Validation and Verification Report

ACR823 A-Gas South Korea 1

May 8, 2023

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1 INTRODUCTION

A-Gas US Inc. (A-Gas) contracted with Ruby Canyon Environmental, Inc. (RCE) to perform the validation and verification of the ACR823 A-Gas South Korea 1 project (Project) for the crediting period of November 1, 2022 through October 31, 2032 and a reporting period of November 1, 2022 to November 16, 2022 under the American Carbon Registry (ACR) program. This report is documentation of validation and verification activities that RCE performed for the Project. For the validation, RCE reviewed the project information as described in the Project Plan "A-Gas South Korea 1" dated April 14, 2023. For the verification, RCE ensured that the GHG assertion was materially correct, that the data provided to RCE was well documented, and that if A-Gas made any material errors, that these errors were corrected.

1.1 OBJECTIVES

The objectives of the validation are to evaluate:

- Conformance to the ACR standard and the approved ACR Methodology for The Destruction of Ozone Depleting Substances from International Sources, Version 1.0, May 821 (Methodology);
- GHG emissions reduction project planning information and documentation in accordance with the applicable ACR-approved methodology, including the project description, baseline, eligibility criteria, monitoring and reporting procedures, and quality assurance/quality control (QA/QC) procedures;
- Reported GHG baseline, ex ante estimated project emissions and emissions reductions/removal enhancements, leakage assessment, and impermanence risk assessment and mitigation (if applicable).

The objectives of the verification are to evaluate:

- The emissions reductions and to ensure that the assertion is materially correct;
- The data provided to RCE can be documented and if errors or omissions are detected, they be corrected.

RCE retains all data and documents for seven years after the end of the project reporting period or for the duration required by the GHG program, whichever is longer.

1.2 PROJECT BACKGROUND

The Project destroyed R-12 that was sourced from a [redacted] located in [redacted], South Korea. The destroyed ODS ensures that it will no longer be used or stockpiled and ensures that the ODS cannot leak into the atmosphere. A-Gas utilized their own plasma arc destruction unit (PDU1) as the destruction facility located in Bowling Green, OH. The facility exceeds the Montreal Methodology's Technology and Economic Assessment Panel (TEAP) requirements for refrigerant destruction.

1.3 RESPONSIBLE PARTY

Project Proponent
A-Gas US Inc.
1100 Haskins Road

Bowling Green, OH 43402
Eric Ripley
eric.ripely@agas.com

Destruction Facility
A-Gas US Inc.
1100 Haskins Road
Bowling Green, OH 43402
Eric Ripley
eric.ripely@agas.com

1.4 Validation and Verification Team

Lead Validator and Verifier: Zach Eyler
Team Members: Garrett Heidrick, Jessica Stavole
Internal Reviewer: Michael Cote

1.5 Validation and Verification Criteria

1.5.1 Validation and Verification Standards, Guidelines, and Tools

- A-Gas South Korea 1 Project Plan (April 14, 2023)
- A-Gas South Korea 1 Monitoring Report
- ACR Standard, Version 7.0 (December 2020)
- ACR Validation and Verification Standard Version 1.1 (May 2018)
- The Destruction of Ozone Depleting Substances from International Sources, Version 1.0 (April 2021) (Methodology)
- ISO 14064-3:2006 "Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions"

1.5.2 Level of Assurance

The validation and verification were conducted to a reasonable level of assurance.

1.5.3 Materiality

The verification was conducted to ACR's required materiality threshold of ±5% of the GHG project's emissions reductions or removal enhancements.

2 Validation and Verification Process

As the first step in validation/verification activities, the Lead Validator/Verifier developed a Validation/Verification Plan to be followed throughout the validation and verification. The plan included the following activities:

- RCE completed a COI form for the validation on January 13, 2023 to identify any potential conflict of interest with the Project or Project Developer. The COI form was approved by ACR on February 2, 2023.
- RCE and A-Gas held a validation and verification kick-off meeting on February 9, 2023. During the kick-off meeting RCE reviewed the validation and verification objectives and process, reviewed the schedule, and submitted an initial document request.
- RCE performed a strategic review and risk assessment of the received data and support documents to understand the scope and areas of potential risk in the GHG emissions reductions.
- RCE developed a risk-based sampling plan based upon the strategic review and risk assessment. The validation/verification plan and sampling plan were used throughout the process and were revised as needed based upon additional risk assessments.
- RCE conducted a site visit to A-Gas' facility in Bowling Green, OH on February 28, 2023. During the site visit RCE observed the A-Gas destruction process, scales, sampling process and equipment, as well as onsite GHG management systems and data gathering, monitoring, and handling practices. RCE interviewed key personnel involved in the destruction process. RCE met with the following A-Gas personnel during the site visit:
    - Briana Reinke, Environmental Services Director
    - Tammy Myers, Environmental Health and Services
    - Mark Dulaney, Operations
    - Nickolas Alsip, Destruction Operator
    - Rick Miller, Operations
    - Amber Medina, Lab Manager
- RCE performed a risk-based desktop review of the submitted validation/verification documents. The desktop review included an assessment of the GHG calculation methods and inputs, source data completeness, GHG management and monitoring systems and eligibility documentation.
- RCE submitted requests for corrective actions, non-material findings, additional documentation, and clarifications as necessary to A-Gas throughout the validation/verification.
- RCE's internal reviewer conducted a review of the validation/verification sampling, report, and statement.
- RCE issued a final validation/verification report, verification statement, and List of Findings.
- RCE held an exit meeting with A-Gas.

3 VALIDATION AND VERIFICATION FINDINGS

3.1 PROJECT BOUNDARY AND ACTIVITIES

RCE reviewed the project boundary and activities and confirmed that both were appropriately identified and described in the Project Plan. For the Project, A-Gas sourced ODS from the [redacted] facility located in [redacted], South Korea and was then shipped to A-Gas's facility in Bowling Green, OH.

The ODS was contained in 10 cylinders at the [redacted] facility that were transported to A-Gas in Bowling Green, OH. The 10 cylinders were consolidated into one destruction tank (5002). From this container, samples were taken to determine ODS composition. The destruction event was recorded on a certificate of destruction (COD).

The Project's temporal boundary is the crediting period from November 1, 2022 – October 31, 2032.

3.2 GHG Sources Sinks, and Reservoirs

Table 1 shows the GHG emission sources included in the project boundary based on the Methodology. RCE confirmed that the Project Plan appropriately identifies the offset project boundary and includes all relevant SSRs.

Table 1. GHG Emissions Sources

Source	GHG	Description
SSR 5	CO_2	Fossil fuel emissions from the vehicular transport of ODS from aggregation point to final destruction facility
SSR 6	ODS, CO_2e	Emissions of ODS and substitute from use, leaks, and servicing through continued operation of equipment.
SSR 7	ODS and CO_2	Emissions of ODS from incomplete destruction at destruction facility. Emissions from the oxidation of carbon contained in destroyed ODS. Fossil fuel emissions from the destruction of ODS at destruction facility. Indirect emissions from the use of grid-delivered electricity.

3.3 Eligibility

3.3.1 ACR Eligibility

RCE confirmed the following ACR eligibility criteria listed in the ACR Standard, Version 7.0 by reviewing the project proponent's Project Plan, Monitoring Report, and calculations as well as other supporting documentation described throughout this report (a full list of documents reviewed is in Appendix A).

- Start Date: The project start date is November 1, 2022.
- Crediting Period: The crediting period is ten years as specified by the Methodology – November 1, 2022 through November 16, 2032.
- Minimum Project Term: Projects with no risk of reversal subsequent to crediting have no required minimum project term.
- Offset Title: RCE confirmed that A-Gas has undisputed title to all offset credits. A-Gas purchased refrigerant from the [redacted] facility through a broker. A-Gas then destroys the refrigerant at an eligible facility. A-Gas retains all legal claims to the environmental attributes and GHG benefits of the destroyed refrigerant.
- Additional: RCE confirmed that the project is additional as described in Section 3.4.
- Permanent: In the absence of the project, the ODS would have been fugitively emitted to the atmosphere. By destroying the refrigerant, A-Gas ensures that no emissions will occur. The Project will generate emission reductions that are permanent and have no risk of reversal.
- Net of Leakage: The Methodology does not specify leakage and the Project does not need to account for this.
- Independently Validated and Verified: RCE is a third-party validation and verification body that the project proponent has contracted to validate the project.

- Community & Environmental Impacts: RCE reviewed project impacts as described in section 3.6 of this report.

3.3.2 Methodology Eligibility

RCE reviewed the Project against the Methodology eligibility requirements and confirmed that the Project meets all requirements.

Eligible Destruction Facilities

The Project destruction occurred at the A-Gas facility which is a facility that meets or exceeds the Montreal Protocol's TEAP standards. Specifically, RCE confirmed:

The A-Gas facility is a TEAP approved facility that operates two plasma arc destruction units (PDU1 and PDU2). RCE reviewed the following documents:

- Intertek Report: Destruction Facility Good Housekeeping Re-Certification Audit Report for audit conducted on October 24-27, 2022. The report was provided for the facility as a certification that the A-Gas destruction facility meets the requirements for qualifying destruction facilities specified by the Climate Action Reserve and California Air Resources Board in each of their respective offset project protocols.
- The report concluded that the A-Gas facility can be considered a qualified destruction facility and specifically, Intertek confirmed:
    - A-Gas retained Air Dynamics Testing to conduct the TEAP tests for PDU1 and PDU2,
    - The PDU1 and PDU2 units meet the technical performance criteria for destruction technologies, and
    - The A-Gas facility is in conformance with the requirements in the TEAP Code of Good Housekeeping.
- Emissions Testing conducted by Air Dynamics Testing dated April 13, 2022 for PDU2.
    - RCE confirmed that the testing as required by TEAP was conducted on April 13, 2022, and it does not need to be re-tested until October 27, 2025.
- Emissions Testing conducted by Air Dynamics Testing dated April 12, 2022 for PDU1.
    - RCE confirmed that the testing as required by TEAP was conducted on April 12, 2022, and it does not need to be re-tested until October 27, 2025.
- Intertek Reports: Third-Party Certification of A-Gas Destruction Facility, Bowling Green, Ohio, dated October 28, 2022.
    - These reports were provided for the facility as a certification that the A-Gas destruction facility meets the requirements for qualifying destruction facilities specified by the Climate Action Reserve and California Air Resources Board in each of their respective offset project protocols.
    - The report was, in part, based on the Air Dynamics Testing reports generated from the results of testing conducted in May 822.
    - The reports concluded that the A-Gas facility can be considered a qualified destruction facility and specifically, Intertek confirmed:
        - The PDU1 and PDU2 units meet the technical performance criteria for destruction technologies, and
        - The A-Gas facility is in conformance with the requirements in the TEAP Code of Good Housekeeping.

- RCE confirmed that the A-Gas facility meet all applicable monitoring and operational requirements under relevant environmental laws, as well as all applicable regulatory requirements that apply directly to ODS destruction activities during the time the ODS destruction. Please see section 3.9 for more detail.

Eligible ODS

RCE confirmed that the ODS was eligible including the following Methodology requirements:

1. ODS destroyed under this Methodology must be from one or more of the eligible sources listed in subchapter 2.2.1 of the Methodology
    a. ODS originated the [ ] facility in South Korea.
    b. The ODS destroyed as part of the project was CFC-12.
2. Eligible ODS may not be combined within the same container.
    a. CFC-12 was the only significant eligible species contained within the containers that were part of the Project. Other eligible species contained less than 0.1%.
3. ODS produced exclusively for use as solvents or other applications not listed in subchapter 2.2.1, are not eligible.
    a. RCE confirmed that the ODS was not produced for non-eligible applications.
4. A single offset project may incorporate ODS obtained from one or more of the source categories listed in subchapter 2.2.1 of the Methodology.
    a. The Project's only source was the 10 containers from the [ ] facility.
5. Destruction activity must take place under one or more Certificates of Destruction.
    a. The Project had one destruction event with its own COD.
6. All the following conditions must be met for multiple Certificates of Destruction to be eligible as a single project:
    a. The project proponent is the same for all ODS destroyed;
        i. Yes, A-Gas
    b. All ODS must be destroyed at the same eligible destruction facility; and
        i. Yes, destroyed at A-Gas facility
    c. The destruction activities must occur during one reporting period.
        i. Yes, included in one reporting period
7. A Certificate of Destruction may be used for only one offset project.
    a. Yes, a COD was issued for the destruction event
8. Each Certificate of Destruction must be issued by the qualifying destruction facility and must include the following information:
    a. Project Proponent
        i. Yes, A-Gas is listed
    b. Destruction facility
        i. A-Gas is listed
    c. Certificate of Destruction ID number
        i. Yes, the COD has a unique ID listed
    d. If applicable, serial, tracking, or ID number of all containers for which ODS destruction occurred
        i. Yes, the serial number for the cylinder is noted on the COD
    e. Mass and type of material destroyed from each container

i. Yes, the mass (kg) and CFC composition is noted on the COD

f. Start and end destruction dates

i. Yes, the start and end dates are noted on the COD

9. The ODS destroyed may originate from a single source or from numerous sources.
    a. The ODS originated from one single source at the [ ] facility
10. The handling, recovery, and disposal of ODS refrigerants must be performed by qualified technicians. Qualified technicians may only service refrigeration or air conditioning equipment they are certified to service if a refrigerant handling, recovery, and disposal certification program exists in the ODS source country. Technician name and certification type(s) (if applicable) must be retained as part of the documentation retention requirements of this Methodology.
    a. [ ]: The facility specializes in the recovery, reclamation and processing of refrigerants and has the appropriate permits for operation.
    b. A-Gas: A-Gas employees are trained and have years of experience handling refrigerants.

3.4 LOCATION

The Project ODS was sourced from outside the U.S. The original location of the ODS was at the [ ] facility located at [ ] South Korea.

3.5 ADDITIONALITY

The Project meets the requirements for the demonstration of additionality specified by the ACR Standard by exceeding the approved performance standard defined in the Methodology and demonstrating surplus to regulations.

3.5.1 Legal Requirement Test

There is no law, regulation, or legally binding mandate requiring the destruction of ODS in South Korea. The Project passes the legal requirement test.

3.5.2 Performance Standard Evaluation

The Project meets the project definition and other eligibility requirements in the Methodology and therefore passes the performance standard.

3.6 START DATE

The Project's start date is November 1, 2022 which is the date when the first destruction event initiated. RCE confirmed this with a review of A-Gas's continuous emissions monitoring system (CEMS) data and also confirmed that it matches the COD.

3.7 REPORTING PERIOD

The Project's reporting period is from November 1, 2022 through November 16, 2022. RCE confirmed that all requirements of the Methodology were met for the destruction event in one reporting period. RCE also confirmed that the reporting period begins on the start date.

3.8 CREDITING PERIOD

The Project's crediting period was confirmed as November 1, 2022 through October 31, 2032.

3.9 REGULATORY COMPLIANCE

RCE confirmed regulatory compliance for the Project including the collection, recovery, storage, transportation, and destruction of the ODS, including disposal of the post-destruction waste products that are directly applicable to the destruction activities.

Collection/Recovery/Storage

RCE confirmed that the [redacted] facility follow all applicable regulations related to the storage, collection and recovery of ODS. RCE reviewed the South Korea Technical Manpower certifications for refrigerant handling and education for [redacted]. In addition, RCE reviewed translated Waste Facility audits and Waste Gas Treatment audits for 2021 and 2022. No issues were noted during the audits. The audits were conducted by the Korea Environment Corporation.

In addition, RCE reviewed the EPA 608 certifications for A-Gas and Refrigeration Mechanical. The Project did not involve recovery or collection.

Transportation

RCE confirmed that all applicable regulations and procedures were followed for the transport of the ODS from its source to the A-Gas facility. A summary of the transport process and application requirements is noted below.

From the source location the ODS was transported to New York, USA in U.S. Department of Transportation approved containers, which was arranged using an importer booking system. The ODS was transported via ship by Ocean Network Express Holdings, Ltd. (ONE). The ODS was received in New York and transported to A-Gas via freight by Universal Intermodal Services, Inc.

Since the ODS is considered hazardous waste it is subject to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (Basel). To be exported according to Basel, [redacted] (through the refrigerant broker BSM) received an export permit from the South Korea Ministry of Trade, Industry and Energy. A-Gas received permission from the U.S. EPA to import the ODS into the U.S. for the purposes of destruction via a non-objection notice letter.

Destruction

RCE confirmed that the A-Gas facility was in compliance during the Project's reporting period. RCE searched electronic files at the Ohio EPA's website and found no compliance issues related to the destruction facility for this reporting period. RCE also confirmed that A-Gas and its employees have either 608 or 609 certifications, as applicable.

In addition, RCE reviewed the following documents from A-Gas, which were the most recent documents available at the time of verification:

- City of Bowling Green – Industrial User Permit, issued 1/1/2021
- Letter and U.S. EPA website with respect to EPA-Certified Refrigerant Reclaimers
    - A-Gas is an EPA-certified refrigerant reclaimer and is currently listed on the EPA website

    - No U.S. EPA inspections have ever occurred
- 2021 Annual U.S. EPA Reclaimer report
- 2022 Annual Ohio State Emergency Response Commission (SERC) report
- 2021 OSHA 300A form
- March 21-22, 2022 Ohio EPA Compliance Evaluation Inspection report

3.10 PERMANENCE

The emissions reductions from the destruction of ODS can be deemed as permanent because they are destroyed at or greater than 99.99% efficiency.

3.11 ENVIRONMENTAL AND COMMUNITY IMPACTS

The Project Plan includes a comprehensive summary of the Project activity's net positive environmental impacts. Destroying ODS avoids the future leakage of the ODS into the atmosphere. There are no negative community or environmental impacts for the Project. The Project Plan also identifies contributions as aligned with relevant sustainable development goals (SDGs) including:

- SDG 9: Industry, Innovation, and Infrastructure
    - The project fosters resilient infrastructure, sustainability in the refrigerant management industry, and innovation through the acquisition and destruction of CFC refrigerant, eliminating emissions of CFCs.
- SDG 11: Sustainable Cities and Communities
    - The project contributes to the transition from higher GWP refrigerant to lower GWP alternatives through the elimination of CFCs used in appliances and refrigeration equipment in the built environment.
- SDG 12: Responsible Consumption and Production
    - Promoted by providing an end-of-life solution for CFC refrigerants contributing to the avoidance of emissions from continued use and alternate disposal methods as well as supporting the transition to lower GWP alternatives.
- SDG 13: Climate Action
    - The project is conducted as a high impact activity to combat climate change.
- SDG15: Life on Land
    - The elimination of CFCs contributes to the protection and recovery of the ozone layer, in addition to significant GHG emission reductions. Harmful ultraviolet radiation has negative impacts on terrestrial carbon sinks and these impacts are minimized through the elimination of ODS such as CFC-12.

RCE confirmed that the Project is not expected to promote significant negative environmental impacts.

3.12 LOCAL STAKEHOLDER CONSULTATION

The Methodology does not require public consultation from stakeholders, but A-Gas did complete stakeholder engagement as part of the Project activities. This engagement included with technicians in South Korea and South Korea regulators.

3.13 SOURCE OF ODS

RCE confirmed that the source of all Project ODS met all Methodology requirements including:

- Owner of the ODS prior to acquisition by the project proponent
  - o [ ] facility located at [ ] South Korea
- Physical address of the ODS prior to acquisition by the project proponent and facility name (if applicable)
  - o [ ] facility located at [ ] South Korea
- If sourced from equipment or refrigeration system: identification of any refrigeration or air conditioning equipment or system by serial number
  - o N/A
- If sourced from other supplies: an affidavit, certification, or attestation by the prior owner asserting the date the owner transferred title of the ODS to the project proponent, whether the prior owner is a manufacturer of refrigerant, importer of refrigerant, or wholesale distributor of refrigerant
  - o Attestation provided from [ ].
- Serial or ID number of any containers used for storage and transport.
  - o Yes, all containers had ID numbers as noted in the Attestation document from [ ] (DH-0001, DH-0002, DH-0003, DH-0004, DH-0005, DH-0006, DH-0007, DH-0008, DH-0009, DH-0044)

RCE also confirmed that the Project did not destroy ODS sourced from government stockpiles or inventories.

3.14 CHAIN OF CUSTODY AND OWNERSHIP DOCUMENTATION

RCE confirm that A-Gas collected and maintained documentation on the chain of custody of the ODS from the original source at [ ] to the A-Gas destruction facility. Bills of lading, manifests, packing documentation and other documentation was provided confirming the transport process as outlined in section 3.9 of this report.

In addition, the Project provided the names, addresses, and contact information of all entities buying and selling the Project ODS, including the mass of ODS at the transaction.

- Seller: [ ] South Korea
- Buyer: A-Gas – 1100 Haskins Road, Bowling Green, OH 43402
- Mass: 10,016 kg

RCE confirmed that A-Gas has ownership of the ODS and all rights associated with its destruction.

RCE also verified the chain of custody documentation for the ODS samples taken for the Project and shipped from the A-Gas facility to the National Refrigerants, Inc. (NRI) Analytical Laboratory located at 661 Kenyon Avenue Bridgeton, NJ 08302. All documentation met Methodology requirements and matched all relevant dates and information found in corresponding documentation.

3.15 ODS Composition and Quantity Analysis

3.15.1 Scales

RCE confirmed that A-Gas used a calibrated scale to measure the pre- and post-destruction weights for the destruction event. The ODS was loaded into one tank (5002). RCE viewed the scale during the site visit. RCE reviewed the third-party calibration reports prepared by Antibus Scales and Systems and confirmed each scale was calibrated at least on a quarterly basis and its accuracy was within 5% of reading. RCE verified that:

- A single scale was used for both the full and empty weights
    - Yes, the same scale was used
- The full mass must be measured no more than 48 hours prior to commencement of destruction per the destruction system monitoring data
    - Yes, confirmed for the destruction event
- The empty mass must be measured no more than 48 hours after the conclusion of destruction per the destruction system monitoring data
    - Yes, confirmed for the destruction event
- Each single compartment, cylinder, drum, or any other eligible ODS container that has been identified and destined for destruction must be weighed separately, sampled separately, and treated as a separate destruction event
    - Yes, only one tank was used
- Recovery, collection, and aggregation activities may occur until the container has been identified and destined for destruction. After the ODS container has been identified and destined for destruction, ODS must not be added or removed, except for the purpose of sampling and analysis.
    - Yes, once all material was consolidated into the destruction tank (5002) no other material was added or removed.
- RCE confirmed that the containers were not permanently affixed to a detachable trailer
    - RCE confirmed that the container was weighed on an individual scale
    - RCE confirmed that the container was on the scale motionless for at least 3 minutes

3.15.2 Composition Sampling

RCE confirmed the procedures for the sampling of the mixed ODS for the destruction event met the requirements of the Methodology by reviewing the documentation provided by A-Gas. A third party, Refrigeration Mechanics, Inc. (RMI), was used for all sampling.

RCE also confirmed that the NRI laboratory used for composition and concentration analysis is an AHRI-certified laboratory.

For sampling, RCE confirmed the following:

- The samples must be taken while ODS is in the possession of the company that will destroy the ODS
    - RCE confirmed that the samples were taken at the A-Gas facility.
- Samples must be taken by a technician unaffiliated with the project proponent
    - RCE confirmed that the samples were taken by RMI
- Samples must be taken with a clean, fully evacuated sample bottle that meets applicable U.S. Department of Transportation requirements with a minimum capacity of one pound
    - RCE confirmed through the ODS Sampling Certificate signed by Steve Abbey of RMI.

- Each sample must be taken in liquid state
    - RCE confirmed through the ODS Sampling Certificate signed by Steve Abbey of RMI.
- A minimum sample size of one pound must be drawn for each sample
    - RCE confirmed through the ODS Sampling Certificate signed by Steve Abbey of RMI.
- Each sample must be individually labeled and tracked according to the container from which it was taken, and the following information recorded: time and date of sample, name of project proponent, name of technician taking sample, employer of technician taking sample, volume of container from which sample was extracted, and the ambient air temperature at time of sampling
    - RCE confirmed through the ODS Sampling Certificate signed by Steve Abbey of RMI.
- Chain of custody for each sample from the point of sampling to the laboratory must be documented by paper bills of lading or electronic, third-party tracking that includes proof of delivery
    - RCE confirmed through the Chain of Custody form.

RCE also confirmed that the following additional requirements were met for mixed ODS for the destruction event:

- The required sampling may be conducted at the final destruction facility or prior to delivery to the destruction facility
    - RCE confirmed that the sampling was conducted at the A-Gas destruction facility
- Circulation and sampling activities must be conducted by a contracted third-party and by individuals who have been properly trained for the functions they perform
    - RCE confirmed through the Mixed ODS Procedures Documentation signed by RMI technician Steve Abbey.
- The offset project documentation must specify the procedures by which mixed ODS are analyzed
    - RCE confirmed through the Mixed ODS Procedures Documentation signed by RMI technician Steve Abbey.
- Prior to sampling, the ODS mixture must be circulated in a container that meets all the following criteria listed in Appendix B of the Methodology
    - RCE confirmed through the Mixed ODS Procedures Documentation signed by RMI technician Steve Abbey.
- Circulation of mixed ODS must be conducted as described in Appendix B of the Methodology
    - RCE confirmed through the Mixed ODS Procedures Documentation signed by RMI technician Steve Abbey.
- Within 30 minutes of the completion of circulation, a minimum of two samples shall be taken from the bottom liquid port for a single container, or minimum of two samples must be taken from the liquid port of each tank if two connected tanks are used and both samples must be analyzed at a laboratory, per the requirements in Appendix B of the Methodology
    - RCE confirmed through the Mixed ODS Procedures Documentation signed by RMI technician Steve Abbey.
- The project proponent must calculate the project GHG emission reductions using both sample results, and choose the sample resulting in the lower project emission reductions
    - RCE confirmed through a review of the emission reduction calculation

Laboratory Analysis Reports

RCE reviewed the lab analysis reports provided by NRI for the destruction event. RCE confirmed that the analysis demonstrates that the ODS met all the requirements as outlined in the Methodology. The analysis provided:

- Identification of the ODS
- Purity of the ODS mixture by mass using gas chromatography
- Moisture level in parts per million demonstrating a moisture content of less than 75 percent of the saturation point of the major ODS species
- Analysis of high boiling residue (HBR) indicating less than 10 percent by mass
- Analysis of other ODS

3.16 Destruction Facility Monitoring Requirements

A-Gas provided an excel file download of the real-time monitoring parameters data for the reporting period as defined in the Methodology. A secure SQL file logs the CEMS data and A-Gas downloads this data to excel on an as-needed basis. The destruction facility tracked the following information during destruction:

- Batch Number
- Feed Tank
- Run Number
- Date
- Time Run
- Time
- Effluent Gas Carbon Monoxide (ppm)
- ODS Feed Rate (kg/h)
- Effluent Gas Oxygen Level (%)
- Molecular Weight MW (r/mol)
- Effluent Liquid pH LevelGas off Pressure (kPag)
- Final Segment Temp. (°C)
- Operating Temp. of Injection Manifold (°C)
- ODS Temp. Exiting Vaporizer (°C)

To determine whether the PDU units operated within the parameters recorded during DRE testing, RCE reviewed all CEMS data provided by A-Gas including the concentration of carbon monoxide (CO) data. RCE confirmed that the Plascon units operated within the parameters recorded during DRE testing. If the CO concentration maintains levels above 100 ppm for 10 minutes, then the unit will automatically shutdown to ensure proper destruction of ODS. RCE confirmed that A-Gas followed their shutdown/startup plan for any instances.

3.17 Baseline Scenario

The project activity is the destruction of ODS to avoid future leakage into the atmosphere. GHG emissions are avoided because in the baseline scenario, the ODS would have been used to charge or recharge refrigeration or air conditioning equipment or stored in collection tanks causing emissions to be released. The Methodology establishes the baseline emission rates for refrigerants and RCE confirmed that the Project Plan appropriately identifies the baseline scenario.

3.18 Data Management System and Monitoring Plan

RCE reviewed A-Gas' processes for data collection and management and determined that they were sufficient to meet all ACR and Methodology requirements. RCE gained an understanding of the controls put in place to account for the ODS received, sampled, and destroyed through interviews with key personnel, the site visit to A-Gas' destruction facility, and the review of all documentation provided by A-Gas.

RCE confirmed that A-Gas' Project Plan includes a Monitoring Plan that identifies all Methodology required data and parameters that must be monitored. The Monitoring Plan includes all relevant data parameters and appropriately identifies units of measurements, data sources, methodologies, uncertainty, monitoring frequency and procedures, and QA/QC procedures. After discussions with A-Gas and reviews of project documents, RCE determined that the Monitoring Plan accurately reflects how Project data is monitored and recorded. A-Gas implemented the monitoring plan as stated in the Project Plan during Project activities.

3.19 Project Data and GHG Emissions Reduction Assertion

RCE reviewed the Project Plan, Project data, and calculations to ensure that appropriate equations were used in calculating baseline emissions, project emissions, and emissions reductions.

3.19.1 Baseline Emissions

Baseline emissions include the emissions that would have occurred had the ODS been used in existing equipment or stored indefinitely. RCE used the total amount of ODS destroyed as found on the COD provided by A-Gas and then removed the amount of high boiling residue (HBR) and moisture determined by the NRI lab analyses. Once this weight was removed, the remaining weight was multiplied by the percent compositions of eligible refrigerant in the material destroyed as documented on the lab analysis. The weight of eligible material was then converted from kg to metric tons to calculate $Qrefr_i$ for each eligible refrigerant. $Qrefr_i$ was then multiplied by the appropriate 10-year cumulative emission rate and GWPs for each refrigerant to determine $BE_{refr,i}$. RCE confirmed that the Project chose the sample resulting in the lower project emission reductions. Due to rounding, some values might not equate to the final values claimed by A-Gas.

3.19.2 Project Emissions

RCE calculated project emissions for the destruction events. RCE calculated the project emissions from substitute refrigerants by multiplying the quantities of eligible ODS by the appropriate refrigerant substitute emission factors. RCE calculated the project emissions from transportation and destruction by multiplying the total weight of all ODS destroyed in the COD by the appropriate default emission factor. RCE then added these values together to determine total project emissions. Due to rounding, some values might not equate to the final values claimed by A-Gas.

3.19.3 Emissions Reductions

RCE verified that A-Gas calculated emissions reductions according to relevant Methodology equations and that the methods are included in the Project Plan and Monitoring Report. RCE calculated emissions

reductions for the reporting period according to the equations defined in the Methodology and the Project Plan and found the assertion to be free of material misstatement.

4 VALIDATION AND VERIFICATION RESULTS

RCE developed a List of Findings for both the validation and verification notifying A-Gas of corrective action requests (CARs), non-material findings (NMs), additional documentation requests (ADRs), and clarification requests (CRs). A-Gas appropriately responded to all items in the List of Findings. The List of Findings is provided as Appendix B.

5 VALIDATION AND VERIFICATION CONCLUSION

RCE conducted a risk-based validation and verification of the A-Gas South Korea 1 project that included a strategic review of the project data, documentation, and emission reduction calculations. The objective of the validation activities was to assess the project design, baseline scenario, and monitoring plan and to ensure compliance of the Project Plan to the assessment criteria defined in Section 1.5.1. The objective of the verification activities was to conduct an independent assessment of the project reporting period and ex-post GHG emission reductions resulting from the Project.

Based on the review and the historical evidence collected, RCE concludes to a reasonable level of assurance that the GHG assertion is free of material misstatement. The emission reductions resulting from the ODS destruction for the reporting period November 1, 2022 to November 16, 2022 can be considered in conformance with the:

- ACR Standard, Version 7.0 (December 5020)
- ACR Validation and Verification Standard Version 1.1 (May 2018)
- The Destruction of Ozone Depleting Substances from International Sources, Version 1.0 (May 821)
- ISO 14064-3:2006 “Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions”

Table 3 provides a summary of the emissions reductions.

Table 3. Emissions Reductions

Vintage	Baseline Emissions ($MTCO_2e$)	Project Emissions ($MTCO_2e$)	Emissions Reductions ($MTCO_2e$)
2022	**95,353**	**6,407**	**88,945**

Lead Validator and Verifier

Zach Eyler

Internal Reviewer

Michael Cote

6 APPENDIX A—DOCUMENTS REVIEWED

1. 2021 [redacted] Facility Audit
2. 2022 [redacted] Facility Audit
3. ACR Project Listing Form_A-Gas South Korea
4. A-Gas - South Korea 1 - ACR Monitoring Report_series
5. A-Gas - South Korea 1 - Project Plan_series
6. A-Gas Batch Mixing & Sampling Forms
7. A-Gas Certificate of Destruction
8. A-Gas Certificate of Mixing and or Sampling to Determine Composition and Concentration of ODS
9. A-Gas Certificates of Sampling
10. A-Gas Consolidation & Transferring Summary
11. A-Gas Continuous Emissions Monitoring System data (excel)
12. A-Gas EPA ECHO Report
13. A-Gas EPA Refrigerant Reclaimer Certificate
14. A-Gas NRI Refrigerant Analysis Reports
15. A-Gas Ohio EPA industrial general permit
16. A-Gas OSHA IMIS search
17. A-Gas Plascon Maintenance Log for destruction event
18. A-Gas receiving reports for all applicable cylinders
19. A-Gas Requests for Analysis for destruction event
20. A-Gas signed Chain of Custody for samples sent to A-Gas laboratory for destruction event
21. A-Gas Tank History reports and Tank Routing for all tanks for destruction event
22. A-Gas Universal Refrigerant Technician cards (multiple employees)
23. A-Gas weight certificates for the pre/post weight of tank for destruction event
24. A-Gas weight certificates for the sample containers
25. Arrival Notice_ODS cylinders
26. Bills of lading for all shipments from a point of origin to A-Gas
27. Certificate of Origin - [redacted]
28. Hazardous freight certificates for applicable companies
29. Industrial User Permit from City of BG
30. Letter and U.S. EPA website with respect to EPA-Certified Refrigerant Reclaimers
31. March 21-22, 2022 Ohio EPA Compliance Evaluation Inspection report
32. Multi-modal Dangerous Goods Certification
33. ODS material purchase order
34. Origin Attestation_[redacted]
35. Pictures of cylinders at [redacted]
36. Plas-1198 ER Calcs After Destruction
37. Point of origin information for all appropriate shipments
38. Scale calibration reports - All relevant quarters
39. South Korea export permit
40. South Korea ODS regulatory confirmation email
41. U.S. EPA non-objection notice

7 APPENDIX B—LIST OF FINDINGS

Includes Corrective Action Requests (CAR), Non-Material Findings (NMs), Additional Documentation Requests (ADR), and Clarification Requests (CR), as relevant.

Corrective Action Request (CAR), Non-Material Finding (NMF), Additional Documentation Request (ADR), or Clarification Request (CR) #	Finding and Date	Section of Protocol/ Methodology or Program Document	Project Developer Response and Date	RCE response and Date	Additional Project Developer Response and Date	Additional RCE Response and Date	Open or Closed
CAR 1	3/1/2023: Please correct the following in the Project Plan: 1) Remove blank pages 10, 22, and 26.	Project Plan Instructions	Blank pages have been removed. 3/2/23	3/31/23: Plan corrected. 4/10/23 update: Please add additional detail in the Project Plan for: -All eligibility items in section 2.2 of the methodology are not discussed (e.g. not for use as solvent) -Provide a complete address for the original source of ODS (methodology section 6.1.II B) -Provide complete information for sections 6.1, 6.2 and 6.3 of the Methodology and how the Project meets these requirements. -Section A.7 of Project Plan - Add RMI as a project participant and clearly define A-Gas as the Project Proponent. - Section B.3: The physical boundary is too generic and does not describe the specific project.	4/11/23: - Project plan has been updated to include discussion of section 2.2 in the Methodology. This is located in section **B2. Methodology Justification** of the project plan. - Complete address for original source of ODS has been added to section **B3. Project Boundaries** in the project plan. - Info pertaining to sections 6.1, 6.2, and 6.3 have been added to section **B2. Methodology Justification** of the project plan. - Section A.7 of project plan has been updated. - **Section B.3** in the project plan has been updated.	4/17/2023: All updated are accepted.	Closed
NMF 1							
ADR 1	3/1/2023: Please provide confirmation of regulatory compliance for the South Korea facility along with supporting documentation/information.	M3.7	We have provided the facility audits conducted by the Korea Environment Corporation for both 2021 and 2022. These are the most recent audits that have been conducted. The documents are provided in original format (PDF files in Korea) and via page by page translations. Each checklist audit form documents the facility's compliance with all regulatory requirements. Note that in the 2022 files, there are checklists for both the "Waste Facility" and "Waste Gas Treatment". The Waste Facility audit covers the facility's compliance with gas collection requirements. The Waste Gas Treatment audit covers the facility's compliance with gas processing requirements. Additionally, we have provided a certification form for R12 specifically documenting the facility's certification to handle and process R12. Finally, these audits are conducted by the Korea Environment Corporation which is a public sector organization established by Korean law to oversee various environmental initiatives related to greenhouse gas emissions and facility waste and recycling operations.	4/5/23: Provided files support regulatory compliance for the [redacted] Facility. RCE also discussed the documents with A-Gas for further information.			Closed
ADR 2	3/1/2023: Please provide Q3 2022 and Q1 2023 scale calibrations.	M6.2(I)	Scale calibrations have been provided for Q3, 2022 and Q1, 2023. 3/2/23	3/31/23: Scale calibrations provided.			Closed
ADR 3	3/1/2023: Please provide evidence of ownership of the environmental benefits by A-Gas.	Standard v7 6.E	All gas acquired, owned, and destroyed by A-Gas is covered under the following disclaimer found on the A-Gas website: *Unless specifically documented, A-Gas retains the rights, ownership, and title to any and all environmental benefits and attributes for the reclaimed gas that is purchased or sold by A-Gas and any gas that is acquired and caused to be destroyed by A-Gas.* Purchase Order for this gas also provided.	4/3/23: RCE confirmed the PO for this gas as well as the attestation on the website. Since the gas was destroyed, the PO is sufficient.			Closed
ADR 4	3/1/2023: Please provide the freight BOL from New York to Ohio as well as the hazmat certification of the transport company.	M3.7	Hazmat certification and freight BOL have been provided. 3/2/23	3/31/23: BOL and Hazmat certificate provided.			Closed
CR 1							