Maricopa County AIR QUALITY DEPARTMENT

Office of the Director
301 W. Jefferson St., Suite 410, Phoenix, AZ 85003
Phone: 602-506-6010
Email: AQMail@maricopa.gov

Maricopa.gov/AQ

July 28, 2022

Mr. Misael Cabrera
Director
Arizona Department of Environmental Quality (ADEQ)
1110 W. Washington St.
Phoenix, AZ 85007

RE: Submittal of Emission Reduction Credit Permit Conditions from Three Waste Management of Arizona, Inc. (Waste Management) Permits as a Revision to the Arizona State Implementation Plan (SIP)

Dear Mr. Cabrera:

As the designated U.S. Environmental Protection Agency (EPA) contact, Maricopa County Air Quality Department (MCAQD) hereby requests that ADEQ submit to the EPA for approval into the Arizona SIP the enclosed emission reduction credit permit conditions from three Waste Management permits. The Maricopa County Board of Supervisors approved submittal of the permit conditions as a revision to the Arizona SIP at a public hearing on July 27, 2022.

In this submittal, MCAQD is requesting that the EPA approve the enclosed Waste Management permit conditions into the Arizona SIP. The package includes all the administrative materials and technical support materials specified in 40 CFR 51, Appendix V.

You may direct any questions to Kimberly Butler, Manager of the Planning & Analysis Division, at 602-506-6731 or Kimberly.Butler@maricopa.gov.

Sincerely,

Philip A. McNeely, R.G.
Director

Enclosure
Cc email: Doris Lo – Lo.Doris@epa.gov, EPA
Daniel Czecholinski – dc5@azdeq.gov, ADEQ

PAM/gjv

Maricopa County Air Quality Department
Phone: 602-506-6010
Fax: 602-506-6179
Maricopa.gov/AQ
CleanAirMakeMore.com

REVISION TO ARIZONA'S STATE IMPLEMENTATION PLAN (SIP) INCORPORATION OF WASTE MANAGEMENT PERMIT CONDITIONS

August 2022

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SECTION 1: INTRODUCTION

1.1 Purpose:

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This SIP revision is being submitted to the U.S. Environmental Protection Agency (EPA) for incorporation of permit conditions from three Waste Management of Arizona, Inc. (Waste Management) permits into the Arizona SIP. Specifically, the Maricopa County Air Quality Department (MCAQD) is requesting the EPA approve the following permit conditions into the Arizona SIP:

- Conditions 37-46 of Maricopa County Air Quality Permit P0008308
- Conditions 33-42 of Maricopa County Air Quality Permit P0008309
- Conditions 37-46 of Maricopa County Air Quality Permit P0008316

The permit conditions above are included in Appendix 1 of this submittal.

1.2 Regulatory Background:

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Waste Management recently replaced 225 diesel-fueled solid waste collection trucks with 225 compressed natural gas (CNG) fueled trucks reducing emissions of NOx from four collection fleets. The four collection fleets are based at three transfer stations within the Maricopa County ozone nonattainment area. Each transfer station is permitted by MCAQD.

On July 8, 2021, Waste Management submitted an emission reduction credit (ERC) application to MCAQD to certify the emission reductions for use as emission offsets. MCAQD representatives reviewed the ERC application to determine if the emission reductions qualified as permanent, quantifiable, surplus, enforceable, and real as required by 40 CFR 51.165(a)(3)(ii)(A) through (D) and 40 CFR 51.165(a)(3)(ii)(G). MCAQD representatives determined the emission reductions qualified as quantifiable, surplus, and real and could qualify as permanent and enforceable with revisions to the three transfer station air quality permits associated with the four collection fleets.

In August of 2021, MCAQD revised Waste Management permits P0008308, P0008309, and P0008316 to include permit conditions to make the emission reductions permanent and enforceable. The permits were revised to include a condition that the replaced diesel-fueled trucks be either permanently disabled or permanently removed from the nonattainment area and a condition that future replacement trucks of the CNG trucks be only with trucks certified to a NOx emission limit equivalent to or less than the CNG trucks. In addition, the permits were revised to include monitoring and recordkeeping requirements to make the reductions enforceable.

After MCAQD revised the Waste Management permits MCAQD certified 33.6 tons/year of emission reduction credits. The Waste Management Emission Reduction Certification Packages are included in Appendix 2.

To further ensure the permanency of the Waste Management emission reductions the EPA directed the MCAQD to submit the Waste Management permit conditions related to the emission reduction credits for approval into the Arizona SIP. See the EPA letter included in Appendix 3 for further details.

The Maricopa County Board of Supervisors approved submittal of the Waste Management permit conditions into the Arizona SIP on July 27, 2022.

SECTION 2: COMPLETENESS CRITERIA

2.1 Administrative Materials:

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2.1(a) A formal letter of submittal from the MCAQD Director or [his] designee, requesting the EPA approval of the SIP revision.

See SIP submission cover letter from Philip A. McNeely, Director of MCAQD, included above.

2.1(b) Evidence that MCAQD has adopted the SIP revision in the State code or body of regulations; or issued the permit, order, consent agreement in final form.

The Maricopa County Board of Supervisors approved submittal of the permit conditions into the Arizona SIP on July 27, 2022.

See Appendix 5 of this document.

2.1(c) Evidence that MCAQD has the necessary legal authority under State law to adopt and implement the SIP revision.

Arizona Revised Statutes (A.R.S.) §§ 49-112, 49-474, 49-479 and 49-480 authorize MCAQD to submit revisions to the SIP for approval.

See Appendix 6 of this document.

2.1(d) A copy of the actual regulations, or documents submitted for approval and incorporation by reference into the plan, including indication of the changes made to the existing approved plan, where applicable.

See Appendix 1 of this document which includes the ERC permit conditions from MCAQD air quality permits P0008308, P0008309, and P0008316.

2.1(e) Evidence that MCAQD followed all of the procedural requirements of the State's laws and constitution in conducting and completing the adoption/issuance of the plan.

MCAQD completed all of the following procedural requirements for obtaining approval of the SIP submittal:

(1) Provided the public at least 30 days to comment on the draft SIP submittal (BOS Public Hearing Notice and Newspaper Affidavit); and

(2) Obtained approval to submit the permit conditions as a revision to the Arizona SIP from the Board of Supervisors (Certified Minutes of BOS Public Hearing July 27, 2022).

See Appendices 4 and 5

2.1(f) Evidence that public notice was given of the proposed change consistent with procedures approved by the EPA, including the date of publication of such notice.

See Appendix 4 for evidence that MCAQD gave public notice of the proposed SIP submittal, including the date of publication of such notice.

2.1(g) Certification that public hearing(s) were held in accordance with the information provided in the public notice and the State's laws and constitution, if applicable and consistent with the public hearing requirements in 40 CFR 51.102.

See Appendix 5.

2.1(h) Compilation of public comments and the MCAQD's response.

Appendix 7 includes a compilation of public comments and MCAQD's responses.

2.2 Technical Support:

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2.2(a) Identification of all regulated pollutant(s) affected by the plan.

The regulated pollutant affected by this plan is NOx.

2.2(b) Identification of the locations of affected sources including the EPA attainment/nonattainment designation of the locations and the status of the attainment plan for the affected area(s).

The affected sources are mobile sources, solid waste collection trucks, traveling in the ozone nonattainment area.

EPA attainment/nonattainment designations for all or parts of Maricopa County are:

1987 PM10 Standard:	Serious Nonattainment (June 10, 1996)
2008 Ozone Standard:	Moderate Nonattainment (May 4, 2016)
2015 Ozone Standard:	Marginal Nonattainment (June 4, 2018)
1971 Carbon Monoxide Standard:	Attainment (April 8, 2005)
2008 Lead Standard:	Unclassified/Attainment (December 31, 2011)
2010 Nitrogen Oxides Standard:	Unclassified/Attainment (January 31, 2012)
2010 Sulfur Dioxide Standard:	Unclassified/Attainment (April 19, 2018)
2012 PM2.5 Standard:	Unclassified/Attainment (April 15, 2015)

The status of attainment plans for Maricopa County are:

2012 Five Percent Plan:	Approved (June 10, 2014)
2017 MAG Ozone Moderate Plan:	Partial Approval/Partial Disapproval (June 2, 2020)

2.2(c) Quantification of the changes in plan allowable emissions from the affected sources; estimates of changes in current actual emissions from affected sources or, where appropriate, quantification of changes in actual emissions from affected sources through calculations of the differences between certain baseline levels and allowable emissions anticipated as a result of the revision.

Waste Management's replacement of 225 diesel-fueled solid waste collection trucks with 225 CNG fueled trucks reduced emissions of NOx by 33.6 tons/year.

2.2(d) The MCAQD's demonstration that the national ambient air quality standards,

prevention of significant deterioration increments, reasonable further progress demonstration, and visibility, as applicable, are protected if the plan is approved and implemented.

The national ambient air quality standards, prevention of significant deterioration increments, reasonable further progress demonstration, and visibility are protected if the plan is approved because approval of the plan is ensuring the permanence of the Waste Management emission reductions.

2.2(e) Modeling information required to support the proposed revision, including input data, output data, models used, justification of model selections, ambient monitoring data used, meteorological data used, justification for use of offsite data (where used), modes of models used, assumptions, and other information relevant to the determination of adequacy of the modeling analysis.

Not applicable.

2.2(f) Evidence, where necessary, that emission limitations are based on continuous emission reduction technology.

Not applicable.

2.2(g) Evidence that the plan contains emission limitations, work practice standards and recordkeeping/reporting requirements, where necessary, to ensure emission levels.

See Appendix 1: Waste Management Permit Conditions

2.2(h) Compliance/enforcement strategies, including how compliance will be determined in practice.

The MCAQD will determine compliance by conducting periodic inspections and ensuring compliance with the permit conditions. Enforcement will be conducted per current department policies and procedures.

2.2(i) Special economic and technological justifications required by any applicable EPA policies, or an explanation of why such justifications are not necessary.

Not applicable.

REVISION TO ARIZONA'S SIP
INCORPORATION OF WASTE MANAGEMENT PERMIT CONDITIONS

APPENDIX 1:
WASTE MANAGEMENT PERMIT CONDITIONS

MARICOPA COUNTY AIR QUALITY DEPARTMENT

Permitting Division

3800 N. Central Avenue, Suite 1400, Phoenix, Arizona 85012
Phone: (602) 506-6010 Fax: (602) 506-6985

AIR QUALITY PERMIT TO OPERATE AND/OR CONSTRUCT

(As required by Title 49, Chapter 3, Article 2, Section 49-480, Arizona Revised Statutes)

ISSUED TO

San Tan Transfer Station
4040 S 80th St
Mesa, AZ 85212

This air quality permit to operate and/or construct does not relieve the applicant of the responsibility of meeting all air pollution regulations.

THE PERMITTEE IS SUBJECT TO THE SPECIFIC AND GENERAL CONDITIONS IDENTIFIED IN THIS PERMIT.

FACILITY NUMBER: F001645 **LEGACY PERMIT NUMBER:** 040027

PERMIT NUMBER: P0008308 **REVISION DATE:** 08/25/2021

EXPIRATION DATE: 06/30/2024

Todd Martin

Todd Martin, Non-Title V Permit Supervisor

EMISSION REDUCTION CREDITS (ERCs)

The following conditions describe standards and measures necessary to comply with Rule 204, which governs the generation of Emission Reduction Credits (ERCs). Conditions 37-46 are included as voluntary limits and activities and are enforceable permit conditions.

37. Quantity of ERCs and Identification of Vehicles:

a. ERCs of 18.3 tons of nitrogen oxides (NOx) covered under this permit are achieved with 129 CNG-powered replacement vehicles, which are part of ERCs achieved with a total of 225 CNG-powered replacement vehicles.

b. The CNG-powered replacement vehicles listed in Appendix A, with identification numbers, account for the ERCs associated with this Permit.

38. Location:
The CNG-powered vehicles used to generate ERCs shall be based and operated within the Phoenix-Mesa ozone nonattainment area located within the jurisdiction of the MCAQD.

[SIP Rule 220 §302.2][Rule 204 §305.1]

39. Vehicle Replacement:
CNG-powered vehicles that were used to acquire ERCs shall be replaced with vehicles certified to the current NOx emission limit of 0.02 g/bhp-hr or less.

[SIP Rule 220 §302.2] [Rule 204 §305.1.a]

40. Quantification of Baseline Emissions and Emission Reductions:

a. The Permittee's documentation to quantify baseline emissions and emission reductions shall comply with the methodology given in Rule 204 Appendix C and with emission factors in grams per mile traveled (g/mile) or comparable units based on application documents, most notably the calculations using Motor Vehicle Emission Simulator (MOVES) software.

b. ERC quantification calculations shall not include emission reductions created or used under any other emissions trading program, emission reductions used to satisfy the State Implementation Plan including transportation conformity requirements, or any emission reductions pursuant to a federal consent decree, or state and local settlements.

[SIP Rule 220 §302.2] [Rule 204 §§305.1.b & c]

41. Operation and Maintenance of CNG-Powered Vehicles:
The Permittee shall operate and maintain CNG-powered vehicles in accordance with the manufacturer's written instructions and maintenance program in order to ensure the continued generation of emission reductions. Vehicle operation and maintenance shall be documented in accordance with Permit Condition 45.d.vii.

[SIP Rule 220 §302.2] [Rule 204 §305.2.a]

42. Monitoring of Equipment Use:

The Permittee shall monitor the use of all CNG-powered equipment used to generate ERCs to verify that the equipment is operated in the same manner as was represented in the ERC application, specifically the emission calculations using Motor Vehicle Emission Simulator (MOVES) software. This monitoring shall include the follow, at minimum:

a. Vehicle miles traveled (VMT) for each CNG-powered vehicle;

b. Percent of VMT within the nonattainment area.

[SIP Rule 220 §302.2] [Rule 204 §305.2.b]

43. Removal/Disposal of Replaced Equipment:

a. The Permittee shall permanently remove any replaced diesel-powered equipment from the nonattainment area or render the replaced equipment permanently disabled and dispose of in a manner that complies with all applicable local, state, and federal laws. For future CNG-powered equipment replacements, the Permittee shall provide evidence of proper disposal upon request from the Control Officer or from the permitted source using the ERCs as offsets. Evidence shall include at a minimum, serial numbers or vehicle numbers if the vehicle number is linked in the Permittee's records to the serial number, and location of where or how the equipment was disposed or removed from the nonattainment area.

b. The Permittee shall monitor the location and usage of CNG-powered vehicles that were used to create ERCs and have been replaced but remain operational outside the ozone nonattainment area. Such monitoring shall include the following, at minimum:

   i. Name and address of the current owner of the vehicle;

   ii. Documentation showing the current owner's geographic coverage area;

   iii. Description of current vehicle usage including the following:

      1) Customer names;

      2) Pickup and delivery locations (address or equivalent).

[SIP Rule 220 §302.2] [Rule 204 §305.2.d]

44. Inspections:

The Permittee shall allow the Control Officer access to the premises for conducting an inspection to verify compliance with requirements applicable to ERCs and their continued achievement. An inspection may include, but is not limited to, a review of records and reports.

[SIP Rule 220 §302.2] [Rule 204 §502]

45. Recordkeeping:

a. Records shall be maintained on site at all times by the Permittee in a consistent and complete manner, in either electronic or paper format.

b. Records shall be made available upon request and without delay to the owner or operator of the permitted source utilizing the ERCs and the Control Officer or his designee.

c. Records shall be maintained for five (5) years beyond the use or retirement of the ERCs, or five years after the retirement of a CNG-powered vehicle which was used to generate ERCs. The ERCs are to be used as offsets for Intel Corporation, facility # F000701, permit # P0006742.

[SIP Rule 220 §302.2] [Rule 204 §501]

d. <u>CNG-powered equipment:</u> Records shall include a detailed inventory of all CNG-powered equipment used to generate ERCs including all of the following for each piece of equipment:

   i. The equipment manufacturer.

   ii. The model number.

iii. The model year.

iv. A description of the equipment.

v. Information on sources used to obtain family or test group, fuel capacities, and emission rates of each CNG-powered vehicle when used to calculate ERCs.

vi. The date each CNG-powered vehicle was:

1) Added to the inventory.

2) Removed from the inventory.

vii. Any maintenance performed on a vehicle including the following, at minimum:

1) A description of the maintenance;

2) The date that the maintenance was performed;

3) The effect of the maintenance on the continued achievement of the ERCs.

e. Diesel-powered vehicle: Records shall include a detailed inventory of all diesel-powered vehicle used for the same purpose as CNG-powered vehicle including all of the following for each vehicle:

i. The vehicle manufacturer.

ii. The model number.

iii. The model year.

iv. A description of the vehicle including serial number.

v. Fuel type.

vi. The date each vehicle was:

1) Added to the inventory.

2) Removed from the inventory.

f. Monthly review and, if necessary, update the vehicle inventory.

g. Operational Records:

i. Monthly: For each CNG-powered vehicle used to generate ERCs, the Permittee shall record a description of all maintenance and repairs and at least one of the following to demonstrate the vehicle is used in the same manner as was represented in the ERC application, most notably the calculations using Motor Vehicle Emission Simulator (MOVES) software:

1) Hours of operation.

2) Mileage accrued.

ii. Monthly: For each piece of diesel-fueled vehicle that can be used for the same purpose as the CNG-powered vehicle used to generate ERCs, the Permittee shall record a description of all maintenance and repairs and at least one of the following:

1) Hours of operation.

2) Mileage accrued.

3) Fuel consumed.

h. Replacement of diesel vehicles:
For any diesel vehicle that is replaced with a higher emitting vehicle, the Permittee shall notify the Department by the end of the month following the vehicle replacement so the Department can review Permittee records to ensure the ERCs continue to meet applicable requirements.

[SIP Rule 220 §302.2][Rule 204 §505]

46. Annual Reporting:

The Permittee shall submit a report to the Control Officer annually by March 1 for the most recent calendar year. The report shall include the following, at minimum:

a. The quantity of ERCs, the vehicles used to generate the ERCs, and the identification of the vehicles, and their location and usage.

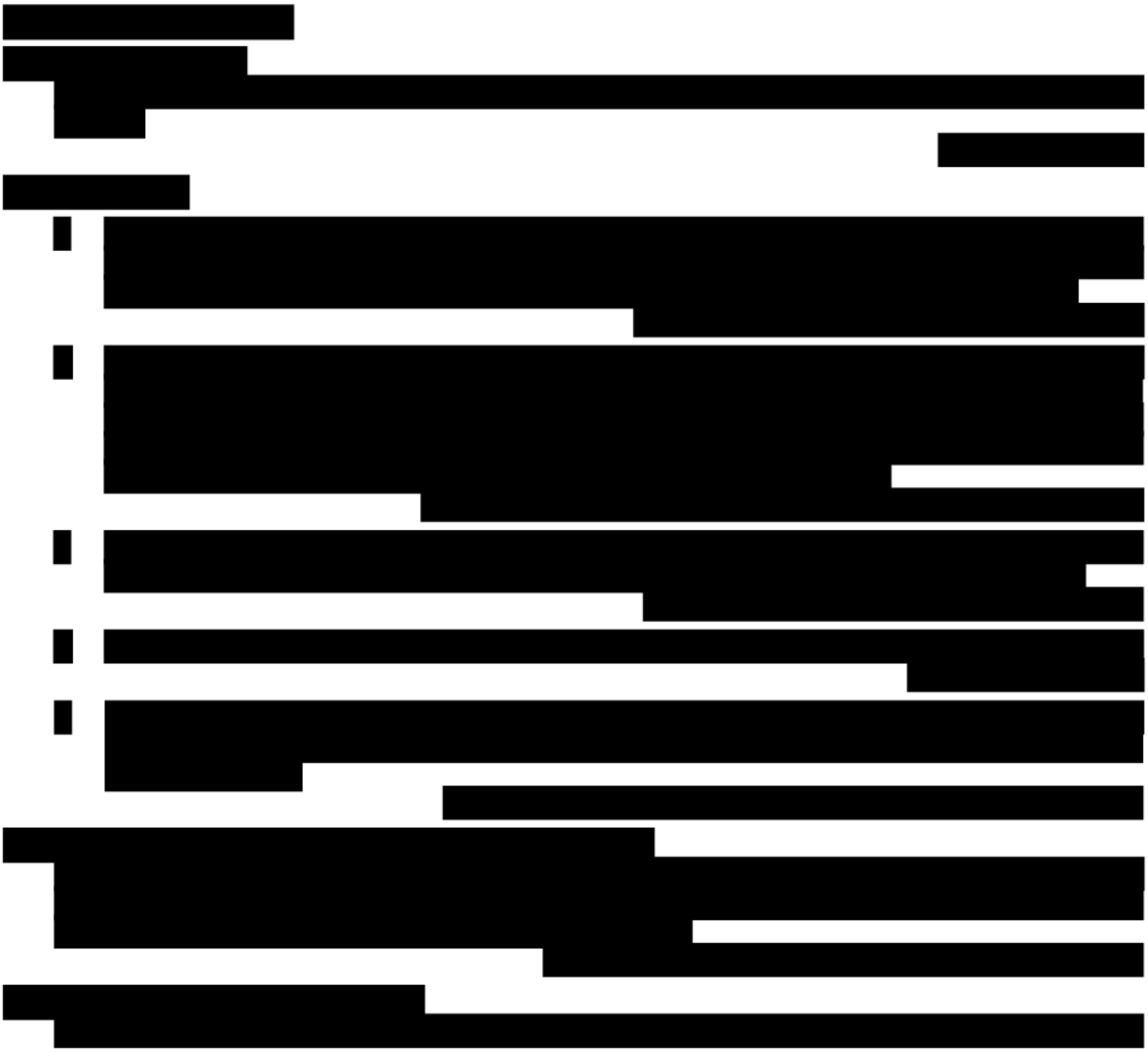
b. A summary of the operation and maintenance of vehicles for the continued achievement of the ERCs. The summary shall include the following, at minimum:

i. A description of maintenance performed to ensure vehicle emissions remain at the level necessary to achieve the ERCs;

ii. A description of vehicle usage as it relates to emissions to ensure continued achievement of the ERCs.

iii. A description of any vehicle(s) that suffered damage or maintenance affecting the Permittee's achievement of the ERCs including how the Permittee maintained the ERCs under the circumstances.

[SIP Rule 220 §303.2]



MARICOPA COUNTY AIR QUALITY DEPARTMENT

Engineering and Permitting Division

3800 N. Central Avenue, Suite 1400, Phoenix, Arizona 85012
Phone: (602) 506-6010 Fax: (602) 506-6985

AIR QUALITY PERMIT TO OPERATE AND/OR CONSTRUCT

(As required by Title 49, Chapter 3, Article 2, Section 49-480, Arizona Revised Statutes)

ISSUED TO

White Tanks Transfer Station
18605 W McDowell Rd
Goodyear, AZ 85338

This air quality permit to operate and/or construct does not relieve the applicant of the responsibility of meeting all air pollution regulations.

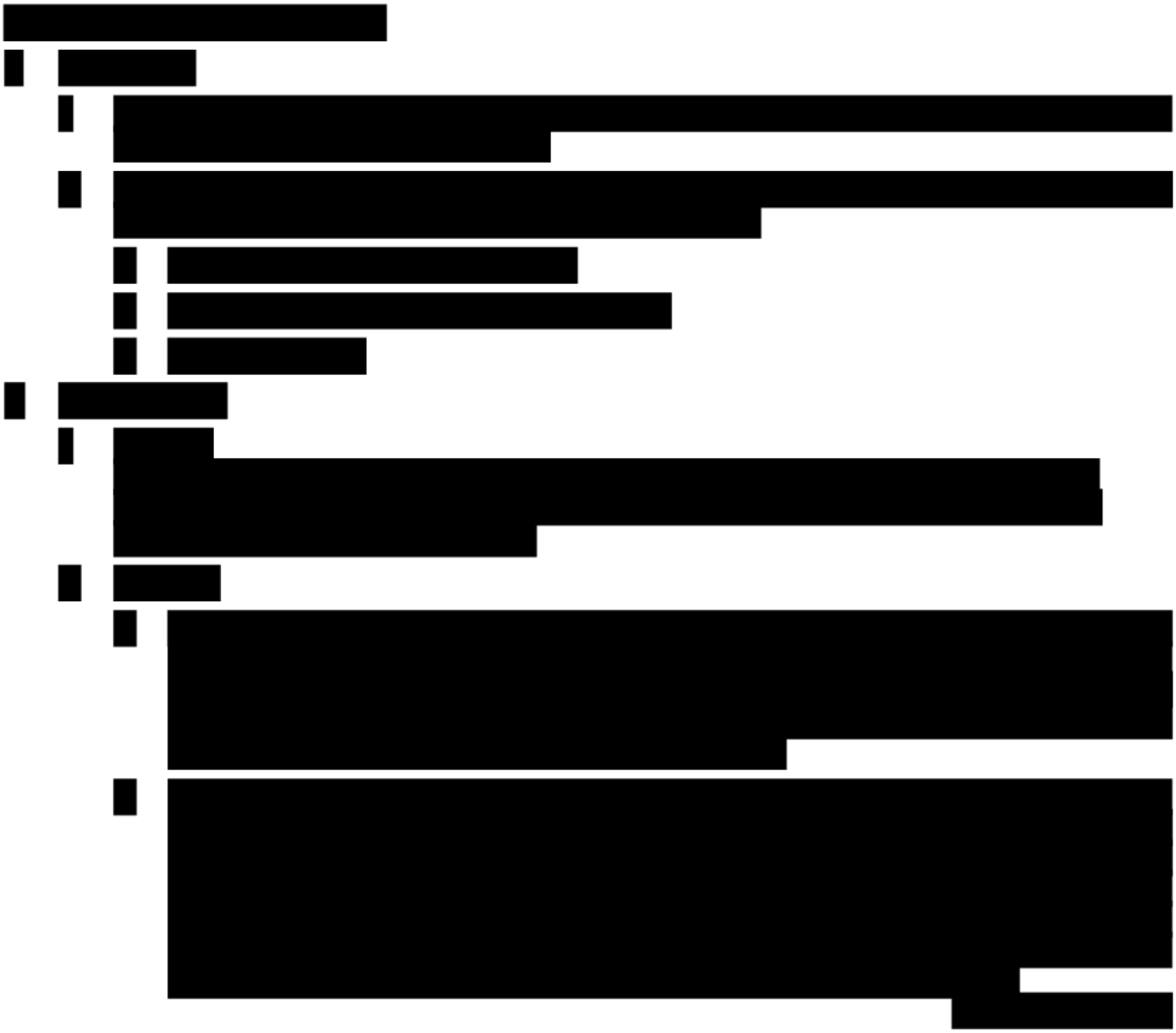
THE PERMITTEE IS SUBJECT TO THE SPECIFIC AND GENERAL CONDITIONS IDENTIFIED IN THIS PERMIT.

FACILITY NUMBER: F001646 **LEGACY PERMIT NUMBER:** 040086

PERMIT NUMBER: P0008309 **REVISION DATE:** 08/25/2021

EXPIRATION DATE: 10/31/2024

Todd Martin **Todd Martin, Non-Title V Permit Supervisor**



EMISSION REDUCTION CREDITS (ERCs)

The following conditions describe standards and measures necessary to comply with Rule 204, which governs the generation of Emission Reduction Credits (ERCs). Conditions 33-42 are included as voluntary limits and activities and are enforceable permit conditions.

33. Quantity of ERCs and Identification of Vehicles:

a. ERCs of 4.1 tons of nitrogen oxides (NOx) covered under this permit are achieved with 22 CNG-powered replacement vehicles, which are part of ERCs achieved with a total of 225 CNG-powered replacement vehicles.

b. The CNG-powered replacement vehicles listed in Appendix A, with identification numbers, account for the ERCs associated with this Permit.

34. Location:

The CNG-powered vehicles used to generate ERCs shall be based and operated within the Phoenix-Mesa ozone nonattainment area located within the jurisdiction of the MCAQD.

[SIP Rule 220 §302.2][Rule 204 §305.1]

35. Vehicle Replacement:

CNG-powered vehicles that were used to acquire ERCs shall be replaced with vehicles certified to the current NOx emission limit of 0.02 g/bhp-hr or less.

[SIP Rule 220 §302.2] [Rule 204 §305.1.a]

36. Quantification of Baseline Emissions and Emission Reductions:

a. The Permittee's documentation to quantify baseline emissions and emission reductions shall comply with the methodology given in Rule 204 Appendix C and with emission factors in grams per mile traveled (g/mile) or comparable units based on application documents, most notably the calculations using Motor Vehicle Emission Simulator (MOVES) software.

b. ERC quantification calculations shall not include emission reductions created or used under any other emissions trading program, emission reductions used to satisfy the State Implementation Plan including transportation conformity requirements, or any emission reductions pursuant to a federal consent decree, or state and local settlements.

[SIP Rule 220 §302.2] [Rule 204 §§305.1.b & c]

37. Operation and Maintenance of CNG-Powered Vehicles:

The Permittee shall operate and maintain CNG-powered vehicles in accordance with the manufacturer's written instructions and maintenance program in order to ensure the continued generation of emission reductions. Vehicle operation and maintenance shall be documented in accordance with Permit Condition 41.d.vii.

[SIP Rule 220 §302.2] [Rule 204 §305.2.a]

38. Monitoring of Equipment Use:

The Permittee shall monitor the use of all CNG-powered equipment used to generate ERCs to verify that the equipment is operated in the same manner as was represented in the ERC application, specifically the emission calculations using Motor Vehicle Emission Simulator (MOVES) software. This monitoring shall include the follow, at minimum:

a. Vehicle miles traveled (VMT) for each CNG-powered vehicle;

b. Percent of VMT within the nonattainment area.

[SIP Rule 220 §302.2] [Rule 204 §305.2.b]

39. Removal/Disposal of Replaced Equipment:

a. The Permittee shall permanently remove any replaced diesel-powered equipment from the nonattainment area or render the replaced equipment permanently disabled and dispose of in a manner that complies with all applicable local, state, and federal laws. For future CNG-powered equipment replacements, the Permittee shall provide evidence of proper disposal upon request from the Control Officer or from the permitted source using the ERCs as offsets. Evidence shall include at a minimum, serial numbers or vehicle numbers if the vehicle number is linked in the Permittee's records to the serial number, and location of where or how the equipment was disposed or removed from the nonattainment area.

b. The Permittee shall monitor the location and usage of CNG-powered vehicles that were used to create ERCs and have been replaced but remain operational outside the ozone nonattainment area. Such monitoring shall include the following, at minimum:

i. Name and address of the current owner of the vehicle;

ii. Documentation showing the current owner's geographic coverage area;

iii. Description of current vehicle usage including the following:

1) Customer names;

2) Pickup and delivery locations (address or equivalent).

[SIP Rule 220 §302.2] [Rule 204 §305.2.d]

40. Inspections:

The Permittee shall allow the Control Officer access to the premises for conducting an inspection to verify compliance with requirements applicable to ERCs and their continued achievement. An inspection may include, but is not limited to, a review of records and reports.

[SIP Rule 220 §302.2] [Rule 204 §502]

41. Recordkeeping:

a. Records shall be maintained on site at all times by the Permittee in a consistent and complete manner, in either electronic or paper format.

b. Records shall be made available upon request and without delay to the owner or operator of the permitted source utilizing the ERCs and the Control Officer or his designee.

c. Records shall be maintained for five (5) years beyond the use or retirement of the ERCs, or five years after the retirement of a CNG-powered vehicle which was used to generate ERCs. The ERCs are to be used as offsets for Intel Corporation, facility # F000701, permit # P0006742.

[SIP Rule 220 §302.2] [Rule 204 §501]

d. CNG-powered equipment: Records shall include a detailed inventory of all CNG-powered equipment used to generate ERCs including all of the following for each piece of equipment:

i. The equipment manufacturer.

ii. The model number.

iii. The model year.

iv. A description of the equipment.

v. Information on sources used to obtain family or test group, fuel capacities, and emission rates of each CNG-powered vehicle when used to calculate ERCs.

vi. The date each CNG-powered vehicle was:

1) Added to the inventory.

2) Removed from the inventory.

vii. Any maintenance performed on a vehicle including the following, at minimum:

1) A description of the maintenance;

2) The date that the maintenance was performed;

3) The effect of the maintenance on the continued achievement of the ERCs.

e. Diesel-powered vehicle: Records shall include a detailed inventory of all diesel-powered vehicle used for the same purpose as CNG-powered vehicle including all of the following for each vehicle:

i. The vehicle manufacturer.

ii. The model number.

iii. The model year.

iv. A description of the vehicle including serial number.

v. Fuel type.

vi. The date each vehicle was:

1) Added to the inventory.

2) Removed from the inventory.

f. Monthly review and, if necessary, update the vehicle inventory.

g. Operational Records:

i. Monthly: For each CNG-powered vehicle used to generate ERCs, the Permittee shall record a description of all maintenance and repairs and at least one of the following to demonstrate the vehicle is used in the same manner as was represented in the ERC application, most notably the calculations

using Motor Vehicle Emission Simulator (MOVES) software:

1) Hours of operation.

2) Mileage accrued.

ii. Monthly: For each piece of diesel-fueled vehicle that can be used for the same purpose as the CNG-powered vehicle used to generate ERCs, the Permittee shall record a description of all maintenance and repairs and at least one of the following:

1) Hours of operation.

2) Mileage accrued.

3) Fuel consumed.

h. Replacement of diesel vehicles:
For any diesel vehicle that is replaced with a higher emitting vehicle, the Permittee shall notify the Department by the end of the month following the vehicle replacement so the Department can review Permittee records to ensure the ERCs continue to meet applicable requirements.

[SIP Rule 220 §302.2][Rule 204 §505]

42. Annual Reporting:
The Permittee shall submit a report to the Control Officer annually by March 1 for the most recent calendar year. The report shall include the following, at minimum:

a. The quantity of ERCs, the vehicles used to generate the ERCs, and the identification of the vehicles, and their location and usage.

b. A summary of the operation and maintenance of vehicles for the continued achievement of the ERCs. The summary shall include the following, at minimum:

i. A description of maintenance performed to ensure vehicle emissions remain at the level necessary to achieve the ERCs;

ii. A description of vehicle usage as it relates to emissions to ensure continued achievement of the ERCs.

iii. A description of any vehicle(s) that suffered damage or maintenance affecting the Permittee's achievement of the ERCs including how the Permittee maintained the ERCs under the circumstances.

[SIP Rule 220 §303.2]

[redacted]

MARICOPA COUNTY AIR QUALITY DEPARTMENT

Engineering and Permitting Division

3800 N. Central Avenue, Suite 1400, Phoenix, Arizona 85012
Phone: (602) 506-6010 Fax: (602) 506-6985

AIR QUALITY PERMIT TO OPERATE AND/OR CONSTRUCT

(As required by Title 49, Chapter 3, Article 2, Section 49-480, Arizona Revised Statutes)

ISSUED TO

DEER VALLEY TRANSFER STATION
2120 W ADOBE DR
PHOENIX, AZ 85027

This air quality permit to operate and/or construct does not relieve the applicant of the responsibility of meeting all air pollution regulations.

THE PERMITTEE IS SUBJECT TO THE SPECIFIC AND GENERAL CONDITIONS IDENTIFIED IN THIS PERMIT.

FACILITY NUMBER: F000443 **LEGACY PERMIT NUMBER:** 000024

PERMIT NUMBER: P0008316 **REVISION DATE:** 08/25/2021

EXPIRATION DATE: 04/30/2025

Todd Martin

Todd Martin, Non-Title V Permit Supervisor

[redacted]

EMISSION REDUCTION CREDITS (ERCs)

The following conditions describe standards and measures necessary to comply with Rule 204, which governs the generation of Emission Reduction Credits (ERCs). Conditions 37-46 are included as voluntary limits and activities and are enforceable permit conditions.

37. Quantity of ERCs and Identification of Vehicles:

a. ERCs of 11.2 tons of nitrogen oxides (NOx) covered under this permit are achieved with 74 CNG-powered replacement vehicles, which are part of ERCs achieved with a total of 225 CNG-powered replacement vehicles.

b. The CNG-powered replacement vehicles listed in Appendix A, with identification numbers, account for the ERCs associated with this Permit.

38. Location:
The CNG-powered vehicles used to generate ERCs shall be based and operated within the Phoenix-Mesa ozone nonattainment area located within the jurisdiction of the MCAQD.

[SIP Rule 220 §302.2][Rule 204 §305.1]

39. Vehicle Replacement:
CNG-powered vehicles that were used to acquire ERCs shall be replaced with vehicles certified to the current NOx emission limit of 0.02 g/bhp-hr or less.

[SIP Rule 220 §302.2] [Rule 204 §305.1.a]

40. Quantification of Baseline Emissions and Emission Reductions:

a. The Permittee's documentation to quantify baseline emissions and emission reductions shall comply with the methodology given in Rule 204 Appendix C and with emission factors in grams per mile traveled (g/mile) or comparable units based on application documents, most notably the calculations using Motor Vehicle Emission Simulator (MOVES) software.

b. ERC quantification calculations shall not include emission reductions created or used under any other emissions trading program, emission reductions used to satisfy the State Implementation Plan including transportation conformity requirements, or any emission reductions pursuant to a federal consent decree, or state and local settlements.

[SIP Rule 220 §302.2] [Rule 204 §§305.1.b & c]

41. Operation and Maintenance of CNG-Powered Vehicles:
The Permittee shall operate and maintain CNG-powered vehicles in accordance with the manufacturer's written instructions and maintenance program in order to ensure the continued generation of emission reductions. Vehicle operation and maintenance shall be documented in accordance with Permit Condition 45.d.vii.

[SIP Rule 220 §302.2] [Rule 204 §305.2.a]

42. Monitoring of Equipment Use:
The Permittee shall monitor the use of all CNG-powered equipment used to generate ERCs to verify that the equipment is operated in the same manner as was represented in the ERC application, specifically the emission calculations using Motor Vehicle Emission Simulator (MOVES) software. This monitoring shall include the follow, at minimum:

a. Vehicle miles traveled (VMT) for each CNG-powered vehicle;

b. Percent of VMT within the nonattainment area.

[SIP Rule 220 §302.2] [Rule 204 §305.2.b]

43. Removal/Disposal of Replaced Equipment:

a. The Permittee shall permanently remove any replaced diesel-powered equipment from the nonattainment area or render the replaced equipment permanently disabled and dispose of in a manner that complies with all applicable local, state, and federal laws. For future CNG-powered equipment replacements, the Permittee shall provide evidence of proper disposal upon request from the Control Officer or from the permitted source using the ERCs as offsets. Evidence shall include at a minimum, serial numbers or vehicle numbers if the vehicle number is linked in the Permittee's records to the serial number, and location of where or how the equipment was disposed or removed from the nonattainment area.

b. The Permittee shall monitor the location and usage of CNG-powered vehicles that were used to create ERCs and have been replaced but remain operational outside the ozone nonattainment area. Such monitoring shall include the following, at minimum:

i. Name and address of the current owner of the vehicle;

ii. Documentation showing the current owner's geographic coverage area;

iii. Description of current vehicle usage including the following:

1) Customer names;

2) Pickup and delivery locations (address or equivalent).

[SIP Rule 220 §302.2] [Rule 204 §305.2.d]

44. Inspections:

The Permittee shall allow the Control Officer access to the premises for conducting an inspection to verify compliance with requirements applicable to ERCs and their continued achievement. An inspection may include, but is not limited to, a review of records and reports.

[SIP Rule 220 §302.2] [Rule 204 §502]

45. Recordkeeping:

a. Records shall be maintained on site at all times by the Permittee in a consistent and complete manner, in either electronic or paper format.

b. Records shall be made available upon request and without delay to the owner or operator of the permitted source utilizing the ERCs and the Control Officer or his designee.

c. Records shall be maintained for five (5) years beyond the use or retirement of the ERCs, or five years after the retirement of a CNG-powered vehicle which was used to generate ERCs. The ERCs are to be used as offsets for Intel Corporation, facility # F000701, permit # P0006742.

[SIP Rule 220 §302.2] [Rule 204 §501]

d. <u>CNG-powered equipment:</u> Records shall include a detailed inventory of all CNG-powered equipment used to generate ERCs including all of the following for each piece of equipment:

i. The equipment manufacturer.

ii. The model number.

iii. The model year.

iv. A description of the equipment.

v. Information on sources used to obtain family or test group, fuel capacities, and emission rates of each CNG-powered vehicle when used to calculate ERCs.

vi. The date each CNG-powered vehicle was:

1) Added to the inventory.

2) Removed from the inventory.

vii. Any maintenance performed on a vehicle including the following, at minimum:

1) A description of the maintenance;

2) The date that the maintenance was performed;

3) The effect of the maintenance on the continued achievement of the ERCs.

e. Diesel-powered vehicle: Records shall include a detailed inventory of all diesel-powered vehicle used for the same purpose as CNG-powered vehicle including all of the following for each vehicle:

i. The vehicle manufacturer.

ii. The model number.

iii. The model year.

iv. A description of the vehicle including serial number.

v. Fuel type.

vi. The date each vehicle was:

1) Added to the inventory.

2) Removed from the inventory.

f. Monthly review and, if necessary, update the vehicle inventory.

g. Operational Records:

i. Monthly: For each CNG-powered vehicle used to generate ERCs, the Permittee shall record a description of all maintenance and repairs and at least one of the following to demonstrate the vehicle is used in the same manner as was represented in the ERC application, most notably the calculations using Motor Vehicle Emission Simulator (MOVES) software:

1) Hours of operation.

2) Mileage accrued.

ii. Monthly: For each piece of diesel-fueled vehicle that can be used for the same purpose as the CNG-powered vehicle used to generate ERCs, the Permittee shall record a description of all maintenance and repairs and at least one of the following:

1) Hours of operation.

2) Mileage accrued.

3) Fuel consumed.

h. Replacement of diesel vehicles:
For any diesel vehicle that is replaced with a higher emitting vehicle, the Permittee shall notify the Department by the end of the month following the vehicle replacement so the Department can review Permittee records to ensure the ERCs continue to meet applicable requirements.

[SIP Rule 220 §302.2][Rule 204 §505]

46. Annual Reporting:

The Permittee shall submit a report to the Control Officer annually by March 1 for the most recent calendar year. The report shall include the following, at minimum:

a. The quantity of ERCs, the vehicles used to generate the ERCs, and the identification of the vehicles, and their location and usage.

b. A summary of the operation and maintenance of vehicles for the continued achievement of the ERCs. The summary shall include the following, at minimum:

i. A description of maintenance performed to ensure vehicle emissions remain at the level necessary to achieve the ERCs;

ii. A description of vehicle usage as it relates to emissions to ensure continued achievement of the

ERCs.

iii. A description of any vehicle(s) that suffered damage or maintenance affecting the Permittee's achievement of the ERCs including how the Permittee maintained the ERCs under the circumstances.

[SIP Rule 220 §303.2]

[redacted]

REVISION TO ARIZONA'S SIP
INCORPORATION OF WASTE MANAGEMENT PERMIT CONDITIONS

APPENDIX 2:
WASTE MANAGEMENT EMISSION REDUCTION CREDIT CERTIFICATION PACKAGES

Maricopa County AIR QUALITY DEPARTMENT
Philip A. McNeely, R.G. Director
Phone: 602-506-6701
Email: Philip.McNeely@maricopa.gov
Maricopa.gov/AQ
CleanAirMakeMore.com

August 25, 2021

Return to Table of Contents

Daniel Czecholinski
Air Quality Division Director
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

RE: Emissions Reduction Certification (ERC)
Waste Management of Arizona, Inc. (Santan Transfer Station) – MCAQD Facility F001645

Dear Mr. Czecholinski:

The Maricopa County Air Quality Department (MCAQD) has verified the credit and number of tons of actual emissions that have been reduced by replacing diesel-fueled solid waste collection trucks with CNG-fueled trucks based at the Waste Management Santan Transfer Station located at 4040 South 80th Street in Mesa, Arizona. In accordance with the Arizona Administrative Code, the following actual emissions have been verified for use as certified emission credits:

Nitrogen Oxides (NOx): 18.3 tons/year

Per Maricopa County Rule 204 §301 and AAC Rule 18-2-1205.A, the Control Officer may certify an emission credit if the credit is verified and determined by all of the following:

1. A reduction in actual emissions that occurred after August 17, 1999.

The facility has replaced 129 diesel-fueled solid waste collection trucks with 129 CNG-fueled solid waste collection trucks. Actual NOx emissions from CNG trucks are 65 - 90% less than diesel-fueled trucks depending on model year.

2. A quantifiable reduction in actual emissions.

The applicant submitted calculations using EPA's Motor Vehicle Emissions Simulator software (v3.01) to quantify emissions from both the old and new trucks. Actual vehicle miles traveled were also provided to define the actual emissions. Emission baseline from the diesel-fueled trucks has been calculated over a series of years (i.e., 2013-2021) depending on when the actual conversion occurred.

3. A permanent reduction in actual emissions.

The trucks removed from service must be disabled or moved outside of the Maricopa County non-attainment area as required in the site air quality permit P0008308. The permit also requires that any future replacement of trucks must be equal to or lower emitting than the truck being replaced. These enforceable permit conditions make the emission reductions permanent.

4. An enforceable reduction in actual emissions.

The air quality permit (i.e., P0008308) for the facility includes provisions requiring removal of the diesel-fired trucks that were replaced by the CNG-fired trucks be removed from the Maricopa County ozone non-attainment area. Additional conditions in the permit require monitoring and record keeping to further make the reductions enforceable.

5. A surplus reduction in actual emissions occurring in addition to any other required emission reduction.

The type of trucks that formed the basis for the emission credit have been listed in the 2017 Ozone Periodic Emission Inventory (PEI) and previous PEIs as diesel-fueled vehicles. These inventories are used for regional planning by the Maricopa Association of Governments. No emission reductions were required at the source either through planning or regulation that would reduce the certified credits. Therefore, the lower emitting CNG-fired trucks are surplus to the inventory. Consequently, the table below is a summary of the emission credit calculation.

Pollutant	Baseline Emissions (tons/year)	Ongoing Emissions (tons/year)	Certified Credits (tons/year)
NOx	23.4	5.1	18.3

Based on the information submitted by the source and verified as described above, the MCAQD certifies emission reduction credits in the amount of 18.3 tons of NOx.

This notification is being provided to the Arizona Department of Environmental Quality in the event the applicant submits the certified ERCs for deposit in the Arizona Emissions Bank.

If you have any questions or need additional information, please contact Richard Sumner of my staff at Richard.sumner@maricopa.gov or 602-506-1842.

Sincerely,

Philip A. McNeely, RG
Director
Maricopa County Air Quality Department

Cc: David Bearden, Waste Management of Arizona, Inc.

Attachments

Emission Reduction Credit
Evaluation

Source: Waste Management (Santan Transfer Station)
Facility ID: F001645 Permit: P0008308
Date: August 11, 2021

Project Description: Replace diesel-powered solid waste collection trucks with CNG-powered trucks.

Baseline Emissions: CNG trucks were brought into the fleet over a number of years. Therefore, the baseline is the diesel truck that was replaced by the CNG truck. For example, the NOx emission rate from the diesel truck was 5.29 g/mile and CNG truck #211914 emission rate put into service in 2015 is 1.76 g/mile. (Emission rates based on EPA MOVES 3.01.) The reduction is the difference between the baseline diesel truck emission rate and the CNG truck emission rate. Credits are reduced by 2.5% to allow for mileage outside of the non-attainment area. Annual mileage used in the calculation is 97.5% of actual average mileage for each individual truck. Note: 5antan Transfer Station includes both Santan Fleet and Elwood Fleet.

Example Calculation (1 Truck): (5.29 g/mile - 1.76 g/mile) x 35,649 miles/year x 0.975 = 122,695 g/yr = 0.135 tons/year

Total NOx from the attached spreadsheet for 73 trucks (Santan Fleet) = 10.6954 tons (uncorrected for outside non attainment area)
Total Creditable NOx (after correction) = 10.6954 tons (97.5/97.51) = 10.7 tons
Creditable NOx reduction (Santan Fleet) = 10.7 tons

Total NOx from the attached spreadsheet for 56 trucks (Elwood Fleet) = 7.7929 tons (uncorrected for outside non attainment area)
Total Creditable NOx (after correction) = 7.7929 tons (97.5/100) = 7.6 tons
Creditable NOx reduction (Elwood Fleet) = 7.6 tons

Total Creditable NOx reduction = 10.7 + 7.6 = 18.3 tons

Prepared by Richard Sumner
August 11, 2021

Return completed form to
Maricopa County Air Quality Department
3800 North Central Ave. Suite 1400, Phoenix, AZ 85012
Phone: 602.506.6010 Fax: 602.372.0587
AQPermits@mail.maricopa.gov

EMISSION REDUCTION CREDIT APPLICATION

3800 North Central Ave. Suite 1400, Phoenix, AZ 85012 or 501 North 44th St. Suite 200 Phoenix, AZ 85008.

Emission Reduction Credit Application

Facility Information	
1. Facility Name:	Waste Management of Arizona, Inc.
2. Facility Address:	222 S. Mill Ave., Suite 333
	City: Tempe State: Arizona Zip Code: 85281
3. Permit #:	040086/F001646 (White Tanks) 040027/F001645 (SAN TAN); 0006438/F000443 (DEER VALLEY)
Contact Information	
4. Is the facility information the same as the contact information?	Yes ☐ No ☒
5. Contact Name:	Dave Bearden
6. Contact Address:	222 S. Mill Ave., Suite 333
	City: Tempe State: Arizona Zip Code: 85281
7. Pollutant (Complete a separate sheet for each pollutant):	NOx
8. Date:	Jun 28, 2021
9. List of the equipment/process involved with the emission reduction:	
Solid Waste Collection Trucks converted from diesel fuel to compressed natural gas	Add a Row / Delete a Row
10. Describe how the emission reduction will be accomplished:	
Waste Management has been converting the majority of their solid waste collection truck fleets in the Phoenix area from diesel fuel to Compressed Natural Gas (CNG), and is applying for NOx Emissions Reduction Credits (ERCs) from the voluntary conversion of trucks from diesel to CNG operation. The trucks are associated with four collection fleets operate at three transfer stations in the non-attainment area. Attachment A provides qualifying criteria, method of calculations and fleet calculations which have been met in the generation of these ERCs.	
11. Estimated date of emission reduction: various see attachment A	
12. Describe how the reduction will be made permanent:	
13. Baseline period (two calendar years): 2020 2021	
If this is not the most recent two calendar years, provide a detailed explanation of why the most recent years were not used.	
The requirements related to the ERCs will be included with permit modification for the transfer stations White Tanks, Deer Valley and San Tan. The proposed requirements relate to 1) WM will continue to purchase CNG trucks or alternative trucks with at least or better NOx emissions compared to the current Cummins Engine, 2) perform routine engine maintenance and 3) maintain at least 22 trucks operating 95% or more of their time in the Non-attainment Area.	
14. Identify the method that is proposed to calculate the baseline emissions and how that method is being used. (Examples: material balance, performance test data, continuous monitor, emission factors, etc.)	
See Attachment A – Criteria, Methods of Calculations and Fleet Calculations	

Return completed form to:
Maricopa County Air Quality Department
3800 North Central Ave Suite 140 Phoenix AZ 85012
Phone: 602.506.6010 Fax: 602.506.6179
AQPermitsmail@maricopa.gov

AIR QUALITY DEPARTMENT

MARICOPA COUNTY

EMISSION REDUCTION CREDIT APPLICATION

3800 North Central Ave Suite 1800 Phoenix AZ 85012 Phone: 602.506.6010 Fax: 602.506.6179 AQPermitsmail@maricopa.gov

15. List the seasonal emission rate on a quarterly basis from the operation/process that provided the emission reduction.

Baseline Year One 2020 Q1: _____ Q2: _____ Q3: _____ Q4: _____

Baseline Year Two 2021 Q1: _____ Q2: _____ Q3: _____ Q4: _____

16. Calculation of baseline emissions in tons per year:

A. List any emission factors with their source (include units):

See Attachment A

Add a Row | Delete a Row

B. List assumptions made to perform the calculations:

See Attachment A

C. Show sample of calculations made to verify emission reduction:

See Attachment A

D. Baseline emission rate (tons per year): 34.14

E. Provide a list of documents attached to substantiate the basis for the calculations (e.g., safety data sheets, process records, material use records, monitoring records, etc.).

See Attachment A

Add a Row | Delete a Row

F. Comments or additional information:

17. Do you plan to register the certified credits in the Arizona Emissions Bank administered by the Arizona Department of Environmental Quality (ADEQ)? ☑ Yes ☐ No If yes, there is a registration fee of $200 payable to ADEQ. For more information about the Arizona Emissions Bank please review Arizona Administrative Code Title 18, Chapter 2, Article 12.

18. I certify that the statements and information provided herein are true, accurate, and complete based on information and belief formed after reasonable inquiry.

Signature of owner or responsible official: Dave Boarder

Type or print name and title: Dave Boarder Date: 7/13/2021

Attachment A – Criteria, Methods of Calculations and Fleet Calculations

The five ERC qualifying criteria are being met in the generation of these ERCs:

- **Real** Each of the CNG trucks are designed to operate solely on natural gas. There is extensive evidence, including engine certification testing results, to show that these trucks emit less NOx on a per mile basis that their diesel counter parts. In quantifying the ERCs, actual miles traveled in the nonattainment area are combined with actual emissions rates using standardize EPA modeling methods applicable to these operating conditions. While these new CNG trucks are replacing older diesel trucks with much higher NOx emissions, to assure that the reductions are real, the analysis is based on the emissions of the CNG trash truck in comparison to a new diesel trash truck of the same vintage.

- **Quantifiable** As described in detail in this Appendix A, the emissions reduction resulting from the voluntary replacement of diesel trash collection trucks with lower NOx emitting CNG trucks is being quantified using the EPA MOVES3.01, reflecting the miles traveled by the CNG trucks within the nonattainment area. The model has been adjusted to reflect actual use patterns of the Waste Management trash trucks and the difference in emissions between diesel and CNG in the year each CNG truck was or will be placed into service.

- **Surplus** The conversion to CNG trash truck fleets is being carried out on a voluntary basis. It is not being done to comply with any current or anticipated regulatory requirement. We understand that trash truck is the region appear as diesel powered in the Regional Ozone Modeling over the last decade including the latest (2017) Regional emissions inventory.

- **Permanent** Waste Management is proposing to make these reductions permanent by keeping these CNG trucks in service in the nonattainment area and replacing them with CNG trucks or trucks with equal or lower NOx emissions whenever one is removed from service. Proposed permit conditions that would be added to the air permit of the Fleet location, reflecting this commitment, are presented in Appendix B.

- **Enforceable** The Fleet requirements will be added to existing minor source air permits issued by the Maricopa County Air Quality Department. The conditions of these air permits are federally enforceable. Waste Management will be requesting permit conditions in each of these permits that will make the continuing use of these CNG trucks or replacement trucks with equal or lower NOx emissions in the nonattainment area. See Appendix B. This will make the action that Waste Management has taken to create these ERCs federally enforceable.

The methods of calculations for the ERCs are:

Waste Management currently operates 225 refuse trucks powered by compressed natural gas (CNG) engines in the greater Phoenix area that collect waste and deliver it to transfer stations. The fleets are referred to as White Tank, San Tan, North Phoenix and Elwood. These CNG vehicles are powered by U.S. EPA certified 2011 to 2020 model-year Cummins 8.9-liter engines. The model-year 2011 to 2015 engines were certified by Cummins to the 0.2 g/bhp-hr NOx standard that applies to 2010 and later model-year vehicles while the 2016 and later model-year engines were certified by Cummins to family NOx emissions limits (FELs) of 0.02 g/bhp-hr.

The MERC calculation methodology is based on a comparison of the CNG refuse truck emissions to the emissions of a diesel refuse truck of the same model year. A credit calculation is performed for each CNG vehicle based the vehicle's lifetime average annual mileage reported by Waste Management and the differential in emissions NOx between the CNG vehicle and a diesel-powered refuse truck with an engine of the same model-year, computed for calendar year 2021 derived from EPA's MOVES3.01.

The emissions differential calculation begins with 2010 through 2020 model-year emission factors (in units of grams of NOx per mile of operation) for diesel and CNG refuse trucks obtained by running MOVES 3.01 configured for Maricopa County in calendar year 2021. Two adjustments were made to the MOVES 3.01 emission factors. The first was made to account for the fact that the engines in the 2016 and later Waste Management CNG vehicles were certified to a family emissions level (FEL) of 0.02 g/bhp-hr for NOx which is 10 times lower than the applicable emission standard of 0.20 g/bhp-hr which is assumed in MOVES3.01.[1] Therefore, CNG emission rates for 2016 to 2020 model-year vehicles were assumed to be one-tenth of the comparable diesel emission rate.

The second adjustment was made to account for the actual load factors experienced by Waste Management's CNG vehicles during routine operations which is not appropriately accounted for in MOVES 3.01.[2] More specifically, Waste Management collected engine load data using a Cummins engine analyzer[3] from three trucks operating on actual in-use refuse routes representative of the three main types of refuse truck operation occurring in the Waste Management : 1) residential, 2) roll-off, and 3) frontload. These load factors were determined

[1] Based on a review of the MOVES3 documentation related to emission factors for heavy-duty CNG trucks, it is clear that the MOVES emission factors are based on data from 2011 and 2014 model-year vehicles certified to the 0.20 g/bhp-hr standard which overestimates the actual emissions of the 2016 to 2020 model-year CNG trucks. See "Exhaust Emission Rates for Heavy-Duty Onroad Vehicles in MOVES3", EPA-420-R-20-018, November 2020, page 197.

[2] For example, the MOVES3.01 fuel consumption values for 2011 to 2020 model-year refuse trucks are only about 12% higher than for transit buses rather than the expected average of about 30%. See Alternative Fuels Data Center: Maps and Data - Average Fuel Economy by Major Vehicle Category (energy.gov)

[3] The analyzer is lap top based unit that directly reads engine performance, monitoring data and calculate parameters including the engine load factor. Dave – can you provide the name of software and maybe a link to a Cummins web page where it is described?

to be 40.5% for residential, 31.5% for roll-off, and 38% for front end loaders which are much higher than the 20 to 25% load engines experience during certification emissions testing.[4] Therefore the diesel and CNG emission rates from MOVES3.01 were scaled using the load factors provided by Waste Management divided by the 25% value that is the upper bound of the range reported from certification testing.

The final MERC calculation for each CNG vehicle involved multiplying the weighted average annual milage of that type of vehicle by the emissions difference between the diesel and CNG emission rates. For example, the MERC value for a 2015 residential refuse truck that travels 50,000 miles would be:

MERC (tons/year) = 50,000 miles/year * (4.20-1.40) grams NOx/mile * (40.5/25)
= 243,000 grams NOx/year = 0.27 tons NOx/year

Where 4.20 and 1.40 grams NOx/mile are the MOVES3 generated NOx emission factors for 2015 model-year diesel and CNG refuse trucks, respectively.

While the MERC value for a 2020 front end loader refuse truck traveling 50,000 miles a year would be:

MERC (tons/year) = 50,000 miles/year * (2.84 – 0.284) grams NOx/mile * (38/25)
= 194,256 grams NOx/year = 0.21 tons NOx/year

Where 2.84 grams NOx/mile is the diesel emission factor and 0.284 the assumed natural gas emission factor given engine certification to a 0.02 g/bhp-hr NOx FEL.

The annual emissions reductions associated with CNG use in the individual trucks are then summed over all trucks to arrive at the total MERC value for the 225 trucks. This value is then multiplied by 0.95 in order to account for actual CNG truck operation in the Phoenix non-attainment area based on information provided by Waste Management indicating that 5% of their operation occurs outside the nonattainment area.

[4] Transit Bus Load-Based Modal Emission Rate Model Development, EPA/600/R-07/106, July 2007, page 3-2.

Appendix B

Proposed Permit Conditions for the Use of CNG Trash Trucks by the Waste Management Fleets in the Maricopa Nonattainment Area[1]

Waste Management (WM) will maintain and operate a minimum of 225 CNG fueled trash trucks, serving the four Fleets in the greater Phoenix area. Any retired CNG truck will be replaced with either a new CNG truck certified at 0.02 g/bhp-hr or lower NOx emitting trash truck fueled with CNG or an alternative fuel, with the replacement truck counting towards this total.

WM will conduct periodic service on each CNG truck consistent with the manufacturer's recommendations consisting of:

Applicable Engine	Description of Service
ALL	Specific inspection related to Cab, Engine, Transmission, Fuel System, Steering System and Axles, Body and Hydraulics, check fuel filter for moisture
ALL	Specific inspection related to Cab, Engine, Transmission, Fuel System, Steering System and Axles, Body and Hydraulics but more in-depth, includes gas leak detection system validation
12L Gas	Specific inspection related to Cab, Engine, Transmission, Fuel System, Steering System and Axles, Body and Hydraulics but more in-depth. Includes engine oil and lube filter replacement
12L Gas	Spark Plug and Ignition System Service
ALL	Specific Inspections related to CNG engines and fuel system, includes the service of the high pressure and low-pressure fuel filters
9L Gas	Specific inspection related to Cab, Engine, Transmission, Fuel System, Steering System and Axles, Body and Hydraulics but more in-depth. Includes servicing high pressure and low-pressure fuel filters, engine oil and filter replacement
9L Gas	Spark Plug and Ignition System Service
ALL	Specific inspection related to Engine, Transmission, Axles, Body and Hydraulics

ALL	Specific CNG Engine and fuel system inspection items, Engine valve lash inspection and adjustment service
ALL	Service of CNG Fuel Delivery and Leak Detection System
ALL	CNG Tanks and Fuel Delivery System Inspection by qualified inspector
ALL	Annual DOT Inspection, PMI Forms have grayed sections that need to be filled out for this service

WM shall maintain the following records:

- Inventory of the CNG trucks used by these four Fleets
- Records of the maintenance of these vehicles

Additionally, we propose to keep records showing generally that the CNG trash trucks are being used in a manner consistent with the derivation of the ERCs. Without an enforceable limit. This would be keeping the following records:

- As part of the inventory of the CNG trucks, annually provide a listing the route(s) for each truck with an annotation of whether the route is or is not predominantly in the nonattainment area.

This would include:

- Annually, WM shall demonstrate that 95% or more of the routes use by their CNG trucks were predominately in the nonattainment area.
- If this figure is not met, WM will notify the MCAPD and explain why the usage was less than expected, what actions WM is taking to ensure that CNG truck use is consistent with this target, and the outlook for the coming year.

[i] These conditions would be inserted into the current air permits of each of the four fleets using the CNG trucks for trash collection.

Refuse truck activity 2021 NOx emission factors (g/mi)				0.02 CNG
Model year	Gasoline	Diesel	CNG	
1992	7.18	29.66		
1993	8.17	29.79		
1994	7.35	29.75		
1995	7.19	28.02		
1996	7.19	29.88		
1997	8.25	29.91		
1998	4.24	27.19		
1999	4.24	21.32		
2000		20.39		
2001		20.43		
2002		20.25	8.30	
2003	1.50	10.74	8.30	
2004		10.73	8.30	
2005	1.45	10.75		
2006	1.45	10.76		
2007	1.56	7.52		
2008	0.47	7.29		
2009	0.47	7.47		
2010		5.88	1.40	
2011		5.16	1.40	
2012		5.27	1.40	
2013	0.32	4.24	1.40	
2014		4.20	1.40	
2015		4.20	1.40	
2016		4.09	0.93	0.41
2017		3.90	0.93	0.39
2018		2.84	0.93	0.28
2019		2.84	0.93	0.28
2020		2.84	0.93	0.28
2021		2.84	0.93	0.28

Total Credits	34.14	tons
Total Vehicles	225.00	

average mileage residential	18068
average mileage roll off	29577
average mileage front load	44463

CNG emissions rates for vehicles certified to 0.02 g/bhp-hr FEL are assumed to be 10% of same model-year diesel emission rates

ELWOOD FLEET (F001645)

CNG Truck Number	CNG Load Factor	Date in Service	Engine Hours in Service	Date of Recent Hours	Recent Hours Reading	Mileage in Service	Date of Recent Mileage	Recent Mileage Reading	Days Between Readings	Years Between Readings	Hours Per Year	Miles Per Year	Make	Model	Family	Displacement	Horsepower	Engine MY	CNG NOx (g/mile)	Diesel NOx (g/mile)	Annual NOx Emissions Reduction (tons)	Truck Route within Non-attainm	Percentage within Non-attainme	Non-Attainment Area Miles	Residential	Rolloff	Front Loader
210741	31.5	01/18/2011	0	05/14/2021	25652	0	05/12/2021	232310	3769.0	10.33	2484	22,498	CUMMINS	ISLG	ISL	8.9	320	2010	1.77	7.41	0.14	Yes	100%	22498	0	22,498	0
210742	31.5	01/18/2011	0	05/14/2021	38776	0	05/12/2021	240292	3769.0	10.33	1818	23,262	CUMMINS	ISLG	ISL	8.9	320	2010	1.77	7.41	0.14	Yes	100%	23262	0	23,262	0
213420	31.5	05/01/2013	0	05/14/2021	17855	0	05/12/2021	198982	2935.0	8.04	2220	24,746	CUMMINS	ISLB	ISL	8.9	320	2012	1.77	6.64	0.13	Yes	100%	24746	0	24,746	0
213480	31.5	10/14/2013	0	05/14/2021	16223	0	05/12/2021	151519	2769.0	7.59	2138	19,973	CUMMINS	ISLG	ISL	8.9	320	2012	1.77	6.64	0.11	Yes	100%	19973	0	19,973	0
213938	31.5	03/27/2015	0	05/14/2021	16501	0	05/12/2021	152120	2240.0	6.14	2689	24,787	CUMMINS	ISLG	ISL	8.9	320	2014	1.76	5.29	0.10	Yes	100%	24787	0	24,787	0
213940	31.5	03/18/2015	0	05/14/2021	14099	0	05/12/2021	158847	2249.0	6.16	2288	25,780	CUMMINS	ISLG	ISL	8.9	320	2014	1.76	5.29	0.10	Yes	100%	25780	0	25,780	0
212058	31.5	06/12/2015	0	05/14/2021	20740	0	05/12/2021	149590	2163.0	5.93	3500	25,243	CUMMINS	ISLG	ISL	8.9	320	2014	1.76	5.29	0.10	Yes	100%	25243	0	25,243	0
213385	31.5	12/01/2017	0	05/14/2021	9352	0	05/12/2021	99990	1260.0	3.45	2709	28,965	CUMMINS	ISLG	ISL	8.9	320	2016	0.52	5.16	0.15	Yes	100%	28965	0	28,965	0
213386	31.5	12/22/2017	0	05/14/2021	2274	0	05/12/2021	90038	1239.0	3.39	670	26,525	CUMMINS	ISLG	ISL	8.9	320	2016	0.52	5.16	0.14	Yes	100%	26525	0	26,525	0
213811	31.5	09/03/2018	0	05/14/2021	10305	0	05/12/2021	76411	984.0	2.70	3822	28,344	CUMMINS	ISLG	ISL	8.9	320	2017	0.49	4.91	0.14	Yes	100%	28344	0	28,344	0
213812	31.5	09/25/2018	0	05/14/2021	7054	0	05/12/2021	47960	962.0	2.64	2676	33,374	CUMMINS	ISLG	ISL	8.9	320	2017	0.49	4.91	0.16	Yes	100%	33374	0	33,374	0
214015	31.5	12/29/2018	53	05/14/2021	3184	1837	05/12/2021	74334	867.0	2.38	1318	30,521	CUMMINS	L9N	L9	8.9	320	2017	0.49	4.91	0.15	Yes	100%	30521	0	30,521	0
214010	31.5	12/18/2018	0	05/14/2021	3271	0	05/12/2021	62344	878.0	2.41	1360	25,917	CUMMINS	L9N	L9	8.9	320	2017	0.49	4.91	0.13	Yes	100%	25917	0	25,917	0
214281	31.5	01/18/2019	47	05/14/2021	2630	1669	05/12/2021	59783	847.0	2.32	1116	24,957	CUMMINS	L9N	L9	8.9	320	2018	0.36	3.58	0.09	Yes	100%	24957	0	24,957	0
214282	31.5	01/31/2019	47	05/14/2021	3045	1764	05/12/2021	61081	834.0	2.28	1312	25,960	CUMMINS	L9N	L9	8.9	320	2018	0.36	3.58	0.09	Yes	100%	25960	0	25,960	0
214702	31.5	06/17/2019	53	05/14/2021	17251	1179	05/12/2021	44118	697.0	1.91	9006	22,486	CUMMINS	L9N	L9	8.9	320	2018	0.36	3.58	0.08	Yes	100%	22486	0	22,486	0
214703	31.5	06/17/2019	51	05/14/2021	19504	1497	05/12/2021	62260	697.0	1.91	10187	31,610	CUMMINS	L9N	L9	8.9	320	2018	0.36	3.58	0.11	Yes	100%	31610	0	31,610	0
214704	31.5	07/08/2019	0	05/14/2021	15116	0	05/12/2021	48411	676.0	1.85	8162	26,139	CUMMINS	L9N	L9	8.9	320	2018	0.36	3.58	0.09	Yes	100%	26139	0	26,139	0
214705	31.5	05/21/2019	0	05/14/2021	7004	0	05/12/2021	47769	724.0	1.98	3531	24,082	CUMMINS	ISLG	ISL	8.9	320	2018	0.36	3.58	0.09	Yes	100%	24082	0	24,082	0
214706	31.5	05/17/2019	0	05/14/2021	6786	0	05/12/2021	54090	728.0	1.99	3402	27,119	CUMMINS	ISLG	ISL	8.9	320	2018	0.36	3.58	0.10	Yes	100%	27119	0	27,119	0
214707	31.5	05/29/2019	45	05/14/2021	6590	1772	05/12/2021	49320	716.0	1.96	3336	24,239	CUMMINS	ISLG	ISL	8.9	320	2018	0.36	3.58	0.09	Yes	100%	24239	0	24,239	0
215229	31.5	05/27/2020	42	05/14/2021	16741	1811	05/12/2021	21721	352.0	0.96	17316	20,645	CUMMINS	L9N	L9	8.9	320	2019	0.36	3.58	0.07	Yes	100%	20645	0	20,645	0
215230	31.5	06/04/2020	0	05/14/2021	15484	0	05/12/2021	29195	344.0	0.94	16429	30,977	CUMMINS	L9N	L9	8.9	320	2019	0.36	3.58	0.11	Yes	100%	30977	0	30,977	0
215231	31.5	05/27/2020	44	05/14/2021	10651	1845	05/12/2021	24028	352.0	0.96	10990	23,002	CUMMINS	L9N	L9	8.9	320	2019	0.36	3.58	0.08	Yes	100%	23002	0	23,002	0
215232	31.5	05/27/2020	42	05/14/2021	7526	1809	05/12/2021	26081	352.0	0.96	7760	25,168	CUMMINS	L9N	L9	8.9	320	2019	0.36	3.58	0.09	Yes	100%	25168	0	25,168	0
215233	31.5	06/06/2020	45	05/14/2021	7450	1831	05/12/2021	25226	342.0	0.94	7903	24,968	CUMMINS	L9N	L9	8.9	320	2019	0.36	3.58	0.09	Yes	100%	24968	0	24,968	0
215234	31.5	06/26/2020	42	05/14/2021	8417	1793	05/12/2021	6579	322.0	0.88	9493	5,425	CUMMINS	L9N	L9	8.9	320	2019	0.36	3.58	0.02	Yes	100%	5425	0	5,425	0
215235	31.5	07/10/2020	44	05/14/2021	8605	1788	05/12/2021	20719	308.0	0.84	10145	22,434	CUMMINS	L9N	L9	8.9	320	2019	0.36	3.58	0.08	Yes	100%	22434	0	22,434	0
215236	31.5	07/21/2020	46	05/14/2021	7106	1805	05/12/2021	17249	297.0	0.81	8676	18,980	CUMMINS	L9N	L9	8.9	320	2019	0.36	3.58	0.07	Yes	100%	18980	0	18,980	0
215237	31.5	08/15/2020	58	05/14/2021	6847	2307	05/12/2021	17153	272.0	0.75	9130	19,922	CUMMINS	L9N	L9	8.9	320	2019	0.36	3.58	0.07	Yes	100%	19922	0	19,922	0
215347	31.5	03/17/2020	51	05/14/2021	7313	1802	05/12/2021	35367	423.0	1.16	6266	28,963	CUMMINS	L9N	L9	8.9	320	2019	0.36	3.58	0.10	Yes	100%	28963	0	28,963	0
215348	31.5	03/19/2020	0	05/14/2021	7084	0	05/12/2021	32501	450.0	1.23	5746	26,363	CUMMINS	L9N	L9	8.9	320	2019	0.36	3.58	0.09	Yes	100%	26363	0	26,363	0
215349	31.5	03/23/2020	0	05/14/2021	7051	0	05/12/2021	33805	417.0	1.14	6172	29,590	CUMMINS	L9N	L9	8.9	320	2019	0.36	3.58	0.11	Yes	100%	29590	0	29,590	0
215350	31.5	04/09/2020	0	05/14/2021	4685	0	05/12/2021	26795	400.0	1.10	4275	24,450	CUMMINS	L9N	L9	8.9	320	2019	0.36	3.58	0.09	Yes	100%	24450	0	24,450	0
414180	38.0	11/01/2013	0	05/14/2021	6227	0	05/12/2021	226452	2751.0	7.54	826	30,045	CUMMINS	ISLG	ISL	8.9	320	2012	2.13	8.00	0.19	Yes	100%	30045	0	0	30,045
414181	38.0	11/01/2013	0	05/14/2021	6101	0	05/12/2021	332063	2751.0	7.54	809	44,058	CUMMINS	ISLG	ISL	8.9	320	2012	2.13	8.00	0.25	Yes	100%	44058	0	0	44,058
414378	38.0	03/27/2015	0	05/14/2021	5609	0	05/12/2021	219624	2240.0	6.14	914	35,787	CUMMINS	ISLG	ISL	8.9	320	2014	2.13	6.38	0.17	Yes	100%	35787	0	0	35,787
414379	38.0	03/27/2015	0	05/14/2021	4652	0	05/12/2021	236366	2240.0	6.14	758	38,515	CUMMINS	ISLG	ISL	8.9	320	2014	2.13	6.38	0.18	Yes	100%	38515	0	0	38,515
414380	38.0	03/27/2015	0	05/14/2021	4728	0	05/12/2021	216836	2240.0	6.14	770	35,333	CUMMINS	ISLG	ISL	8.9	320	2014	2.13	6.38	0.17	Yes	100%	35333	0	0	35,333
415589	38.0	01/18/2017	0	05/14/2021	5264	0	05/12/2021	227655	1577.0	4.32	1218	52,691	CUMMINS	ISLG	ISL	8.9	320	2016	0.62	6.22	0.32	Yes	100%	52691	0	0	52,691
415724	38.0	09/13/2017	0	05/14/2021	5691	0	05/12/2021	112512	1339.0	3.67	1551	30,670	CUMMINS	ISLG	ISL	8.9	320	2016	0.62	6.22	0.19	Yes	100%	30670	0	0	30,670
415776	38.0	01/08/2018	0	05/14/2021	5505	0	05/12/2021	110875	1222.0	3.35	1644	33,117	CUMMINS	ISLG	ISL	8.9	320	2017	0.59	5.93	0.19	Yes	100%	33117	0	0	33,117
415777	38.0	02/14/2018	0	05/14/2021	2335	0	05/12/2021	104325	1185.0	3.25	719	32,134	CUMMINS	ISLG	ISL	8.9	320	2017	0.59	5.93	0.19	Yes	100%	32134	0	0	32,134
415779	38.0	11/17/2017	0	05/14/2021	2366	0	05/12/2021	114254	1274.0	3.49	678	32,734	CUMMINS	ISLG	ISL	8.9	320	2016	0.62	6.22	0.20	Yes	100%	32734	0	0	32,734
415966	38.0	08/18/2018	0	05/14/2021	2375	0	05/12/2021	88156	1002.0	2.75	865	32,113	CUMMINS	ISLG	ISL	8.9	320	2017	0.59	5.93	0.19	Yes	100%	32113	0	0	32,113
415967	38.0	09/01/2018	0	05/14/2021	2438	0	05/12/2021	160752	986.0	2.70	903	59,508	CUMMINS	ISLG	ISL	8.9	320	2017	0.59	5.93	0.35	Yes	100%	59508	0	0	59,504
415968	38.0	07/02/2018	0	05/14/2021	2508	0	05/12/2021	107926	1047.0	2.87	874	37,625	CUMMINS	ISLG	ISL	8.9	320	2017	0.59	5.93	0.22	Yes	100%	37625	0	0	37,625
415969	38.0	09/14/2018	0	05/14/2021	2295	0	05/12/2021	92607	973.0	2.67	861	34,740	CUMMINS	ISLG	ISL	8.9	320	2017	0.59	5.93	0.20	Yes	100%	34740	0	0	34,740
415970	38.0	07/30/2018	0	05/14/2021	2292	0	05/12/2021	97201	1029.0	2.82	813	34,478	CUMMINS	ISLG	ISL	8.9	320	2017	0.59	5.93	0.20	Yes	100%	34478	0	0	34,478
417042	38.0	06/10/2019	18	05/14/2021	4693	402	05/12/2021	59061	704.0	1.93	2424	30,413	CUMMINS	L9N	L9	8.9	320	2018	0.43	4.32	0.13	Yes	100%	30413	0	0	30,413
417043	38.0	06/20/2019	0	05/14/2021	5256	0	05/12/2021	56459	694.0	1.90	2764	29,694	CUMMINS	L9N	L9	8.9	320	2018	0.43	4.32	0.13	Yes	100%	29694	0	0	29,694
417044	38.0	07/05/2019	18	05/14/2021	4581	369	05/12/2021	80849	679.0	1.86	2453	43,262	CUMMINS	L9N	L9	8.9	320	2018	0.43	4.32	0.19	Yes	100%	43262	0	0	43,262
417045	38.0	06/27/2019	0	05/14/2021	2531	0	05/12/2021	66065	687.0	1.88	1345	35,100	CUMMINS	L9N	L9	8.9	320	2018	0.43	4.32	0.15	Yes	100%	35100	0	0	35,100
417192	38.0	01/15/2020	23	05/14/2021	1996	442	05/12/2021	48617	485.0	1.33	1485	36,255	CUMMINS	ISX	ISX	11.9	320	2019	0.43	4.32	0.16	Yes	100%	36255	0	0	36,255
417650	38.0	11/04/2020	58	05/14/2021	1235	2332	05/12/2021	22153	191.0	0.52	2249	37,878	CUMMINS	L9N	L9	8.9	320	2019	0.43	4.32	0.16	Yes	100%	37878	0	0	37,878
417651	38.0	11/02/2020	49	05/14/2021	1210	2215	05/12/2021	19953	193.0	0.53	2196	33,546	CUMMINS	L9N	L9	8.9	320	2019	0.43	4.32	0.14	Yes	100%	33546	0	0	33,546
	56																			Total	7.7929		Total NAA	1657110			
																							Total Miles	1657110			
																							% in NAA =	100.00%			
																							average annual mileage		0	24,924	36,804
																									0	34	22

SANTAN FLEET (F001645)

CNG Truck Number	CNG Load Factor	Date In Service	Engine Hours In Service	Date of Recent Hours	Recent Hours Reading	Mileage in Service	Date of Recent Mileage	Recent Mileage Reading[1]	Days Between Readings	Years Between Readings	Hours Per Year	Miles Per Year	Make	Model	Family	Displacement	Horse power	Engine MY
103810	40.5	02/01/2012	17	05/12/2021	19,793	0	05/12/2021	134,791	3388.0	9.28	2131	14,521	CUMMINS	ISLG	ISL	8.9	320	2011
103811	40.5	02/06/2012	26	05/12/2021	11,254	0	05/12/2021	129,231	3381.0	9.26	1212	13,951	CUMMINS	ISLG	ISL	8.9	320	2011
103881	40.5	01/24/2012	59	05/12/2021	20,763	0	05/12/2021	142,578	3396.0	9.30	2225	15,324	CUMMINS	ISLG	ISL	8.9	320	2011
103882	40.5	01/24/2012	61	05/12/2021	17,955	0	05/12/2021	176,447	3396.0	9.30	1923	18,964	CUMMINS	ISLG	ISL	8.9	320	2011
103883	40.5	01/25/2012	39	05/12/2021	19,290	0	05/12/2021	172,879	3395.0	9.30	2070	18,586	CUMMINS	ISLG	ISL	8.9	320	2011
103884	40.5	01/25/2012	41	05/12/2021	18,191	0	05/12/2021	154,652	3395.0	9.30	1951	18,627	CUMMINS	ISLG	ISL	8.9	320	2011
103885	40.5	02/17/2012	46	05/12/2021	18,376	0	05/12/2021	108,372	3372.0	9.24	1984	11,721	CUMMINS	ISLG	ISL	8.9	320	2011
103886	40.5	01/25/2012	36	05/12/2021	18,089	0	05/12/2021	188,620	3395.0	9.30	1941	20,279	CUMMINS	ISLG	ISL	8.9	320	2011
103887	40.5	01/25/2012	42	05/12/2021	20,953	0	05/12/2021	123,028	3395.0	9.30	2248	13,227	CUMMINS	ISLG	ISL	8.9	320	2011
103888	40.5	02/13/2012	10	05/12/2021	21,184	0	05/12/2021	224,419	3376.0	9.25	2289	24,263	CUMMINS	ISLG	ISL	8.9	320	2011
103889	40.5	01/25/2012	43	05/12/2021	19,389	0	05/12/2021	149,706	3395.0	9.30	2080	16,095	CUMMINS	ISLG	ISL	8.9	320	2011
103890	40.5	01/25/2012	46	05/12/2021	18,447	0	05/12/2021	123,325	3395.0	9.30	2086	13,259	CUMMINS	ISLG	ISL	8.9	320	2011
103891	40.5	01/25/2012	49	05/12/2021	18,922	0	05/12/2021	149,067	3395.0	9.30	2029	16,026	CUMMINS	ISLG	ISL	8.9	320	2011
103892	40.5	02/13/2012	38	05/12/2021	18,123	0	05/12/2021	120,840	3376.0	9.25	1955	13,065	CUMMINS	ISLG	ISL	8.9	320	2011
103961	40.5	05/07/2012	41	05/12/2021	17,751	0	05/12/2021	220,486	3292.0	9.02	1964	24,446	CUMMINS	ISLG	ISL	8.9	320	2011
103962	40.5	05/07/2012	41	05/12/2021	15,428	0	05/12/2021	115,400	3292.0	9.02	1706	12,795	CUMMINS	ISLG	ISL	8.9	320	2011
103963	40.5	05/07/2012	35	05/12/2021	18,773	0	05/12/2021	197,828	3292.0	9.02	2078	21,934	CUMMINS	ISLG	ISL	8.9	320	2011
103964	40.5	05/07/2012	34	05/12/2021	19,612	0	05/12/2021	213,139	3292.0	9.02	2171	23,632	CUMMINS	ISLG	ISL	8.9	320	2011
103965	40.5	05/07/2012	33	05/12/2021	21,709	0	05/12/2021	216,671	3292.0	9.02	2403	24,023	CUMMINS	ISLG	ISL	8.9	320	2011
103966	40.5	05/07/2012	23	05/12/2021	19,281	0	05/11/2021	143,002	3292.0	9.02	2135	15,855	CUMMINS	ISLG	ISL	8.9	320	2011
103967	40.5	05/07/2012	36	05/12/2021	18,003	0	05/12/2021	146,976	3292.0	9.02	1992	16,296	CUMMINS	ISLG	ISL	8.9	320	2011
103968	40.5	05/07/2012	34	05/12/2021	18,311	0	05/12/2021	130,298	3292.0	9.02	2026	14,447	CUMMINS	ISLG	ISL	8.9	320	2011
103969	40.5	05/07/2012	37	05/12/2021	19,581	0	05/12/2021	161,175	3292.0	9.02	2167	17,870	CUMMINS	ISLG	ISL	8.9	320	2011
103970	40.5	05/07/2012	30	05/12/2021	18,083	0	05/12/2021	129,250	3292.0	9.02	2002	14,331	CUMMINS	ISLG	ISL	8.9	320	2011
103971	40.5	05/24/2012	30	05/12/2021	18,509	0	05/12/2021	192,792	3275.0	8.97	2059	21,487	CUMMINS	ISLG	ISL	8.9	320	2011
103972	40.5	05/24/2012	28	05/12/2021	18,029	0	05/12/2021	147,472	3275.0	8.97	2118	16,436	CUMMINS	ISLG	ISL	8.9	320	2011
104402	40.5	04/15/2013	32	05/12/2021	16,080	0	05/12/2021	175,892	2949.0	8.08	1986	21,770	CUMMINS	ISLG	ISL	8.9	320	2012
104449	40.5	06/25/2013	1	05/12/2021	16,917	0	05/12/2021	175,589	2878.0	7.88	2145	22,269	CUMMINS	ISLG	ISL	8.9	320	2012
105288	40.5	11/25/2015	90	05/12/2021	11,771	0	05/12/2021	75,581	1965.0	5.47	2137	13,828	CUMMINS	ISLG	ISL	8.9	320	2014
105289	40.5	12/31/2015	75	05/12/2021	12,241	0	05/12/2021	96,865	1959.0	5.37	2267	18,048	CUMMINS	ISLG	ISL	8.9	320	2014
106098	40.5	12/04/2018	24	05/12/2021	4,965	0	05/12/2021	60,479	890.0	2.44	2026	24,803	CUMMINS	ISLG	ISL	8.9	320	2017
106099	40.5	10/29/2018	8	05/12/2021	5,770	0	05/12/2021	64,779	926.0	2.54	2271	25,534	CUMMINS	ISLG	ISL	8.9	320	2017
106188	40.5	12/20/2018	30	05/12/2021	5,466	612	05/12/2021	67,987	874.0	2.39	2270	28,137	CUMMINS	ISLG	L9	8.9	320	2017
106191	40.5	01/26/2019	25	05/12/2021	4,606	409	05/12/2021	75,565	837.0	2.29	1998	32,774	CUMMINS	L9N	L9	8.9	320	2018
211910	31.5	02/20/2015	75	05/12/2021	15,598	0	05/12/2021	200,790	2273.0	6.23	2493	32,243	CUMMINS	ISLG	ISL	8.9	320	2014
211911	31.5	02/12/2015	70	05/12/2021	16,268	0	05/12/2021	231,187	2281.0	6.25	2592	36,994	CUMMINS	ISLG	ISL	8.9	320	2014
211912	31.5	02/01/2015	78	05/12/2021	15,419	0	05/12/2021	202,450	2292.0	6.28	2443	32,240	CUMMINS	ISLG	ISL	8.9	320	2014
211913	31.5	02/20/2015	71	05/12/2021	17,725	0	05/12/2021	208,751	2273.0	6.23	2835	33,521	CUMMINS	ISLG	ISL	8.9	320	2014
211914	31.5	02/24/2015	68	05/12/2021	16,081	0	05/12/2021	221,612	2269.0	6.22	2576	35,649	CUMMINS	ISLG	ISL	8.9	320	2014
212262	31.5	10/14/2015	60	05/12/2021	14,480	0	05/12/2021	193,100	2037.0	5.58	2590	34,601	CUMMINS	ISLG	ISL	8.9	320	2014
212263	31.5	11/11/2015	64	05/12/2021	16,113	0	05/12/2021	181,351	2009.0	5.50	2916	32,948	CUMMINS	ISLG	ISL	8.9	320	2014
212265	31.5	10/01/2015	10	05/12/2021	16,751	0	05/12/2021	192,100	2050.0	5.62	2981	34,203	CUMMINS	ISLG	ISL	8.9	320	2014
212266	31.5	10/21/2015	59	05/12/2021	15,154	0	05/12/2021	211,115	2030.0	5.56	2714	37,959	CUMMINS	ISLG	ISL	8.9	320	2014
212267	31.5	12/04/2015	59	05/12/2021	15,305	0	05/12/2021	203,158	1986.0	5.44	2802	37,340	CUMMINS	ISLG	ISL	8.9	320	2014
212454	31.5	11/16/2015	55	05/12/2021	14,700	0	05/12/2021	203,135	2004.0	5.49	2667	36,998	CUMMINS	ISLG	ISL	8.9	320	2014
212455	31.5	02/05/2016	72	05/12/2021	15,328	0	05/12/2021	184,558	1922.0	5.27	2890	35,031	CUMMINS	ISLG	ISL	8.9	320	2015
212456	31.5	01/11/2016	59	05/12/2021	14,822	0	05/12/2021	193,247	1948.0	5.34	2766	36,209	CUMMINS	ISLG	ISL	8.9	320	2015
212457	31.5	01/06/2016	74	05/12/2021	15,555	0	05/12/2021	181,322	1953.0	5.35	2893	33,888	CUMMINS	ISLG	ISL	8.9	320	2015
213364	31.5	02/09/2018	73	05/12/2021	10,138	0	05/12/2021	111,801	1188.0	3.25	3092	34,350	CUMMINS	ISLG	ISL	8.9	320	2017
213887	31.5	12/28/2017	411	05/12/2021	10,501	0	05/12/2021	106,411	1231.0	3.37	2992	32,145	CUMMINS	ISLG	ISL	8.9	320	2016
214296	31.5	02/23/2019	82	05/12/2021	6,499	0	05/12/2021	81,590	810.0	2.22	2892	36,766	CUMMINS	L9N	L9	8.9	320	2018
214270	31.5	03/20/2019	81	05/12/2021	5,675	0	05/12/2021	75,121	784.0	2.15	2604	34,974	CUMMINS	L9N	L9	8.9	320	2018
214758	31.5	11/14/2019	49	05/12/2021	4,161	0	05/12/2021	49,280	549.0	1.49	2754	33,004	CUMMINS	L9N	L9	8.9	320	2018
214759	31.5	10/15/2019	54	05/12/2021	4,483	0	05/12/2021	46,356	575.0	1.58	2811	29,426	CUMMINS	L9N	L9	8.9	320	2018
311450	40.5	02/20/2012	1	05/12/2021	15,520	0	05/12/2021	152,183	3369.0	9.23	1681	16,485	CUMMINS	ISLG	ISL	8.9	320	2011
311451	40.5	02/20/2012	27	05/12/2021	12,196	0	05/12/2021	78,730	3369.0	9.23	1318	8,530	CUMMINS	ISLG	ISL	8.9	320	2011
311853	40.5	04/30/2013	68	05/12/2021	18,431	0	05/12/2021	261,609	2934.0	8.04	2284	25,081	CUMMINS	ISLG	ISL	8.9	320	2012
412893	38.0	11/18/2013	74	05/12/2021	19,778	0	05/12/2021	274,883	2732.0	7.48	2632	36,725	CUMMINS	ISLG	ISL	8.9	320	2012
414045	38.0	11/25/2013	35	05/12/2021	17,298	0	05/12/2021	268,416	2725.0	7.47	2312	35,953	CUMMINS	ISLG	ISL	8.9	320	2012
414046	38.0	12/10/2013	18	05/12/2021	19,515	0	05/12/2021	277,807	2710.0	7.42	2626	37,417	CUMMINS	ISLG	ISL	8.9	320	2012
414185	38.0	02/10/2014	73	05/12/2021	16,197	0	05/12/2021	243,213	2648.0	7.25	2223	33,524	CUMMINS	ISLG	ISL	8.9	320	2013
414398	38.0	03/17/2015	26	05/12/2021	15,378	0	05/12/2021	253,917	2248.0	6.16	2493	41,228	CUMMINS	ISLG	ISL	8.9	320	2014
414400	38.0	04/01/2015	36	05/12/2021	15,941	0	05/12/2021	244,741	2233.0	6.12	2600	40,005	CUMMINS	ISLG	ISL	8.9	320	2014
414401	38.0	04/06/2015	38	05/12/2021	14,656	0	05/12/2021	249,696	2228.0	6.10	2395	40,906	CUMMINS	ISLG	ISL	8.9	320	2014
414993	38.0	02/29/2016	28	05/12/2021	12,965	0	05/12/2021	221,146	1899.0	5.20	2487	42,506	CUMMINS	ISLG	ISL	8.9	320	2015
414994	38.0	03/17/2016	1	05/12/2021	11,871	0	05/12/2021	215,838	1882.0	5.16	2302	41,870	CUMMINS	ISLG	ISL	8.9	320	2015
415980	38.0	10/16/2018	30	05/12/2021	7,360	0	05/12/2021	136,807	938.0	2.57	2849	53,178	CUMMINS	ISLG	ISL	8.9	320	2017
415981	38.0	09/13/2018	22	05/12/2021	7,600	0	05/12/2021	136,792	972.0	2.66	2846	51,367	CUMMINS	ISLG	ISL	8.9	370	2017
417071	38.0	02/04/2020	18	05/12/2021	3,717	0	05/12/2021	76,260	463.0	1.27	2916	61,711	CUMMINS	L9N	L9	8.9	320	2019
417072	38.0	01/15/2020	12	05/12/2021	3,456	0	05/12/2021	72,676	483.0	1.32	2603	54,921	CUMMINS	L9N	L9	8.9	320	2019
417610	38.0	05/23/2020	25	05/12/2021	3,805	0	05/12/2021	70,228	354.0	0.97	3897	72,410	CUMMINS	L9N	L9	8.9	320	2019
417614	38.0	05/29/2020	31	05/12/2021	2,783	0	05/12/2021	50,865	348.0	0.95	2885	53,350	CUMMINS	L9N	L9	8.9	320	2019
417610	38.0	06/18/2020	29	05/12/2021	2,177	0	05/12/2021	43,037	267.0	0.73	2936	58,833	CUMMINS	L9N	L9	8.9	320	2019
Total	73																	

CNG NOx (g/mile)	Diesel NOx (g/mile)	Annual NOx Emissions Reduction (tons)	Truck Route within Non-attainment Area	Percentage within Non-attainment Area	Non-Attainment Area Miles	Residential	Rolloff	Front Loader
2.27	8.35	0.10	Yes	100%	14521	14,521	0	0
2.27	8.35	0.09	Yes	100%	13951	13,951	0	0
2.27	8.35	0.10	Yes	100%	15324	15,324	0	0
2.27	8.35	0.13	Yes	100%	18964	18,964	0	0
2.27	8.35	0.12	Yes	100%	18586	18,586	0	0
2.27	8.35	0.11	Yes	100%	16627	16,627	0	0
2.27	8.35	0.08	Yes	100%	11731	11,731	0	0
2.27	8.35	0.14	Yes	100%	20279	20,279	0	0
2.27	8.35	0.09	Yes	100%	13227	13,227	0	0
2.27	8.35	0.16	Yes	100%	24263	24,263	0	0
2.27	8.35	0.11	Yes	100%	16095	16,095	0	0
2.27	8.35	0.09	Yes	100%	13259	13,259	0	0
2.27	8.35	0.11	Yes	100%	16026	16,026	0	0
2.27	8.35	0.09	Yes	100%	13065	13,065	0	0
2.27	8.35	0.16	Yes	100%	24446	24,446	0	0
2.27	8.35	0.09	Yes	100%	12795	12,795	0	0
2.27	8.35	0.15	Yes	100%	21934	21,934	0	0
2.27	8.35	0.16	Yes	100%	23632	23,632	0	0
2.27	8.35	0.16	Yes	100%	24023	24,023	0	0
2.27	8.35	0.11	Yes	100%	15855	15,855	0	0
2.27	8.35	0.11	Yes	100%	16296	16,296	0	0
2.27	8.35	0.10	Yes	100%	14447	14,447	0	0
2.27	8.35	0.12	Yes	100%	17870	17,870	0	0
2.27	8.35	0.10	Yes	100%	14331	14,331	0	0
2.27	8.35	0.14	Yes	100%	21487	21,487	0	0
2.27	8.35	0.11	Yes	100%	16436	16,436	0	0
2.27	8.52	0.15	Yes	82%	17870	17,870	0	0
2.27	8.53	0.15	Yes	16%	3549	3,549	0	0
2.27	6.80	0.07	Yes	100%	13828	13,828	0	0
2.27	6.80	0.09	Yes	100%	18048	18,048	0	0
0.63	6.32	0.16	Yes	89%	17003	17,003	0	0
0.63	6.32	0.16	Yes	100%	25534	25,534	0	0
0.63	6.32	0.18	Yes	100%	28137	28,137	0	0
0.46	4.61	0.15	Yes	100%	32774	32,774	0	0
1.76	5.29	0.13	Yes	100%	32243	0	32,243	0
1.76	5.29	0.14	Yes	100%	36994	0	36,994	0
1.76	5.29	0.13	Yes	100%	32240	0	32,240	0
1.76	5.29	0.13	Yes	100%	33521	0	33,521	0
1.76	5.29	0.14	Yes	100%	35649	0	35,649	0
1.76	5.29	0.13	Yes	88%	30545	0	30,545	0
1.76	5.29	0.13	Yes	100%	32948	0	32,948	0
1.76	5.29	0.13	Yes	100%	34203	0	34,203	0
1.76	5.29	0.15	Yes	100%	37959	0	37,959	0
1.76	5.29	0.14	Yes	100%	37340	0	37,340	0
1.76	5.29	0.14	Yes	100%	36998	0	36,998	0
1.76	5.29	0.14	Yes	100%	35031	0	35,031	0
1.76	5.29	0.14	Yes	100%	36209	0	36,209	0
1.76	5.29	0.13	Yes	100%	33888	0	33,888	0
0.49	4.91	0.17	Yes	98%	33830	0	33,830	0
0.52	5.16	0.16	Yes	100%	32145	0	32,145	0
0.36	3.58	0.13	Yes	100%	36766	0	36,766	0
0.36	5.16	0.18	Yes	100%	34974	0	34,974	0
0.36	3.58	0.12	Yes	100%	33004	0	33,004	0
0.36	3.58	0.10	Yes	100%	29426	0	29,426	0
2.27	8.35	0.11	Yes	100%	16488	16,488	0	0
2.27	8.35	0.06	Yes	100%	8530	8,530	0	0
2.27	8.53	0.17	Yes	100%	25081	25,081	0	0
2.13	8.00	0.24	Yes	100%	36725	0	0	36,725
2.13	8.00	0.23	Yes	100%	35953	0	0	35,953
2.13	8.00	0.24	Yes	100%	37417	0	0	37,417
2.13	6.44	0.16	Yes	96%	32224	0	0	32,224
2.13	6.38	0.19	Yes	100%	41228	0	0	41,228
2.13	6.38	0.19	Yes	97%	38705	0	0	38,705
2.13	6.38	0.19	Yes	100%	40906	0	0	40,906
2.13	6.38	0.20	Yes	100%	42506	0	0	42,506
2.13	6.38	0.20	Yes	100%	41870	0	0	41,870
0.59	5.93	0.31	Yes	100%	53178	0	0	53,178
0.59	5.93	0.30	Yes	100%	51367	0	0	51,367
0.43	4.32	0.26	Yes	100%	61711	0	0	61,711
0.43	4.32	0.24	Yes	72%	38321	0	0	38,321
0.43	4.32	0.31	Yes	100%	72410	0	0	72,410
0.43	4.32	0.23	Yes	100%	53350	0	0	53,350
0.43	4.32	0.25	Yes	100%	58833	0	0	58,833
	Total	10.6954						

Total NAA = 2079929
Total Miles 2133125
% in NAA = 97.51%

average annual mileage	17,738	34,296	48,107
	37	20	16

Footnote:
[1] missing data calc'd using ratio of the average CNG truck in service mileage and hours

Maricopa County AIR QUALITY DEPARTMENT
Philip A. McNeely, R.G. Director
Phone: 602-506-6701
Email: Philip.McNeely@maricopa.gov
Maricopa.gov/AQ
CleanAirMakeMore.com

August 13, 2021

Return to Table of Contents

Daniel Czecholinski
Air Quality Division Director
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

RE: Emissions Reduction Certification (ERC)
Waste Management of Arizona, Inc. (White Tank Transfer Station) – MCAQD Facility F001646

Dear Mr. Czecholinski:

The Maricopa County Air Quality Department (MCAQD) has verified the credit and number of tons of actual emissions that have been reduced by replacing diesel-fueled solid waste collection trucks with CNG-fueled trucks based at the Waste Management White Tank Transfer Station located at 18605 West McDowell Road in Goodyear, Arizona. In accordance with the Arizona Administrative Code, the following actual emissions have been verified for use as certified emission credits:

Nitrogen Oxides (NOx): 4.1 tons/year

Per Maricopa County Rule 204 §301 and AAC Rule 18-2-1205.A, the Control Officer may certify an emission credit if the credit is verified and determined by all of the following:

1. A reduction in actual emissions that occurred after August 17, 1999.

The facility has replaced 22 diesel-fueled solid waste collection trucks with 22 CNG-fueled solid waste collection trucks. Actual NOx emissions from CNG trucks are 65 - 90% less than diesel-fueled trucks depending on model year.

2. A quantifiable reduction in actual emissions.

The applicant submitted calculations using EPA's Motor Vehicle Emissions Simulator software (v3.01) to quantify emissions from both the old and new trucks. Actual vehicle miles traveled were also provided to define the actual emissions. Emission baseline from the diesel-fueled trucks has been calculated over a series of years (i.e., 2013-2021) depending on when the actual conversion occurred.

3. A permanent reduction in actual emissions.

The trucks removed from service must be disabled or moved outside of the Maricopa County non-attainment area as required in the site air quality permit P0008309. The permit also requires that any future replacement of trucks must be equal to or lower emitting than the truck being replaced. These enforceable permit conditions make the emission reductions permanent.

4. An enforceable reduction in actual emissions.

The air quality permit (i.e., P0008309) for the facility includes provisions requiring removal of the diesel-fired trucks that were replaced by the CNG-fired trucks be removed from the Maricopa County ozone non-attainment area. Additional conditions in the permit require monitoring and record keeping to further make the reductions enforceable.

5. A surplus reduction in actual emissions occurring in addition to any other required emission reduction.

The type of trucks that formed the basis for the emission credit have been listed in the 2017 Ozone Periodic Emission Inventory (PEI) and previous PEIs as diesel-fueled vehicles. These inventories are used for regional planning by the Maricopa Association of Governments. No emission reductions were required at the source either through planning or regulation that would reduce the certified credits. Therefore, the lower emitting CNG-fired trucks are surplus to the inventory. Consequently, the table below is a summary of the emission credit calculation.

Pollutant	Baseline Emissions (tons/year)	Ongoing Emissions (tons/year)	Certified Credits (tons/year)
NOx	4.6	0.5	4.1

Based on the information submitted by the source and verified as described above, the MCAQD certifies emission reduction credits in the amount of 4.1 tons of NOx.

This notification is being provided to the Arizona Department of Environmental Quality in the event the applicant submits the certified ERCs for deposit in the Arizona Emissions Bank.

If you have any questions or need additional information, please contact Richard Sumner of my staff at Richard.sumner@maricopa.gov or 602-506-1842.

Sincerely,

Philip A. McNeely, RG
Director
Maricopa County Air Quality Department

Cc: David Bearden, Waste Management of Arizona, Inc.

Attachments

Emission Reduction Credit
Evaluation

Source: Waste Management (White Tank Transfer Station)
Facility ID: F001646 Permit: P0008309
Date: August 11, 2021

Project Description: Replace diesel-powered solid waste collection trucks with CNG-powered trucks.

Baseline Emissions: CNG trucks were brought into the fleet over a number of years. Therefore, the baseline is the diesel truck that was replaced by the CNG truck. For example, the NOx emission rate from the diesel truck was 6.32 g/mile and CNG truck #106190 emission rate put into service in 2018 is 0.63 g/mile. (Emission rates based on EPA MOVES 3.01.) The reduction is the difference between the baseline diesel truck emission rate and the CNG truck emission rate. Credits are reduced by 2.5% to allow for mileage outside of the non-attainment area. Annual mileage used in the calculation is 97.5% of actual average mileage for each individual truck.

Sample Calculation (1 Truck): (6.32 g/mile - 0.63 g/mile) x 13,220 miles/year x 0.975 = 118,813 g/yr = 0.08 tons/year

Total NOx from the attached spreadsheet for 22 trucks = 4.1395 tons (uncorrected for outside non attainment area)
Total Creditable NOx (after correction) = 4.1395 tons (97.5/99.17)
Creditable NOx reduction = 4.1 tons

Prepared by Richard Sumner
August 11, 2021

Return completed form to
Maricopa County Air Quality Department
3800 North Central Ave Suite 1400, Phoenix AZ 85012
Phone: 602.506.6010 Fax: 602.372.0587
AQPermits@mail.maricopa.gov

EMISSION REDUCTION CREDIT APPLICATION

3800 North Central Ave. Suite 1400, Phoenix, AZ 85012 or 501 North 44th St, Suite 200 Phoenix AZ 85008.

Emission Reduction Credit Application

Facility Information	
1. Facility Name:	Waste Management of Arizona, Inc.
2. Facility Address:	222 S. Mill Ave., Suite 333
	City: Tempe State: Arizona Zip Code: 85281
3. Permit #:	040086/F001646 (White Tanks); 040027/F001645 (SANTAN); 0006438/F000443 (DEER VALLEY)
Contact Information	
4. Is the facility information the same as the contact information?	Yes ☐ No ☒
5. Contact Name:	Dave Bearden
6. Contact Address:	222 S. Mill Ave., Suite 333
	City: Tempe State: Arizona Zip Code: 85281
7. Pollutant (Complete a separate sheet for each pollutant):	NOx
8. Date:	Jun 28, 2021
9. List of the equipment/process involved with the emission reduction:	
Solid Waste Collection Trucks converted from diesel fuel to compressed natural gas	Add a Row / Delete a Row
10. Describe how the emission reduction will be accomplished:	
Waste Management has been converting the majority of their solid waste collection truck fleets in the Phoenix area from diesel fuel to Compressed Natural Gas (CNG), and is applying for NOx Emissions Reduction Credits (ERCs) from the voluntary conversion of trucks from diesel to CNG operation. The trucks are associated with four collection fleets operate at three transfer stations in the non-attainment area. Attachment A provides qualifying criteria, method of calculations and fleet calculations which have been met in the generation of these ERCs.	
11. Estimated date of emission reduction:	various see attachment A
12. Describe how the reduction will be made permanent:	
13. Baseline period (two calendar years):	2020 2021
If this is not the most recent two calendar years, provide a detailed explanation of why the most recent years were not used.	
The requirements related to the ERCs will be included with permit modification for the transfer stations White Tanks, Deer Valley and San Tan. The proposed requirements relate to 1) WM will continue to purchase CNG trucks or alternative trucks with at least or better NOx emissions compared to the current Cummins Engine, 2) perform routine engine maintenance and 3) maintain at least 22 trucks operating 95% or more of their time in the Non-attainment Area.	
14. Identify the method that is proposed to calculate the baseline emissions and how that method is being used. (Examples: material balance, performance test data, continuous monitor, emission factors, etc.)	
See Attachment A – Criteria, Methods of Calculations and Fleet Calculations	

AIR QUALITY DEPARTMENT

Return completed form to:
Maricopa County Air Quality Department
3800 [illegible]
[illegible]
[illegible]

EMISSION REDUCTION CREDIT APPLICATION

3300 North Central Ave, Suite 1400 [illegible] 44th St, Suite 200, Phoenix, AZ [illegible]

15. List the seasonal emission rate on a quarterly basis from the operation/process that provided the emission reduction.

Baseline Year	Year	Q1:	Q2:	Q3:	Q4:
Baseline Year One	2020				
Baseline Year Two	2021				

16. Calculation of baseline emissions in tons per year:

A. List any emission factors with their source (include units):

See Attachment A

Add a Row | Delete a Row

B. List assumptions made to perform the calculations:

See Attachment A

C. Show sample of calculations made to verify emission reduction:

See Attachment A

D. Baseline emission rate (tons per year): 34.14

E. Provide a list of documents attached to substantiate the basis for the calculations (e.g., safety data sheets, process records, material use records, monitoring records, etc.).

See Attachment A

Add a Row | Delete a Row

F. Comments or additional information:

17. Do you plan to register the certified credits in the Arizona Emissions Bank administered by the Arizona Department of Environmental Quality (ADEQ)? ☑ Yes ☐ No If yes, there is a registration fee of $200 payable to ADEQ. For more information about the Arizona Emissions Bank please review Arizona Administrative Code Title 18, Chapter 2, Article 12.

18. I certify that the statements and information provided herein are true, accurate, and complete based on information and belief formed after reasonable inquiry.

Signature of owner or responsible official: [signature]

Type or print name and title: Dave Bearden

Date: 7/13/2021

Attachment A – Criteria, Methods of Calculations and Fleet Calculations

The five ERC qualifying criteria are being met in the generation of these ERCs:

- **Real** Each of the CNG trucks are designed to operate solely on natural gas. There is extensive evidence, including engine certification testing results, to show that these trucks emit less NOx on a per mile basis that their diesel counter parts. In quantifying the ERCs, actual miles traveled in the nonattainment area are combined with actual emissions rates using standardize EPA modeling methods applicable to these operating conditions. While these new CNG trucks are replacing older diesel trucks with much higher NOx emissions, to assure that the reductions are real, the analysis is based on the emissions of the CNG trash truck in comparison to a new diesel trash truck of the same vintage.

- **Quantifiable** As described in detail in this Appendix A, the emissions reduction resulting from the voluntary replacement of diesel trash collection trucks with lower NOx emitting CNG trucks is being quantified using the EPA MOVES3.01, reflecting the miles traveled by the CNG trucks within the nonattainment area. The model has been adjusted to reflect actual use patterns of the Waste Management trash trucks and the difference in emissions between diesel and CNG in the year each CNG truck was or will be placed into service.

- **Surplus** The conversion to CNG trash truck fleets is being carried out on a voluntary basis. It is not being done to comply with any current or anticipated regulatory requirement. We understand that trash truck is the region appear as diesel powered in the Regional Ozone Modeling over the last decade including the latest (2017) Regional emissions inventory.

- **Permanent** Waste Management is proposing to make these reductions permanent by keeping these CNG trucks in service in the nonattainment area and replacing them with CNG trucks or trucks with equal or lower NOx emissions whenever one is removed from service. Proposed permit conditions that would be added to the air permit of the Fleet location, reflecting this commitment, are presented in Appendix B.

- **Enforceable** The Fleet requirements will be added to existing minor source air permits issued by the Maricopa County Air Quality Department. The conditions of these air permits are federally enforceable. Waste Management will be requesting permit conditions in each of these permits that will make the continuing use of these CNG trucks or replacement trucks with equal or lower NOx emissions in the nonattainment area. See Appendix B. This will make the action that Waste Management has taken to create these ERCs federally enforceable.

The methods of calculations for the ERCs are:

Waste Management currently operates 225 refuse trucks powered by compressed natural gas (CNG) engines in the greater Phoenix area that collect waste and deliver it to transfer stations. The fleets are referred to as White Tank, San Tan, North Phoenix and Elwood. These CNG vehicles are powered by U.S. EPA certified 2011 to 2020 model-year Cummins 8.9-liter engines. The model-year 2011 to 2015 engines were certified by Cummins to the 0.2 g/bhp-hr NOx standard that applies to 2010 and later model-year vehicles while the 2016 and later model-year engines were certified by Cummins to family NOx emissions limits (FELs) of 0.02 g/bhp-hr.

The MERC calculation methodology is based on a comparison of the CNG refuse truck emissions to the emissions of a diesel refuse truck of the same model year. A credit calculation is performed for each CNG vehicle based the vehicle's lifetime average annual mileage reported by Waste Management and the differential in emissions NOx between the CNG vehicle and a diesel-powered refuse truck with an engine of the same model-year, computed for calendar year 2021 derived from EPA's MOVES3.01.

The emissions differential calculation begins with 2010 through 2020 model-year emission factors (in units of grams of NOx per mile of operation) for diesel and CNG refuse trucks obtained by running MOVES 3.01 configured for Maricopa County in calendar year 2021. Two adjustments were made to the MOVES 3.01 emission factors. The first was made to account for the fact that the engines in the 2016 and later Waste Management CNG vehicles were certified to a family emissions level (FEL) of 0.02 g/bhp-hr for NOx which is 10 times lower than the applicable emission standard of 0.20 g/bhp-hr which is assumed in MOVES3.01.[1] Therefore, CNG emission rates for 2016 to 2020 model-year vehicles were assumed to be one-tenth of the comparable diesel emission rate.

The second adjustment was made to account for the actual load factors experienced by Waste Management's CNG vehicles during routine operations which is not appropriately accounted for in MOVES 3.01.[2] More specifically, Waste Management collected engine load data using a Cummins engine analyzer[3] from three trucks operating on actual in-use refuse routes representative of the three main types of refuse truck operation occurring in the Waste Management : 1) residential, 2) roll-off, and 3) frontload. These load factors were determined

[1] Based on a review of the MOVES3 documentation related to emission factors for heavy-duty CNG trucks, it is clear that the MOVES emission factors are based on data from 2011 and 2014 model-year vehicles certified to the 0.20 g/bhp-hr standard which overestimates the actual emissions of the 2016 to 2020 model-year CNG trucks. See "Exhaust Emission Rates for Heavy-Duty Onroad Vehicles in MOVES3", EPA-420-R-20-018, November 2020, page 197.

[2] For example, the MOVES3.01 fuel consumption values for 2011 to 2020 model-year refuse trucks are only about 12% higher than for transit buses rather than the expected average of about 30%. See Alternative Fuels Data Center: Maps and Data - Average Fuel Economy by Major Vehicle Category (energy.gov)

[3] The analyzer is lap top based unit that directly reads engine performance, monitoring data and calculate parameters including the engine load factor. Dave – can you provide the name of software and maybe a link to a Cummins web page where it is described?

to be 40.5% for residential, 31.5% for roll-off, and 38% for front end loaders which are much higher than the 20 to 25% load engines experience during certification emissions testing.[4] Therefore the diesel and CNG emission rates from MOVES3.01 were scaled using the load factors provided by Waste Management divided by the 25% value that is the upper bound of the range reported from certification testing.

The final MERC calculation for each CNG vehicle involved multiplying the weighted average annual milage of that type of vehicle by the emissions difference between the diesel and CNG emission rates. For example, the MERC value for a 2015 residential refuse truck that travels 50,000 miles would be:

MERC (tons/year) = 50,000 miles/year * (4.20-1.40) grams NOx/mile * (40.5/25)
= 243,000 grams NOx/year = 0.27 tons NOx/year

Where 4.20 and 1.40 grams NOx/mile are the MOVES3 generated NOx emission factors for 2015 model-year diesel and CNG refuse trucks, respectively.

While the MERC value for a 2020 front end loader refuse truck traveling 50,000 miles a year would be:

MERC (tons/year) = 50,000 miles/year * (2.84 – 0.284) grams NOx/mile * (38/25)
= 194,256 grams NOx/year = 0.21 tons NOx/year

Where 2.84 grams NOx/mile is the diesel emission factor and 0.284 the assumed natural gas emission factor given engine certification to a 0.02 g/bhp-hr NOx FEL.

The annual emissions reductions associated with CNG use in the individual trucks are then summed over all trucks to arrive at the total MERC value for the 225 trucks. This value is then multiplied by 0.95 in order to account for actual CNG truck operation in the Phoenix non-attainment area based on information provided by Waste Management indicating that 5% of their operation occurs outside the nonattainment area.

[4] Transit Bus Load-Based Modal Emission Rate Model Development, EPA/600/R-07/106, July 2007, page 3-2.

Appendix B

Proposed Permit Conditions for the Use of CNG Trash Trucks by the Waste Management Fleets in the Maricopa Nonattainment Area[1]

Waste Management (WM) will maintain and operate a minimum of 225 CNG fueled trash trucks, serving the four Fleets in the greater Phoenix area. Any retired CNG truck will be replaced with either a new CNG truck certified at 0.02 g/bhp-hr or lower NOx emitting trash truck fueled with CNG or an alternative fuel, with the replacement truck counting towards this total.

WM will conduct periodic service on each CNG truck consistent with the manufacturer's recommendations consisting of:

Applicable Engine	Description of Service
ALL	Specific inspection related to Cab, Engine, Transmission, Fuel System, Steering System and Axles, Body and Hydraulics, check fuel filter for moisture
ALL	Specific inspection related to Cab, Engine, Transmission, Fuel System, Steering System and Axles, Body and Hydraulics but more in-depth, includes gas leak detection system validation
12L Gas	Specific inspection related to Cab, Engine, Transmission, Fuel System, Steering System and Axles, Body and Hydraulics but more in-depth. Includes engine oil and lube filter replacement
12L Gas	Spark Plug and Ignition System Service
ALL	Specific Inspections related to CNG engines and fuel system, includes the service of the high pressure and low-pressure fuel filters
9L Gas	Specific inspection related to Cab, Engine, Transmission, Fuel System, Steering System and Axles, Body and Hydraulics but more in-depth. Includes servicing high pressure and low-pressure fuel filters, engine oil and filter replacement
9L Gas	Spark Plug and Ignition System Service
ALL	Specific inspection related to Engine, Transmission, Axles, Body and Hydraulics

ALL	Specific CNG Engine and fuel system inspection items, Engine valve lash inspection and adjustment service
ALL	Service of CNG Fuel Delivery and Leak Detection System
ALL	CNG Tanks and Fuel Delivery System Inspection by qualified inspector
ALL	Annual DOT Inspection, PMI Forms have grayed sections that need to be filled out for this service

WM shall maintain the following records:

- Inventory of the CNG trucks used by these four Fleets
- Records of the maintenance of these vehicles

Additionally, we propose to keep records showing generally that the CNG trash trucks are being used in a manner consistent with the derivation of the ERCs. Without an enforceable limit. This would be keeping the following records:

- As part of the inventory of the CNG trucks, annually provide a listing the route(s) for each truck with an annotation of whether the route is or is not predominantly in the nonattainment area.

This would include:

- Annually, WM shall demonstrate that 95% or more of the routes use by their CNG trucks were predominately in the nonattainment area.
- If this figure is not met, WM will notify the MCAPD and explain why the usage was less than expected, what actions WM is taking to ensure that CNG truck use is consistent with this target, and the outlook for the coming year.

[i] These conditions would be inserted into the current air permits of each of the four fleets using the CNG trucks for trash collection.

Refuse truck activity 2021 NOx emission factors (g/mi)				0.02 CNG	
Model year	Gasoline	Diesel	CNG		
1992	7.18	29.66			
1993	8.17	29.79			
1994	7.35	29.75			
1995	7.19	28.02			
1996	7.19	29.88			
1997	8.25	29.91			
1998	4.24	27.19			
1999	4.24	21.32			
2000		20.39			
2001		20.43			
2002		20.25	8.30		
2003	1.50	10.74	8.30		
2004		10.73	8.30		
2005	1.45	10.75			
2006	1.45	10.76			
2007	1.56	7.52			
2008	0.47	7.29			
2009	0.47	7.47			
2010		5.88	1.40		
2011		5.16	1.40		
2012		5.27	1.40		
2013	0.32	4.24	1.40		
2014		4.20	1.40		
2015		4.20	1.40		
2016		4.09	0.93	0.41	
2017		3.90	0.93	0.39	
2018		2.84	0.93	0.28	
2019		2.84	0.93	0.28	
2020		2.84	0.93	0.28	
2021		2.84	0.93	0.28	

Total Credits	34.14	tons
Total Vehicles	225.00	

average mileage residential	18068
average mileage roll off	29577
average mileage front load	44463

CNG emissions rates for vehicles certified to 0.02 g/bhp-hr FEL are assumed to be 10% of same model-year diesel emission rates

WHITE TANK FLEET (F001646)

CNG Truck Number	CNG Load Factor	Date In Service	Engine Hours In Service	Date of Recent Hours	Recent Hours Reading	Mileage in Service	Date of Recent Mileage	Recent Mileage Reading	Days Between Readings	Years Between Readings	Hours Per Year	Miles Per Year	Make	Model	Horse power	Engine MY	CNG NOx (g/mile)	Diesel NOx (g/mile)	Annual NOx EmissionsReduction (tons)	Truck Route within Non-attainment Area	Percentage within Non-attainment Area	Non-Attainment Area Miles	Residential	Rolloff	Front Load
106096	40.5	09/20/2018	35	04/28/2021	5,764	511	04/28/2021	50,095	951.0	2.61	2199	19,031	CUMMINS	ISLG	320	2017	0.63	6.32	0.12	Yes	100%	19031	19,031	0	0
106097	40.5	01/02/2019	23	04/28/2021	4,610	408	04/28/2021	35,215	847.0	2.32	1977	14,999	CUMMINS	L9N	320	2018	0.46	4.61	0.07	Yes	100%	14999	14,999	0	0
106189	40.5	02/04/2019	21	04/28/2021	4,494	437	04/28/2021	35,571	814.0	2.23	2006	15,754	CUMMINS	L9N	320	2018	0.46	4.61	0.07	Yes	100%	15754	15,754	0	0
106190	40.5	11/12/2018	26	04/28/2021	4,334	509	04/28/2021	33,035	898.0	2.46	1751	13,220	CUMMINS	L9N	320	2017	0.63	6.32	0.08	Yes	100%	13220	13,220	0	0
211939	31.5	03/18/2015	82	04/28/2021	17,187	2,211	04/28/2021	208,339	2233.0	6.12	2796	32,876	CUMMINS	ISLG	320	2014	1.76	5.29	0.13	Yes	100%	32876	0	32,876	0
214010	31.5	11/26/2018	49	04/28/2021	6,378	1,767	04/28/2021	90,829	884.0	2.42	2613	36,773	CUMMINS	ISLG	320	2017	0.49	4.91	0.18	Yes	100%	36773	0	36,773	0
214011	31.5	11/30/2018	51	04/28/2021	6,806	1,851	04/28/2021	93,874	880.0	2.41	2802	38,169	CUMMINS	ISLG	320	2017	0.49	4.91	0.19	Yes	100%	38169	0	38,169	0
214012	31.5	12/18/2018	51	04/28/2021	6,519	1,813	04/28/2021	91,471	862.0	2.36	2739	37,964	CUMMINS	ISLG	320	2017	0.49	4.91	0.18	Yes	100%	37964	0	37,964	0
214418	31.5	09/06/2019	57	04/28/2021	4,958	1,884	04/28/2021	55,043	600.0	1.64	2981	32,338	CUMMINS	L9N	320	2018	0.36	3.58	0.11	Yes	100%	32338	0	32,338	0
214420	31.5	09/16/2019	58	04/28/2021	5,010	1,810	04/28/2021	61,839	590.0	1.62	3064	37,137	CUMMINS	L9N	320	2018	0.36	3.58	0.13	Yes	100%	37137	0	37,137	0
214668	31.5	01/17/2020	68	04/28/2021	3,896	1,974	04/28/2021	56,219	467.0	1.28	2992	42,397	CUMMINS	L9N	320	2019	0.36	3.58	0.15	Yes	100%	42397	0	42,397	0
415982	38.0	10/05/2018	30	04/28/2021	7,338	573	04/28/2021	153,898	936.0	2.56	2850	59,790	CUMMINS	ISLG	320	2017	0.59	5.93	0.35	Yes	100%	59790	0	0	59,790
416403	38.0	01/10/2019	23	04/28/2021	8,715	432	04/28/2021	152,698	839.0	2.30	3781	66,242	CUMMINS	L9N	320	2018	0.43	4.32	0.28	Yes	100%	66242	0	0	66,242
416404	38.0	01/15/2019	25	04/28/2021	6,809	439	04/28/2021	149,911	834.0	2.28	2969	65,416	CUMMINS	L9N	320	2018	0.43	4.32	0.28	Yes	100%	65416	0	0	65,416
416599	38.0	06/24/2019	28	04/28/2021	5,646	513	04/28/2021	118,685	674.0	1.85	3042	63,995	CUMMINS	L9N	320	2018	0.43	4.32	0.27	Yes	100%	63995	0	0	63,995
416600	38.0	06/10/2019	14	04/28/2021	5,157	723	04/28/2021	117,710	688.0	1.88	2728	62,064	CUMMINS	L9N	320	2018	0.43	4.32	0.27	Yes	100%	62064	0	0	62,064
417065	38.0	09/23/2019	21	04/28/2021	3,730	350	04/28/2021	81,198	583.0	1.60	2322	50,617	CUMMINS	L9N	320	2018	0.43	4.32	0.22	Yes	100%	50617	0	0	50,617
417068	38.0	10/01/2019	34	04/28/2021	3,706	364	04/28/2021	68,577	575.0	1.58	2331	43,300	CUMMINS	L9N	320	2018	0.43	4.32	0.19	Yes	100%	43300	0	0	43,300
417611	38.0	06/22/2020	35	04/28/2021	2,254	641	04/28/2021	43,978	310.0	0.85	2613	51,026	CUMMINS	L9N	320	2019	0.43	4.32	0.22	Yes	100%	51026	0	0	51,026
417612	38.0	06/26/2020	27	04/28/2021	2,114	707	04/28/2021	44,561	306.0	0.84	2489	52,310	CUMMINS	L9N	320	2019	0.43	4.32	0.22	Yes	85%	44486	0	0	44,486
417613	38.0	06/22/2020	56	04/28/2021	2,277	1,065	04/28/2021	42,050	310.0	0.85	2615	48,257	CUMMINS	L9N	320	2019	0.43	4.32	0.21	Yes	100%	48257	0	0	48,257
417615	38.0	06/22/2020	60	04/28/2021	2,343	1,178	04/28/2021	50,559	310.0	0.85	2688	58,142	CUMMINS	L9N	320	2019	0.43	4.32	0.25	Yes	100%	58142	0	0	58,142
Vehicles	22																	Total	4.1395		Total NAA =	933994			
																					Total Miles =	941818			
																					% in NAA =	99.17%			
																						average an	15,751	36,808	55,758
																							4	7	11

Maricopa County AIR QUALITY DEPARTMENT

Philip A. McNeely, R.G. Director
Phone: 602-506-6701
Email: Philip.McNeely@maricopa.gov

Maricopa.gov/AQ
CleanAirMakeMore.com

August 13, 2021

Return to Table of Contents

Daniel Czecholinski
Air Quality Division Director
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

RE: Emissions Reduction Certification (ERC)
Waste Management of Arizona, Inc. (Deer Valley Transfer Station) – MCAQD Facility F000443

Dear Mr. Czecholinski:

The Maricopa County Air Quality Department (MCAQD) has verified the credit and number of tons of actual emissions that have been reduced by replacing diesel-fueled solid waste collection trucks with CNG-fueled trucks based at the Waste Management Deer Valley Transfer Station located at 2120 West Adobe Drive in Phoenix, Arizona. In accordance with the Arizona Administrative Code, the following actual emissions have been verified for use as certified emission credits:

Nitrogen Oxides (NOx): 11.2 tons/year

Per Maricopa County Rule 204 §301 and AAC Rule 18-2-1205.A, the Control Officer may certify an emission credit if the credit is verified and determined by all of the following:

1. A reduction in actual emissions that occurred after August 17, 1999.

The facility has replaced 74 diesel-fueled solid waste collection trucks with 74 CNG-fueled solid waste collection trucks. Actual NOx emissions from CNG trucks are 65 - 90% less than diesel-fueled trucks depending on model year.

2. A quantifiable reduction in actual emissions.

The applicant submitted calculations using EPA's Motor Vehicle Emissions Simulator software (v3.01) to quantify emissions from both the old and new trucks. Actual vehicle miles traveled were also provided to define the actual emissions. Emission baseline from the diesel-fueled trucks has been calculated over a series of years (i.e., 2013-2021) depending on when the actual conversion occurred.

3. A permanent reduction in actual emissions.

The trucks removed from service must be disabled or moved outside of the Maricopa County non-attainment area as required in the site air quality permit P0008316. The permit also requires that any future replacement of trucks must be equal to or lower emitting than the truck being replaced. These enforceable permit conditions make the emission reductions permanent.

4. An enforceable reduction in actual emissions.

The air quality permit (i.e., P0008316) for the facility includes provisions requiring removal of the diesel-fired trucks that were replaced by the CNG-fired trucks be removed from the Maricopa County ozone non-attainment area. Additional conditions in the permit require monitoring and record keeping to further make the reductions enforceable.

5. A surplus reduction in actual emissions occurring in addition to any other required emission reduction.

The type of trucks that formed the basis for the emission credit have been listed in the 2017 Ozone Periodic Emission Inventory (PEI) and previous PEIs as diesel-fueled vehicles. These inventories are used for regional planning by the Maricopa Association of Governments. No emission reductions were required at the source either through planning or regulation that would reduce the certified credits. Therefore, the lower emitting CNG-fired trucks are surplus to the inventory. Consequently, the table below is a summary of the emission credit calculation.

Pollutant	Baseline Emissions (tons/year)	Ongoing Emissions (tons/year)	Certified Credits (tons/year)
NOx	15.2	4.0	11.2

Based on the information submitted by the source and verified as described above, the MCAQD certifies emission reduction credits in the amount of 11.2 tons of NOx.

This notification is being provided to the Arizona Department of Environmental Quality in the event the applicant submits the certified ERCs for deposit in the Arizona Emissions Bank.

If you have any questions or need additional information, please contact Richard Sumner of my staff at Richard.sumner@maricopa.gov or 602-506-1842.

Sincerely,

Philip A. McNeely, RG
Director
Maricopa County Air Quality Department

Cc: David Bearden, Waste Management of Arizona, Inc.

Attachments

Emission Reduction Credit
Evaluation

Source: Waste Management (Deer Valley Transfer Station)
Facility ID: F000443 Permit: P0008316
Date: August 11, 2021

Project Description: Replace diesel-powered solid waste collection trucks with CNG-powered trucks.

Baseline Emissions: CNG trucks were brought into the fleet over a number of years. Therefore, the baseline is the diesel truck that was replaced by the CNG truck. For example, the NOx emission rate from the diesel truck was 5.29 g/mile and CNG truck #212441 emission rate put into service in 2016 is 1.76 g/mile. (Emission rates based on EPA MOVES 3.01.) The reduction is the difference between the baseline diesel truck emission rate and the CNG truck emission rate. Credits are reduced by 2.5% to allow for mileage outside of the non-attainment area. Annual mileage used in the calculation is 97.5% of actual average mileage for each individual truck. The North Yard Fleet is associated with the Deer Valley Transfer Station.

Example Calculation (1 Truck): (S.29 g/mile - 1.76 g/mile) x 20,506 miles/year x 0.975 = 69,028 g/yr = 0.078 tons/year

Total NOx from the attached spreadsheet for 74 trucks = 11.5167 tons (uncorrected for outside non attainment area)
Total Creditable NOx (after correction) = 11.5167 tons (97.5/99.87)
Creditable NOx reduction = 11.2 tons

Prepared by Richard Sumner
August 11, 2021

Return completed form to
Maricopa County Air Quality Department
3800 North Central Ave Suite 1400, Phoenix AZ 85012
Phone: 602.506.6010 Fax. 602.372.0587
AQPermits@mail.maricopa.gov

EMISSION REDUCTION CREDIT APPLICATION

3800 North Central Ave. Suite 1400, Phoenix, AZ 85012 or 501 North 44th St, Suite 200 Phoenix AZ 85008.

Emission Reduction Credit Application

Facility Information	
1. Facility Name:	Waste Management of Arizona, Inc.
2. Facility Address:	222 S. Mill Ave., Suite 333
City:	Tempe State: Arizona Zip Code: 85281
3. Permit #:	040086/F001646 (White Tanks) 040027/F001645 (SANTAN); 0006438/F000443 (DEER VALLEY)
Contact Information	
4. Is the facility information the same as the contact information?	Yes ☐ No ☒
5. Contact Name:	Dave Bearden
6. Contact Address:	222 S. Mill Ave., Suite 333
City:	Tempe State: Arizona Zip Code: 85281
7. Pollutant (Complete a separate sheet for each pollutant):	NOx
8. Date:	Jun 28, 2021
9. List of the equipment/process involved with the emission reduction:	
Solid Waste Collection Trucks converted from diesel fuel to compressed natural gas	Add a Row / Delete a Row
10. Describe how the emission reduction will be accomplished:	
Waste Management has been converting the majority of their solid waste collection truck fleets in the Phoenix area from diesel fuel to Compressed Natural Gas (CNG), and is applying for NOx Emissions Reduction Credits (ERCs) from the voluntary conversion of trucks from diesel to CNG operation. The trucks are associated with four collection fleets operate at three transfer stations in the non-attainment area. Attachment A provides qualifying criteria, method of calculations and fleet calculations which have been met in the generation of these ERCs.	
11. Estimated date of emission reduction:	various see attachment A
12. Describe how the reduction will be made permanent:	
13. Baseline period (two calendar years):	2020 2021
If this is not the most recent two calendar years, provide a detailed explanation of why the most recent years were not used.	
The requirements related to the ERCs will be included with permit modification for the transfer stations White Tanks, Deer Valley and San Tan. The proposed requirements relate to 1) WM will continue to purchase CNG trucks or alternative trucks with at least or better NOx emissions compared to the current Cummins Engine, 2) perform routine engine maintenance and 3) maintain at least 22 trucks operating 95% or more of their time in the Non-attainment Area.	
14. Identify the method that is proposed to calculate the baseline emissions and how that method is being used. (Examples: material balance, performance test data, continuous monitor, emission factors, etc.)	
See Attachment A – Criteria, Methods of Calculations and Fleet Calculations	

Return completed form to:
Maricopa County Air Quality Department
3800 North Central Ave Suite 460 Phoenix, AZ 85012
Phone 602.506.6010 Fax 602.506.6179
AQPermitsMail@maricopa.gov

AIR QUALITY DEPARTMENT

MARICOPA COUNTY

EMISSION REDUCTION CREDIT APPLICATION

3800 North Central Ave Suite 1400 Phoenix, AZ 85012 or 501 North 44th St, Suite 300 Phoenix, AZ 85008

15. List the seasonal emission rate on a quarterly basis from the operation/process that provided the emission reduction.

Baseline Year One 2020 Q1: _____ Q2: _____ Q3: _____ Q4: _____

Baseline Year Two 2021 Q1: _____ Q2: _____ Q3: _____ Q4: _____

16. Calculation of baseline emissions in tons per year:

A. List any emission factors with their source (include units):

See Attachment A

Add a Row | Delete a Row

B. List assumptions made to perform the calculations:

See Attachment A

C. Show sample of calculations made to verify emission reduction:

See Attachment A

D. Baseline emission rate (tons per year): 34.14

E. Provide a list of documents attached to substantiate the basis for the calculations (e.g., safety data sheets, process records, material use records, monitoring records, etc.).

See Attachment A

Add a Row | Delete a Row

F. Comments or additional information:

17. Do you plan to register the certified credits in the Arizona Emissions Bank administered by the Arizona Department of Environmental Quality (ADEQ)? ☑ Yes ☐ No If yes, there is a registration fee of $200 payable to ADEQ. For more information about the Arizona Emissions Bank please review Arizona Administrative Code Title 18, Chapter 2, Article 12.

18. I certify that the statements and information provided herein are true, accurate, and complete based on information and belief formed after reasonable inquiry.

Signature of owner or responsible official: Dave Bearden

Type or print name and title: Dave Bearden Date: 7/13/2021

Attachment A – Criteria, Methods of Calculations and Fleet Calculations

The five ERC qualifying criteria are being met in the generation of these ERCs:

- **Real** Each of the CNG trucks are designed to operate solely on natural gas. There is extensive evidence, including engine certification testing results, to show that these trucks emit less NOx on a per mile basis that their diesel counter parts. In quantifying the ERCs, actual miles traveled in the nonattainment area are combined with actual emissions rates using standardize EPA modeling methods applicable to these operating conditions. While these new CNG trucks are replacing older diesel trucks with much higher NOx emissions, to assure that the reductions are real, the analysis is based on the emissions of the CNG trash truck in comparison to a new diesel trash truck of the same vintage.

- **Quantifiable** As described in detail in this Appendix A, the emissions reduction resulting from the voluntary replacement of diesel trash collection trucks with lower NOx emitting CNG trucks is being quantified using the EPA MOVES3.01, reflecting the miles traveled by the CNG trucks within the nonattainment area. The model has been adjusted to reflect actual use patterns of the Waste Management trash trucks and the difference in emissions between diesel and CNG in the year each CNG truck was or will be placed into service.

- **Surplus** The conversion to CNG trash truck fleets is being carried out on a voluntary basis. It is not being done to comply with any current or anticipated regulatory requirement. We understand that trash truck is the region appear as diesel powered in the Regional Ozone Modeling over the last decade including the latest (2017) Regional emissions inventory.

- **Permanent** Waste Management is proposing to make these reductions permanent by keeping these CNG trucks in service in the nonattainment area and replacing them with CNG trucks or trucks with equal or lower NOx emissions whenever one is removed from service. Proposed permit conditions that would be added to the air permit of the Fleet location, reflecting this commitment, are presented in Appendix B.

- **Enforceable** The Fleet requirements will be added to existing minor source air permits issued by the Maricopa County Air Quality Department. The conditions of these air permits are federally enforceable. Waste Management will be requesting permit conditions in each of these permits that will make the continuing use of these CNG trucks or replacement trucks with equal or lower NOx emissions in the nonattainment area. See Appendix B. This will make the action that Waste Management has taken to create these ERCs federally enforceable.

The methods of calculations for the ERCs are:

Waste Management currently operates 225 refuse trucks powered by compressed natural gas (CNG) engines in the greater Phoenix area that collect waste and deliver it to transfer stations. The fleets are referred to as White Tank, San Tan, North Phoenix and Elwood. These CNG vehicles are powered by U.S. EPA certified 2011 to 2020 model-year Cummins 8.9-liter engines. The model-year 2011 to 2015 engines were certified by Cummins to the 0.2 g/bhp-hr NOx standard that applies to 2010 and later model-year vehicles while the 2016 and later model-year engines were certified by Cummins to family NOx emissions limits (FELs) of 0.02 g/bhp-hr.

The MERC calculation methodology is based on a comparison of the CNG refuse truck emissions to the emissions of a diesel refuse truck of the same model year. A credit calculation is performed for each CNG vehicle based the vehicle's lifetime average annual mileage reported by Waste Management and the differential in emissions NOx between the CNG vehicle and a diesel-powered refuse truck with an engine of the same model-year, computed for calendar year 2021 derived from EPA's MOVES3.01.

The emissions differential calculation begins with 2010 through 2020 model-year emission factors (in units of grams of NOx per mile of operation) for diesel and CNG refuse trucks obtained by running MOVES 3.01 configured for Maricopa County in calendar year 2021. Two adjustments were made to the MOVES 3.01 emission factors. The first was made to account for the fact that the engines in the 2016 and later Waste Management CNG vehicles were certified to a family emissions level (FEL) of 0.02 g/bhp-hr for NOx which is 10 times lower than the applicable emission standard of 0.20 g/bhp-hr which is assumed in MOVES3.01.[1] Therefore, CNG emission rates for 2016 to 2020 model-year vehicles were assumed to be one-tenth of the comparable diesel emission rate.

The second adjustment was made to account for the actual load factors experienced by Waste Management's CNG vehicles during routine operations which is not appropriately accounted for in MOVES 3.01.[2] More specifically, Waste Management collected engine load data using a Cummins engine analyzer[3] from three trucks operating on actual in-use refuse routes representative of the three main types of refuse truck operation occurring in the Waste Management : 1) residential, 2) roll-off, and 3) frontload. These load factors were determined

[1] Based on a review of the MOVES3 documentation related to emission factors for heavy-duty CNG trucks, it is clear that the MOVES emission factors are based on data from 2011 and 2014 model-year vehicles certified to the 0.20 g/bhp-hr standard which overestimates the actual emissions of the 2016 to 2020 model-year CNG trucks. See "Exhaust Emission Rates for Heavy-Duty Onroad Vehicles in MOVES3", EPA-420-R-20-018, November 2020, page 197.

[2] For example, the MOVES3.01 fuel consumption values for 2011 to 2020 model-year refuse trucks are only about 12% higher than for transit buses rather than the expected average of about 30%. See Alternative Fuels Data Center: Maps and Data - Average Fuel Economy by Major Vehicle Category (energy.gov)

[3] The analyzer is lap top based unit that directly reads engine performance, monitoring data and calculate parameters including the engine load factor. Dave – can you provide the name of software and maybe a link to a Cummins web page where it is described?

to be 40.5% for residential, 31.5% for roll-off, and 38% for front end loaders which are much higher than the 20 to 25% load engines experience during certification emissions testing.[4] Therefore the diesel and CNG emission rates from MOVES3.01 were scaled using the load factors provided by Waste Management divided by the 25% value that is the upper bound of the range reported from certification testing.

The final MERC calculation for each CNG vehicle involved multiplying the weighted average annual milage of that type of vehicle by the emissions difference between the diesel and CNG emission rates. For example, the MERC value for a 2015 residential refuse truck that travels 50,000 miles would be:

MERC (tons/year) = 50,000 miles/year * (4.20-1.40) grams NOx/mile * (40.5/25)
= 243,000 grams NOx/year = 0.27 tons NOx/year

Where 4.20 and 1.40 grams NOx/mile are the MOVES3 generated NOx emission factors for 2015 model-year diesel and CNG refuse trucks, respectively.

While the MERC value for a 2020 front end loader refuse truck traveling 50,000 miles a year would be:

MERC (tons/year) = 50,000 miles/year * (2.84 – 0.284) grams NOx/mile * (38/25)
= 194,256 grams NOx/year = 0.21 tons NOx/year

Where 2.84 grams NOx/mile is the diesel emission factor and 0.284 the assumed natural gas emission factor given engine certification to a 0.02 g/bhp-hr NOx FEL.

The annual emissions reductions associated with CNG use in the individual trucks are then summed over all trucks to arrive at the total MERC value for the 225 trucks. This value is then multiplied by 0.95 in order to account for actual CNG truck operation in the Phoenix non-attainment area based on information provided by Waste Management indicating that 5% of their operation occurs outside the nonattainment area.

[4] Transit Bus Load-Based Modal Emission Rate Model Development, EPA/600/R-07/106, July 2007, page 3-2.

Appendix B

Proposed Permit Conditions for the Use of CNG Trash Trucks by the Waste Management Fleets in the Maricopa Nonattainment Area[i]

Waste Management (WM) will maintain and operate a minimum of 225 CNG fueled trash trucks, serving the four Fleets in the greater Phoenix area. Any retired CNG truck will be replaced with either a new CNG truck certified at 0.02 g/bhp-hr or lower NOx emitting trash truck fueled with CNG or an alternative fuel, with the replacement truck counting towards this total.

WM will conduct periodic service on each CNG truck consistent with the manufacturer's recommendations consisting of:

Applicable Engine	Description of Service
ALL	Specific inspection related to Cab, Engine, Transmission, Fuel System, Steering System and Axles, Body and Hydraulics, check fuel filter for moisture
ALL	Specific inspection related to Cab, Engine, Transmission, Fuel System, Steering System and Axles, Body and Hydraulics but more in-depth, includes gas leak detection system validation
12L Gas	Specific inspection related to Cab, Engine, Transmission, Fuel System, Steering System and Axles, Body and Hydraulics but more in-depth. Includes engine oil and lube filter replacement
12L Gas	Spark Plug and Ignition System Service
ALL	Specific Inspections related to CNG engines and fuel system, includes the service of the high pressure and low-pressure fuel filters
9L Gas	Specific inspection related to Cab, Engine, Transmission, Fuel System, Steering System and Axles, Body and Hydraulics but more in-depth. Includes servicing high pressure and low-pressure fuel filters, engine oil and filter replacement
9L Gas	Spark Plug and Ignition System Service
ALL	Specific inspection related to Engine, Transmission, Axles, Body and Hydraulics

ALL	Specific CNG Engine and fuel system inspection items, Engine valve lash inspection and adjustment service
ALL	Service of CNG Fuel Delivery and Leak Detection System
ALL	CNG Tanks and Fuel Delivery System Inspection by qualified inspector
ALL	Annual DOT Inspection, PMI Forms have grayed sections that need to be filled out for this service

WM shall maintain the following records:

- Inventory of the CNG trucks used by these four Fleets
- Records of the maintenance of these vehicles

Additionally, we propose to keep records showing generally that the CNG trash trucks are being used in a manner consistent with the derivation of the ERCs. Without an enforceable limit. This would be keeping the following records:

- As part of the inventory of the CNG trucks, annually provide a listing the route(s) for each truck with an annotation of whether the route is or is not predominantly in the nonattainment area.

This would include:

- Annually, WM shall demonstrate that 95% or more of the routes use by their CNG trucks were predominately in the nonattainment area.
- If this figure is not met, WM will notify the MCAPD and explain why the usage was less than expected, what actions WM is taking to ensure that CNG truck use is consistent with this target, and the outlook for the coming year.

[3] These conditions would be inserted into the current air permits of each of the four fleets using the CNG trucks for trash collection.

Refuse truck activity 2021 NOx emission factors (g/mi)				0.02 CNG
Model year	Gasoline	Diesel	CNG	
1992	7.18	29.66		
1993	8.17	29.79		
1994	7.35	29.75		
1995	7.19	28.02		
1996	7.19	29.88		
1997	8.25	29.91		
1998	4.24	27.19		
1999	4.24	21.32		
2000		20.39		
2001		20.43		
2002		20.25	8.30	
2003	1.50	10.74	8.30	
2004		10.73	8.30	
2005	1.45	10.75		
2006	1.45	10.76		
2007	1.56	7.52		
2008	0.47	7.29		
2009	0.47	7.47		
2010		5.88	1.40	
2011		5.16	1.40	
2012		5.27	1.40	
2013	0.32	4.24	1.40	
2014		4.20	1.40	
2015		4.20	1.40	
2016		4.09	0.93	0.41
2017		3.90	0.93	0.39
2018		2.84	0.93	0.28
2019		2.84	0.93	0.28
2020		2.84	0.93	0.28
2021		2.84	0.93	0.28

Total Credits	34.14	tons
Total Vehicles	225.00	

average mileage residential	18068
average mileage roll off	29577
average mileage front load	44463

CNG emissions rates for vehicles certified to 0.02 g/bhp-hr FEL are assumed to be 10% of same model-year diesel emission rates

NORTH YARD FLEET (F000443)

CNG Truck Number	CNG Load Factor	Date In Service	Engine Hours In Service	Date of Recent Hours	Recent Hours Reading	Mileage In Service	Date of Recent Mileage	Recent Mileage Reading	Days Between Readings	Years Between Readings	Hours Per Year	Miles Per Year	Make	Model	Horse power	Engine MY	CNG NOx (g/mile)	Diesel NOx (g/mile)	Annual NOx Emissions Reduction (tons)	Truck Route within Non-attainment Area	Percentage within Non-attainment Area	Non-Attainment Area Miles	Residential	Rolloff	Front Loader
104474	40.5	12/18/2013	77	05/13/2021	15,433	2246	05/13/2021	186,606	2703.0	7.41	2074	24,895	CUMMINS	ISLG	320	2012	2.27	6.53	0.17	Yes	100%	24895	24,895	0	0
104475	40.5	12/18/2013	12	05/13/2021	14,630	2561	05/13/2021	178,345	2703.0	7.41	1977	23,737	CUMMINS	ISLG	320	2012	2.27	6.53	0.16	Yes	100%	23737	23,737	0	0
105290	40.5	11/24/2015	66	05/13/2021	12,744	1804	05/13/2021	121,255	1997.0	5.47	2317	21,833	CUMMINS	ISLG	320	2014	2.27	6.80	0.11	Yes	100%	21833	21,833	0	0
105291	40.5	12/05/2015	64	05/13/2021	12,457	1882	05/13/2021	149,148	1986.0	5.44	2290	27,066	CUMMINS	ISLG	320	2014	2.27	6.80	0.14	Yes	100%	27066	27,066	0	0
106100	40.5	11/01/2018	247	05/13/2021	5,558	0	05/13/2021	58,208	924.0	2.53	2098	22,992	CUMMINS	ISLG	320	2017	0.63	6.32	0.14	Yes	100%	22992	22,992	0	0
106101	40.5	09/24/2018	45	05/13/2021	5,505	0	05/13/2021	65,117	962.0	2.64	2110	24,707	CUMMINS	ISLG	320	2017	0.63	6.32	0.15	Yes	100%	24707	24,707	0	0
153056	40.5	08/15/2018	40	05/13/2021	6,391	1700	05/13/2021	64,072	1002.0	2.75	2313	22,720	CUMMINS	ISLG	320	2017	0.63	6.32	0.14	Yes	100%	22720	22,720	0	0
211459	31.5	12/18/2013	71	05/13/2021	19,320	0	05/13/2021	326,548	2703.0	7.41	2599	44,095	CUMMINS	ISLG	320	2012	1.77	6.64	0.24	Yes	100%	44095	0	44,095	0
211469	31.5	05/13/2013	68	05/13/2021	19,267	0	05/13/2021	212,494	2922.0	8.01	2398	26,544	CUMMINS	ISLG	320	2012	1.77	6.64	0.14	Yes	100%	26544	0	26,544	0
211492	31.5	05/13/2013	70	05/13/2021	20,007	458	05/13/2021	221,960	2922.0	8.01	2490	27,669	CUMMINS	ISLG	320	2012	1.77	6.64	0.15	Yes	100%	27669	0	27,669	0
211493	31.5	04/22/2013	78	05/13/2021	19,650	0	05/13/2021	234,789	2943.0	8.06	2427	29,119	CUMMINS	ISLG	320	2012	1.77	6.64	0.16	Yes	100%	29119	0	29,119	0
211784	31.5	01/01/2015	73	05/13/2021	17,121	0	05/13/2021	176,045	2324.0	6.37	2678	27,649	CUMMINS	ISLG	320	2014	1.76	5.29	0.11	Yes	100%	27649	0	27,649	0
211785	31.5	01/10/2015	124	05/13/2021	17,520	0	05/13/2021	220,973	2315.0	6.34	2743	34,840	CUMMINS	ISLG	320	2014	1.76	5.29	0.14	No	91%	31720	0	31,720	0
211786	31.5	12/10/2014	66	05/13/2021	17,311	0	05/13/2021	210,227	2346.0	6.43	2683	32,708	CUMMINS	ISLG	320	2013	1.77	5.34	0.13	Yes	100%	32708	0	32,708	0
211787	31.5	01/01/2015	63	05/13/2021	16,840	0	05/13/2021	189,119	2324.0	6.37	2635	29,702	CUMMINS	ISLG	320	2014	1.76	5.29	0.12	Yes	100%	29702	0	29,702	0
211788	31.5	02/01/2015	54	05/13/2021	17,996	0	05/13/2021	220,131	2293.0	6.28	2856	35,040	CUMMINS	ISLG	320	2014	1.76	5.29	0.14	Yes	100%	35040	0	35,040	0
211789	31.5	02/01/2015	86	05/13/2021	16,866	0	05/13/2021	206,563	2293.0	6.28	2671	32,881	CUMMINS	ISLG	320	2014	1.76	5.29	0.13	Yes	100%	32881	0	32,881	0
211790	31.5	02/01/2015	64	05/13/2021	17,464	0	05/13/2021	230,994	2293.0	6.28	2770	36,770	CUMMINS	ISLG	320	2014	1.76	5.29	0.14	Yes	100%	36770	0	36,770	0
211916	31.5	02/27/2015	101	05/13/2021	17,346	0	05/13/2021	173,863	2267.0	6.21	2777	27,993	CUMMINS	ISLG	320	2014	1.76	5.29	0.11	Yes	100%	27993	0	27,993	0
211971	31.5	01/04/2015	84	05/13/2021	16,207	0	05/13/2021	164,839	2321.0	6.36	2535	25,923	CUMMINS	ISLG	320	2014	1.76	5.29	0.10	Yes	100%	25923	0	25,923	0
212219	31.5	08/24/2015	68	05/13/2021	13,920	0	05/13/2021	194,561	2089.0	5.72	2420	33,995	CUMMINS	ISLG	320	2014	1.76	5.29	0.13	Yes	100%	33995	0	33,995	0
212220	31.5	10/15/2015	55	05/13/2021	14,896	1923	05/13/2021	164,705	2037.0	5.58	2659	29,168	CUMMINS	ISLG	320	2014	1.76	5.29	0.11	Yes	100%	29168	0	29,168	0
212221	31.5	09/10/2015	63	05/13/2021	14,828	0	05/13/2021	115,800	2072.0	5.68	2601	20,399	CUMMINS	ISLG	320	2014	1.76	5.29	0.08	Yes	100%	20399	0	20,399	0
212222	31.5	09/30/2015	55	05/13/2021	15,119	2607	05/13/2021	177,252	2052.0	5.62	2680	31,065	CUMMINS	ISLG	320	2014	1.76	5.29	0.12	Yes	100%	31065	0	31,065	0
212437	31.5	11/02/2015	90	05/13/2021	15,241	1845	05/13/2021	197,785	2019.0	5.53	2739	35,423	CUMMINS	ISLG	320	2014	1.76	5.29	0.14	Yes	100%	35423	0	35,423	0
212438	31.5	12/04/2015	61	05/13/2021	14,933	2150	05/13/2021	163,771	1987.0	5.44	2732	29,689	CUMMINS	ISLG	320	2014	1.76	5.29	0.12	Yes	100%	29689	0	29,689	0
212439	31.5	12/23/2015	82	05/13/2021	15,072	2102	05/13/2021	192,761	1968.0	5.39	2780	35,361	CUMMINS	ISLG	320	2014	1.76	5.29	0.14	Yes	100%	35361	0	35,361	0
212440	31.5	01/04/2016	63	05/13/2021	14,120	1795	05/13/2021	132,637	1956.0	5.36	2623	24,416	CUMMINS	ISLG	320	2015	1.76	5.29	0.09	Yes	100%	24416	0	24,416	0
212441	31.5	01/08/2016	75	05/13/2021	14,290	1745	05/13/2021	111,410	1952.0	5.35	2658	20,506	CUMMINS	ISLG	320	2015	1.76	5.29	0.08	Yes	100%	20506	0	20,506	0
212442	31.5	01/13/2016	123	05/13/2021	13,796	1795	05/13/2021	158,881	1947.0	5.33	2583	29,449	CUMMINS	ISLG	320	2015	1.76	5.29	0.11	Yes	100%	29449	0	29,449	0
212940	31.5	01/30/2017	69	05/13/2021	11,712	1822	05/13/2021	111,643	1564.0	4.28	2717	25,630	CUMMINS	ISLG	320	2016	0.52	5.16	0.13	Yes	100%	25630	0	25,630	0
212941	31.5	02/09/2017	62	05/13/2021	10,457	1705	05/13/2021	145,518	1554.0	4.26	2442	33,778	CUMMINS	ISLG	320	2016	0.52	5.16	0.17	Yes	100%	33778	0	33,778	0
212942	31.5	03/15/2017	57	05/13/2021	10,930	1711	05/13/2021	142,173	1520.0	4.16	2611	33,729	CUMMINS	ISLG	320	2016	0.52	5.16	0.17	Yes	100%	33729	0	33,729	0
214013	31.5	02/04/2019	64	05/13/2021	5,606	0	05/13/2021	65,692	829.0	2.27	2440	28,923	CUMMINS	L9N	320	2018	0.36	3.58	0.10	Yes	100%	28923	0	28,923	0
214014	31.5	12/17/2018	99	05/13/2021	6,616	136	05/13/2021	52,530	878.0	2.41	2709	21,781	CUMMINS	ISLG	320	2017	0.49	4.91	0.11	Yes	100%	21781	0	21,781	0
214279	31.5	01/24/2019	63	05/13/2021	5,567	0	05/13/2021	66,323	840.0	2.30	2392	28,819	CUMMINS	L9N	320	2018	0.36	3.58	0.10	Yes	100%	28819	0	28,819	0
214280	31.5	01/28/2019	74	05/13/2021	8,232	179	05/13/2021	79,141	836.0	2.29	2689	34,475	CUMMINS	L9N	320	2018	0.36	3.58	0.12	Yes	100%	34475	0	34,475	0
214413	31.5	07/01/2019	49	05/13/2021	4,003	0	05/13/2021	45,767	682.0	1.87	2164	24,494	CUMMINS	L9N	320	2018	0.36	3.58	0.09	Yes	100%	24494	0	24,494	0
214414	31.5	08/09/2019	48	05/13/2021	4,591	0	05/13/2021	38,455	643.0	1.76	2579	21,829	CUMMINS	L9N	320	2018	0.36	3.58	0.08	Yes	100%	21829	0	21,829	0
214415	31.5	07/01/2019	50	05/13/2021	4,689	0	05/13/2021	60,859	682.0	1.87	2483	32,571	CUMMINS	L9N	320	2018	0.36	3.58	0.12	Yes	100%	32571	0	32,571	0
214416	31.5	07/15/2019	67	05/13/2021	4,960	935	05/13/2021	49,284	668.0	1.83	2674	26,418	CUMMINS	L9N	320	2018	0.36	3.58	0.09	Yes	100%	26418	0	26,418	0
214417	31.5	08/09/2019	45	05/13/2021	4,411	0	05/13/2021	52,225	643.0	1.76	2478	29,646	CUMMINS	L9N	320	2018	0.36	3.58	0.11	Yes	100%	29646	0	29,646	0
214419	31.5	07/22/2019	55	05/13/2021	4,490	0	05/13/2021	67,473	661.0	1.81	2670	37,258	CUMMINS	L9N	320	2018	0.36	3.58	0.13	Yes	100%	37258	0	37,258	0
215238	31.5	06/03/2020	15	05/13/2021	2,431	494	05/13/2021	27,278	344.0	0.94	2563	28,419	CUMMINS	L9N	320	2019	0.36	3.58	0.10	Yes	100%	28419	0	28,419	0
215239	31.5	06/29/2020	49	05/13/2021	2,411	400	05/13/2021	35,224	318.0	0.87	2711	39,971	CUMMINS	L9N	320	2019	0.36	3.58	0.14	Yes	100%	39971	0	39,971	0
215240	31.5	06/15/2020	46	05/13/2021	2,261	408	05/13/2021	15,041	332.0	0.91	2435	16,087	CUMMINS	L9N	320	2019	0.36	3.58	0.06	Yes	100%	16087	0	16,087	0
215464	31.5	11/11/2020	46	05/13/2021	1,011	508	05/13/2021	15,062	183.0	0.50	1925	29,028	CUMMINS	L9N	320	2019	0.36	3.58	0.10	Yes	100%	29028	0	29,028	0
215465	31.5	12/30/2020	51	05/13/2021	722	424	05/13/2021	12,407	134.0	0.37	1828	32,640	CUMMINS	L9N	320	2019	0.36	3.58	0.12	Yes	100%	32640	0	32,640	0
215466	31.5	11/11/2020	46	05/13/2021	1,081	395	05/13/2021	16,754	183.0	0.50	2064	32,629	CUMMINS	L9N	320	2019	0.36	3.58	0.12	Yes	100%	32629	0	32,629	0
363115	40.5	08/15/2012	29	05/13/2021	6,828	4806	05/13/2021	65,142	3346.0	9.17	742	6,582	CUMMINS	ISLG	320	2011	2.27	8.35	0.04	Yes	100%	6582	6,582	0	0
363116	40.5	03/15/2012	23	05/13/2021	8,283	0	05/13/2021	87,587	3346.0	9.17	901	9,554	CUMMINS	ISLG	320	2011	2.27	8.35	0.06	Yes	100%	9554	9,554	0	0
414040	38.0	12/18/2013	51	05/13/2021	16,059	0	05/13/2021	332,208	2703.0	7.41	2162	44,860	CUMMINS	ISLG	320	2012	2.13	8.00	0.29	Yes	100%	44860	0	0	44,860
414071	38.0	11/30/2013	61	05/13/2021	18,500	0	05/13/2021	367,190	2721.0	7.45	2473	49,256	CUMMINS	ISLG	320	2012	2.13	8.00	0.32	Yes	100%	49256	0	0	49,256
414072	38.0	11/12/2013	16	05/13/2021	19,244	626	05/13/2021	393,771	2739.0	7.50	2562	52,383	CUMMINS	ISLG	320	2012	2.13	8.00	0.34	Yes	100%	52383	0	0	52,383
414083	38.0	12/10/2013	21	05/13/2021	19,024	2229	05/13/2021	385,864	2711.0	7.43	2559	51,651	CUMMINS	ISLG	320	2012	2.13	8.00	0.33	Yes	100%	51651	0	0	51,651
414088	38.0	11/12/2013	19	05/13/2021	16,586	1536	05/13/2021	333,061	2739.0	7.50	2208	44,179	CUMMINS	ISLG	320	2012	2.13	8.00	0.29	Yes	100%	44179	0	0	44,179
414371	38.0	03/13/2015	40	05/13/2021	13,264	0	05/13/2021	266,443	2253.0	6.17	2142	43,165	CUMMINS	ISLG	320	2014	2.13	6.38	0.20	Yes	100%	43165	0	0	43,165
414372	38.0	03/13/2015	33	05/13/2021	13,743	0	05/13/2021	299,186	2253.0	6.17	2221	48,470	CUMMINS	ISLG	320	2014	2.13	6.38	0.23	Yes	100%	48470	0	0	48,470
414373	38.0	03/09/2015	29	05/13/2021	12,960	0	05/13/2021	271,242	2257.0	6.18	2091	43,865	CUMMINS	ISLG	320	2014	2.13	6.38	0.21	Yes	100%	43865	0	0	43,865
414374	38.0	03/13/2015	31	05/13/2021	13,741	0	05/13/2021	291,585	2243.0	6.15	2231	47,449	CUMMINS	ISLG	320	2014	2.13	6.38	0.22	Yes	100%	47449	0	0	47,449
414375	38.0	03/13/2015	34	05/13/2021	13,860	0	05/13/2021	252,096	2253.0	6.17	2240	40,841	CUMMINS	ISLG	320	2014	2.13	6.38	0.19	Yes	100%	40841	0	0	40,841
414547	38.0	04/11/2016	39	05/13/2021	12,287	1822	05/13/2021	249,523	1858.0	5.09	2406	48,660	CUMMINS	ISLG	320	2015	2.13	6.38	0.23	Yes	100%	48660	0	0	48,660
414653	38.0	09/21/2015	35	05/13/2021	14,101	4016	05/13/2021	231,220	2061.0	5.65	2491	40,237	CUMMINS	ISLG	320	2014	2.13	6.38	0.19	Yes	100%	40237	0	0	40,237
414995	38.0	02/22/2016	31	05/13/2021	14,659	1785	05/13/2021	287,330	1907.0	5.22	2800	54,653	CUMMINS	ISLG	320	2015	2.13	6.38	0.26	Yes	100%	54653	0	0	54,653
414996	38.0	03/28/2016	35	05/13/2021	12,035	1821	05/13/2021	241,500	1872.0	5.13	2340	46,732	CUMMINS	ISLG	320	2015	2.13	6.38	0.22	Yes	100%	46732	0	0	46,732
414997	38.0	03/01/2016	48	05/13/2021	11,876	1670	05/13/2021	232,652	1899.0	5.20	2273	44,396	CUMMINS	ISLG	320	2015	2.13	6.38	0.21	Yes	100%	44396	0	0	44,396
414998	38.0	02/01/2016	31	05/13/2021	13,598	1855	05/13/2021	282,000	1928.0	5.28	2568	53,036	CUMMINS	ISLG	320	2015	2.13	6.38	0.25	Yes	100%	53036	0	0	53,036
415995	38.0	08/31/2018	38	05/13/2021	5,919	1791	05/13/2021	116,229	986.0	2.70	2177	42,363	CUMMINS	ISLG	320	2017	0.59	5.93	0.25	Yes	100%	42363	0	0	42,363
415996	38.0	09/17/2018	34	05/13/2021	5,935	1946	05/13/2021	130,765	969.0	2.65	2223	48,523	CUMMINS	ISLG	320	2017	0.59	5.93	0.28	Yes	100%	48523	0	0	48,523
416601	38.0	04/26/2019	24	05/13/2021	5,197	0	05/13/2021	115,541	748.0	2.05	2524	56,380	CUMMINS	L9N	320	2018	0.43	4.32	0.24	Yes	100%	56380	0	0	56,380
416602	38.0	03/05/2019	11	05/13/2021	4,538	0	05/13/2021	99,347	800.0	2.19	2063	45,327	CUMMINS	L9N	320	2018	0.43	4.32	0.19	Yes	100%	45327	0	0	45,327
416603	38.0	04/11/2019	29	05/13/2021	4,445	0	05/13/2021	80,586	763.0	2.09	2113	38,550	CUMMINS	L9N	320	2018	0.43	4.32	0.17	Yes	100%	38550	0	0	38,550
417066	38.0	10/02/2019	21	05/13/2021	3,040	0	05/13/2021	60,437	589.0	1.61	1871	37,452	CUMMINS	L9N	320	2018	0.43	4.32	0.16	Yes	100%	37452	0	0	37,452
417067	38.0	11/04/2019	28	05/13/2021	1,616	517	05/13/2021	28,218	556.0	1.52	1042	18,185	CUMMINS	L9N	370	2018	0.43	4.32	0.08	Yes	100%	18185	0	0	18,185
Total	74																	Total	11.5167		Total NAA =	2480111			
																					Total Miles =	2483231			
																					% in NAA =	99.87%			
																					average annual mileage		20,454	29,891	45,244
																							9	42	23

REVISION TO ARIZONA'S SIP
INCORPORATION OF WASTE MANAGEMENT PERMIT CONDITIONS

APPENDIX 3:
EPA LETTER DATED AUGUST 18, 2021

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Richard Sumner
Permitting Division Manager
Maricopa County Air Quality Department
3800 N. Central Avenue, Suite 1400
Phoenix, AZ 85012

Re: Comments on Proposed Permit Action for the Intel Corporation – Ocotillo Campus in Chandler, AZ

Dear Richard Sumner:

Thank you for the opportunity to review the Maricopa County Air Quality Department's (MCAQD) July 21, 2021 proposed permit action for the Intel Corporation – Ocotillo Campus ("Intel"). In this action, Intel is requesting authorization for a major modification to construct and operate two new semiconductor Fab modules and supporting equipment ("Fab 52 and Fab 62"). The permit action also relies on the MCAQD's permits for three Waste Management, Inc. (WM) facilities to generate mobile source emission reduction credits (MERCs) to be used as emissions offsets for the Intel project. This letter and the enclosure provide the U.S. Environmental Protection Agency's (EPA) comments on the MCAQD's proposed action and the WM permits. In developing our comments, we also reviewed the requirements of Clean Air Act (CAA) section 173, the MCAQD's State Implementation Plan (SIP)-approved and non-SIP approved rules, and the EPA's guidance document "Improving Air Quality with Economic Incentive Programs" (January 2001).

Our comments focus primarily on ensuring the enforceability of the emissions offsets required for this project under the CAA's Nonattainment New Source Review (NNSR) program. This permit action pilots an innovative approach of generating offsets by imposing requirements on a mobile source fleet through the fleet owner's CAA stationary source permit. Mobile sources are not typically subject to CAA stationary source permitting requirements. In this case, the MERCs are being generated by WM's refuse truck fleets by switching diesel fueled vehicles to vehicles fueled with compressed natural gas (CNG). This approach was used because the MCAQD does not currently have an EPA-approved program in the MCAQD's portion of the Arizona SIP for generating MERCs for the purpose of meeting CAA stationary source permitting requirements.

The ability to generate MERCs through MCAQD-issued permits is based, in part, on our understanding of the MCAQD's authority to issue a stationary source permit that includes enforceable requirements for mobiles sources that are under the control of the stationary source owner or operator. Thus, this option may have limited application if the entity seeking to generate MERCs does not also have an enforceable CAA stationary source permit. Our comments are as comprehensive as possible to ensure that the permits issued to WM to generate the offsets upon which Intel is relying will meet the NNSR program's offset integrity requirements at the time construction is authorized.

Additionally, the MERCs being certified for this project appear to be good candidates for emissions offsets because the vehicles that are the source of the credits are municipal refuse trucks that represent

"captive fleets" (e.g., where all the vehicles in the fleet are identifiable, have GPS tracking equipment installed, and return to base daily), their emissions are included in the MCAQD's emissions inventory used for ozone attainment planning, and they can be expected to operate at current or greater utilization levels into the future. Also, the emission reductions associated with these MERCs have not been relied upon in any demonstrations of attainment or reasonable further progress.

We are not aware of another instance of generating offsets from mobile sources by imposing requirements on a mobile source fleet through the fleet owner's CAA stationary source permit. Thus, the EPA will continue to evaluate this approach to ensure all the NNSR program criteria are met. A SIP-approved rule remains the EPA's preferred approach for ensuring MERCs are generated in a manner that meets the NNSR program's criteria of being real, surplus, permanent, quantifiable, and federally enforceable.

We appreciate your willingness to include us in the development of this permitting action and we look forward to continuing to work with the MCAQD in meeting the CAA's requirements, as well as our shared goal of protecting human health and the environment.

If you have any questions regarding the EPA's comments, please contact Lisa Beckham at (415) 972-3811 or beckham.lisa@epa.gov.

Sincerely,

Laura Yannayon
Acting Manager, Permits Office
Air and Radiation Division

Enclosure
cc: Craig McCurry, Senior Environmental Engineer, Intel Corp

Below are the EPA's comments on the MCAQD's July 21, 2021 proposed action to authorize the Fab 52 and Fab 62 project for the Intel Corporation – Ocotillo Campus under the New Source Review (NSR) program through revisions to the facility's title V permit. Our comments also relate to the permits issued to three WM facilities, which Intel is relying on to generate emission reductions to meet the NNSR program's offset requirements.

1. **Enforceability of Emissions Offsets Obligations in Intel's Permit**
   a. Intel's draft permit does not contain enforceable conditions requiring Intel to use emissions offsets certified by the MCAQD for the Fab 52 and Fab 62 project. Consistent with MCAQD Rule 240 § 304.9.c, and in the same manner that MCAQD has made its Lowest Achievable Emission Rate (LAER) determinations enforceable, the permit must include conditions identifying the specific ton per year offset obligation applicable to this project (204.3 VOC credits and 189.5 NO_X credits) to ensure the reductions are an enforceable condition of the permit to construct and operate.

   b. Condition 2.c of Intel's draft permit needs additional specificity to ensure its enforceability. Consistent with the comment above, the condition should be expanded to include volatile organic compounds (VOC) to ensure enforceability of the offset requirement for VOC. Additionally, it is unclear what is meant by the nitrogen oxide (NO_X) offset credits "shall be in effect" by the time Intel commences operation of the project, as the emissions reductions that generate the offsets credits must be federally enforceable prior to issuance of the authorization to construct (consistent with CAA section 173(a)). Please clarify this condition to indicate that such emission reductions must have occurred and/or been implemented prior to the project commencing operation.

2. **Permanency of Offsets Obtained from Waste Management**
   The offsets generated by WM are made federally enforceable through SIP-approved MCAQD Rule 220 § 302.2, which provides a means for permittees to accept voluntary, federally enforceable permit conditions. However, the voluntary origin of the federally enforceable conditions affects whether they meet the permanency requirements of the MCAQD's NNSR program (MCAQD Rule 240 § 304.4). To ensure the permanency of these reductions, the MCAQD should submit the MERC permit conditions in WM's permits for approval into the MCAQD portion of the Arizona SIP. The EPA will work with the MCAQD to help establish permanency of these offsets prior to the project commencing operation.

3. **Enforceability of Waste Management MERCs**
   Many of the conditions in the WM permits regarding the MERCs are too general to be enforceable as a practical matter and insufficient for ensuring the offsets meet the offset integrity requirements in MCAQD Rule 240 § 304.4 and are therefore valid. To ensure the offsets are valid, the WM permits must be revised to identify the criteria upon which MCAQD is certifying the emission reductions, including but not limited to: (1) the quantity in tons per year of credits generated by WM's permit, (2) the total number of CNG-powered vehicles that have been (or will be) used to generate the offsets granted by the permit, (3) a list of the specific municipal refuse vehicles used to generate the offsets (e.g., by serial/VIN), (4) the specific nonattainment area (e.g., Phoenix-Mesa ozone nonattainment area) within which the CNG-powered vehicles must be operated, and (5) specific monitoring and recordkeeping conditions for ensuring compliance with these requirements.

For example, in response to this comment, an attachment could be added to the permit that is referenced within the emission reduction credit (ERC) conditions that identifies items (1) through (3). We would also recommend including a reporting requirement that WM submit an updated version of the attachment annually.

4. **Reporting Requirements for Waste Management**
   Because WM has ongoing obligations to ensure compliance with the information upon which the ERC credits were certified, WM's permits must include conditions to monitor ongoing compliance through, at a minimum, an annual reporting requirement. The report should summarize how monitoring/recordkeeping demonstrates that WM is continuing to ensure the emissions reductions are being achieved. Other types of notifications should be considered, for example, what happens if a CNG refuse truck is damaged or suffers significant maintenance issues that inhibits the truck from generating the offset credits attributed to that truck.

5. **Removal/Disposal of Replaced Refuse Trucks in Waste Management Permits**
   The current conditions in WM's permits related to removal and disposal of replaced refuse trucks do not ensure that all replaced trucks for which offset credits have been generated do not return to the Phoenix-Mesa ozone nonattainment area. To meet the permanent and enforceable requirements for valid offsets, WM's permits must include additional requirements to monitor the operation of replaced refuse trucks to ensure they do not return to the nonattainment area. This should include monitoring and recordkeeping requirements to ensure that replaced trucks for which offset credits were generated and that remain in operation (instead of being permanently disabled) are not being used or will not be used in the Phoenix-Mesa ozone nonattainment area.

6. **Monitoring of Equipment Use in Waste Management Permits**
   The ERC permit condition related to "monitoring of equipment use" appears to be intended to require WM to monitor the operational parameters of the refuse trucks that were used in certifying that the emission reductions for the project are real, surplus, and quantifiable. However, the condition is not clear enough to make this requirement enforceable as a practical matter, as required by MCAQD Rule 240 § 304.4. To ensure enforceability, the permit must specifically identify the parameters that require ongoing monitoring and recordkeeping, and the method that will be used to conduct the monitoring. We expect that the monthly monitoring and recordkeeping would include factors such as vehicle miles traveled (VMT) for each refuse truck, VMT travelled while in service, and the percent of VMT traveled within the nonattainment area.

7. **Clarification of Several Waste Management ERC Permit Conditions**
   As described below, several of the conditions pertaining to the emission reductions in the WM permits warrant additional specificity to ensure their practical enforceability:
   a. **Operation and Maintenance**
      The permit condition related to operation and maintenance is not fully enforceable because we could not find a clear corresponding monitoring/recordkeeping provision related to this requirement. This permit must include requirements to keep records onsite that demonstrate compliance with this requirement.
   b. **Inspections**
      The permit condition related to inspections must further specify that the refuse trucks and monitoring equipment can also be inspected.

c. Recordkeeping

In the recordkeeping section, it is unclear what the permit is referring to by "equipment category." This must be revised to provide more clarity. This section also allows WM to choose which records they will maintain. As currently written, it appears WM could choose a different monitoring parameter each month. It is unclear how such information would ensure enforceability of the MERCs. For example, the ability to only monitor hours of operation would not ensure the MERCs meet the offset integrity requirements. Please ensure the required recordkeeping matches the monitoring data used to determine the quantity of offsets generated.

d. Terminology in ERC Conditions is Inconsistent

The permits' ERC conditions seem to use the terms equipment, vehicle, and engine interchangeably. Please review the final conditions to ensure consistent terminology. The language of the ERC conditions needs to be specific enough to ensure that an inspector can properly identify what they are looking for from the permit conditions. For example, identifying the equipment as "refuse trucks" would significantly clarify the permit conditions. There is also an instance where the term "generator" is used that we believe should be clarified to "Permittee."

e. References to Application

The permit conditions contain several references to the "application" used for generating these emission reductions. These references appear to be intended to make specific elements of the application enforceable, but they lack specificity, which likely makes them unenforceable. To the extent any references to the "application" remain in the permit conditions after consideration of our comments, such references must specify which portions of the application they refer to in order to be able to make those provisions enforceable as a practical matter. One option might be including portions of the application as an attachment to the permit.

REVISION TO ARIZONA'S SIP
INCORPORATION OF WASTE MANAGEMENT PERMIT CONDITIONS

APPENDIX 4:
NOTICE OF PUBLIC HEARING

Enhanced Regulatory Outreach Program
Maricopa County Air Quality Department

Notice of Public Hearing

Incorporation of Waste Management Permit Conditions Into the Arizona State Implementation Plan

Date/Time: July 27, 2022 at 9:30 a.m.
Location: Board of Supervisors' Auditorium
205 W. Jefferson St., Phoenix, Arizona

The Board of Supervisors meeting will be held in-person and have an option to attend virtually. If you wish to participate virtually, please check the Board of Supervisors' website at least 24 hours before the date of the public hearing for directions for remote access.

The Maricopa County Board of Supervisors is scheduled to conduct a public hearing to solicit comments on a proposed revision to the Arizona State Implementation Plan (SIP). Specifically, the Maricopa County Air Quality Department (MCAQD) is proposing to submit emission reduction credit permit conditions from three Waste Management of Arizona, Inc. (Waste Management) permits to the U.S. Environmental Protection Agency (EPA) for incorporation into the Arizona SIP.

You may comment on the proposed submission using the Enhanced Regulatory Outreach Program (EROP) online comment form.

Waste Management recently replaced 225 diesel-fueled solid waste collection trucks with 225 compressed natural gas fueled trucks reducing emissions of nitrogen oxides from four collection fleets. In August of 2021, MCAQD revised Waste Management permits P0008308, P0008309, and P0008316 to include permit conditions to make the emission reductions permanent and enforceable so the emission reductions could be certified for use as emission offsets. The EPA directed MCAQD to submit the Waste Management permit conditions related to the emission reductions for approval into the Arizona SIP to further ensure the permanency of the emission reductions.

For more information regarding this submission, please refer to the draft SIP submittal attached to this notice and available on the EROP Active Regulatory Process webpage. A copy of the draft SIP submittal will also be available at least 30 days prior to the hearing for public inspection at the offices of the Maricopa County Air Quality Department, 301 W. Jefferson St., Suite 410, Phoenix, Arizona 85003.

MCAQD will take reasonable measures to provide access to department services to individuals with limited ability to speak, write, or understand English and/or to those with disabilities. Requests for language interpretation services or for disability accommodations must be made at least 48 hours in advance by contacting: 602-506-6443.

MCAQD tomará las medidas necesarias para brindar acceso a los servicios del departamento a personas que no dominan el idioma inglés y/o personas con discapacidades. Las solicitudes de servicios de interpretación de otro idioma o adaptaciones para discapacitados deben realizarse con al menos 48 horas de anticipación comunicándose con: 602-506-6443.

Arizona Business Gazette
The business resource

PO BOX 194
Phoenix, Arizona 85001-0194
(602) 444-7315 FAX (602) 444-5901

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PNI-Arizona Business Gazette

AFFIDAVIT OF PUBLICATION

MC AIR QUALITY DIV
301 W JEFFERSON ST # 410
PHOENIX, AZ 85003-2157

RECEIVED
JUL 5 2022
MARICOPA COUNTY
AIR QUALITY DEPARTMENT

NOTICE OF PUBLIC HEARING FOR ARIZONA STATE IMPLEMENTATION PLAN (SIP) REVISION NOTICE IS HEREBY GIVEN that the Maricopa County Board of Supervisors will conduct a public hearing on **July 27, 2022, at 9:30 a.m.** to solicit comments on a proposed revision to the Arizona State Implementation Plan (SIP). Specifically, the Maricopa County Air Quality Department (MCAQD) is proposing to submit emission reduction credit permit conditions from three Waste Management of Arizona, Inc. permits to the U.S. Environmental Protection Agency for incorporation into the Arizona SIP. The public hearing will be held at the Maricopa County Board of Supervisors' Auditorium, 205 W. Jefferson St., Phoenix, Arizona 85003. The public is invited to attend the meeting in-person or online. Please check the Board of Supervisors' website at least 24 hours before the date of the public hearing at www.maricopa.gov/324 for directions for remote access. For more information regarding this proposed SIP revision, please refer to the draft SIP submittal, available at maricopa.gov/3536. Copies of the draft SIP submittal will also be available at least 30 days prior to the hearing for public inspection at the offices of MCAQD, 301 W. Jefferson St., Suite 410, Phoenix, Arizona 85003. MCAQD will take reasonable measures to provide access to department services to individuals with limited ability to speak, write, or understand English and/or to those with disabilities. Requests for language interpretation services or for disability accommodations must be made at least 48 hours in advance by contacting: 602-506-6443. MCAQD tomará las medidas necesarias para brindar acceso a los servicios del departamento a personas que no dominan el idioma inglés y/o personas con discapacidades. Las solicitudes de servicios de interpretación de otro idioma o adaptaciones para discapacitados deben realizarse con al menos 48 horas de anticipación comunicándose con: 602-506-6443.
Pub: June 23, 30, 2022

This is not an invoice

Order # 0005305830 # of Affidavits 1

P.O # legal ad

Issues Dated:

06/23/22, 06/30/22

STATE OF WISCONSIN
COUNTY OF BROWN } **SS.**

I, being first duly sworn, upon oath deposes and says: That I am the legal clerk of the Arizona Republic, a newspape of general circulation in the counties of Maricopa, Coconino, Pima and Pinal, in the State of Arizona, published weekly at Phoenix, Arizona, and that the copy hereto attached is a true copy of the advertisement published in the said paper in the issue(s) dated indicated.

Sworn to before me this
30 TH day of
JUNE 2022

Notary Public

My Commission expires: 1-7-25

KATHLEEN ALLEN
Notary Public
State of Wisconsin

REVISION TO ARIZONA'S SIP
INCORPORATION OF WASTE MANAGEMENT PERMIT CONDITIONS

APPENDIX 5:

BOARD OF SUPERVISORS' APPROVAL

COUNTY OF MARICOPA
State of Arizona

Office of the Clerk
Board of Supervisors

State of Arizona ***) ss.***
County of Maricopa ***)***

I, ***Juanita Garza, Clerk of the Board of Supervisors,*** *do hereby certify that the following is a true and correct statement of the agenda item and the action taken by the* ***Board of Supervisors*** *at their meeting held on* ***July 27, 2022.***

27. REVISION TO ARIZONA'S STATE IMPLEMENTATION PLAN – INCORPORATION OF WASTE MANAGEMENT OF ARIZONA, INC. EMISSION REDUCTION CREDIT PERMIT CONDITIONS

Convene a public hearing to solicit comments on a proposed revision to the Arizona State Implementation Plan (SIP). Specifically, the Maricopa County Air Quality Department is proposing to submit emission reduction credit permit conditions from three Waste Management of Arizona, Inc. permits to the U.S. Environmental Protection Agency (EPA) for incorporation into the Arizona SIP. Following the public hearing, the Board is requested to approve submission of the permit conditions to the EPA as a revision to the Arizona SIP.
(C-85-22-049-X-01)

Motion to approve by Supervisor Jack Sellers, seconded by Supervisor Thomas Galvin

Ayes: Bill Gates, Clint Hickman, Jack Sellers, Thomas Galvin, Steve Gallardo

IN WITNESS WHEREOF, *I have hereunto set my hand and affixed the Official Seal of the County of Maricopa. Done at Phoenix, the County Seat, on August 1, 2022.*

Juanita Garza

Clerk of the Board of Supervisors

File

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REVISION TO ARIZONA'S SIP
INCORPORATION OF WASTE MANAGEMENT PERMIT CONDITIONS

APPENDIX 6:
RELEVANT ARIZONA REVISED STATUTES

49-112. County regulation; standards

A. When authorized by law, a county may adopt a rule, ordinance or regulation that is more stringent than or in addition to a provision of this title or rule adopted by the director or any board or commission authorized to adopt rules pursuant to this title if all of the following requirements are met:
   1. The rule, ordinance or regulation is necessary to address a peculiar local condition.
   2. There is credible evidence that the rule, ordinance or regulation is either:
      (a) Necessary to prevent a significant threat to public health or the environment that results from a peculiar local condition and is technically and economically feasible.
      (b) Required under a federal statute or regulation, or authorized pursuant to an intergovernmental agreement with the federal government to enforce federal statutes or regulations if the county rule, ordinance or regulation is equivalent to federal statutes or regulations.
   3. Any fee or tax adopted under the rule, ordinance or regulation does not exceed the reasonable costs of the county to issue and administer the permit or plan approval program.

B. When authorized by law, a county may adopt rules, ordinances or regulations in lieu of a state program that are as stringent as a provision of this title or rule adopted by the director or any board or commission authorized to adopt rules pursuant to this title if the county demonstrates that the cost of obtaining permits or other approvals from the county will approximately equal or be less than the fee or cost of obtaining similar permits or approvals under this title or any rule adopted pursuant to this title. If the state has not adopted a fee or tax for similar permits or approvals, the county may adopt a fee when authorized by law in the rule, ordinance or regulation that does not exceed the reasonable costs of the county to issue and administer that permit or plan approval program.

C. A county that adopts rules, ordinances or regulations pursuant to subsection B of this section and that at any time cannot comply with subsection B of this section shall prepare and fil e a notice of noncompliance with the director. The county shall post a copy of the notice of noncompliance on the county's website with a date stamp of the date of posting. If the county does not comply with subsection B of this section within one year after posting of the notice on the county's website, the director shall provide written notice to and assert regulatory jurisdiction over those persons and entities subject to the affected county rules, ordinances or regulations.

D. Except as provided in chapter 3, article 3 of this title, before adopting or enforcing any rule, ordinance or regulation pursuant to subsection A or B of this section, the county shall comply with the following requirements:
   1. Prepare a notice of proposed rulemaking to include the proposed rule, ordinance or regulation. This notice shall demonstrate evidence of compliance with subsection A or B of this section. The notice shall include the name, address and phone number of a person who can answer questions about the proposed rule, ordinance or regulation and accept any written requests for the county to conduct an oral proceeding. The county shall post the notice on the county's website with a date stamp of the date of posting. The county shall publish the availability of the notice of the proposed rule, ordinance or regulation in a newspaper of general circulation in the county. If there is no newspaper of general circulation in the county, the county shall publish the notice in a newspaper of general circulation in an adjoining county. If requested by the public, the county shall make available a paper copy of the notice at a reasonable cost.

2. For at least thirty days after the posting of the notice of the proposed rule, ordinance or regulation, afford persons the opportunity to submit in writing comments, statements, arguments, data and views on the proposed rule, ordinance or regulation.
3. Respond in writing to the comments submitted pursuant to paragraph 2 of this subsection and post the county's response on the county's website. If requested by the public, the county shall make paper copies of its comments available at a reasonable cost.
4. Schedule a public hearing on the proposed rule, ordinance or regulation if a written request for an oral proceeding is submitted to the county during the thirty-day comment period. The county shall post the notice of oral proceeding on a proposed rule, ordinance or regulation on the county's website. The county shall post the notice of oral proceeding at least twenty days before the date of the oral proceeding. The county shall publish notice of any public hearing required pursuant to this paragraph in any newspaper as prescribed by this title or county ordinance. The county shall select a time and location for the public hearing that affords a reasonable opportunity for the public to participate.

E. A county is not required to comply with subsection D, paragraphs 2, 3 and 4 of this section before it adopts or enforces a rule, ordinance or regulation if the rule, ordinance or regulation only incorporates by reference an existing state or federal rule or law that provides greater regulatory flexibility for regulated parties and otherwise satisfies the requirements prescribed in subsection B of this section.

F. Until June 30, 1995, a person may file with the clerk of the board of supervisors for that county a petition challenging a county rule, ordinance or regulation adopted before July 15, 1994 for compliance with the criteria set forth in subsection A or B of this section. The petition shall contain the grounds for challenging the specific county rule, ordinance or regulation. Within one year after the petition is filed, the board of supervisors shall review the challenged rule, ordinance or regulation and make a written demonstration of compliance with the criteria set forth in subsection A or B of this section and challenged in the petition. Any rules, ordinances or regulations that have been challenged and for which the board of supervisors has not made the written demonstration within one year after the filing of the petition required by this section become unenforceable as of that date. If a county has already made a written demonstration under section 49-479, subsection C, for a rule, ordinance or regulation, the person filing the petition shall state the specific grounds in the petition why that demonstration does not meet the requirements of this section.

G. A rule, ordinance or regulation adopted pursuant to subsection A of this section may not be invalidated subsequent to its adoption on the grounds that the economic feasibility analysis is insufficient or inaccurate if a county makes a good faith effort to comply with the economic feasibility requirement of subsection A, paragraph 2, subdivision (a), of this section and has explained in the written statement, made public pursuant to subsection D of this section, the methodology used to satisfy the economic feasibility requirement.

H. This section shall not apply to any rule, ordinance or regulation adopted by a county pursuant to:
1. Title 36 for which the state has similar statutory or rule making authority in this title.
2. Section 49-391.
3. Chapter 3, article 8 of this title.
4. Chapter 4, article 3 of this title and section 49-765.
5. Nonsubstantive rules relating to the application process that have a de minimis economic effect on regulated parties.

49-474. County control boards

The board of supervisors of each county may authorize the board of health or health department of their respective counties in cooperation with the department of environmental quality to:

1. Study the problem of air pollution in the county.
2. Study possible effects on adjoining counties.
3. Cooperate with chambers of commerce, industry, agriculture, public officials and all other interested persons or organizations.
4. Hold public hearings if in their discretion such action is necessary.
5. The board of supervisors by resolution may establish an air pollution control district.

49-479. Rules; hearing

A. The board of supervisors shall adopt such rules as it determines are necessary and feasible to control the release into the atmosphere of air contaminants originating within the territorial limits of the county or multi-county air quality control region in order to control air pollution, which rules, except as provided in subsection C shall contain standards at least equal to or more restrictive than those adopted by the director. In fixing such standards, the board or region shall give consideration but shall not be limited to:
   1. The latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on health and welfare which may be expected from the presence of an air pollution agent, or combination of agents in the ambient air, in varying quantities.
   2. Atmosphere conditions and the types of air pollution agent or agents which, when present in the atmosphere, may interact with another agent or agents to produce an adverse effect on public health and welfare.
   3. Securing, to the greatest degree practicable, the enjoyment of the natural attractions of the state and the comfort and convenience of the inhabitants.

B. No rule may be enacted or amended except after the board of supervisors first holds a public hearing after twenty days' notice of such hearing. The proposed rule, or any proposed amendment of a rule, shall be made available to the public at the time of notice of such hearing.

C. A county may adopt or amend a rule, emission standard, or standard of performance that is as stringent or more stringent than a rule, emission standard or standard of performance for similar sources adopted by the director only if the county complies with the applicable provisions of section 49-112.

D. All rules enacted pursuant to this section shall be made available to the public at a reasonable charge upon request.

49-480. Permits; fees

A. The board of supervisors may adopt a program for the review, issuance, revision, administration and enforcement of permits and for public review of proposed permits for sources that are subject to section 49-426, subsection A, that are not under the jurisdiction of the state pursuant to section 49-402 and that are not otherwise exempt pursuant to section 49-426, subsection B and subsection K of this section. This program shall include provisions for administration, inspection and enforcement of general permits issued pursuant to section 49-426, subsection H and subsection J of this section.

B. Procedures for the review, issuance, revision and administration of permits issued pursuant to this section and required to be obtained pursuant to title V of the clean air act including sources

that emit hazardous air pollutants shall be substantially identical to procedures for the review, issuance, revision and administration of permits issued by the department under this chapter. Such procedures shall comply with the requirements of sections 165, 173 and 408 and titles III and V of the clean air act and implementing regulations for sources subject to titles III and V of the clean air act. Procedures for the review, issuance, revision and administration of permits issued pursuant to this section and not required to be obtained pursuant to title V of the clean air act shall impose no greater procedural burden on the permit applicant than procedures for the review, issuance, revision and administration of permits issued by the department under sections 49-426 and 49-426.01 and other applicable provisions of this chapter.

C. Upon adoption of a permit program by the board of supervisors pursuant to this section, no person may begin actual construction, operate or make a modification to any source subject to the permit program without complying with the requirements of that program.

D. Permits issued pursuant to a program adopted under this section are subject to payment of a reasonable fee to be determined as follows:
   1. For any source required to obtain a permit under title V of the clean air act, the board of supervisors shall establish by rule a system of fees consistent with and equivalent to that prescribed under section 502 of the clean air act. Such system shall prescribe procedures for increasing the fee each year by the percentage, if any by which the consumer price index for the most recent calendar year ending before the beginning of such year exceeds the consumer price index for the calendar year 1989.
   2. For any facility subject to the permitting requirements of this chapter but not required to obtain a permit under title V of the clean air act, the board of supervisors shall determine a permit fee based on all reasonable direct and indirect costs required to administer the permit, but not exceeding twenty-five thousand dollars.

The board of supervisors shall establish an annual inspection fee, not to exceed the average cost of services.

E. Funds received for permits issued pursuant to this section shall be deposited in a special public health fund and shall be used by the control officer to defray the costs of implementing this article.

F. Permits issued pursuant to this section for a source required to obtain a permit under title V of the clean air act shall, and for a source that is not required to obtain a title V permit may, contain all of the following:
   1. Conditions reflecting all applicable requirements of this article and rules adopted pursuant to this article.
   2. Enforceable emission limitations and standards.
   3. A schedule for compliance, if applicable.
   4. The requirement to submit at least every six months the results of any required monitoring.
   5. Any other conditions that are necessary to assure compliance with this article and the clean air act, including the applicable implementation plan.

G. The control officer may refuse to issue any permit to any source subject to the requirements of title V of the clean air act if the administrator objects to its issuance in a timely manner as prescribed under title V of the act.

H. In the case of a permit with a term of three or more years issued pursuant to the requirements of title V of the clean air act to a major source, the control officer shall require revisions to the

permit to incorporate applicable standards and regulations adopted by the administrator pursuant to the clean air act after the issuance of the permit. The control officer shall require any revisions as expeditiously as practicable but not later than eighteen months after the promulgation of such standards and regulations. No permit revision shall be required if the effective date of the standards and regulations is after the expiration of the permit. Any permit revision required pursuant to this subsection shall be treated as a permit renewal.

I. Except as provided in section 49-426, subsection B and subsection A of this section, any person burning used oil, used oil fuel, hazardous waste or hazardous waste fuel in any machine, incinerator or device shall first obtain a permit from the control officer. Any permit issued by the control officer under this subsection shall contain, at a minimum, conditions governing:
    1. Limitations on the types, amounts and feed rates of used oil, used oil fuel, hazardous waste or hazardous waste fuel which may be burned.
    2. The frequency and types of fuel testing to be conducted by the person.
    3. The frequency and type of emissions testing or monitoring to be conducted by the person.
    4. Requirements for record keeping and reporting.
    5. Numeric emission limitations expressed in pounds per hour and tons per year for air contaminants to be emitted from the facility burning used oil, used oil fuel, hazardous waste or hazardous waste fuel.

J. The board of supervisors may authorize by rule the control officer to issue a general permit for a defined class of facilities if that class of facilities has not been issued a general permit by the director for sources in that county pursuant to section 49-426, subsection H. The criteria for issuance of a general permit are those applicable to the director pursuant to section 49-426, subsection G.

K. The board of supervisors may identify by rule sources or classifications of sources for which a permit is not required and pollutant-emitting activities and emissions units at permitted sources that are not subject to inclusion in the permit. The criteria for exemptions granted pursuant to this subsection are those applicable to exemptions granted by the director pursuant to section 49 -426, subsection B.

L. In determining whether a permitting threshold established pursuant to this section applies to an existing source, the control officer shall exclude particulate matter that is not subject to a national ambient air quality standard under the clean air act.

M. The board of supervisors may adopt a rule or ordinance that establishes less burdensome permit procedures and requirements for permits that are not required to be obtained pursuant to title V of the clean air act. Until the effective date of a rule or ordinance adopted by a board of supervisors pursuant to this section, the control officer, either on the control officer's own initiative or on the request of a permit applicant, may waive requirements that are not appropriate for non-title V sources.

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REVISION TO ARIZONA'S SIP
INCORPORATION OF WASTE MANAGEMENT PERMIT CONDITIONS

APPENDIX 7:
COMPILATION OF PUBLIC COMMENTS

(No Comments Received)