

Verification Report for GHG Project -
Multimodal transport on the Magdalena River by
Impala Terminals

Prepared for:
Impala Terminals Colombia S.A.S.

September 4, 2019

Ruby Canyon Engineering, Inc.
743 Horizon Ct. Suite 385
Grand Junction, Colorado 81506
(970) 241-9298
www.rubycanyoneng.com

1. VERIFICATION OBJECTIVE AND DETAILS

Impala Terminals S.A.S. (Impala) contracted Ruby Canyon Engineering, Inc. (RCE) to perform the third-party greenhouse gas (GHG) verification of their “Multimodal transport on the Magdalena River by Impala Terminals” project (Project). The first reporting period of the Project is from June 19, 2015 to December 31, 2017. The objectives of the verification activities were to confirm that the data, controls and processes supporting the emission reduction calculations as presented in the GHG Report and corresponding GHG Assertion spreadsheet are in conformance with the procedures set out in ISO 14064-2:2006 and the selected methodology. Additional objectives included validating the baseline scenario against the defined criteria, infrastructure and technologies used, GHG sources, start date, crediting period, and confirming that the Project will result in the stated emission reductions. Finally, RCE confirmed that the GHG Report and corresponding GHG Assertion conformed to the requirements and principles of ISO 14064-3:2006 and are without material discrepancies.

RCE verified the Project to the CDM methodology AM0090 – Modal shift in transportation of cargo from road transportation to water or rail transportation version 01.1.0 (Methodology) that was complemented with the CDM Tool03: Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion version 03.0, and the CDM Tool05: Baseline, Project and/or leakage emissions from electricity consumption and monitoring of electricity generation version 03.0; the final GHG Report; and the Monitoring Report. The Project involves GHG emission reductions resulting from the modal shift in transportation of crude oil and other petroleum products from road transportation to water transportation via barges.

RCE ensured that the GHG emission reductions claimed by Impala were within scope, real, quantifiable, additional, verifiable, counted once, under clear ownership, and that the Project complied with monitoring and reporting requirements. Furthermore, the verification activities ensure that the data provided to RCE is well documented and free of any material errors or omissions.

1.1. Project title

Multimodal transport on the Magdalena River by Impala Terminals.

1.2. Date when the project began

The start date for the Project is June 19, 2015.

1.3. Verification Site Visit (date)

RCE conducted a site visit to the Project on May 21, 2019 and visited Impala’s local office in Barranquilla, Colombia on May 22, 2019. The verification team (lead verifier and verifier) inspected the downstream end of Project operations to confirm that the Project activity and operations, extended GHG boundary, monitoring and metering, and information control systems adhere to the conditions of the submitted GHG Report and the methodology.

During the site visit, the verification team visited the port terminal at Sociedad Portuaria Puerto Bahia located in Cartagena. The team observed the port operations and Project

equipment to gain an understanding of the Project operations including the processes to dispense fuel to barges and to unload and load product into the barges. The team viewed barges at the loading and unloading berth and viewed tugboats pushing barges in the bay. The processes at the upstream terminal in Barrancabermeja for dispensing fuel to barges and unloading and loading product into barges is the same.

At the office visit, the verification team met with Impala personnel and the technical consultants from CAIA at Impala's office. The personnel described the GHG project boundary, baseline scenario and pre-project conditions, the processes to collect and aggregate all project data, the sources of all project data, and the methods to apply the data in the calculation of emission reductions. In addition, the RCE team spot checked samples of source data to confirm values used in the emission reduction calculations and requested additional samples of source data to be reviewed back in the office including agreements, letters, invoices, bills of lading, and details of transportation routes.

The verification team interviewed several Impala personnel involved in project operations and responsible for data collection and management to gain an understanding of the day-to-day operation and data flow. The following is the list of the personnel interviewed by the verification team:

- 1) Felipe López. HSE Regional Manager for Latin America and Project Manager (at time of the site visit). He explained to the verification team the characteristics of the fleet and the terminal at Barrancabermeja. He described the method to determine the quantity of cargo transported including that all measurements are certificated by a third party.
- 2) Susana Dennis. Trafigura lawyer. She provided explanations and evidence about the legal framework of the project.
- 3) Manuel Camargo. Impala engineer and member of the technical staff at the Cartagena port. During the site visit to the port, he explained the general procedures to manage the cargo and the fuel used in the barge and tugboat operations.
- 4) Jessica Wade-Murphy and Alexander Valencia. Personnel from CAIA Ingeniería, the technical consultant that developed the GHG Report and monitoring plan and assembled other Project documents for Impala.

1.4. Expected lifetime of the project

RCE confirmed the Project crediting period is from June 19, 2015 to June 18, 2025.

1.5. Type of greenhouse gas emission reduction or removal project

The emission reduction Project is a transportation project involving a modal shift from trucks transporting petroleum products via land to barges transporting the products via the Magdalena River. The Project scenario reduces GHG emissions by consuming less fuel to transport the products via the river. RCE is ANSI-accredited to perform validations and verifications under the applicable scope extensions (Scope 2 – Fuel Combustion), as well as EMA-accredited to perform validations and verifications under IAF MD14 and CDM Sectoral Scope 1 (Energy Industries) and Scope 7 (Transport).

1.6. Verification of appropriateness of the methodology being used for the project

RCE confirmed the applicability and appropriateness of the methodology used for the Project. The Project correctly applies CDM methodology AM0090 – Modal shift in transportation of cargo from road transportation to water or rail transportation version 01.1.0 which also refers to two CDM tools that were used to calculate project emissions: Tool03: Tool to calculate project or leakage CO2 emissions from fossil fuel combustion version 03.0 and Tool05: Baseline, Project and/or leakage emissions from electricity consumption and monitoring of electricity generation version 03.0.

RCE reviewed one methodology deviation identified in the GHG Report. It applies to the calculation of project emissions from complementary routes. Instead of directly measuring fuel used on complementary routes, Impala calculates consumption based on the route distances, number of trips on each route, and the fuel efficiency of the trucks transporting the product. RCE approves the methodology deviation for the project emissions calculations and confirms that it does not impact the conservativeness of the GHG assertion.

RCE confirms the emission reductions generated by the Project are additional to what otherwise would have occurred in the absence of the Project.

1.7. Legal land description of the project or the unique latitude and longitude

RCE confirmed the physical location for the downstream port operation at Sociedad Portuaria Puerto Bahía during the site visit and confirmed the latitude and longitude using Google Earth. During the site visit to Impala's office, the staff gave a presentation and virtual tour of the terminal at Barrancabermeja. Then, the verification team confirmed the location of the port via Google Earth.

Terminal, Barrancabermeja Colombia

- Latitude: 7.100000
- Longitude: -73.891151

Sociedad Portuaria Puerto Bahía, Cartagena Colombia

- Latitude: 10,286578
- Longitude: -75,52845

1.8. Ownership verification

RCE confirmed that Impala Terminals Colombia S.A.S. (NIT 900.439.562) owns the Project.

RCE verified the Project ownership through a review of facility permits, equipment ownership records, and contractual agreements.

1.9. Reporting, monitoring, and verification details

The reporting period covered by this verification report is from June 19, 2015 to December 31, 2017. For the remainder of the crediting period, Impala intends to update the GHG project documentation and reporting to GHG CleanProjects® on an annual

basis. RCE acknowledges that the verification report (Version 2.2, dated September 4, 2019) pertaining to Impala's Project will be publicly posted on GHG CleanProjects®. RCE also acknowledges that the related GHG report (GHG Report - "Multimodal transport on the Magdalena River by Impala Terminals", Version 3, dated August 23, 2019) and GHG Assertion will be posted publicly.

RCE validated and verified the GHG Report conforms to the AM0090 – Modal shift in transportation of cargo from road transportation to water or rail transportation methodology regarding applicability, eligibility, baseline scenario, GHG boundaries, inventory of SSRs, monitoring data and information, and quantification methods. RCE validated one methodology deviation in the GHG Report relating to the calculation of project emissions from fuels consumed on complementary routes. RCE found the deviation to be acceptable and confirmed that the methodology deviation does not negatively impact the conservativeness of the quantification of GHG emission reductions.

RCE's emission reduction calculations assessment included a recalculation, as well as a review of the baseline and project assumptions, data inputs, data management, and accuracy of calculations. RCE first evaluated the completeness and validity of the original data, and how the data is transferred from source records to Impala's data management system and the GHG emission reductions calculation spreadsheet. RCE confirmed the Project followed the GHG Report monitoring plan including QA/QC procedures.

RCE sampled source documentation including records for trips occurring in the baseline scenario, fuel invoices, bills of lading documenting upstream and downstream trips as part of the Project activity, and calculation of route distances including for baseline trips and complementary routes during the Project activity. RCE verified that the source documentation supported the values applied in the baseline and project emissions calculations.

RCE conducted cross checks of the spreadsheet functionality and the use of Methodology equations in the GHG assertion. The calculation methodologies were also compared to the methods described in the GHG Report. RCE verified that Impala applied the appropriate default emission factor for road transportation of solid mineral fuels and petroleum products from the Methodology to calculate baseline emissions; the factor was adjusted, per Methodology guidance, to assume an emission factor of zero for the biofuel portion of the fuel consumed. Project emissions were calculated for all required sources using equations described in the Methodology: for fossil fuel combustion using Tool03: Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion version 03.0; for electricity consumption using Tool05: Baseline, Project and/or leakage emissions from electricity consumption and monitoring of electricity generation version 03.0; for non-empty return trips; and for transportation of cargo in complementary routes in trucks (from the oil fields to the Barrancabermeja terminal), except as noted in the methodology deviation. Impala's method to calculate the quantity of fuel combusted by trucks in complementary routes is reasonable and was appropriately applied. RCE reviewed fuel efficiency estimates from a sample of the trucking companies, records for the number of trips, and maps for the trucking route distances.

RCE verified that Impala applied appropriate emissions factors for fuels combusted—marine diesel, diesel B10 (10% ethanol and 90% ACPM), and gasoline E10 (10% ethanol and 90% gasoline)—and for electricity consumed. As described in the assessment of methodology, Impala used Colombia electricity grid emission factors for 2014, 2015, and 2016 to calculate emissions associated with purchased electricity.

Total emission reductions, by vintage, were appropriately calculated. RCE recalculated the total GHG emission reductions and compared the results to Impala’s calculations; the difference between RCE’s and Impala’s calculated emission reductions was non-material. RCE found all GHG quantification methods (with one deviation described above) to be consistent with the Methodology and the GHG Report.

1.10. Level of assurance and verification summary

This verification statement was completed in a manner consistent with ISO 14064-3. RCE conducted a risk-based analysis of Impala’s Project and emission reductions including a strategic review of the Project data and supporting documentation. Based upon the processes and procedures and the evidence collected and provided in the GHG Report - “Multimodal transport on the Magdalena River by Impala Terminals”, Version 3, dated August 23, 2019, RCE concludes that the GHG emission reductions 66,366 tCO₂ in the GHG Report resulting from the reduction of CO₂ emissions during the reporting period June 19, 2015 to December 31, 2017 are fair and accurate and free from material discrepancy.

Vintage	CO ₂ (metric tons)
2015	1,351
2016	19,675
2017	45,340
Total Emission Reductions	66,366

The Project can be considered:

- In conformance with the GHG CleanProjects® Registry, Clean Development Mechanism Methodology AM0090 Modal shift in transportation of cargo from road transportation to water or rail transportation version 01.1.0; Colombia Ministry of Finance Decree 926 of 2017 and Ministry of Environment Resolution 1447 of 2018; and ISO 14064-2 and ISO 14064-3:2006 standards;
- Fair and accurate;
- Without material discrepancy or material changes in how the project was carried out compared to the GHG Report, and
- Verified to a reasonable level of assurance.

1.11. Roles and responsibilities

Verification Body:

Ruby Canyon Engineering, Inc.

783 Horizon Court, Suite 385
Grand Junction, Colorado 81506
+1.970.241.9298

Lead Verifier: Nina Pinette, Environmental Scientist
npinette@rubycanyoneng.com

Verifier: Minerva Lopez, Environmental Scientist
mlopez@rubycanyoneng.com

Independent Peer Reviewer: Michael Cote, President and Environmental Scientist
mcote@rubycanyoneng.com

Project Developer:

Impala Terminals Group:
Impala Terminals Colombia S.A.S.
Impala Terminals Barrancabermeja S.A.

Alexander Higuera, Director General de Operaciones
alexander.higuera@impalaterminals.com
+57.5.385.0537

Trafigura:
Trafigura Energy Colombia S.A.S.
Trafigura Petroleum Colombia S.A.S.

Susana Dennis. Lawyer.
susana.dennis@trafigura.com
+57.1.742.0910

Technical Consultant:

CAIA Ingeniería S.A.S.
Alexander Valencia Cruz



RUBY CANYON ENGINEERING

avalencia@caiaingenieria.com
+57 300 216 2406

Jessica Wade-Murphy de Jiménez
jwm@atmospherealternative.com
+57 310 782 7017

2. VERIFICATION CRITERIA

Verification Criteria	Details
Standards and Protocols for Verification	<ul style="list-style-type: none"> • GHG CleanProjects® Registry. • Clean Development Mechanism AM0090 Modal shift in transportation of cargo from road transportation to water or rail transportation version 01.1.0. • Associated Clean Development Mechanism Tools. • Colombia Ministry of Finance Decree 926 of 2017 and Ministry of Environment and Sustainable Development Resolution 1447 of 2018. • ISO 14064-3:2006 Greenhouse Gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions. • ISO 14064-2:2006 Greenhouse Gases – Part 2: Specification with guidance at the project level for quantification, monitoring, and reporting of greenhouse gas emission reductions or removal enhancements.
Supporting Data	Have sufficient controls to be considered fair and accurate and without material discrepancy.
GHG Assertion	Are sufficiently accurate to be considered fair and accurate and without material discrepancy.
Level of Assurance	Reasonable Assurance
Ownership	There are no competing claims to the ownership of the Project and the resulting emission reductions or removals.

2.1. Scope

Scope Criteria	Details
Organizational Boundaries	Impala's cargo transportation operation via the Magdalena River between its terminal in Barrancabermeja, Colombia and Sociedad Portuaria Puerto Bahia in Cartagena, Colombia
Infrastructure, Activities, Technologies, Processes	Transportation project involving a modal shift from trucks transporting petroleum products via land to barges transporting the products via the Magdalena River. The Project scenario reduces GHG emissions by consuming less fuel to transport the products via the river.
GHG SSRs	Baseline Emissions: fuel consumption for road cargo transportation Project Emissions: Fuel and/or electricity consumption for river cargo transportation

GHGs Reported	CO ₂
Reporting Period	June 19, 2015 – December 31, 2017

2.2. Materiality

A +/-5 percent materiality threshold was applied in the assessments of the GHG Report and calculations in the GHG assertion.

3. VERIFICATION PLAN

As the first step in verification activities, RCE developed a risk-based verification plan to follow throughout the verification process. The verification plan included the following activities:

- RCE’s Internal Auditor completed a Project Conflict of Interest (COI) form on April 15, 2019 to identify any potential conflict with the Project or Project developer. The COI assessment revealed no conflicts of interest. RCE adhered to its COI Policies used under ISO 14065 throughout the verification activities to ensure RCE remained independent and fair, and exercised professional due care and judgement during the verification.
- RCE held a verification kick-off meeting with Impala via teleconference on April 16, 2019. During the kick-off meeting RCE reviewed the verification objectives and process, reviewed the verification schedule, and requested verification background documents.
- RCE performed a strategic review and risk assessment of the received data and support documents in order to understand the nature, scale, and complexity and areas of potential risk in the GHG emissions reductions. RCE reviewed the methodologies used as well as the requirements of the GHG CleanProjects® Registry. The risk-assessment identified areas of inherent, control, and detection risks related to conformance to the methodology, baseline scenarios, monitoring and metering, data management, emission reduction calculations, and emission factors used.
- RCE developed a sampling plan that controlled detection risk based upon the strategic review and risk assessment. The sampling plan included assessment of project boundaries, the GHG management systems, information control systems, quality assurance (QA) procedures, application of emissions factors, and GHG emission reductions calculations. The verification plan and sampling plan were used and updated throughout the verification activities and revised as necessary based upon additional perceived risks.
- The verification team, consisting of the lead verifier and a verifier, conducted a site visit to the project location on May 21-22, 2019. During the site visit, the verification team performed key personnel interviews with Impala and Impala’s technical consultants, as described in more detail in section 1.3 of this report, above. The team viewed project equipment and project operations, also described in more detail in section 1.3 of this report; observed onsite GHG management systems, including data gathering, monitoring and handling

- practices; and reviewed polices for project data quality assurance/quality control and data retention practices. RCE confirmed that all involved personnel are experienced and possess the necessary competencies to perform their Project roles.
- RCE performed a risk-based review of the submitted GHG Report and supporting documents. The review included an assessment of the GHG Report's adherence to the CDM methodology and tools, GHG calculation methods and inputs, source documentation completeness, evidence of ownership, GHG management and monitoring systems, evidence of start date, evidence that the project activity follows the GHG Report and methodology, evidence of compliance to the monitoring plan, and company record retention practices. RCE found the data management and flow to GHG calculations to be transparent and accurate.
 - RCE submitted five rounds of findings via the List of Findings document that included two requests for corrective action, a request for non-material corrective action, 9 requests for additional documentation, and 4 requests for clarifications. Impala updated the GHG Report to meet the requirements of the methodology and provided satisfactory responses to all requested documentation and clarifications.
 - RCE's independent peer reviewer conducted a review of the GHG Report and Assertion, verification procedures, sampling plan, findings, verification report and verification statement.
 - RCE developed a final Verification Report, Verification Statement, and List of Findings based on the GHG Report v3 and GHG Assertion v2.0, which will be presented for registration.
 - The verification plan, sampling plan, and other verification documents are available upon request.
 - RCE held an exit meeting with Impala on September 4 of 2019.

3.1.Verification Records

RCE's QA/QC policies are consistent with ISO 14065 standards. RCE retains verification records in accordance with GHG program, contractual, legal, or other management system requirements. Where no external record retention mandates are required, RCE shall retain all records according to RCE's Record Retention Policy. The Policy outlines procedures to maintain validation or verification records securely and confidentially, including during their transport, transmission, or transfer for a minimum of seven years.

3.2.Facts discovered after the verification

RCE's policies for addressing facts discovered after the verification are consistent with ISO 14064-3:2006 and 14065 standards.

4. VERIFICATION STATEMENT

The objective of the verification activities was to ensure that the GHG emission reductions claimed by Impala were real, quantifiable, additional, verifiable, counted once, under clear ownership, and that the Project was in compliance with methodology monitoring and reporting requirements. The Project meets the requirements for offset projects under Colombia Ministry of Environment and Sustainable Development rules. Furthermore, the verification activities ensure that the data provided to RCE is well documented and free of any material errors or omissions.

RCE and the verification team have avoided any actual or potential conflicts of interest with Impala and the intended users of the GHG emission reductions in the GHG Report. The parties involved in the verification of the GHG Report were not, in any way, involved in GHG consultancy services for the development of the Project or the GHG Report. To ensure independence and avoid conflicts of interest RCE follows its “RCE Conflict of Interest Policy - Version 1.1.”

Impala provided sufficient evidence and documentation of its emission estimates, data collection procedures, and monitoring and quality control procedures. The verification process focused on ensuring that the GHG Report and monitoring plan adhere to the AM0090 – Modal shift in transportation of cargo from road transportation to water or rail transportation methodology and reviewing the emission reduction calculations and the source data used by Impala to quantify the emission reductions. The Project reported emission reductions of CO₂ from the modal shift in transportation of crude oil and other petroleum products from road transportation to water transportation of **66,366** metric tons of CO₂ from June 19, 2015 through December 31, 2017 as per the information provided in the Project calculation spreadsheet.

During the verification process, RCE made requests for corrective actions, additional documentation, and clarifications to complete the verification. Impala sufficiently addressed all requests. The details of these requests are documented in RCE’s List of Findings provided to Impala. The Project can be considered:

- In conformance with GHG CleanProjects® Registry, Clean Development Mechanism Methodology AM0090 Modal shift in transportation of cargo from road transportation to water or rail transportation version 01.1.0, Colombia Ministry of Finance Decree 926 of 2017 and Ministry of Environment Resolution 1447 of 2018, ISO 14064-2 and ISO 14064-3 standards;
- Fair and accurate;
- Without material discrepancy or material changes in how the project was carried out compared to the GHG Report, and
- Verified to a reasonable level of assurance.

Emission Reductions Verified for June 19, 2015 to December 31, 2017

Vintage	CO ₂ (metric tons)
2015	1,351
2016	19,675
2017	45,340
Total Emission Reductions	66,366



Nina Pinette

Lead Verifier, Ruby Canyon Engineering

Date: September 4, 2019

CONFLICT OF INTEREST REVIEW CHECKLIST

5. ASSESSMENT AND PROCEDURES

5.1. Assessment of threats to Independence

The COI assessment addressed the financial results with the project proponent and also the prior work history of all management and verification team members involved in this project. RCE has never performed verification services and has not performed any consulting services for the project proponent and has not consulted on this GHG Project. There is no shared management or any prior relationship with the project proponent. In addition, the conflict of interest assessment resulted in no perceived threats related to incentives, financial interest, self-review or consulting, familiarity or relationship or intimidation or coercion. Based on this review, there does not appear to be any threat to the independence in relation to performing this verification with the operator.

5.2. Mitigation procedures

There were no mitigation procedures that were deemed necessary based on the results the assessment for a conflict of interest or threats to independence.

5.3. Conflict of Interest Checklist

	Yes	No	Details
<p>Independence</p> <p>Remain independent of the activity being verified, and free from bias and conflict of interest.</p> <p>Maintain objectivity throughout the verification to ensure that the findings and conclusions will be based on objective evidence generated during the verification.</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	RCE completes an internal COI assessment which addresses independence and objectivity based on its ISO 14065 policies. This assessment looks at past services (verification, non-verification, etc.) provided for the client on a company and individual level and discusses the nature of the work in addition to any financial relationships, if any exist. RCE's internal COI form shows that the COI risk is low and does not require mitigation.
<p>Ethical conduct</p> <p>Demonstrate ethical conduct through trust, integrity, confidentiality and discretion throughout the verification process.</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	RCE follows ISO 14064-3 standards when completing validations and verifications and thus, demonstrates ethical conduct throughout all verification activities.
<p>Fair presentation</p> <p>Reflect truthfully and accurately verification activities, findings, conclusions and reports. Report significant obstacles encountered</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	RCE follows ISO 14064-3 standards when completing validations verifications and thus, demonstrates fair representation throughout the verification process. All findings are

during the verification process, as well as unresolved, diverging opinions among verifiers, the responsible party and the client.			documented in a list of findings and if any significant obstacles are encountered, these would be discussed in the verification report. There were no significant obstacles during this verification.
Due professional care Exercise due professional care and judgment in accordance with the importance of the task performed and the confidence placed by clients and intended users. Have the necessary skills and competences to undertake the verification.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	RCE follows ISO 14064-3 standards when completing validations and verifications and thus, demonstrates due professional care throughout all verification activities. RCE follows the competency requirements set forth by ISO 14065 and selects the verification team based on appropriate skills, abilities, experience, and technical expertise.

6.2 AFFIRMATION

In signing this document, I certify, on behalf of the Verification Body that:

I am an authorized officer of the Verification Body and have personally examined and am familiar with the information submitted in this Conflict of Interest Assessment.

Based upon reasonable investigation, including my inquiry of those individuals responsible for completing the assessment and implementing the procedures, I hereby warrant that the Verification Body avoided any actual or potential conflict of interest with the project proponent.

Verification Body-Signatory Name and Title:	Eilleen M. Kerby Treasurer/Independent Auditor for Ruby Canyon Engineering, Inc.
Signature:	
Date:	September 4, 2019