Verification Report for

El Dorado Nitrogen LP,
Nitrous Oxide Abatement Project
Baytown, TX, USA

Fifteenth Reporting Period

Climate Action Reserve Project CAR639

Nitric Acid Production
Project Protocol, Version 2.1

December 17, 2018

Report Prepared for

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Summary

LSB Industries, Inc. ("LSB") is the project developer for the "El Dorado Nitrogen LP (EDNLP), Nitrous Oxide Abatement Project" (Project) located at Baytown, TX. EDNLP is a wholly owned subsidiary of LSB and EDNLP provided the Project monitoring and data gathering on behalf of LSB Industries, Inc. In this Fifteenth reporting period, LSB reported on its nitrous oxide reduction results during its 34th nitric acid production campaign that commenced on June 12, 2018, and concluded on October 7, 2018. NSF International (NSF) was engaged to verify the nitrous oxide emission reductions achieved during the campaign in accordance with the requirements of the Climate Action Reserve Nitric Acid Production Project Protocol, Version 2.1. LSB reduced emissions into the atmosphere by 226,774 metric tons of carbon dioxide-equivalent in this reporting period. EDNLP's nitric acid production operations were described by the NAICS code 335311 ("nitrogenous fertilizer manufacturing"). For this project, LSB engaged the services of ClimeCo Corporation, a carbon emissions mitigation consultancy. ClimeCo consultants assisted LSB with the preparation of emission reduction calculations for the Fifteenth reporting period.

1. Introduction

1.1 Objective

The objective of this verification audit was to determine, with reasonable assurance, that LSB had quantified, monitored, and fairly reported to the Climate Action Reserve its emission reductions from the abatement of nitrous oxide emissions during nitric acid production and to confirm the project's eligibility.

1.2 Scope

The scope of the engagement included verification of the quantification, monitoring and reporting of greenhouse gas emission reductions from the project. It also included verification of the project's eligibility and the calculation of project emissions of nitrous oxide measured in the nitric acid plant stack.

1.3 Criteria

NSF verified the reported project emission reductions against criteria in the Climate Action Reserve Nitric Acid Production Project Protocol, Version 2.1 (June 21, 2016), (hereafter, the "Protocol") and the Nitric Acid Production Project Version 2.1 Protocol Errata and Clarifications (January 3, 2017). The Project also was verified against applicable requirements of the Climate Action Reserve's Program Manual (September 1, 2015). The verification methodology conformed to requirements in the Climate Action Reserve's Verification Program Manual (February 8, 2017), and ISO 14064:2006 Part 3, *Greenhouse gases – Specification with guidance for the validation and verification of greenhouse gas assertions.*

1.4 Materiality

In accordance with the Climate Action Reserve Verification Program Manual, the threshold for materiality of emission reduction assertions was based upon annualized rates of issuance of Climate Reserve Tonnes (CRTs). As the project claimed more than 100,000 metric tons of emission reductions on an annualized basis during the reporting period, the emission reduction assertion was considered fairly stated if it varied by no more than 1% from a complete statement of the Project's emission reductions. Thresholds of materiality defined by the Verification Program Manual allowed verifiers of emission reduction reports to consider as immaterial discrepancies of 1% or less.

1.5 Level of Assurance

This engagement was performed at the reasonable level of assurance.

2. Verification Approach

2.1 Team Appointment and COI Review

This verification was performed by Tina Sentner, Lead Verifier. The verification was internally reviewed by John Shideler, Lead Verifier. Conflict of Interest inquiries were completed for NSF, for the verification team, and for the independent reviewer, and a finding of low COI risk was confirmed by the Climate Action Reserve.

2.2 Document Review

The verification team conducted a document review to inform the planning process in advance of performing verification activities. Documents and records reviewed were provided by EDNLP, on behalf of the project developer, and by ClimeCo, the project developer's consultant. Documents reviewed included previous project verification reports; project documentation submitted to the Climate Action Reserve; the project Monitoring Plan; spreadsheets providing logged hourly raw operating data and calculations of emission reductions; CEMS, gas flow meter, and methane analyzer calibration and verification records; regulatory compliance information from the US EPA Enforcement & Compliance History Online (ECHO) report and from company records; and manufacturer's information related to monitoring equipment.

2.3 Planning

NSF's verification approach is risk-based. It draws upon our understanding of risks to the fair statement of reported emissions and the operation of controls to reduce such risks. As a result of the document review and correspondence with EDNLP and ClimeCo personnel, a verification plan and a sampling plan were developed for this engagement.

2.4 Verification Activities

For this Fifteenth reporting period, verification activities commenced on October 11, 2018, with a kick-off teleconference with ClimeCo. During this report period, NSF did not conduct a site visit. NSF conducted a previous site visit to EDNLP's nitric acid facility in Baytown, TX, on August 8, 2018. Verification activities for this engagement included:

- Confirmation of the project start date and plant location.
- Verification of the ownership of the emission reduction credits earned by this project.
- Verification that the project monitored legal and regulatory changes and that the project continued to meet the legal requirement test for continuing eligibility under applicable laws and regulations.
- Verification that the project campaign was operated in material compliance with applicable environmental and safety laws.
- Demonstration by the project developer that none of the exclusions to eligibility applied to the nitric acid production campaign conducted during this reporting period.
- Review of Project compliance with monitoring requirements and that any identified variances have been approved by the Climate Action Reserve and appropriately applied.
- Verification that applicable sources, sinks and reservoirs were included in the project assessment boundary.
- Verification that the project developer correctly calculated permitted operating ranges for temperature and pressure in accordance with protocol requirements.
- Assessment of the adequacy of the control environment, information management systems, and monitoring plans of EDNLP.
- Inquiries concerning the records management system implemented at EDNLP for acquisition and retention of all Protocol required information.
- Verification of the project emission reduction calculations.

3. Verification Findings

3.1 Project Description

LSB has implemented a project to abate the emissions of nitrous oxide (N_2O) at its EDNLP facility located in Baytown, TX. EDNLP is situated on a larger chemical production facility owned by Covestro, LLC. To reduce N_2O emissions, a secondary abatement catalyst was immediately installed below the ammonia oxidation catalyst in the ammonia oxidation reactor

(AOR). NSF confirmed via review of plant drawings and permits that the plant had not used nonselective secondary catalytic reduction (NSCR) technology at any point prior to or during the Project.

In this Fifteenth reporting period, the "El Dorado Nitrogen LP, Nitrous Oxide Abatement Project" abated 226,774 metric tons of carbon dioxide–equivalent greenhouse gas that would have been emitted into the atmosphere absent the application of secondary catalytic reduction technology. The campaign started on June 12, 2018, and concluded on October 7, 2018.

3.2 Eligibility

Location. LSB planned its nitric acid production project to abate N_2O emissions at its existing EDNLP plant in Baytown, TX. This facility met the protocol requirement for location in the United States.

Project Start Date. The start date of the Project is defined by the Protocol as the date on which production commences after the first installation of a secondary catalyst. NSF confirmed that EDNLP completed a campaign on June 26, 2010, and installed a new primary catalyst and a secondary catalyst for N_2O abatement. NSF confirmed the commencement of nitric acid production for the first reporting period campaign on July 1, 2010. This start date was verified by reviewing documentation for secondary abatement catalyst material purchase, installation and work plans for replacement of the primary catalyst, along with records of N_2O production for the first campaign. Based on this review, NSF concluded the start date was July 1, 2010. In addition, the project must be submitted for listing on the Reserve website no more than six months after the project start date or anytime prior to the Project start date. NSF confirmed the project was submitted in May of 2010 prior to the Project start date and met this eligibility requirement.

Crediting Period. The crediting period for the Project extends for ten years to June 30, 2020. This Fifteenth reporting period is within the crediting period for the Project.

3.3 Additionality

Legal Requirement Test. NSF confirmed the project monitoring plan included procedures to ascertain and demonstrate that the Project at all times passed the Legal Requirement Test. During the previous site visit, the verification team interviewed the site's manager concerning the methods for monitoring legal and regulatory developments. In accordance with their procedure, EDNLP tracked changes to regulations affecting nitric acid production via regulatory newsletters, and through the regulatory team of LSB Industries, Inc. This information was shared with the relevant site personnel. NSF also reviewed the Title V operating permit and New Source Review (NSR) permit and found no requirements for secondary abatement of nitrous oxide emissions. The facility did not have a Prevention of Significant Deterioration (PSD) permit nor was it subject to PSD requirements.

Lastly, NSF reviewed the Attestation of Voluntary Implementation signed on October 30, 2018, by an appropriate representative for LSB for this reporting period. Based on this review, NSF has concluded that there were no legal requirements that mandated the abatement of N_2O at the

project site, that the Project met the Protocol's monitoring requirement for voluntary implementation, and that the Project continued to pass the legal requirement test.

Performance Standard Test. LSB had installed a secondary N_2O abatement catalyst in the ammonia oxidation reactor of its nitric acid plant in Baytown, TX. During its first site visit, NSF reviewed the documentation for secondary abatement catalyst equipment purchase, installation and work plans for replacement of the primary catalyst, along with records of N_2O production for the Project's first campaign. NSF has concluded that the Project has met the Performance Standard Test.

3.4 Regulatory Compliance

Regulatory Compliance. NSF verified ENDLP's regulatory compliance by reviewing the US EPA ECHO report as well as the TCEQ Central Registry database. NSF observed that neither source recorded any violations or enforcement actions related to the reporting period. NSF reviewed the facility's Title V Annual Compliance Certification and found that the facility had reported one deviation that happened during the reporting period. The deviation was reviewed by the verification team and was confirmed not related to the Project activity nor were a result of the Project. Further details can be found in the list of findings.

NSF also reviewed the Attestation of Regulatory Compliance completed by LSB for the Fifteenth reporting period dated October 30, 2018. From these verification activities, NSF concluded that the project was in material compliance with regulatory requirements during the project's Fifteenth reporting period.

3.5 Ownership

Project Developer and Ownership. The Project is located at the El Dorado Nitrogen LP facility in Baytown TX. In February 2017, El Dorado Nitrogen LP merged with El Dorado Nitrogen LLC and El Dorado Nitrogen LLC was the successor entity. Both entities are wholly owned subsidiaries of LSB Industries, Inc. NSF reviewed corporate documentation confirming the ownership status change. In addition, LSB Industries, Inc. attested to its ownership of the greenhouse gas emission reduction credits through a signed Attestation of Title dated October 30, 2018. From this evidence NSF has concluded that LSB Industries, Inc. was the legal owner of the greenhouse gas emission reduction credits during this reporting period.

3.6 Project Boundaries and Emission Sources

Sources, Sinks and Reservoirs. NSF has verified that for this reporting period, the relevant sources, sinks and reservoirs (SSRs) were identified. Sources included the nitric acid plant's AOR from the inlet of the ammonia burner to the waste gas stack, and the production of nitric acid. Nitrous oxide (N_2O) is a by-product of nitric acid production. Secondary catalytic abatement reduces N_2O immediately after it is formed in the ammonia oxidation step of nitric acid production. The project measured the amount of N_2O released to the environment through the AOR stack and subtracted that from the baseline condition of uncontrolled N_2O emissions.

3.7 Project Management System

Management System. NSF reviewed relevant aspects of the EDNLP plant's management system during the previous site visit on August 8, 2018, and via document review and interviews during this reporting period. NSF found a mature management system and competent personnel. Safety training was required for access inside the plant and procedures were in place for plant operation and environmental management. NSF included the following management systems elements in its evaluation:

- Definition and maintenance of an appropriate control environment by EDNLP
- Training and competence of project managers and operating/data management personnel
- Identification and management of legal requirements related to nitric acid production
- Identification and maintenance of records required by the project
- Selection, installation, maintenance, calibration and monitoring of the Continuous Emissions Monitoring System (CEMS), stack gas analyzer, and flow metering equipment
- Quantification methods and calculations of project emissions; and
- Checking and corrective action mechanisms.

From information gathered during the site visit through observations, interviews and records reviewed, NSF has concluded that EDNLP's management system met the requirements described in the Climate Action Reserve's Verification Program Manual.

Project Documentation and Reserve Tracking System. NSF verified that the required documents for the Project had been completed and submitted to the Reserve. These included an up-to-date Project Submittal form, uploaded at the beginning of the Project; signed attestations of title, of regulatory compliance, and of voluntary implementation for this Fifteenth reporting period; a project diagram, and an assertion of Climate Reserve Tonnes earned during campaign 33.

3.8 Performance Against Project Protocol/Methodology

The Project was implemented in conformity with the Climate Action Reserve Nitric Acid Production Project Protocol Version 2.1.

Monitoring and Operations Plan. LSB's current "EDN Monitoring Plan version 6.0 for Nitrous Oxide Abatement Project EDNLP Nitric Acid Plant" addressed monitoring, operations and reporting of relevant parameters included in Table 6.1 of the Protocol, including the frequency of data acquisition, the frequency of instrument field check and calibration activities, and the roles of individuals performing each specific monitoring activity. It also defined record keeping requirements and described the procedure LSB used to determine that the project at all times met the Legal Requirement Test. NSF concluded from its review that the monitoring plan covered all aspects of monitoring and reporting contained in the Protocol.

Use of CEMS. An EcoChem Continuous Emissions Monitoring System was used to directly measure N_2O concentration and gas flow rate in the stack gas of the AOR. A Kurz thermal resistance mass flow meter (model 155-A) was used to measure gas flows and an EcoChem MC3 infrared analyzer was used to measure N_2O concentration. N_2O concentration and gas flow rate parameters were monitored continuously but logged in hourly increments along with stack

temperature and pressure and the air-to-ammonia ratio and ammonia flow. A CALCMET™ MS Windows-based analyzer control system was coupled with an Analog to Digital Module (ADM) computer used for CEMS data generation. The record keeping and reporting of the data were processed by the EcoChem computer, which monitored CEMS status. A Modbus Interface (MBIF) was used for data feeds from the distributed control system and fed to the EcoChem program. EcoChem software was used to generate reports in the required formats and provided to plant management. These reports were backed up on the company server. The process manager checked the CEMS status via the EcoChem display, and any necessary corrective action was taken as appropriate and documented in the process manager's "Environmental Log". The CEMS was maintained in accordance with a quality assurance/quality control program as defined in Appendix B to Part 75 of the Clean Air Act, Subpart H: NOx Mass Emissions Provisions. After a review of data logs provided by the project consultant, NSF concluded that the CEMS operated normally during the project reporting period.

Initial Certification of the original CEMS. The Project developer was required to follow the requirements for CEMS installation and initial certification as noted in 40 CFR Part 60 Section 60.13, 40 CFR Part 60 Performance and Specification 2 of Appendix B, and 40 CFR Part 75 section 6 of Appendix A.

EDNLP installed its CEMS several years prior to commencing the Project. The Kurz flow meter was installed in 1999 and the Temet N_2O analyzer was installed in 2003 for NO_x compliance reasons. At that time the CEMS was installed and operated in accordance with 40 CRF Part 60, Appendix F. As a result, the Project requested a variance from the Climate Action Reserve to allow the Project developer to not fully adhere to certain requirements from 40 CFR Part 75. NSF confirmed the Project demonstrated conformity with the system installation and certification requirements against a CAR Variance Determination dated June 15, 2010, and to the Nitric Acid Production Project Protocol, version 1.0 (the Protocol the Project was initially subject to).

- **7-day Calibration Error Test**
  The Project submitted the calibration drift summary for September 15-21, 2009. This was before the baseline sampling period began on September 22, 2009. The drift never exceeded 5 percent and was in compliance with 40 CFR Part 75.
- **Linearity Check**
  The Project was granted a variance from Reserve on June 15, 2010, that allowed the April 2010 Linearity Check to take the place of the Check required for the initial certification. The analyzer met the linearity check requirement of <5.0% error.
- **RATA and bias tests**
  The Project provided the results of the RATA that was conducted on September 22, 2009. The analyzer failed to meet the bias test requirement; however, a bias adjustment factor (BAF) was applied correctly to the N_2O concentration in the stack gas ($N_2O_{conc,BL}$).
- **Cycle Time Test**
  The Project provided the document EDN Cylinder Gas Audit and a memo to demonstrate that the analyzer met the 40 CFR Part 60.13(e)(2) requirement that the CEMS complete a minimum of one cycle of operation for each 15-minute period.
- **DAHS Verification**

NSF reviewed documentation and examples from the data acquisition and handling system (DAHS) that demonstrated that all emission calculations were performed correctly and that missing data substitution methods were applied properly.

From this evidence reviewed, NSF has concluded that the Project met the initial installation and certification requirements.

Initial Certification of the New CEMS: In April 2017 a new CEMS (EcoCHEM) was installed along with the new N_2O analyzer. As such the Project developer recertified the CEMS to the requirements for CEMS installation and initial certification as noted in 40 CFR Part 60 Section 60.13, 40 CFR Part 60 Performance and Specification 2 of Appendix B, and 40 CFR Part 75 section 6 of Appendix A. NSF confirmed the Project demonstrated conformity with the system installation and certification requirements and manufacturer recommendations.

- **7-day Calibration Error Test**
  The Project submitted the calibration drift summary for April 18-25, 2017. This was before the CEMS was transitioned over on September 7, 2017. The drift never exceeded 5 percent and was in compliance with 40 CFR Part 75.
- **Linearity Check**
  The Project conducted a Linearity Check on June 7, 2017. The analyzer met the linearity check requirement of <5.0% error.
- **RATA and bias tests**
  The Project provided the results of the RATA that was conducted on April 26, 2017. The analyzer failed to meet the bias test requirement; however, a bias adjustment factor (BAF) was applied correctly to the N_2O concentration in the stack gas (N_2O_{conc}).
- **Cycle Time Test**
  The Project provided the document EDN Cycle Time report to demonstrate that the analyzer met the 40 CFR Part 60.13(e)(2) requirement that the CEMS complete a minimum of one cycle of operation for each 15-minute period.
- **DAHS Verification**
  NSF reviewed documentation and examples from the data acquisition and handling system (DAHS) that demonstrated that all emission calculations were performed correctly and that missing data substitution methods were applied properly.

CEMS QA/QC and Frequency of Testing. NSF verified that Quality Assurance/Quality Control procedures were implemented in accordance with Clean Air Act requirements of the U.S. Environmental Protection Agency, specifically those included in the Acid Rain Program regulations published at 40 CFR Part 75, Appendix B, as required by the Protocol. QA/QC procedures included daily, quarterly and annual assessments and scheduled preventive maintenance for the CEMS and its components.

- **CEMs Daily Testing.** Daily checks were performed for calibration error and adjustments, data validation, quality assurance and data recording for the analyzer and flow meter. NSF verified that EDNLP had performed daily tests of the N_2O analyzer to ensure the accuracy of the CEMS recorded data. Minimum pressures of the certified calibration gases were monitored to ensure accurate daily test results. Data to the CEMS were

deemed valid as long as the daily calibration tests resulted in variation of no greater than 5% from the N_2O analyzer span. Variations greater than 2.5% and less than 5% over a two-day period triggered automatic recalibration of the analyzer. Variations greater than 5% were considered calibration failures and were acted upon immediately by plant personnel.

- **CEMS Quarterly Testing.** NSF verified that EDNLP had performed the following QA/QC on a quarterly basis:
    - EDNLP conducted daily flow meter and N_2O analyzer calibration error checks. Calibration records for the reporting period were reviewed. There was one instance where the daily calibration error check on the Stack flow meter appeared to read a false fail. Data substitution was not implemented as an immediate recalibration was conducted and the data remained valid. All other daily calibration checks for the flow meter during the reporting period were within the ±3% threshold.
    - Linearity checks were performed in quarters for which there was no RATA for the EcoChem CEMS unit to determine the accuracy of the gas composition analyzer. A Linearity test was performed at low, mid and high levels of concentration as required by 40 CFR Part 75 Appendix B. NSF reviewed the linearity test record created for the CEMS on 07/23/2018. A linearity check had not yet been conducted for the fourth quarter of 2018 as of verification. The average of three test runs returned results that varied by less than five percent from the reference values for the CEMS unit.
    - Leak Testing was not applicable as EDNLP utilized a thermal mass flow meter for the Project.
    - Flow-to-load ratio or gross heat rate evaluation was not performed because the nitric acid plant did not also produce electricity or steam.

CEMS Relative Accuracy Test Audit. NSF verified that CEMS data used during the Project had been validated through the performance of a Relative Accuracy Test Audit (RATA) which was conducted on the CEMS unit on April 25, 2018, by an independent third party in accordance with the requirements of 40 CFR Part 75 Appendix A, 7.4, and the test methods specified in 40 CFR Part 60, Appendix B, Performance Specifications 2 and 6. NSF checked online websites to confirm that the laboratory was certified by the Stack Testing Accreditation Council and the American Association of Laboratory Certification. The relative accuracy of the nitrogen analyzer was found to be 1.13% when measured in parts per million by volume (PPMV) on a wet basis, and a bias adjustment factor of 1.0 was applied. Relative accuracy of the flow meter (measuring in scfm) was found to be 0.2%, and a bias adjustment factor (BAF) of 1.026 was applied.

Flow RATAs were performed at a single load level consistent with the steady-state operation of the nitric acid plant. The annual 2018 RATA showed that the flow meter and gas analyzer instruments met accuracy requirements. Lastly, NSF sampled records to ensure the BAF was applied correctly during the reporting period.

Data Management. NSF verified that the project had logged operational data on a continual basis and exported data on an hourly basis for monitoring purposes. Data logged included stack

flow, temperature and pressure, and N_2O concentration. Data were recorded in English measurement units for operational monitoring and converted for reporting purposes to metric units. NSF reviewed the conversion algorithms and determined that data had been properly reported in metric units.

ClimeCo compiled campaign comparison data files which established emissions estimates and provided quarterly reviews to EDNPLP. The comparison looked for outliers and if any were detected, ClimeCo asked EDNPLP for explanations. NSF confirmed there were no outliers during this campaign. ClimeCo also produced records to review the reasonableness of the emission estimates. These data were part of the QA/QC records noted above. NSF found from review of these data that emission reductions during the 34th campaign were in line with previous campaigns.

Missing Data Substitution. There was no missing data substitution applied during the reporting period. NSF confirmed by review of the CEMs operational report.

3.9 Calculation of GHG Emission Reductions

The emission reduction calculations assessment included a review of the historical, baseline, and Project assumptions, data inputs, data management and accuracy of calculations. NSF reviewed data downloaded from the CEMS and performed check calculations in the spreadsheet on values such as mean concentration of stack gas and the mean stack gas volume flow. The Kurz flow meter and N_2O analyzer were used for other environmental compliance reasons and air emissions calculations. As such, the flow meter data were adjusted to 1 atm and 25 deg C, and the N_2O analyzer data were adjusted and recorded to 1 atm and 20 deg C. NSF verified that all data were normalized to 1 atm and 0 deg C in the calculation spreadsheets.

Previous Historical Data Review. The Project provided data from five previous campaigns dating from April 29, 2006, to February 17, 2009. NSF reviewed the raw data and statistical adjustments from the historical campaigns that were used to calculate two variables: $HNO_{3,MAX}$ and Campaign Production Volume Cap (CPV_{cap}). NSF independently recalculated the $HNO_{3,MAX}$ value by determining an average HNO_3 production number in metric tons per day for each of the five historical campaigns and selecting the highest of the average values as the $HNO_{3,MAX}$. The following values were verified:

- $HNO_{3,MAX}$ = 49.19 metric tons HNO_3/hr
- CPV_{cap}= 210,633 metric tons HNO_3.

During a previous reporting period, EDNLP upgraded its nitric acid plant, and due to changed operating parameters, the Project revised its previously defined allowable operating conditions (AOCs). The new AOC ranges and values were determined by operating manuals for the existing equipment and by guidance from the ammonia oxidation catalyst manufacturer. During the last reporting period, NSF confirmed the AOCs were revised according to the Protocol steps outlined in Section 5.1.2 for an "upgrade" at the facility as well as additional Reserve guidance. All previous AOCs were revised, including:

- Oxidation Temperature (minimum and maximum)
    - Minimum: 1544 °F (840 °C)
    - Maximum: 1688 °F (920 °C)

- Oxidation Pressure (minimum and maximum)
  - Minimum: 44 psig (3.03 bar)
  - Maximum: 70.6 psig (4.86 bar)

- Ammonia-to-Air Ratio (maximum only): 10.4%

NSF checked the raw logged data to verify that the AOR did not exceed allowable operating conditions during more than 50% of the time during the reporting period, and verified that average operating values obtained during the campaign remained within the revised AOC ranges.

Baseline Campaign Review.
In accordance with the Protocol, the baseline emission rate had been established by measuring N_2O emissions during a complete production campaign prior to the installation of the secondary catalyst for the abatement project. EDNLP provided data from the baseline campaign conducted from November 3, 2009, to June 27, 2010. However, the baseline campaign exceeded the CPV_{cap} at 9:00 a.m. on May 22, 2010. As a result, the Project used only data prior to that point to determine the baseline calculation parameters. The baseline emission factor developed during this pre-project monitoring was verified by review of production records.

NSF verified that the raw data from the baseline campaign was correctly adjusted in accordance with the Protocol and used to determine the Baseline Emission Factor. NSF verified the assumptions and variables used for Equations 5.4 and 5.5 in the Protocol.

Project Campaign Review. NSF compared the hourly data from the EDNLP CEMS data (for selected days) to the hourly gas flow volumes and N_2O concentrations recorded in the campaign calculation spreadsheets. No material errors in the raw data or data transfers to the calculation spreadsheet were identified. NSF confirmed that the reporting period included a few instances of maintenance downtime periods. NSF confirmed that no ammonia or nitric acid was produced during the downtime periods. NSF also confirmed the Project had performed the required statistical analysis steps specified in the Protocol to compare the average values of permitted operating conditions (stack gas flow, N_2O concentration, temperature, pressure and maximum ammonia to air ratio) with the average values obtained during the baseline sampling and campaign period. NSF confirmed when verifying items a-e in 5.1.3.1 (Step 3) and 5.1.4.1 in the Protocol that the Project included all flow and concentration data for hours when the NAP was operating and excluded the data generated during the maintenance or downtime periods. The NAP was considered operating when ammonia was flowing and HNO_3 was produced. NSF found that the results obtained for campaign 33 were within the AOCs. NSF also reviewed the variable $HNO_{3,RP,scaled}$ and confirmed that the lesser of $HNO_{3,MAX,scaled}$ and $HNO_{3,RP}$ was used. In this reporting period, $HNO_{3,MAX,scaled}$ was the lesser. NSF also confirmed the correct calculation of $HNO_{3,new}$.

NSF separately calculated project emission reductions from monitored information and confirmed that Project's claimed emission reductions did not vary by a material amount from those calculated by NSF.

NSF reviewed the inputs to Equation 5.7, which calculated project emissions as the product of stack gas flow volume multiplied by the N_2O concentration and the operating hours. The input numbers for this equation matched operating records. An emissions factor for the campaign was calculated in accordance with Equation 5.4 as a ratio of product emissions to nitric acid produced.

3.10 Corrective Action Requests

NSF issued findings throughout the verification process. Details are provided to the project developer and to the Reserve in a List of Findings, a private document.

3.11 Approved Variances

There were no variances requested for the reporting period.

4. Verification Results

4.1 Verification Team Recommendation

Based on the verification activities described above, the verification team has concluded that CAR639 project, "El Dorado Nitrogen LP, Nitrous Oxide Abatement Project" Fifteenth reporting period, has achieved the following emission reductions:

Emission Reductions, Fifteenth Reporting Period	Metric tons CO_2-e
Secondary abatement emission reductions *ER, Campaign 34*	
Emission Reductions, Vintage 2018	226,774.00
Total	**226,774**

4.2 Verification Audit Summary

Project Developer	LSB Industries, Inc. 16 S. Pennsylvania Ave. Oklahoma City, OK 73107 (USA)
Project Location	El Dorado Nitrogen LLC 8490 West Bay Road Baytown, TX 77520 (USA)
Project Type	Nitric Acid N_2O – Secondary Catalyst
Project Period	June 12, 2018 – October 7, 2018
Protocol/Methodology	Climate Action Reserve, Nitric Acid Production Project Protocol, v. 2.1, (June 2016). Climate Action Reserve, Nitric Acid Production Project Protocol Errata And Clarifications (January 3, 2017)
Emissions/Removals Verified	Vintage 2018: 226,774 metric tons CO_2-e

Verification Conclusion	Based upon the verification activities described above, NSF has concluded that LSB Industries, Inc. reported emission reductions of 226,774 metric tons CO_2-e reported to the Climate Action Reserve for the period June 12, 2018 – October 7, 2018 are, in all material respects, fairly stated.
Lead Verifier	Tina Sentner, December 17, 2018
Independent Reviewer	John C. Shideler, December 20, 2018
This verification statement is valid when signed and dated by an NSF independent reviewer.	