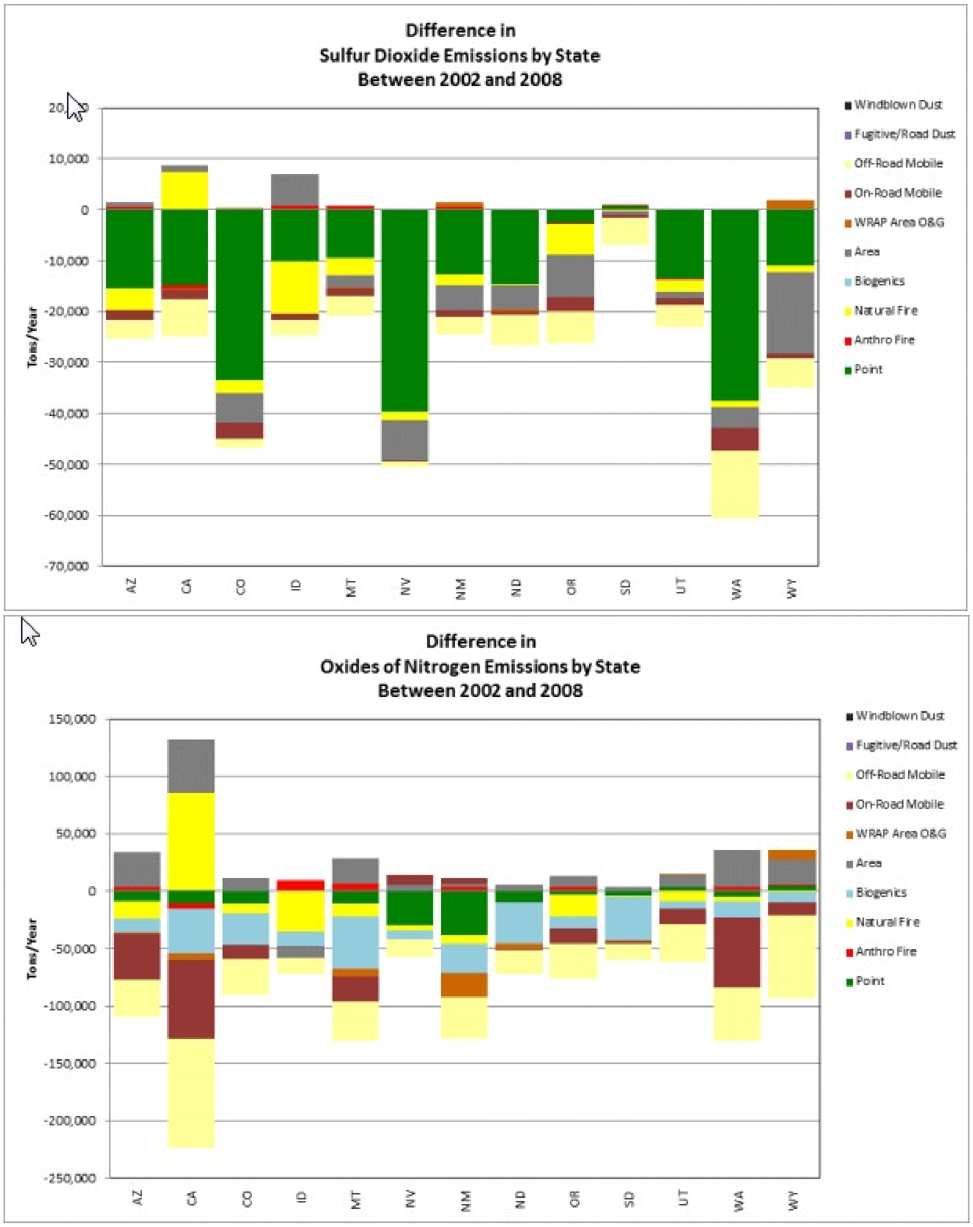


Figure 3.1, Sulfur Dioxide and Oxides of Nitrogen Emission Reductions by State Between 2002 and 2008.

Pollution Prevention and Renewable Energy

The Grand Canyon Visibility Transport Commission set a goal of achieving 10 percent of generation from renewable resources in 2005 and 20 percent in 2015. Significant progress has been achieved towards meeting this regional goal. Table 3.2 shows energy generation estimates for the GCVTC states. Thirteen percent of electricity generation in the Transport Region was from renewable resources in 2012. Thirteen percent of electricity generation in Utah was from renewable resources in 2012.

Table 3.2 Energy Generation Estimates 2012 (Trillion Btu)

	Nuclear	Hydro	Other Renewable	Natural Gas Fired	Coal Fired	Total Generation
Arizona	2,973	515		196	1,231	4,915
California	1,530	985	2,885	9,408	0	14,808
Colorado		111	673	1,102	2,699	4,585
Idaho		656	278	162	0	1,096
New Mexico		0	213	691	2,067	2,971
Nevada		124	371	1,909	314	2,718
Oregon		3,403	572	1,214	253	5,442
Utah		46	105	677	298	1,126
Wyoming		29	430	46	3,773	4,278
	4,503	5,869	5,527	15,405	10,635	41,939

Total Renewable	**5,527**
% Renewable Region	**13.2%**
% Renewable Utah	**13.4%**

Source: Energy Information Administration, State Profiles and Energy Estimates,

In 2008 the State of Utah established a renewable energy goal of 20% by 2025. Table 14 of Utah's RH SIP shows 328 MW of renewable energy capacity in 2002. Table 3.3 summarizes current and proposed commercial scale renewable energy facilities in Utah.

Table 3.3 Current and Proposed Commercial and Utility-scale Renewable Energy Facilities in the State of Utah

This table only lists commercial and utility-scale facilities. Several residential units exist throughout the state but are not included in this list.

Red font indicates proposed project. last updated: 1/23/2014

Technology	# of Facilities	Capacity (kW)
Biomass	4	12,800
Biomass - Proposed	0	0
Geothermal	3	77,100
Geothermal - Proposed	2	44,000
Solar	135	8,176
Solar - Proposed	6	301,155
Wind	11	326,803
Wind - Proposed	3	239,500
Hydro	64	286,492
Hydro - Proposed	0	0
Total	217	711,371
Total Proposed		584,655

Source: Utah Geological Survey, Utah Energy and Mineral Statistics, Table 6.4

Mobile Sources

The adoption of new on-road vehicle emission and fuel standards by EPA resulted in a substantial reduction of projected mobile source emissions. As stated in Section F.2.b of the SIP, Utah is committed to monitoring the emissions from mobile sources to assure a continuous decline in emissions as defined in 40 CFR 51.309(b)(6). If Utah determines that a continuous decline in emissions is not being achieved, additional control measures will be reviewed to determine if they are needed to make reasonable progress.

Comprehensive emissions tracking system.

Utah completes a comprehensive, statewide inventory every three years as required for the national emission inventory (NEI) and these data are available for use by the WRAP. This inventory is used as an annual inventory during the intervening year for some categories. Large point sources are inventoried annually and this inventory is also submitted to EPA and is available for use by the WRAP. Wildfire and prescribed fire emissions are tracked real time through the WRAP's Fire Emissions Tracking System (FETS). Utah participates in regional emission inventory improvement efforts, such as WESTAR's update to the biogenics inventory and WRAP's on-going efforts to improve the area source inventory for oil and gas sources. When WRAP compiles regional emissions inventories for modeling analyses, such as the WESTJUMP ozone modeling, Utah reviews the WRAP's inventory to ensure that the best data available are used.

Utah's triennial inventories are available on-line at http://www.airquality.utah.gov/Planning/Emission-Inventory/index.htm and WRAP's regional inventories are available on-line at http://vista.cira.colostate.edu/tss/Results/HazePlanning.aspx. Emissions data for electric generating units are available on-line at http://ampd.epa.gov/ampd/ and EPA's NEI inventory is available at http://www.epa.gov/ttnchie1/eiinformation.html

New Source Performance Standards Program

Utah's New Source Performance Standards (NSPS) rule, R307-210, incorporates the latest version of 40 CFR Part 60 into Utah's administrative rules. These technology based standards which apply to specific categories of stationary sources, result in significant emissions reductions – 40 CFR Part 60 Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines; and Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, are just two examples.

Maximum Achievable Control Technology (MACT) Standards Program

Utah's administrative rule, R307-214, National Emission Standards for Hazardous Air Pollutants, incorporates the latest version of 40 CFR Parts 61 and 63 into Utah's Air Quality rules. NESHAPs are the result of MACT standards, performance-based standards, EPA has developed specific to source categories. As with NSPS, these NESHAPS result in significant emissions reductions – 40 CFR Part 63 Subpart ZZZZ, Standards for Reciprocating Internal Combustion Engines, is just one example.

Other GCVTC Recommendations

DAQ has reviewed the *Report to the Environmental Protection Agency and the Public to Satisfy the Requirements of 40 CFR 51.309(d)(9)*[8] that was prepared for the 2003 RH SIP and determined that no

[8] Utah Division of Air Quality. *Report to the Environmental Protection Agency and the Public to Satisfy the Requirements of 40 CFR 51.309(d)(9)*. Salt Lake City, Utah. December, 2003.

updates are necessary. Utah has continued and expanded upon the programs identified in this report to meet other air quality objectives including plans to attain and maintain the NAAQS.

Enforceability of Utah's Measures

40 CFR §51.309(d)(9) of the RH rule requires states to ensure that emission limitations and control measures used to meet reasonable progress goals are enforceable. Utah has ensured that all existing emission limitations and control measures for which it is responsible that were used to meet reasonable progress goals are enforceable, either through Utah's Administrative Rules or SIP measures previously approved by the Utah Air Quality Board and the EPA. Enforceability of future emission limitations and control measures for which the State is responsible will be enforceable through permit conditions or SIP measures to be approved in the future by EPA. Utah is preparing a separate SIP submittal, concurrent with this progress report, to address the portions of the SIP that EPA disapproved because it did not contain the provisions necessary to make BART limits practically enforceable.

3.3 Summary of Emission Reduction Achieved: 40 CFR § 51.309(d)(10)(i)(B)

40 CFR § 51.309(d)(10)(i)(B) requires "a summary of the emissions reductions achieved throughout the State through implementation of the measures in paragraph (g)(1)."

This section provides a summary of emissions reduced as a result of implementation measures discussed in Section 3.2. Since the submittal of Utah's Section 309 SIP in 2003, there has been a significant decrease in SO_2 emissions in accordance with the state's SO_2 Milestone and Backstop Trading Program. Each year since 2003, states have been able to demonstrate through milestone reports that actual SO_2 emissions have declined every year and are well below the milestones. Sulfur dioxide emission reductions associated with the Backstop Trading Program will continue through 2018, as shown through declining milestone commitments. If SO_2 emissions exceed the milestone a regulatory emission cap and backstop trading program will be triggered to ensure that the 2018 goal is achieved and maintained. The actual emissions and their respective milestones are shown in Table 3.4.

Table 3.4, Regional Sulfur Dioxide Emissions and Milestone Report Summary

Year	3-State Adjusted SO_2 Emissions (tons)	3-Year Average (tons)	Milestone (tons)
2003	214,780	214,780	303,264
2004	232,388	223,584	303,264
2005	215,793	220,987	303,264
2006	207,316	218,499	303,264
2007	187,599	203,569	303,264
2008	165,595	186,837	269,083
2009	143,704	165,633	234,903
2010	131,124	146,808	200,722
2011	117,976	130,935	200,722
2012	96,246	115,115	200,722
2013	101,381	105,402	185,795

While Utah has not quantified the emissions reductions due to the remaining strategies, the state saw an overall improvement in visibility at all of Utah's Class I areas for the 20% best days and an overall improvement in visibility at three of Utah's Class I areas for the 20% worst days between 2000 and 2009 (See Figures 3.2 and 3.3). Changes in the overall emission inventory are described in section 3.5 of this report.

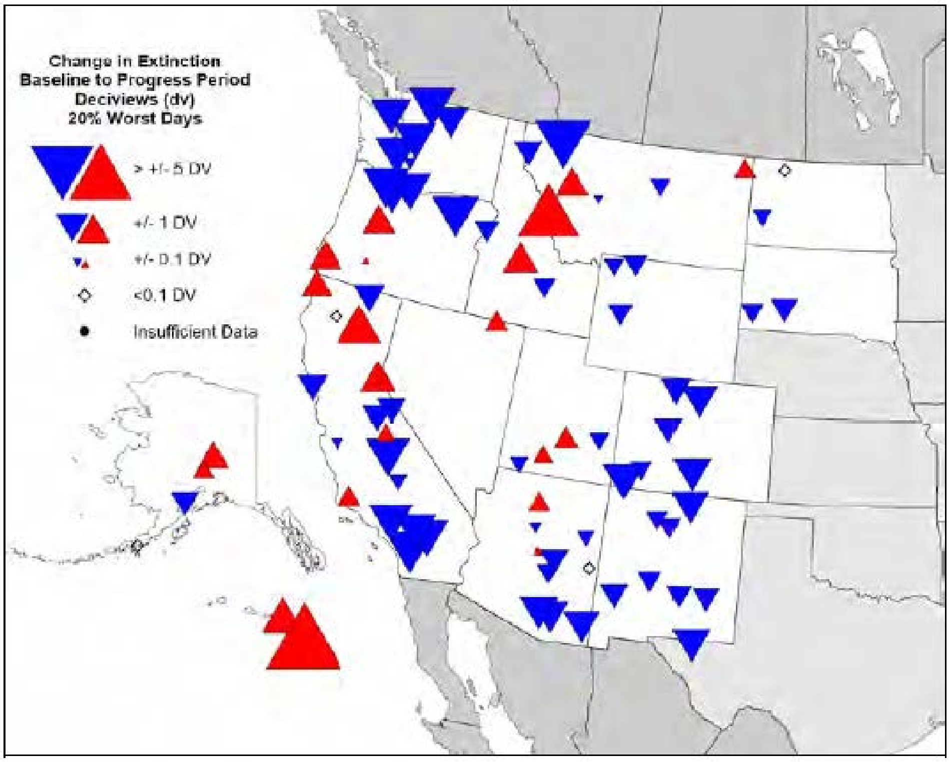


Figure 3.2. Change in Deciview Extinction between Baseline Period Average (2000-2004) and the First Progress Period Average (2005-2009) for the 20% Worst Visibility Days

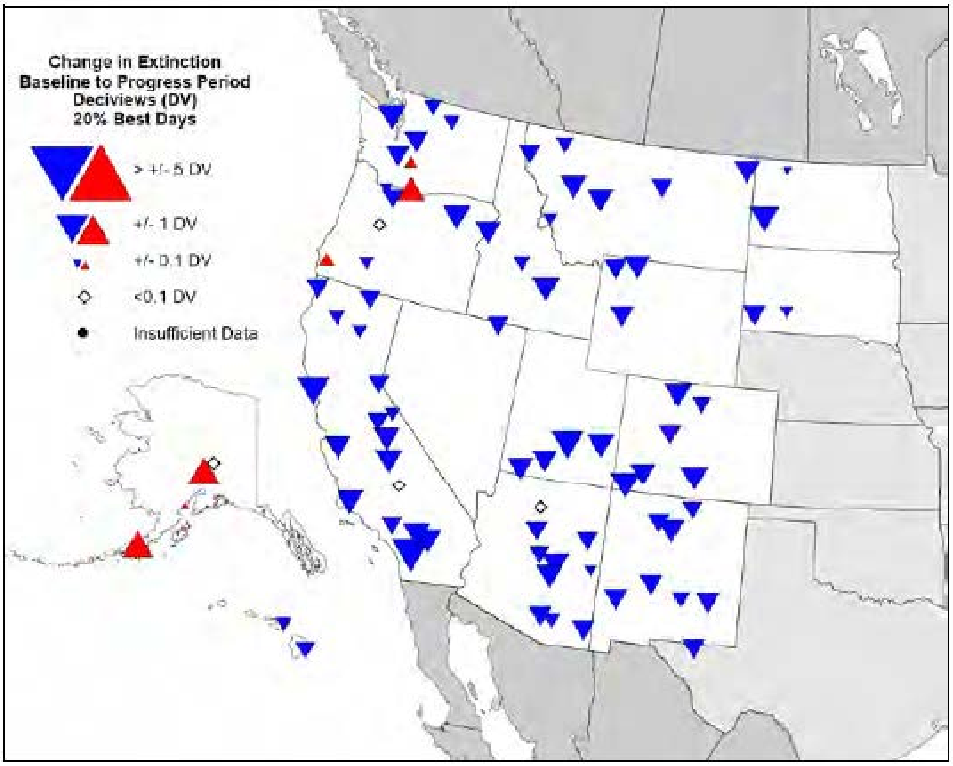


Figure 3.3. Change in Deciview Extinction between Baseline Period Average (2000-2004) and the First Progress Period Average (2005-2009) for the 20% Best Visibility Days

The RH rule haze index, as defined using deciview units, does not provide information regarding the relative contributions of specific pollutants to overall visibility impairment. The calculation of visibility impairment is based on the cumulative impacts of several different species measures at IMPROVE network sites. Analyzing the behavior of each individual species has important implications for control measures, as some species originate from largely anthropogenic sources while others may originate form a mixture of both anthropogenic and natural sources.

Figures 3.4 and 3.5 present regional maps of average aerosol extinction for the most impaired days during the baseline period (2000-2004), and the first progress period average (2005-2009), respectively, for the IMPROVE monitors representing Federal Class I areas in the WRAP region. The size of the pie chart is related to the magnitude of visibility impairment, and colors represent the relative contribution of the pollutants measured by the IMPROVE network.

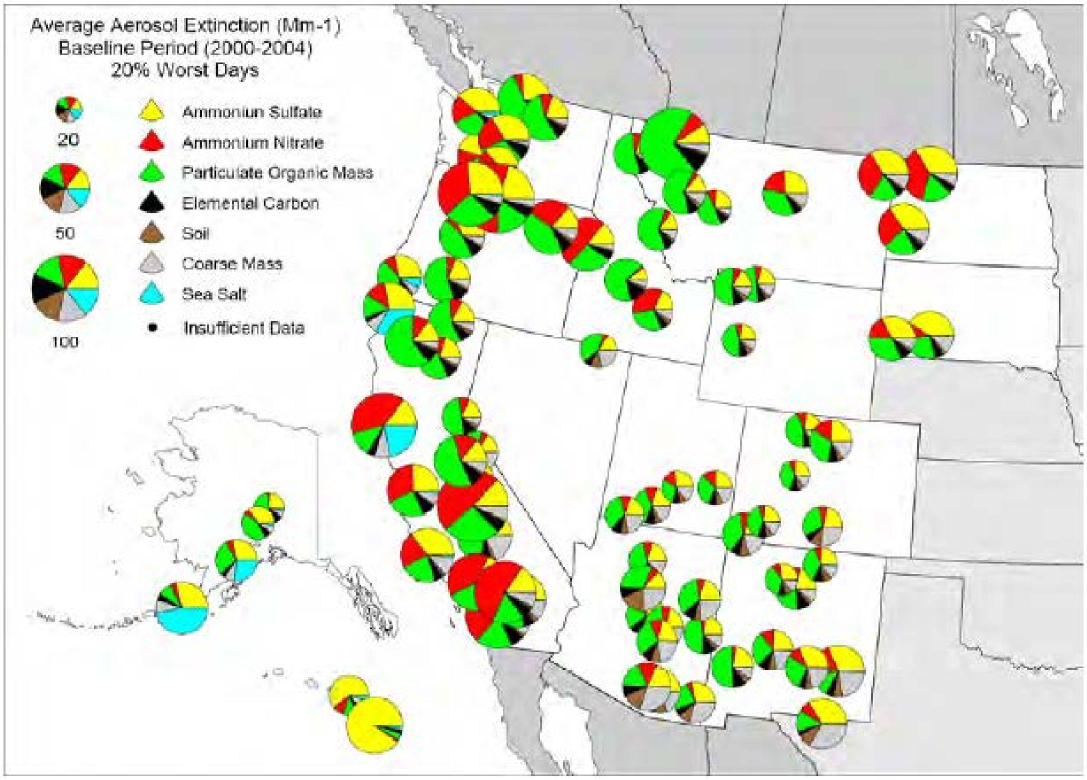


Figure 3.4. Regional Average of Aerosol Extinction by Pollutant for Baseline Period average (2000-2004) for 20% Worst Days.

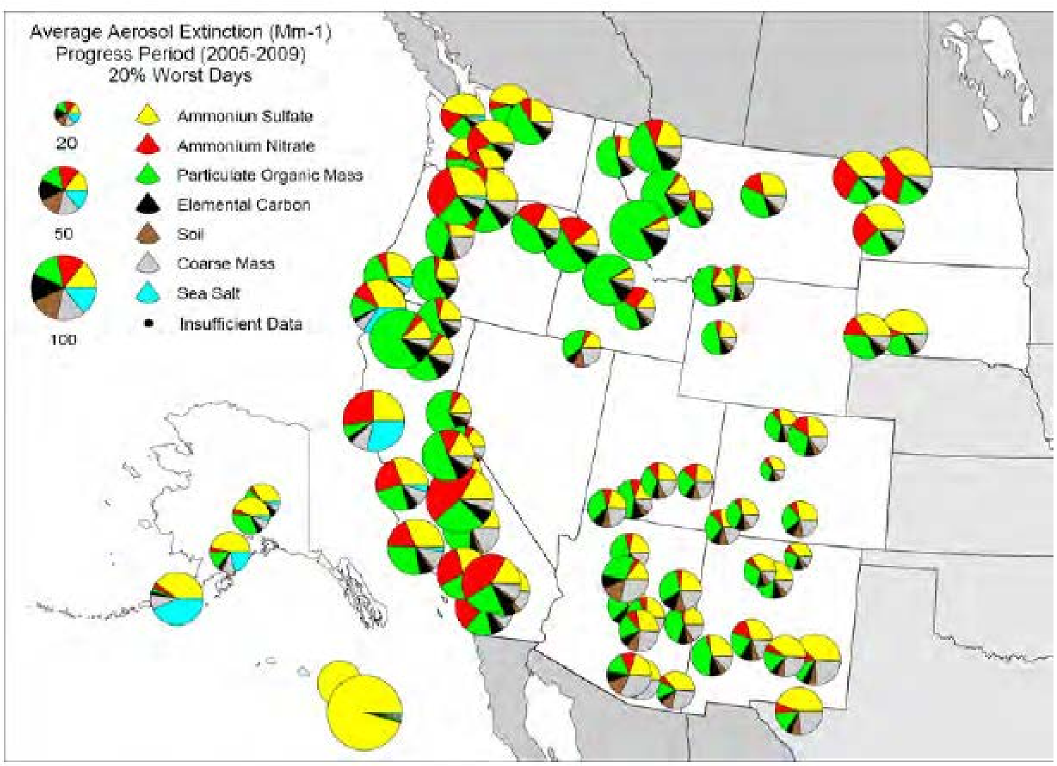


Figure 3.5. Regional Average of Aerosol Extinction by Pollutant for the First Progress Period Average (2005-2009) for 20% Worst Days.

Figure 3.6 presents the individual species of haze that have decreased between the 2000-2004 baseline period and the 2005-2009 progress period, where sites with corresponding decreases in deciview measurements are highlighted with blue circles.

For Utah, Figure 3.6 depicts most of the decreases in deciview averages that were associated with decreases in ammonium nitrate, ammonium sulfate, coarse mass and particulate organic mass. The decrease in ammonium nitrate and ammonium sulfate is most likely due to the implementation of the SO_2 milestones beginning in 2003, BART controls beginning at the end of 2006 and federal mobile source regulations. The decrease in coarse mass and particulate organic mass is likely due to the decreasing effect of natural events in the progress period, such as windblown dust storms and wild fires. These natural events are highly variable from year to year and the 5-year average can be significantly affected by a high fire year.

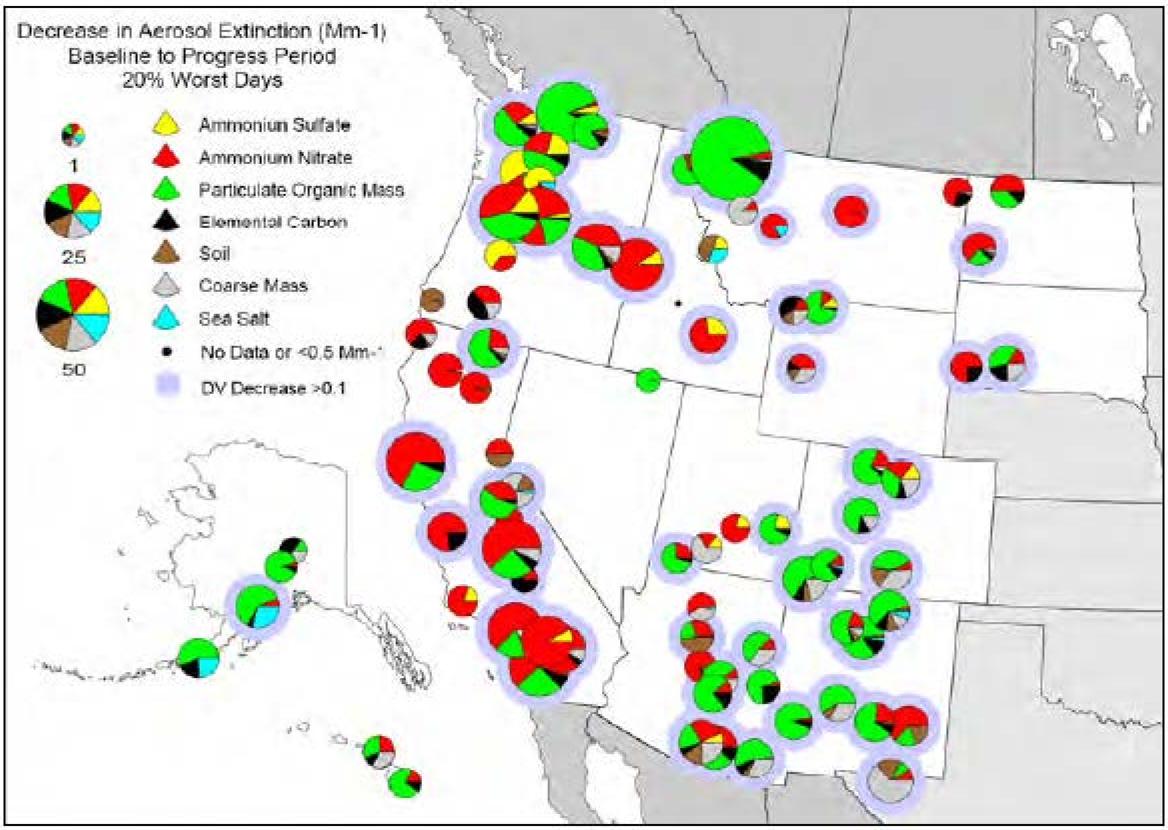


Figure 3.6. Magnitude of Aerosol Extinction Species that have Decreased Between the Baseline Average (2000-2004) and the First Progress Period Average (2005-2009) for the 20% Worst Days.

3.4 Assessment of Visibility Conditions: 40 CFR § 51.309(d)(10)(i)(C)

40 CFR § 51.309(d)(10)(i)(C) requires "*for each mandatory Class I Federal area within the State, the State must assess the following visibility conditions and changes, with values for most impaired and least impaired days expressed in terms of 5-year averages of these annual values*

The current visibility conditions for the most impaired and least impaired days;
The difference between current visibility conditions for the most impaired and least days and baseline visibility conditions;
The changes in visibility impairment for the most impaired and least impaired days over the past 5-years."

This section addresses RH rule regulatory requirements for monitored data as measured by IMPROVE monitors representing Federal Class I areas in Utah.

Regional haze progress in Federal Class I areas is tracked using calculations based on speciated aerosol mass as collected by IMPROVE monitors. The RH rule calls for tracking haze in units of deciviews, where the deciview metric was designed to be linearly associated with human perception of visibility. In a pristine atmosphere, the deciview metric is near zero, and a one deciview change is approximately equivalent to a 10% change in cumulative species extinction. To better understand visibility conditions, summaries here include both the deciview metric and the apportionment of haze into extinction due to the various measured species in units of inverse megameters (Mm^{-1}).

3.4.1 Current Visibility Conditions for the Most and Least Impaired Days

EPA guidance for the 2003 RH SIP specifies that 5-year averages be calculated over successive 5-year periods; i.e., 2000-2004, 2005-2009, 2010-2014, etc.[9] EPA's Guidance[10] for the first progress report specifies that current visibility conditions be reported for the most recent 5 years of data available. Therefore, for this report, Utah is presenting information for 2005-2009 as well as 2009-13. The information and data presented in this section are from that "*Western Regional Air Partnership Regional Haze Rule Reasonable Progress Summary Report*" (Appendix A), supplemented by more recent data compiled by the Division of Air Quality from the WRAP TSS.

Tables 3.5 and 3.6 present the calculated deciview values for current conditions at each site, along with the percent contribution to extinction from each aerosol species for the 20% worst and best days for each of the Federal Class I area IMPROVE monitors in Utah. Appendix M of the WRAP Progress Report includes figures that represent the annual and 5-year period averages for the 20% most and least impaired visibility days at each IMPROVE site from 2000 to 2010.

[9] EPA's September 2003 *Guidance for Tracking Progress Under the Regional Haze Rule* specifies that progress is tracked against the 2000-2004 baseline period using corresponding averages over successive 5-year periods; i.e., 2005-2009, 2010-2014, etc. (see page 4-2 in the Guidance document).

[10] *General Principles for the 5-Year Regional Haze Progress Reports for the Initial Regional Haze State Implementation Plans (Intended to Assist States and EPA Regional Offices in Development and Review of the Progress Reports)*, US Environmental Protection Agency, April 2013.

Figure 3.7 presents 5-year average extinction for the first progress period and current conditions for both the 20% worst and best days. Note that the percentages in the tables consider only the aerosol species which contribute to extinction, while the charts also show Rayleigh, or scattering due to background gases in the atmosphere. Specific observations for the current visibility conditions on the 20% most impaired days are as follows:

- The largest contributors to aerosol extinction at Utah sites were particulate organic mass, ammonium sulfate and coarse mass.
- The highest aerosol extinction in the first progress period (12.3 dv) was measured at the ZICA1 site, where particulate organic mass was the largest contributor to aerosol extinction, followed by coarse mass.
- The lowest aerosol extinction (11.0 dv) in the first progress period was measured at the CANY1 site.

Specific observations for the current visibility conditions on the 20% least impaired days are as follows:

- The aerosol contribution to total extinction on the best days was less than Rayleigh, or the background scattering that would occur in clean air.
- Average extinction (including Rayleigh) ranged from 2.1 dv (BRCA2) to 4.3 dv (ZICA1).
- For all sites, ammonium sulfate was the largest contributor to the non-Rayleigh aerosol species of extinction.

Table 3.5, Utah Class I Area IMPROVE Sites
Current Visibility Conditions, 20% Most Impaired Days

2005-2009 Progress Period

Site	Deciviews (dv)	Percent Contribution to Aerosol Extinction by Species (Excludes Rayleigh) (% of Mm^{-1}) and Rank*						
		Ammonium Sulfate	Ammonium Nitrate	Particulate Organic Mass	Elemental Carbon	Soil	Coarse Mass	Sea Salt
BRCA1	11.9	19% (2)	9% (5)	**45% (1)**	10% (4)	5% (6)	12% (3)	0% (7)
CANY1	11.0	23% (2)	14% (4)	**27% (1)**	7% (5)	7% (6)	20% (3)	0% (7)
CAPI1	11.3	24% (2)	12% (4)	**32% (1)**	8% (5)	7% (6)	17% (3)	0% (7)
ZICA1	12.3	21% (3)	7% (5)	**33% (1)**	9% (4)	7% (6)	22% (2)	0% (7)

*Highest aerosol species contribution per site is highlighted in bold.

2009-13 Current Conditions

Site	Deciviews (dv)	Percent Contribution to Aerosol Extinction by Species (Excludes Rayleigh) (% of Mm^{-1}) and Rank*						
		Ammonium Sulfate	Ammonium Nitrate	Particulate Organic Mass	Elemental Carbon	Soil	Coarse Mass	Sea Salt
BRCA1	10.6	20%	9%	**42%**	8%	5%	14%	1%
CANY1	10.8	21%	18%	**26%**	6%	6%	22%	0%
CAPI1	10.2	25%	15%	**29%**	6%	7%	18%	1%
ZICA1	10.8	23%	7%	24%	6%	9%	**30%**	1%

*Highest aerosol species contribution per site is highlighted in bold.

Table 3.6, Utah Class I Area IMPROVE Sites
Current Visibility Conditions, 20% Least Impaired Days

2005-2009 Progress Period

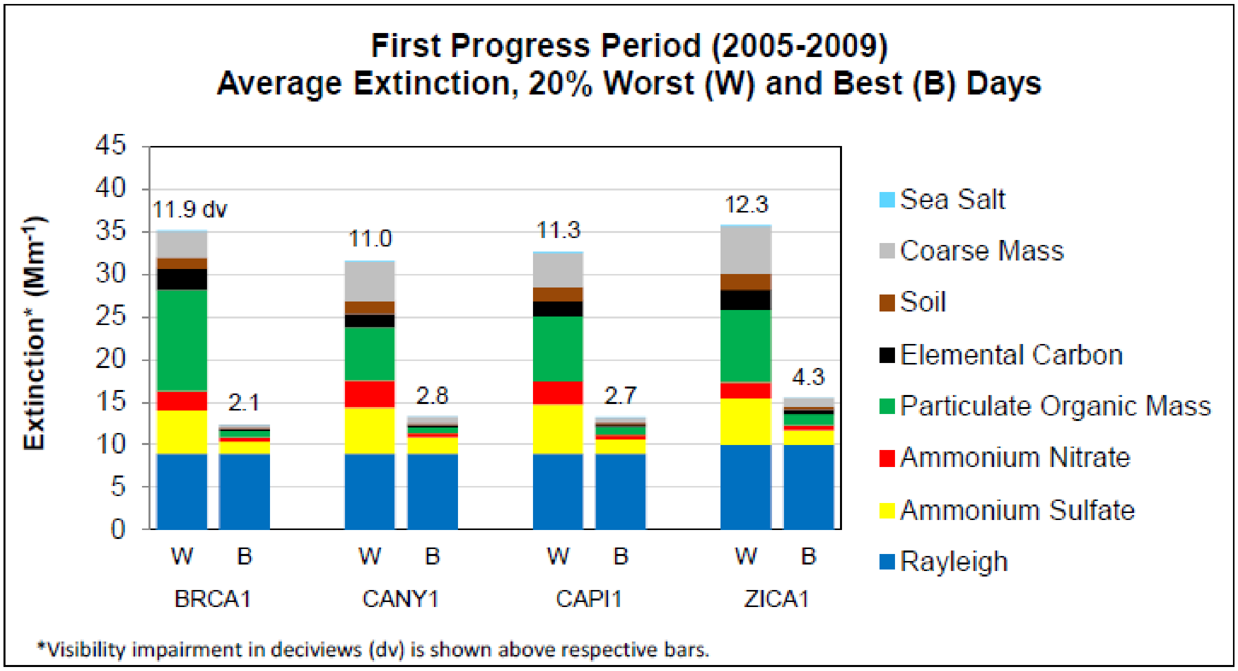
Site	Deciviews (dv)	Percent Contribution to Aerosol Extinction by Species (Excludes Rayleigh) (% of Mm^{-1}) and Rank						
		Ammonium Sulfate	Ammonium Nitrate	Particulate Organic Mass	Elemental Carbon	Soil	Coarse Mass	Sea Salt
BRCA1	2.1	**40% (1)**	15% (3)	22% (2)	7% (5)	4% (6)	11% (4)	1% (7)
CANY1	2.8	**43% (1)**	12% (4)	15% (3)	7% (5)	5% (6)	17% (2)	1% (7)
CAPI1	2.7	**38% (1)**	13% (4)	21% (2)	8% (5)	5% (6)	14% (3)	1% (7)
ZICA1	4.3	**30% (1)**	11% (4)	23% (2)	10% (5)	6% (6)	18% (3)	1% (7)

*Highest aerosol species contribution per site is highlighted in bold.

2009-2013 Current Conditions

Site	Deciviews (dv)	Percent Contribution to Aerosol Extinction by Species (Excludes Rayleigh) (% of Mm^{-1}) and Rank*						
		Ammonium Sulfate	Ammonium Nitrate	Particulate Organic Mass	Elemental Carbon	Soil	Coarse Mass	Sea Salt
BRCA1	1.8	**43%**	15%	20%	6%	4%	11%	0%
CANY1	3.1	**41%**	12%	17%	6%	6%	18%	1%
CAPI1	2.6	**40%**	13%	20%	7%	5%	16%	1%
ZICA1	4.3	**32%**	13%	22%	8%	6%	18%	1%

*Highest aerosol species contribution per site is highlighted in bold.



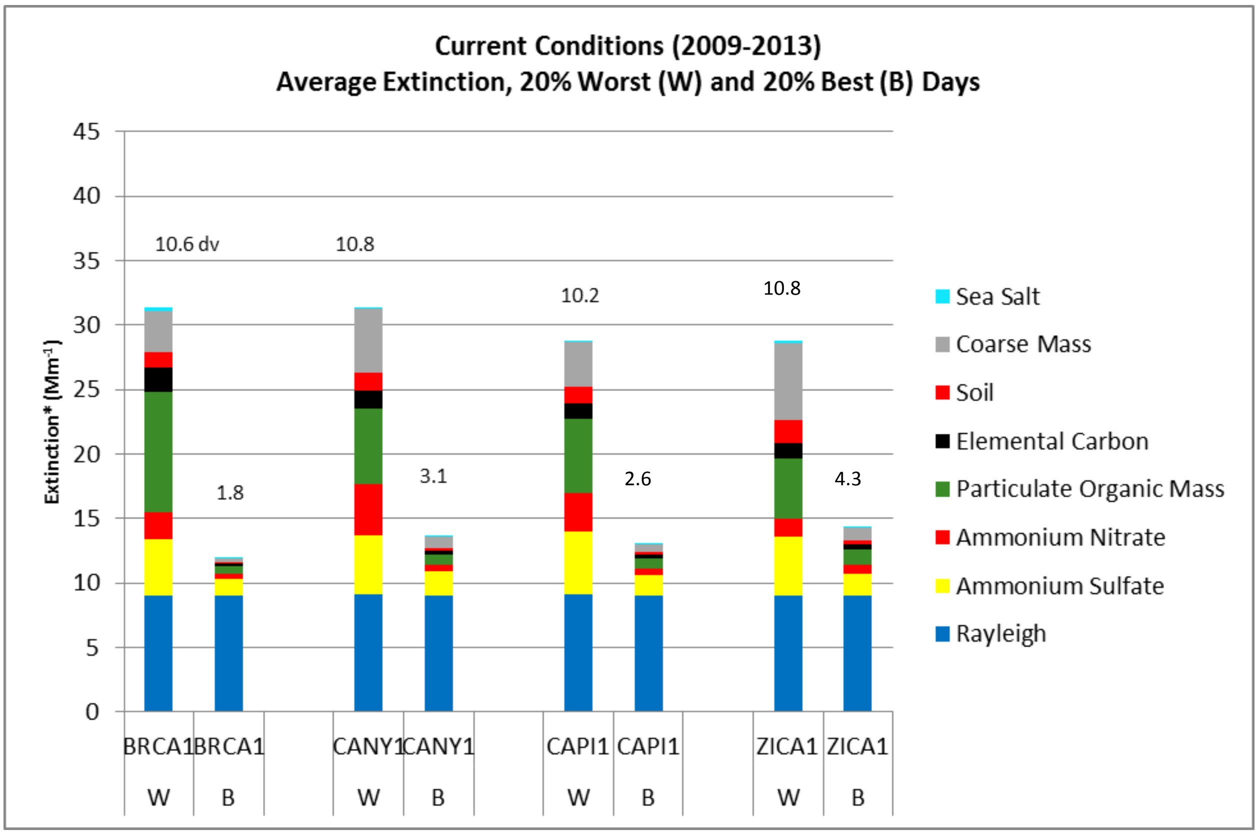


Figure 3.7. Average Extinction for Current Progress Period (2005-2009) for the Worst (Most Impaired) and Best (Least Impaired) Days Measured at Utah Class I Area IMPROVE Sites

3.4.2 Differences Between Current Visibility Conditions for the Most and Least Impaired Days and Baseline Visibility Conditions

Included here are comparisons between the 5-year average baseline conditions (2000-2004), the first progress period (2005-2009), and the most recent 5-year period (2009-2013) extinction.

Table 3.7 presents the differences between the 2000-2004 baseline period average extinction and both the 2005-2009 progress period average and the current 5-year average (2009-2013) for each site in Utah for the 20% most impaired days, and Table 3.8 presents similar data for the least impaired days. Averages that increased are depicted in red text, and averages that decreased are depicted in blue.

Figure 3.8 presents the 5-year average extinction for the baseline, first progress period, and current 5-year average for the worst days, and Figure 3.9 presents the differences in averages by aerosol species, with increases represented above the zero line and decreases below the zero line. Figures 3.10 and 3.11 present similar plots for the best days.

For the 20% most impaired days, the 5-year average Regional Haze Rule (RHR) deciview metric increased between the 2000-2004 and 2005-2009 periods at the BRCA1 and CAPI1 sites and decreased at the CANY1 and ZICA1 sites. The most recent 5-year average shows a decrease at all Class I areas. Notable differences for individual species averages were as follows:

Increases in 5-year average deciviews at the BRCA1 and CAPI1 sites during the first progress period were mostly due to increases in particulate organic mass, with some increases also measured in elemental carbon and soil. Coarse mass also contributed to increases at the CAPI1 site. Increases were offset by decreases in ammonium nitrate and ammonium sulfate at both sites. Ammonium sulfate decreased at all sites except ZICA1 during the first progress period but by 2009-2013 decreased at all sites. Note that data was not collected at the ZICA site during the baseline years, and changes reported here are proportional to average changes in extinction as measured at regional sites.

Increases in ammonium nitrate at CANY1 may be due to decreases in SO_2 emissions that reduce the formation of ammonium sulfate and therefore result in an increase in ammonium nitrate in ammonia limited conditions.

For the 20% least impaired days, the 5-year average deciview metric decreased at all sites. Notable differences for individual species averages on the 20% least impaired days were as follows:

All species at all sites either decreased or stayed the same on the best days between the baseline and both the first progress period and the most recent 5-year average. The largest decreases on the best days were measured in particulate organic mass, ammonium nitrate, ammonium sulfate, and coarse mass.

Table 3.7 Utah Class I Area IMPROVE Sites
Difference in Aerosol Extinction by Species, 2000-2004 Baseline Period to 2005-2009 Progress Period and Current Conditions, 20% Most Impaired Days

2005-2009 Progress Period

Site	Deciview (dv)			Change in Extinction by Species (Mm^{-1})*						
	2000-04 Baseline Period	2005-09 Progress Period	Change in dv*	Amm. Sulfate	Amm. Nitrate	POM	EC	Soil	CM	Sea Salt
BRCA1	11.6	11.9	+0.3	-0.2	-0.3	+2.5	+0.2	+0.1	-0.9	0.0
CANY1	11.2	11.0	-0.2	-0.3	+0.3	-0.9	-0.1	+0.1	+0.8	0.0
CAPI1	10.9	11.3	+0.4	-0.2	-0.7	+1.8	+0.2	+0.3	+0.7	+0.1
ZICA1	12.5	12.3	-0.2	+0.2	-0.3	-0.8	-0.1	+0.1	0.0	+0.1

*Change is calculated as progress period average minus baseline period average. Values in red indicate increases in extinction and values in blue indicate decreases.

Current Conditions 2009-2013

Site	Deciview (dv)			Change in Extinction by Species (Mm-1)*						
	2000-04 Baseline Period	2009-13 Current Conditions	Change in dv*	Amm. Sulfate	Amm. Nitrate	POM	EC	Soil	CM	Sea Salt
BRCA1	11.6	10.6	-1.0	-0.8	-0.4	0.0	-0.5	0.0	-0.8	0.2
CANY1	11.2	10.8	-0.4	-1.0	1.0	-1.3	-0.4	-0.1	1.2	0.1
CAPI1	10.9	10.2	-0.7	-1.0	-0.5	-0.1	-0.4	0.0	0.1	0.1
ZICA	12.5	10.8	-1.7	-0.6	-0.8	-4.6	-1.3	0.1	0.4	0.0

*Change is calculated as current conditions average minus baseline period average. Values in red indicate increases in extinction and values in blue indicate decreases.

Table 3.8 Utah Class I Area IMPROVE Sites
Difference in Aerosol Extinction by Species, 2000-2004 Baseline Period to 2005-2009 Progress Period
20% Least Impaired Days

2005-2009 Progress Period

Site	Deciview (dv)			Change in Extinction by Species (Mm^{-1})*						
	2000-04 Baseline Period	2005-09 Progress Period	Change in dv*	Amm. Sulfate	Amm. Nitrate	POM	EC	Soil	CM	Sea Salt
BRCA1	2.8	2.1	-0.7	-0.1	-0.2	-0.3	-0.2	0.0	-0.1	0.0
CANY1	3.7	2.8	-0.9	-0.3	-0.1	-0.5	-0.1	-0.1	-0.2	0.0
CAPI1	4.1	2.7	-1.4	-0.3	-0.4	-0.5	-0.3	-0.1	-0.4	0.0
ZICA1	5.0	4.3	-0.7	-0.1	-0.2	-0.5	-0.2	0.0	-0.1	0.0

*Change is calculated as progress period average minus baseline period average. Values in red indicate increases in extinction and values in blue indicate decreases.

Current Conditions 2009-2013

	Deciview (dv)			Change in Extinction by Species (Mm-1)*						
	2000-04 Baseline Period	2009-13 Current Conditions	Change in dv*	Amm. Sulfate	Amm. Nitrate	POM	EC	Soil	CM	Sea Salt
BRCA1	2.8	1.8	-1.0	-0.2	-0.2	-0.4	-0.2	0.0	-0.2	0.0
CANY1	3.7	3.1	-0.6	-0.3	0.0	-0.3	-0.2	-0.1	-0.1	0.0
CAPI1	4.1	2.6	-1.5	-0.3	-0.5	-0.6	-0.3	-0.1	-0.3	0.0
ZICA	5.0	4.3	-0.7	-0.1	-0.1	-0.6	-0.4	0.0	-0.1	0.0

*Change is calculated as current conditions average minus baseline period average. Values in red indicate increases in extinction and values in blue indicate decreases.

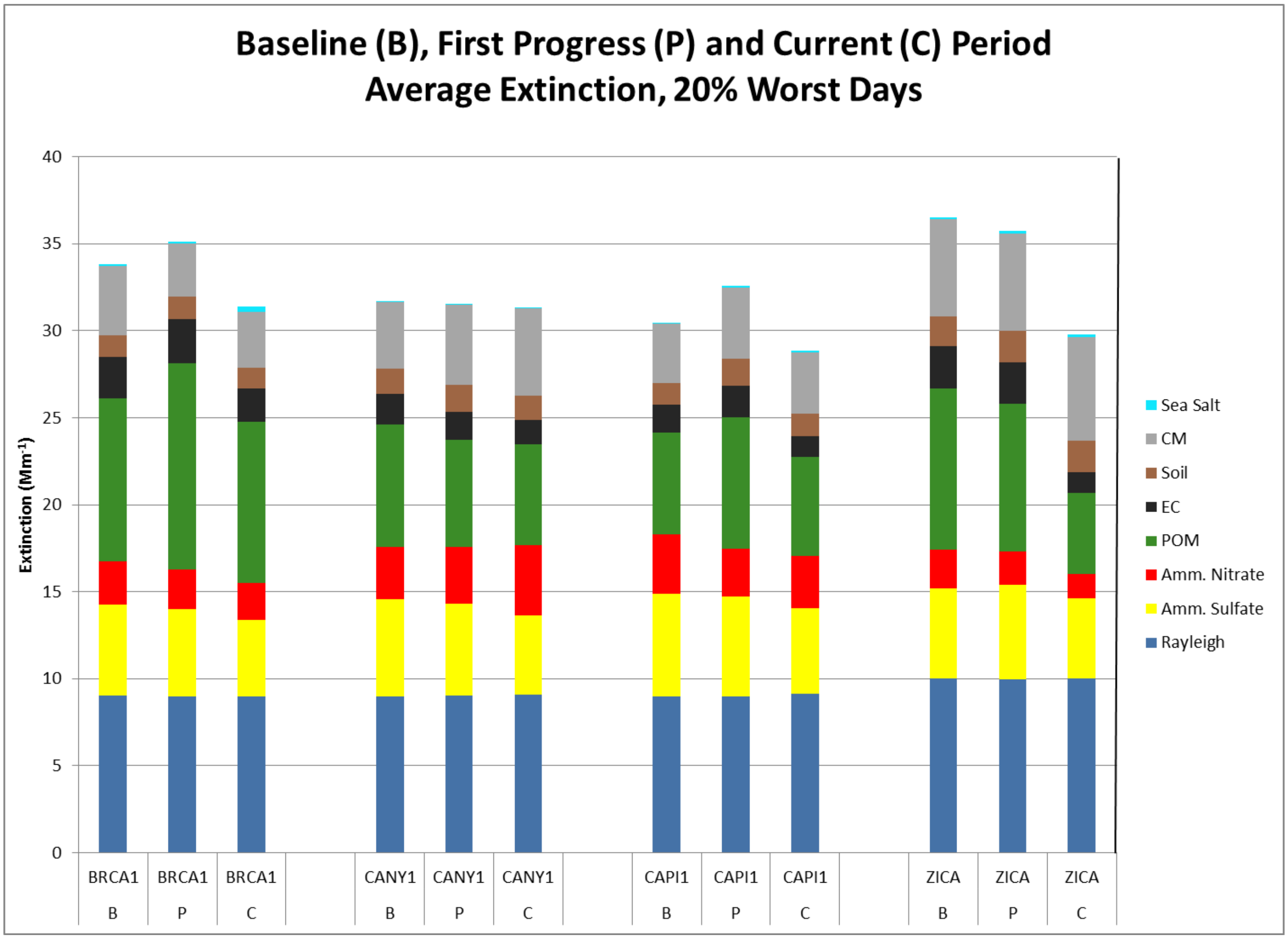
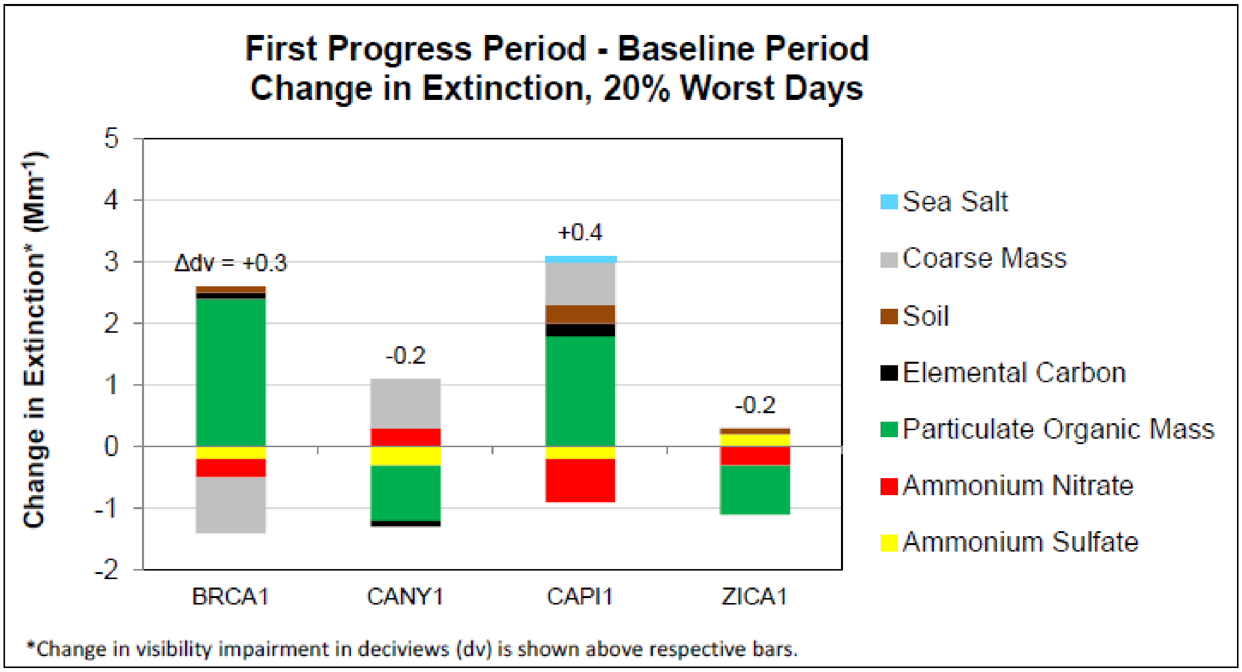


Figure 3.8. Average Extinction for Baseline, Progress Period, and Current Conditions Extinction for Worst (Most Impaired) Days Measured at Utah Class I Area IMPROVE Sites.



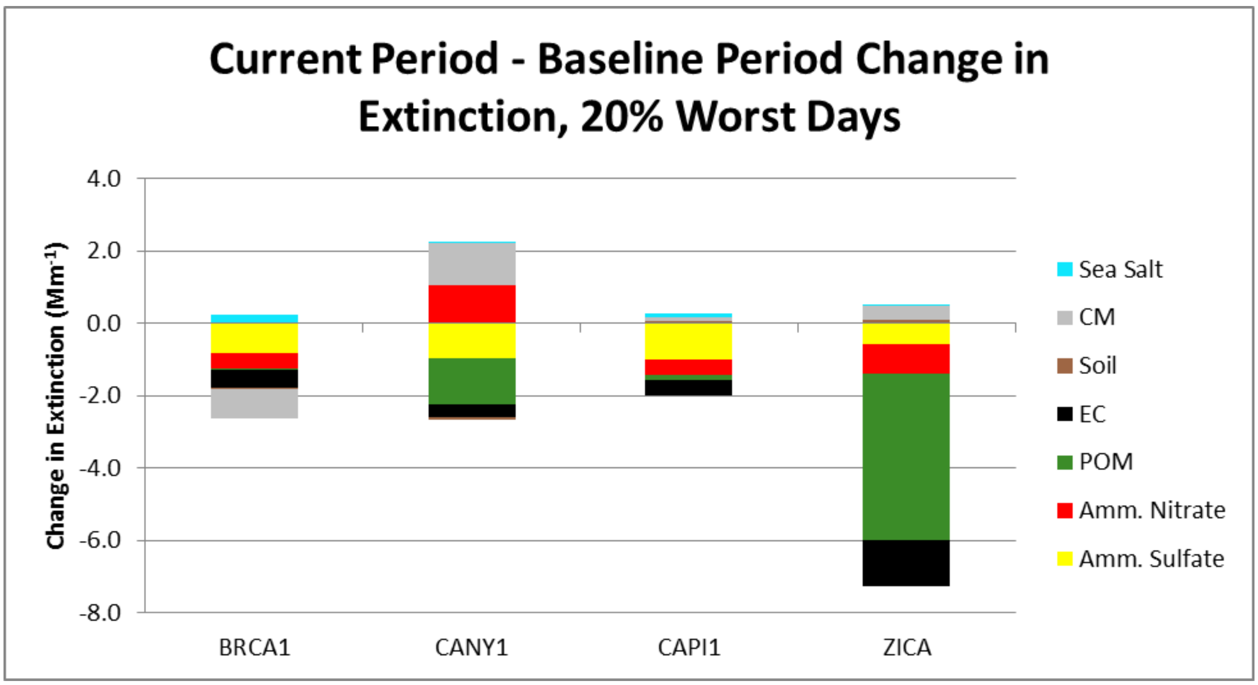


Figure 3.9. Difference between Average Extinction for Current Progress Period (2005-2009) and Baseline Period (2000-2004) for the Worst (Most Impaired) Days Measured at Utah Class I Area IMPROVE Sites.

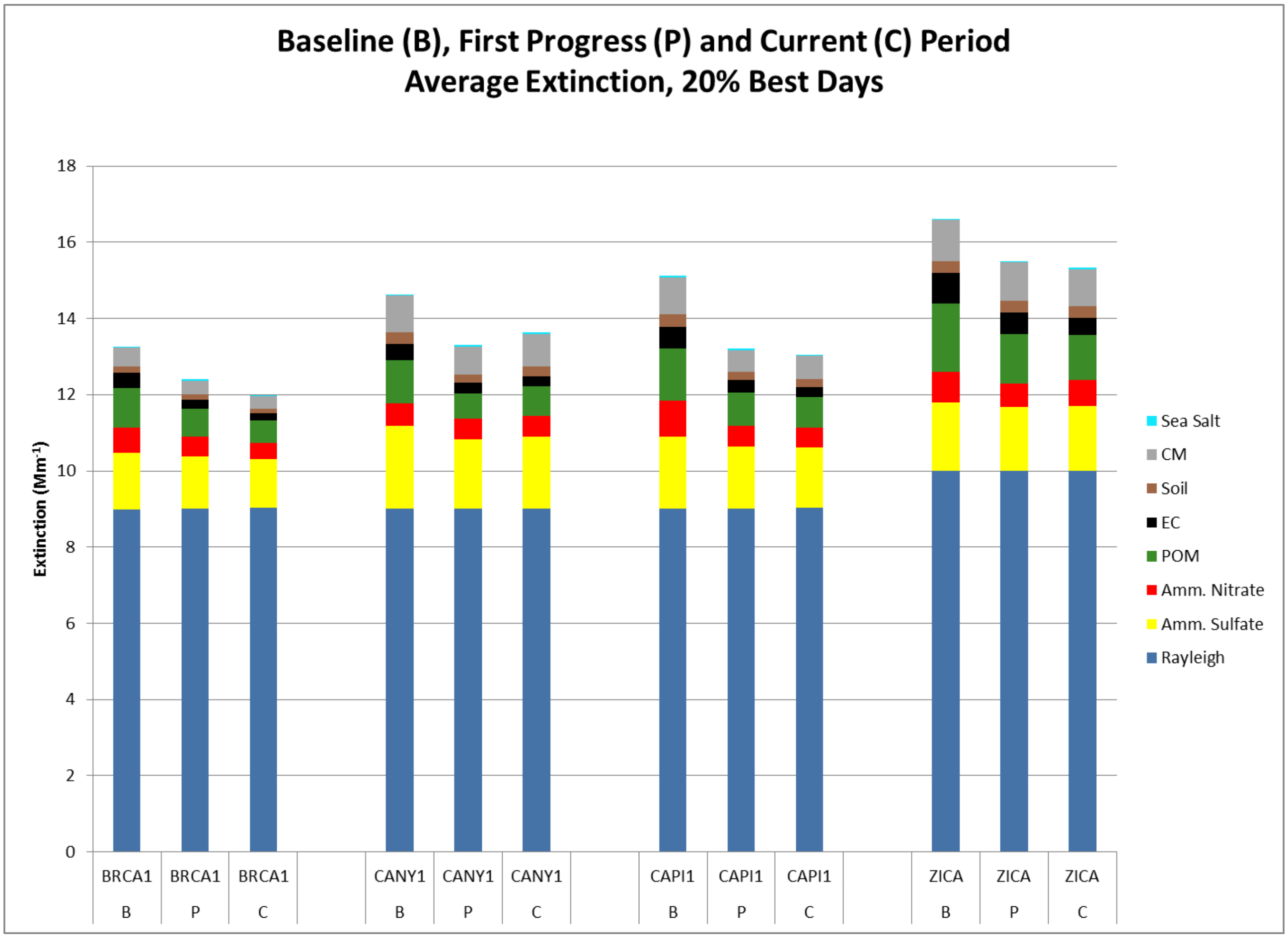
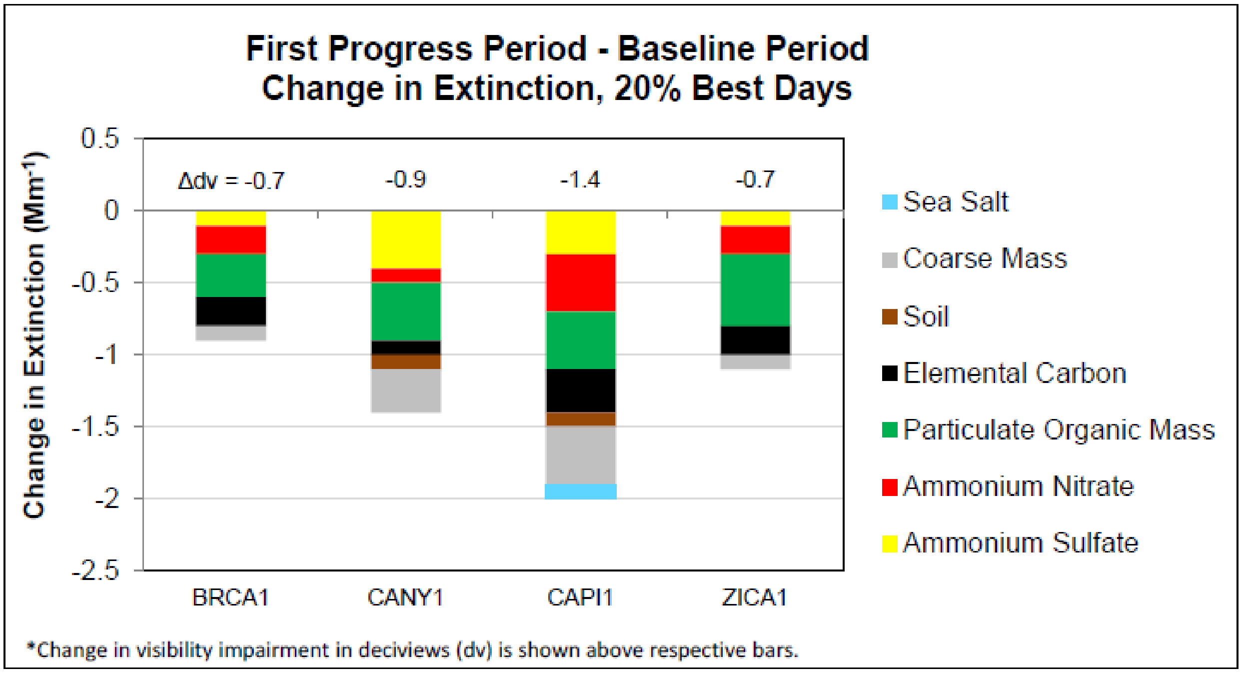


Figure 3.10. Average Extinction for Baseline and Progress Period Extinction for Best (Least Impaired) Days Measured at Utah Class I Area IMPROVE Sites



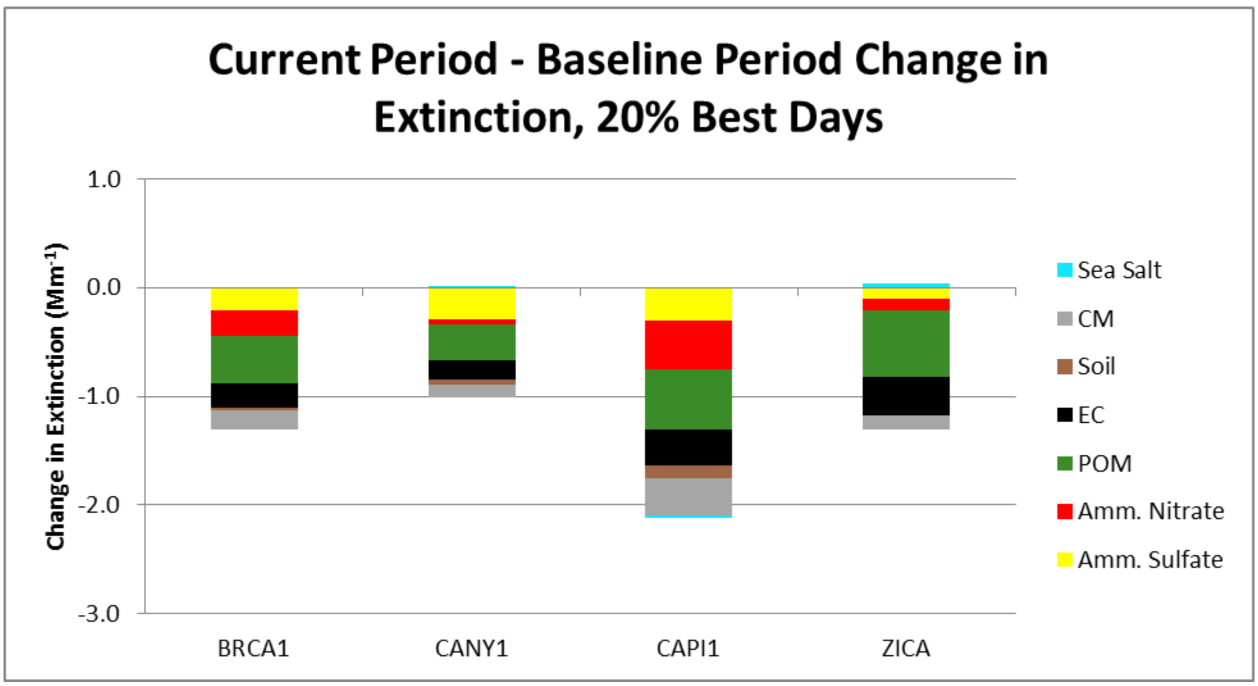


Figure 3.11. Difference Between Average Extinction for Current Progress Period (2005-2009) and Baseline Period (2000-2004) for the Best (Least Impaired) Days Measured at Utah Class I Area IMPROVE Sites

3.4.3 Change in Visibility Impairment for the Most Impaired and Least Impaired Days Over the Past Five Years

Included here are changes in visibility impairment as characterized by annual average trend statistics and some general observations regarding local and regional events and outliers on a daily and annual basis that affected the first 5-year progress period. The regulatory requirement asks for a description of changes over the past 5-year progress period, but trend analysis is better suited to longer periods of time, so trends for the entire 10-year planning period are presented here. Rolling 5-year average trends are also shown.

Trend statistics for the years 2000-2009 for each species at each site in Utah are summarized in Table 3.9[11]. Only trends for aerosol species trends with p-value statistics less than 0.15 (85% confidence level) are presented in the table here, with increasing slopes in red and decreasing slopes in blue[12]. In some cases, trends may show decreasing tendencies while the difference between the 5-year averages do not (or vice versa). In these cases, the 5-year average for the best and worst days is the important metric for the RHR regulatory purposes, but trend statistics may be of value to understand and address visibility impairment issues for planning purposes.

For each site, a more comprehensive list of all trends for all species, including the associated p-values, is provided in Appendix M of the *Western Regional Air Partnership Regional Haze Rule Reasonable Progress Summary Report*. Additionally, the appendix includes plots depicting 5-year, annual, monthly and daily average extinction for each site. Some general observations regarding changes in visibility impairment at sites in Utah are as follows:

- Particulate organic mass was the largest contributor to aerosol extinction at all sites in Utah. The largest difference between the 5-year average baseline and progress periods was measured for particulate organic mass at the BRCA1 site. This difference average was influenced by high particulate organic mass events in July and August, 2009.

- For ammonium sulfate, annual average trend statistics for all measured days indicated decreasing trends at all Utah sites. A slight increase in the 5-year average ammonium sulfate was reported for the ZICA1 site, but this was based on a baseline average estimate (Section 6.13.1.1 of Appendix M of the WRAP Report). Actual data measured between 2004 and 2009 at the ZICA1 site indicated a slightly decreasing annual average trend.

[11] Annual trends were calculated for the years 2000-2009, with a trend defined as the slope derived using Theil statistics. Trends derived from Theil statistics are useful in analyzing changes in air quality data because these statistics can show the overall tendency of measurements over long periods of time, while minimizing the effects of year-to-year fluctuations which are common in air quality data. Theil statistics are also used in EPA's National Air EPA's National Air Quality Trends Reports (http://www.epa.gov/airtrends/) and the IMPROVE program trend reports (http://vista.cira.colostate.edu/improve/Publications/improve_reports.htm)

[12] The significance of the trend is represented with p-values calculated using Mann-Kendall trend statistics. Determining a significance level helps to distinguish random variability in data from a real tendency to increase or decrease over time, where lower p-values indicate higher confidence levels in the computed slopes.

- For ammonium nitrate, annual average trend statistics for all measured days indicated a decreasing trend at the CAPI1 site and either no trend or insignificant trends at the other Utah sites.

- For soil, slightly increasing annual average tends were measured at the ZICA1 site and an increasing trend for the worst days was measured at the CAPI1 site.

- Coarse mass increased at the CAPI1 and CANY1 sites, but these sites did not show increasing trends. Higher 5-year current period averages were influenced by higher than average coarse mass events in late April of 2008 at both sites.

Rolling 5-year average trends are shown for all sites in Tables 3.10 through 3.17.

Table 3.9 Utah Class I Area IMPROVE Sites
Change in Aerosol Extinction by Species
2000-2009 Annual Average Trends

Site	Group	Annual Trend* (Mm^{-1}/year)						
		Ammonium Sulfate	Ammonium Nitrate	Particulate Organic Mass	Elemental Carbon	Soil	Coarse Mass	Sea Salt
BRCA1	20% Best	--	0.0	-0.1	0.0	--	0.0	0.0
	20% Worst	-0.2	--	0.5	0.1	--	--	0.0
	All Days	-0.1	0.0	--	--	--	--	--
CANY1	20% Best	-0.1	--	-0.1	0.0	--	-0.1	0.0
	20% Worst	-0.1	--	--	--	--	--	0.0
	All Days	-0.1	0.0	--	0.0	0.0	--	0.0
CAPI1	20% Best	-0.1	-0.1	-0.1	0.0	--	-0.1	--
	20% Worst	--	-0.2	--	--	0.1	--	0.0
	All Days	-0.1	-0.1	--	0.0	--	--	0.0
ZICA1	20% Best	0.0	--	--	0.0	0.0	--	0.0
	20% Worst	-0.5	--	--	--	--	--	--
	All Days	-0.2	--	--	-0.1	0.1	--	--

Table 3.10 Visibility Summary for Arches and Canyonlands, 20% Worst Days

	Class I Area Visibility Summary: Arches NP, UT: Canyonlands NP, UT Class I areas **Visibility Conditions:** Worst 20% Days **Reasonable Progress Summary**					
	2000-04 Baseline Conditions (Mm-1)	2005-09 Progress Period (Mm-1)	2006-10 Progress Period (Mm-1)	2007-11 Progress Period (Mm-1)	2008-12 Progress Period (Mm-1)	2009-13 Progress Period (Mm-1)
Sulfate	5.6	5.3	5.3	5.1	4.9	4.6
Nitrate	3.0	3.3	3.5	3.5	3.0	4.0
Organic Carbon	7.1	6.2	6.0	5.7	6.1	5.8
Elemental Carbon	1.7	1.6	1.5	1.4	1.3	1.4
Fine Soil	1.5	1.5	1.6	1.6	1.8	1.4
Coarse Material	3.8	4.6	4.9	5.1	5.7	5.0
Sea Salt	0.1	0.1	0.1	0.1	0.1	0.1
Total Light Extinction	31.7	31.6	31.9	31.6	31.9	31.4
Deciview	11.2	11.0	11.0	10.9	11.0	10.8

Table 3.11 Visibility Summary for Arches and Canyonlands, 20% Best Days

	Class I Area Visibility Summary: Arches NP, UT: Canyonlands NP, UT Class I areas **Visibility Conditions:** Best 20% Days **Reasonable Progress Summary**					
	2000-04 Baseline Conditions (Mm-1)	2005-09 Progress Period (Mm-1)	2006-10 Progress Period (Mm-1)	2007-11 Progress Period (Mm-1)	2008-12 Progress Period (Mm-1)	2009-13 Progress Period (Mm-1)
Sulfate	2.2	1.8	1.8	1.8	1.8	1.9
Nitrate	0.6	0.5	0.6	0.6	0.5	0.5
Organic Carbon	1.1	0.7	0.7	0.8	0.8	0.8
Elemental Carbon	0.4	0.3	0.3	0.3	0.3	0.3
Fine Soil	0.3	0.2	0.2	0.2	0.2	0.3
Coarse Material	1.0	0.7	0.7	0.8	0.8	0.8
Sea Salt	0.0	0.0	0.0	0.0	0.0	0.1
Total Light Extinction	14.6	13.3	13.4	13.4	13.5	13.6
Deciview	3.7	2.8	2.9	2.9	2.9	3.1

Table 3.12 Visibility Summary for Bryce Canyon, 20% Worst Days

	Class I Area Visibility Summary: Bryce Canyon NP, UT Class I area **Visibility Conditions:** Worst 20% Days **Reasonable Progress Summary**					
	2000-04 Baseline Conditions (Mm-1)	2005-09 Progress Period (Mm-1)	2006-10 Progress Period (Mm-1)	2007-11 Progress Period (Mm-1)	2008-12 Progress Period (Mm-1)	2009-13 Progress Period (Mm-1)
Sulfate	5.2	5.0	4.7	4.7	4.5	4.4
Nitrate	2.5	2.2	2.4	2.5	2.2	2.1
Organic Carbon	9.4	11.8	10.8	11.0	9.8	9.3
Elemental Carbon	2.4	2.5	2.3	2.2	2.0	1.9
Fine Soil	1.2	1.3	1.3	1.3	1.4	1.2
Coarse Material	4.0	3.1	3.0	3.1	3.3	3.2
Sea Salt	0.1	0.1	0.1	0.3	0.3	0.3
Total Light Extinction	33.8	35.1	33.6	34.2	32.5	31.4
Deciview	11.6	11.9	11.4	11.4	11.0	10.6

Table 3.13 Visibility Summary for Bryce Canyon, 20% Best Days

	Class I Area Visibility Summary: Bryce Canyon NP, UT Class I area **Visibility Conditions:** Best 20% Days **Reasonable Progress Summary**					
	2000-04 Baseline Conditions (Mm-1)	2005-09 Progress Period (Mm-1)	2006-10 Progress Period (Mm-1)	2007-11 Progress Period (Mm-1)	2008-12 Progress Period (Mm-1)	2009-13 Progress Period (Mm-1)
Sulfate	1.5	1.4	1.3	1.2	1.2	1.3
Nitrate	0.7	0.5	0.5	0.5	0.4	0.4
Organic Carbon	1.0	0.7	0.7	0.7	0.6	0.6
Elemental Carbon	0.4	0.2	0.2	0.2	0.2	0.2
Fine Soil	0.1	0.1	0.1	0.1	0.1	0.1
Coarse Material	0.5	0.4	0.3	0.4	0.3	0.3
Sea Salt	0.0	0.0	0.0	0.0	0.0	0.0
Total Light Extinction	13.2	12.4	12.3	12.2	12.0	12.0
Deciview	2.8	2.1	2.0	2.0	1.8	1.8

Table 3.14 Visibility Summary for Capitol Reef NP, 20% Worst Days

	Class I Area Visibility Summary: Capitol Reef NP, UT Class I area **Visibility Conditions:** Worst 20% Days **Reasonable Progress Summary**					
	2000-04 Baseline Conditions (Mm-1)	2005-09 Progress Period (Mm-1)	2006-10 Progress Period (Mm-1)	2007-11 Progress Period (Mm-1)	2008-12 Progress Period (Mm-1)	2009-13 Progress Period (Mm-1)
Sulfate	5.9	5.7	5.1	5.2	5.0	4.9
Nitrate	3.4	2.7	3.2	3.0	2.7	3.0
Organic Carbon	5.8	7.6	6.6	6.0	6.3	5.7
Elemental Carbon	1.6	1.8	1.4	1.3	1.3	1.2
Fine Soil	1.3	1.6	1.6	1.5	1.5	1.3
Coarse Material	3.4	4.1	3.9	3.7	3.8	3.5
Sea Salt	0.0	0.1	0.1	0.1	0.1	0.1
Total Light Extinction	30.4	32.6	30.9	29.9	29.8	28.8
Deciview	10.9	11.3	10.8	10.4	10.5	10.2

Table 3.15 Visibility Summary for Capitol Reef NP, 20% Best Days

	Class I Area Visibility Summary: Capitol Reef NP, UT Class I area **Visibility Conditions:** Best 20% Days **Reasonable Progress Summary**					
	2000-04 Baseline Conditions (Mm-1)	2005-09 Progress Period (Mm-1)	2006-10 Progress Period (Mm-1)	2007-11 Progress Period (Mm-1)	2008-12 Progress Period (Mm-1)	2009-13 Progress Period (Mm-1)
Sulfate	1.9	1.6	1.5	1.6	1.5	1.6
Nitrate	1.0	0.6	0.5	0.5	0.5	0.5
Organic Carbon	1.4	0.9	0.9	0.9	0.8	0.8
Elemental Carbon	0.6	0.3	0.3	0.3	0.3	0.3
Fine Soil	0.3	0.2	0.2	0.2	0.2	0.2
Coarse Material	1.0	0.6	0.6	0.6	0.6	0.6
Sea Salt	0.1	0.0	0.0	0.0	0.0	0.0
Total Light Extinction	15.1	13.2	13.1	13.1	12.9	13.0
Deciview	4.1	2.7	2.6	2.7	2.5	2.6

Table 3.16 Visibility Summary for Zion NP, 20% Worst Days

	Class I Area Visibility Summary: Zion NP, UT Class I area					
	Visibility Conditions: Worst 20% Days					
	Reasonable Progress Summary					
	2000-04 Baseline Conditions	2005-09 Progress Period	2006-10 Progress Period	2007-11 Progress Period	2008-12 Progress Period	2009-13 Progress Period
	(Mm-1)	(Mm-1)	(Mm-1)	(Mm-1)	(Mm-1)	(Mm-1)
Sulfate	5.2	5.42	5.08	4.86	4.69	4.63
Nitrate	2.24	1.92	2.04	2.13	1.72	1.37
Organic Carbon	9.34	8.5	9.01	8.21	6.7	4.69
Elemental Carbon	2.41	2.36	2.33	1.88	1.48	1.15
Fine Soil	1.71	1.83	1.99	2.15	1.97	1.8
Coarse Material	5.6	5.59	5.94	6.14	6.15	5.96
Sea Salt	0.06	0.13	0.15	0.16	0.18	0.14
Total Light Extinction	36.89	35.73	36.53	35.56	32.93	29.77
Deciview	12.5	12.3	12.5	12.2	11.5	10.8

Table 3.17 Visibility Summary for Zion NP, 20% Worst Days

	Class I Area Visibility Summary: Zion NP, UT Class I area					
	Visibility Conditions: Best 20% Days					
	Reasonable Progress Summary					
	2000-04 Baseline Conditions	2005-09 Progress Period	2006-10 Progress Period	2007-11 Progress Period	2008-12 Progress Period	2009-13 Progress Period
	(Mm-1)	(Mm-1)	(Mm-1)	(Mm-1)	(Mm-1)	(Mm-1)
Sulfate	1.78	1.67	1.65	1.55	1.6	1.69
Nitrate	0.79	0.62	0.66	0.73	0.61	0.7
Organic Carbon	1.79	1.29	1.34	1.29	1.3	1.18
Elemental Carbon	0.76	0.57	0.59	0.52	0.5	0.44
Fine Soil	0.34	0.3	0.33	0.31	0.29	0.29
Coarse Material	1.11	1.01	1.08	1.07	0.95	0.97
Sea Salt	0.01	0.03	0.04	0.04	0.03	0.04
Total Light Extinction	16.46	15.5	15.67	15.54	15.31	15.33
Deciview	5	4.3	4.5	4.4	4.2	4.2

3.5 Analysis of Emissions: 40 CFR 40 CFR § 51.309(d)(10)(i)(D)

40 CFR §51.309(d)(10(i)(D) requires "*An analysis tracking the change over the past 5 years in emissions of pollutants contributing to visibility impairment from all sources and activities within the State. Emissions changes should be identified by type of source or activity. The analysis must be based on the most recent updated emissions inventory, with estimates projected forward as necessary and appropriate, to account for emissions changes during the applicable 5-year period.*"

Included here are summaries depicting differences between two emission inventory years that are used to represent the 5-year baseline and current progress periods. The baseline period is represented using a 2002 inventory developed by the WRAP for use in the initial WRAP state SIPs, and the progress period is represented by a 2008 inventory which leverages recent WRAP inventory work for modeling efforts. The 2018 inventory (projected from the 2002 baseline inventory) that was used in the modeling for Utah's RH SIP is also included. For reference, Table 3.18 lists the pollutants inventoried, the related aerosol species, some of the key sources for each pollutant, and some notes regarding implications of these pollutants.

Differences between these baseline and progress period inventories, and a separate summary of annual emissions from electrical generating units (EGUs), are presented in this section.

Table 3.18
Utah
Pollutants, Aerosol Species, and Major Sources

Emitted Pollutant	Related Aerosol	Major Sources	Notes
Sulfur Dioxide (SO_2)	Ammonium Sulfate	Point Sources; On- and Off-Road Mobile Sources	SO_2 emissions are generally associated with anthropogenic sources such as coal-burning power plants, other industrial sources such as refineries and cement plants, and both on- and off-road diesel engines.
Oxides of Nitrogen (NO_X)	Ammonium Nitrate	On- and Off-Road Mobile Sources; Point Sources; Area Sources	NO_X emissions are generally associated with anthropogenic sources. Common sources include virtually all combustion activities, especially those involving cars, trucks, power plants, and other industrial processes.
Ammonia (NH_3)	Ammonium Sulfate and Ammonium Nitrate	Area Sources; On-Road Mobile Sources	Gaseous NH_3 has implications in particle formation because it can form particulate ammonium. Ammonium is not generally directly measured by the IMPROVE program, but affects formation potential of ammonium sulfate and ammonium nitrate. All measured nitrate and sulfate is assumed to be associated with ammonium for IMPROVE reporting purposes.
Volatile Organic Compounds (VOCs)	Particulate Organic Mass (POM)	Biogenic Emissions; Vehicle Emissions; Area Sources	VOCs are gaseous emissions of carbon compounds, which are often converted to POM through chemical reactions in the atmosphere. Estimates for biogenic emissions of VOCs have undergone significant updates since 2002, so changes reported here are more reflective of methodology changes than actual changes in emissions (see Section 3.2.1).
Primary Organic Aerosol (POA)	POM	Wildfires; Area Sources	POA represents organic aerosols that are emitted directly as particles, as opposed to gases. Wildfires in the west generally dominate POA emissions, and large wildfire events are generally sporadic and highly variable from year-to-year.
Elemental Carbon (EC)	EC	Wildfires; On- and Off-Road Mobile Sources	Large EC events are often associated with large POM events during wildfires. Other sources include both on- and off-road diesel engines.
Fine Soil	Soil	Windblown Dust; Fugitive Dust; Road Dust; Area Sources	Fine soil is reported here as the crustal or soil components of $PM_{2.5}$.
Coarse Mass (PMC)	Coarse Mass	Windblown Dust; Fugitive Dust	Coarse mass is reported by the IMPROVE Network as the difference between PM_{10} and $PM_{2.5}$ mass measurements. Coarse mass is not separated by species in the same way that $PM_{2.5}$ is speciated, but these measurements are generally associated with crustal components. Similar to crustal $PM_{2.5}$, natural windblown dust is often the largest contributor to PMC.

For these summaries, emissions during the baseline years are represented using a 2002 inventory, which was developed with support from the WRAP for use in the original RH SIP strategy development (termed plan02d). Differences between inventories are represented as the difference between the 2002 inventory and a 2008 inventory which leverages recent inventory development work performed by the WRAP for the West-wide Jumpstart Air Quality Modeling Study (WestJumpAQMS) and Deterministic & Empirical Assessment of Smoke's contribution to Ozone ($DEASCO_3$) modeling projects (termed WestJump2009). Note that the comparison of differences between inventories does not necessarily reflect a change in emissions, as a number of methodology changes and enhancements have occurred between development of the individual inventories (See Appendix A). Inventories for all major visibility impairing pollutants are presented for major source categories, and categorized as either anthropogenic or natural emissions. The projected 2018 inventory, which was developed with support from the WRAP for use in RH SIPs (termed PRP 18a) is included for comparison purposes. The 2018 inventory was projected from the 2002 baseline inventory and does not include the methodology improvements from the WestJump project. The projected 2018 inventory was used for the western reasonable progress modeling demonstrations.

Table 3.19 and Figure 3.12 present the differences between the 2002 and 2008 sulfur dioxide (SO_2) inventories by source category. Table 3.20 and Figure 3.13 present data for oxides of nitrogen (NO_X), and Tables 3.21 through 3.24 and Figures 3.14 through 3.19 present data for ammonia (NH_3), volatile organic compounds (VOCs), primary organic aerosol (POA), elemental carbon (EC), fine soil, and coarse mass. General observations regarding emissions inventory comparisons are listed below.

- The largest differences for point source inventories were a decrease in SO_2 emissions and an increase in NO_X . The SO_2 decrease shown in Table 3.19 reflects the significant emission reductions due to the installation of emission controls on PacifiCorp Huntington Unit 2 in 2006. The eleven annual SO_2 milestone reports that have been completed since the program started in 2003 document emission changes from all major SO_2 sources in the 3-state region, and also document all sources that have been added to the program or have shut down in the three state-region since 2000. Table 3.19 shows that point source SO_2 emissions are significantly below the 2018 estimate in Utah's RH SIP. Table 3.20 shows NOx increases in 2008 that are due to normal fluctuations in plant operations and do not indicate a trend of increasing emissions. Utah's most recent triennial inventory for 2011 shows point source NOx emissions of 69,913 tons/yr, 17% lower than recorded in the base year inventory and below the 2018 estimate in Utah's RH SIP. All other pollutants were below the 2018 estimates.
- Area source inventories showed decreases in SO_2 and increases in NO_X, NH_3, POA, and VOCs. These changes may be due to a combination of population changes and differences in methodologies used to estimate these emissions (see Section 3.2.1 of Appendix A). One methodology change was the reclassification of some off-road mobile sources (such as some types of marine vessels and locomotives) into the area source category in 2008, which may have contributed to increases in area source inventory totals, but decreases in off-road mobile totals.
- On-road mobile source inventory comparisons showed decreases in most parameters, especially NO_X and VOCs, with increases in POA, EC, and coarse mass. Reductions in NO_X and VOC are likely influenced by federal and state emissions standards that have already been implemented. The increases in POA, EC, and coarse mass occurred in all of the WRAP states for on-road

mobile inventories, regardless of reductions in NO_X and VOCs, indicating that these increases were likely due use of different on-road models, as referenced in Section 3.2.1 of Appendix A.

- Off-road mobile source inventories showed decreases in NO_x, SO_2, and VOCs, and increases in fine soil and coarse mass, which was consistent with most contiguous WRAP states. These differences were likely due to a combination of actual changes in source contributions and methodology differences, as referenced in Section 3.2.1 of Appendix A. As noted previously, one major methodology difference was the reclassification of some off-road mobile sources (such as some types of marine vessels and locomotives) into the area source category in 2008, which may have contributed to decreases in the off-road inventory totals, but increases in area source totals.
- Inventory comparison results for area oil and gas showed an increase in all pollutants. Note that inventory methodologies for these sources have evolved substantially between the baseline and 2008 inventories as referenced in Section 3.2.1. Also, WRAP Phase III oil and gas inventories are reported here for entire basins, and include oil and gas emissions within tribal boundaries. DAQ has evaluated the emission impact of growth in oil and gas production under state jurisdiction. Production from existing legacy equipment, and corresponding emissions, is declining while new production requires stringent emission controls due to state permitting requirements and federal NSPS and NESHAPs. The overall result is that VOC emissions from the oil and gas industry are declining.[13] New engines must meet stringent state permitting and federal NESHAP standards and these standards will affect NOx emissions as legacy equipment is replaced over time. DAQ anticipates that additional emission reductions to address wintertime ozone in the Uinta Basin will provide co-benefits, including improvements in regional haze. DAQ is currently working with EPA, the Ute Tribe, and producers in the Uinta Basin to improve the oil and gas area source inventory.
- For most parameters, especially POAs, VOCs, and EC, fire emission inventory estimates decreased. Note that these differences are not necessarily reflective of changes in monitored data, as the baseline period is represented by an average of 2000-2004 fire emissions, and the progress period is represented only by the fires that occurred in 2008, as referenced in Section 3.2.1 of Appendix A.
- Comparisons between VOC inventories showed large decreases in biogenic emissions, which was consistent with other contiguous WRAP states. Estimates for biogenic emissions of VOCs have undergone significant updates since 2002, so changes reported here are more reflective of methodology changes than actual changes in emissions, as referenced in Section 3.2.1 of Appendix A.
- Fine soil and coarse mass increased for the windblown dust inventory comparisons and the combined fugitive/road dust inventories. Large variability in changes in windblown dust was observed for the contiguous WRAP states, which was likely due in large part to enhancements in dust inventory methodology rather than in changes in actual emissions.

[13] *Using growth and decline factors to project VOC emissions from oil and gas production*, Oswald et. al.,Journal of the Air and Waste Management Association, Volume 65, Issue 1, 2015.

Table 3.19
Sulfur Dioxide Emissions by Category

Source Category	Sulfur Dioxide Emissions (tons/yr)				
	2002 (Plan02d)	2008 (WestJump2008)	Difference	Percent Change	2018 (PRP18a)
Anthropogenic Sources					
Point	41,863	28,206	-13,658		37,938
Area	3,434	1,988	-1,446		3,582
On-Road Mobile	1,777	497	-1,280		368
Off-Road Mobile	4,504	286	-4,218		152
Area Oil and Gas	17	425	408		1
Fugitive and Road Dust	0	0	0		0
Anthropogenic Fire	70	8	-62		54
Total Anthropogenic	51,665	31,410	-20,256	-39%	42,096
Natural Sources					
Natural Fire	2,418	92	-2,326		2,418
Biogenic	0	0	0		0
Wind Blown Dust	0	0	0		0
Total Natural	2,418	92	-2,326	-96%	2,418
All Sources					
Total Emissions	54,083	31,190	-22,892	-42%	44,513

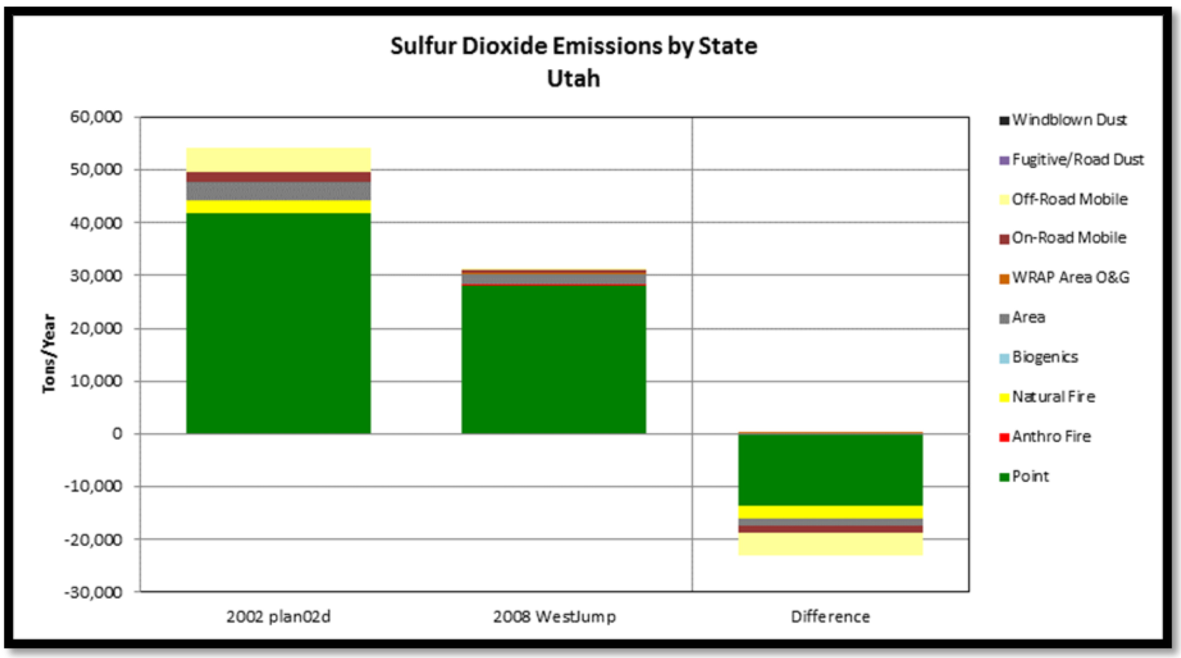


Figure 3.12. 2002 and 2008 Emission and Difference between Emissions Inventory Totals, for Sulfur Dioxide by Source Category for Utah

Table 3.20
Oxides of Nitrogen Emissions by Category

Source Category	Oxides of Nitrogen Emissions (tons/yr)				
	2002 (Plan02d)	2008 (WestJump2008)	Difference (Percent Change)		2018 (PRP18a)
Anthropogenic Sources					
Point	84,218	87,623	3,405		79,817
Area	6,146	17,269	11,123		8,462
On-Road Mobile	77,381	64,186	-13,195		27,364
Off-Road Mobile	47,100	13,249	-33,851		28,426
Area Oil and Gas	3,335	12,521	9,186		6,297
Fugitive and Road Dust	0	0	0		0
Anthropogenic Fire	319	65	-254		228
Total Anthropogenic	218,499	194,913	-23,586	-11%	150,593
Natural Sources					
Natural Fire	8,873	650	-8,223		8,874
Biogenic	12,597	6,144	-6,453		12,597
Wind Blown Dust	0	0	0		0
Total Natural	21,470	6,793	-14,676	-68%	21,470
All Sources					
Total Emissions	239,969	193,322	-38,262	-19%	172,063

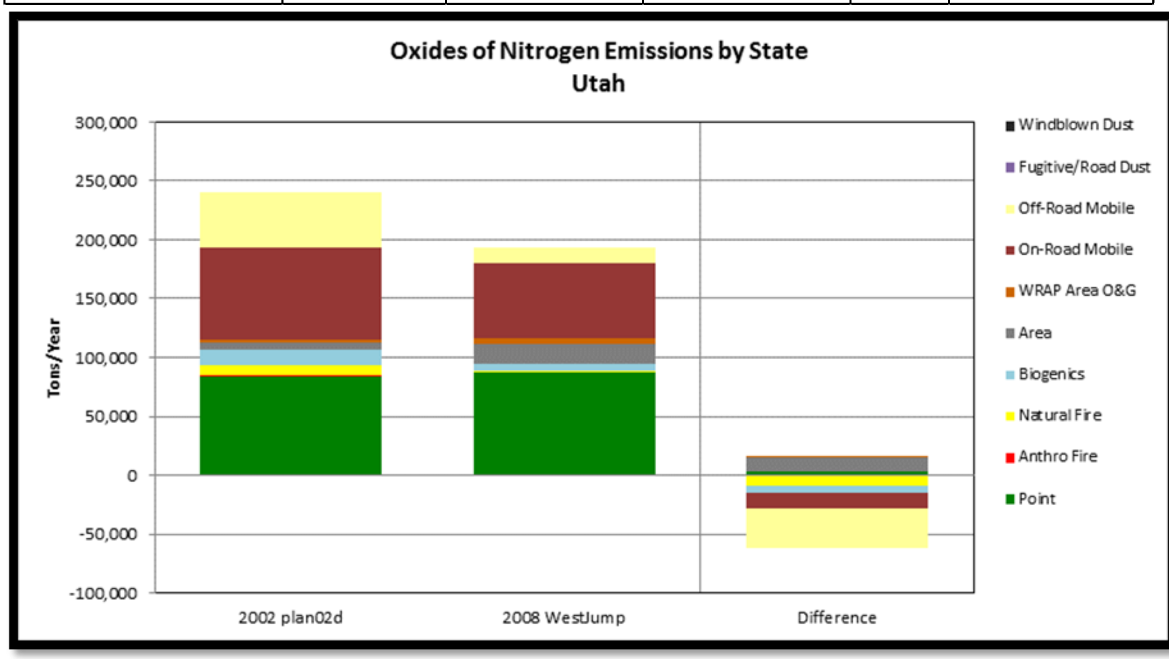


Figure 3.13. 2002 and 2008 Emissions and Difference between Emissions Inventory Totals, for Oxides of Nitrogen by Source Category for Utah

Table 3.21
Ammonia Emissions by Category

Source Category	Ammonia Emissions (tons/yr)				
	2002 (Plan02d)	2008 (WestJump2008)	Difference (Percent Change)		2018 (PRP18a)
Anthropogenic Sources					
Point	1,905	556	-1,349		2,050
Area	23,642	37,639	13,997		24,002
On-Road Mobile	2,453	1,048	-1,405		3,810
Off-Road Mobile	32	16	-16		45
Area Oil and Gas	0	0	0		0
Fugitive and Road Dust	0	0	0		0
Anthropogenic Fire	75	37	-38		40
Total Anthropogenic	28,107	39,295	11,188	40%	29,947
Natural Sources					
Natural Fire	1,893	449	-1,444		1,893
Biogenic	0	0	0		0
Wind Blown Dust	0	0	0		0
Total Natural	1,893	449	-1,444	-76%	1,893
All Sources					
Total Emissions	29,999	39,744	9,745	32%	31,840

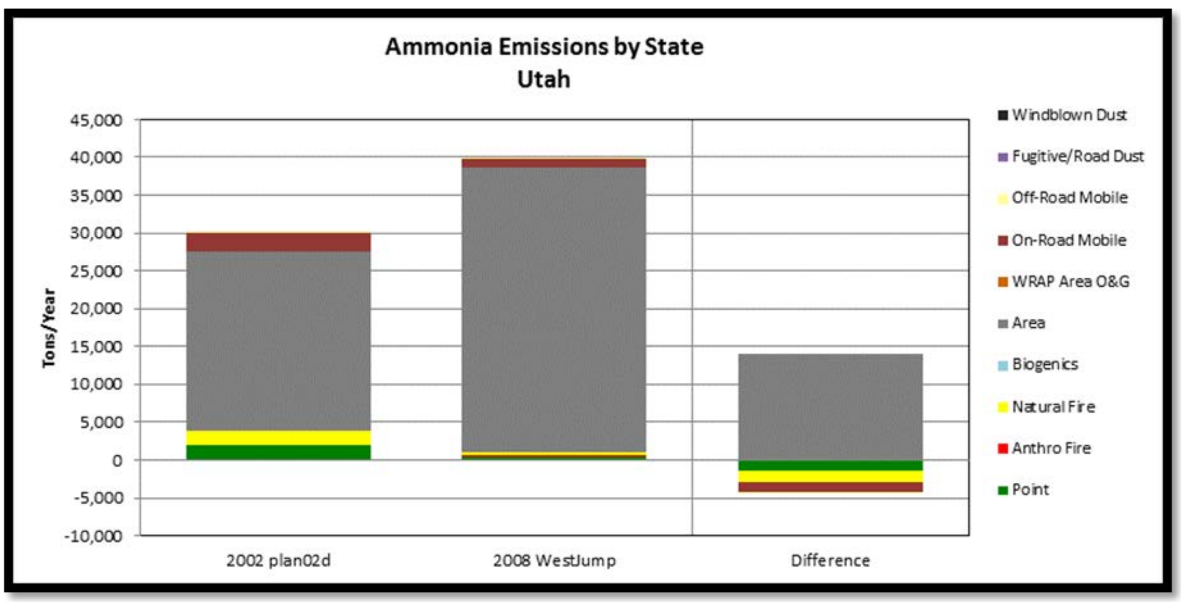


Figure 3.14. 2002-2008 Emission and Difference between Emission Inventory Totals, for Ammonia by Source Category for Utah

Table 3.22
Volatile Organic Compound Emissions by Category

Source Category	Volatile Organic Compound Emissions (tons/yr)				
	2002 (Plan02d)	2008 (WestJump2008)	Difference (Percent Change)		2018 (PRP18a)
Anthropogenic Sources					
Point	7,367	9,285	1,918		13,277
Area	46,679	72,811	26,132		78,058
On-Road Mobile	49,075	27,138	-21,937		22,685
Off-Road Mobile	26,933	23,213	-3,720		17,528
Area Oil and Gas	35,961	96,412	60,451		81,890
Fugitive and Road Dust	0	0	0		0
Anthropogenic Fire	536	126	-410		329
Total Anthropogenic	166,550	228,985	62,434	37%	213,767
Natural Sources					
Natural Fire	19,484	720	-18,764		19,485
Biogenic	641,481	237,799	-403,682		641,481
Wind Blown Dust	0	0	0		0
Total Natural	660,965	238,518	-422,447	-64%	660,966
All Sources					
Total Emissions	827,515	396,449	-431,066	-52%	874,732

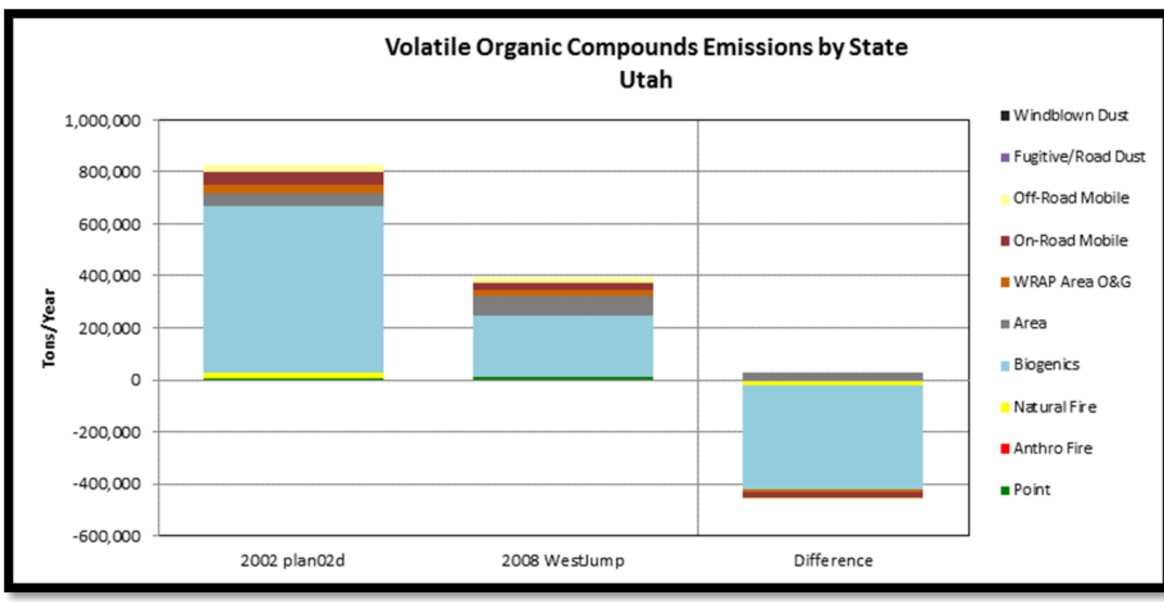


Figure 3.15. 2002-2008 Emission and Difference between Emission Inventory Totals, for Volatile Organic Compounds by Source Category for Utah

Table 3.23
Primary Organic Aerosol Emissions by Category

Source Category	Primary Organic Aerosol Emissions (tons/yr)				
	2002 (Plan02d)	2008 (WestJump2008)	Difference (Percent Change)		2018 (PRP18a)
Anthropogenic Sources					
Point	392	75	-317		523
Area	578	3,045	2,467		710
On-Road Mobile	637	1,573	936		715
Off-Road Mobile	965	666	-299		560
Area Oil and Gas	0	28	28		0
Fugitive and Road Dust	141	886	745		235
Anthropogenic Fire	507	106	-401		322
Total Anthropogenic	3,220	6,379	3,159	98%	3,064
Natural Sources					
Natural Fire	26,187	1,167	-25,020		26,188
Biogenic	0	0	0		0
Wind Blown Dust	0	0	0		0
Total Natural	26,187	1,167	-25,020	-96%	26,188
All Sources					
Total Emissions	29,407	7,547	-21,860	-74%	29,252

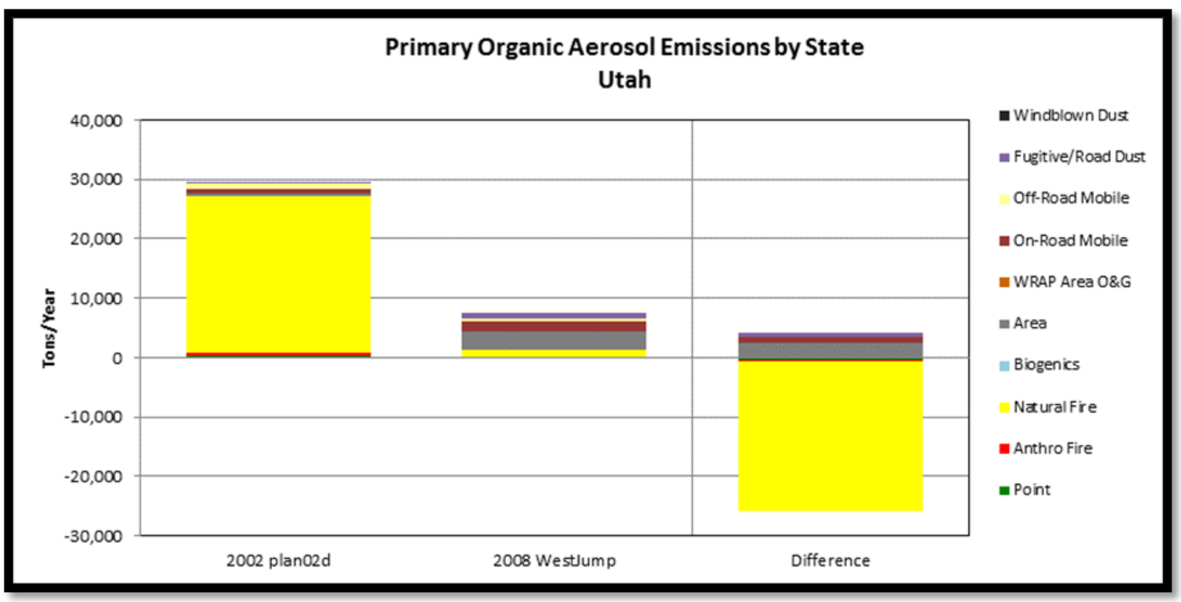


Figure 3.16. 2002-2008 Emission and Difference between Emission Inventory Totals, for Primary Organic Aerosol by Source Category for Utah

Table 3.24
Elemental Carbon Emissions by Category

Source Category	Elemental Carbon Emissions (tons/yr)				
	2002 (Plan02d)	2008 (WestJump2008)	Difference (Percent Change)		2018 (PRP18a)
Anthropogenic Sources					
Point	102	24	-78		65
Area	12	513	501		16
On-Road Mobile	663	2,593	1,930		214
Off-Road Mobile	2,492	715	-1,777		956
Area Oil and Gas	0	0	0		0
Fugitive and Road Dust	11	21	10		17
Anthropogenic Fire	85	23	-62		58
Total Anthropogenic	3,364	3,889	524	16%	1,327
Natural Sources					
Natural Fire	5,405	209	-5,196		5,405
Biogenic	0	0	0		0
Wind Blown Dust	0	0	0		0
Total Natural	5,405	209	-5,196	-96%	5,405
All Sources					
Total Emissions	8,769	4,098	-4,671 (-53%)	-53%	6,732

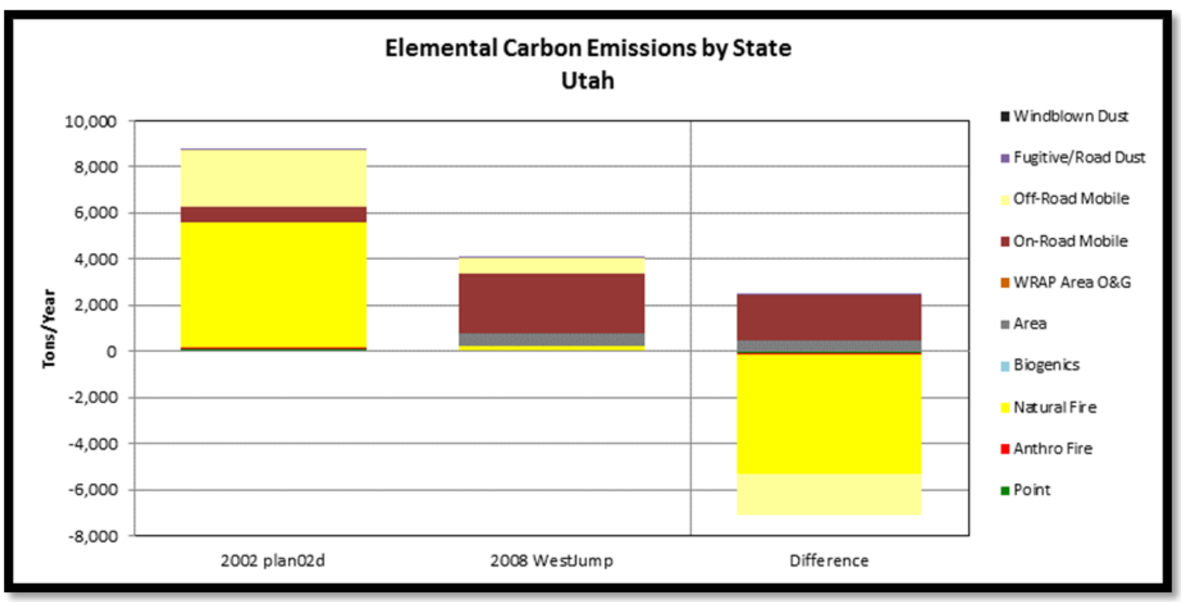


Figure 3.17. 2002-2008 Emission and Difference between Emission Inventory Totals, for Elemental Carbon by Source Category for Utah

Table 3.25
Fine Soil Emissions by Category

Source Category	Fine Soil Emissions (tons/yr)				
	2002 (Plan02d)	2008 (WestJump2008)	Difference (Percent Change)		2018 (PRP18a)
Anthropogenic Sources					
Point	2,933	712	-2,221		3,641
Area	160	1,595	1,435		222
On-Road Mobile	0	257	257		0
Off-Road Mobile	0	47	47		0
Area Oil and Gas	0	479	479		0
Fugitive and Road Dust	2,411	14,164	11,753		4,049
Anthropogenic Fire	81	43	-38		41
Total Anthropogenic	5,585	17,297	11,712	>100%	7,953
Natural Sources					
Natural Fire	1,719	429	-1,290		1,719
Biogenic	0	0	0		0
Wind Blown Dust	7,573	10,810	3,237		7,573
Total Natural	9,292	11,239	1,947	21%	9,292
All Sources					
Total Emissions	14,877	28,536	13,659	92%	17,245

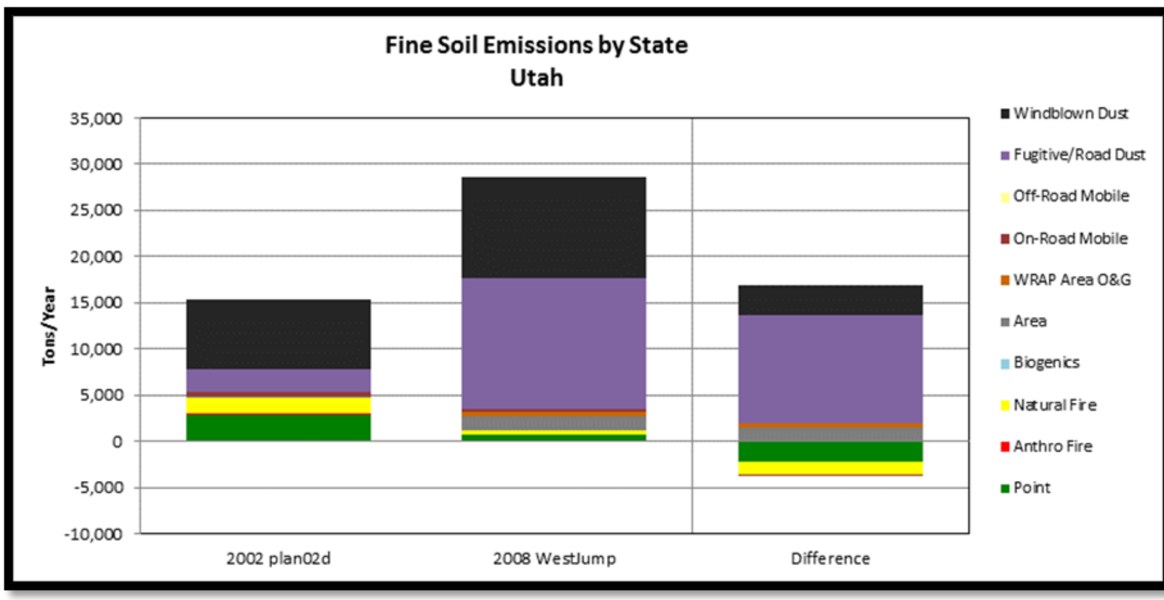


Figure 3.18. 2002-2008 Emission and Difference between Emission Inventory Totals, for Fine Soil by Source Category for Utah

Table 3.26
Coarse Mass Emissions by Category

Source Category	Coarse Mass Emissions (tons/yr)				
	2002 (Plan02d)	2008 (WestJump2008)	Difference (Percent Change)		2018 (PRP18a)
Anthropogenic Sources					
Point	8,442	5,227	-3,215		11,184
Area	2,387	2,017	-370		2,815
On-Road Mobile	414	2,801	2,387		529
Off-Road Mobile	0	76	76		0
Area Oil and Gas	0	12	12		0
Fugitive and Road Dust	12,374	107,079	94,705		21,798
Anthropogenic Fire	59	20	-39		30
Total Anthropogenic	23,676	117,232	93,556	>100%	36,357
Natural Sources					
Natural Fire	5,671	224	-5,447		5,671
Biogenic	0	0	0		0
Wind Blown Dust	68,153	97,289	29,136		68,153
Total Natural	73,824	97,513	23,689	32%	73,824
All Sources					
Total Emissions	97,500	214,745	117,245	>100%	110,181

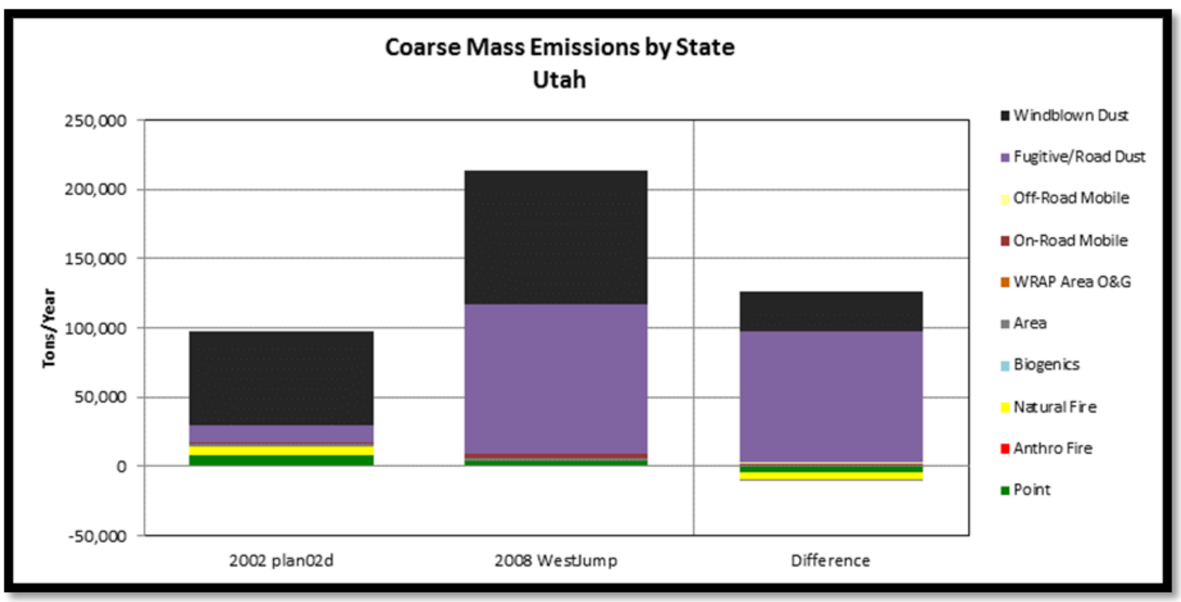


Figure 3.19. 2002-2008 Emission and Difference between Emission Inventory Totals, for Coarse Mass by Source Category for Utah

As described above, differences between the baseline and progress period inventories presented here do not necessarily represent changes in actual emissions because numerous updates in inventory methodologies have occurred between the development of the separate inventories. Also, the 2002 baseline and 2008 progress period inventories represent only annual snapshots of emissions estimates, which may not be representative of the entire 5-year monitoring periods compared. To better account for year-to-year changes in emissions, annual emissions totals for Utah electrical generating units (EGUs) are presented here. EGU emissions are some of the more consistently reported emissions, as tracked in EPA's Air Markets Program Database for permitted Title V facilities in the state (http://ampd.epa.gov/ampd). RHR implementation plans are required to pay specific attention to certain major stationary sources, including EGUs built between 1962 and 1977.

Figure 3.20 presents a sum of annual NOx and SO_2 emissions as reported for Utah EGU sources between 1996 and 2014. The chart shows significant decline for both NOx and SO_2, with a sharp decline in SO_2 emissions between 2006 and 2007.

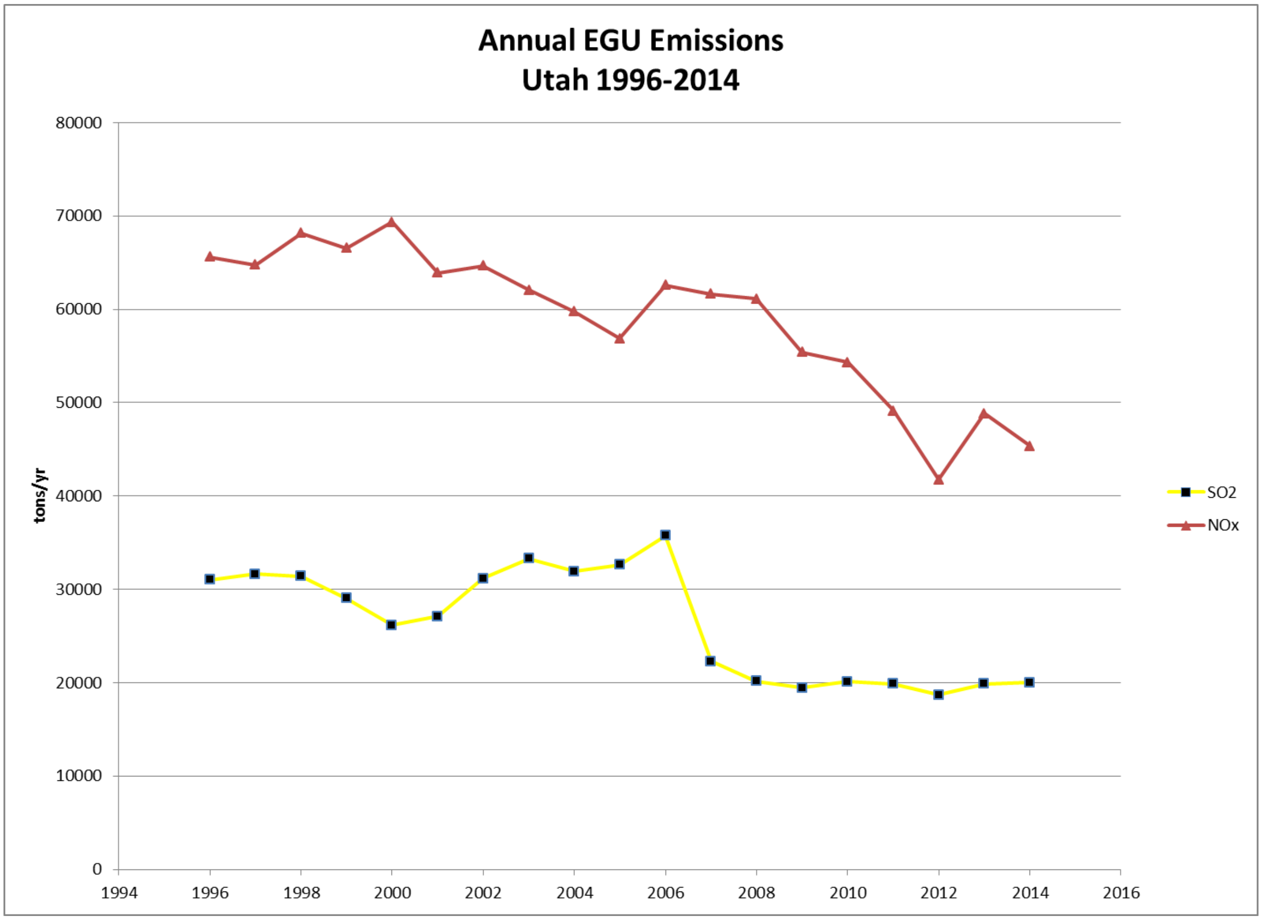


Figure 3.20. Sum of EGU Emissions of SO_2 and NOx Reported between 1996 and 2014

3.6 Changes to Anthropogenic Emissions: § 51.309(d)(10)(i)(E)

40 CFR §51.309(d)(10)(i)(E) requires *an assessment of any significant changes in anthropogenic emissions within or outside the State that have occurred over the past 5 years that have limited or impeded progress in reducing pollutant emissions and improving visibility.”*

Table 3.27 displays the average light extinction for the 20% worst days over the 5-year period 2005 through 2009 for all Class I areas in Utah. The table demonstrates that on the 20% worst days in the Class I areas in Utah, particulate organic mass and ammonium sulfate are the major concern for visibility impairment. Appendix M includes monitoring data summaries over the 5-year period 2005-2009 for the 20% worst and best days for each Class I area in Utah.

Table 3.27. Average extinction for 20% Worst Days for the Current Progress Period of 2005-2009

Site	Deciviews (dv)	Percent Contribution to Aerosol Extinction by Species (Excludes Rayleigh) (% of Mm^{-1}) and Rank*						
		Ammonium Sulfate	Ammonium Nitrate	Particulate Organic Mass	Elemental Carbon	Soil	Coarse Mass	Sea Salt
BRCA1	11.9	19% (2)	9% (5)	**45% (1)**	10% (4)	5% (6)	12% (3)	0% (7)
CANY1	11.0	23% (2)	14% (4)	**27% (1)**	7% (5)	7% (6)	20% (3)	0% (7)
CAPI1	11.3	24% (2)	12% (4)	**32% (1)**	8% (5)	7% (6)	17% (3)	0% (7)
ZICA1	12.3	21% (3)	7% (5)	**33% (1)**	9% (4)	7% (6)	22% (2)	0% (7)

The primary sources of anthropogenic particulate organic mass in Utah include prescribed burning, vehicle exhaust, vehicle refueling, solvent evaporation (e.g., paints), food cooking, and various commercial and industrial sources. While particulate organic mass is the most significant contributor to aerosol extinction, the anthropogenic portion is small (see Table 3.23); the emissions are primarily from wildfires and these emissions are highly variable from year to year. The inventory shows increases in anthropogenic primary organic aerosols, but as described in section 3.5 there were a number of methodology changes between 2002 and 2008 so this may not reflect a real change in emissions. Anthropogenic sources of SO_2 include coal-burning power plants and other industrial sources, such as boilers, oil refineries and copper smelters. Stationary point sources account for approximately 90% of SO_2 emissions in Utah. Table 3.19 shows that SO_2 emissions declined by 42% between 2002 and 2008. Table 3.20 shows that NOx emissions declined by 19% between 2002 and 2008. Overall, anthropogenic emissions within Utah have decreased and therefore have not limited or impeded progress in reducing pollutant emissions or improving visibility.

3.7 Assessment of Current SIP Strategy: § 51.309(d)(10)(i)(F)

40 CFR § 51.309(d)(10)(i)(F) requires “an assessment of whether the current implementation plan elements and strategies are sufficient to enable the State, or other States with mandatory Federal Class I areas affected by emissions from the State, to meet all established reasonable progress goals.”

Figures 3.21 and 3.22 show the rolling 5-year period averages for the 20% worst days and 20% best days at Utah's Class I areas. These figures demonstrate that visibility continues to improve at these Class I areas.

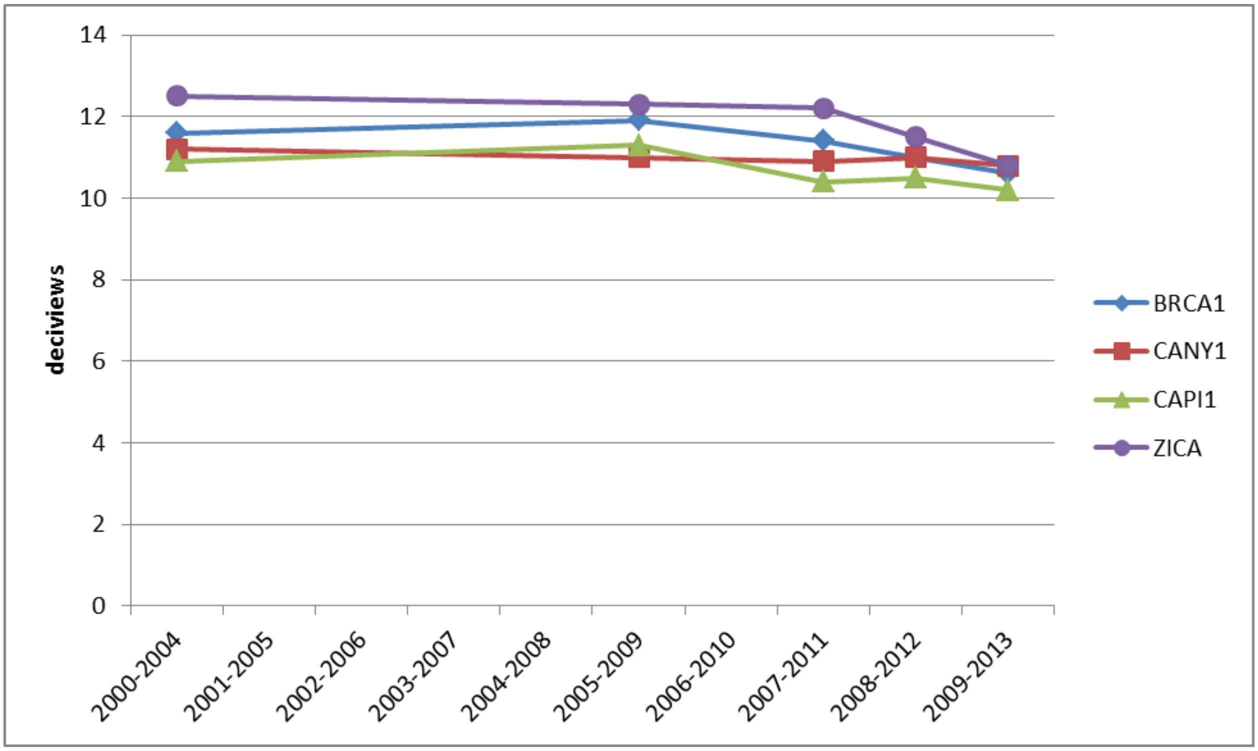


Figure 3.21. 5-Yr Rolling Trends at Utah's Class I Areas, 20% Worst Days

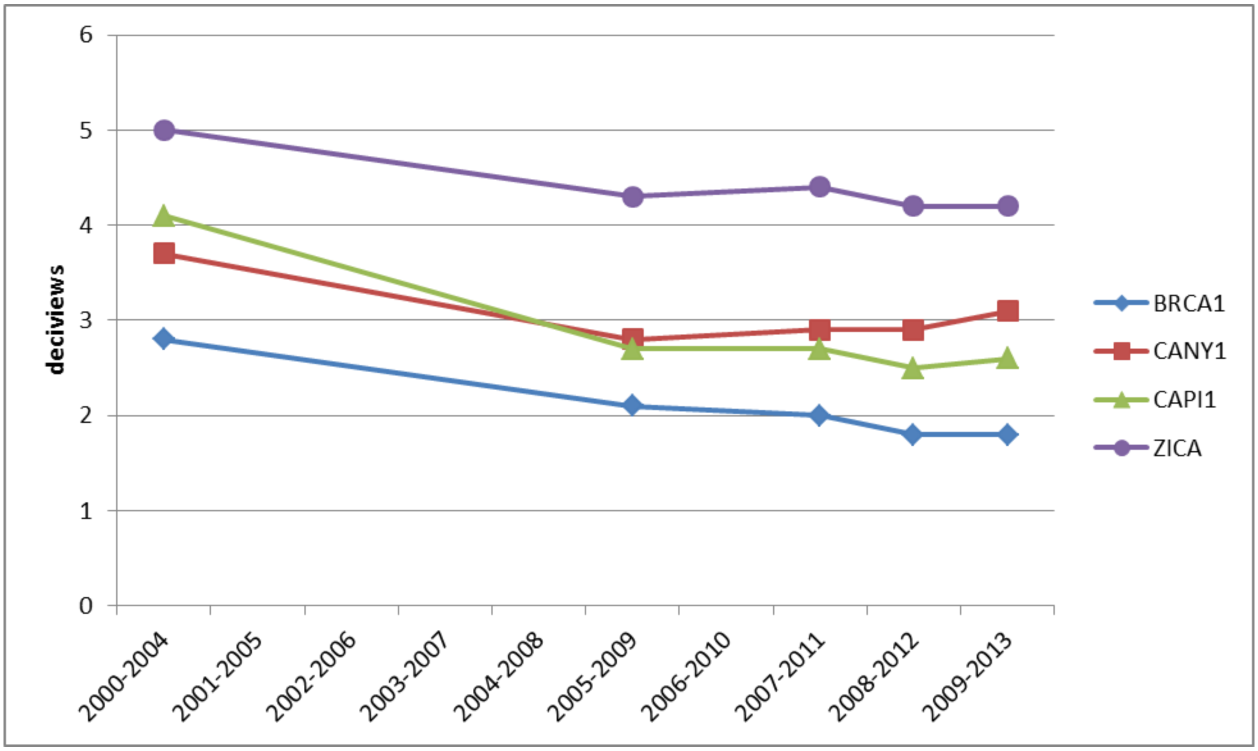


Figure 3.22. 5-Yr Rolling Trends at Utah's Class I Areas, 20% Best Days

As table 3.28 shows, Utah is showing improvement in visibility on the most impaired days and no degradation on the least impaired days between baseline and current monitoring data. The first 5-year progress period evaluated in this report covers the 2005-2009 timeframe, as it represents the most recent successive 5-year averaging period; however, the WRAP TSS has been updated to include data up through 2013. The average of the most recent 5-year average indicates that visibility at Utah's Class I areas is improving on both the 20% worst and 20% best days, and is in fact on course to exceed preliminary reasonable progress (PRP) projections for 2018.

Table 3.28. Utah Class I Area IMPROVE Sites Visibility conditions – 20% Most and Least Impaired Days Including 2010 to 2012 data

Class I Area	Baseline (2000-2004) (dv)	First Progress Period (2005-2009) (dv)	(2009-2013) (dv)	2018 Preliminary Reasonable Progress Case (PRP18a) (dv)
20% Worst Days				
Arches NP (CANY1)	11.2	11.0	10.8	10.9
Bryce Canyon NP (BRCA1)	11.6	11.9	10.6	11.2
Canyonlands NP (CANY1)	11.2	11.0	10.8	10.9
Capitol Reef NP (CAPI1)	10.9	11.3	10.2	10.5
Zion NP (ZICA1)	12.5	12.3	10.8	N/A[14]
20% Best Days				
Arches NP (CANY1)	3.7	2.8	3.1	3.5
Bryce Canyon NP (BRCA1)	2.8	2.1	1.8	2.6
Canyonlands NP (CANY1)	3.7	2.8	3.1	3.5
Capitol Reef NP (CAPI1)	4.1	2.7	2.6	3.9
Zion NP (ZICA1)	5.0	4.3	4.2	N/A (see footnote 15)

The emission reduction strategies in Utah's RH SIP have been implemented and have been effective, as outlined in section 3.2 of this report. Visibility has improved at all Class I areas in Utah as outlined in section 3.4 of this report. Anthropogenic emissions have declined as expected as outline in section 3.5 of this report. After considering these factors, the State of Utah has determined that the current control strategies in the state's Regional Haze SIP are sufficient to improve visibility at Federal Class I areas in the state.

Utah's SIP focused on expected emission reductions in different regions of the state to address the impact of emissions in Utah on Class I areas in other states. These emission reductions were included in the WRAP reasonable progress inventories that were relied upon by other states for their Class I areas. The emission reductions have been occurring as expected and therefore the State of Utah has determined that the current implementation plan elements and strategies are sufficient to enable other States with mandatory Federal Class I areas affected by emissions from the State, to meet all established reasonable progress goals.

Northern Utah, which may impact Federal Class I areas in Idaho, Nevada, and Wyoming, is an urban area with emissions predominately coming from mobile sources. Mobile NO_x emissions in the four main urban counties (Weber, Salt Lake, and Utah) were projected to decrease 42,000 tons/yr or 61% between 2002 and 2018. These emission reductions were projected using EPA's Mobile 6 model and are difficult to quantitatively compare to current inventories that are based on EPA's MOVES model. However, even greater emission reductions will be achieved by 2018 than had been anticipated in Utah's RH SIP due to

[14] There is no PRP18a established for the new ZICA1 monitor. The PRP18a was originally established for the original ZIONI IMPROVE monitor, which was discontinued on July 29, 2004.

federal Tier 3 fuel and vehicle standards that were adopted in 2014. BART controls installed at plants in central Utah (as described in Section 3.2 of this report) will have decreased SO_2 emissions by 27,947 tons and NO_X emissions by 15,258 tons from the 2002 inventory by 2015. This reduction is significantly greater than the 13,189 tons SO2 and 6,206 tons of NO_X reduction that was projected due to BART in Utah's 2008 SIP and that was included in the PRP 18a regional modeling analysis. And as is the case with northern Utah, southern Utah has an emissions inventory dominated by mobile sources. In Washington County, NO_X emissions from mobile sources were projected to decrease 2,300 tons or 57% between 2002 and 2018. These emissions reductions benefit Federal Class I areas in Colorado, New Mexico and Arizona.

As stated in Section K of the SIP, oil and gas production in eastern Utah is increasing. Approximately 80% of current oil and gas production in Uintah and Duchesne Counties occurs on land that is under the jurisdiction of the Ute Indian Tribe and EPA and is therefore not covered under Utah's SIP. Figure 19 in Utah's SIP shows the expected impact from Utah sources on Class I areas in western Colorado. While oil and gas production is increasing, mobile source NO_X emissions are decreasing in the urban area along the Wasatch Front, and NO_X emissions are decreasing due to BART in Central Utah, showing an overall decreased contribution to nitrate levels in western Colorado. Utah is currently working with EPA and the Ute Tribe to address wintertime ozone levels in the Uinta Basin. DAQ anticipates that the efforts to improve ozone levels will have the co-benefit of improving visibility in Class I areas affected by emissions from eastern Utah. Utah is participating in the Ozone Advance Program to reduce wintertime ozone levels in the Uinta Basin and through that program has implemented a series of regulatory and voluntary measures to reduce VOC and NO_X emissions. New federal strategies to reduce VOC, NO_X and methane emissions from oil and gas sources have been implemented and are benefiting the area. DAQ is currently working with EPA and the Ute Tribe to improve the emission inventory for oil and gas sources in the Uinta Basin to better characterize oil and gas emissions and to account for the significant emission control measures that have been implemented since 2008.

3.8 Assessment of Current Monitoring Strategy: § 51.309(d)(10)(i)(G)

40 CFR § 51.309(d)(10)(i)(G) requires "*a review of the State's visibility monitoring strategy and any modifications to the strategy as necessary.*"

The primary monitoring network for regional haze, both nationwide and in Utah, is the IMPROVE monitoring network. Given that IMPROVE monitoring data from 2000 to 2004 serves as the baseline for the regional haze program, the future regional haze monitoring strategy must necessarily be based on, or directly comparable to the current IMPROVE network. The IMPROVE measurements provide the only long-term record available for tracking visibility improvement or degradation; therefore, Utah intends to continue reliance on the IMPROVE network for complying with the RH monitoring requirement in the RH rule.

There are currently four IMPROVE sites in Utah (Table 3.29), and no modifications to the existing visibility monitoring strategy are necessary at this time.

Table 3.29. Utah CIAs and Representative IMPROVE Monitors

Class I Area	Representative IMPROVE Site	Latitude	Longitude	Elevation (m)
Bryce Canyon NP	BRCA1	37.62	-112.17	2481
Canyonlands NP	CANY1	38.46	-109.82	1798
Arches NP				
Capitol Reef NP	CAPI1	38.30	-111.29	1896
Zion NP	ZICA1*	37.20	-113.15	1215

*Replaced the ZION1 monitoring site in 2003.

3.9 Determination of Adequacy: § 51.309(d)(10)(ii)

40 CFR § 51.309(d)(10)(ii)(d)(10)(ii) requires "*Determination of the adequacy of existing implementation plan. At the same time the State is required to submit any 5-year progress report to EPA in accordance with paragraph (d)(10)(i) of this section, the State must also take one of the following actions based upon the information presented in the progress report:*

(1) If the State determines that the existing implementation plan requires no further substantive revision at this time in order to achieve established goals for visibility improvement and emissions reductions, the State must provide to the administrator a negative declaration that further revision of the existing implementation plan is not needed at this time.

(2) If the State determines that the implementation plan is or may be inadequate to ensure reasonable progress due to emissions from sources in another State(s) which participated in a regional planning process, the State must provide notification to the administrator and to the other State(s) which participated in the regional planning process with the States. The State must also collaborate with the other State(s) through the regional planning process for the purpose of developing additional strategies to address the plan's deficiencies.

(3) Where the State determines that the implementation plan is or may be inadequate to ensure reasonable progress due to emissions from sources in another country, the State shall provide notification, along with available information, to the Administrator.

(4) Where the State determines that the implementation plan is or may be inadequate to ensure reasonable progress due to emissions from sources within the State, the State shall revise its implementation plan to address the plan's deficiencies within one year."

The State of Utah has provided the information required under 40 CFR § 51.309(d)(10)(i) and (d)(10)(ii) in this 5-year progress report. Based on the information in this report, the State of Utah has determined that the current implementation plan elements and strategies are sufficient to meet all established reasonable progress goals established by WRAP. Because EPA disapproved the BART determination for NOx and PM (because the SIP did not fully address the factors that need to be considered as part of a BART determination), the State acknowledges that the BART determinations are in need of revision. The Utah Air Quality Board proposed a revision to Utah's RH SIP on March 4, 2014 to provide a 5-factor analysis to support the BART determination for PM and an alternative to BART for NOx that will provide greater reasonable progress than the most stringent NOx control technology available. DAQ anticipates that the Board will take final action on this proposal in June, 2015 to resolve EPA's concerns.

4.0 REGIONAL SUMMARY FOR 309 GCVTC CLASS I AREAS

Section 309 rules were based on recommendations from the Grand Canyon Visibility Transport Commission (GCVTC) Recommendations report,[15] specific to visibility impacts at the 16 Class I areas on the Colorado Plateau. Of the nine western states originally eligible for Section 309 RH rule implementation, only the states of New Mexico, Utah, and Wyoming and the city of Albuquerque/Bernalillo County currently exercise this option.

The 16 Class I areas on the Colorado Plateau are depicted in Figure 4.1 and listed in Table 4.1. Note that the ZION1 site, which originally represented Zion Canyon National Park, has since been replaced with the ZICA1 site. This section presents regional progress summaries specific to monitoring and emissions data at these Colorado Plateau sites.

Table 4.1
Colorado Plateau Class I Areas and Representative IMPROVE Monitors

Class I Area	Representative IMPROVE Site	Latitude	Longitude	Elevation (m)
Arizona				
Grand Canyon NP	GRCA2	35.97	-111.98	2267
Mount Baldy WA	BALD1	34.06	-109.44	2508
Petrified Forest NP	PEFO1	35.08	-109.77	1766
Sycamore Canyon WA	SYCA1	35.14	-111.97	2046
Colorado				
Black Canyon of the Gunnison NP Weminuche WA	WEMI1	37.66	-107.80	2750
Flat Tops WA Maroon Bells-Snowmass WA West Elk WA	WHRI1	39.15	-106.82	3413
Mesa Verde NP	MEVE1	37.20	-108.49	2172
New Mexico				
San Pedro Parks WA	SAPE1	36.01	-106.84	2935
Utah				
Bryce Canyon NP	BRCA1	37.62	-112.17	2481
Canyonlands NP Arches NP	CANY1	38.46	-109.82	1798
Capitol Reef NP	CAPI1	38.30	-111.29	1896
Zion NP	ZICA1*	37.20	-113.15	1215

*Replaced the ZION1 monitoring site in 2003.

[15] The Grand Canyon Visibility Transport Commission Recommendations for Improving Western Vistas Report is archived on the WRAP website at www.wrapair.org/WRAP/reports/GCVTCFinal.PDF.

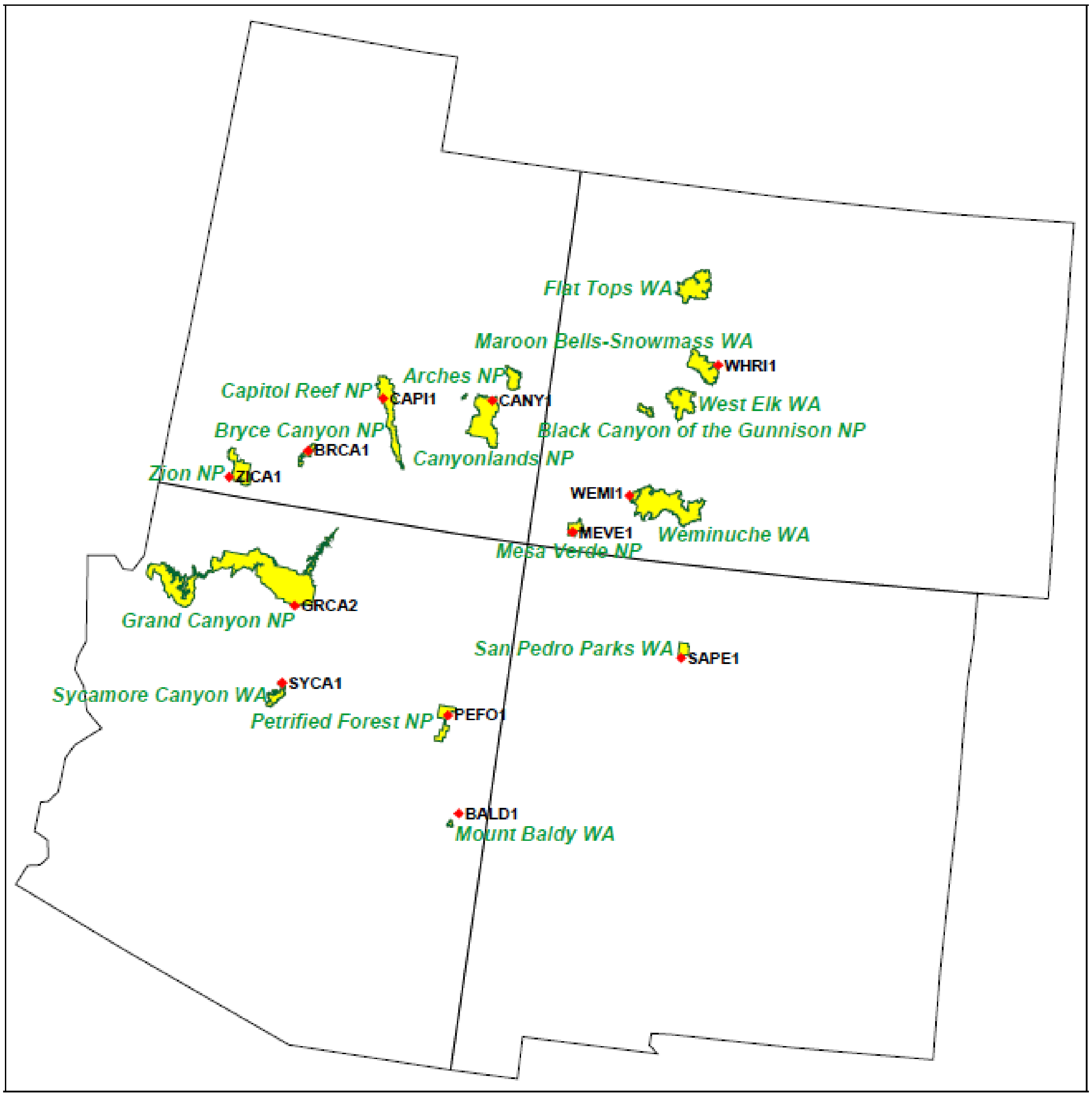


Figure 4.1. Map Depicting Colorado Plateau Class I Areas and Representative IMPROVE Monitors in Arizona, Colorado, New Mexico and Utah

Monitoring Data

Figures 4.2 and 4.3 present the 2005-2009 visibility averages for the 20% worst and best days for the IMPROVE sites representing Class I areas on the Colorado Plateau. The size of the pie chart is relative to the magnitude of visibility impairment, and colors represent the relative contribution of the pollutants which are measured by the IMPROVE network. Tables 4.2 and 4.3 present the difference between the 2000-2004 baseline period average and the 2005-2009 first progress period average for the 20% worst and best days, respectively, for the Class I area sites in the Colorado Plateau region.

Table 4.4 presents the differences between the 2000-2004 baseline period average extinction and the 2005-2009 progress period average for each Class I area site in the Colorado Plateau region for the 20% most impaired days, and Table 4.5 presents similar data for the least impaired days. Averages that increased are depicted in red text and averages that decreased in blue.

Trend statistics for the years 2000-2009 for each species at each Class I area site in the Colorado Plateau region are presented in Table 4.6. Only trends for aerosol species trends with p-value statistics less than 0.15 (85% confidence level) are presented in the table here, with increasing slopes in red and decreasing slopes in blue.

Some general observations for the current visibility conditions and the difference between current and baseline conditions are listed below:

- The largest contributors to aerosol extinction at the Colorado Plateau sites were particulate organic mass, ammonium sulfate, and coarse mass.

- For all sites, the 5-year average as measured in deciview metric decreased for the best days between the baseline and first progress period.

- For most sites, the 5-year average as measured in deciview metric decreased for the worst days between the baseline and first progress period. Exceptions included GRCA2 and BALD1 in Arizona and BRCA1 and CAPI1 in Utah. Some contributing factors for aerosol measurements that affected increased in 5-year average deciviews are listed below.

- The increase at GRCA2 was due to increases in ammonium sulfate, elemental carbon, particulate organic mass and soil, partially offset by decreases in ammonium nitrate and coarse mass. The particulate organic carbon increase was associated with high measurements due to fire events in June and August of 2009. No statistically significant increasing annual trends were measured for any of the species at the GRCA2 site.

- Extinction remained relatively unchanged in terms of deciviews for the worst days measured at the BALD1 site. Increases in coarse mass, soil, and ammonium sulfate were offset by decreases in particulate organic mass, elemental carbon, and ammonium nitrate. Trend statistics showed an increasing coarse mass trend at the BALD1 and PEFO1 sites in eastern Arizona.

- At the BRCA1 and CAPI1 sites, the largest contributor to increases was particulate organic mass which, similar to GRCA2, was associated with large fires events in July and August 2009. These increases were offset by decreases in ammonium nitrate and ammonium sulfate. An increasing soil trend was measured for the worst days at the CAPI1 site.

- Increases in 5-year average ammonium sulfate were measured at many regional sites, although most sites showed decreasing annual average ammonium sulfate trends. The 5-year average was influenced by relatively high regional measurements of ammonium sulfate in 2005. Figure 4.4 presents a plot of the annual averages for all Colorado Plateau sites, showing the high values measured in 2005, followed by generally decreasing trends.

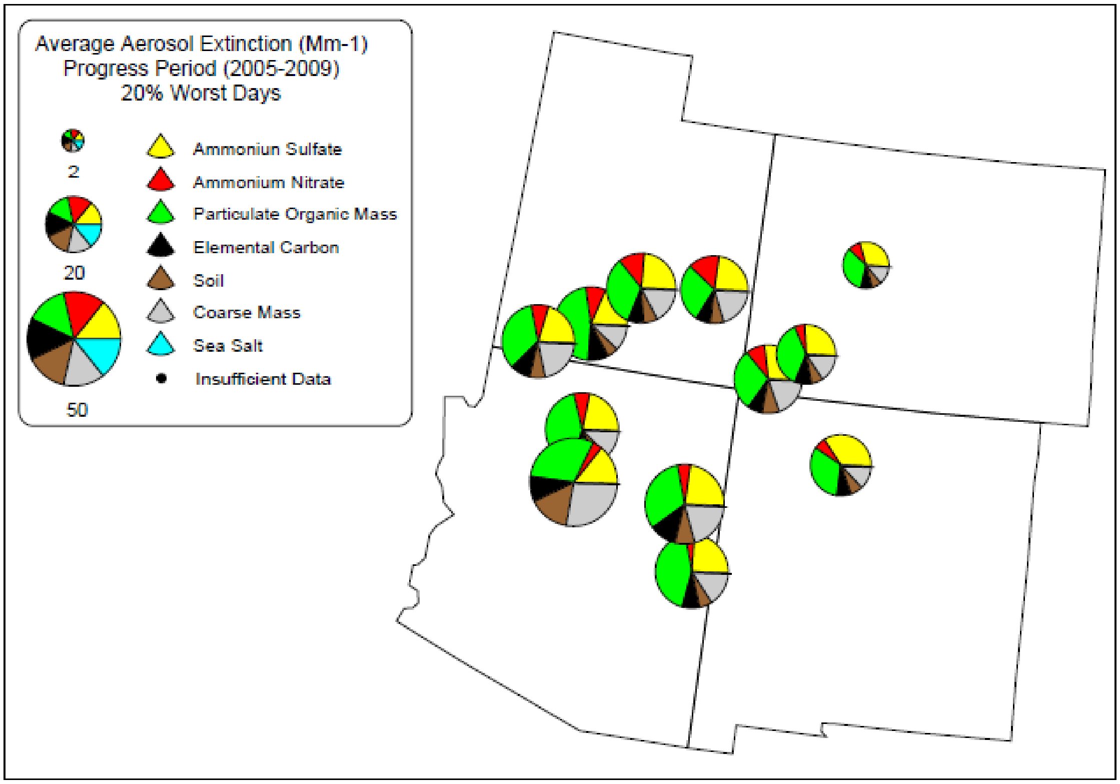


Figure 4.2. Regional Average of Aerosol Extinction by Pollutant for the First Progress Period Average (2005-2009) for 20% worst days

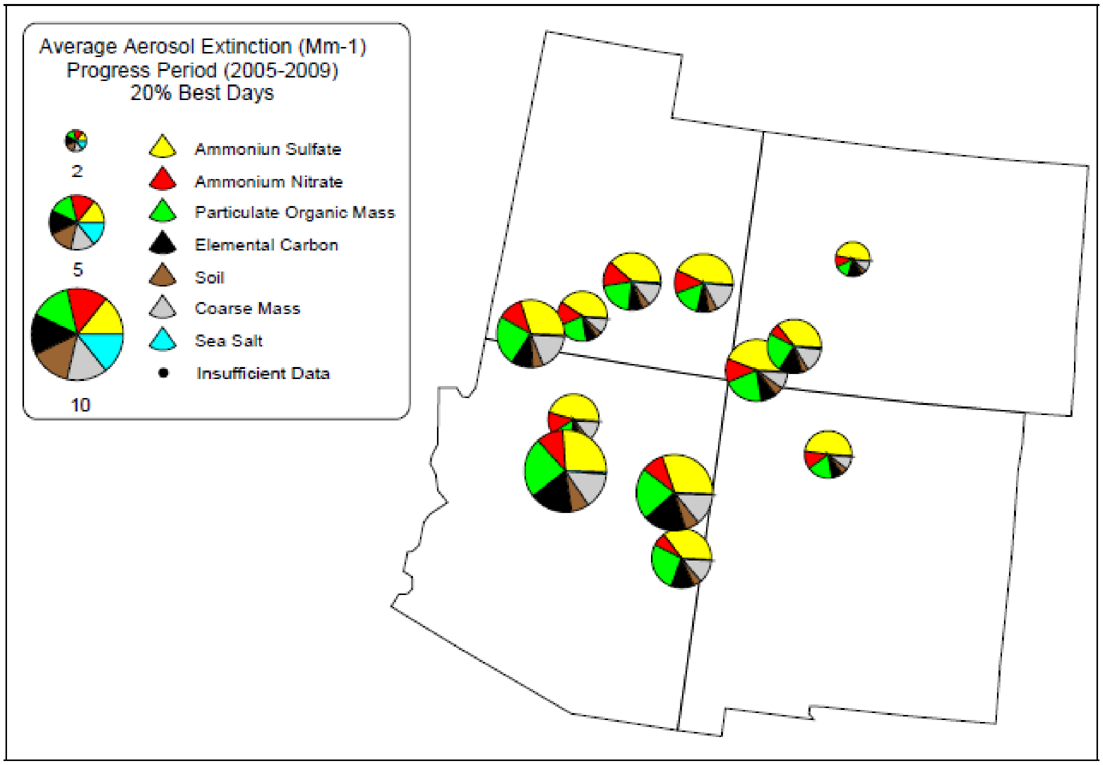


Figure 4.3. Regional Average of aerosol Extinction by Pollutant for First Progress Period Average (2005-2009) for 20% Best Days

Table 4.2
Colorado Plateau Class I Area IMPROVE Sites
Current Visibility Conditions
2005-2009 Progress Period, 20% Most Impaired Days

Site	Deciviews (dv)	Percent Contribution to Aerosol Extinction by Species (Excludes Rayleigh) (% of Mm^{-1}) and Rank*						
		Ammonium Sulfate	Ammonium Nitrate	Particulate Organic Mass	Elemental Carbon	Soil	Coarse Mass	Sea Salt
Arizona								
GRCA2	12.0	22% (2)	7% (5)	**41% (1)**	11% (4)	6% (6)	12% (3)	0% (7)
BALD1	11.8	25% (2)	4% (6)	**42% (1)**	8% (4)	6% (5)	16% (3)	0% (7)
PEFO1	13.0	23% (2)	5% (6)	**31% (1)**	11% (4)	8% (5)	21% (3)	1% (7)
SYCA1	15.2	15% (4)	4% (6)	**29% (1)**	9% (5)	15% (3)	28% (2)	0% (7)
Colorado								
WEMI1	10.0	27% (2)	5% (6)	**36% (1)**	10% (4)	7% (5)	15% (3)	0% (7)
WHRI1	8.9	30% (2)	8% (5)	**33% (1)**	8% (4)	7% (6)	13% (3)	0% (7)
MEVE1	11.3	27% (2)	9% (4)	**28% (1)**	7% (6)	9% (5)	20% (3)	0% (7)
New Mexico								
SAPE1	9.9	**34% (1)**	6% (6)	32% (2)	8% (4)	7% (5)	13% (3)	0% (7)
Utah								
BRCA1	11.9	19% (2)	9% (5)	**45% (1)**	10% (4)	5% (6)	12% (3)	0% (7)
CANY1	11.0	23% (2)	14% (4)	**27% (1)**	7% (5)	7% (6)	20% (3)	0% (7)
CAPI1	11.3	24% (2)	12% (4)	**32% (1)**	8% (5)	7% (6)	17% (3)	0% (7)
ZICA1	12.3	21% (3)	7% (5)	**33% (1)**	9% (4)	7% (6)	22% (2)	0% (7)

*Highest aerosol species contribution per site is highlighted in bold.

Table 4.3
Colorado Plateau Class I Area IMPROVE Sites
Current Visibility Conditions
2005-2009 Progress Period, 20% Least Impaired Days

Site	Deciviews (dv)	Percent Contribution to Aerosol Extinction by Species (Excludes Rayleigh) (% of Mm^{-1}) and Rank*						
		Ammonium Sulfate	Ammonium Nitrate	Particulate Organic Mass	Elemental Carbon	Soil	Coarse Mass	Sea Salt
Arizona								
GRCA2	2.2	**45% (1)**	13% (4)	15% (2)	9% (5)	4% (6)	14% (3)	1% (7)
BALD1	2.9	**35% (1)**	7% (5)	26% (2)	13% (4)	5% (6)	13% (3)	1% (7)
PEFO1	4.6	**31% (1)**	9% (5)	21% (2)	19% (3)	6% (6)	14% (4)	0% (7)
SYCA1	5.1	**27% (1)**	10% (5)	23% (2)	17% (3)	7% (6)	15% (4)	1% (7)
Colorado								
WEMI1	2.4	**36% (1)**	6% (5)	23% (2)	15% (4)	4% (6)	15% (3)	1% (7)
WHRI1	0.2	**46% (1)**	10% (5)	14% (3)	15% (2)	5% (6)	11% (4)	0% (7)
MEVE1	3.1	**44% (1)**	12% (3)	21% (2)	9% (5)	5% (6)	9% (4)	0% (7)
New Mexico								
SAPE1	1.0	**47% (1)**	12% (3)	18% (2)	8% (5)	5% (6)	10% (4)	1% (7)
Utah								
BRCA1	11.9	19% (2)	9% (5)	**45% (1)**	10% (4)	5% (6)	12% (3)	0% (7)
CANY1	11.0	23% (2)	14% (4)	**27% (1)**	7% (5)	7% (6)	20% (3)	0% (7)
CAPI1	11.3	24% (2)	12% (4)	**32% (1)**	8% (5)	7% (6)	17% (3)	0% (7)
ZICA1	12.3	21% (3)	7% (5)	**33% (1)**	9% (4)	7% (6)	22% (2)	0% (7)

*Highest aerosol species contribution per site is highlighted in bold.

Table 4.4
Colorado Plateau Class I Area IMPROVE Sites
Difference in Aerosol Extinction by Species
2000-2004 Baseline Period to 2005-2009 Progress Period
20% Most Impaired Days

Site	Deciview (dv)			Change in Extinction by Species (Mm^{-1})*						
	2000-04 Baseline Period	2005-09 Progress Period	Change in dv*	Amm. Sulfate	Amm. Nitrate	POM	EC	Soil	CM	Sea Salt
Arizona										
GRCA2	11.7	12.0	+0.3	+0.5	-0.4	+0.1	+0.5	+0.1	-0.3	0.0
BALD1	11.8	11.8	0.0	+0.3	-0.1	-2.1	-0.7	+0.4	+1.3	+0.1
PEFO1	13.2	13.0	-0.2	+0.5	-0.3	-1.4	+0.5	+0.6	-1.0	+0.1
SYCA1	15.3	15.2	-0.1	+0.7	-0.7	-0.5	+0.4	-1.0	+1.4	0.0
Colorado										
WEMI1	10.3	10.0	-0.3	+0.1	-0.2	-1.4	-0.2	+0.1	0.0	-0.1
WHRI1	9.6	8.9	-0.7	+0.3	0.0	-2.3	-0.3	+0.1	-0.5	0.0
MEVE1	13.0	11.3	-1.7	-0.2	-0.3	-5.8	-0.7	-0.5	-2.0	0.0
New Mexico										
SAPE1	10.2	9.9	-0.3	+1.0	-0.4	-1.4	-0.1	-0.1	-0.2	0.0
Utah										
BRCA1	11.6	11.9	+0.3	-0.2	-0.3	+2.5	+0.2	+0.1	-0.9	0.0
CANY1	11.2	11.0	-0.2	-0.3	+0.3	-0.9	-0.1	+0.1	+0.8	0.0
CAPI1	10.9	11.3	+0.4	-0.2	-0.7	+1.8	+0.2	+0.3	+0.7	+0.1
ZICA1	12.5	12.3	-0.2	+0.2	-0.3	-0.8	-0.1	+0.1	0.0	+0.1

*Change is calculated as progress period average minus baseline period average. Values in red indicate increases in extinction and values in blue indicate decreases.

Table 4.5
Colorado Plateau Class I Area IMPROVE Sites
Difference in Aerosol Extinction by Species
2000-20004 Baseline Period to 2005-2009 Progress Period
20% Least Impaired Days

Site	Deciview (dv)			Change in Extinction by Species (Mm^{-1})*						
	2000-04 Baseline Period	2005-09 Progress Period	Change in dv*	Amm. Sulfate	Amm. Nitrate	POM	EC	Soil	CM	Sea Salt
Arizona										
GRCA2	2.2	2.2	0.0	+0.1	0.0	-0.1	0.0	0.0	0.0	0.0
BALD1	3.0	2.9	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	0.0
PEFO1	5.0	4.6	-0.4	-0.1	-0.2	-0.4	0.0	+0.1	0.0	0.0
SYCA1	5.6	5.1	-0.5	+0.1	-0.1	-0.6	-0.2	-0.1	+0.1	0.0
Colorado										
WEMI1	3.1	2.4	-0.7	-0.1	-0.1	-0.4	-0.2	0.0	-0.1	0.0
WHRI1	0.7	0.2	-0.5	0.0	-0.1	-0.3	-0.1	0.0	0.0	0.0
MEVE1	4.3	3.1	-1.2	-0.3	-0.3	-0.5	-0.2	-0.2	-0.3	0.0
New Mexico										
SAPE1	1.5	1.0	-0.5	-0.1	-0.1	-0.2	-0.1	0.0	0.0	0.0
Utah										
BRCA1	2.8	2.1	-0.7	-0.1	-0.2	-0.3	-0.2	0.0	-0.1	0.0
CANY1	3.7	2.8	-0.9	-0.3	-0.1	-0.5	-0.1	-0.1	-0.2	0.0
CAPI1	4.1	2.7	-1.4	-0.3	-0.4	-0.5	-0.2	-0.1	-0.4	0.0
ZICA1	5.0	4.3	-0.7	-0.1	-0.2	-0.5	-0.2	0.0	-0.1	0.0

*Change is calculated as progress period average minus baseline period average. Values in red indicate increases in extinction and values in blue indicate decreases.

Table 4.6
Colorado Plateau Class I Area IMPROVE Sites
Change in Aerosol Extinction by Species
2000-2009 Annual Average Trends

Site	Group	Annual Trend* (Mm^{-1}/year)						
		Amm. Sulfate	Amm. Nitrate	POM	EC	Soil	CM	Sea Salt
Arizona								
GRCA2	20% Best	--	--	--	0.0	--	--	0.0
	20% Worst	--	-0.1	--	--	--	--	--
	All Days	--	0.0	--	--	--	--	--
BALD1	20% Best	--	0.0	--	0.0	--	0.0	0.0
	20% Worst	-0.2	--	--	--	0.1	0.3	0.0
	All Days	-0.1	0.0	--	--	--	0.1	0.0
PEFO1	20% Best	--	0.0	-0.1	--	--	--	0.0
	20% Worst	--	--	--	--	0.1	--	0.0
	All Days	--	0.0	--	--	0.0	0.1	0.0
SYCA1	20% Best	--	--	-0.1	--	--	--	0.0
	20% Worst	--	--	--	0.1	-0.3	--	--
	All Days	--	0.0	--	--	-0.1	--	--
Colorado								
WEMI1	20% Best	-0.1	0.0	-0.1	-0.1	--	--	--
	20% Worst	--	--	--	0.0	--	--	--
	All Days	--	0.0	--	-0.1	--	--	--
WHRI1	20% Best	--	0.0	-0.1	0.0	--	--	--
	20% Worst	--	--	--	-0.1	--	--	0.0
	All Days	--	--	-0.1	0.0	--	--	0.0
MEVE1	20% Best	-0.1	0.0	-0.1	0.0	0.0	0.0	--
	20% Worst	--	--	--	-0.2	--	--	0.0
	All Days	-0.1	--	-0.3	-0.1	--	--	0.0
New Mexico								
SAPE1	20% Best	--	0.0	0.0	0.0	--	--	--
	20% Worst	--	-0.1	--	--	--	--	--
	All Days	--	0.0	-0.1	0.0	--	0.0	0.0
Utah								
BRCA1	20% Best	--	0.0	-0.1	0.0	--	0.0	0.0
	20% Worst	-0.2	--	0.5	0.1	--	--	0.0
	All Days	-0.1	0.0	--	--	--	--	--
CANY1	20% Best	-0.1	--	-0.1	0.0	--	-0.1	0.0
	20% Worst	-0.1	--	--	--	--	--	0.0
	All Days	-0.1	0.0	--	0.0	0.0	--	0.0
CAPI1	20% Best	-0.1	-0.1	-0.1	0.0	--	-0.1	--
	20% Worst	--	-0.2	--	--	0.1	--	0.0
	All Days	-0.1	-0.1	--	0.0	--	--	0.0
ZICA1	20% Best	0.0	--	--	0.0	0.0	--	0.0
	20% Worst	-0.5	--	--	--	--	--	--
	All Days	-0.2	--	--	-0.1	0.1	--	--

*(--) Indicates statistically insignificant trend (<85% confidence level). Annual averages and complete trend statistics for all significance levels are included for each site in state specific appendices.

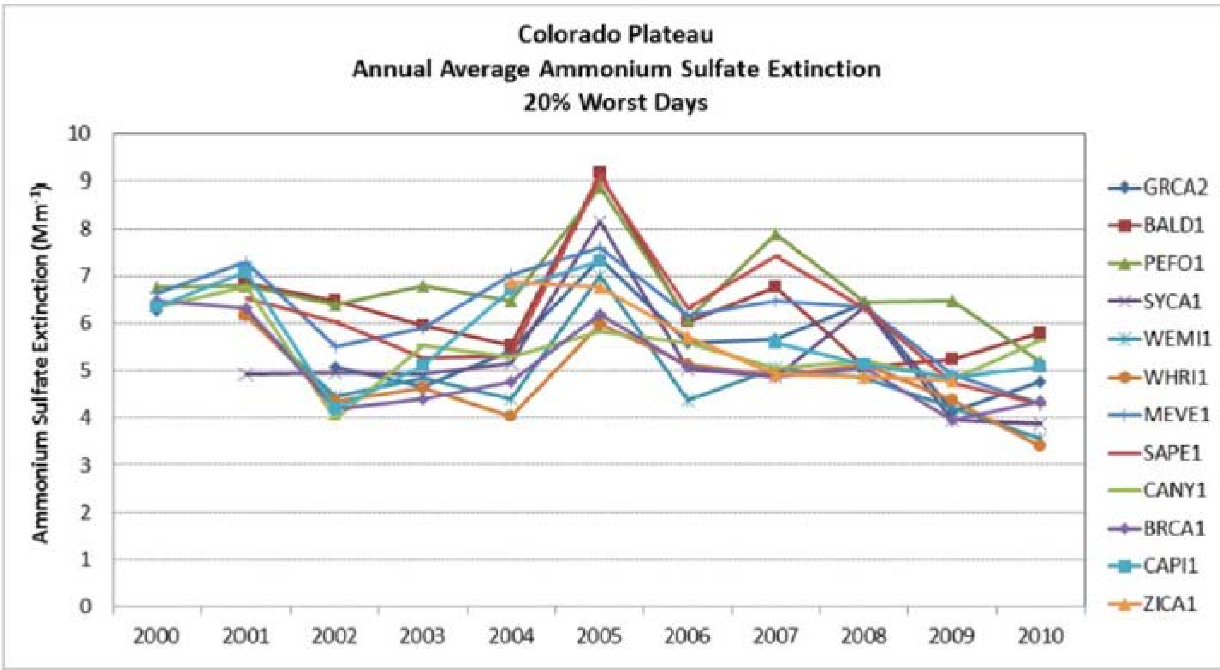


Figure 4.4 Chart Depicting Annual Average Ammonium Sulfate Concentrations for the 20% Worst Days as Measured at the Colorado Plateau CIA IMPROVE Sites

Similar to 308 requirements, Section 309 states are required to address how total state emissions have changed over the past five years (51.309(d)(10)(i)(D)). Emission inventory summaries using 2002 and 2008 inventories to represent changes between the baseline and progress periods are described in detail for the entire state in Section 3.5.

In addition to tracking these differences in inventories, for the initial SIPs, Section 309 states were required to identify "clean air corridors" and track emissions inside and outside of these corridors that may affect impairment on the cleanest days.[16] In these initial Section 309 SIPs, an area covering major portions of Nevada, southern Utah, eastern Oregon and southwestern Idaho was defined as a "clean air corridor," which was intended to represent a region from which clean air transport influences many of the clean air days at Grand Canyon National Park. Visibility has improved for the best days at all of the Class I area sites on the Colorado Plateau, so emissions specific to the "clean air corridor" counties are not presented separately here.

As part of the Western Backstop Sulfur Dioxide Trading Program, the participating states (and county) identified SO_2 emissions milestones, where a milestone is a maximum level of annual emissions for a given year. WRAP supports the Section 309 states with the submittal of annual regional SO_2 and emission milestone reports which compare actual emissions estimates to the pre-defined milestones.[17] Figure 4.5 presents a plot from the most recent SO_2 milestone report, showing the 3-year average of current emissions through 2013, which indicated that actual emissions were below the SO_2 milestone.

[16] Section 51.309(d)(3) states, for treatment of clean-air corridors, "the plan must describe and provide for implementation of comprehensive emission tracking strategies for clean-air corridors to ensure that the visibility does not degrade on the least-impaired days at any of the 16 Class I areas."

[17] Annual regional SO2 emissions and milestone reports are located on the WRAP website at http://www.wrapair2.org/reghaze.aspx.

Additionally, SO_2 emissions specific to EGU sources are presented in Figure 3.21 on an annual basis showing changes in these sources between 1996 and 2014 for Utah.

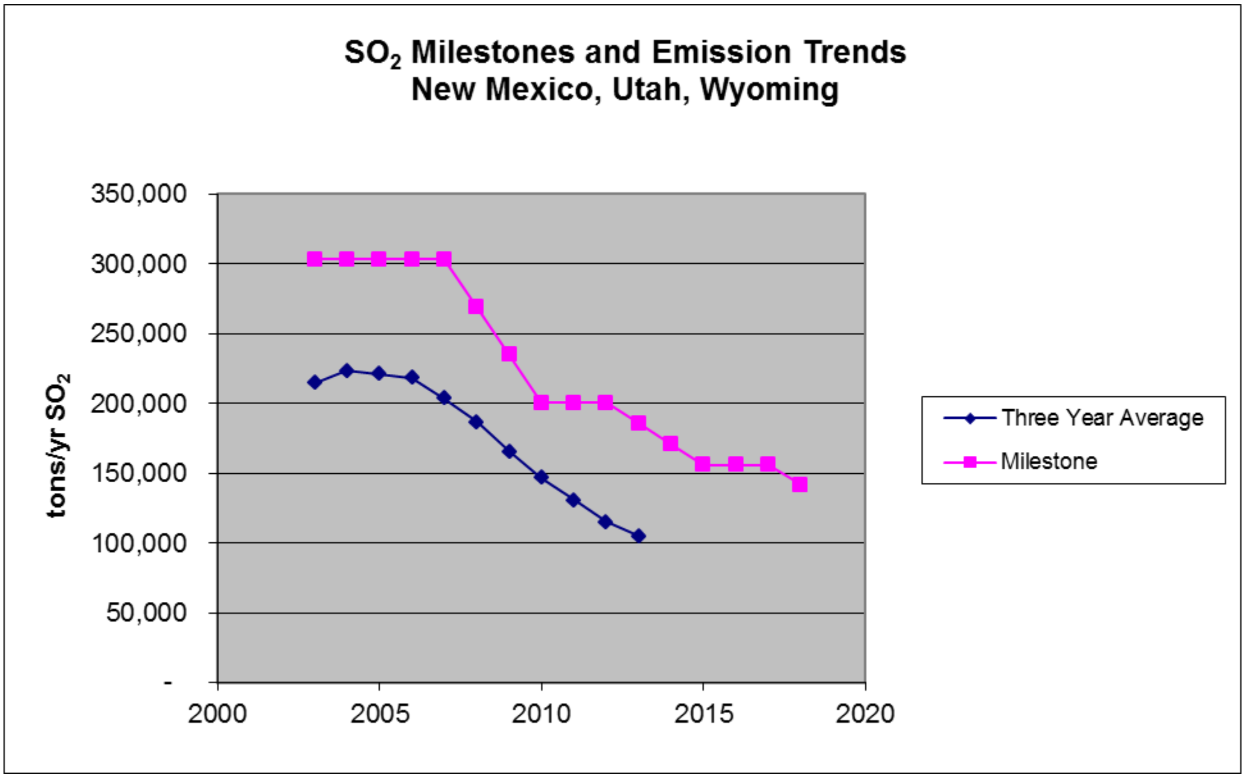


Figure 4.5. Chart Depicting 3-Year Average Sum of SO_2 Emissions for New Mexico, Utah and Wyoming and the City of Albuquerque/Bernalillo County as Compared to the Section 309 SIP SO_2 Milestones

Appendix A

Western Regional Air Partnership

Regional Haze Rule Reasonable Progress

Summary Report, June 2013

Available Online at

http://wrapair2.org/RHRPR.aspx

Appendix B

Utah Smoke Management Plan 5-Year Review, 2010-2014

Utah Department of Environmental Quality

UTAH SMOKE MANAGEMENT PLAN

FIVE YEAR REVIEW

2010-2014

Utah Smoke Management Partnership

- Utah Division of Air Quality
- Utah Division of Forestry, Fire and State lands
- US Bureau of Land Management
- US Forest Service
- US Fish and Wildlife Services
- US National Park Service
- US Bureau of Indian Affairs

Overview

The Utah Smoke Management Plan (SMP) was developed to identify the responsibilities of the Utah Division of Air Quality (DAQ) and Federal and State land managers (Land Managers) to coordinate procedures that mitigate the impacts of prescribed fire used for resource benefits on public health, public safety and visibility. The plan was designed to meet the requirements of R307-204, Utah's smoke management air quality rule, and the policies of the U.S. Environmental Protection Agency's (EPA) Interim Air Quality Policy on Wildland and Prescribed Fires (Interim Policy). On November 8, 1999, the EPA certified the plan under the Interim Policy.

The goals of the SMP are:

- ❖ To use prescribed fire for resource benefits to accomplish land management objectives of wildland fuel hazard reduction, vegetative management, natural ecological practices, and wildlife habitat improvement,

- ❖ To develop an emission inventory for pollutants of interest based on reports of prescribed fire used for resource benefits,

- ❖ To develop a system for reporting and coordinating burning operations on all forest and range lands in the State,

- ❖ To minimize or prevent smoke impacts to such a degree as possible to protect public health, public, safety and visibility, and

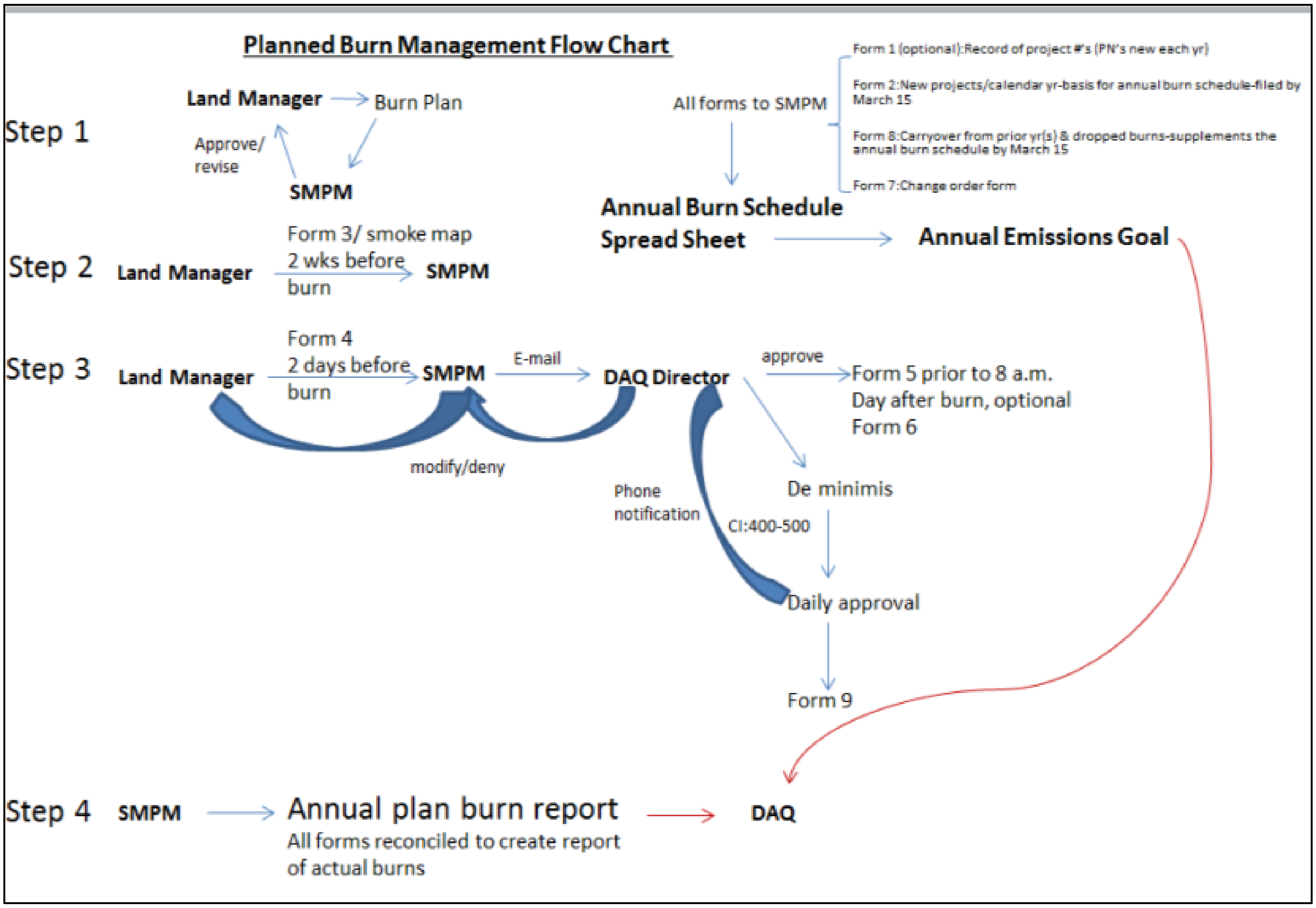
- ❖ To encourage the development and use of alternative methods to burning for disposing of or reducing the amount of wildland fuels on lands in the State.

In order to execute the SMP, federal and state land managers and the DAQ entered into a Memorandum of Understanding (MOU). Signatories to the MOU formed a management group called the Utah Airshed Oversight Group, whose function is to manage, oversee and evaluate the SMP. The Utah Airshed Oversight Group meets at least annually in order to conduct necessary business, to discuss SMP issues and to recommend necessary amendments to the SMP. In 2014, the Utah Airshed Oversight Group recommended a budgetary expenditure to develop a web-based burn permitting program to replace the labor intensive paper-based permitting system. The web-based permitting tool will be launched in 2015.

In 2011, the EPA conducted an evaluation of R307-204, Emission Standards: Smoke Management, as part of a consent decree. EPA identified a typographical error in the rule and suggested several wording amendments but no structural rule changes. The rule was amended in July 2011 as per EPA suggestions and subsequently approved by EPA.

Burn Permitting System

A primary objective of the SMP was to develop a system for reporting and coordinating burning operations on all forest and range lands in the State. The burn permitting system was established to meet that objective. A Land Manager initiates the process by submitting a burn plan to the smoke management program manager (SMPM). Two subsequent forms must be completed and approved by the SMPM before it is submitted to the DAQ Director for consideration. Should the Director deny or require burn plan modifications, adjustments to the permit must be made. De minims burns must be approved by the DAQ Director the morning of a burn to ensure current air quality conditions are acceptable for the burn. The flow diagram shows that there are many forms and multiple individuals are involved who must approve a planned burn.



Our current system requires staff to manually enter fire data into a separate database compatible with the Western Regional Air Partnership (WRAP) program after the fire season is over. Unfortunately, this task has been overwhelming and past year submissions to WRAP have been delayed. The automated burn permit tool currently in development will resolve this problem. The web-based tool will eliminate the form transfers, automate the approval process and process data in a format compatible with the regional fire emissions tracking system. The data could then be electronically transmitted to the WRAP.

Wildlands Management

The first goal of the SMP is to use prescribed fire for resource benefits to accomplish land management objectives of wildland fuel hazard reduction, vegetative management, natural ecological practices, and wildlife habitat improvement. These objectives are captured within the burn permitting system, as shown in Form 3, Pre-Burn Information.

Project Name: [ ] 3-Letter ID ▾ **PN:** [ ]

Form 3 - Pre-Burn Information

Use when project covers more than 20 acres/day **OR** produces more than 0.5 tons of PM/day. Complete this form two (2) weeks prior to the earliest burn date. Attach map showing daytime smoke path (+/-15 degrees), nighttime smoke path, and down-drainage flow for a minimum of 15 miles from the burn site with smoke sensitive areas delineated. (see Appendix D for example).

Date: MM ▾ DD ▾ , 2014 **Submitted by:** [ ]

Agency email address: [ ] If Other selected write in and fax: [ ]

Burn Manager: [ ] Office phone: [ ] Cell phone: [ ]

Burn objective(s): Select or provide objective(s) below ▾

- Select or provide objective(s) below
- Hazard Reduction
- Wildlife Habitat Improvement
- Site Preparation
- Historical Scene Maintenance
- Other Cultural site Maintenance
- Exotic or Undesirable Species Control
- Habitat Maintenance
- Research

Other: [ ]

Other: [ ]

Sensitive receptors/ ... at 260 degrees from site

1) [ ] Name of receptor/ - ▾ miles at - ▾ degrees from site

2) [ ] Name of receptor/ - ▾ miles at - ▾ degrees from site

3) [ ] Name of receptor/ - ▾ miles at - ▾ degrees from site

Planned smoke mitigation method(s): Avoidance: - ▾ Dilution: - ▾

Prescribed Fire Emissions Inventory

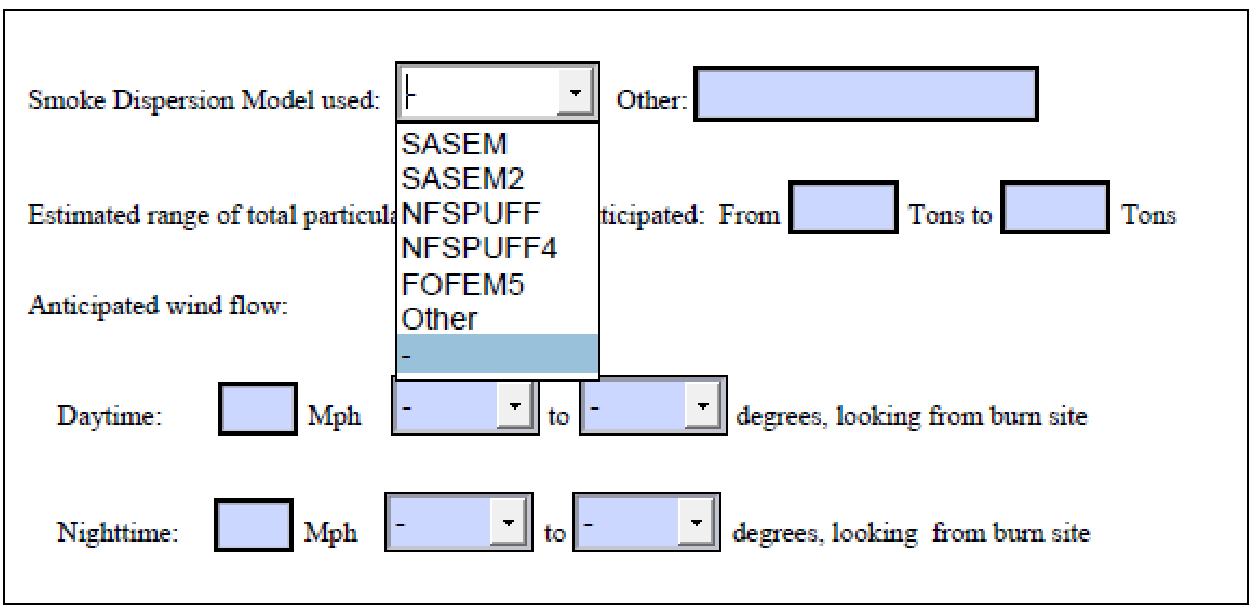
Prescribed fire emissions are inventoried per EPA's guidance, *Development of Emissions Inventory Methods for Wildland Fire, US EPA, EPA Contract No. 68-D-98-046, February 2002* and AP42, Section 13.1, "Wildfires and Prescribed Burning," (10/96 edition).

The current manual-based burn permitting system for prescribed fires requires laborious burn tracking and spreadsheet based calculations. The web-based burn permitting system in development will automatically calculate emissions upon burn completion acreage data entry by the Land Managers. A searchable summary table will provide emissions for PM_{10}, $PM_{2.5}$, NO_x, SO_x, CO and VOCs.

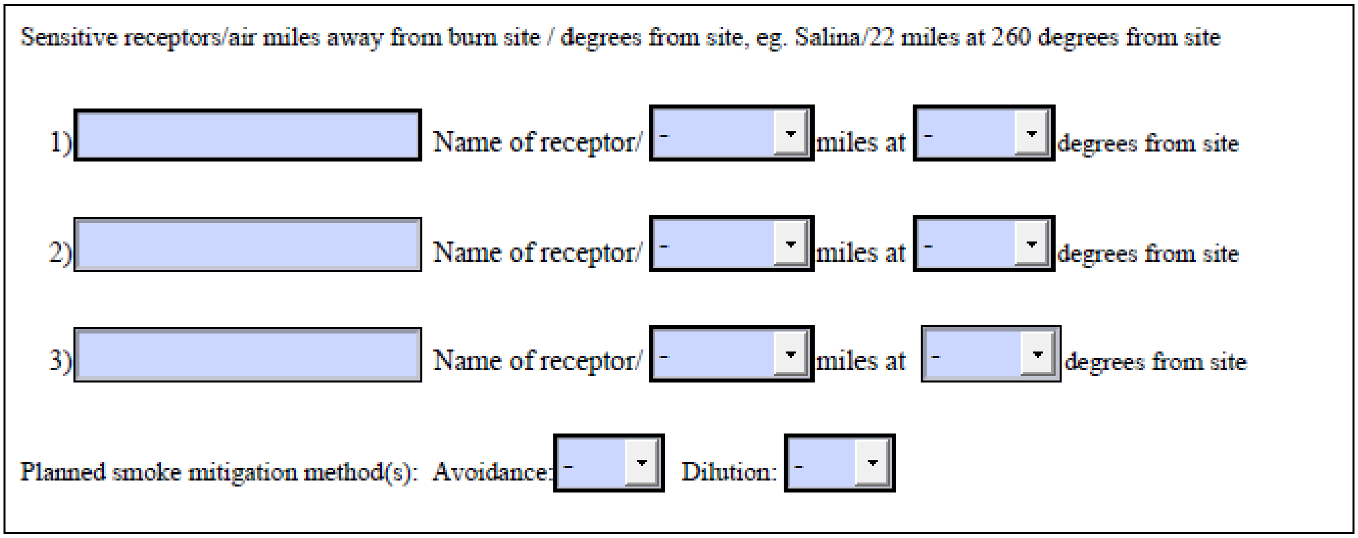
Smoke Mitigation

Smoke mitigation begins with the burn permitting system. Form 3 must be completed two weeks prior to the earliest burn date for prescribed burns that cover more than 20 acres/day or produce more than 0.5 tons of PM/day. Along with Form 3, the Land Manager must submit a map showing daytime smoke path (+/-15 degrees), nighttime smoke path, and down-drainage flow for a minimum of 15 miles from the burn site, with smoke sensitive areas delineated.

Smoke dispersion modeling, wind speed and wind vector considerations are included in the burn permitting analysis (Form 3).



Form 3 includes information on sensitive receptors and additional smoke mitigation measures for identified receptors: avoidance and dilution.


Sensitive receptors/air miles away from burn site / degrees from site, eg. Salina/22 miles at 260 degrees from site

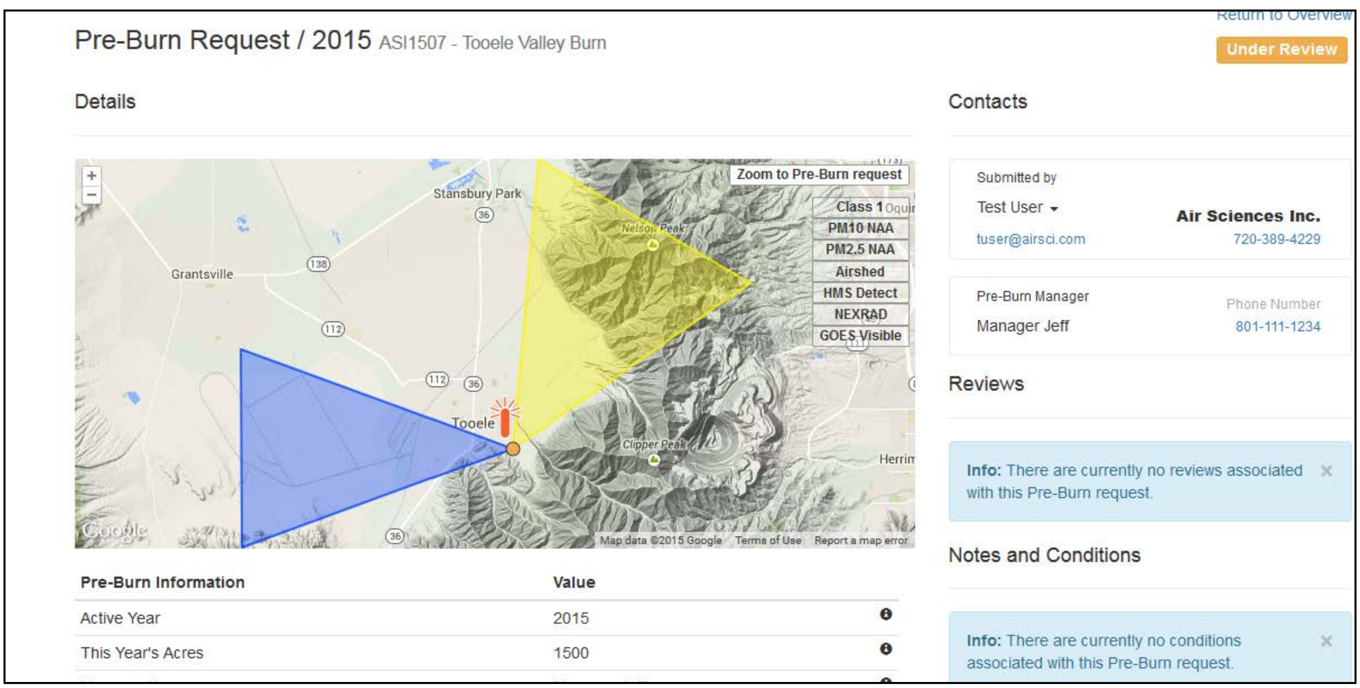
1) Name of receptor/ - miles at - degrees from site

2) Name of receptor/ - miles at - degrees from site

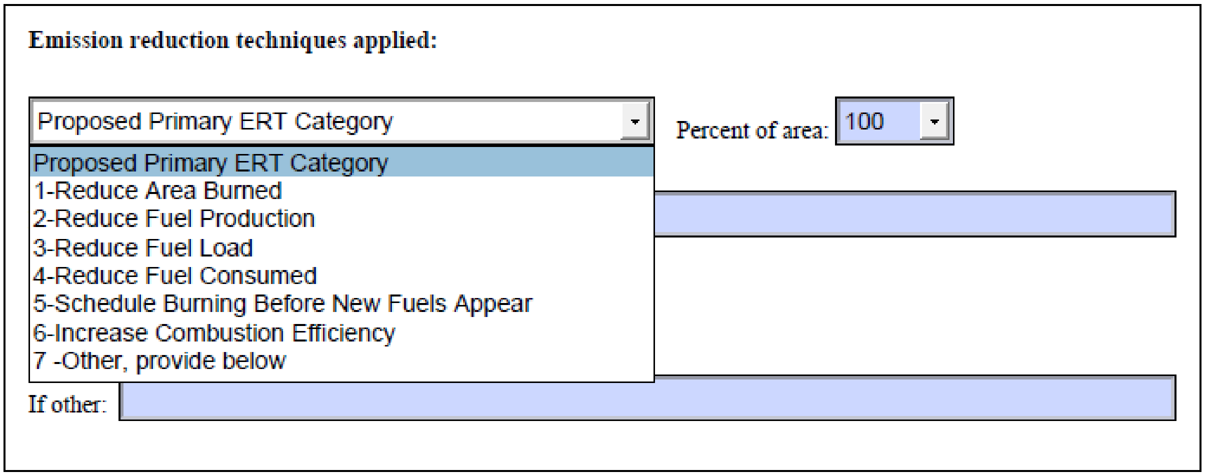
3) Name of receptor/ - miles at - degrees from site

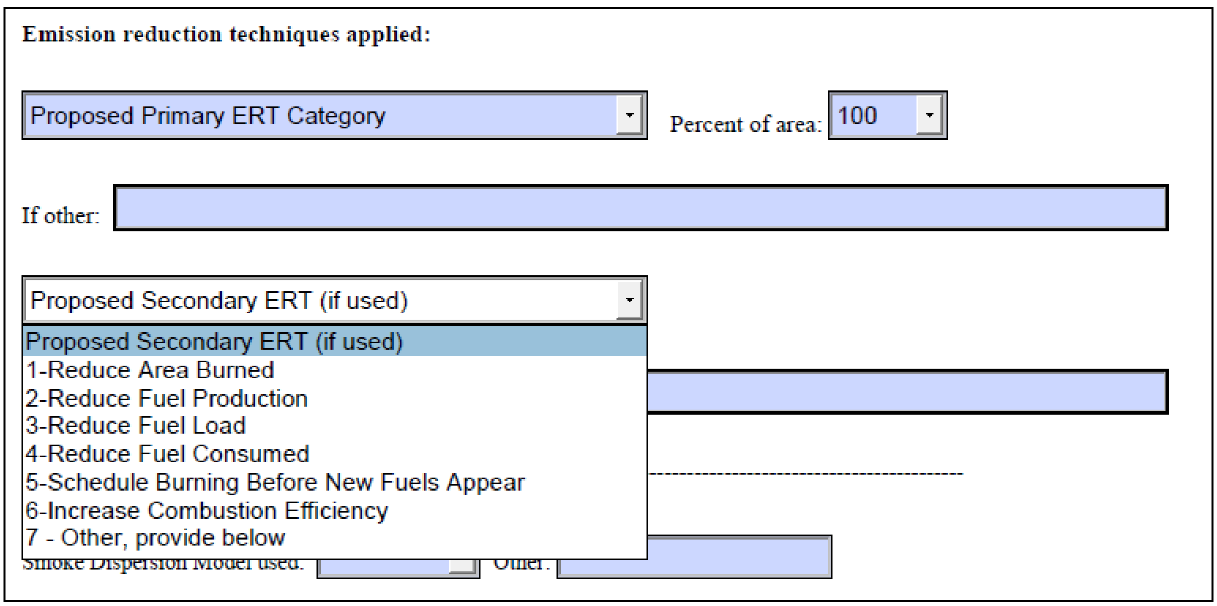
Planned smoke mitigation method(s): Avoidance: - Dilution: -

The sample smoke dispersion map for a prescribed burn near the City of Tooele depicts the city as the receptor as a red mark, the expected daytime dispersion in yellow and the nighttime dispersion in blue.



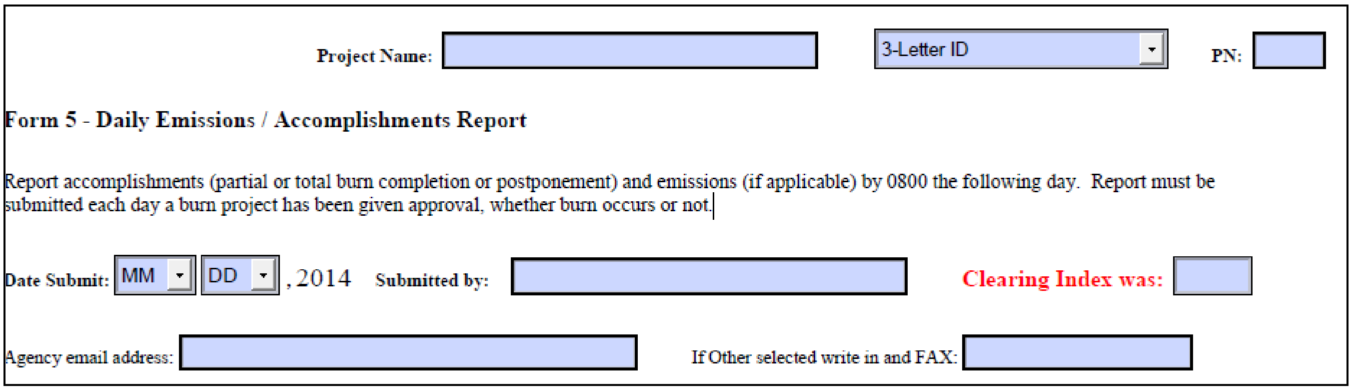
Form 3 requires the Land Manager to identify the primary and, if applicable, a secondary mitigation measure.





Mitigation Confirmation

Form 5, Daily Emission/Accomplishment Report, must be submitted each day a project has been given approval, whether or not a burn occurs. The clearing index must be documented to ensure proper atmospheric dispersion as required in R307-204.



Project Name: 3-Letter ID PN:

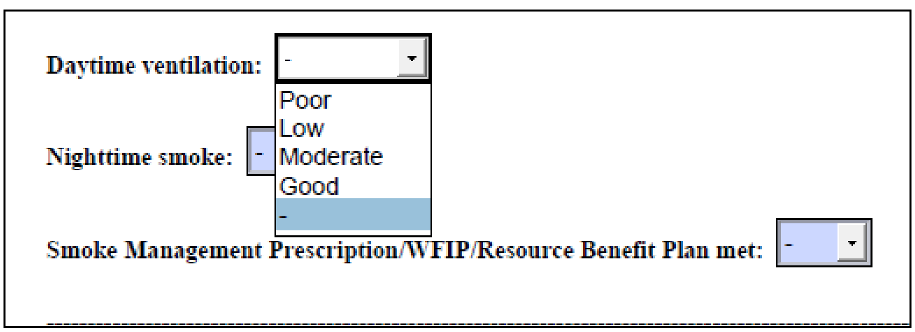
Form 5 - Daily Emissions / Accomplishments Report

Report accomplishments (partial or total burn completion or postponement) and emissions (if applicable) by 0800 the following day. Report must be submitted each day a burn project has been given approval, whether burn occurs or not.

Date Submit: MM DD , 2014 Submitted by: Clearing Index was:

Agency email address: If Other selected write in and FAX:

Daytime ventilation must be designated and nighttime smoke must be classified as poor, low, moderate or good. Further, the burn plan objectives must be designated at met or not met.



Daytime ventilation: -

Poor
Low
Moderate
Good
-

Nighttime smoke: -

Smoke Management Prescription/WFIP/Resource Benefit Plan met: -

The Land Manager must confirm on Form 5 which mitigation reduction technique(s) was actually applied.

REQUIRED INFO: Emission reduction techniques applied

Proposed Primary ERT Category | Percent of area: 100

If other:

Proposed Secondary ERT (if used)

If other:

Large burns may include hourly plume observation information submitted on Form 6, Hourly Plume Observation Record.

Project Name: | 3-Letter ID | **PN:**

Form 6 - Hourly Plume Observation Record (Optional)

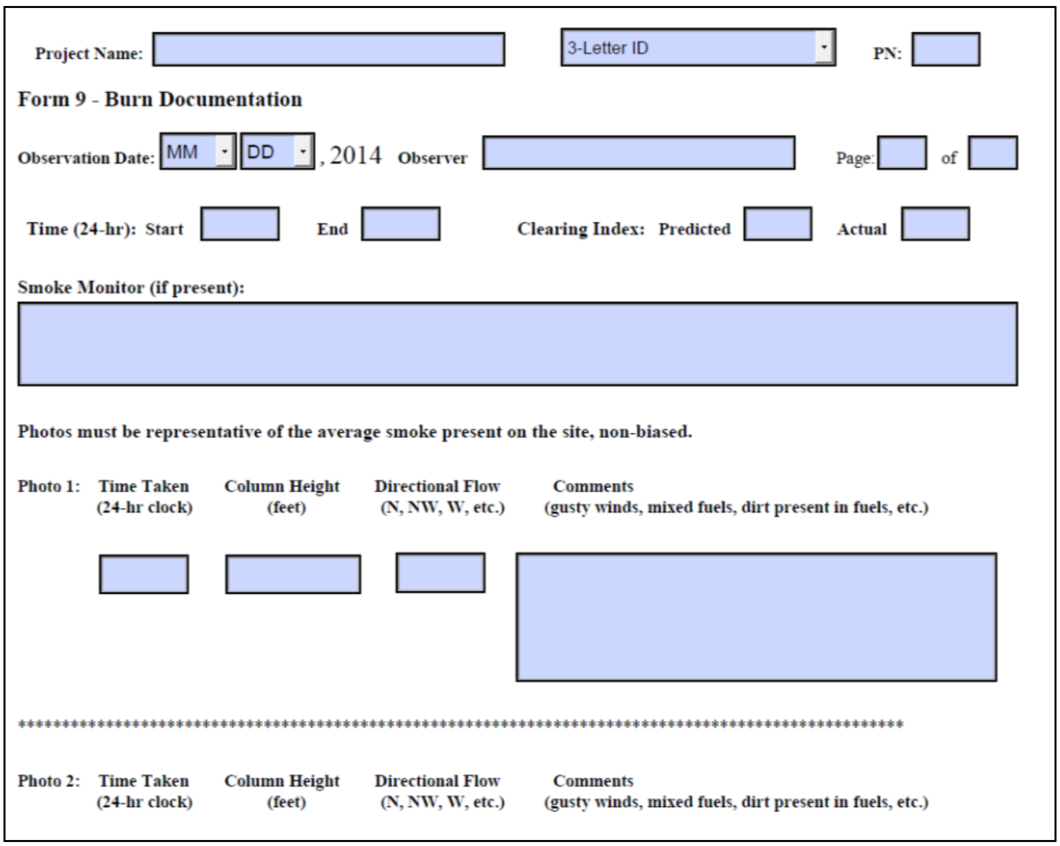
Land Managers are required to monitor effects of prescribed fire smoke on sensitive receptors, and visibility in Class I Areas. This form can be used if no other is available.

Date Submit: MM DD , 2014 **Submitted by:**

Agency email address: Was residual smoke present from the previous day of burning: -

Obs Time 2400 hrs	Atmosphere Stable/ Unstab	Transport Wind Dir	Ob Location	Photo #	Comment	Ob Initial
0000	-	-	-	-		
0000	-	-	-	-		
0000	-	-	-	-		
0000	-	-	-	-		
0000	-	-	-	-		
0000	-	-	-	-		
0000	-	-	-	-		
0000	-	-	-	-		
0000	-	-	-	-		
0000	-	-	-	-		
0000	-	-	-	-		
0000	-	-	-	-		

Form 9, Burn Documentation, is used to document a burn with photographs and monitoring data, if applicable.



Project Name: 3-Letter ID PN:

Form 9 - Burn Documentation

Observation Date: MM DD , 2014 Observer Page: of

Time (24-hr): Start End Clearing Index: Predicted Actual

Smoke Monitor (if present):

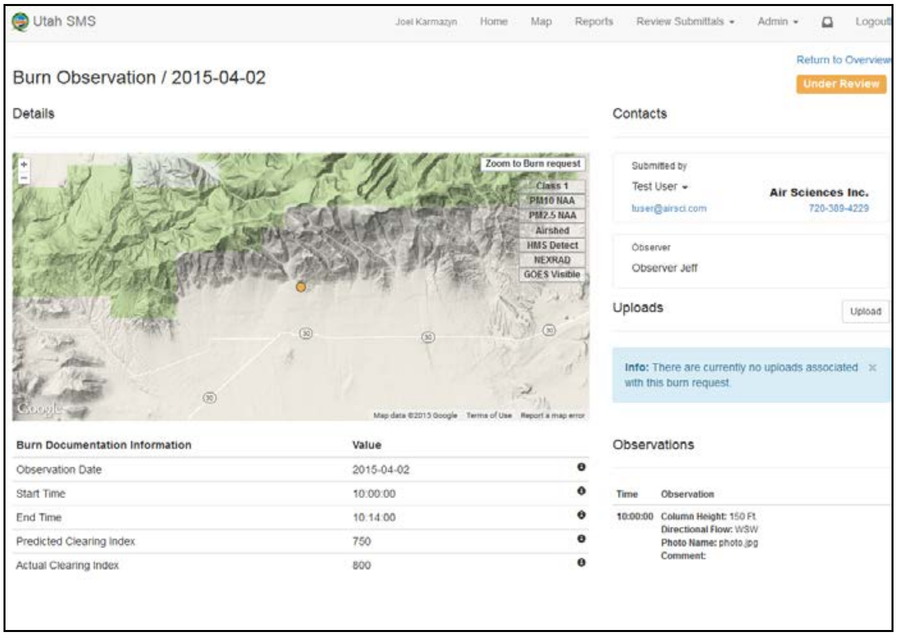
Photos must be representative of the average smoke present on the site, non-biased.

Photo 1: Time Taken (24-hr clock) Column Height (feet) Directional Flow (N, NW, W, etc.) Comments (gusty winds, mixed fuels, dirt present in fuels, etc.)

****

Photo 2: Time Taken (24-hr clock) Column Height (feet) Directional Flow (N, NW, W, etc.) Comments (gusty winds, mixed fuels, dirt present in fuels, etc.)

The web-based system currently in development will also include a mapping function for Form 9, as shown in the sample below.



Public Outreach

Land Managers are encouraged to develop a public outreach plan for larger burns. The depth of a plan is directly related to the size of the planned burn and the proximity of receptors. Extensive plans include public notices and meetings. An excerpt from the prescribed burn notice in the Salt Lake Tribune for the Dixie National Forest, notifies the public of the planned burn.

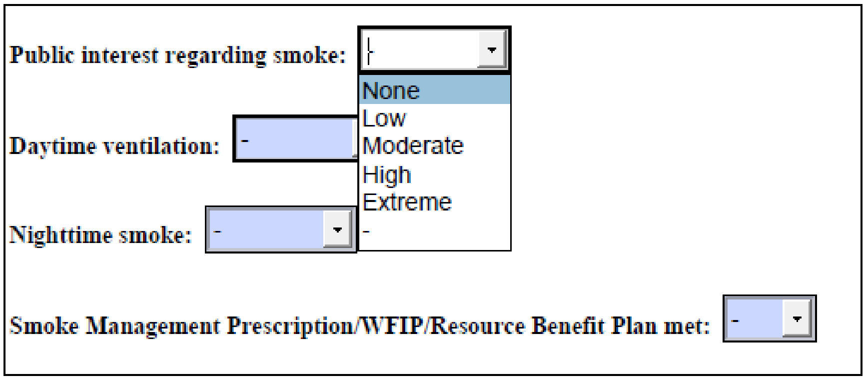
Dixie National Forest going up in smoke — and that's a good thing

By BOB MIMS | The Salt Lake Tribune

First Published Apr 20 2015 12:33PM • Last Updated Apr 20 2015 08:22 pm

Southern Utah's Dixie National Forest is about to go up in smoke, at least a little bit — and that's OK. Forest Supervisor Angelita Bulletts said Monday that as early as this week, more than 3,000 acres of grass, sagebrush, juniper and pinyon will purposely be going up in smoke. The series of prescribed burns are meant to reduce hazardous levels of fuels that could later feed out of control wildfires, while also restoring the health and sustainability of targeted stretches of the forest in Garfield County. Signs will be posted along roadways as a reminder to residents, reading "Prescribed Burn Ahead" or "Managed Fired, Do Not Report."

At a minimum, Form 5, the Daily Emission/Accomplishment Report includes information on public interest regarding smoke from the burn project.



Public interest regarding smoke: -

None
Low
Moderate
High
Extreme
-

Daytime ventilation: -

Nighttime smoke: -

Smoke Management Prescription/WFIP/Resource Benefit Plan met: -

Alternative Treatment Methods

Burning has long been a cost effective and efficient treatment method. However, burning can cause adverse air quality impacts on a surrounding community. Consequently, alternative methods must be considered. The use of a specific alternatives are dependent on a variety of factors, including, but not limited to, access and associated safety reaching a wildland area, the season, weather conditions, possible environmental impacts and cost-effectiveness.

The Utah Airshed Oversight Group has not identified any administrative barriers to the use of non-burning alternatives. During the review period, more acres were managed using alternative treatments to prescribed burning. The appendix provides detailed information for each alternative treatment project per year.

Compliance

There have been no violations of permit conditions. The permitting process requires smoke mitigation however, unforeseen wind shifts can result in occasional smoke complaints. The Land Managers document these complaints on Form 9.

Conclusions

The SMP was designed to provide a mechanism to use prescribed fire for resource benefits to accomplish land management objectives of wildland fuel hazard reduction, vegetative management, natural ecological practices, and wildlife habitat improvement in a way that mitigates smoke impact.

The SMP originated on July 20, 1999 and was revised on January 16, 2006 and again on January 24, 2014, in accordance with the evaluations conducted by Utah Airshed Oversight Group. EPA approved Utah's smoke management rule, R307-204, on January 18, 2013. The SMP has been proven to be an effective program because it provides:

- A system for reporting and coordinating burning operations on all forest and range lands in the State,

- Supports DAQs collection of fire emissions data,
- Minimizes smoke impacts to a feasible degree to protect public health, public, safety and visibility, and
- Encourages the use of alternative methods to burning.

Appendix

Alternative Treatment Methods Report

Fuel Treatments 2010-2014						
Agency	**Project Name**	**Treatment Kind**	**Treatment Type**	**Latitude**	**Longitude**	**Acres**
2010						40685
BIA						220
BIA	09 U&O HFR Projects	Mechanical	Mastication/Mowing	40.5	-109.974	220
BLM						39704
BLM	Columbia	Mechanical	Biomass Removal	39.5362	-110.4044	1275
BLM	Hill Springs	Mechanical	Biomass Removal	40.1072	-112.5434	27
BLM	RFO Antimony	Mechanical	Biomass Removal	38.0154	-112.0056	500
BLM	Apple Valley	Mechanical	Chipping	37.37	-113.6708	7
BLM	CA - Bullion Cayon	Mechanical	Chipping	38.4466	-112.2288	5
BLM	Fillmore	Mechanical	Chipping	38.6039	-112.6532	5
BLM	Interstate Project	Mechanical	Chipping	38.1528	-112.6123	22
BLM	RFO Seven Mile	Mechanical	Crushing	38.4676	-111.6785	3000
BLM	Apple Valley	Mechanical	Hand Pile	37.37	-113.6708	14
BLM	CA - Bullion Cayon	Mechanical	Hand Pile	38.4466	-112.2288	5
BLM	CA Kolob Terrace	Mechanical	Hand Pile	37.4231	-113.0389	3
BLM	CA Leeds	Mechanical	Hand Pile	37.2372	-113.3566	18
BLM	Dolores River	Mechanical	Hand Pile	38.7399	-109.1023	28

Fuel Treatments 2010-2014						
Agency	**Project Name**	**Treatment Kind**	**Treatment Type**	**Latitude**	**Longitude**	**Acres**
	Restoration					
BLM	Eastland	Mechanical	Hand Pile	37.8194	-109.1696	33
BLM	Fillmore	Mechanical	Hand Pile	38.6039	-112.6532	5
BLM	Kimbell	Mechanical	Hand Pile	41.779	-113.836	31
BLM	Ray Mesa	Mechanical	Hand Pile	38.2939	-109.1303	57
BLM	Tamarisk	Mechanical	Hand Pile	38.5577	-109.5841	3
BLM	Diamond Mountain	Mechanical	Lop and Scatter	40.9659	-109.2414	246
BLM	Five Mile Hollow (KFO)	Mechanical	Lop and Scatter	37.7825	-112.413	1500
BLM	HL Bookcliffs	Mechanical	Lop and Scatter	39.7171	-109.415	1000
BLM	Otter Creek	Mechanical	Lop and Scatter	41.7405	-111.3423	88
BLM	Ray Mesa	Mechanical	Lop and Scatter	38.2939	-109.1303	71
BLM	RFO Valley Mountains	Mechanical	Lop and Scatter	39.1274	-111.9626	500
BLM	Big Hollow	Mechanical	Mastication/Mowing	40.3585	-112.561	1158
BLM	Bluff	Mechanical	Mastication/Mowing	37.148	-109.861	278
BLM	Bumble Bee Interface	Mechanical	Mastication/Mowing	37.5072	-113.258	1000
BLM	Clover Creek/Rush Valley	Mechanical	Mastication/Mowing	40.2604	-112.4927	173
BLM	Diamond	Mechanical	Mastication/Mowing	40.605	-109.1101	372
BLM	Dolores River Restoration	Mechanical	Mastication/Mowing	38.7399	-109.1023	17
BLM	FFO Low Hills	Mechanical	Mastication/Mowing	39.3277	-112.0944	700
BLM	Fillmore	Mechanical	Mastication/Mowing	38.6039	-112.6532	55
BLM	HL Bookcliffs	Mechanical	Mastication/Mowing	40.1149	-109.1537	1100
BLM	HL South Beaver	Mechanical	Mastication/Mowing	38.1828	-112.5647	1000
BLM	Ibapah	Mechanical	Mastication/Mowing	39.9713	-113.928	1033
BLM	Kimbell	Mechanical	Mastication/Mowing	41.779	-113.836	142
BLM	Lake Point	Mechanical	Mastication/Mowing	40.6666	-112.3008	45
BLM	Lincoln	Mechanical	Mastication/Mowing	40.5768	-112.2639	160
BLM	Little Baullie Mesa	Mechanical	Mastication/Mowing	37.5629	-109.6465	948
BLM	RFO North Narrows East Side	Mechanical	Mastication/Mowing	38.3438	-111.8883	4000
BLM	RFO Valley Mountains	Mechanical	Mastication/Mowing	39.1274	-111.9626	500
BLM	Terra East	Mechanical	Mastication/Mowing	40.3112	-112.6038	10
BLM	Black Ridge	Mechanical	Seeding	38.3883	-109.3741	1629
BLM	Bumblebee Mtn. (St. George FO)	Mechanical	Seeding	37.5072	-113.258	305
BLM	Columbia Fuels Reduction	Mechanical	Seeding	39.5218	-110.4201	162
BLM	Diamond	Mechanical	Seeding	40.6207	-109.1181	250
BLM	Greater Buckskin	Mechanical	Seeding	37.2618	-112.2447	2200
BLM	HL South Beaver	Mechanical	Seeding	38.1828	-112.5647	1771

Fuel Treatments 2010-2014						
Agency	**Project Name**	**Treatment Kind**	**Treatment Type**	**Latitude**	**Longitude**	**Acres**
BLM	HL South Canyon	Mechanical	Seeding	37.7825	-112.413	1749
BLM	Ray Mesa	Mechanical	Seeding	38.2939	-109.1303	124
BLM	RFO North Freemont Dixie Harrow	Mechanical	Seeding	38.4916	-111.5753	1697
BLM	RFO North Narrows East Side	Mechanical	Seeding	38.3438	-111.8883	4000
BLM	RFO Seven Mile	Mechanical	Seeding	38.4676	-111.6785	3000
BLM	Bowery Springs	Mechanical	Thinning	40.36	-109.18	540
BLM	CA - Bullion Cayon	Mechanical	Thinning	38.4466	-112.2288	5
BLM	CA Cedar Highlands	Mechanical	Thinning	37.6377	-113.0521	4
BLM	CA Leeds	Mechanical	Thinning	37.2372	-113.3566	18
BLM	Diamond Mountain	Mechanical	Thinning	40.6207	-109.1181	250
BLM	Dolores River Restoration	Mechanical	Thinning	38.7399	-109.1023	28
BLM	Eastland	Mechanical	Thinning	37.8194	-109.1696	23
BLM	Fillmore	Mechanical	Thinning	38.6039	-112.6532	5
BLM	Interstate Project	Mechanical	Thinning	38.1528	-112.6123	22
BLM	Ray Mesa	Mechanical	Thinning	38.2939	-109.1303	57
BLM	Tamarisk	Mechanical	Thinning	38.5577	-109.5841	3
BLM	Bluff	Other	Chemical	37.148	-109.861	25
BLM	Dolores River Restoration	Other	Chemical	38.7399	-109.1023	45
BLM	HL Bookcliffs	Other	Chemical	40.1145	-109.1537	600
BLM	Tamarisk	Other	Chemical	38.5577	-109.5841	3
BLM	Lamborn	Other	Grazing	41.701	-111.2472	55
NPS						761
NPS	Fremont River Corridor Fuels Reduction	Mechanical	Chipping	38.2872	-111.2411	5
NPS	Kolob Canyons VC/Admin Defensible Space	Mechanical	Lop and Scatter	37.4594	-113.2244	2
NPS	Boundary/Cultural Protection	Mechanical	Mastication/Mowing	41.618	-112.5505	650
NPS	Fremont River Corridor Fuels Reduction	Mechanical	Thinning	38.2872	-111.2411	5
NPS	ZION Fuels Treatments	Other	Chemical	37.2045	-112.9774	99
2011						63146
BLM						62118
BLM	Lake Point	Mechanical	Biomass Removal	40.6666	-112.3008	45
BLM	Lincoln	Mechanical	Biomass Removal	40.5768	-112.2639	150
BLM	Reservation Ridge	Mechanical	Biomass Removal	39.8904	-110.9404	83

Fuel Treatments 2010-2014						
Agency	**Project Name**	**Treatment Kind**	**Treatment Type**	**Latitude**	**Longitude**	**Acres**
BLM	Apple Valley	Mechanical	Chipping	37.37	-113.6708	2
BLM	CA Cedar Highlands	Mechanical	Chipping	37.6377	-113.0521	11
BLM	CA Moab/Spanish Valley	Mechanical	Chipping	38.5285	-109.4922	8
BLM	East Zion	Mechanical	Chipping	37.2586	-112.8564	2
BLM	Frampton Heights	Mechanical	Chipping	39.01	-112.2508	5
BLM	RFO Aurora Ezra's Flat	Mechanical	Crushing	38.9557	-111.9406	1600
BLM	RFO West Grass Valley	Mechanical	Crushing	38.218	-112.0065	288
BLM	Black Ridge	Mechanical	Hand Pile	38.3883	-109.3741	154
BLM	CA Diamond/Winchester Hills	Mechanical	Hand Pile	37.2559	-113.6208	2
BLM	CA Kolob Terrace	Mechanical	Hand Pile	37.4231	-113.0389	6
BLM	Canoyn Country HL_PA	Mechanical	Hand Pile	37.9668	-109.3696	315
BLM	Dolores River Restoration	Mechanical	Hand Pile	38.7399	-109.1023	81
BLM	Eastland	Mechanical	Hand Pile	37.8194	-109.1696	14
BLM	Frampton Heights	Mechanical	Hand Pile	39.01	-112.2508	5
BLM	Hi-Country Estates	Mechanical	Hand Pile	40.4823	-112.0924	162
BLM	Reservation Ridge	Mechanical	Hand Pile	39.8904	-110.9404	83
BLM	Spring Glen	Mechanical	Hand Pile	39.669	-110.8325	3
BLM	Tamarisk	Mechanical	Hand Pile	38.5577	-109.5841	4
BLM	Black Ridge	Mechanical	Lop and Scatter	38.3687	-109.3762	1410
BLM	Diamond Mountain	Mechanical	Lop and Scatter	40.7053	-109.1666	750
BLM	Dugout	Mechanical	Lop and Scatter	39.6523	-110.6683	163
BLM	Faust	Mechanical	Lop and Scatter	40.2846	-112.513	773
BLM	FFO Hog Springs	Mechanical	Lop and Scatter	39.7576	-112.1379	480
BLM	Grouse Creek	Mechanical	Lop and Scatter	41.7317	-113.856	633
BLM	RFO Deer Peak	Mechanical	Lop and Scatter	38.41	-111.22	900
BLM	Black Ridge	Mechanical	Mastication	38.3687	-109.3762	53
BLM	Canoyn Country HL_PA	Mechanical	Mastication	37.9668	-109.3696	364
BLM	Ray Mesa	Mechanical	Mastication	38.2939	-109.1303	59
BLM	Winter Ridge Fuels Reduction	Mechanical	Mastication	39.5195	-109.5556	600
BLM	Anthro Mountain Hazardous Fuels Reduction	Mechanical	Mastication/Mowing	39.9251	-110.1616	406
BLM	Black Ridge	Mechanical	Mastication/Mowing	38.3687	-109.3762	1259
BLM	Bumblebee Mtn. (St. George FO)	Mechanical	Mastication/Mowing	37.5072	-113.258	305
BLM	Clover Creek/Rush	Mechanical	Mastication/Mowing	40.2604	-112.4927	861

Fuel Treatments 2010-2014						
Agency	Project Name	Treatment Kind	Treatment Type	Latitude	Longitude	Acres
	Valley					
BLM	Deep Creek	Mechanical	Mastication/Mowing	40.5684	-109.592	7
BLM	Diamond Mountain	Mechanical	Mastication/Mowing	40.9721	-109.06	570
BLM	E. Woodruff #1	Mechanical	Mastication/Mowing	41.4502	-111.0653	246
BLM	Fillmore	Mechanical	Mastication/Mowing	38.6039	-112.6532	8
BLM	Grouse Creek	Mechanical	Mastication/Mowing	41.7317	-113.856	1405
BLM	HL South Beaver	Mechanical	Mastication/Mowing	38.1828	-112.5647	1760
BLM	HL South Canyon	Mechanical	Mastication/Mowing	37.7825	-112.413	1749
BLM	Iosepa	Mechanical	Mastication/Mowing	40.5405	-112.6822	700
BLM	Muddy Creek	Mechanical	Mastication/Mowing	37.3487	-112.8477	1000
BLM	Ray Mesa	Mechanical	Mastication/Mowing	38.2939	-109.1303	222
BLM	RFO Frying Pan	Mechanical	Mastication/Mowing	38.41	-111.24	420
BLM	RFO Praetor Slope	Mechanical	Mastication/Mowing	38.5159	-111.8237	1942
BLM	Rockwell	Mechanical	Mastication/Mowing	40.0817	-112.6447	1378
BLM	Terra East	Mechanical	Mastication/Mowing	40.3112	-112.6038	1966
BLM	Dolores River Restoration	Mechanical	Mowing	38.7399	-109.1023	72
BLM	Dugout	Mechanical	Mowing	39.6523	-110.6683	1007
BLM	Black Ridge	Mechanical	Seeding	38.3687	-109.3762	144
BLM	Dolores River Restoration	Mechanical	Seeding	38.7399	-109.1023	72
BLM	Dugout	Mechanical	Seeding	39.6523	-110.6683	492
BLM	Greater Buckskin	Mechanical	Seeding	37.2618	-112.2447	3200
BLM	Grouse Creek	Mechanical	Seeding	41.7317	-113.856	683
BLM	HL Greenville Bench (Cedar City FO)	Mechanical	Seeding	38.0655	-112.9845	14600
BLM	HL South Beaver	Mechanical	Seeding	38.4286	-112.6164	1800
BLM	HL South Canyon	Mechanical	Seeding	37.7825	-112.413	1800
BLM	Lake Mountain	Mechanical	Seeding	40.3	-111.9175	83
BLM	Puddle Valley	Mechanical	Seeding	40.8776	-112.9955	818
BLM	RFO Antimony	Mechanical	Seeding	39.3277	-112.0056	1500
BLM	RFO Aurora Ezra's Flat	Mechanical	Seeding	38.9557	-111.9406	1600
BLM	Rosette	Mechanical	Seeding	41.7701	-113.4538	630
BLM	West Onaqui	Mechanical	Seeding	40.1376	-112.5809	300
BLM	Apple Valley	Mechanical	Thinning	37.37	-113.6708	2
BLM	Black Ridge	Mechanical	Thinning	38.3883	-109.3741	154
BLM	CA Cedar Highlands	Mechanical	Thinning	37.6377	-113.0521	11
BLM	CA Diamond/Winchester Hills	Mechanical	Thinning	37.2559	-113.6208	2

Fuel Treatments 2010-2014						
Agency	**Project Name**	**Treatment Kind**	**Treatment Type**	**Latitude**	**Longitude**	**Acres**
BLM	Canoyn Country HL_PA	Mechanical	Thinning	37.9668	-109.3696	315
BLM	Crawford Mountains	Mechanical	Thinning	41.6267	-111.0668	766
BLM	Diamond Mountain	Mechanical	Thinning	40.9041	-109.1762	2115
BLM	Dolores River Restoration	Mechanical	Thinning	38.7399	-109.1023	81
BLM	East Zion	Mechanical	Thinning	37.2586	-112.8564	2
BLM	Eastland	Mechanical	Thinning	37.8194	-109.1696	7
BLM	Frampton Heights	Mechanical	Thinning	39.01	-112.2508	5
BLM	Lake Mountain	Mechanical	Thinning	40.3	-111.9175	83
BLM	Puddle Valley	Mechanical	Thinning	40.8776	-112.9955	775
BLM	Spring Glen	Mechanical	Thinning	39.669	-110.8325	3
BLM	Tamarisk	Mechanical	Thinning	38.5577	-109.5841	4
BLM	Tavaputs Plateau	Mechanical	Thinning	39.591	-110.2228	15
BLM	Dolores River Restoration	Other	Chemical	38.7399	-109.1023	5
BLM	Grouse Creek	Other	Chemical	41.7317	-113.856	696
BLM	Lake Mountain	Other	Chemical	40.3	-111.9175	26
BLM	Puddle Valley	Other	Chemical	40.8776	-112.9955	775
BLM	Rosette	Other	Chemical	41.7701	-113.4538	2041
BLM	Tamarisk	Other	Chemical	38.5577	-109.5841	11
BLM	Woodruff Longhill	Other	Chemical	41.5353	-111.2012	11
NPS						1028
NPS	Canyonlands Defensible Space	Mechanical	Biomass Removal	38.1272	-109.7673	50
NPS	ZION Fuels Treatments	Mechanical	Chipping	37.2045	-112.9774	20
NPS	ZION Fuels Treatments	Mechanical	Hand Pile	37.2045	-112.9774	20
NPS	BRCA Residential/Admin Areas Reduction	Mechanical	Lop and Scatter	37.6299	-112.1695	5
NPS	Clear Trap Restoration	Mechanical	Lop and Scatter	37.2552	-112.9035	55
NPS	ZION Fuels Treatments	Mechanical	Lop and Scatter	37.2714	-113.0101	8
NPS	Boundary/Cultural Protection	Mechanical	Mastication/Mowing	41.618	-112.5505	650
NPS	Zion Canyon Admin Defensible Space	Mechanical	Thinning	37.2	-112.9808	5
NPS	ZION Fuels Treatments	Mechanical	Thinning	37.2045	-112.9774	20
NPS	East Entrance Boundary Protection	Other	Chemical	37.2335	-112.8636	100
NPS	ZION Fuels Treatments	Other	Chemical	37.2045	-112.9774	95
2012						40036

Fuel Treatments 2010-2014						
Agency	**Project Name**	**Treatment Kind**	**Treatment Type**	**Latitude**	**Longitude**	**Acres**
BLM						38758
BLM	Lake Point	Mechanical	Biomass Removal	40.6666	-112.3008	45
BLM	Lincoln	Mechanical	Biomass Removal	40.5768	-112.2639	150
BLM	CA Central Wayne Co	Mechanical	Chipping	38.2256	-111.3531	33
BLM	CA Moab/Spanish Valley	Mechanical	Chipping	38.5285	-109.4922	2
BLM	Castle Valley	Mechanical	Chipping	38.6285	-109.3958	18
BLM	Deep Creek	Mechanical	Chipping	40.5684	-109.592	5
BLM	East Zion	Mechanical	Chipping	37.2586	-112.8564	19
BLM	FFO Salt Creek	Mechanical	Chipping	39.25	-111.52	353
BLM	HL Bookcliffs	Mechanical	Chipping	39.6253	-109.0688	555
BLM	Quichapa	Mechanical	Chipping	37.6268	-113.2406	17
BLM	Black Ridge	Mechanical	Hand Pile	38.3687	-109.3762	29
BLM	CA Central Wayne Co	Mechanical	Hand Pile	38.2256	-111.3531	33
BLM	Canoyn Country HL_PA	Mechanical	Hand Pile	37.9668	-109.3696	377
BLM	Canyon Country HL-PA	Mechanical	Hand Pile	37.504	-109.4832	628
BLM	Canyon Terrace	Mechanical	Hand Pile	37.7383	-109.3896	4
BLM	Castle Valley	Mechanical	Hand Pile	38.6285	-109.3958	13
BLM	Deep Creek	Mechanical	Hand Pile	40.5684	-109.592	5
BLM	Faust	Mechanical	Hand Pile	40.2846	-112.513	254
BLM	Horse Canyon	Mechanical	Hand Pile	39.5821	-110.4564	28
BLM	Oak City	Mechanical	Hand Pile	39.371	-112.346	20
BLM	Quichapa	Mechanical	Hand Pile	37.6268	-113.2406	12
BLM	Ray Mesa	Mechanical	Hand Pile	38.2939	-109.1303	124
BLM	RFO Antimony	Mechanical	Hand Pile	38.0405	-112.0314	181
BLM	Black Ridge	Mechanical	Lop and Scatter	38.3687	-109.3762	136
BLM	Dry Fork Hazardous Fuel Project	Mechanical	Lop and Scatter	40.32	-109.41	423
BLM	Faust	Mechanical	Lop and Scatter	40.2846	-112.513	102
BLM	FFO Scipio	Mechanical	Lop and Scatter	39.2135	-112.146	400
BLM	Horse Canyon	Mechanical	Lop and Scatter	39.5821	-110.4564	447
BLM	Kings Point	Mechanical	Lop and Scatter	40.59	-109.59	1963
BLM	Park Ridge	Mechanical	Lop and Scatter	40.12	-109.35	516
BLM	Ray Mesa	Mechanical	Lop and Scatter	38.2939	-109.1303	159
BLM	Red Fleet	Mechanical	Lop and Scatter	40.61	-109.4407	300
BLM	Seep Ridge	Mechanical	Lop and Scatter	39.528	-109.35	250
BLM	Anthro Mountain Hazardous Fuels Reduction	Mechanical	Mastication	39.9251	-110.1616	256
BLM	Black Ridge	Mechanical	Mastication	38.3687	-109.3762	544

Fuel Treatments 2010-2014						
Agency	**Project Name**	**Treatment Kind**	**Treatment Type**	**Latitude**	**Longitude**	**Acres**
BLM	Canoyn Country HL_PA	Mechanical	Mastication	37.9668	-109.3696	889
BLM	Chicken Coop	Mechanical	Mastication	40.1149	-109.1537	406
BLM	Crawford Mountains	Mechanical	Mastication	41.6267	-111.0668	1016
BLM	Dry Fork Hazardous Fuel Project	Mechanical	Mastication	40.32	-109.41	942
BLM	Faust	Mechanical	Mastication	40.2846	-112.513	418
BLM	FFO Chris Creek	Mechanical	Mastication	39.26	-112.54	100
BLM	Grouse Creek	Mechanical	Mastication	41.7317	-113.856	315
BLM	HL South Beaver	Mechanical	Mastication	38.4286	-112.5647	3400
BLM	HL South Canyon	Mechanical	Mastication	37.7825	-112.413	1800
BLM	Horse Canyon	Mechanical	Mastication	39.5821	-110.4564	131
BLM	Pole Creek	Mechanical	Mastication	41.9844	-113.8998	857
BLM	Ray Mesa	Mechanical	Mastication	38.2939	-109.1303	399
BLM	RFO Antimony	Mechanical	Mastication	38.0154	-112.0056	500
BLM	Rockwell	Mechanical	Mastication	40.0621	-112.6362	2132
BLM	Stockton	Mechanical	Mastication	40.4187	-112.338	1561
BLM	Winter Ridge Fuels Reduction	Mechanical	Mastication	39.5264	-109.5621	381
BLM	Crawford Mountains	Mechanical	Mowing	41.6267	-111.0668	298
BLM	Puddle Valley	Mechanical	Mowing	40.8776	-112.9955	126
BLM	Chokecherry Springs	Mechanical	Seeding	41.5506	-113.6752	1154
BLM	FFO Chris Creek	Mechanical	Seeding	39.26	-112.54	500
BLM	HL Duncan Creek Interface	Mechanical	Seeding	37.6402	-113.2787	880
BLM	HL Kanab Creek	Mechanical	Seeding	37.2618	-112.2447	1000
BLM	HL South Canyon	Mechanical	Seeding	37.7825	-112.413	2000
BLM	Ibapah	Mechanical	Seeding	39.9713	-113.928	1073
BLM	Interstate Project	Mechanical	Seeding	38.1528	-112.6123	1
BLM	Iosepa	Mechanical	Seeding	40.5405	-112.6822	369
BLM	Black Ridge	Mechanical	Thinning	38.3687	-109.3762	29
BLM	CA Central Wayne Co	Mechanical	Thinning	38.2256	-111.3531	33
BLM	CA Moab/Spanish Valley	Mechanical	Thinning	38.5285	-109.4922	2
BLM	Canoyn Country HL_PA	Mechanical	Thinning	37.9668	-109.3696	377
BLM	Canyon Country HL-PA	Mechanical	Thinning	37.504	-109.4832	628
BLM	Canyon Terrace	Mechanical	Thinning	37.7383	-109.3896	2
BLM	Castle Valley	Mechanical	Thinning	38.6285	-109.3958	13
BLM	Crawford Mountains	Mechanical	Thinning	41.6267	-111.0668	254
BLM	Deep Creek	Mechanical	Thinning	40.5684	-109.592	5
BLM	East Zion	Mechanical	Thinning	37.2586	-112.8564	19

Fuel Treatments 2010-2014						
Agency	**Project Name**	**Treatment Kind**	**Treatment Type**	**Latitude**	**Longitude**	**Acres**
BLM	HL Bookcliffs	Mechanical	Thinning	39.9054	-109.2645	2500
BLM	Horse Canyon	Mechanical	Thinning	39.5821	-110.4564	28
BLM	Interstate Project	Mechanical	Thinning	38.1528	-112.6123	1
BLM	Oak City	Mechanical	Thinning	39.371	-112.346	10
BLM	Quichapa	Mechanical	Thinning	37.6268	-113.2406	23
BLM	Ray Mesa	Mechanical	Thinning	38.2939	-109.1303	124
BLM	RFO Antimony	Mechanical	Thinning	38.0405	-112.0314	181
BLM	Ibapah	Other	Chemical	39.9713	-113.928	1135
BLM	Lincoln	Other	Chemical	40.5768	-112.2639	124
BLM	Skull Valley/Cedar Mountain	Other	Chemical	40.6495	-112.9851	1308
BLM	West Onaqui	Other	Chemical	40.178	-112.6057	913
NPS						1278
NPS	Canyonlands Defensible Space	Mechanical	Biomass Removal	38.1272	-109.7673	15
NPS	BRCA Residential/Admin Areas Reduction	Mechanical	Hand Pile	37.6299	-112.1695	250
NPS	CEBR VC Defensible Space	Mechanical	Hand Pile	37.6119	-112.8374	8
NPS	Lava Point Aspen Restoration/WUI	Mechanical	Hand Pile	37.3833	-113.028	26
NPS	Horse Pasture Platuea Restoration	Mechanical	Lop and Scatter	37.3643	-112.9733	20
NPS	Boundary/Cultural Protection	Mechanical	Mowing	41.618	-112.5505	650
NPS	BRCA Residential/Admin Areas Reduction	Mechanical	Thinning	37.6299	-112.1695	250
NPS	CEBR VC Defensible Space	Mechanical	Thinning	37.6119	-112.8374	8
NPS	Lava Point Aspen Restoration/WUI	Mechanical	Thinning	37.3833	-113.028	26
NPS	Zion Canyon Admin Defensible Space	Mechanical	Thinning	37.2	-112.9808	5
NPS	Zion Canyon Admin Defensible Space	Other	Chemical	37.2	-112.9808	20
2013						17363
BLM						16647
BLM	CA Argyle Canyon	Mechanical	Chipping	39.8731	-110.5786	12
BLM	CA Cedar Highlands	Mechanical	Chipping	37.6377	-113.0521	10
BLM	CA Central Wayne Co	Mechanical	Chipping	38.2656	-111.3995	20

Fuel Treatments 2010-2014						
Agency	**Project Name**	**Treatment Kind**	**Treatment Type**	**Latitude**	**Longitude**	**Acres**
BLM	CA East Carbon/Columbia	Mechanical	Chipping	39.5494	-110.4181	13
BLM	CA Moab/Spanish Valley	Mechanical	Chipping	38.5285	-109.4922	2
BLM	Quichapa	Mechanical	Chipping	37.6268	-113.2406	13
BLM	RFO Parker Front	Mechanical	Crushing	38.4009	-111.8991	250
BLM	CA Argyle Canyon	Mechanical	Hand Pile	39.8731	-110.5786	8
BLM	CA Cedar Highlands	Mechanical	Hand Pile	37.6377	-113.0521	3
BLM	CA Central Wayne Co	Mechanical	Hand Pile	38.2656	-111.3995	20
BLM	CA Kolob Terrace	Mechanical	Hand Pile	37.4231	-113.0389	4
BLM	Quichapa	Mechanical	Hand Pile	37.6268	-113.2406	11
BLM	Browns Park Hazardous Fuels Reduction	Mechanical	Lop and Scatter	40.8664	-109.1947	20
BLM	Dry Fork Hazardous Fuel Project Phase II	Mechanical	Lop and Scatter	40.52	-109.686	2525
BLM	FFO Little Valley West	Mechanical	Lop and Scatter	39.1292	-112.0416	487
BLM	Veterans Hazardous Fuel Crew	Mechanical	Lop and Scatter	40.3247	-112.6236	237
BLM	Winter Ridge Fuels Reduction	Mechanical	Lop and Scatter	39.4851	-109.5203	1000
BLM	Bluff	Mechanical	Mastication	37.148	-109.861	113
BLM	Browns Park Hazardous Fuels Reduction	Mechanical	Mastication	40.8706	-109.2003	216
BLM	Bumble Bee Interface	Mechanical	Mastication	37.5072	-113.258	1000
BLM	Bumblebee Mtn. (St. George FO)	Mechanical	Mastication	37.5072	-113.258	90
BLM	Canyon Country HL-PA	Mechanical	Mastication	37.678	-109.3744	886
BLM	FFO Chris Creek	Mechanical	Mastication	39.26	-112.54	333
BLM	Grouse Creek	Mechanical	Mastication	41.7317	-113.856	751
BLM	HL Duncan Creek Interface	Mechanical	Mastication	37.6402	-113.2787	1280
BLM	HL South Canyon	Mechanical	Mastication	37.7825	-112.413	2000
BLM	Iosepa	Mechanical	Mastication	40.5405	-112.6822	369
BLM	RFO Hayes Canyon	Mechanical	Mastication	39.2332	-111.9811	700
BLM	Stockton	Mechanical	Mastication	40.4187	-112.338	868
BLM	Chokecherry Springs	Mechanical	Seeding	41.5506	-113.6752	577
BLM	Quichapa	Mechanical	Seeding	37.6268	-113.2406	5
BLM	RFO Parker Front	Mechanical	Seeding	38.4009	-111.8991	500
BLM	CA Argyle Canyon	Mechanical	Thinning	39.8731	-110.5786	8
BLM	CA Cedar Highlands	Mechanical	Thinning	37.6377	-113.0521	3
BLM	CA Central Wayne Co	Mechanical	Thinning	38.2656	-111.3995	20

Fuel Treatments 2010-2014						
Agency	Project Name	Treatment Kind	Treatment Type	Latitude	Longitude	Acres
BLM	CA East Carbon/Columbia	Mechanical	Thinning	39.5494	-110.4181	13
BLM	CA Kolob Terrace	Mechanical	Thinning	37.4231	-113.0389	8
BLM	CA Moab/Spanish Valley	Mechanical	Thinning	38.5285	-109.4922	2
BLM	Dammeron Valley	Mechanical	Thinning	37.2883	-113.6731	0
BLM	Quichapa	Mechanical	Thinning	37.6268	-113.2406	13
BLM	Reservation Ridge	Mechanical	Thinning	39.854	-110.8229	111
BLM	Dry Fork Hazardous Fuel Project	Other	Chemical	40.32	-109.41	367
BLM	Dry Fork Hazardous Fuel Project Phase II	Other	Chemical	40.5519	-109.6303	630
BLM	Lincoln	Other	Chemical	40.5768	-112.2639	193
BLM	Stockton	Other	Chemical	40.4187	-112.338	480
BLM	Rosette	Other	Grazing	41.8186	-113.3353	476
NPS						716
NPS	Lava Point Aspen Restoration/WUI	Mechanical	Hand Pile	37.3833	-113.028	15
NPS	ZION Fuels Treatments	Mechanical	Hand Pile	37.2045	-112.9774	5
NPS	Boundary/Cultural Protection	Mechanical	Mowing	41.618	-112.5505	650
NPS	Lava Point Aspen Restoration/WUI	Mechanical	Thinning	37.3833	-113.028	15
NPS	ZION Fuels Treatments	Mechanical	Thinning	37.2045	-112.9774	5
NPS	Campground Ditch Debris Removal	Other	Chemical	37.2045	-112.9774	26
2014						63356
BLM						62306
BLM	Lincoln	Mechanical	Biomass Removal	40.5768	-112.2639	195
BLM	Anthro Mountain Hazardous Fuels Reduction	Mechanical	Chipping	39.9251	-110.1616	402
BLM	Bumble Bee Ridge	Mechanical	Chipping	37.535	-113.215	46
BLM	CA Leeds	Mechanical	Chipping	37.2372	-113.3566	3
BLM	Lake Mountain	Mechanical	Crushing	40.3225	-111.9872	48
BLM	Lincoln	Mechanical	Crushing	40.5768	-112.2639	227
BLM	Black Ridge	Mechanical	Hand Pile	38.3883	-109.3741	17
BLM	Bumble Bee Ridge	Mechanical	Hand Pile	37.535	-113.215	36
BLM	CA Kolob Terrace	Mechanical	Hand Pile	37.4231	-113.0389	1
BLM	CA Leeds	Mechanical	Hand Pile	37.2372	-113.3566	13
BLM	Canyon Country HL-PA	Mechanical	Hand Pile	37.504	-109.4832	36

Fuel Treatments 2010-2014						
Agency	**Project Name**	**Treatment Kind**	**Treatment Type**	**Latitude**	**Longitude**	**Acres**
BLM	FFO Meadow	Mechanical	Hand Pile	38.8882	-112.3511	234
BLM	Atchee Ridge Fuels Reduction	Mechanical	Lop and Scatter	39.7073	-109.1484	483
BLM	Black Ridge	Mechanical	Lop and Scatter	38.3883	-109.3741	361
BLM	Castle Country/Bookcliffs HL-PA	Mechanical	Lop and Scatter	39.172	-110.6193	534
BLM	East Tintic	Mechanical	Lop and Scatter	40.0459	-112.3101	214
BLM	FFO Scipio	Mechanical	Lop and Scatter	39.2135	-112.146	400
BLM	HL South Slope	Mechanical	Lop and Scatter	40.5909	-109.114	2352
BLM	Indian Springs Fuel Reduction	Mechanical	Lop and Scatter	39.39	-109.09	634
BLM	RFO Angle	Mechanical	Lop and Scatter	38.3438	-111.8883	650
BLM	RFO Antimony	Mechanical	Lop and Scatter	38.0405	-112.0314	67
BLM	RFO Hayes Canyon	Mechanical	Lop and Scatter	39.2332	-111.9811	100
BLM	RFO Mormon Peak	Mechanical	Lop and Scatter	38.6444	-111.8611	2500
BLM	RFO Praetor Slope	Mechanical	Lop and Scatter	38.5159	-111.8237	100
BLM	Sage Hen Hollow Restoration	Mechanical	Lop and Scatter	37.7554	-112.422	10000
BLM	Seep Ridge	Mechanical	Lop and Scatter	39.588	-109.375	729
BLM	HL Kanab Creek	Mechanical	Machine Pile	37.2618	-112.2447	1600
BLM	Anthro Mountain Hazardous Fuels Reduction	Mechanical	Mastication	39.8888	-110.2063	584
BLM	Black Ridge	Mechanical	Mastication	38.3883	-109.3741	260
BLM	Bluff	Mechanical	Mastication	37.148	-109.861	45
BLM	Canyon Country HL-PA	Mechanical	Mastication	37.504	-109.4832	185
BLM	Castle Country/Bookcliffs HL-PA	Mechanical	Mastication	39.172	-110.6193	469
BLM	Diamond Rim	Mechanical	Mastication	40.572	-109.2681	449
BLM	Faust	Mechanical	Mastication	40.1775	-112.492	2177
BLM	FFO Eureka	Mechanical	Mastication	39.9867	-112.1424	1100
BLM	Gov't Creek	Mechanical	Mastication	40.033	-112.6418	1410
BLM	Grouse Creek	Mechanical	Mastication	41.7264	-113.9148	1079
BLM	HL Bookcliffs	Mechanical	Mastication	40.13	-109.4	495
BLM	HL Duncan Creek Interface	Mechanical	Mastication	37.6402	-113.2787	7900
BLM	HL Kanab Creek	Mechanical	Mastication	37.2618	-112.2447	2000
BLM	HL South Canyon	Mechanical	Mastication	37.7825	-112.413	2267
BLM	HL Yellow Jacket	Mechanical	Mastication	37.1264	-112.6205	2100

Fuel Treatments 2010-2014						
Agency	**Project Name**	**Treatment Kind**	**Treatment Type**	**Latitude**	**Longitude**	**Acres**
	Habitat Restoration					
BLM	Monument Ridge	Mechanical	Mastication	39.551	-109.273	334
BLM	RFO Antimony	Mechanical	Mastication	38.0154	-112.0056	1566
BLM	RFO Little Valley	Mechanical	Mastication	39.2514	-111.9487	527
BLM	Canyon Country HL-PA	Mechanical	Seeding	37.504	-109.4832	56
BLM	Castle Country/Bookcliffs HL-PA	Mechanical	Seeding	39.172	-110.6193	595
BLM	Dry Fork Hazardous Fuel Project	Mechanical	Seeding	40.32	-109.41	350
BLM	East Tintic	Mechanical	Seeding	40.0459	-112.3101	765
BLM	Faust	Mechanical	Seeding	40.1536	-112.5274	326
BLM	Grouse Creek	Mechanical	Seeding	41.7264	-113.9148	950
BLM	HL Kanab Creek	Mechanical	Seeding	37.2618	-112.2447	3600
BLM	HL South Canyon	Mechanical	Seeding	37.7825	-112.413	2267
BLM	HL Yellow Jacket Habitat Restoration	Mechanical	Seeding	37.1264	-112.6205	2100
BLM	Lincoln	Mechanical	Seeding	40.5768	-112.2639	227
BLM	RFO Antimony	Mechanical	Seeding	38.0405	-112.0056	2066
BLM	Rockwell	Mechanical	Seeding	40.0621	-112.6362	499
BLM	Black Ridge	Mechanical	Thinning	38.3883	-109.3741	17
BLM	CA Leeds	Mechanical	Thinning	37.2372	-113.3566	13
BLM	Canyon Country HL-PA	Mechanical	Thinning	37.504	-109.4832	106
BLM	HL Blue Mountain	Mechanical	Thinning	40.4486	-109.1197	577
BLM	Bluff	Other	Chemical	37.148	-109.861	35
BLM	Lake Mountain	Other	Chemical	40.3225	-111.9872	48
BLM	Lincoln	Other	Chemical	40.5768	-112.2639	780
NPS						1050
NPS	BRCA Residential/Admin Areas Reduction	Mechanical	Biomass Removal	37.6308	-112.1686	5
NPS	Canyonlands Defensible Space	Mechanical	Biomass Removal	38.1257	-109.8396	10
NPS	BRCA Residential/Admin Areas Reduction	Mechanical	Hand Pile	37.6308	-112.1686	150
NPS	Colorado River Riparian Restoration Project	Mechanical	Hand Pile	38.1585	-109.9268	4
NPS	Courthouse Wash/Wolfe Ranch Restoration	Mechanical	Hand Pile	39.63	-109.6207	10

Fuel Treatments 2010-2014						
Agency	**Project Name**	**Treatment Kind**	**Treatment Type**	**Latitude**	**Longitude**	**Acres**
NPS	Lava Point Aspen Restoration/WUI	Mechanical	Hand Pile	37.3833	-113.028	22
NPS	Zion Lodge Defensible Space	Mechanical	Hand Pile	37.2045	-112.9774	9
NPS	BRCA Residential/Admin Areas Reduction	Mechanical	Lop and Scatter	37.6308	-112.1686	150
NPS	Boundary/Cultural Protection	Mechanical	Mowing	41.618	-112.5505	630
NPS	Canyonlands Defensible Space	Mechanical	Thinning	38.1257	-109.8396	10
NPS	Colorado River Riparian Restoration Project	Mechanical	Thinning	38.1585	-109.9268	4
NPS	Lava Point Aspen Restoration/WUI	Mechanical	Thinning	37.3833	-113.028	22
NPS	Zion Lodge Defensible Space	Mechanical	Thinning	37.2045	-112.9774	9
NPS	Campground Ditch Debris Removal	Other	Chemical	37.2045	-112.9774	15
	Super 2010-2014 year Grand Total					224586

US Forest Service

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
8/1/2010	Ashley	RESERVATION RIDGE	Machine Pile	Piling of Fuels, Hand or Machine	39.871	-110.857	117
9/22/2010	Ashley	RESERVATION RIDGE	Thinning	Thinning for Hazardous Fuels Reduction	39.871	-110.857	200
9/22/2010	Ashley	RESERVATION RIDGE	Machine Pile	Piling of Fuels, Hand or Machine	39.871	-110.857	383
9/15/2010	Ashley	SOUTH UNIT HABITAT IMPROVEMENT	Lop and Scatter	Rearrangement of Fuels	39.93	-110.41	400
10/30/2010	Ashley		Machine Pile	Piling of Fuels, Hand or Machine	39.877	-110.769	29
10/30/2010	Ashley		Machine Pile	Piling of Fuels, Hand or Machine	39.883	-110.717	11
9/24/2010	Dixie	D1 CHAINING FUELS REDUCTION	Crushing	Compacting/Crushing of Fuels	37.548	-113.709	566
9/25/2010	Dixie	D1 SANTA CLARA VEG	Thinning	Thinning for Hazardous Fuels Reduction	37.3771	-113.4676	24
9/26/2010	Dixie	D1 SANTA CLARA VEG	Machine Pile	Piling of Fuels, Hand or Machine	37.3771	-113.4676	28
8/4/2010	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4666	-112.625	40
4/1/2010	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	43
4/1/2010	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.3001	-112.4046	43
7/30/2010	Dixie		Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4607	-112.6378	43
7/30/2010	Dixie		Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	47
7/30/2010	Dixie		Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	68
7/30/2010	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.4607	-112.6378	43
7/30/2010	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	33
7/30/2010	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	47
7/30/2010	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	132
7/30/2010	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.4607	-112.6378	43
7/30/2010	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	80
7/30/2010	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	132
9/13/2010	Dixie		Crushing	Compacting/Crushing of Fuels	37.548	-113.709	1031
9/24/2010	Dixie		Crushing	Compacting/Crushing of Fuels	37.5359	-113.6889	566
9/30/2010	Dixie		Crushing	Compacting/Crushing of Fuels	37.5602	-112.1646	218
10/1/2010	Dixie		Chipping	Chipping of Fuels	37.3001	-112.4046	1
10/2/2010	Dixie		Chipping	Chipping of Fuels	37.3001	-112.4046	2
10/27/2010	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.606	-112.3338	58
10/28/2010	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.606	-112.3338	58
11/5/2010	Dixie		Crushing	Compacting/Crushing of Fuels	37.547	-113.709	30
11/10/2010	Dixie		Chipping	Chipping of Fuels	37.5602	-112.1646	74
7/28/2010	Fishlake	BOX CREEK	Thinning	Thinning for Hazardous Fuels Reduction	38.5108	-112.0462	272
12/13/2010	Fishlake	BULL SPRINGS	Thinning	Thinning for Hazardous Fuels Reduction	38.7224	-111.8385	259
1/1/2010	Fishlake	CEDAR MOUNTAIN	Thinning	Thinning for Hazardous Fuels Reduction	38.9521	-111.7521	2750
12/31/2010	Fishlake	CEDAR MOUNTAIN	Thinning	Thinning for Hazardous Fuels	38.9521	-111.7521	2750

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
				Reduction			
3/2/2010	Fishlake	DURFEY CREEK CHAINING	Lop and Scatter	Rearrangement of Fuels	38	-111	350
9/29/2010	Fishlake		Crushing	Compacting/Crushing of Fuels	38.4302	-112.3251	100
9/29/2010	Fishlake		Crushing	Compacting/Crushing of Fuels	38.17	-112.15	1000
7/23/2010	Fishlake		Crushing	Compacting/Crushing of Fuels	38.4826	-111.517	200
6/29/2010	Fishlake		Thinning	Thinning for Hazardous Fuels Reduction	38.35	-112.28	75682
8/6/2010	Fishlake		Machine Pile	Piling of Fuels, Hand or Machine	38.15	-112.28	150
9/17/2010	Fishlake		Thinning	Thinning for Hazardous Fuels Reduction	38.3	-112.33	29537
4/8/2010	Fishlake		Thinning	Thinning for Hazardous Fuels Reduction	38.7224	-111.8385	700
10/18/2010	Manti-Lasal	RESILIENCY	Chipping	Chipping of Fuels	39.32	-111.27	84
10/18/2010	Manti-Lasal	RESILIENCY	Chipping	Chipping of Fuels	39.33	-111.27	64
10/14/2010	Manti-Lasal	RESILIENCY	Chipping	Chipping of Fuels	39.34	-111.27	210
10/1/2010	Manti-Lasal	RESILIENCY	Chipping	Chipping of Fuels	39.1857	-111.1807	400
8/2/2010	Manti-Lasal	RESILIENCY	Thinning	Thinning for Hazardous Fuels Reduction	39.204	-111.1739	152
10/14/2010	Manti-Lasal	RESILIENCY	Machine Pile	Piling of Fuels, Hand or Machine	39.204	-111.1739	347
10/14/2010	Manti-Lasal	RESILIENCY	Chipping	Chipping of Fuels	39.35	-111.27	7
10/8/2010	Manti-Lasal	RESILIENCY,FUELS MECHANICAL TREATMENT	Chipping	Chipping of Fuels	39.317	-111.309	341
1/11/2010	Manti-Lasal		Chipping	Chipping of Fuels	39.322	-111.283	60
1/11/2010	Manti-Lasal		Chipping	Chipping of Fuels	39.112	-111.284	79
11/19/2010	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	38.976	-111.366	42.4
11/19/2010	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	38.976	-111.366	31.8
11/18/2010	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	38.987	-111.337	26
11/18/2010	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	38.987	-111.337	19.5
11/18/2010	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	38.978	-111.371	190.4
11/18/2010	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	38.978	-111.371	142.8
11/18/2010	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	38.968	-111.348	62
11/18/2010	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	38.968	-111.348	46.5
11/18/2010	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	38.966	-111.354	12.8
11/18/2010	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	38.966	-111.354	9.6
10/26/2010	Manti-Lasal		Machine Pile	Piling of Fuels, Hand or Machine	39.928	-111.403	165
11/17/2010	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	38.999	-111.335	142.2
11/17/2010	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	38.999	-111.335	189.6

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
8/2/2010	Uinta-Wasatch-Cache	SPRINGDELL SOUTH	Thinning	Thinning for Hazardous Fuels Reduction	40.296	-111.612	1875
7/21/2010	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	40.0029	-112.332	617
7/21/2010	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	39.966	-112.3233	830
7/21/2010	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	40.2	-111.1	500
8/2/2010	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	40.296	-111.612	625
7/21/2010	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	40	-112.3	500
7/21/2010	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	40	-112.3	250
7/1/2010	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	40.974	-110.849	169
7/1/2010	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	40.6013	-111.5832	20
7/1/2010	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	40.6013	-111.5832	10
9/25/2010	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	40.6275	-111.2162	276
7/21/2010	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	40.0029	-112.332	253
							127090
8/26/2011	Ashley		Lop and Scatter	Rearrangement of Fuels	39.93	-110.41	550
9/30/2011	Ashley		Lop and Scatter	Rearrangement of Fuels	40.7473	-109.4595	140
8/3/2011	Ashley		Lop and Scatter	Rearrangement of Fuels	39.93	-110.41	280
10/20/2011	Ashley		Lop and Scatter	Rearrangement of Fuels	39.93	-110.41	64
9/30/2011	Ashley		Lop and Scatter	Rearrangement of Fuels	40.8824	-109.4293	168
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	68
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	93
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	258
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.466	-112.625	99

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4666	-112.625	5
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4666	-112.625	11
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4666	-112.625	100
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4666	-112.625	128
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.3001	-112.4046	14
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.3001	-112.4046	15
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.3001	-112.4046	24
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.3001	-112.4046	32
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.3001	-112.4046	164
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.3001	-112.4046	188
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.3001	-112.4046	423
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	10
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	14
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	15
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	24
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	32
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	164
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	188
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	423
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.477	-112.6541	29
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.477	-112.6541	36
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.477	-112.6541	78
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.3001	-112.4046	14
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.3001	-112.4046	15
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.3001	-112.4046	24

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.3001	-112.4046	32
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.3001	-112.4046	164
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.3001	-112.4046	188
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.3001	-112.4046	433
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.477	-112.6541	29
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.477	-112.6541	36
9/22/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.477	-112.6541	78
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	11
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	27
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	28
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	32
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	33
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	43
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	93
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	119
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.466	-112.625	74
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4666	-112.625	5
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4666	-112.625	100
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4666	-112.625	128
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Lop and Scatter	Rearrangement of Fuels	37.4608	-112.6378	68
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Lop and Scatter	Rearrangement of Fuels	37.4608	-112.6378	93
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Lop and Scatter	Rearrangement of Fuels	37.4666	-112.625	128
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	11
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	23
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	27

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	28
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	32
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	33
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	48
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	63
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	258
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.466	-112.625	25
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.466	-112.625	74
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4666	-112.625	5
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4666	-112.625	11
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4666	-112.625	100
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	11
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	27
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	28
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	32
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	33
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	48
6/1/2011	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	63
8/25/2011	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	38.0421	-111.8697	15
8/25/2011	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	38.0421	-111.8697	102
8/25/2011	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	38.0421	-111.8697	104
8/25/2011	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	38.0421	-111.8697	152
8/25/2011	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	38.0421	-111.8697	174
8/25/2011	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	38.0421	-111.8697	275
8/25/2011	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	38.0421	-111.8697	280
8/25/2011	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	38.0421	-111.8697	433
9/1/2011	Dixie		Chipping	Chipping of Fuels	37.516	-112.699	8

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
9/1/2011	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.516	-112.699	7
9/1/2011	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.516	-112.699	8
9/15/2011	Dixie		Chipping	Chipping of Fuels	37.7375	-112.0752	81
9/15/2011	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.505	-112.703	55
9/15/2011	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.5563	-112.8068	20
9/19/2011	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.505	-112.703	18
9/19/2011	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.505	-112.703	87
9/20/2011	Dixie		Crushing	Compacting/Crushing of Fuels	37.541	-113.499	1725
9/20/2011	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.3771	-113.4676	28
9/20/2011	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.3771	-113.4676	28
9/21/2011	Dixie		Chipping	Chipping of Fuels	37.7375	-112.0752	480
9/22/2011	Dixie		Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.521	-112.699	40
9/26/2011	Dixie		Crushing	Compacting/Crushing of Fuels	37.611	-114.0391	1200
7/1/2011	Dixie		Chipping	Chipping of Fuels	37.7375	-112.0752	69
7/15/2011	Dixie		Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.521	-112.699	45
7/15/2011	Dixie		Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.592	-112.905	11
7/15/2011	Dixie		Chipping	Chipping of Fuels	37.521	-112.699	5
7/15/2011	Dixie		Chipping	Chipping of Fuels	37.592	-112.905	11
7/15/2011	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.521	-112.699	40
8/25/2011	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	38.0421	-111.8697	8
8/25/2011	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	38.0421	-111.8697	10
6/16/2011	Fishlake	CLEAR CREEK	Thinning	Thinning for Hazardous Fuels Reduction	38.35	-112.28	75682
4/15/2011	Fishlake	DURFEY CREEK CHAINING	Lop and Scatter	Rearrangement of Fuels	38	-111	350
6/1/2011	Fishlake	EIGHT MILE	Thinning	Thinning for Hazardous Fuels Reduction	38.17	-112.15	450
6/1/2011	Fishlake	KANOSH BENCH	Thinning	Thinning for Hazardous Fuels Reduction	38.4302	-112.3251	200
6/16/2011	Fishlake	PINE CREEK	Thinning	Thinning for Hazardous Fuels Reduction	38.3	-112.33	29537
11/15/2011	Fishlake	TWIN PEAKS	Thinning	Thinning for Hazardous Fuels Reduction	38.2591	-112.1075	578
6/1/2011	Fishlake	WATER CANYON	Thinning	Thinning for Hazardous Fuels Reduction	38.3644	-112.3226	2000
12/31/2011	Fishlake		Thinning	Thinning for Hazardous Fuels Reduction	38.939	-111.7507	30
12/31/2011	Fishlake		Thinning	Thinning for Hazardous Fuels Reduction	38.7224	-111.8385	101
9/30/2011	Manti-Lasal	RESILIENCY	Chipping	Chipping of Fuels	37.737	-109.543	248
9/30/2011	Manti-Lasal	RESILIENCY	Chipping	Chipping of Fuels	37.734	-109.517	162
4/25/2011	Manti-Lasal	RESILIENCY	Chipping	Chipping of Fuels	39.332	-111.281	423
1/7/2011	Manti-Lasal	RESILIENCY,FUELS MECHANICAL TREATMENT	Chipping	Chipping of Fuels	39.31	-111.338	719
9/30/2011	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	39.827	-111.462	380

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
11/4/2011	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.6367	-110.9463	20
11/15/2011	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.7141	-110.8929	8
11/15/2011	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.6403	-111.6375	5
11/15/2011	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.6137	-111.5878	5
11/15/2011	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.5932	-110.9991	13
11/15/2011	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.5932	-111.1164	12
11/30/2011	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.6959	-110.8921	15
11/30/2011	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.6145	-111.1308	13
11/30/2011	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.5944	-110.9753	12
6/20/2011	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.6575	-110.9457	4
7/8/2011	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	40.0483	-112.6231	1300
10/15/2011	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	41.1767	-111.9292	5
10/15/2011	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	40.9289	-110.1157	63
10/15/2011	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	40.9289	-110.1157	62
7/26/2011	Uinta-Wasatch-Cache		Lop and Scatter	Rearrangement of Fuels	40.0483	-112.6231	1980
9/15/2011	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	40.2	-111.1	70.38
9/15/2011	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	40.1023	-111.14	257.3

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
9/15/2011	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	40.1023	-111.14	52.7
11/15/2011	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	41.9192	-111.461	10
11/15/2011	Uinta-Wasatch-Cache		Chipping	Chipping of Fuels	41.9192	-111.461	10
9/15/2011	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	40.2	-111.1	343.62
							127452
8/24/2012	Ashley		Lop and Scatter	Rearrangement of Fuels	40.599	-109.58	1057.32
8/24/2012	Ashley		Lop and Scatter	Rearrangement of Fuels	40.599	-109.58	544.68
9/6/2012	Ashley		Lop and Scatter	Rearrangement of Fuels	40.95	-109.47	70
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	45
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4666	-112.625	80
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.477	-112.6541	324
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Lop and Scatter	Rearrangement of Fuels	37.4608	-112.6378	45
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	8
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	16
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	21
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	22
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	35
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	52
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.477	-112.6541	324
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	300
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	17
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	35
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4666	-112.625	80
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.477	-112.6541	324
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.3001	-112.4046	16

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.3001	-112.4046	35
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.3001	-112.4046	43
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.3001	-112.4046	52
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.3001	-112.4046	56
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.3001	-112.4046	308
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	16
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	35
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	45
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4666	-112.625	80
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	35
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.3001	-112.4046	300
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.3001	-112.4046	52
10/20/2012	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.3001	-112.4046	56
4/9/2012	Dixie		Lop and Scatter	Rearrangement of Fuels	37.606	-112.3338	68
5/2/2012	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.606	-112.3338	68
5/31/2012	Dixie		Chipping	Chipping of Fuels	37.7375	-112.0752	154
5/31/2012	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.7375	-112.0752	4
5/31/2012	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.7375	-112.0752	4
8/1/2012	Dixie		Crushing	Compacting/Crushing of Fuels	37.611	-114.0391	395
8/1/2012	Dixie		Crushing	Compacting/Crushing of Fuels	37.611	-114.0391	543
8/6/2012	Dixie		Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.505	-112.703	55
8/6/2012	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.505	-112.703	55
8/6/2012	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.505	-112.703	55
8/15/2012	Dixie		Crushing	Compacting/Crushing of Fuels	37.9	-112.011	401
8/22/2012	Dixie		Crushing	Compacting/Crushing of Fuels	37.592	-113.512	614
9/24/2012	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.3771	-113.4676	40
9/24/2012	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.3771	-113.4676	40
9/26/2012	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.3771	-113.4676	10
9/26/2012	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.3771	-113.4676	10
9/27/2012	Dixie		Crushing	Compacting/Crushing of Fuels	37.611	-114.0391	1007
11/1/2012	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.627	-112.711	16
11/9/2012	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.521	-112.789	4
11/9/2012	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.521	-112.789	34
11/27/2012	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	39.96	-112.61	13

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
7/26/2012	Fishlake	DURFEY CREEK CHAINING	Lop and Scatter	Rearrangement of Fuels	38	-111	350
4/24/2012	Fishlake	EIGHT MILE	Thinning	Thinning for Hazardous Fuels Reduction	38.17	-112.15	617
3/1/2012	Fishlake	KANOSH BENCH	Thinning	Thinning for Hazardous Fuels Reduction	38.4302	-112.3251	60
7/15/2012	Fishlake		Machine Pile	Piling of Fuels, Hand or Machine	38.539	-111.9587	97
9/17/2012	Fishlake		Crushing	Compacting/Crushing of Fuels	38.4826	-111.517	4000
7/15/2012	Fishlake		Thinning	Thinning for Hazardous Fuels Reduction	38.539	-111.9587	277
9/13/2012	Fishlake		Thinning	Thinning for Hazardous Fuels Reduction	38.2208	-112.2977	990
9/13/2012	Fishlake		Thinning	Thinning for Hazardous Fuels Reduction	38.264	-112.295	706
9/19/2012	Manti-Lasal	RESILIENCY	Thinning	Thinning for Hazardous Fuels Reduction	37.743	-109.526	30
9/19/2012	Manti-Lasal	RESILIENCY	Thinning	Thinning for Hazardous Fuels Reduction	37.751	-109.534	42
12/7/2012	Manti-Lasal	RESILIENCY	Thinning	Thinning for Hazardous Fuels Reduction	37.763	-109.556	242
9/19/2012	Manti-Lasal	RESILIENCY	Thinning	Thinning for Hazardous Fuels Reduction	37.749	-109.531	78
12/7/2012	Manti-Lasal	RESILIENCY	Thinning	Thinning for Hazardous Fuels Reduction	37.732	-109.528	229
12/6/2012	Manti-Lasal	RESILIENCY	Thinning	Thinning for Hazardous Fuels Reduction	37.745	-109.513	412
9/19/2012	Manti-Lasal	RESILIENCY	Thinning	Thinning for Hazardous Fuels Reduction	37.756	-109.534	55
9/19/2012	Manti-Lasal	RESILIENCY	Thinning	Thinning for Hazardous Fuels Reduction	37.744	-109.53	40
9/19/2012	Manti-Lasal	RESILIENCY	Thinning	Thinning for Hazardous Fuels Reduction	37.753	-109.53	24
9/15/2012	Manti-Lasal	RESILIENCY	Thinning	Thinning for Hazardous Fuels Reduction	39.928	-111.371	1000
9/19/2012	Manti-Lasal	RESILIENCY	Thinning	Thinning for Hazardous Fuels Reduction	37.756	-109.531	53
9/11/2012	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	39.821	-111.472	93
9/6/2012	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	39.859	-111.498	246
9/1/2012	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	39.853	-111.486	85
9/1/2012	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	38.999	-111.335	3716
9/1/2012	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	37.74	-109.55	196
9/20/2012	Manti-Lasal		Thinning	Thinning for Hazardous Fuels Reduction	38.594	-109.249	363
9/20/2012	Manti-Lasal		Machine Pile	Piling of Fuels, Hand or Machine	38.594	-109.249	363
9/19/2012	Manti-Lasal		Thinning	Thinning for Hazardous Fuels Reduction	37.748	-109.528	19
6/28/2012	Uinta-Wasatch-Cache	RECOVERY	Thinning	Thinning for Hazardous Fuels Reduction	40.4864	-111.0837	90
9/21/2012	Uinta-Wasatch-Cache	RECOVERY,HOLIDAY PARK/SOUTH FORK WEBER	Thinning	Thinning for Hazardous Fuels Reduction	40.7704	-110.9949	60

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
6/28/2012	Uinta-Wasatch-Cache	RESILIENCY,SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.5738	-111.0452	95
9/15/2012	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	41.0329	-110.3652	49
9/15/2012	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	41.0048	-110.5843	8
9/15/2012	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.9875	-110.3855	13
9/15/2012	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.9652	-110.3894	18
9/15/2012	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.9554	-110.3973	11
9/15/2012	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.9526	-110.3943	19
9/15/2012	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.9221	-110.401	15
9/15/2012	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.9221	-110.401	3
7/15/2012	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.7474	-110.8738	170
1/20/2012	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.6293	-111.1732	12
9/15/2012	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.9247	-110.125	20
9/19/2012	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	40.0146	-112.3318	566
9/19/2012	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	39.9567	-112.5875	620
8/30/2012	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	41.5789	-111.3871	1365
8/15/2012	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	40.0142	-112.3326	1123
3/30/2012	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	40.0029	-112.332	127

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
2/10/2012	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	39.966	-112.3233	30
9/19/2012	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	39.9567	-112.5875	1200
							28116
9/13/2013	Ashley		Lop and Scatter	Rearrangement of Fuels	39.907	-110.43	674
6/20/2013	Ashley		Thinning	Thinning for Hazardous Fuels Reduction	40.543	-110.642	128
9/23/2013	Ashley		Lop and Scatter	Rearrangement of Fuels	39.909	-110.406	832
10/1/2013	Ashley		Machine Pile	Piling of Fuels, Hand or Machine	40.543	-110.642	128
10/1/2013	Ashley		Machine Pile	Piling of Fuels, Hand or Machine	40.896	-109.444	51
10/1/2013	Ashley		Machine Pile	Piling of Fuels, Hand or Machine	40.897	-109.458	27
10/1/2013	Ashley		Machine Pile	Piling of Fuels, Hand or Machine	40.898	-109.451	60
10/1/2013	Ashley		Machine Pile	Piling of Fuels, Hand or Machine	40.909	-109.432	36
10/1/2013	Ashley		Machine Pile	Piling of Fuels, Hand or Machine	40.909	-109.428	72
10/1/2013	Ashley		Machine Pile	Piling of Fuels, Hand or Machine	40.91	-109.404	108
10/1/2013	Ashley		Machine Pile	Piling of Fuels, Hand or Machine	40.914	-109.402	52
10/1/2013	Ashley		Machine Pile	Piling of Fuels, Hand or Machine	40.915	-109.409	8
10/1/2013	Ashley		Machine Pile	Piling of Fuels, Hand or Machine	40.916	-109.417	15
10/22/2013	Ashley		Chipping	Chipping of Fuels	40.837	-110.001	2
10/22/2013	Ashley		Chipping	Chipping of Fuels	40.837	-110.001	3
6/13/2013	Ashley		Thinning	Thinning for Hazardous Fuels Reduction	40.896	-109.444	51
6/13/2013	Ashley		Thinning	Thinning for Hazardous Fuels Reduction	40.897	-109.458	27
6/13/2013	Ashley		Thinning	Thinning for Hazardous Fuels Reduction	40.898	-109.451	60
6/13/2013	Ashley		Thinning	Thinning for Hazardous Fuels Reduction	40.909	-109.432	36
6/13/2013	Ashley		Thinning	Thinning for Hazardous Fuels Reduction	40.909	-109.428	72
6/13/2013	Ashley		Thinning	Thinning for Hazardous Fuels Reduction	40.91	-109.404	108
6/13/2013	Ashley		Thinning	Thinning for Hazardous Fuels Reduction	40.914	-109.402	52
6/13/2013	Ashley		Thinning	Thinning for Hazardous Fuels Reduction	40.915	-109.409	8
6/13/2013	Ashley		Thinning	Thinning for Hazardous Fuels Reduction	40.916	-109.417	15
6/20/2013	Ashley		Lop and Scatter	Rearrangement of Fuels	39.937	-110.44	114
6/20/2013	Ashley		Lop and Scatter	Rearrangement of Fuels	39.937	-110.417	788
6/20/2013	Ashley		Lop and Scatter	Rearrangement of Fuels	40.547	-110.677	140
9/16/2013	Ashley		Lop and Scatter	Rearrangement of Fuels	40.54	-110.64	510
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	78
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	47
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	129
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4666	-112.625	27

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4666	-112.625	34
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4666	-112.625	38
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4666	-112.625	41
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4666	-112.625	63
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4666	-112.625	298
4/15/2013	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4666	-112.625	40
4/15/2013	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4666	-112.625	345
4/15/2013	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4666	-112.625	40
4/15/2013	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4666	-112.625	47
4/15/2013	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4666	-112.625	345
4/15/2013	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4666	-112.625	40
4/15/2013	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4666	-112.625	392
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	104
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.477	-112.6541	26
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4666	-112.625	276
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4666	-112.625	41
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4666	-112.625	38
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4666	-112.625	35
8/1/2013	Dixie	D2 DUCK CREEK FUELS	Lop and Scatter	Rearrangement of Fuels	37.4608	-112.6378	19
8/1/2013	Dixie	D2 DUCK CREEK FUELS	Lop and Scatter	Rearrangement of Fuels	37.4608	-112.6378	41
8/1/2013	Dixie	D2 DUCK CREEK FUELS	Lop and Scatter	Rearrangement of Fuels	37.4608	-112.6378	97
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	47
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	78
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	104
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	107

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4666	-112.625	27
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4666	-112.625	28
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4666	-112.625	38
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4666	-112.625	41
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4666	-112.625	276
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.477	-112.6541	26
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	22
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	47
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	78
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	104
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4608	-112.6378	107
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4666	-112.625	22
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4666	-112.625	27
9/11/2013	Dixie	D2 DUCK CREEK FUELS	Machine Pile	Piling of Fuels, Hand or Machine	37.4666	-112.625	28
7/31/2013	Dixie	D3 SIELER SPA	Thinning	Thinning for Hazardous Fuels Reduction	37.6099	-112.2593	600
7/31/2013	Dixie	D3 SIELER SPA	Thinning	Thinning for Hazardous Fuels Reduction	37.6099	-112.2593	181
7/31/2013	Dixie	D3 SIELER SPA	Thinning	Thinning for Hazardous Fuels Reduction	37.5653	-112.2744	411
7/31/2013	Dixie	D3 SIELER SPA	Thinning	Thinning for Hazardous Fuels Reduction	37.4533	-112.2853	247
7/31/2013	Dixie	D3 SIELER SPA	Machine Pile	Piling of Fuels, Hand or Machine	37.5895	-112.277	476
7/31/2013	Dixie	D3 SIELER SPA	Machine Pile	Piling of Fuels, Hand or Machine	37.4599	-112.314	99
9/24/2013	Dixie		Crushing	Compacting/Crushing of Fuels	37.9	-112.011	1068
9/25/2013	Dixie		Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.9203	-111.8718	815
9/25/2013	Dixie		Crushing	Compacting/Crushing of Fuels	37.539	-113.759	107
9/30/2013	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.3771	-113.4676	40
9/30/2013	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.3771	-113.4676	40
10/3/2013	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.6719	-112.6738	63
6/27/2013	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.572	-113.656	55
8/1/2013	Dixie		Crushing	Compacting/Crushing of Fuels	37.534	-113.636	729
9/2/2013	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.6099	-112.2593	420
11/5/2013	Fishlake		Thinning	Thinning for Hazardous Fuels Reduction	38.7224	-111.8385	69
5/13/2013	Fishlake		Thinning	Thinning for Hazardous Fuels	38.17	-112.15	1277

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
				Reduction			
7/16/2013	Fishlake		Thinning	Thinning for Hazardous Fuels Reduction	38.264	-112.295	581
7/16/2013	Fishlake		Thinning	Thinning for Hazardous Fuels Reduction	38.244	-112.361	567
5/13/2013	Fishlake		Thinning	Thinning for Hazardous Fuels Reduction	38.4302	-112.3251	299
8/30/2013	Manti-Lasal	BUCKEYE HAZARD FUELS	Lop and Scatter	Rearrangement of Fuels	38.44	-109.036	30
8/30/2013	Manti-Lasal	BUCKEYE HAZARD FUELS	Lop and Scatter	Rearrangement of Fuels	38.437	-109.038	49
8/30/2013	Manti-Lasal	BUCKEYE HAZARD FUELS	Lop and Scatter	Rearrangement of Fuels	38.437	-109.038	36
9/15/2013	Manti-Lasal	RESILIENCY	Lop and Scatter	Rearrangement of Fuels	39.891	-111.534	7
9/15/2013	Manti-Lasal	RESILIENCY	Lop and Scatter	Rearrangement of Fuels	39.894	-111.534	24
9/15/2013	Manti-Lasal	RESILIENCY	Lop and Scatter	Rearrangement of Fuels	39.867	-111.507	50
9/15/2013	Manti-Lasal	RESILIENCY	Thinning	Thinning for Hazardous Fuels Reduction	39.919	-111.367	1000
9/15/2013	Manti-Lasal	RESILIENCY	Thinning	Thinning for Hazardous Fuels Reduction	39.939	-111.366	459
9/27/2013	Manti-Lasal	RESILIENCY	Thinning	Thinning for Hazardous Fuels Reduction	38.607	-109.229	584
9/15/2013	Manti-Lasal	RESILIENCY	Lop and Scatter	Rearrangement of Fuels	39.877	-111.536	223
9/15/2013	Manti-Lasal	RESILIENCY	Lop and Scatter	Rearrangement of Fuels	39.891	-111.536	23
9/15/2013	Manti-Lasal	RESILIENCY	Lop and Scatter	Rearrangement of Fuels	39.877	-111.531	8
9/15/2013	Manti-Lasal	RESILIENCY	Lop and Scatter	Rearrangement of Fuels	39.875	-111.523	6
9/15/2013	Manti-Lasal	RESILIENCY	Lop and Scatter	Rearrangement of Fuels	39.898	-111.535	11
10/15/2013	Manti-Lasal		Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	39.526	-111.254	10
9/15/2013	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	39.887	-111.523	803
9/15/2013	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	39.886	-111.537	18
9/15/2013	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	39.878	-111.512	2
9/15/2013	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	39.877	-111.534	4
9/15/2013	Manti-Lasal		Lop and Scatter	Rearrangement of Fuels	39.874	-111.524	20
9/15/2013	Manti-Lasal		Chipping	Chipping of Fuels	39.838	-111.48	1572
10/15/2013	Manti-Lasal		Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	39.508	-111.25	10
12/10/2013	Uinta-Wasatch-Cache	RECOVERY	Machine Pile	Piling of Fuels, Hand or Machine	40.4864	-111.0837	90
11/15/2013	Uinta-Wasatch-Cache	RESILIENCY	Machine Pile	Piling of Fuels, Hand or Machine	40.5784	-111.0268	35

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
11/15/2013	Uinta-Wasatch-Cache	RESILIENCY,SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.9399	-110.6097	50
11/15/2013	Uinta-Wasatch-Cache	RESILIENCY,SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.7685	-111.1071	20
11/30/2013	Uinta-Wasatch-Cache	RESILIENCY,SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.6186	-111.136	26
11/15/2013	Uinta-Wasatch-Cache	RESILIENCY,SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.5993	-111.1162	61
11/15/2013	Uinta-Wasatch-Cache	RESILIENCY,SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.5784	-111.0268	35
9/20/2013	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	40.9362	-110.1422	694
12/6/2013	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	41.1767	-111.9292	5
11/30/2013	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	41.2779	-111.8218	50
11/30/2013	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	40.497	-112.5727	5
9/10/2013	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	40.2	-111.1	225
10/20/2013	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	41.6297	-111.6843	600
11/30/2013	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	39.9861	-111.3749	450
11/6/2013	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	39.9728	-112.4197	166
11/15/2013	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	41.9192	-111.461	10
11/15/2013	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	40.5921	-110.9844	30
11/15/2013	Uinta-Wasatch-Cache		Machine Pile	Piling of Fuels, Hand or Machine	40.5921	-110.9844	30
11/30/2013	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	41.2508	-111.8196	150

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
							23890
8/28/2014	Ashley		Lop and Scatter	Rearrangement of Fuels	39.925	-110.44	1578
7/23/2014	Ashley		Lop and Scatter	Rearrangement of Fuels	40.544	-110.658	10
10/16/2014	Ashley		Lop and Scatter	Rearrangement of Fuels	40.537	-110.62	100
4/3/2014	Dixie	D1 CHAINING FUELS REDUCTION	Crushing	Compacting/Crushing of Fuels	37.539	-113.759	954
9/15/2014	Dixie	D3 LEFT FORK SPA	Machine Pile	Piling of Fuels, Hand or Machine	37.4637	-112.3748	50.44
9/15/2014	Dixie	D3 LEFT FORK SPA	Thinning	Thinning for Hazardous Fuels Reduction	37.4637	-112.3748	101.52
9/15/2014	Dixie	D3 LEFT FORK SPA	Thinning	Thinning for Hazardous Fuels Reduction	37.4637	-112.3748	180.48
9/20/2014	Dixie	D3 LEFT FORK SPA	Thinning	Thinning for Hazardous Fuels Reduction	37.6099	-112.2593	232.92
9/15/2014	Dixie	D3 LEFT FORK SPA	Machine Pile	Piling of Fuels, Hand or Machine	37.4637	-112.3748	46.56
9/20/2014	Dixie	D3 LEFT FORK SPA	Thinning	Thinning for Hazardous Fuels Reduction	37.6099	-112.2593	414.08
9/15/2014	Dixie	D3 LEFT FORK SPA	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4649	-112.3721	189
9/15/2014	Dixie	D3 LEFT FORK SPA	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4637	-112.3748	59
9/15/2014	Dixie	D3 LEFT FORK SPA	Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4656	-112.3713	82
11/25/2014	Dixie		Chipping	Chipping of Fuels	37.516	-112.699	1
11/25/2014	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.516	-112.699	5
4/8/2014	Dixie		Chipping	Chipping of Fuels	37.8539	-112.1246	796
6/3/2014	Dixie		Chipping	Chipping of Fuels	37.8254	-112.0642	502
7/22/2014	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.572	-113.656	19
7/29/2014	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.7927	-112.2362	194
7/29/2014	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.7927	-112.2362	194
8/6/2014	Dixie		Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	43
8/6/2014	Dixie		Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	61
8/6/2014	Dixie		Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4608	-112.6378	79
8/6/2014	Dixie		Biomass Removal	Yarding - Removal of Fuels by Carrying or Dragging	37.4666	-112.625	80
8/6/2014	Dixie		Lop and Scatter	Rearrangement of Fuels	37.4608	-112.6378	43
8/6/2014	Dixie		Lop and Scatter	Rearrangement of Fuels	37.4608	-112.6378	52
8/6/2014	Dixie		Lop and Scatter	Rearrangement of Fuels	37.4608	-112.6378	61
8/6/2014	Dixie		Lop and Scatter	Rearrangement of Fuels	37.4608	-112.6378	79
8/6/2014	Dixie		Machine Pile	Piling of Fuels, Hand or Machine	37.4666	-112.625	80
8/6/2014	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	43
8/6/2014	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	61
8/6/2014	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	75
8/6/2014	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.4608	-112.6378	79
8/6/2014	Dixie		Thinning	Thinning for Hazardous Fuels Reduction	37.4666	-112.625	80
9/24/2014	Dixie		Crushing	Compacting/Crushing of Fuels	37.534	-113.636	64
9/24/2014	Dixie		Crushing	Compacting/Crushing of Fuels	37.539	-113.759	1875

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
9/24/2014	Dixie		Crushing	Compacting/Crushing of Fuels	37.592	-113.512	71
5/15/2014	Fishlake	EIGHT MILE	Thinning	Thinning for Hazardous Fuels Reduction	38.17	-112.15	511
7/14/2014	Fishlake		Machine Pile	Piling of Fuels, Hand or Machine	38.5148	-112.0425	272
7/17/2014	Fishlake		Machine Pile	Piling of Fuels, Hand or Machine	38.539	-111.9587	206
5/12/2014	Fishlake		Thinning	Thinning for Hazardous Fuels Reduction	38.7578	-112.4499	844
7/30/2014	Fishlake		Thinning	Thinning for Hazardous Fuels Reduction	38.1632	-112.3442	290
7/30/2014	Fishlake		Thinning	Thinning for Hazardous Fuels Reduction	38.2853	-112.5506	710
3/22/2014	Fishlake		Thinning	Thinning for Hazardous Fuels Reduction	38.9521	-111.7521	106
9/15/2014	Fishlake		Crushing	Compacting/Crushing of Fuels	38.4826	-111.517	214
10/30/2014	Manti-Lasal	FUELS MECHANICAL TREATMENT	Chipping	Chipping of Fuels	39.284	-111.297	152
10/30/2014	Manti-Lasal	FUELS MECHANICAL TREATMENT	Chipping	Chipping of Fuels	39.282	-111.303	223
10/30/2014	Manti-Lasal	FUELS MECHANICAL TREATMENT	Chipping	Chipping of Fuels	39.277	-111.303	123
10/30/2014	Manti-Lasal	FUELS MECHANICAL TREATMENT	Chipping	Chipping of Fuels	39.281	-111.291	186
10/30/2014	Manti-Lasal	FUELS MECHANICAL TREATMENT	Chipping	Chipping of Fuels	39.3	-111.307	374
10/30/2014	Manti-Lasal	FUELS MECHANICAL TREATMENT	Chipping	Chipping of Fuels	39.315	-111.276	147
10/30/2014	Manti-Lasal	FUELS MECHANICAL TREATMENT	Chipping	Chipping of Fuels	39.309	-111.31	345
10/30/2014	Manti-Lasal	FUELS MECHANICAL TREATMENT	Chipping	Chipping of Fuels	39.303	-111.327	145
10/30/2014	Manti-Lasal	FUELS MECHANICAL TREATMENT	Chipping	Chipping of Fuels	39.282	-111.31	126
9/23/2014	Manti-Lasal	RESILIENCY	Chipping	Chipping of Fuels	38.61	-109.206	125
9/23/2014	Manti-Lasal	RESILIENCY	Chipping	Chipping of Fuels	38.6003	-109.2546	18
8/19/2014	Manti-Lasal	RESILIENCY	Chipping	Chipping of Fuels	37.744	-109.543	879
8/27/2014	Manti-Lasal	RESILIENCY	Machine Pile	Piling of Fuels, Hand or Machine	37.735	-109.522	49
8/15/2014	Manti-Lasal	RESILIENCY	Chipping	Chipping of Fuels	38.368	-109.25	53
9/23/2014	Manti-Lasal	RESILIENCY	Chipping	Chipping of Fuels	38.6126	-109.2363	404
9/23/2014	Manti-Lasal	RESILIENCY	Chipping	Chipping of Fuels	38.5923	-109.2529	14
9/23/2014	Manti-Lasal	RESILIENCY	Chipping	Chipping of Fuels	38.593	-109.2422	10
8/15/2014	Manti-Lasal	RESILIENCY	Lop and Scatter	Rearrangement of Fuels	39.875	-111.513	96
6/1/2014	Uinta-Wasatch-Cache	RESILIENCY	Machine Pile	Piling of Fuels, Hand or Machine	40.5738	-111.0452	95
9/26/2014	Uinta-Wasatch-Cache	RESILIENCY	Machine Pile	Piling of Fuels, Hand or Machine	40.9652	-110.3894	18

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
9/26/2014	Uinta-Wasatch-Cache	RESILIENCY	Machine Pile	Piling of Fuels, Hand or Machine	40.6806	-110.9332	15.5
9/26/2014	Uinta-Wasatch-Cache	RESILIENCY	Machine Pile	Piling of Fuels, Hand or Machine	40.9399	-110.6097	50
9/26/2014	Uinta-Wasatch-Cache	RESILIENCY,SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.6806	-110.9332	15.5
9/15/2014	Uinta-Wasatch-Cache	RESILIENCY,SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.911	-110.8217	225
9/26/2014	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.4864	-111.0837	90
11/7/2014	Uinta-Wasatch-Cache	SAFETY	Machine Pile	Piling of Fuels, Hand or Machine	40.7408	-111.0989	7
11/7/2014	Uinta-Wasatch-Cache	SAFETY	Thinning	Thinning for Hazardous Fuels Reduction	40.7408	-111.0989	7
4/15/2014	Uinta-Wasatch-Cache		Machine Pile	Piling of Fuels, Hand or Machine	40.497	-112.5727	5
8/29/2014	Uinta-Wasatch-Cache		Machine Pile	Piling of Fuels, Hand or Machine	40.4531	-111.6613	3
8/29/2014	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	40.4531	-111.6613	3
11/7/2014	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	39.843	-111.7209	3
9/19/2014	Uinta-Wasatch-Cache		Chipping	Chipping of Fuels	40.6476	-111.6395	10
9/19/2014	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	40.6476	-111.6395	10
4/15/2014	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	39.7685	-111.714	20
4/21/2014	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	39.9759	-112.414	1517
4/21/2014	Uinta-Wasatch-Cache		Thinning	Thinning for Hazardous Fuels Reduction	39.9812	-112.5799	192
6/13/2014	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	39.9501	-111.1906	741

DATE	FOREST	PROJECT NAME	TREATMENT TYPE	ACTIVITY DESCRIPTIPTION	LATITUDE	LONGITUDE	ACRES
5/9/2014	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	39.9501	-111.1906	540
5/9/2014	Uinta-Wasatch-Cache		Crushing	Compacting/Crushing of Fuels	39.9501	-111.1906	290
							19114

Utah Division of Forestry, Fire, and State Lands[1]

	Project Name	Treatment Kind	Treatment Type	Latitude	Longitude	Acres
2010						
UDFFSL	Bluff Fuelbreak	Mechanical	Mastication	37.2830406	-109.5556717	30
UDFFSL	Uintah Highlands	Mechanical	Chipping	41.1482188	-111.9170505	11
UDFFSL	Boulder	Mechanical	Mastication	37.9083177	-111.4229508	16
UDFFSL	Leeds	Mechanical	Thinning	37.2372905	-113.3617338	25
UDFFSL	Leeds	Mechanical	Hand Pile	37.2372905	-113.3617338	25
UDFFSL	Washington City	Mechanical	Thinning	37.126	-113.5026702	10
UDFFSL	Washington City	Mechanical	Hand Pile	37.126	-113.5026702	10
UDFFSL	Northelk	Mechanical	Mastication			29
UDFFSL	Northelk	Mechanical	Thinning			17
UDFFSL	Northelk	Mechanical	Hand Pile			17
UDFFSL	Comstock/Farwest	Mechanical	Thinning	37.6076036	-113.3586313	47
UDFFSL	Cornstock/Farwest	Mechanical	Chipping	37.6076036	-113.3586313	47
UDFFSL	Bumble Bee	Mechanical	Thinning	37.5203525	-113.2198788	47
UDFFSL	Bumble Bee	Mechanical	Hand Pile	37.5203525	-113.2198788	47
UDFFSL	Interstate	Mechanical	Thinning			24
UDFFSL	Interstate	Mechanical	Chipping			24
UDFFSL	Washington	Mechanical	Thinning	37.126	-113.5026702	3
UDFFSL	Quichapa	Mechanical	Thinning	37.6445494	-113.6874227	19
UDFFSL	Quichapa	Mechanical	Hand Pile	37.6445494	-113.6874227	19
UDFFSL	Quichapa	Mechanical	Mastication	37.6445494	-113.6874227	137
UDFFSL	Hi/Lo	Mechanical	Thinning	38.2545111	-112.4839286	3
UDFFSL	Hi/Lo	Mechanical	Hand Pile	38.2545111	-112.4839286	3
UDFFSL	Panguitch	Mechanical	Thinning	37.8227591	-112.4357611	10
UDFFSL	Panguitch	Mechanical	Hand Pile	37.8227591	-112.4357611	10
UDFFSL	Cedar Mountain	Mechanical	Thinning			13
UDFFSL	Cedar Mountain	Mechanical	Hand Pile			13
UDFFSL	Parowan Front	Mechanical	Thinning	37.8450505	-112.828278	5
UDFFSL	Parowan Front	Mechanical	Hand Pile	37.8450505	-112.828278	5
UDFFSL	Cedar Highlands	Mechanical	Thinning	37.6366727	-113.041798	6
UDFFSL	Cedar Highlands	Mechanical	Hand Pile	37.6366727	-113.041798	6
UDFFSL	Kolob Terrace	Mechanical	Mastication			5
UDFFSL	East Zion	Mechanical	Thinning	37.3059052	-112.862178	11
UDFFSL	East Zion	Mechanical	Hand Pile	37.3059052	-112.862178	11
UDFFSL	Mountain Center	Mechanical	Mastication			47

[1] Data compiled for 2010 and 2014, raw data are available for 2011-2013 upon request.

	Project Name	Treatment Kind	Treatment Type	Latitude	Longitude	Acres
UDFFSL	Mountain Center	Mechanical	Thinning			39
UDFFSL	Mountain Center	Mechanical	Hand Pile			49
UDFFSL	Kolob Terrace	Mechanical	Thinning	37.5789213	-113.037488	1
UDFFSL	Kolob Terrace	Mechanical	Hand Pile	37.5789213	-113.037488	1
UDFFSL	Kolob Terrace	Mechanical	Chipping	37.5789213	-113.037488	4
UDFFSL	Bryce Woodlands	Mechanical	Mastication	37.535193	-112.4141247	20
UDFFSL	Deer Springs	Mechanical	Thinning	37.3426141	-112.2231413	3
UDFFSL	Deer Springs	Mechanical	Hand Pile	37.3426141	-112.2231413	3
UDFFSL	Duck Creek	Mechanical	Thinning	37.5266608	-112.6718311	3
UDFFSL	The Colony	Mechanical	Thinning	40.6663613	-111.5682153	11
UDFFSL	The Colony	Mechanical	Hand Pile	40.6663613	-111.5682153	11
UDFFSL	The Colony	Mechanical	Chipping	40.6663613	-111.5682153	11
UDFFSL	Holden	Mechanical	Thinning	39.0996	-112.2702	5
UDFFSL	Holden	Mechanical	Hand Pile	39.0996	-112.2702	5
UDFFSL	Holden	Mechanical	Chipping	39.0996	-112.2702	5
UDFFSL	Clear Creek	Mechanical	Thinning			20
UDFFSL	Clear Creek	Mechanical	Hand Pile			20
UDFFSL	Clear Creek	Mechanical	Chipping			20
UDFFSL	Mountain Dell	Mechanical	Mastication			52
UDFFSL	PineMountain	Mechanical	Thinning	39.4679947	-111.4213347	29
UDFFSL	PineMountain	Mechanical	Hand Pile	39.4679947	-111.4213347	29
UDFFSL	PineMountain	Mechanical	Chipping	39.4679947	-111.4213347	29
UDFFSL	Gooseberry	Mechanical	Thinning	39.319675	-111.4863361	12
UDFFSL	Gooseberry	Mechanical	Hand Pile	39.319675	-111.4863361	12
UDFFSL	Gooseberry	Mechanical	Chipping	39.319675	-111.4863361	12
UDFFSL	Skyline Mountain Resort	Mechanical	Thinning	39.604715	-111.3874608	20
UDFFSL	Skyline Mountain Resort	Mechanical	Hand Pile	39.604715	-111.3874608	20
UDFFSL	Skyline Mountain Resort	Mechanical	Chipping	39.604715	-111.3874608	20
UDFFSL	Monroe Mountain	Mechanical	Thinning			21
UDFFSL	Monroe Mountain	Mechanical	Hand Pile			21
UDFFSL	Monroe Mountain	Mechanical	Chipping			21
UDFFSL	Frampton Heights	Mechanical	Mastication			30
UDFFSL	Frampton Heights	Mechanical	Thinning			8
UDFFSL	Frampton Heights	Mechanical	Hand Pile			8
UDFFSL	Frampton Heights	Mechanical	Chipping			8
UDFFSL	Accord Lake	Mechanical	Thinning	38.9167608	-111.4847111	26
UDFFSL	Accord Lake	Mechanical	Hand Pile	38.9167608	-111.4847111	26
UDFFSL	Accord Lake	Mechanical	Chipping	38.9167608	-111.4847111	26
UDFFSL	Central Wayne Co	Mechanical	Thinning			18
UDFFSL	Central Wayne Co	Mechanical	Hand Pile			18
UDFFSL	Central Wayne Co	Mechanical	Chipping			18
UDFFSL	Fruitland	Mechanical	Thinning	40.2069358	-110.8242019	9
UDFFSL	Fruitland	Mechanical	Hand Pile	40.2069358	-110.8242019	9
UDFFSL	Fruitland	Mechanical	Chipping	40.2069358	-110.8242019	9
UDFFSL	Moose Hollow	Mechanical				2
UDFFSL	Samak	Mechanical	Thinning	40.6258325	-111.2361114	1
UDFFSL	Samak	Mechanical	Hand Pile	40.6258325	-111.2361114	1

	Project Name	Treatment Kind	Treatment Type	Latitude	Longitude	Acres
UDFFSL	Samak	Mechanical	Chipping	40.6258325	-111.2361114	1
UDFFSL	Oak Haven	Mechanical	Thinning	40.5301586	-111.5088642	8
UDFFSL	Oak Haven	Mechanical	Hand Pile	40.5301586	-111.5088642	8
UDFFSL	Oak Haven	Mechanical	Chipping	40.5301586	-111.5088642	8
UDFFSL	Argyle	Mechanical	Thinning	39.8819441	-110.7008325	50
UDFFSL	Argyle	Mechanical	Hand Pile	39.8819441	-110.7008325	50
UDFFSL	Argyle	Mechanical	Chipping	39.8819441	-110.7008325	50
UDFFSL	BCC	Mechanical	Thinning			27
UDFFSL	BCC	Mechanical	Hand Pile			27
UDFFSL	BCC	Mechanical	Chipping			27
UDFFSL	Sundance	Mechanical	Thinning	40.3977147	-111.5930177	30
UDFFSL	Sundance	Mechanical	Hand Pile	40.3977147	-111.5930177	30
UDFFSL	Sundance	Mechanical	Chipping	40.3977147	-111.5930177	40
UDFFSL	Longs Ridge	Mechanical	Thinning			20
UDFFSL	Longs Ridge	Mechanical	Chipping			20
UDFFSL	Oquirrah Mountain	Mechanical	Thinning	40.3281119	-112.1090177	5
UDFFSL	Oquirrah Mountain	Mechanical	Chipping	40.3281119	-112.1090177	5
UDFFSL	Lamb's Canyon	Mechanical	Thinning			35
UDFFSL	Lamb's Canyon	Mechanical	Hand Pile			35
UDFFSL	Lamb's Canyon	Mechanical	Chipping			35
UDFFSL	Spring Glen	Mechanical	Thinning	39.6580064	-110.8503861	2
UDFFSL	Spring Glen	Mechanical	Hand Pile	39.6580064	-110.8503861	2
UDFFSL	Scofield Mountain Homes	Mechanical	Thinning	39.7586078	-111.1753542	10
UDFFSL	Scofield Mountain Homes	Mechanical	Hand Pile	39.7586078	-111.1753542	10
UDFFSL	Scofield Mountain Homes	Mechanical	Chipping	39.7586078	-111.1753542	8
UDFFSL	Pack Creek	Mechanical	Thinning	38.4394431	-109.3641631	5
UDFFSL	Pack Creek	Mechanical	Hand Pile	38.4394431	-109.3641631	5
UDFFSL	Pack Creek	Mechanical	Chipping	38.4394431	-109.3641631	5
UDFFSL	Blanding	Mechanical	Thinning	37.6165014	-109.4811669	5
UDFFSL	Blanding	Mechanical	Hand Pile	37.6165014	-109.4811669	5
UDFFSL	Blue Mountain	Mechanical	Mastication	37.7873333	-109.4154997	15
UDFFSL	Blue Mountain	Mechanical	Thinning	37.7873333	-109.4154997	31
UDFFSL	Blue Mountain	Mechanical	Hand Pile	37.7873333	-109.4154997	31
UDFFSL	Blue Mountain	Mechanical	Chipping	37.7873333	-109.4154997	31
UDFFSL	Wray Mesa	Mechanical	Thinning	38.3403347	-109.1601694	1
UDFFSL	Wray Mesa	Mechanical	Hand Pile	38.3403347	-109.1601694	1
UDFFSL	Wray Mesa	Mechanical	Chipping	38.3403347	-109.1601694	1
UDFFSL	Canyon Terrace	Mechanical	Thinning	37.7351752	-109.3737683	3
UDFFSL	Canyon Terrace	Mechanical	Hand Pile	37.7351752	-109.3737683	3
UDFFSL	Canyon Terrace	Mechanical	Chipping	37.7351752	-109.3737683	3
UDFFSL	Eastland	Mechanical	Thinning	37.8032306	-109.13623	28
UDFFSL	Eastland	Mechanical	Hand Pile	37.8032306	-109.13623	28
UDFFSL	Eastland	Mechanical	Chipping	37.8032306	-109.13623	28
UDFFSL	Strongs Peak	Mechanical	Thinning	41.188739	-111.936642	7
UDFFSL	Strongs Peak	Mechanical	Chipping	41.188739	-111.936642	7
						2,284.00

	Project Name	Treatment Kind	Treatment Type	Latitude	Longitude	Acres
2014						
UDFFSL	Pine Mountain Fuel Break	Mechanical	Thinning	39.4679947	-111.4213347	62
UDFFSL	Pine Mountain Fuel Break	Mechanical	Hand Pile	39.4679947	-111.4213347	62
UDFFSL	Pine Mountain Fuel Break	Mechanical	Chipping			12
UDFFSL	Wayne County	Mechanical	Thinning			4.75
UDFFSL	Wayne County	Mechanical	Hand Pile			4.75
UDFFSL	Kjar Break	Mechanical	Thinning			14
UDFFSL	Kjar Break	Mechanical	Hand Pile			14
UDFFSL	BSA camp	Mechanical	Thinning			18
UDFFSL	BSA camp	Mechanical	Hand Pile			18
UDFFSL	BSA camp	Mechanical	C			18
UDFFSL	Aspen Hills	Mechanical	Thinning	39.5716672	-111.3700025	12
UDFFSL	Aspen Hills	Mechanical	Hand Pile	39.5716672	-111.3700025	12
UDFFSL	Aspen Hills	Mechanical	Chipping	39.5716672	-111.3700025	12
UDFFSL	Aspen Hills	Mechanical	Mastication	39.5716672	-111.3700025	61
UDFFSL	Aspen Hills	Other	Seeding	39.5716672	-111.3700025	280
UDFFSL	Gooseberry	Mechanical	Thinning	39.319675	-111.4863361	5
UDFFSL	Gooseberry	Mechanical	Hand Pile	39.319675	-111.4863361	5
UDFFSL	Gooseberry	Mechanical	Chipping	39.319675	-111.4863361	5
UDFFSL	Mountain Dell	Mechanical	Mastication			40
UDFFSL	Mountain Dell	Mechanical	Thinning			13
UDFFSL	Mountain Dell	Mechanical	Hand Pile			13
UDFFSL	Mountain Dell	Mechanical	Chipping			13
UDFFSL	Monroe/Cove	Mechanical	Mastication	38.6242736	-112.1120627	5
UDFFSL	Monroe/Cove	Mechanical	Thinning	38.6242736	-112.1120627	10
UDFFSL	Monroe/Cove	Mechanical	Hand Pile	38.6242736	-112.1120627	10
UDFFSL	Monroe/Cove	Mechanical	Chipping	38.6242736	-112.1120627	10
UDFFSL	Hideaway Valley	Other	Seeding	39.7581891	-111.4479619	758
UDFFSL	Holiday Oaks	Mechanical	Chaining	39.6837222	-111.7060027	40
UDFFSL	Holiday Oaks	Mechanical	Thinning	39.6837222	-111.7060027	23
UDFFSL	Holiday Oaks	Mechanical	Hand Pile	39.6837222	-111.7060027	23
UDFFSL	Holiday Oaks	Mechanical	Chipping	39.6837222	-111.7060027	23
UDFFSL	Fairview Heights	Mechanical	Mastication	39.648333	-111.3100005	91
UDFFSL	Fairview Heights	Other	Seeding	39.648333	-111.3100005	200
UDFFSL	Bald Mountain	Mechanical	Mastication			10
UDFFSL	Leeds	Mechanical	Thinning	37.2372905	-113.3617338	9
UDFFSL	Leeds	Mechanical	Hand Pile	37.2372905	-113.3617338	9
UDFFSL	Leeds	Mechanical	Chipping	37.2372905	-113.3617338	9
UDFFSL	Bumblebee	Mechanical	Thinning	37.5203525	-113.2198788	23
UDFFSL	Bumblebee	Mechanical	Hand Pile	37.5203525	-113.2198788	23
UDFFSL	Hamblin Valley	Mechanical	Thinning	37.9984672	-113.9694988	9
UDFFSL	Hamblin Valley	Mechanical	Hand Pile	37.9984672	-113.9694988	9
UDFFSL	New Harmony	Mechanical	Thinning	37.4780066	-113.30717	10
UDFFSL	New Harmony	Mechanical	Hand Pile	37.4780066	-113.30717	10
UDFFSL	New Harmony	Mechanical	Chipping	37.4780066	-113.30717	14

	Project Name	Treatment Kind	Treatment Type	Latitude	Longitude	Acres
UDFFSL	FarWest/Pinto Hwy 56	Mechanical	Thinning	37.6076036	-113.3586313	9
UDFFSL	FarWest/Pinto Hwy 56	Mechanical	Hand Pile	37.6076036	-113.3586313	9
UDFFSL	Iron Mountain/Pinto	Mechanical	Mastication	37.6076036	-113.3586313	210
UDFFSL	Bumblebee	Other	Seeding	37.5203525	-113.2198788	11
UDFFSL	Panguitch Lake	Mechanical	Thinning	37.70744	-112.6418072	6
UDFFSL	Panguitch Lake	Mechanical	Hand Pile	37.70744	-112.6418072	6
UDFFSL	Panguitch Lake	Mechanical	Chipping	37.70744	-112.6418072	4
UDFFSL	Kolob Terrace	Mechanical	Thinning	37.5789213	-113.037488	21
UDFFSL	Kolob Terrace	Mechanical	Hand Pile	37.5789213	-113.037488	21
UDFFSL	Kolob Terrace	Mechanical	Chipping	37.5789213	-113.037488	3
UDFFSL	Brycewoodslands FB	Mechanical	Thinning	37.535193	-112.4141247	11
UDFFSL	Brycewoodslands FB	Mechanical	Hand Pile	37.535193	-112.4141247	11
UDFFSL	Brycewoodslands FB	Mechanical	Chipping	37.535193	-112.4141247	8
UDFFSL	Brianhead	Mechanical	Thinning	37.6927538	-112.8507747	27
UDFFSL	Brianhead	Mechanical	Chipping	37.6927538	-112.8507747	27
UDFFSL	North Creek Demo	Mechanical	Thinning	38.3371897	-112.5779938	5
UDFFSL	North Creek Demo	Mechanical	Hand Pile	38.3371897	-112.5779938	5
UDFFSL	North Creek	Mechanical	Mastication	38.3371897	-112.5779938	104
UDFFSL	Dixie RAC	Mechanical	Thinning			6
UDFFSL	Dixie RAC	Mechanical	Hand Pile			6
UDFFSL	Hwy 56 - Duncan Creek	Mechanical	Thinning			1
UDFFSL	Hwy 56 - Duncan Creek	Mechanical	Hand Pile			1
UDFFSL	Duck Creek	Mechanical	Thinning	37.5266608	-112.6718311	29
UDFFSL	Duck Creek	Mechanical	Hand Pile	37.5266608	-112.6718311	29
UDFFSL	Duck Creek	Mechanical	Chipping	37.5266608	-112.6718311	29
UDFFSL	Hwy 18 Dammeron BLM unit	Mechanical	Thinning	37.313483	-113.6706752	24
UDFFSL	Hwy 18 Dammeron BLM unit	Mechanical	Hand Pile	37.313483	-113.6706752	24
UDFFSL	Hwy 18 Bullhog	Mechanical	Mastication	37.313483	-113.6706752	74
UDFFSL	Beaver Manderfield	Mechanical	Thinning	38.377887	-112.639213	4
UDFFSL	Beaver Manderfield	Mechanical	Hand Pile	38.377887	-112.639213	4
UDFFSL	Beaver Manderfield	Mechanical	Chipping	38.377887	-112.639213	4
UDFFSL	Mammoth Creek	Mechanical	Thinning	37.6275163	-112.6354016	48
UDFFSL	Mammoth Creek	Mechanical	Hand Pile	37.6275163	-112.6354016	48
UDFFSL	Cedar Highlands	Mechanical	Thinning	37.6366727	-113.041798	3
UDFFSL	Cedar Highlands	Mechanical	Hand Pile	37.6366727	-113.041798	3
UDFFSL	Cedar Highlands	Mechanical	Chipping	37.6366727	-113.041798	3
UDFFSL	Johnson Creek	Mechanical	Thinning	37.6165014	-109.4811669	49
UDFFSL	Johnson Creek	Mechanical	Hand Pile	37.6165014	-109.4811669	49
UDFFSL	Johnson Creek	Mechanical	Mastication	37.6165014	-109.4811669	30
UDFFSL	Willow Basin	Mechanical	Mastication	38.586	-109.2201681	1
UDFFSL	Old LaSal/Wray Mesa	Mechanical	Thinning	38.3403347	-109.1601694	3
UDFFSL	Old LaSal/Wray Mesa	Mechanical	Hand Pile	38.3403347	-109.1601694	3
UDFFSL	Old LaSal/Wray Mesa	Mechanical	Chipping	38.3403347	-109.1601694	3
UDFFSL	Moose Hollow	Mechanical	Thinning			9
UDFFSL	Moose Hollow	Mechanical	Hand Pile			9
UDFFSL	Moose Hollow	Mechanical	Chipping			9

	Project Name	Treatment Kind	Treatment Type	Latitude	Longitude	Acres
UDFFSL	Cherry Canyon	Mechanical	Thinning	40.8138886	-111.3822217	21
UDFFSL	Cherry Canyon	Mechanical	Hand Pile	40.8138886	-111.3822217	21
UDFFSL	Cherry Canyon	Mechanical	Chipping	40.8138886	-111.3822217	21
UDFFSL	West Duchesne	Mechanical	Thinning	40.1633188	-110.4014169	54
UDFFSL	West Duchesne	Mechanical	Hand Pile	40.1633188	-110.4014169	54
UDFFSL	West Duchesne	Mechanical	Chipping	40.1633188	-110.4014169	54
UDFFSL	Argyle	Mechanical	Thinning	39.8819441	-110.7008325	48
UDFFSL	Argyle	Mechanical	Hand Pile	39.8819441	-110.7008325	48
UDFFSL	Argyle	Mechanical	Chipping	39.8819441	-110.7008325	26
UDFFSL	Upper Weber	Mechanical	Thinning	40.7349994	-111.2488919	47
UDFFSL	Upper Weber	Mechanical	Hand Pile	40.7349994	-111.2488919	47
UDFFSL	Upper Weber	Mechanical	Chipping	40.7349994	-111.2488919	37
UDFFSL	Mill City Creek	Mechanical	Thinning			12
UDFFSL	Mill City Creek	Mechanical	Hand Pile			12
UDFFSL	Wolf Creek	Mechanical	Thinning			4
UDFFSL	Wolf Creek	Mechanical	Hand Pile			4
UDFFSL	Wolf Creek	Mechanical	Chipping			4
UDFFSL	Beaver Creek	Mechanical	Thinning			7
UDFFSL	Beaver Creek	Mechanical	Hand Pile			7
UDFFSL	Beaver Creek	Mechanical	Chipping			7
UDFFSL	North Summit	Mechanical	Thinning			16
UDFFSL	North Summit	Mechanical	Hand Pile			16
UDFFSL	North Summit	Mechanical	Chipping			1
UDFFSL	Pineview Estates	Mechanical	Thinning	41.2567325	-111.8195894	27
UDFFSL	Pineview Estates	Mechanical	Hand Pile	41.2567325	-111.8195894	27
UDFFSL	Pineview Estates	Mechanical	Chipping	41.2567325	-111.8195894	27
UDFFSL	Causey Estates	Mechanical	Thinning	41.2709166	-111.5770855	300
UDFFSL	Causey Estates	Mechanical	Hand Pile	41.2709166	-111.5770855	300
UDFFSL	Causey Estates	Mechanical	Chipping	41.2709166	-111.5770855	300
UDFFSL	Farmington Canyon	Mechanical	Thinning	40.9791689	-111.8858353	13
UDFFSL	Farmington Canyon	Mechanical	Hand Pile	40.9791689	-111.8858353	13
UDFFSL	Farmington Canyon	Mechanical	Chipping	40.9791689	-111.8858353	13
UDFFSL	Sandy	Mechanical	Thinning	40.5710733	-111.7921880	15
UDFFSL	Sandy	Mechanical	Hand Pile	40.5710733	-111.7921880	15
UDFFSL	Sandy	Mechanical	Chipping	40.5710733	-111.7921880	15
UDFFSL	Sandy	Other	Seeding	40.5710733	-111.7921880	2
UDFFSL	Hi County Estates	Mechanical	Chipping	40.5008358	-112.0872250	7
UDFFSL	Woodland Hills	Mechanical	Thinning	40.0152772	-111.6494444	10
UDFFSL	Woodland Hills	Mechanical	Hand Pile	40.0152772	-111.6494444	10
UDFFSL	Woodland Hills	Mechanical	Chipping	40.0152772	-111.6494444	20
UDFFSL	Suncrest	Mechanical	Thinning	40.6427769	-112.0227769	30
UDFFSL	Suncrest	Mechanical	Hand Pile	40.6427769	-112.0227769	21
UDFFSL	Suncrest	Mechanical	Chipping	40.6427769	-112.0227769	21
UDFFSL	Lake Mountain	Other	Grazing	40.3712772	-111.9875286	270
UDFFSL	Davis Bench	Mechanical	Mastication	41.0330547	-111.9369431	2
UDFFSL	Davis Bench	Mechanical	Thinning	41.0330547	-111.9369431	2
UDFFSL	Davis Bench	Mechanical	Hand Pile	41.0330547	-111.9369431	2

	Project Name	Treatment Kind	Treatment Type	Latitude	Longitude	Acres
UDFFSL	Davis Bench	Mechanical	Chipping	41.0330547	-111.9369431	2
UDFFSL	Ferguson Canyon	Mechanical	Lop and Scatter	40.5619452	-111.8150019	3
						5,064.50

Air Toxics Compliance Monitoring

State of Utah
GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQA-532-15

M E M O R A N D U M

TO: Air Quality Board

FROM: Bryce C. Bird, Executive Secretary

DATE: May 6, 2015

SUBJECT: Air Toxics, Lead-Based Paint, and Asbestos (ATLAS) Section Compliance Activities – April 2015

MACT Compliance Inspections	1
Asbestos Demolition/Renovation NESHAP Inspections	39
Asbestos AHERA Inspections	30
Asbestos State Rules Only Inspections	8
Asbestos Notifications Accepted	174
Asbestos Telephone Calls Answered	401
Asbestos Individuals Certifications Approved/Disapproved	87/1
Asbestos Company Certifications/Re-Certifications	2/4
Asbestos Alternate Work Practices Approved/Disapproved	19/0
Lead-Based Paint (LBP) Inspections	4
LBP Notifications Approved	1
LBP Telephone Calls Answered	80
LBP Letters Prepared and Mailed	117
LBP Courses Reviewed/Approved	0/0
LBP Course Audits	1
LBP Individual Certifications Approved/Disapproved	57/4

LBP Firm Certifications	20
Notices of Violation Issued	0
Compliance Advisories Issued	19
Warning Letters Issued	10
Settlement Agreements Finalized	1
Penalties Agreed to:	
Weber State University	$156.26

State of Utah
GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQC-643-15

M E M O R A N D U M

TO: Air Quality Board

FROM: Bryce C. Bird, Executive Secretary

DATE: May 8, 2015

SUBJECT: Compliance Activities – April 2015

Annual Inspections Conducted:

Major... 11
Synthetic Minor 6
Minor 30

On-Site Stack Test Audits Conducted: 5

Stack Test Report Reviews:.. 13

On-Site CEM Audits Conducted: 11

Emission Reports Reviewed: 20

Temporary Relocation Requests Reviewed & Approved:.............................. 18

Fugitive Dust Control Plans Reviewed & Accepted:................................... 145

Soil Remediation Report Reviews:.. 0

[1]Miscellaneous Inspections Conducted:.. 101

Complaints Received:... 18
Wood Burning Complaints 0

Breakdown Reports Received:.. 2

Compliance Actions Resulting From a Breakdown.. 0

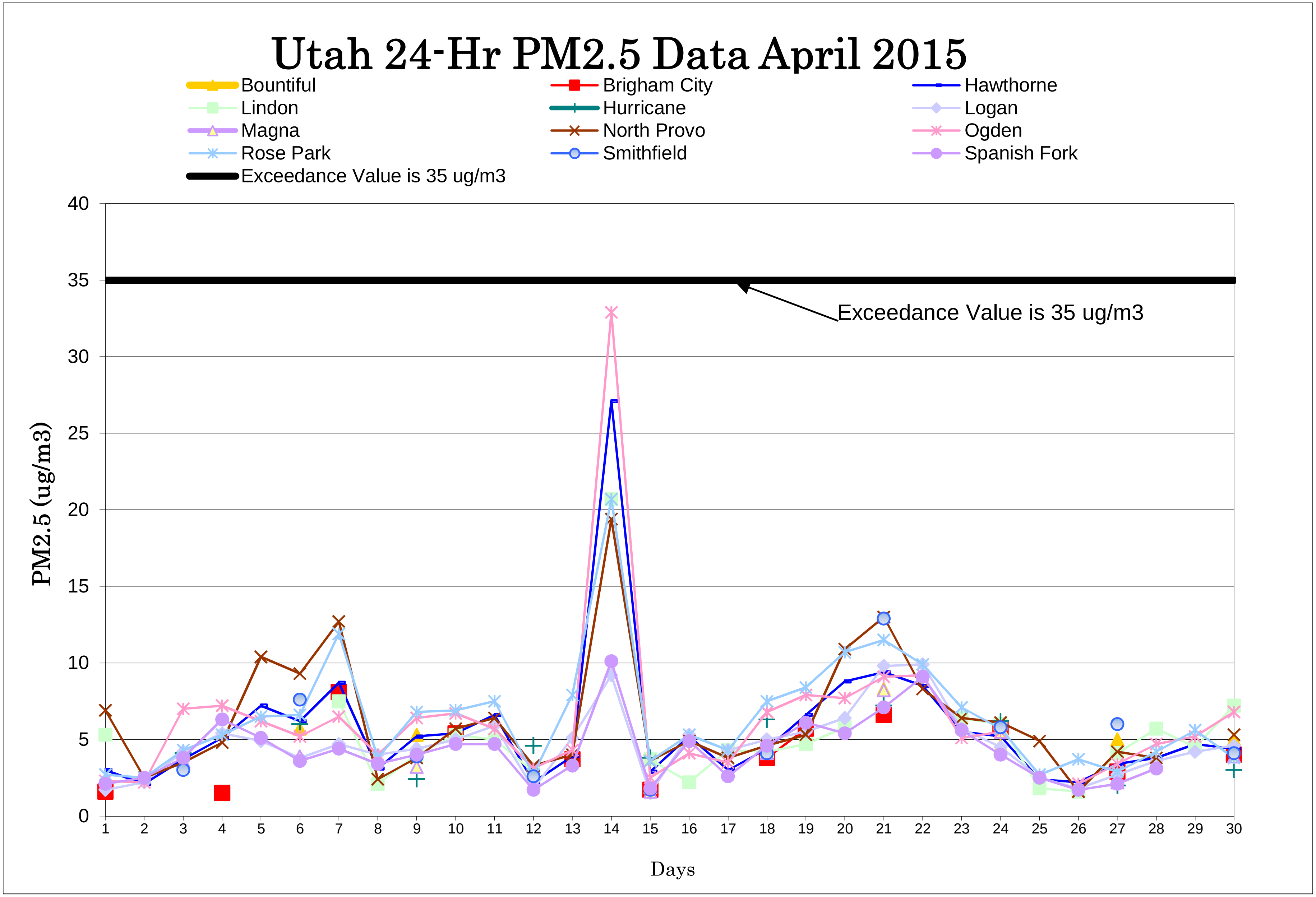
Warning Letters Issued: 4

Notices of Violation Issued:.. 0

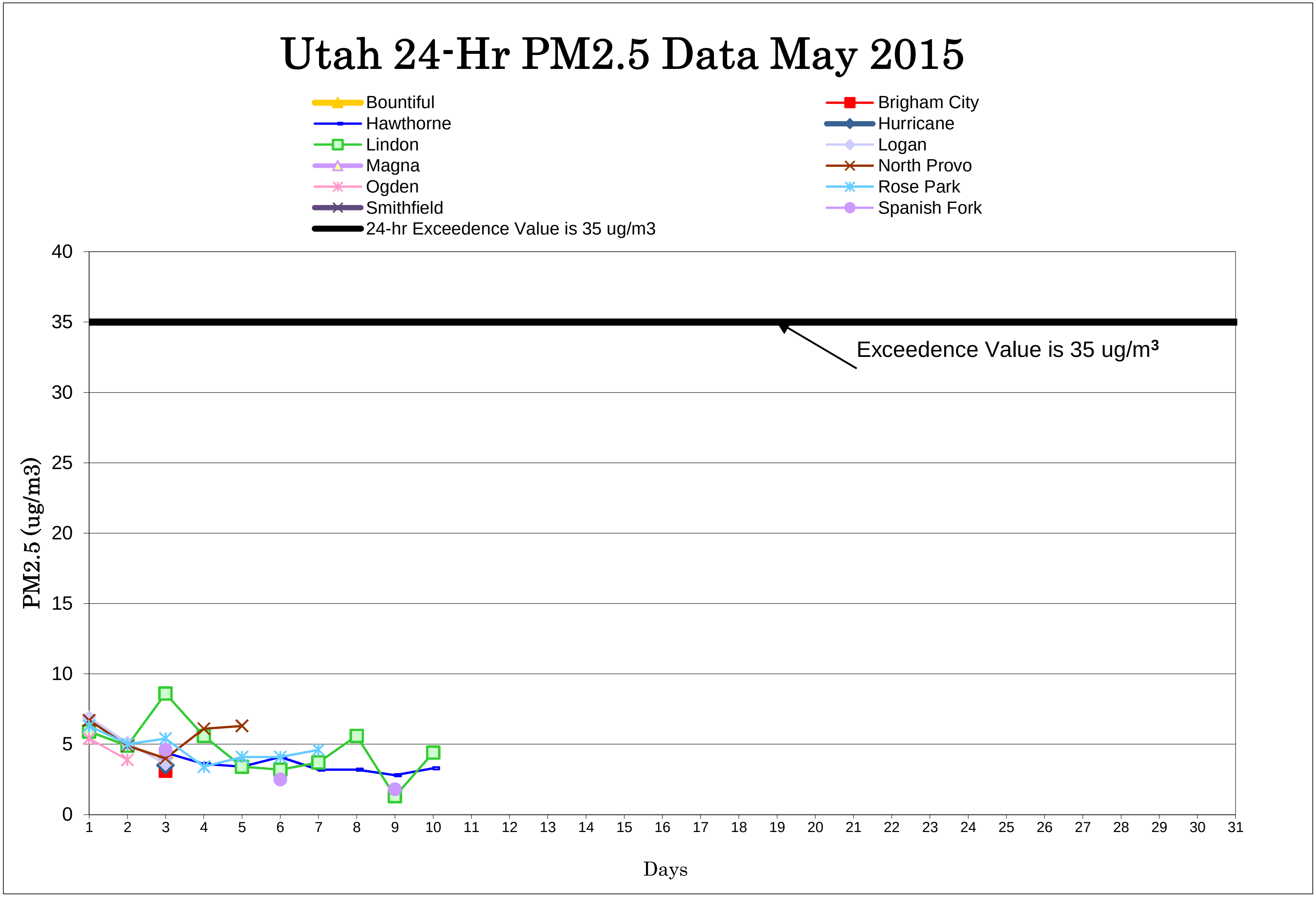
Compliance Advisories Issued:... 5

Settlement Agreements Reached: 0

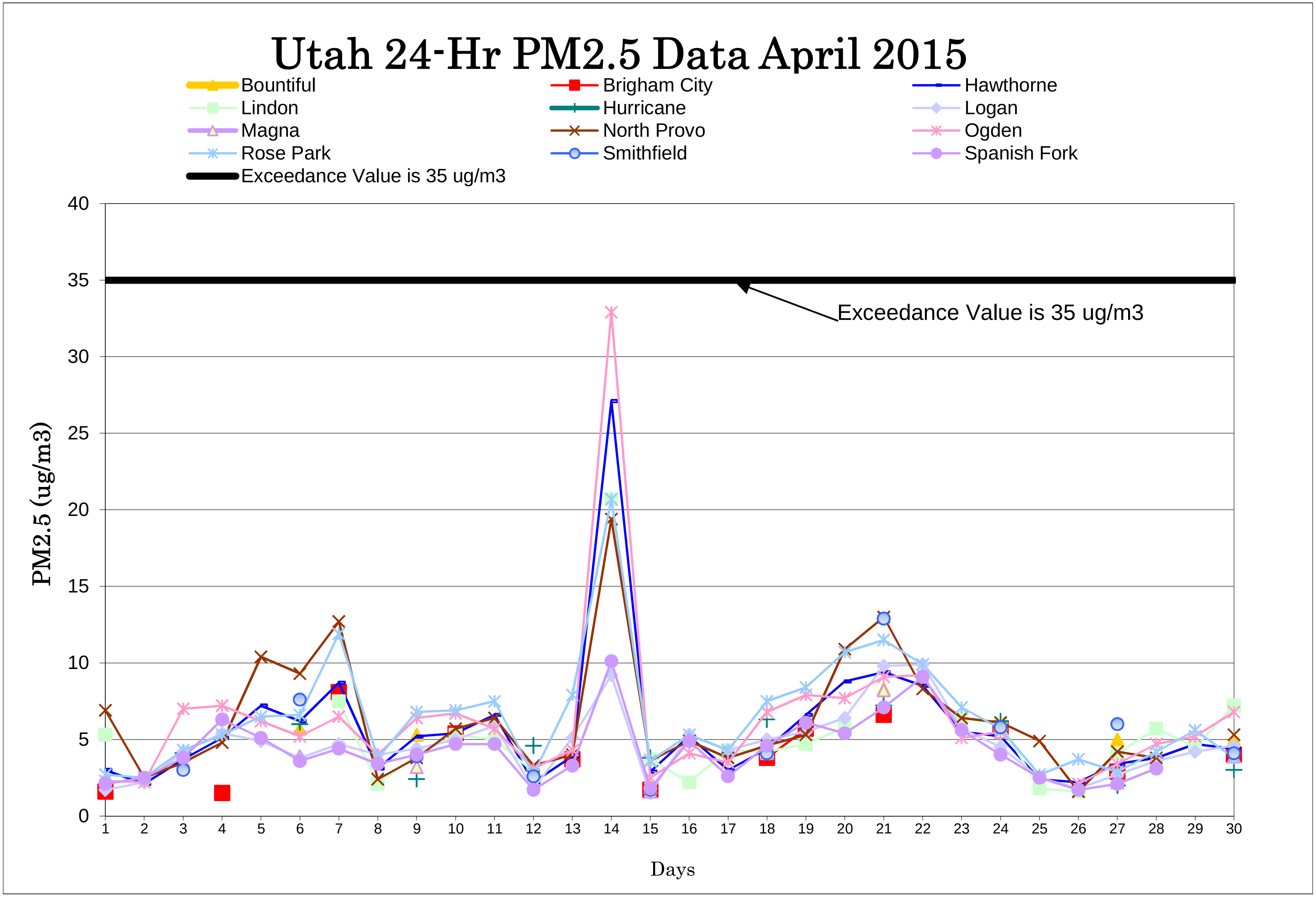
[1]Miscellaneous inspections include, e.g., surveillance, level I inspections, VOC inspections, complaints, on-site training, dust patrol, smoke patrol, open burning, etc.



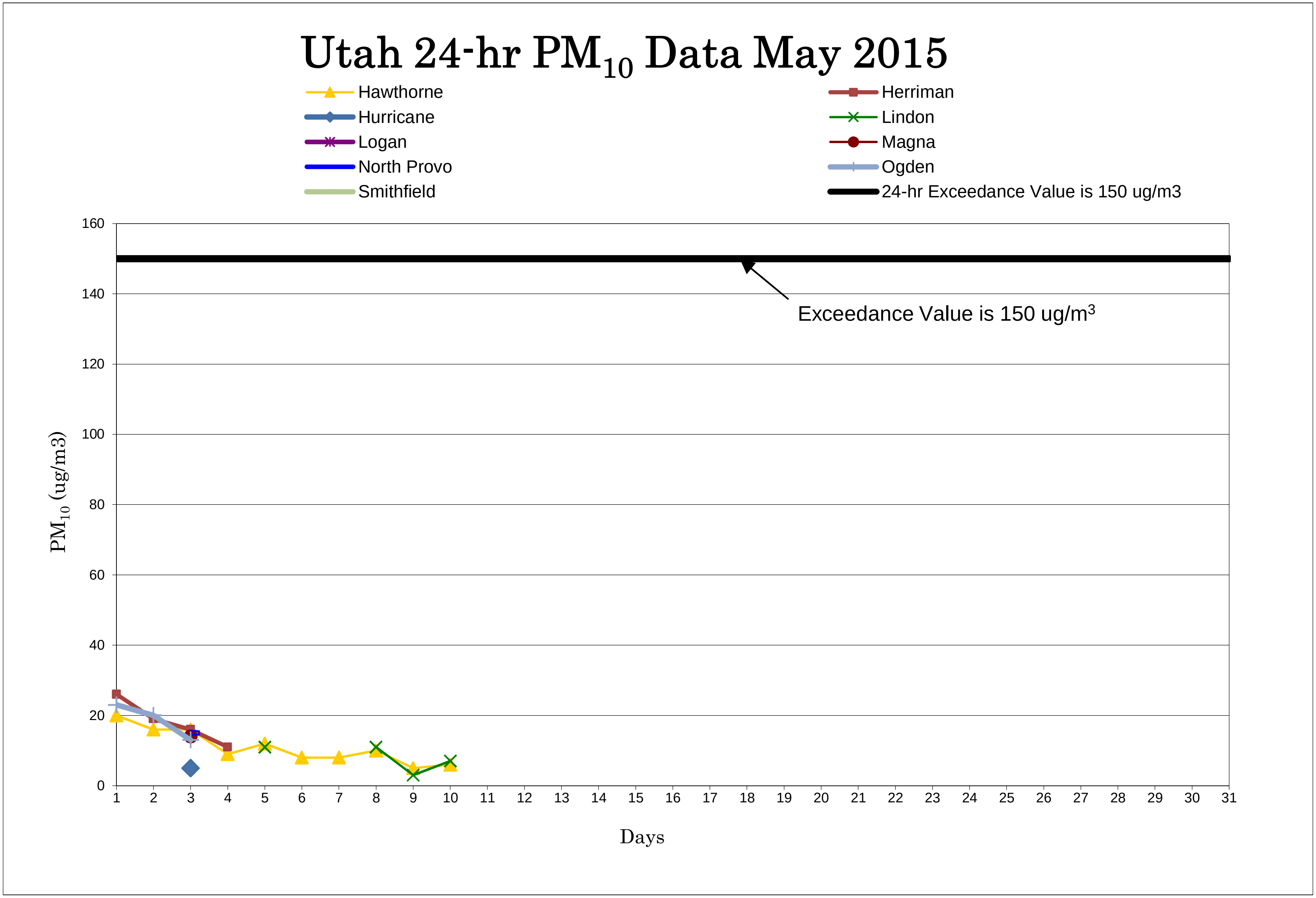
Utah Division of Air Quality



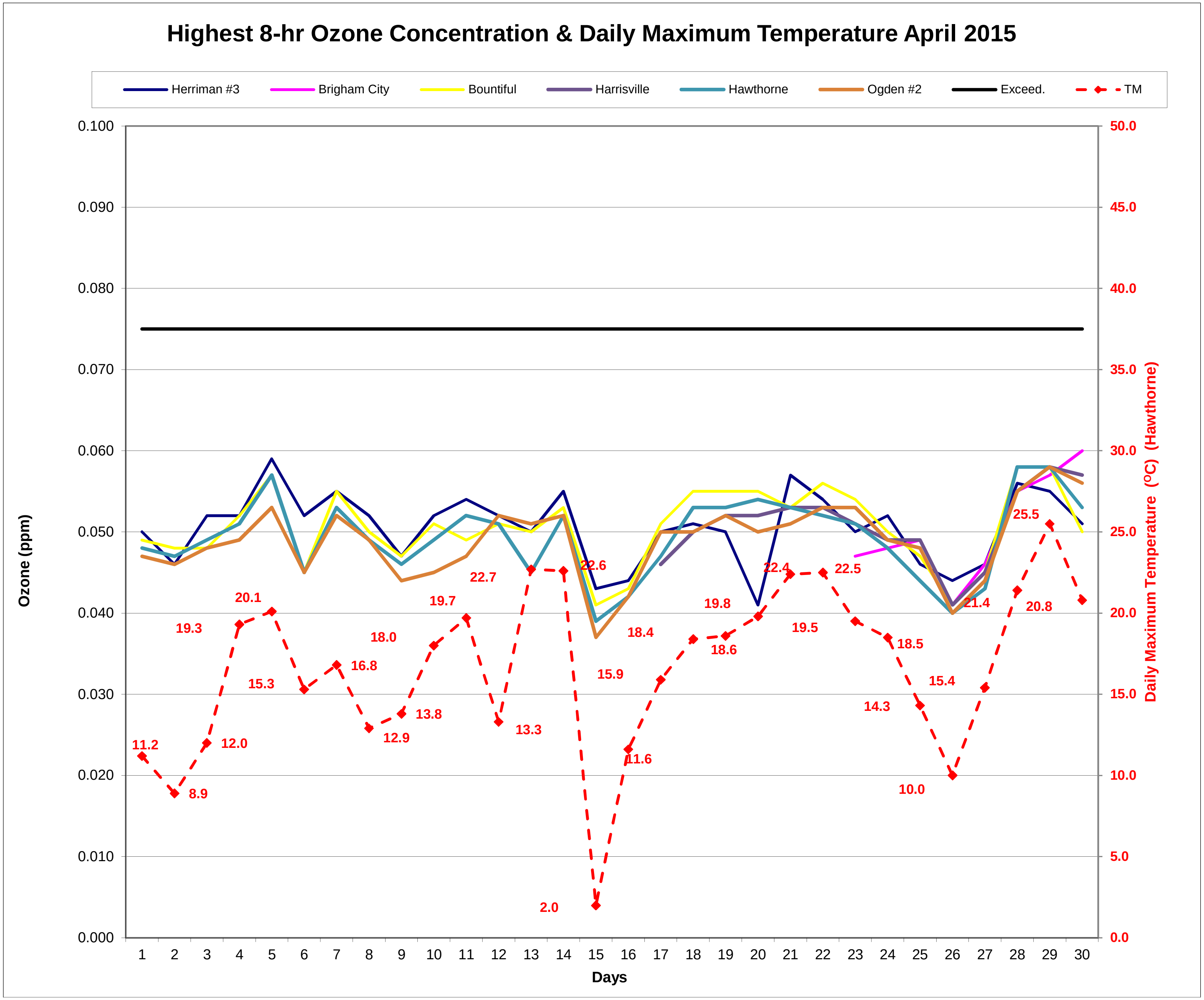
Utah Division of Air Quality

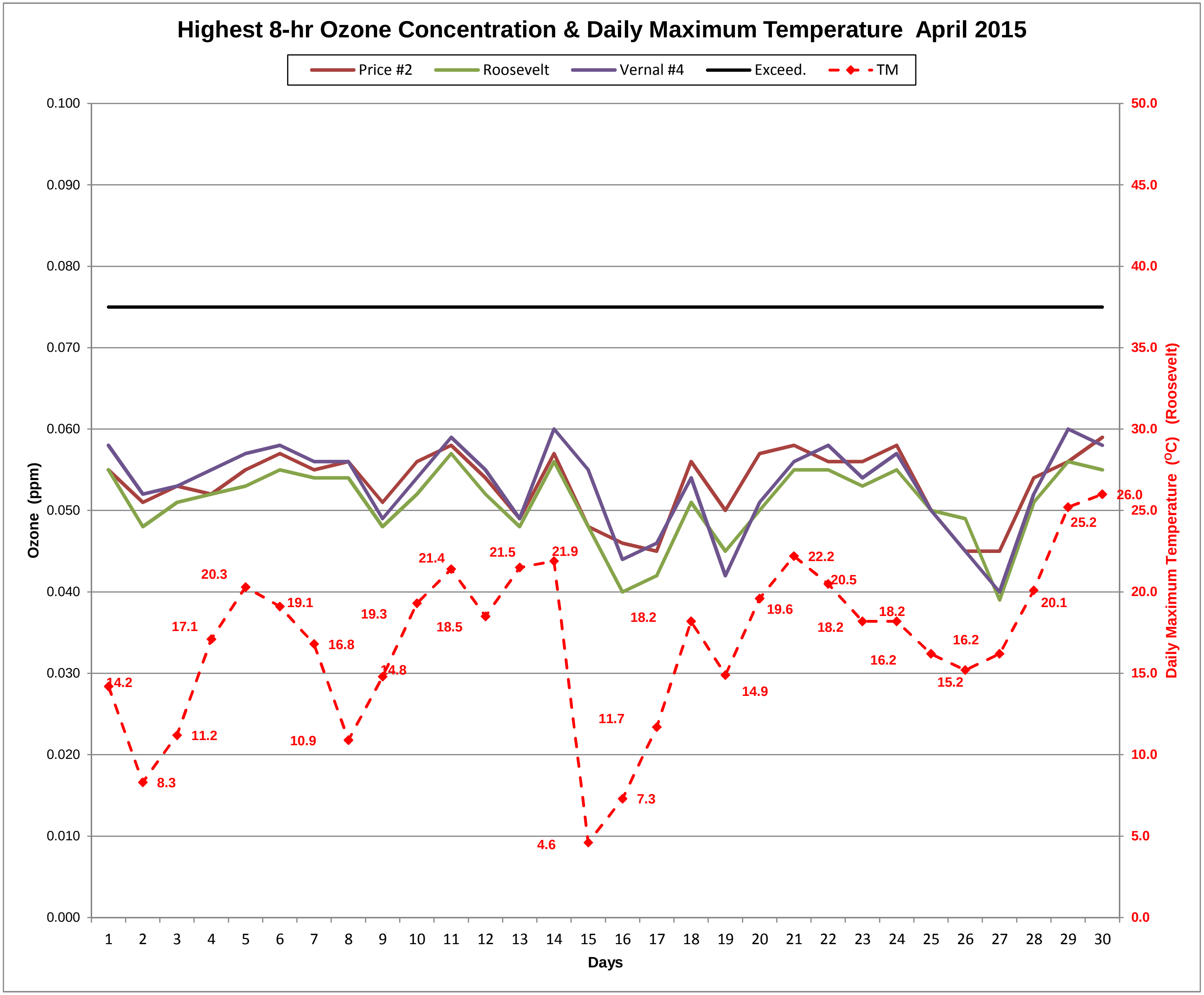


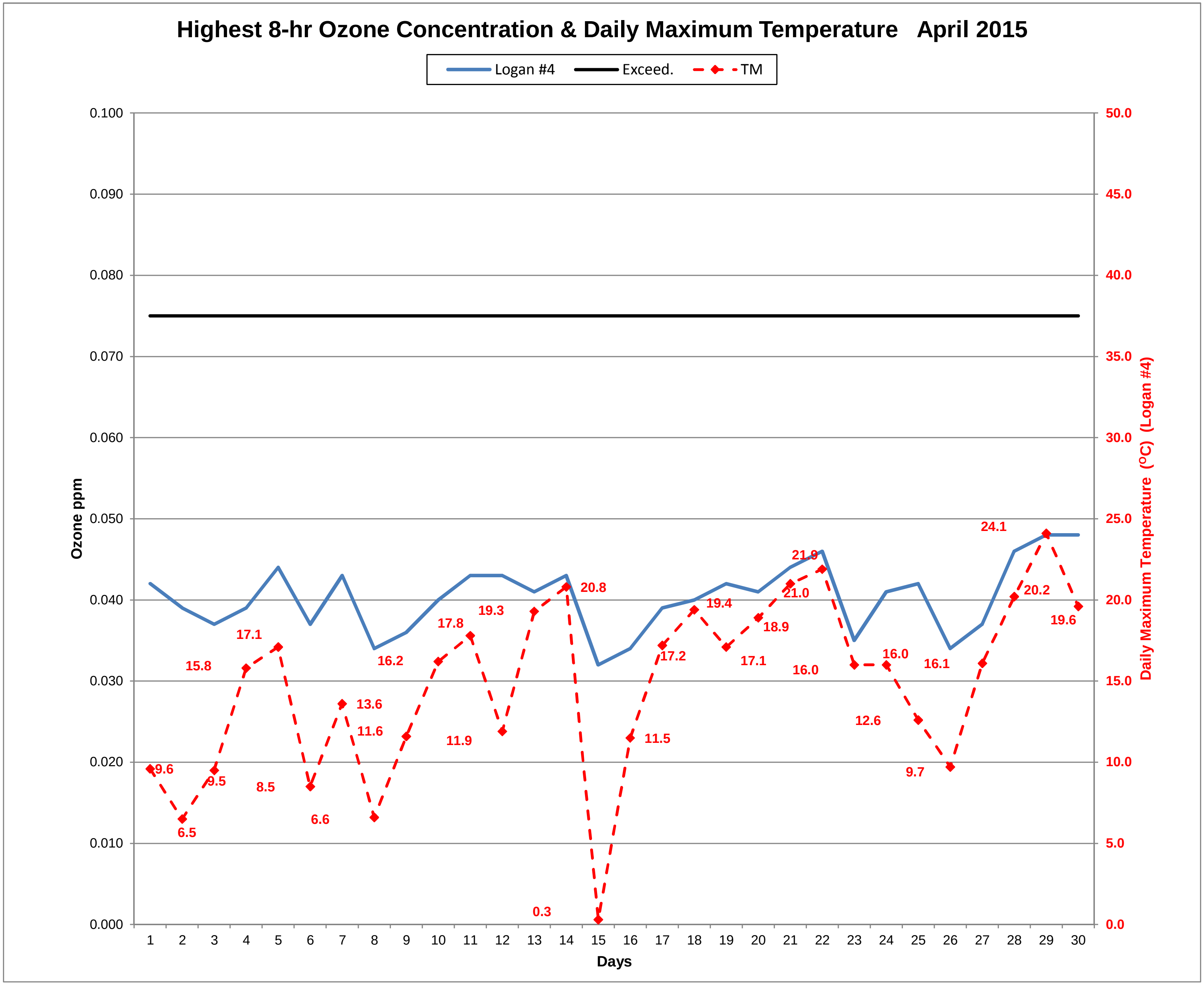
Utah Division of Air Quality



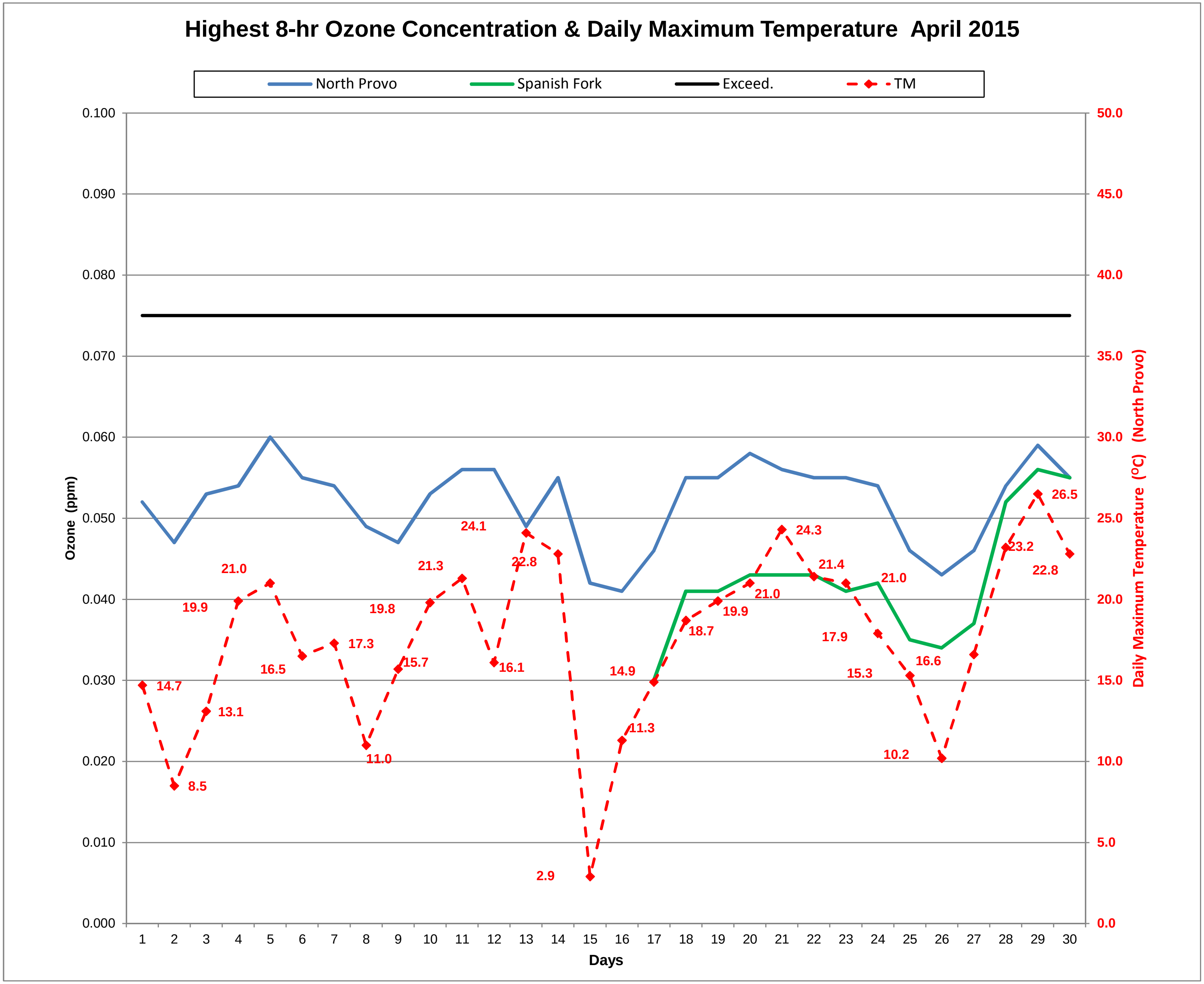
Utah Division of Air Quality

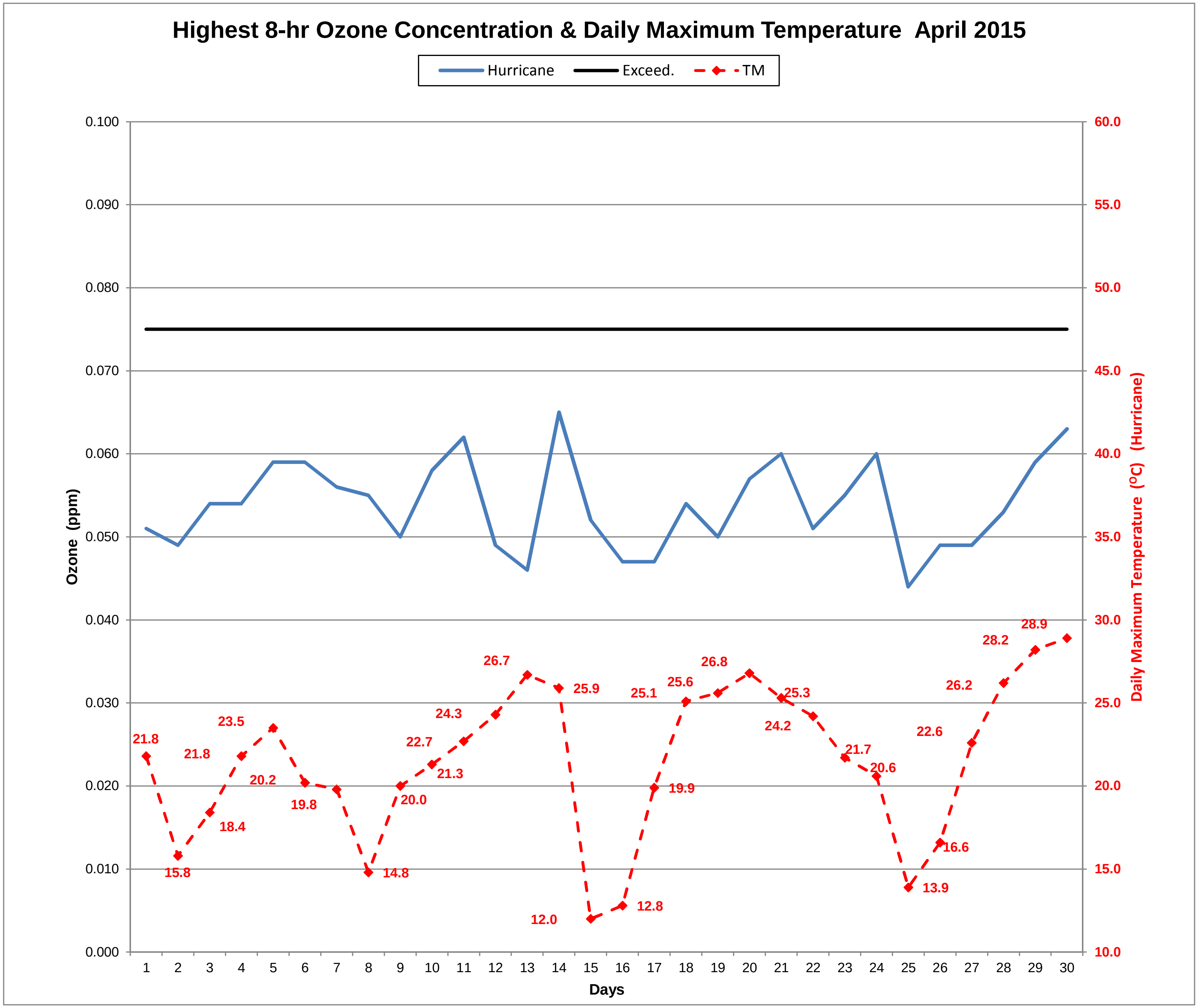

Highest 8-hr Ozone Concentration & Daily Maximum Temperature April 2015
Herriman #3
Brigham City
Bountiful
Harrisville
Hawthorne
Ogden #2
Exceed.
TM
Ozone (ppm)
Daily Maximum Temperature (°C) (Hawthorne)
Days
11.2
8.9
12.0
19.3
20.1
15.3
16.8
12.9
18.0
13.8
19.7
22.7
13.3
2.0
22.6
15.9
11.6
18.4
18.6
19.8
22.4
19.5
22.5
14.3
18.5
15.4
10.0
21.4
25.5
20.8


Highest 8-hr Ozone Concentration & Daily Maximum Temperature April 2015
Price #2
Roosevelt
Vernal #4
Exceed.
TM
Ozone (ppm)
Daily Maximum Temperature (ºC) (Roosevelt)
Days
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
14.2
8.3
11.2
17.1
20.3
19.1
16.8
10.9
14.8
19.3
21.4
18.5
21.5
21.9
4.6
7.3
11.7
18.2
14.9
19.6
22.2
20.5
18.2
18.2
16.2
16.2
15.2
20.1
25.2
26.0

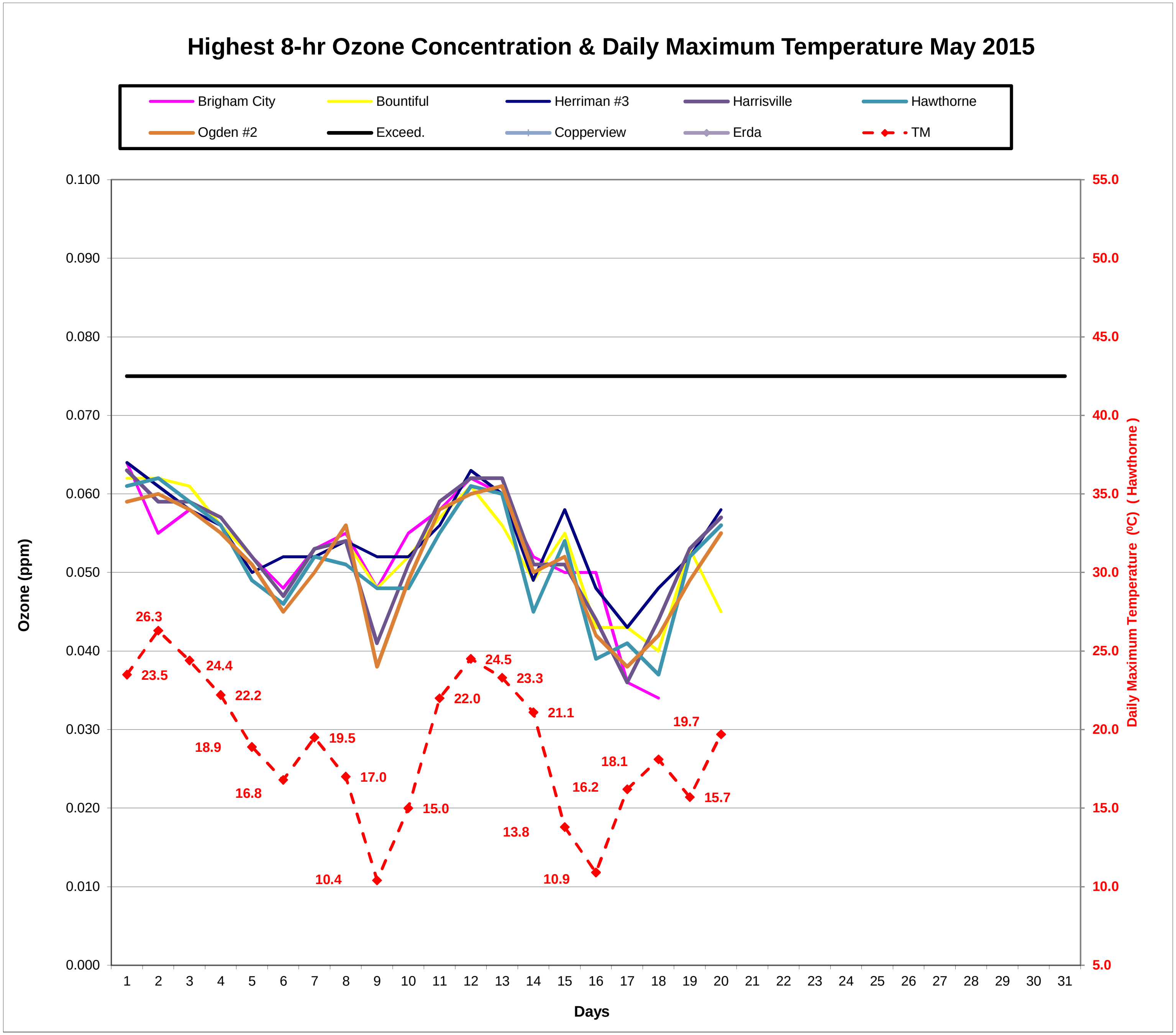


Highest 8-hr Ozone Concentration & Daily Maximum Temperature April 2015
Logan #4
Exceed.
TM
Ozone ppm
Daily Maximum Temperature (°C) (Logan #4)
Days
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
9.6
6.5
9.5
15.8
17.1
8.5
6.6
13.6
11.6
16.2
11.9
17.8
19.3
0.3
20.8
11.5
17.2
19.4
17.1
18.9
21.0
21.9
16.0
12.6
16.0
9.7
16.1
24.1
20.2
19.6

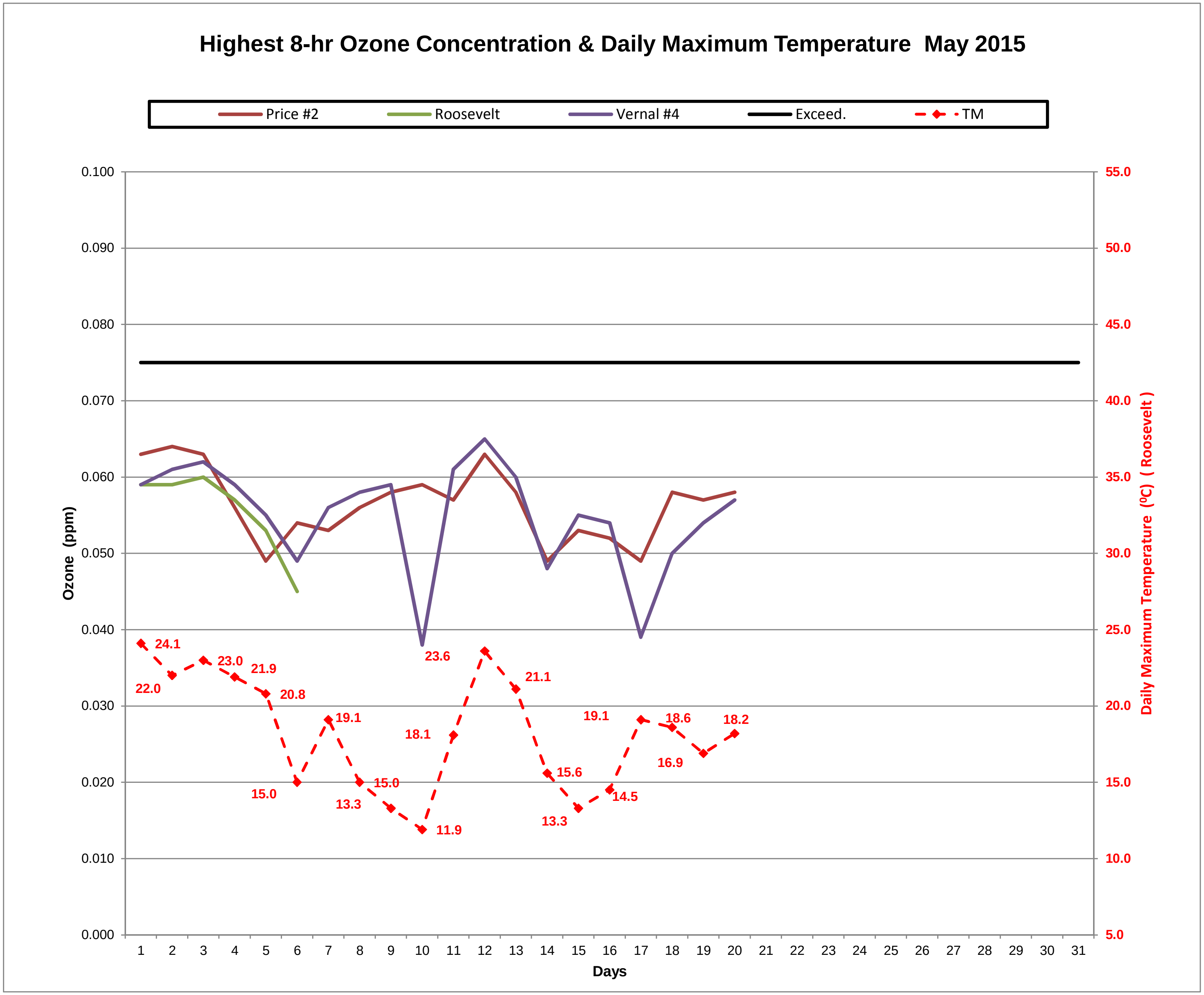

Highest 8-hr Ozone Concentration & Daily Maximum Temperature April 2015
North Provo
Spanish Fork
Exceed.
TM
Ozone (ppm)
Daily Maximum Temperature (°C) (North Provo)
Days
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
14.7
8.5
13.1
19.9
21.0
16.5
17.3
11.0
15.7
19.8
21.3
16.1
24.1
22.8
2.9
11.3
14.9
18.7
19.9
21.0
24.3
21.4
17.9
21.0
15.3
16.6
10.2
23.2
26.5
22.8



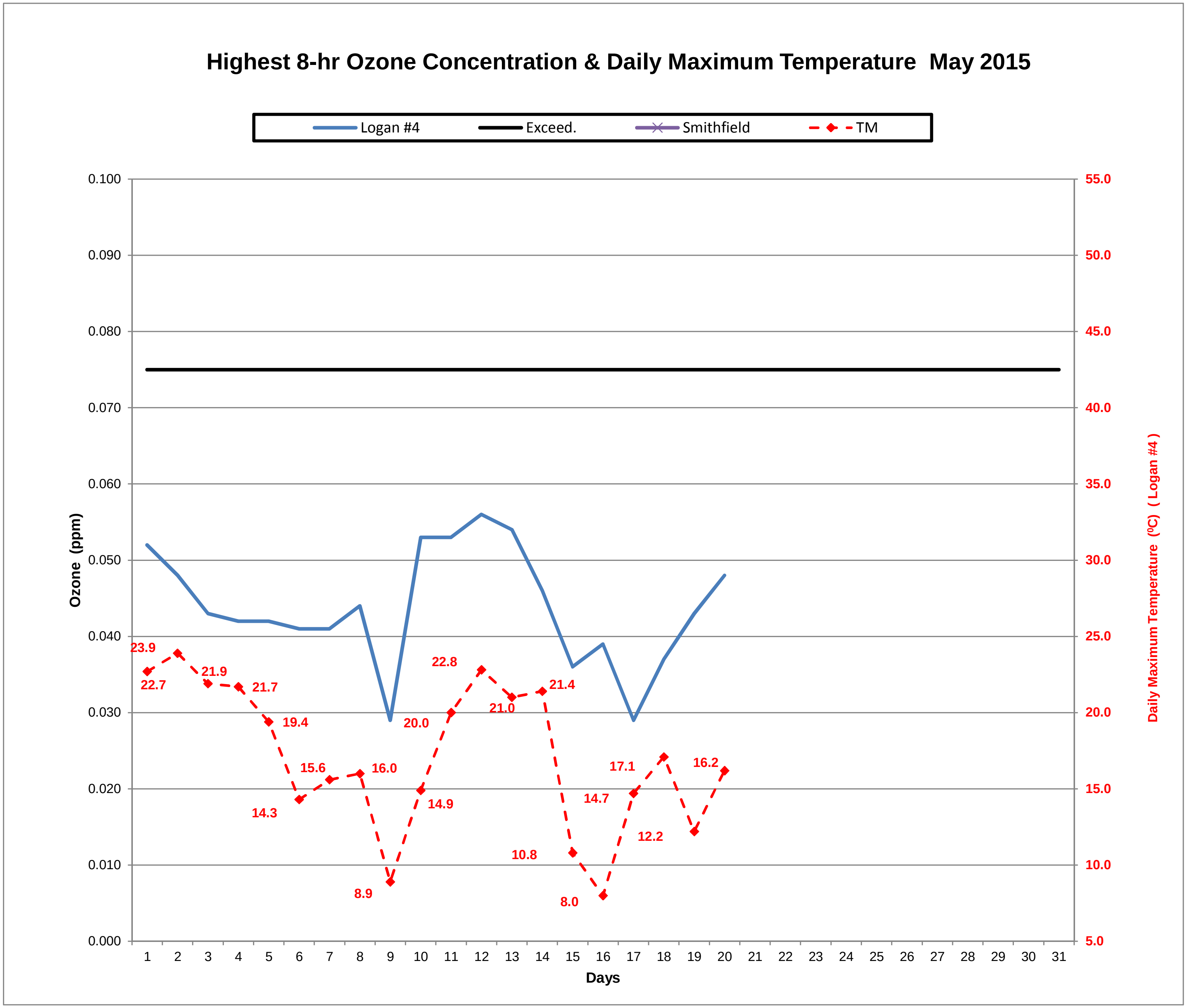
Highest 8-hr Ozone Concentration & Daily Maximum Temperature April 2015
Hurricane
Exceed.
TM
Ozone (ppm)
Daily Maximum Temperature (°C) (Hurricane)
Days
0.000
0.010
0.020
0.030
0.040
0.050
0.060
0.070
0.080
0.090
0.100
10.0
15.0
20.0
25.0
30.0
35.0
40.0
45.0
50.0
55.0
60.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
21.8
15.8
18.4
21.8
23.5
20.2
19.8
14.8
20.0
22.7
21.3
24.3
26.7
25.9
12.0
12.8
19.9
25.1
25.6
26.8
25.3
24.2
21.7
20.6
13.9
16.6
22.6
26.2
28.2
28.9



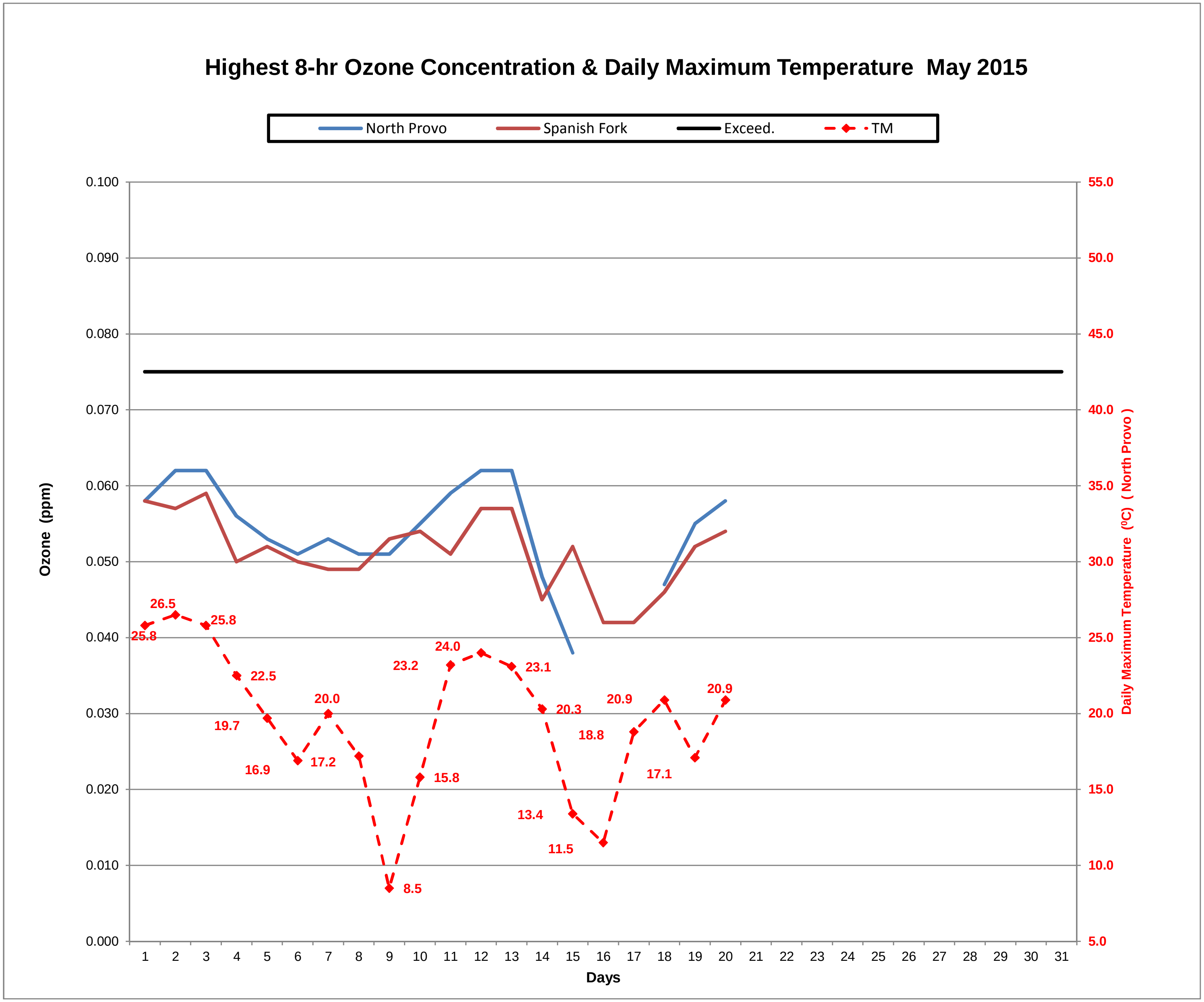
Highest 8-hr Ozone Concentration & Daily Maximum Temperature May 2015
Brigham City
Bountiful
Herriman #3
Harrisville
Hawthorne
Ogden #2
Exceed.
Copperview
Erda
TM
Ozone (ppm)
Daily Maximum Temperature (ºC) (Hawthorne)
Days
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
23.5
26.3
24.4
22.2
18.9
16.8
19.5
17.0
10.4
15.0
22.0
24.5
23.3
21.1
13.8
10.9
16.2
18.1
19.7
15.7



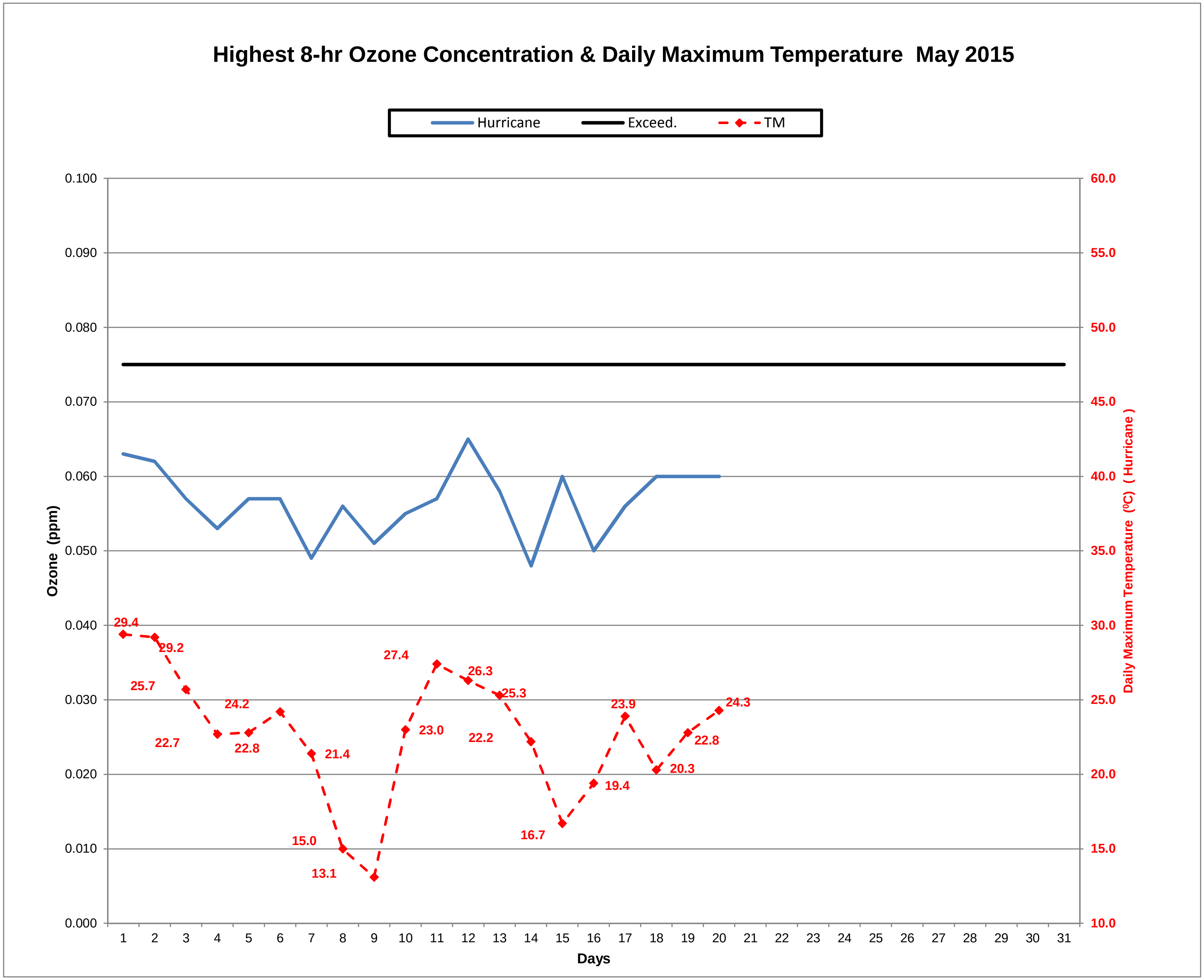
Highest 8-hr Ozone Concentration & Daily Maximum Temperature May 2015
Price #2
Roosevelt
Vernal #4
Exceed.
TM
Ozone (ppm)
Daily Maximum Temperature (°C) (Roosevelt)
Days
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
24.1
22.0
23.0
21.9
20.8
15.0
19.1
13.3
15.0
11.9
18.1
23.6
21.1
15.6
13.3
14.5
19.1
18.6
16.9
18.2



Highest 8-hr Ozone Concentration & Daily Maximum Temperature May 2015
Logan #4
Exceed.
Smithfield
TM
Ozone (ppm)
Daily Maximum Temperature (oC) (Logan #4)
Days
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
23.9
22.7
21.9
21.7
19.4
15.6
16.0
14.3
8.9
20.0
14.9
22.8
21.0
21.4
10.8
8.0
14.7
17.1
12.2
16.2



Highest 8-hr Ozone Concentration & Daily Maximum Temperature May 2015
North Provo
Spanish Fork
Exceed.
TM
Ozone (ppm)
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
Daily Maximum Temperature (ºC) (North Provo)
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
25.8
26.5
25.8
22.5
19.7
16.9
20.0
17.2
8.5
15.8
23.2
24.0
23.1
20.3
13.4
11.5
18.8
20.9
17.1
20.9
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Days



Highest 8-hr Ozone Concentration & Daily Maximum Temperature May 2015
Hurricane
Exceed.
TM
Ozone (ppm)
Daily Maximum Temperature (°C) (Hurricane)
Days
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
29.4
29.2
25.7
22.7
24.2
22.8
21.4
15.0
13.1
23.0
27.4
26.3
25.3
22.2
16.7
19.4
23.9
20.3
22.8
24.3