Project design document form
(Version 12.0)

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION	
Title of the project activity	Providencia III: 9.11MW Small Hydro Power generation Plant
Scale of the project activity	☐ Large-scale ☒ Small-scale
Version number of the PDD	Version 9.1
Completion date of the PDD	31/07/2021
Project participants	MINEROS ALUVIAL S.A.S. BIC (private entity) The Andean Center for Economics in the Environment – CAEMA – ACEE (Private entity)
Host Party	Colombia
Applied methodologies and standardized baselines	Methodology: AMS – I.F – Renewable electricity generation for captive use and minigrid. (Version 3, EB 61).
Sectoral scopes	01. Energy industries (renewable - / non-renewable sources)
Estimated amount of annual average GHG emission reductions	36,165 tCO2e/year

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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The project activity is to build and operate a new small hydropower generation plant named *Providencia III* located at the Providencia region, municipality of Anorí, Department of Antioquia, Colombia. Mineros Aluvial S.A.S. BIC built the *Providencia III* project activity, a Type I Small Scale CDM Project Activity, implementing a run-of-the-river power plant without reservoir generating electricity by means of two Francis-type turbines with a combined installed net capacity of 11.16 MWe (6,975kVA x 0.8 operation factor x 2 gensets = 11,160kW net installed capacity). Installed capacity is not be higher than 15 MWe during the crediting period. Prior to the implementation of the project activity no hydropower plant existed at that location. Mineros Aluvial S.A.S. BIC is a state owned commercial enterprise that works under private law. Mineros Aluvial S.A.S. BIC uses electricity to be generated at the *Providencia III* project for dredging and gold mining activities located on the basin of the Anorí river. All dredging and mining activities are connected to a small privately owned electricity grid, with connection to the National Interconnected grid. According to the Mineros Aluvial S.A.S. BIC mining extraction plans, in the absence of the project activity increases in electricity demand for all dredging and mining activities would be taken from the national grid.

The power plant have a net head of 84.06m and a design flow of 14.3m^3/s. Water for power generation at *Providencia III* is captured from the Anorí River downstream of the *Providencia* SHP plant water outlet, where the intake and sands retainer channel were built. The discharge is made downstream at the same Anorí river.

Two Francis-type horizontal axis turbines with installed capacity of 5,580MWe each, a water flow of 7.15m^3/s each, a net head of 84.06m, and a rotation speed of 600rpm. The turbine's operation control is handled by the speed control, by governing the operation of the blades to start the unit, sync, charge and discharge. Thus, the net electricity outflow is 13,950kVA (6,975kVA x 2) x 0.8 x 8760 = 97,761.6MWh. In leap years total energy outflow is calculated as (6,975kVA x 2) x 0.8 x 8784 = 98,029.44MWh. The generators are three-phased synchronous generators with a horizontal axis. They have an operating power of 5,580kW each, with an efficiency of no less than 96.5%, and a rotor temperature increase of 75°C over an ambient temperature of 40°C. Their synchronous speed is 600rpm and runaway speed is estimated at 1,100rpm. The three-phase transformers are oil submerged with a primary voltage in synchronization with the generation voltage (4160 V) and 60 Hz; a secondary voltage of 44 kV and a nominal power of 12 MVA.

Prior to the implementation of the project activity no hydropower plant existed at that location. Mineros Aluvial S.A.S. BIC is a state owned commercial enterprise that works under private law. Mineros Aluvial S.A.S. BIC uses electricity generated at the Providencia III project for dredging and gold mining activities located on the basin of the Anorí river. All dredging, mining and refining activities are connected to a small privately owned electricity grid, with connection to the National Interconnected grid at the point named Bijagual. According to the Mineros Aluvial S.A.S. BIC development plans, the national interconnected electricity grid would have provided excess electricity demand in the absence of the Providencia III project activity to supply power to all dredging, mining and refining activities. The power plant have a net head of 84.06m and a design flow of 14.3m^3/s. Water for power generation at Providencia III is captured from the Anorí River downstream of the Providencia SHP plant water outlet, where the intake and sands retainer channel is built. The discharge is made downstream at the same Anorí river.

The conduction of water from the intake to the powerhouse is underground. The optimal section of the horseshoe shaped tunnel is 3.20m in diameter and the diameter selected for the penstock pipe is 2.0m. Considering the hydraulic losses generated by the proposed

tunnel and pipe diameters, the estimated net installed capacity for the Providencia III *Small Hydroelectric Power (SHP) plant project is of 11.16 MW.*

The project reduces greenhouse gas (GHG) emissions through the operation of the new plant, which displaces electricity consumption from the National electricity grid that served a privately owned small local grid owned by Mineros Aluvial S.A.S. BIC which supplied electricity to the encampments and areas of mining of gold and precious minerals.

Expected emission reductions are presented in the following table:

Year	ER [tCO2e/y]
12/03/2022 - 31/12/2022	30,464
01/01/2023- 31/12/2023	37,565
01/01/2024 - 31/12/2024	37,668
01/01/2025 - 31/12/2025	37,565
01/01/2026 - 31/12/2026	37,565
01/01/2027- 31/12/2027	37,565
01/01/2028 - 11/03/2029	44,769
Total	263,160
Length of the crediting period	7
Average	36,165

The project activity contributes significantly to the sustainable development of the region for the following reasons:

- It promotes local economic growth by creating employment and offering training to the communities directly related with the project. This can help to reduce poverty in areas where great influence of irregular armed groups (guerilla, paramilitaries and criminal bands) exists.

- The use of renewable energy displaces the generation of electricity through GHG emitting fossil fuels, which affects global warming, as well as other gases that pollute local air.

- The project allows a broad access to higher quality, more stable electricity. As stable sources of electricity are expanded to municipalities at the edge of the interconnected grid, this allows to increase coverage in rural areas.

- It stimulates the transfer of clean technologies and renewable energy generation, thus promoting a greater sustainable development in the country.

- Because the generator plant is a run-of-the-river, no water reservoirs are required. This decrease the impact of the project on the environment, as they do not require dams or major civil works.

- The project ensures that, in the section of the river that channels water into the power plant, the sufficient ecological flow is maintained to meet the water needs of the communities that are supplied from this source and also meet the needs of the surrounding flora and fauna.

- To develop the project, roads and bridges must be adapted to transport

generating equipment and materials. This initial investment and maintenance of these roads and bridges are an additional contribution of this project to the surrounding community.

- This is a Small Scale Type I CDM project activity

- With the implementation of the project activity, the municipality of Anorí receives additional revenues from royalties established by law, giving the municipality the opportunity to increase social investment. Social investment is greatly needed due to the existence of guerrillas, paramilitaries and criminal bands.

A.2. Location of project activity

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Country: Colombia.
Zone: Department of Antioquia
Loacation: Municipality of Anorí, areas of Providencia, Toná and Usurá; and the human settlement named El Charcón-Liberia.

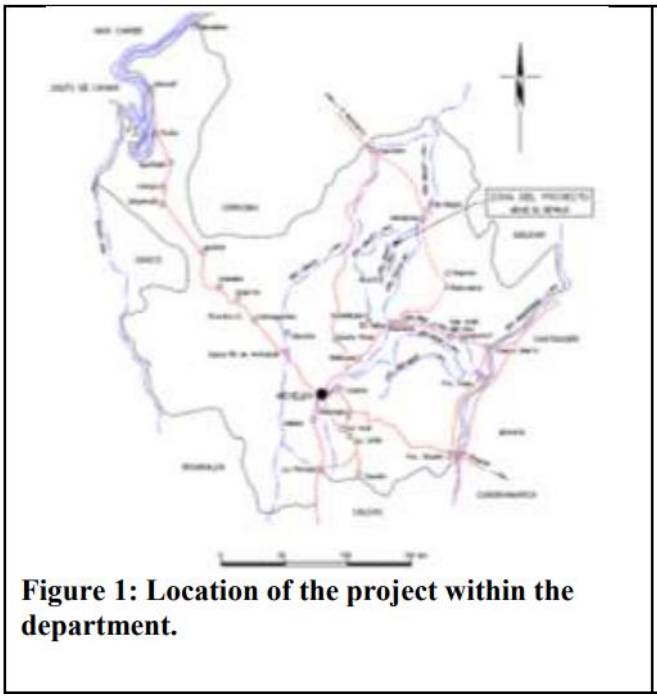

Figure 1: Location of the project within the department.

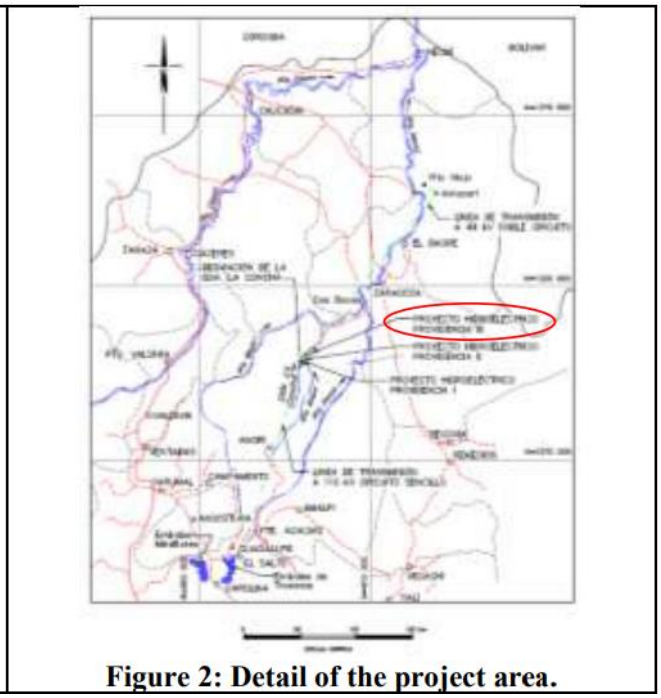

Figure 2: Detail of the project area.

Geographic coordinates of the SHP Providencia III CDM project activity are the following:

Place	Decimal UTM coordinates
Underground Powerhouse[1]:	Latitud: 7.330196° Longitud: - 75.030010°

A.3. Technologies/measures

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Scale: Small Scale Project Activity
Type: Type I – Renewable Energy Projects
Category: I.F. Renewable electricity generation for captive use and mini-grid

[1] UTM coordinates was calculated using following link:
http://www.asturnatura.com/sinflac/calculadoraconversiones-coordenadas.php

The small hydropower plant Providencia III has two Francis-type horizontal axis turbines with installed capacity of 5.58MWe each, a water flow of 7.15m³/s each, a net head of 84.06m, and a rotation speed of 600rpm.

The turbine's operation control is handled by the speed control, by governing the operation of the blades to start the unit, sync, charge and discharge. Thus, the net electricity outflow is 13,950kVA (6,975kVA x 2) x 0.8 x 8760 = 97,761.6MWh. In leap years total energy outflow is calculated as 13,950kVA (6,975kVA x 2) x 0.8 x 8784 = 98,029.44MWh.

Generators are three-phased synchronous generators horizontal axis. They have an operating power of 5,580kW each, with an efficiency of no less than 96.5%, and a rotor temperature increase of 75°C over an ambient temperature of 40°C. Their synchronous speed is 600rpm and runaway speed is estimated at 1,100rpm. Average lifetime of turbines and generators is 30 years according to common practices in the sector.

The three-phase transformers are oil submerged with a primary voltage in synchronization with the generation voltage (4160 V) and 60 Hz; a secondary voltage of 44 kV and a nominal power of 12 MVA.

Its electronic system protection, control and measurement is based on programmable logic controllers. The control shall be distributed and have various levels of control. The powerhouse is permanently staffed, and have a chain of command that starts from the manual operation control panels for each team to an automatic control of each unit that can be programmed with the corresponding logic controller and can be activated by manual command on the control board, running the different start and stop sequences to be defined in the coming design phase.

Regarding the civil works, both the penstock and powerhouse of the SHP plant Providencia III were built underground. The horseshoe shaped tunnel begins at the sand retaining structure and has a length of 3,358m and a vaulted section of 3.2 m wide and 3.2 m in height. The underground powerhouse is located on a rock formation that is not affected by geologic failures or misalignments. It houses the bridge crane, the two generator groups, the intake valves, the assembly room, auxiliary electromechanical equipment, power transformer, the area for the electrical panels and substation, the control room, office, storage area and service area. It has three levels:

- Top level or control level: Area located at an elevation of 219.80 m.a.s.l. It has the protection and control panels, battery room, offices, bathrooms and a kitchenette.
- Intermediate Level or Access Level: At 213.50 m.a.s.l. Access to cavern, location of the three- phase transformer, the substation enclosure, the assembly area and the board area.
- Lower level or equipment level: At an elevation of 209.60 m.a.s.l. The generating equipment is installed at this level, intake and relief valves, and auxiliary electromechanical equipment.

The outflow from the plant is delivered back to the Anorí River through a discharge tunnel of 255 m in length and 0.3% downward slope. This section of the tunnel is 3.5 m wide by 3.5 m high, with straight walls and vaulted. The tunnel operates free-flow at a height of 1.98m and flow velocity of 1.9 m/s when it channels the design flow of 14.3 m3/s.

To move the energy and connect the plant to the Mineros privately owned small grid, it was necessary to build a double circuit power line from the Providencia III substation to the "New Industrial Zone" (Nueva Zona Industrial) substation A second auxiliary double circuit power line was built to the Providencia substation (0,3 km). From the

Providencia substation, a double-circuit, overhead, power line is projected to move 44 kV a distance ranging from 36.6 to 45,3km from the Providence substation to the "Nueva Zona Industrial" substation at the Mineros Aluvial S.A.S. BIC headquarters at El Bagre City.

Measurement of electricity generation at the Providencia III project is undertaken using 2 high precision energy meters located at the new Providencia III Substation (44kV). In cases when excess electricity is to be delivered to the National Grid, 2 more high precision energy meters are located at the "El Bagre" Substation for metering dispatched electricity to the grid. Delivery of electricity to the National Grid depends upon electricity demand from dredgers and gold refining activities at Mineros Aluvial S.A.S. BIC. An additional backup high precision electricity meter is available at each substation. Check of the information is performed by MINEROS ALUVIAL S.A.S. BIC Energy Division at the Providencia III substation. Hourly records are taken by supervisors at Providencia III substation in paper formats; daily electricity generation is written in an internal spreadsheet and sent to Mineros Aluvial S.A.S. BIC El Bagre Headquarters energy division.

Main characteristics of the generating equipment:

Data	**Option selected for the SHP Providencia III**
Gross head (m.c.a.)	90.3
Net head (m.c.a.)	84.06
Losses (m.c.a.)	6.24
Total Net Power output (MW)	11.16
No. of units	2
Turbine type	Francis
Synchronous speed (rpm)	600
GD2 (ton-m^2)	21.4
Pressure compensation mechanism	Relief valve set to open
Bridge crane hoisting distance (m)	6.5

Data	**Option selected for the SHP Providencia III**
Average lifetime of equipment according to common practice in sector (years)	30
Monitoring equipment and location	2 High precision energy meters located at the new Providencia III Substation (44kV). In cases when excess electricity is delivered to the National Grid.

Equipment efficiency	0.884

▪ Turbine (η_t)	0.92
▪ Generator (η_g)	0.975
▪ Load Factor	0.82
▪ Transformer (η_{tt})	0.985

The most significant negative impacts are:

- The production of discharge and solid waste during the construction and operation of the generator plant. These are handled and disposed of in accordance with the provisions of the Environmental Management Plan and with current environmental regulations.
- Noise created by the operation of the SHP station. The noise is measured periodically to determine compliance with environmental regulations regarding the maximum permissible standards. Since the Providencia III power station is located at the outlet of the discharge tunnel. Nuisance to the nearby community are expected to be negligible.

No significant environmental impacts are expected during implementation.

The project activity stimulates the transfer of clean technologies and renewable energy generation, in Colombian underdeveloped zones thus promoting greater development in the region by capacity building of workers at the new facility and long term positions for those operating the new Providencia III power station.

A.4. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Colombia (host)	Mineros Aluvial S.A.S. BIC (private entity)	No
	The Andean Center for Economics in the Environment – CAEMA - ACEE	

A.5. Public funding of project activity

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The project do not receive any public funding and is not a diversion of ODA

A.6. History of project activity

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The Providencia III CDM project activity:

- ✓ It is not registered as a CPA to a registered PoA nor it has been excluded from a registered PoA. It is neither a CPA or part of a PoA whose crediting period expired.
- ✓ It has not already registered as a CDM Project Activity.
- ✓ It is not a deregistered Project activity.

A.7. Debundling

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According to the Guidelines on assessment of debundling for SSC project activities, V03, EB 54, debundling is defined as the fragmentation of a large project activity into

smaller parts. A proposed small- scale project activity shall be deemed to be a debundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

- With the same project participants;
- In the same project category and technology/measure; and
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

Following the above Guidelines on assessment of debundling for SSC project activities, V03, EB 54, this project is not a fragmentation of a larger CDM project activity nor has this project applied before to be registered as part of another small scale project activity.

SECTION B. Application of methodologies and standardized baselines

B.1. References to methodologies and standardized baselines

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Methodology: AMS – I.F - Renewable electricity generation for captive use and mini-grid. (Version 3, EB 61).

Tools:

- Tool to calculate baseline, project and/or leakage emissions from electricity consumption. Version 5.
- Tool to calculate the Emission Factor for an electricity system version 7 was used to calculate a combined margin (CM) grid emissions factor for the National Interconnected Electricity System in Colombia, consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed. This project activity uses the UPME calculated emissions factor being UPME the national institution commissioned of doing such calculations by the designated national authority (DNA) for the CDM.
- Methodological Tool for Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period, version 03.0.1

B.2. Applicability of methodologies and standardized baselines

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The choice of the selected methodology is justified by showing that the project activity meets applicability conditions of Methodology AMS – I.F.v.3. as follows:

	APLICABILITY CONDITIONS (as per §3-11 in AMS-I.F Small-scale Methodology for crediting emission reductions from "renewable electricity generation for captive use and mini-grid". Version 03.0. Sectoral scope: 01)	Explanation of compliance by Project Participant
1	Illustration of respective situations under which each of the methodology (AMS-I.D., AMS-I.F. and AMS-I.[2]) applies is included in Table 3.	Under Project Type 2 of Table 3 in AMS-I.F it is possible to include projects that "displace grid electricity consumption […] (excess electricity may be supplied to a grid)".

[2] "AMS-I.D.: Grid connected renewable electricity generation", "AMS-I.F.: Renewable electricity generation for captive use and mini-grid" and "AMS-I.A: Electricity generation by the user".

2 Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:	N/A
(a) The project activity is implemented in an existing reservoir with no change in the volume of reservoir;	This is a Run-off-the River project activity. Water is brought back downstream to the river once it overpasses the SHP plant's turbine.
(b) The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m2;	N/A
(c) The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m2.	
3 This methodology is applicable for project activities that:	N/A
(a) Install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant)	This is a greenfield project.
(b) Involve a capacity addition[3]	N/A
(c) Involve a retrofit[4] of (an) existing plant(s).	N/A
(d) Involve a replacement[5] of (an) existing plant(s).	N/A
4 In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct[6] from the existing units.	N/A
5 In the case of retrofit or replacement, to qualify as a small-scale project, the total	N/A

[3] A capacity addition is an increase in the installed power generation capacity of an existing power plant through: (i) The installation of a new power plant beside the existing power plant/units; or (ii) The installation of new power units, additional to the existing power plant/units. The existing power plant/units continue to operate after the implementation of the project activity.

[4] Retrofit (or rehabilitation or refurbishment). A retrofit is an investment to repair or modify an existing power plant/unit, with the purpose to increase the efficiency, performance or power generation capacity of the plant, without adding new power plants or units, or to resume the operation of closed (mothballed) power plants. A retrofit restores the installed power generation capacity to or above its original level. Retrofits shall only include measures that involve capital investments and not regular maintenance or housekeeping measures.

[5] Replacement. Investment in a new power plant or unit that replaces one or several existing unit(s) at the existing power plant. The new power plant or unit has the same or a higher power generation capacity than the plant or unit that was replaced.

[6] Physically distinct units are those that are capable of generating electricity without the operation of existing units, and that do not directly affect the mechanical, thermal, or electrical characteristics of the existing facility. For example, the addition of a steam turbine to an existing combustion turbine to create a combined cycle unit would not be considered "physically distinct".

	output of the retrofitted or replacement unit shall not exceed the limit of 15 MW	
6	If the unit added has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, [7]the capacity of the entire unit shall not exceed the limit of 15 MW.	N/A
7	In case biomass is sourced from dedicated plantations, the applicability criteria in the tool "Project emissions from cultivation of biomass" shall apply.	N/A

	APPLICABILITY CONDITIONS (as per Tool 7 v7 Tool to calculate the emissions factor for an electricity system)	**Explanation of compliance by Project Participant**
1	This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	The Providencia III SHP plant substitutes grid electricity consumption supplying electricity to the Mineros S.A.S. BIC minigrid. Therefore, it uses the TOOL07 to estimate the OM, BM and/or CM to calculate its baseline emissions.
2	The emission factor for the project electricity system can be calculated for grid power plants.	Emission factor used in this document is the summary of emissions from power plants bound to the National Interconnected System and calculated using Simple Adjusted Method
3	Tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	This project if fully located in a non Annex I Country.
4	Under this tool, the value applied to the CO2 emission factor of biofuels is zero.	Biofuels emissions factor was assumed as zero (0) for the calculation of the National grid emissions factor.

[7] A co-fired system uses both fossil and renewable fuels, for example the simultaneous combustion of both biomass residues and fossil fuels in a single boiler. Fossil fuel may be used during a period of time when the biomass is not available and due justification are provided.

	APPLICABILITY CONDITIONS (as per Tool 11 v3.01 Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period)	Explanation of compliance by Project Participant
1	This tool provides a stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period, as required by paragraph 49 (a)[8] of the modalities and procedures of the clean development mechanism.	This document applied tool 11 for the renewal of the second crediting period to be seen in section B.4

According to the feasibility assessment for the construction of the Providencia III power station, installed capacity of each of the two turbines is 5.58MW totalling a gross capacity of 11.16MW which is below the 15 MW installed capacity required for Type I projects. It is important to note that the net installed capacity is calculated to be 11.16MW.

Under Project Type 2 of Table 2 in AMS-I.F it is possible to include projects that "displace grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)". In this case, Providencia III project activity displaces grid electricity consumption by delivering electricity to Mineros Aluvial S.A.S. BIC privately owned small grid (captive user).

According to paragraph 1 in AMS-I.F, this project activity comprises the installation of two "renewable energy generation unit(s), such as […] hydro [...] that supply electricity to user(s) (MINEROS ALUVIAL S.A.S. BIC mining activities). The project activity displaces electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit i.e. in the absence of the project activity, the users would have been supplied electricity from […] A national or a regional grid [and] Fossil fuel fired captive power plant[s] (in the footnote: Where the users of the captive electricity are also connected to the grid in the project site)". The measures quoted above are in accordance with those defined for AMS.I-F/Version 3. In addition, the capacity of the equipment is lower than 15MW. As per Appendix B of the simplified modalities and procedures for small-scale project activities, the project activity falls under type I.F categories. Yet, the average annual estimation of the estimated emission reductions of this project activity will not exceed 60 ktCO2e in any year of the crediting period (see section B.6.4) and the installed capacity of the equipment is lower than 15MWe (see section A.1). Therefore this small-scale CDM project category was selected to be applied for this project activity.

Summarizing, the Providencia III greenfield project qualifies under this project category since:

- The project activity is a hydroelectric power plant with net installed capacity of 11.16MWe.
- It displaces grid electricity consumption of dredgers and gold refining activities that draw electricity from the Mineros Aluvial S.A.S. BIC small privately owned grid (dredgers and refining facilities belong to Mineros Aluvial S.A.S. BIC- the end user). Excess electricity may be supplied to the National Interconnected Grid.

[8] §49(a) of the CDM modalities and procedures states: "Project participants shall select a crediting period for a proposed project activity from one of the following alternative approaches: (a) A maximum of seven years which may be renewed at most two times, provided that, for each renewal, a designated operational entity determines and informs the Executive Board that the original project baseline is still valid or has been updated taking account of new data where applicable.

- The project activity is a new power plant (Greenfield plant) at a site where no renewable energy plant operated prior to the implementation of the project activity;

- It is a run-of-the-river plant.

B.3. Project boundary, sources and greenhouse gases (GHGs)

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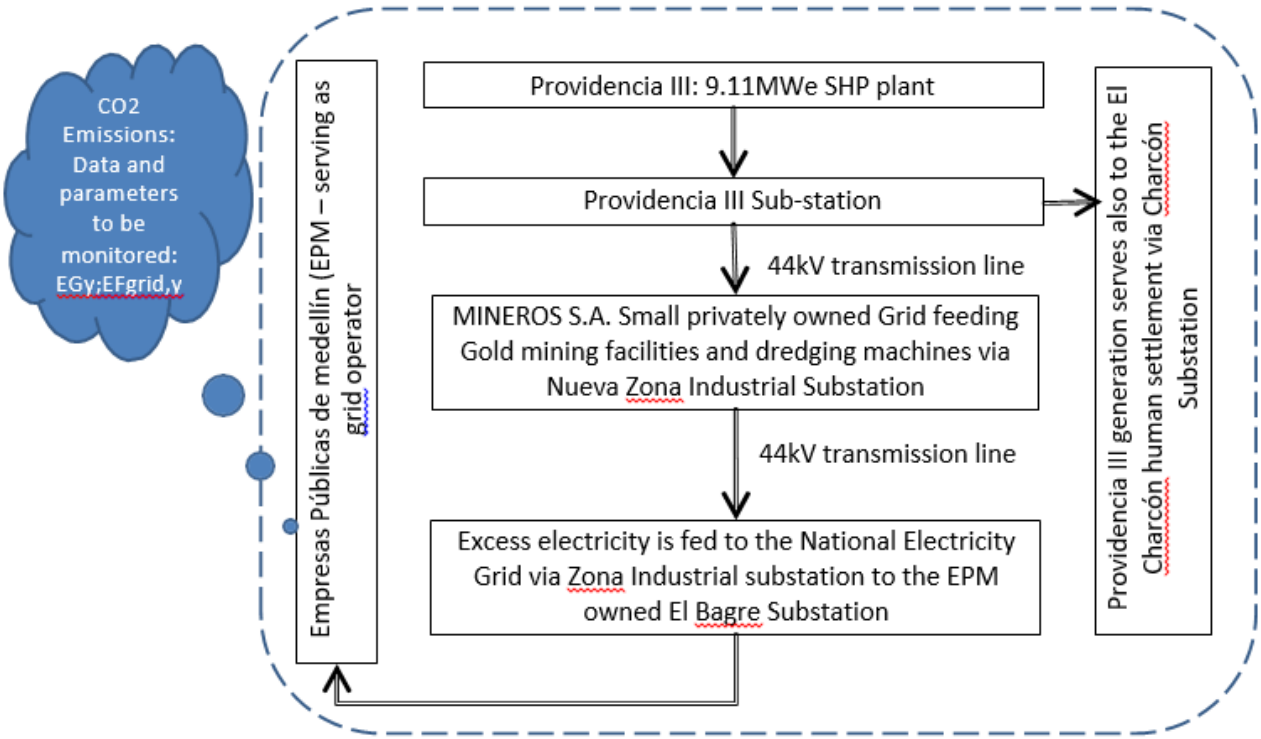
According to AMS-I.F v.3 the Project Boundary includes "industrial, commercial facilities consuming energy generated by the system. […] The boundary also extends to the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to".

Definition of an electricity system is provided by the "Tool to calculate the emission factor for an electricity system v.7": "electricity system is defined by the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity (e.g. the renewable power plant location) and that can be dispatched without significant transmission constraints". Since the Providencia III electricity generation is mainly addressing electricity consumption from dredgers, machinery, and refining facilities within the small privately owned small grid but small amounts of electricity may be dispatched to the grid without significant constraints, once the project is implemented. Then, the spatial extent of the project boundary is considered to be the national electricity grid according to the description of the National Electricity Grid presented by the National Dispatch Centre at the web link https://www1.upme.gov.co/Energia_electrica/Plan_GT_2017_2031_PREL.pdf

An overview of all emission sources included in or excluded is depicted in the following table:

	Source	Gas	Included?	Justification / Explanation
Baseline	Emission from combustion of fossil fuel in power plant for electricity generation	CO2	Included	This is the major source of Green house gas emission from consumption of electricity from the grid.
		CH4	Excluded	Excluded as they are minor emission sources
		N2O	Excluded	Excluded as they are minor emission sources
Project activity	Electricity Generation from Renewable sources	CO2	Included	Project emissions from generation of hydropower are considered to be 0.
		CH4	Excluded	Power generation utilizing hydropower without reservoir results in zero emission.
		N2O	Excluded	Power generation utilizing hydropower without reservoir results in zero emission.

The topology diagram for the project boundary is presented in Appendix 3: BASELINE INFORMATION; Section 2: In place electricity connections from the PROVIDENCIA SHP plant to the small MINEROS ALUVIAL S.A.S. BIC grid and to the national electricity grid. For simplicity, the electricity topology diagram in Appendix 3 has been summarized in the schematic below to presents the project's boundary.



B.4. Establishment and description of baseline scenario

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Following the Tool 11 stepwise approach for the "assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period (Version 03.0.1)"

STEP 1.: Assess the validity of the current baseline for the next crediting Period

STEP 1.1.: Assess the compliance of the current baseline with relevant mandatory and or sectoral policies.

MINEROS ALUVIAL S.A.S. uses electricity to run dredging machines for gold mining activities and to run refining and administrative facilities. All activities take place in the lower Cauca River region at the Anorí municipality; administrative facilities are located near El Bagre city and dredging vessels are located on the run of the Nechí, Anorí and Cauca rivers.

SITUATION IN THE FIRST CREDITING PERIOD:
MINEROS ALUVIAL S.A.S. B.I.C. owns a small grid that includes 7.5MWe installed capacity of hydropower generation and 6.62MWe of diesel based generation. During the period comprised between 2009 and 2013, excess electricity demand was purchased from the grid. Registries of the last three years are presented in Appendix 3 under section 1: Electricity consumption of administrative facilities and dredging machines at Mineros Aluvial S.A.S. BIC. A diagram representing the current electricity connexions from the Providencia SHP plant to the small MINEROS ALUVIAL S.A.S. BIC grid and to the National electricity grid is presented in Appendix 3 under section 2.

MINEROS ALUVIAL S.A.S BIC. performs preventive maintenance for the generation equipment. As per the Providencia SHP plant, retrofitting of the

Pelton turbines and generators was performed on the period 1997-2003[9]. In addition, the MINEROS ALUVIAL S.A.S. BIC Energy Division performs a complete maintenance on the start-up, shut down and delivery of electricity activities seeking to secure the longest lifetime of the four generation units. The attached file named "Maintenance records on Providencia units 1-4 – Energy division.xlsx" includes a list of the retrofitting and maintenance activities performed in the period 2000- 2011.

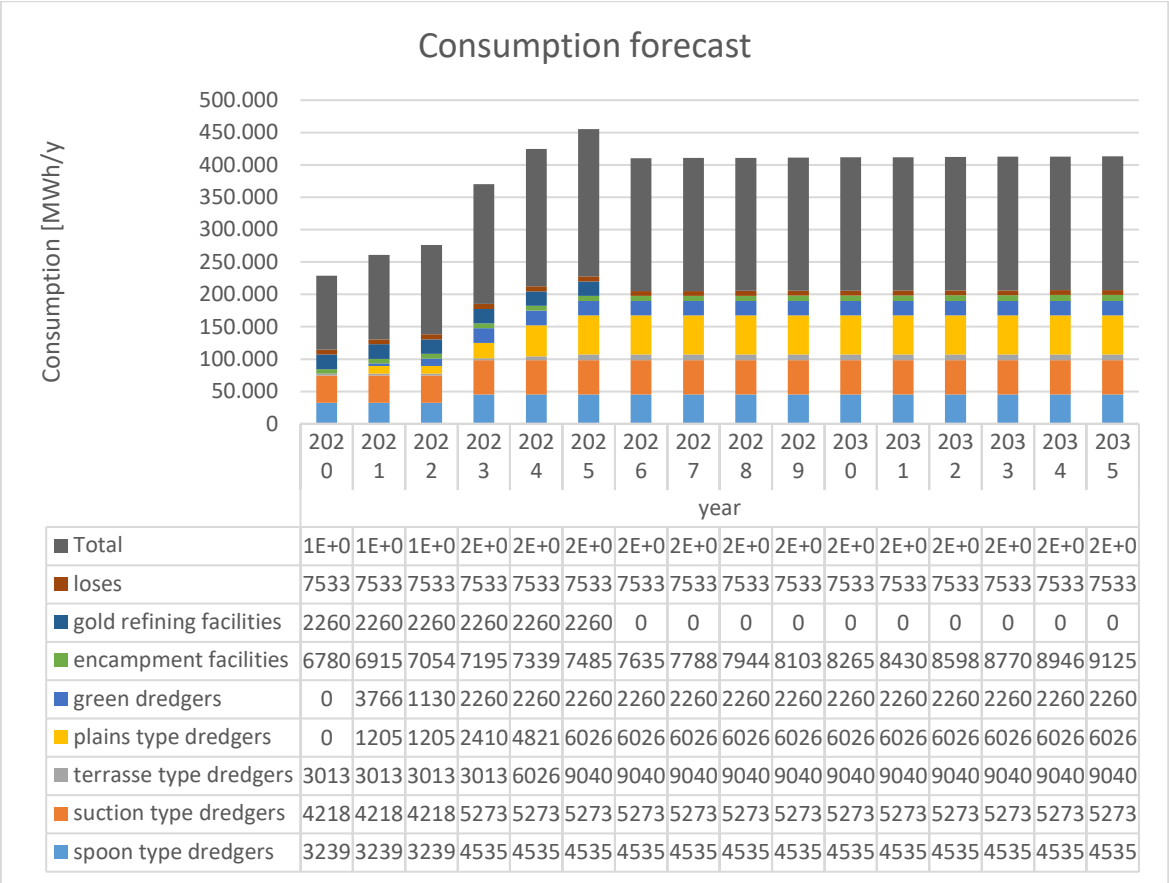
FUTURE SITUATION:

MINEROS ALUVIAL S.A.S. B.I.C. will increase demand in the medium to long term.

According to the expansion plan of Mineros Aluvial S.A.S. BIC, the number of dredging machines are increasing in time and, as a result, electricity consumption is going to increase. Mineros Aluvial S.A.S. estimations of future needed capacity expansion is presented in **Figure 5.** This forecast was made in 2010 and represents the best case scenario for gold mining production. Acquisition of dredging machines is in place.

As presented in Appendix 3 section 1, the use of diesel for electricity generation has increased in recent years. Diesel generation was implemented in Mineros Aluvial S.A.S. looking to prevent temporary failures in electricity supply at the Bijagual substation, point of connection with EPM (the electricity provider), and blackouts due to bombing attacks to the electricity transmission lines by the illegal armed forces. However, given the expansion of gold mining activities as of May 2009, diesel generation was considered as a part of the base load of electricity for the small Mineros Aluvial S.A.S. privately owned grid instead of being a backup source of electricity as initially planned. The cost of generating electricity by means of diesel is also increasing given the rise in the international oil price. Therefore, Mineros Aluvial S.A.S. is willing to rely on more stable prices for electricity coming from renewable sources.

[9] According to the energy division: Unit 4 has a complete retrofitting in 2001; Unit 3 on 2003; and, Unit 2 and Unit 1 on 1997



	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Total	1E+0	1E+0	1E+0	2E+0	2E+0	2E+0	2E+0	2E+0	2E+0	2E+0	2E+0	2E+0	2E+0	2E+0	2E+0	2E+0
loses	7533	7533	7533	7533	7533	7533	7533	7533	7533	7533	7533	7533	7533	7533	7533	7533
gold refining facilities	2260	2260	2260	2260	2260	2260	0	0	0	0	0	0	0	0	0	0
encampment facilities	6780	6915	7054	7195	7339	7485	7635	7788	7944	8103	8265	8430	8598	8770	8946	9125
green dredgers	0	3766	1130	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
plains type dredgers	0	1205	1205	2410	4821	6026	6026	6026	6026	6026	6026	6026	6026	6026	6026	6026
terrasse type dredgers	3013	3013	3013	3013	6026	9040	9040	9040	9040	9040	9040	9040	9040	9040	9040	9040
suction type dredgers	4218	4218	4218	5273	5273	5273	5273	5273	5273	5273	5273	5273	5273	5273	5273	5273
spoon type dredgers	3239	3239	3239	4535	4535	4535	4535	4535	4535	4535	4535	4535	4535	4535	4535	4535

Figure 5: Forecast of expected capacity additions of electricity to fulfil future Mineros Aluvial S.A.S. demand. Source: Mineros Aluvial S.A.S. energy division.

SCENARIOS TO SATISFY FUTURE ELECTRICITY DEMAND.

Scenario 1: **Electricity supply from the grid is increased**. EPM already supplies electricity to Mineros Aluvial S.A.S., both companies are still looking for a binding agreement to avoid fluctuations and blackouts and improve quality of the service in general terms.

Scenario 2: **Electricity supply from diesel based generation is increased**. Diesel based electricity has proven to be effective, already in place, reliable, easy to install and cheaper than other sources of electricity but the Colombian Electricity grid which is fed by Hydro Power principally. However, falling prices of diesel would bring diesel power an opportunity to compete with hydropower.

Scenario 3: **Electricity supply from new hydropower developments is increased**. Depending on own hydropower sources will result in the lesser emissions from these scenarios. However, sources of financing may result elusive due to the complexities of the endeavour in a very underdeveloped region where an armed conflict is ongoing.

Due to variability in fuel prices, increase capacity by means of diesel based generation Scenario 2 is not attractive. Scenario 3 is preferred on top of other scenarios since it solves problems of variability in the supply of electricity at the edge of the grid. For raising capacity, MINEROS ALUVIAL S.A.S. BIC followed all policy directives for the Colombian electricity sector for the construction and turnkey of the Providencia I SHP plant.

	Substantive difference with regulation in baseline?	Validity during second crediting period?
Laws 142/143 of 1994 Set procedures for the generation, interconnection, transmission, distribution, and commercialization of electricity	No	Yes
Resolution 055 of 1994 - Electricity market conditions	No	Yes
Resolution 086 of 1996 - Power generation activities regulation	No	Yes
Resolution 039 of 2001 - Establish complementary conditions	No	Yes
Law 697 of 2001 - Promotes the development and use of rational and efficient sources of energy	No	Yes
Law 1715 of 2014 Controls the integration of nonconventional renewable energies into the National Energy System.	No	Yes

Also, during operation phase, the National Dispatch Centre supervises the operation of Providencia I and other Providencia generation units to secure compliance of all regulation applicable to the feeding of electricity activity day after day; therefore, operation follows national and sectoral regulations.

In conclusion, as it was demonstrated in validation of this project activity and during operation until present, the Providencia I SHP plant project fulfils all national and sectoral Policy.

STEP 1.2.: Assess the impact of circumstances

Original baseline for this project activity is increased consumption of electricity due to expansion of mining activities. Alternatives were:

1) Increase grid electricity consumption;
2) Increase of fossil fuel based electricity consumption; and,
3) Raise new capacity to fulfil inner demand.

Additional circumstances include:

1) the Mineros mini-grid is the last consumer for the region and it is fed by the National grid electricity system and, therefore, supply is fluctuating, though, during years the grid has been the only supplier to satisfy electricity demand, hence, investment in stability of the supply may come in the future;
2) in the meantime (while investment in supply stability comes) Mineros Aluvial S.A.S. BIC would invest in new capacity either fossil based or renewable;
3) In case of renewable, first step should be use the maximum ability from the Providencia small hydropower station.

This set of circumstances have not changed since the validation of the project activity. Construction of Providencia III SHP plant project still considers the above set of decisions every time Mineros envisions increases in electricity demand.

STEP 1.3: Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested

Again, baseline for this project activity is increase in electricity demand due to expansion of dredging and refining of gold activities which are the Mineros Aluvial S.A.S. B.I.C. core businesses.

The Providencia power started operations in 1938 with four generators. As of today, Providencia generators have been working for 80 years; last complete overhaul for units 1 and 2 was performed in 1997, for unit 3 in 2004 and unit 4 in 2001. It is common practice in Colombia to extend lifetime of generators. The Providencia I SHP project (Unit 5) is expected to work for a period longer than the crediting period of this project activity. So far, no new investments in addition of capacity to the Providencia I power station are envisioned due to end of technical lifetime.

Solar and biomass power are new sources participating in the Colombian grid. They started receiving same conditions for feeding the grid as other existing power plants feeding the grid. As it is seen by experts, renewable sources of electricity other than hydro do not limit or displace significantly the use of existing hydro power stations. Specially, due to the characteristics of power demand within the Mineros Aluvial S.A.S. BIC minigrid, it is not expected that biomass o solar power limit the use of the existing baseline equipments during the second crediting period of the Providencia I project activity.

Thus, the most likely scenario for the second crediting period is the continuation of use of the current baseline equipments or new technologies introduced in the Colombian electricity market without undertaking new investments due to end of technical lifetime during the second crediting period.

STEP 1.4.: Assessment of the validity of the data and parameters

At the time of first verification, it was amended what it seemed to be an editorial error leaving the possibility that the emissions factor would either be fixed at 2008 quantity or rather be variable during the crediting period in conformance of the yearly billed resolutions of UPME[10]. This controversy was clarified in the validation of Post Registration Changes to the PDD allowing the emissions factor to be variable in accordance to UPME resolutions.

The Project activity supplies renewable energy to the MINEROS ALUVIAL S.A.S.'s small privately owned internal grid. Power is mostly used to attend electricity consumption from MINEROS ALUVIAL S.A.S. gold mining activities (captive user). Along with MINEROS ALUVIAL S.A.S. consumption, the project strengthen electricity reliability at the edge of the national electricity grid benefiting the mining activity of MINEROS ALUVIAL S.A.S. Determination of baseline emissions follows the guidance in paragraph 22 in AMS-I.F v3.

Installed capacity of Providencia III SHP plant project changed from the initially stated 9,100kWe to 11,160kWe, 22.6% change is still below the limiting power for small scale project activities.

Relevant data, for the calculation of the operating and built margin emissions factor to obtain the final combined margin emission factor, were updated for the second

[10] UPME stands as the Energy and Mining Planning Unit as its acronym in Spanish who by means of Resolution MME 91304/2014 (art.3) was imposed with the function of updating the yearly GHG emissions factor for the Colombian Electricity Grid.

crediting period according to the latest Tool 07 (Tool to calculate the emission factor for an electricity system - version 7.0.) This update is based on the latest UPME resolution 385/2020 that recalculates the operating and built margin emissions factor involving all values and parameters used in its calculation (fossil fuel emission factors, most recent three historical years for which Colombian grid national generation data is available, among other), see section B.6.

Application of Steps 1.1, 1.2, 1.3 and 1.4 above, confirmed that the current baseline remains valid for the second crediting period; even though, some data needed to be updated due to changes presented above. In this context step 2 is assessed below.

STEP 2.: Update the current baseline and the data and parameters

As said in step 1.4 above, the parameters regarding the grid emission factor calculation have been updated for this third crediting period using TOOL07 - Tool to calculate the emission factor for an electricity system - version 7.0.

STEP 2.1: Update the current baseline

Baseline emissions for the second crediting period has been updated in accordance to the stated above in step 1.4., without reassessing the current baseline, based on the latest approved version of the methodology AMS-I.F. This update was applied in the context of the sectoral policies and circumstances that are applicable at the time of requesting for renewal of the crediting period, which have not changed as to affect the project generation nor the need for additional investment prior to the end of the requested crediting period.

STEP 2.2.: Update the data and parameters

As said in step 1.4, data for the calculation of the 2020 national grid's emission factor has been updated for this third crediting period using TOOL07 - Tool to calculate the emission factor for an electricity system - version 7.0. More details can be seen in section B.6 and B.7 (updated monitoring parameters).

B.5. Demonstration of additionality

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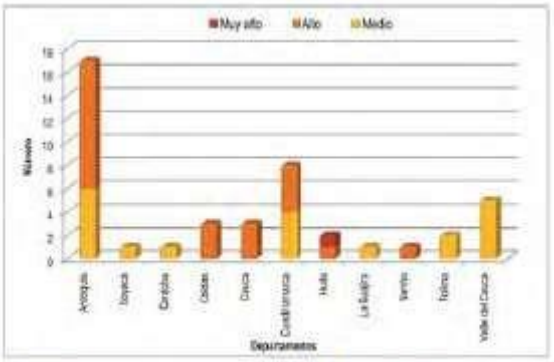
Because it is a project of less than 15MW (small scale) that generates renewable energy, the new *Providencia III* SHP plant permits the use of the *Guidelines on the demonstration of additionality of small-scale project activities, version 09.0, EB 68* for the demonstration of additionality. Since the main barrier the Providencia III project is to overcome institutional barriers due to the lack of legitimate work opportunities that have historically led to the establishment of illegal armed groups, the Providencia III project seeks to open new working positions by means of the implementation of the project and to support social awareness programs by means of fresh incomes from the CDM. In the absence of the project activity it is expected that expansion of power capacity to cope with future electricity demand from dredgers and refining activities by Mineros Aluvial S.A.S. BIC should be supplied by new diesel based power generators or by connection to the national grid. Therefore, additionality criteria applicable to the project activity is option (d) Other barriers, without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher. However, for full understanding of barriers faced by the project activity arguments to options (a), (b) and (c) are presented in the following table, and then we present justification for option (d).

OPTION		DESCRIPTION
(a)	Investment barrier: a financially more viable alternative to the project activity would have led to higher emissions;	The Mineros Aluvial S.A.S. BIC providencia III project seeks stable and reliable power capacity for its dredging and gold refining activities located in an Special Underdeveloped Zone where poor access roads and rural violence conditions prevents investment given the uncertainties of finishing and operating the Small Hydropower plant. Strengthening Mineros Aluvial S.A.S. BIC connection to the National Interconnected Grid would be the most feasible alternative to feed electricity into the Mineros Aluvial S.A.S. BIC privately owned small grid seeking to supply growing electricity demand from new dredging machines, gold refining facilities and administrative activities in line with the Mineros Aluvial S.A.S. BIC 2020 Megaplan[11]. In 2010, Mineros Aluvial S.A.S. BIC and EPM signed a contract that allowed Mineros Aluvial S.A.S. BIC to connect to the EPM regional operated grid at the Caceri substation where the metering was defined to be located at the Bijagual Substation (Attached please find a copy of the signed contract in the file entitled "Contrato Nº 1249 EPM.pdf"). Under this agreement, Mineros Aluvial S.A.S. BIC agreed to pay a monthly fee of Col$15 millions (USD$8240) for the access to 4MW capacity electricity at the Caceri substation in addition to the electricity dispatched to the Mineros Aluvial S.A.S. BIC privately owned grid. New conversations between Mineros Aluvial S.A.S. BIC and EPM (not documented) dealt about a new connection to the Cacerí substation to fulfill future Mineros Aluvial S.A.S. BIC electricity demand. Though no agreement was reached, the basis for the potencial new agreement was set, i.e. the payment for the access to one additional MW capacity would be at least Col$3.75 Millions (USD$2060). If the access were to be 10MW, Mineros Aluvial S.A.S. BIC would pay at least Col$450 millions per year (USD$247 thousands) or USD$7.4Millions in 30 years. The total construction cost of the project is nearly USD$31 millions, therefore, it would have been better to pay for the access to the grid than implementing the Providencia III project. It is important to note that grid electricity is more carbon intensive than hydropower generation at Providencia III.

[11] The Megaplan is the internal target that Mineros S.A. structured on its development plan to follow Colombian government National Development Plan on Mining. The current Colombian Development Plan has defined the mining sector as one of the main development locomotives (Locomotoras del Desarrollo) to increase GDP and, this way, accomplish national social targets.

OPTION		DESCRIPTION
(b)	Technological barrier: a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;	In order to prevent bombing attacks, Mineros Aluvial S.A.S. BIC has in place 6.62 MWe installed capacity in diesel generators. This capacity is currently used only as backup. However, the second feasible option to supply the Mineros Aluvial S.A.S. BIC privately owned small grid would be to increase capacity in diesel based generation to supply growing electricity demand from the new mining fronts. This is clearly a more emitting technology than producing electricity with hydropower. Following table I.F.1 from Methodology AMS-I.F, the emissions factor for a diesel based generation system for load factor higher than 200kW is 0.8tCO2e/kWh, while electricity consumption from the Colombian electricity grid has an emissions factor of 0.2849tCO2e/kWh and Providencia III small hydropower designed as a run of the river plant has an emissions factor equaling cero. It is also easy to transport fuel and involves much lower investment, reducing upfront costs. Diesel based generation is already installed at Mineros Aluvial S.A.S. BIC El Bagre headquarters. Currently 6.62MW diesel based installed capacity serve as back up for dredgers and gold refining activities. As presented in appendix 3 section 3 during 2010 -2011 diesel based electricity generation was increasingly used due to instability of electricity supply by EPM. All logistic is already in place to transport diesel to El Bagre by means of the diesel supplier. Connections from diesel supplier to Mineros headquarters are already in place. A higher consumption of diesel to feed diesel based power plants is feasible. Since diesel power generation is an already used technology and facilities are located within the administrative installations safe guarded by Colombian military forces, bombing attacks are not feasible. Therefore, diesel generation would face low performance uncertainties.
	Barrier due to prevailing practice: prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;	Due to the existing connection between Mineros Aluvial S.A.S. BIC and the national connected grid at Bijagual substation, prevailing practice would have led to strengthening the electricity transmissions lines between Mineros Aluvial S.A.S. BIC and the National Interconnected grid. According to the Ministry of Mines and Energy, an emphasis is placed on the importance of taking into account the entrance of at least 600 MW from thermal projects beginning 2021, in order to reduce system vulnerability and help to diversify the energy matrix, which could be achieved by using one of the most abundant resources in Colombia, coal."[12]

[12] Unión Temporal Universidad Nacional and Fundación Bariloche. Energy Policies. 2010. National Energy Plan (PEN for its acronym in spanish). Analysis and review of Colombian energy policy long-term objectives and update of its development strategies. Mining and Energy Planning Unit UPME. Page 40.

OPTION		DESCRIPTION
(c)		Therefore, the use of grid electricity for supplying demand of Mineros Aluvial S.A.S. BIC would have led to higher emissions than the implementation of the Providencia III project. *Chapter 4* of the *Second National Communication to the UN Framework Convention on Climate Change* regarding Colombia's *Vulnerability* to the adverse effects of climate change, states that climatic variations, specifically those caused by "El Niño "and" La Niña" have impacted, and will continue to impact: agricultural production, livestock, health, water supply to cities and rural communities and power generation in different ways, according to observations made in previous years. Concerning the new hydropower capacity, Figure 4 categorizes this impact as highly likely. Special emphasis is placed on high (37%) and very high (6%) impacts that could potentially affect the hydroelectric generation capacity (net effective) in the departments of Antioquia, Caldas, Cauca, Cundinamarca, Huila and Nariño, which would yield about 43% of the existing total[13].  **Fuente:** Ideam, 2010; generado con información de la UPME, 2010 **Figure 4:** **Potential impact on hydroelectric generation unit number from 2011 to 2040.**

Following Option D of *the Guidelines on the demonstration of additionality of small-scale project activities, version 09.0, EB 68:* given that the area where the project takes place has been marked by the presence of illegal armed groups, institutional barriers consisting in lack of investors interested in investing in the region would increase grid electricity consumption and/or diesel based electricity generation. The demonstration of additionality considers that the project activity consist of two turbines and generators with combined installed capacity of less than 15MWe that uses the Anorí river slope as a source of renewable energy; and the geographic location of the project activity is in a special underdeveloped zone of Colombia. Mineros Aluvial S.A.S. BIC uses CDM incomes to justify the investment and to support and expanding environmental and social programs already under way in the region headed by the Corporate Environment Division and the Corporate Social Responsibility Division. By means of the improvement of such programs, Mineros Aluvial S.A.S. BIC expects that social and economic conditions will improve; reducing the probability of preventing attacks to the

[13] Rodado Noriega C. Ministro de Minas y Energía. 2011. Memorias al Congreso de la Republica 2010 - 2011. The locomotive that moves the country. Ministerio de Minas y Energía. República de Colombia. Page 281

new hydropower developments and, as a consequence, increases the confidence of investors regarding investing in the project.

The project activities take place in the municipality of Anorí, in the Department of Antioquia where Mineros Aluvial S.A.S. BIC generates part of the electricity needed for the Development Unit, which operates the alluvial and underground mining of gold and associated metals in the municipalities of El Bagre, Nechí and Zaragoza, a sub region of Antioquia's Lower Cauca. This region is characterized by the exploitation of mining, an activity that has historically determined the use of its natural resources and the dynamics of its locale.

The strategic conditions offered by the Lower Cauca region in terms of obtaining resources (mainly illegal mining and grow of illicit crops) and its privileged location, that accesses the Urabá, the Serrania de San Lucas and Magdalena Medio have made it possible for the guerrilla groups ELN and the FARC to establish their bases and areas of refuge. The AUC paramilitaries, with its mining block, have also had a presence in the area until they were demobilized. Criminal bands are very active in the area.

Figure 5. FARC active presence between 1998 and 2005.

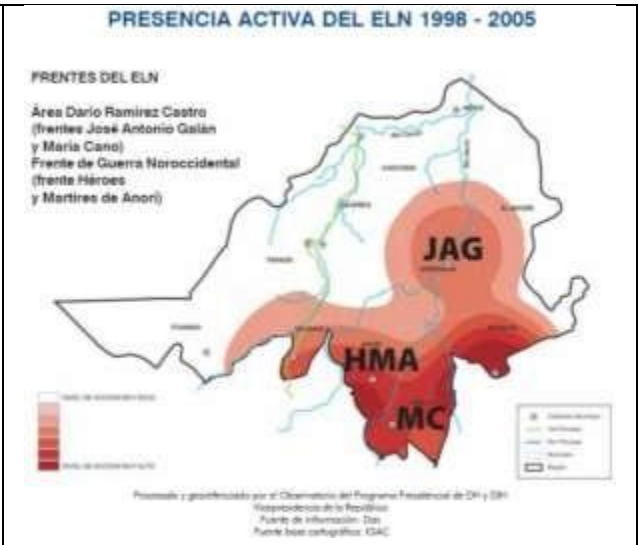


Figure 6. ELN active presence between 1998 and 2005.

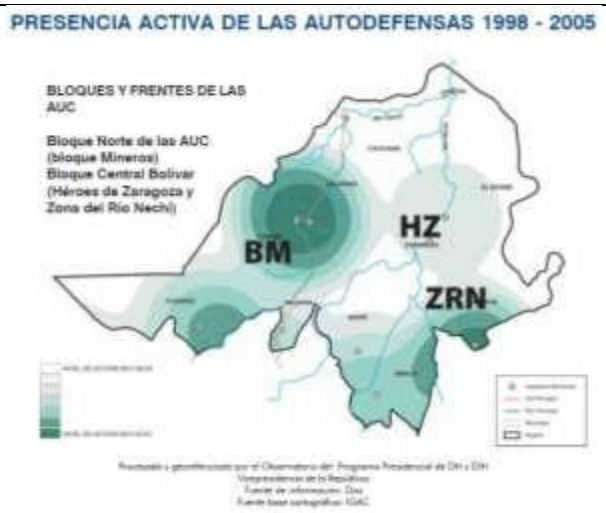


Figure 7. Historic record of the presence of the Minero Block of the AUC Paramilitaries between 1998 and 2005.

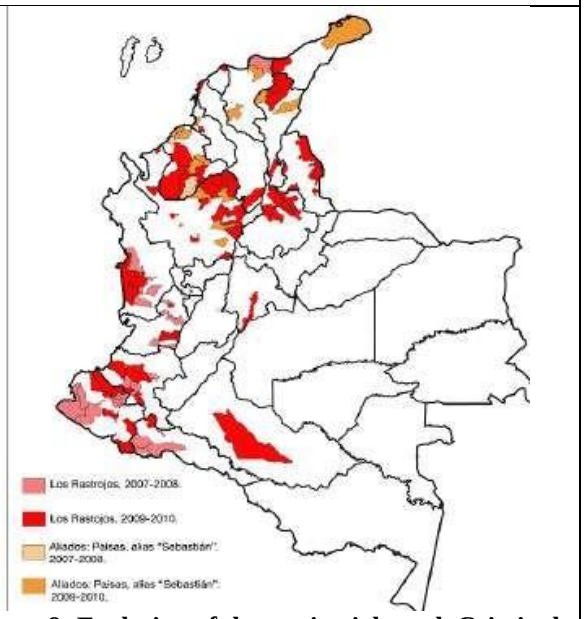


Figure 8: Evolution of the territorial reach Criminal Bands 2007-2008 and 2009-2010

Source: Panorama Actual del Bajo Cauca Antioqueño.
Observatorio del Programa Presidencial de Derechos Humanos y DHI. 2006

As per the security assessments carried out in January of 2011 by the Integral Protection department of Mineros Aluvial S.A.S. BIC the presence of the following Perpetrators of Violence (AGV per its acronym in Spanish) continues to exists in the corridor influenced by the Providencia III project and the mining exploitation fronts:

- Guerrilla 36th Column named "JAIR ALDANA BAQUERO" FARC, the Northwestern Block "IVAN RIOS". Currently led by armed personnel that consist of four main leaders and two alternates, who in turn are responsible of the finances, armed resistance and intelligence commissions. The 36th column consists of two armed order companies and a finance group divided into two finances commissions.
  - The Company Gerardo Torres;
  - The Company Felipe Paternina; and,
  - The Finances Group
- This organization carries out its illegal activities in the municipalities of Angostura, Guadalupe, Campamento, Toledo, San Andrés de Cuerquia, Anorí, Yarumal, Valdivia, Briceño the Rio San Pablo canyon in the Department of Antioquia. Currently and under pressure from the Colombian military troops at the Nudo Paramillo the organization is shifting to the north side of the municipality, therefore, their presence in the general area of Providencia should not be ruled out.

- Two emerging criminal bands with paramilitary origins, the Urabeños and the Águilas Negras, according to local information, are currently at odds because of their participation in the production, harvesting and processing of coca in the region. Members of the illegal paramilitary forces “Aguilas Negras” commanded by alias NN Valdivia are displacing the Urabeños. Valdivia is commanding approximately 20 men and has as his operations hub the area between El Toná, Charcón and/or La Liberia, and neighboring villages where the illicit crops are located.

These violence perpetrators seek the control of this area to develop illicit crops, coca production and the illegal mining of gold and related minerals. These activities have characterized the region and the high international price of gold is an incentive to the persistence of armed confrontation in a scenario determined by an economy linked to the exploitation of a mineral resource that has a high external demand and whose benefits does not flow to the very precarious regional economy. The Lower Cauca region 1) attracts many migrants and the distribution of income is very disproportionate, 2) the lack of regulation on local bonanzas leads to anarchic investments, 3) The presence of state institutions is poor and infrastructure is inadequate[14].

The displacement of population arises as a result of the dynamics of armed conflict and violence in the region, it’s most critical period, during the direct confrontation between the guerrillas and the AUC, between 2000 and 2003, when population movements were generated for individuals, families and as mass exodus[15]. In 2008, 3,260 people were displaced to the urban center of the municipality of Anorí. This occurred because the FARC guerillas sought to protect large extensions planted with coca[16]. The most recent case occurred in January of 2011 when, by order of the 36th front of the FARC, farmers were moved massively from 38 villages to the urban area of Anorí. It should be noted

[14] Panorama Actual del Bajo Cauca Antioqueño. Observatorio del Programa Presidencial de Derechos Humanos y DHI. 2006, page 7.

[15] Ibidem pag 30

[16] https://verdadabierta.com/desplazamiento-forzado-sin-freno-en-el-bajo-cauca-antioqueno

that the occurrence of displacement is associated with the threat of attacks on the population by illegal armed groups, execution of massacres and clashes with the civilian population.

Forced displacement causes the loss of assets, **the destruction of social networks and the deterioration of economic conditions in the receiving municipality**[17]. Hence the importance of persevering to guarantee the security conditions necessary to achieve the territorial consolidation by the State, restoring the normal functioning of the administration of justice, strengthening local democracy, addressing the most urgent needs of the population, extending essential services and promoting sustainable production projects[18], such as the Providencia III project to be developed by Mineros Aluvial S.A.S. BIC

Historically, there have been terrorist attacks on the electrical infrastructure (the destruction of towers) on the Providencia Hydroelectric Plant and on the water inlet in Algibes. The risk facing Mineros Aluvial S.A.S. BIC during the operation of the Providence III PCH consists of the following:

- Once the conversion and expansion of the Providence hydroelectric plant begins, assaults on strategic objectives such as storage areas for explosives and powder kegs, materials essential for their terrorist activities.
- Attacks on the physical facilities of the Providence III Hydroelectric Power Station.

According to recent studies by the Arco Iris corporation[19], in the last two years, the criminal bands (BaCrim: Rastrojos and Aliados) have moved into the lower Cauca in Antioquia, creating alliances with the FARC and actively participating in the farming and distribution of illegal narcotics as shown in Figure 8 Minero S.A. has had to endure the lack of state presence in their area of influence and for this reason, has established an agreement with the army. Only in March 2011 was the military able to enter the territory thanks of the agreement. To date there are military bases in Aljibes, Las Cruces, Providencia and el Charcón.

However, terrorist threats and incidents are still occurring, these are recorded by the Integral Protection Department and reported to the national military forces.

The barrier to investment due to the location of the project activity in a Colombian underdeveloped region is a barrier that discourages investors from providing any financial resources to new hydropower developments due to the project's high security risks. The Colombia's president, Santos, develops a program named "Prosperidad para Todos"[20] asks for new private investment in regions where the armed conflict has recently passed and, more importantly, in regions where the armed conflict is still ongoing; however, the security risks are very high.

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[17] Panorama Actual del Bajo Cauca Antioqueño. Observatorio del Programa Presidencial de Derechos Humanos y DHI. 2006, page 31.

[18] Ibidem pag 37.

[19] Arco Iris Corporation –CNAI as per its acronym in spanish - is a think tank research center and social awareness media looking for granting peace conditions in Colombia, building social inciatives and promoting actions regarding peace, developing post-conflict strategies, security mechanisms to grants democracy and developing strategies to obtain social equity and stenghtening the rule of the government and civil society. During the last 10 years has tracked bacrim's behavior in the lower Colombian Cauca region. As an example following article shows involvment of Arco Iris Corporation in the lower Cauca Region: http://www.arcoiris.com.co/2012/12/mas-alianzas-y-traiciones-en-la-guerra-de-bandas-del-bajo-cauca/

[20] http://www.dnp.gov.co/PND/PND20102014.aspx

Figures 5 to 8 above demonstrate the intensity of the armed conflict in the Anorí municipality and the surrounding region, that has been named as an Special Consolidation Territory (Zonas de Consolidación Territorial) for the eradication of coca crops in order to provide government assistance in economic, social and environmental issues to the zone. The *Unidad Administrativa Especial de Consolidación Territorial* (UAECT) is a recently created entity that operates directly from the President's Office, created under Decree Number 4161 issued on 3 November 2011. The UAECT is committed to "implement, execute [programs of development assistance] and follow up the National Territory Consolidation Policy seeking to channel, articulate and coordinate the institutional interventions in zones affected by the growing of illicit crops. UAECT and the United Nation Offices on Drugs and Crime issued on June 2012 the report named *Colombia Monitoreo de Cultivos de Coca 2011*[21]*.* On page 68, for the first time, a map is presented defining the Territory Consolidation Zones which are subject of a special treatment and financing for illicit crops eradication and strenthening of the social structures in such zones. The zone called *Nudo de Paramillo* (*Bajo Cauca Antioqueño y Sur de Bolivar*) includes the Anorí municipality as part of this Territory Consolidation Zone.

Figure 9 presents statistical information on the municipalities reported on by UAECT in page 68 of the report, from the National Statistic Department (DANE- Departamento Administrativo Nacional de Estadistica) based on projections of the latest population census. DANE reports the *Unsatisfied Basic Needs* index and *People Under the Misery Line* index. The National Planning Department is the authority responsible for methods to calculate those indexes: the definitions can be found at:

https://colaboracion.dnp.gov.co/CDT/Estudios%20Econmicos/Evoluci%C3%B3n%20de%20los%20principales%20indicadores%20de%20pobreza%20y%20desigualdad%20en%20Ibagu%C3%A9%20(2001-2008).pdf.

According to the National Planning Department, a person is considered to have Unsatisfied Basic Needs if his monthly income is below Col$187,079; and is considered to be Under the Misery Line if his monthly income is below Col$83,581. Following these definitions, Figure 9 presents all municipalities within the Antioquia Department included in the *Nudo de Paramillo* Territory Consolidation Zone. It can be seen that on average, 59% of the total population falls into the Unsatisfied Basic Needs Line and that the weighted average of per capita daily incomes of this population is USD$1.84.[22] In conclusion, the violence characteristics of the region along with the extreme poverty reigning in rural areas of the Anorí municipality discourage investors from commiting financial resources to new Greenfield projects in the area of influence of the Providencia III project.

[21] Oficina de las Naciones Unidas contra la Droga y el Delito. Gobierno de Colombia. 2012. Colombia Monitoreo de Cultivo de Coca 2011. Electronic source on: http://www.unodc.org/documents/crop-monitoring/Colombia/Censo_cultivos_coca_2011.pdf

[22] It was considered that the average yearly exchange rate is Col$1848.17/USD$ (Source: National Central Bank – Banco de la Republica at: http://www.banrep.gov.co/series-estadisticas/see_ts_trm.htm#tasa, click on the Excel link named "Serie de datos promedio anual (Información disponible desde 1950)"

Deapartment Code	Department Name	Municipality Code	Municipa lity Na me	Unsitisfied Basic Needs Index (Necesidades Basicas Insatisfechas)						Total Population 2011			Percapit Inccome
				Town		Rural Areas		Total					
				Unsatisfied Basic Needs	Under the Misery Line	Unsatisfied Basic Needs	Under the Misery Line	Unsatisfied Basic Needs	Under the Misery Line	Total	Town	Rural Areas	Total
05	ANTIOQUIA	040	ANORI	0.42	0.14	0.56	0.26	0.48	0.20	16,237	6,187	10,050	2.1173
05		107	BRICEÑO	0.44	0.20	0.59	0.31	0.55	0.28	8,737	2,429	6,308	1.8490
05		154	CAUCASIA	0.49	0.18	0.71	0.39	0.52	0.22	101,788	82,481	19,307	2.1148
05		250	EL BAGRE	0.40	0.18	0.71	0.43	0.51	0.26	48,211	25,747	22,464	1.8077
05		361	ITUANGO	0.28	0.11	0.79	0.57	0.65	0.44	22,538	5,897	16,641	1.4893
05		495	NECHI	0.62	0.38	0.77	0.48	0.68	0.42	24,085	12,624	11,461	1.6939
05		895	ZARAGOZA	0.46	0.14	0.83	0.58	0.64	0.36	29,228	13,400	15,828	1.8116
05		120	CACERES	0.61	0.35	0.68	0.38	0.67	0.37	33,950	7,688	26,262	1.8452
			Average USD$	0.46	0.21	0.71	0.43	0.59	0.32	35,596.75	19,556.63	16,040.13	1.84

Figure 9. Statistical information from the Municipalities reported by UAECT: Unsatisfied Basic Needs and Under the Misery Line indexes.

Seeking to overcome these investment barriers, MINEROS S.A has partnered with Bancolombia (as presented in Appendix 7 Section A) to invest in the lower Cauca River region where MINEROS ALUVIAL S.A.S. BIC is settled. Bancolombia's back up to MINEROS ALUVIAL S.A.S. BIC investment *provided the financial resources to build and operate the Mineros Aluvial S.A.S. BIC hydropower project.* Additional incomes from the CDM supports this investment through social investments necessary to reduce the risks described in this document. .

MINEROS ALUVIAL S.A.S. BIC runs a wide environmental and social program headed by the Corporate Environment Department and the Corporate Social Responsibility Department. Both programs already conduct a program that includes a tripartisan collaboration: the local community (with the Junta de Acción Local representative) – the local government (with the Anorí's municipality representative) – MINEROS ALUVIAL S.A.S. BIC (with the head of the CSR department). Decisions by the committee conformed by the three parts result in a regional action plan where all parties are committed to bring human/financial resources to execute the plan. So far, MINEROS ALUVIAL S.A.S. BIC has financially supported the endowment of the local health center and the local library. A continuation of these programs is envisioned to be supported by new CDM incomes. The impact of these continued actions is expected to reduce the armed conflict by bringing the convened action plan into reality.

In addition, beyond obstacles to the implementation of the project caused by the illegal armed forces acting in the region, accessibility problems also exist due to the poor conditions of roads and bridges needed to reach the selected site. The set of photos below presents the difficulties of moving equipments, machinery and workers to the site. Mineros Aluvial S.A.S. BIC has estimated that the investment required for the improvement of roads and bridges to reach the project's site at US$2.5 million. This investment helps the Providencia residents to transport agricultural products and merchandise. Mineros Aluvial S.A.S. BIC expects that such investment will provide villagers an additional economic support. CDM incomes from selling CERs are used by Mineros SA to support social projects to help/teach people in the region how to run small businesses that use the new road system to increase local economic flows reducing violence in the region that have occurred historically due to lack of opportunities.

Figure 10: Precarious road and bridge conditions in the region

In conclusion, based on the above explanation of the rural violence conditions in the area where the Providencia III project was implemented, and following option D, of Attachment A to Appendix B, the most feasible activities to produce the increased electricity generation projects needed to supply growing electricity demand from Mineros Aluvial S.A.S. BIC mining activities would have been either to strengthen the transmission line with the National Interconnected Grid or to increase installed capacity based on fossil fuels (diesel generation in own plants). Both of them would have emitted more greenhouse gases than the Providencia III project activity.

B.6. Estimation of emission reductions

B.6.1. Explanation of methodological choices

>>

The emission reductions calculation follows methodology AMS-I.F named “Renewable electricity generation for captive use and mini-grid” version 3 EB61, the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” and the “Tool to Calculate the Emissions Factor for an Electricity System”

General Set of equations

(1) $ER_y = BE_y - PE_y - LE_y$; $LE_y = 0$; $ER_y = BE_y - PE_y$. *Equation 2 AMS-I.F Version 02.* $LE_y = 0$ Since *following paragraph 21 in AMS-I.F Version 3, the energy generating equipment is not transferred from another activity. Therefore, leakage is not to be considered.*

(2) $BE_y = EG_{BL,y} * EF_{CO2,y}$ Equation 1 AMS-I.F Version 3.

(3) $EF_{CO2,y} = EF_{EL,j/k/l,y} = EF_{grid,CM,y}$ and are used during the crediting period,. The “Tool to calculate the Emission Factor for an electricity system” was used to calculate a combined margin (CM) grid emissions factor for the National Interconnected

Electricity System in Colombia, consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed. This project activity uses takes the UPME calculated emissions factor, given that UPME is the national institution commissioned for doing such calculations by the designated national authority (DNA) for the CDM.

(4) PE_y = 0. Following paragraph 24 in AMS-I.F Version 02 for most renewable energy project activities, $PE_y = 0$.

Where:

ER_y	Emission reductions in year y (t CO2e/y)
BE_y	Baseline Emissions in year y (t CO2/y)
PE_y	Project emissions in year y (t CO2/y)
LE_y	Leakage emissions in year y (t CO2/y) This project does not consider Any leakages.
$EG_{BL,y}$	Quantity of net electricity displaced as a result of the implementation of the CDM project activity in year y (MWh)
$EF_{CO2,y}$	CO2 emissions factor (tCO2/MWh) for the project activity. The emissions factor is calculated as per the "Tool to calculate the emission factor for an electricity system" following Simple Adjusted Method for calculating the Grid Operating Margin. The emissions factor is a weighted average of the emissions that fuels displaced by the project activity used to feed electricity wheeled throughout the small grid owned by Mineros Aluvial S.A.S. BIC. Weights are calculated as the historic share between national electricity grid consumption and generation of electricity into the small grid by means of diesel fuel. W_{OM} = 0.25 and W_{BM} = 0.75 for the second and third crediting periods.
$EF_{Grid,CM,y}$	Combined margin CO2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO2/MWh). This project activity takes the UPME calculated emissions factor, given that UPME the national institution commissioned for doing such calculations by the designated national authority (DNA) for the CDM.

B.6.2. Data and parameters fixed ex ante

Data/Parameter	**EF_{BM}**
Data unit	%
Description	Built margin emissions factor (per cent)
Source of data	UPME (The National Energy and Mining Planning Unit)
Value(s) applied	0.281
Choice of data or measurement methods and procedures	Latest data from the National Dispatch Center and Electricity Generators bound to the Colombian Electricity Grid. Data is compiled by UPME following the latest version of the methodological tool to calculate the emissions factor for an electricity system (as per this RCP, version 7 of the tool was used). Method used was Simple adjusted data.
Purpose of data	Calculation of baseline emissions
Additional comment	

B.6.3. Ex ante calculation of emission reductions

>>

The following table summarizes equations presented in Section B.6.1. in conformity with results presented in the attached excel sheet entitled "DB Providencia III RCP rJCC1407211851".

	year	*power* *[MWh/y]*	*emissionsfactor* *[tCO2e/MWh]*	*ER* *[tCO2e/y]*
1	12/03/2022-31/12/2022	79,281	0.3843	30,464
2	01/01/2023-31/12/2023	97,762	0.3843	37,565
3	01/01/2024-31/12/2024	98,029	0.3843	37,668
4	01/01/2025-31/12/2025	97,762	0.3843	37,565
5	01/01/2026-31/12/2026	97,762	0.3843	37,565
6	01/01/2027-31/12/2027	97,762	0.3843	37,565
7	01/01/2028-11/03/2029	116,510	0.3843	44,769
			Total	263,160
			Average	36,165

B.6.4. Summary of ex ante estimates of emission reductions

Year	Baseline emissions (tCO_2e)	Project emissions (tCO_2e)	Leakage (tCO_2e)	Emission reductions (tCO_2e)
12/03/2022-31/12/2022	30,464	-	-	30,464
01/01/2023-31/12/2023	37,565	-	-	37,565
01/01/2024-31/12/2024	37,668	-	-	37,668
01/01/2025-31/12/2025	37,565	-	-	37,565
01/01/2026-31/12/2026	37,565	-	-	37,565
01/01/2027-31/12/2027	37,565	-	-	37,565
01/01/2028-11/03/2029	44,769	-	-	44,769
Total	263,160	-	-	263,160
Total number of crediting years	7 (Of a total of 21 years crediting period - 7*3)			
Annual Average over the crediting period	36,165	-	-	36,165

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

(Copy this table for each piece of data or parameter.)

Data/Parameter	$EG_{BL,y}$
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project plant to the small grid in year y
Source of data	High precision electricity meter installed on the Providencia III substation.

Value(s) applied	

year		*electricity generation* *[MWh/y]*
1	12/03/2022 - 31/12/2022	79,281
2	01/01/2023- 31/12/2023	97,762
3	01/01/2024 - 31/12/2024	98,029
4	01/01/2025 - 31/12/2025	97,762
5	01/01/2026 - 31/12/2026	97,762
6	01/01/2027- 31/12/2027	97,762
7	01/01/2028 - 11/03/2029	116,510

Measurement methods and procedures	Measurements are undertaken using high precision energy meters. A backup high precision electricity meter should be available at the project site. Check of the information is performed by MINEROS ALUVIAL S.A.S. BIC Energy Division at Providencia III SHP plant. The MINEROS ALUVIAL S.A.S. BIC power station staff shall, in an hourly basis, take the reading from the electricity meter in a paper based template. Data from the template is aggregated and stored in a daily basis on a spreadsheet and is checked daily by the plant's supervisor. Daily information shall be sent to El Bagre headquarters where a double check is performed for quality assurance purposes. The records of energy delivered are recorded from the start of project. Hourly records are taken by supervisors at Providencia III power station in paper formats; daily electricity generation are written in an internal spreadsheet and sent to Mineros Aluvial S.A.S. BIC El Bagre Headquarters energy division.
Monitoring frequency	Continuous monitoring, hourly measurement and at least monthly recording

QA/QC procedures	Records are stored in only basis on a spreadsheet and checked daily by the plant's supervisor. Daily information shall be sent to El Bagre headquarters and double checked for quality assurance purposes. At El Bagre headquarters information is stored in data basis and consolidated monthly. Information is available for third persons under supervision of a Mineros S.A officer. Gathered information contains all relevant parameters of measurement instruments including: Date of installation, registries taken by the instruments, registry of calibrations and maintenance and certifications of calibration. To ensure the proper functioning of a given instrument MINEROS ALUVIAL S.A.S. BIC undertakes the following activities: - Preventive maintenance: every second month MINEROS ALUVIAL S.A.S. BIC staff undergoes routine/preventive maintenance (according to the activities planned with anticipation) of cleaning and revision of a given instrument depending on the type of the equipment, the specifications of the manufacturer and the functioning of the device itself. - Corrective maintenance: In case of the necessity of the replacement of the measurement device, MINEROS ALUVIAL S.A.S. BIC has its stand-by calibrated replacement on stock. The instrument on stock is stored and maintained according to the indications given by the manufacturer and planned accordingly by MINEROS ALUVIAL S.A.S. BIC staff in the monthly reports of instruments preventive maintenance. Replacement of measurement equipments are performed by MINEROS ALUVIAL S.A.S. BIC staff assisted by external experts. - Calibration: should be done in accordance with national standards or requirements set by the meter supplier. The accuracy class of the meters should be in accordance with the stipulation of the meter supplier or national requirements. If these standards are not available, calibrate the meters every 3 years and use the meters with at least 0.5 accuracy classQuality control: The MINEROS ALUVIAL S.A.S. BIC Energy Division at El Bagre city undertakes statistical control that indicates deviations from the daily measurements. In cases where deviation is higher than the internal standard data is placed under revision and the information flow chain revises data of such period.
Purpose of data	Calculation of project emissions
Additional comment	-

Data / Parameter	$EF_{OM,y}$
Unit	tCO2e/MWh
Description	Operating margin CO2 emissions factor for the Colombian electricity grid in year y
Source of data	Seeking to help CDM project activities, the Colombian government by means of the Ministry of Energy and Mining and its Energy and Mining Planning Unit (UPME as its acronym in Spanish) calculates yearly National Grid's emissions factor and releases a ministerial resolution including the calculation of the national grid emissions factor for the year being using the simple adjusted methodology, for project developers to rely on this official information for project activities emission reductions calculations. This project activity shall use the results from the calculation of the operating margin released by UPME and also ponder them by the weights set in the Tool.

Value(s) applied	UPME calculations of the National Annual Grid Emissions Factor is used: Supporting document: 2019 and beyond uses RESOLUCIÓN No. 000385 de 2020 as soon as a new bill is issued the Operating margin CO2 emissions factor will be changed accordingly. Value: 0.694 tCO2/MWh Source: https://www1.upme.gov.co/siame/Paginas/calculo-factor-de-emision-de-Co2-del-SIN.aspx
Measurement methods and procedures	Gathering of yearly released emissions factor by UPME
Monitoring frequency	Annually.
QA/QC procedures	-
Purpose of data	Calculation of emissions reductions.
Additional comment	The data is stored for a period of two years after the verification.

B.7.2. Sampling plan

>>

No sampling is used for the determination of any parameter on this PDD. Data is taken directly either from measurement instruments or official data sources.

B.7.3. Other elements of monitoring plan

>>

The parameters to be monitored, stated in section B.7.1 are consistent with the AMS I.F version 3 methodology and the "Tool to calculate the emission factor for an electricity system" version 2.2.1. The Figure below presents the project boundary and the main monitoring instruments for measuring parameters.

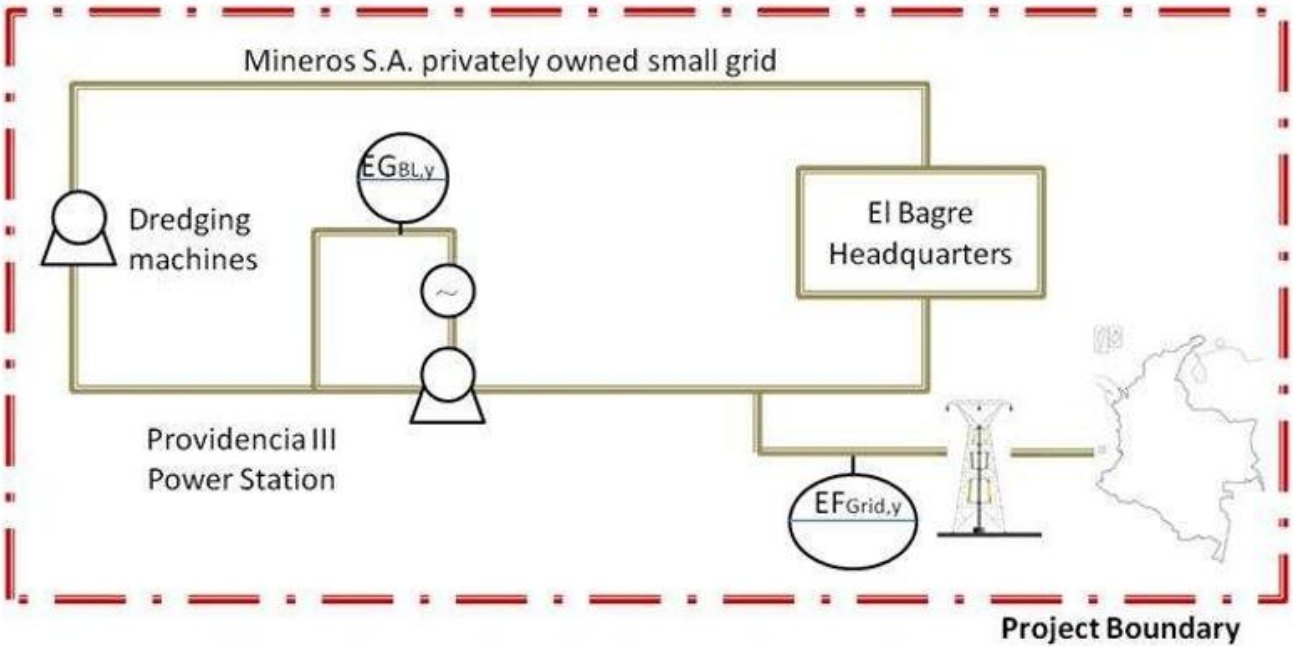


Figure 11: Project Boundary

Following paragraph 29 “data / parameter table 5” in AMS-I.F v.3, regarding $EG_{BL,y}$ “measurements are undertaken using energy meters”. Calibration should be undertaken as prescribed in the relevant paragraph of the “General Guidelines to SSC CDM Methodologies v.1, EB66 Annex 09”. Calibration procedures are presented in Section B.7.1. for $EG_{BL,y}$ Following paragraph 14 in AMS-I.F , for more accuracy the emission factor are calculated ex- post according to the Tool to Calculate the Emission Factor for an Electricity System following Simple Adjusted Method

CAEMA and MINEROS ALUVIAL S.A.S. BIC adjust and prepared pre-programmed spreadsheets to collect the information described in section B.7.1 and apply the formulas as instructed in section B.6.1. XM (the national dispatch center) and UPME are the data providers for the annual ex- post calculation of the Project’s ERs. Paper and electronic based templates was considered to bring redundancy and robustness to data taking. The on-site designated project staff confirmed these data with their own records.

Organizational Structure of the Monitoring Plan:

The management and operation of the monitoring program involves both the environment division and the energy generation division of MINEROS ALUVIAL S.A.S. BIC. MINEROS ALUVIAL S.A.S. BIC oversees the implementers who must assemble a staff to consolidate monitoring data. CAEMA uses this data to complete periodic monitoring reports and briefings, which are delivered to the DOE during the verification activities (Figure 12).

Mineros Aluvial S.A.S. BIC are also be responsible for the equipment’s operating procedures, and ensuring their maintenance and calibration so that the installed equipment complies with all requirements.

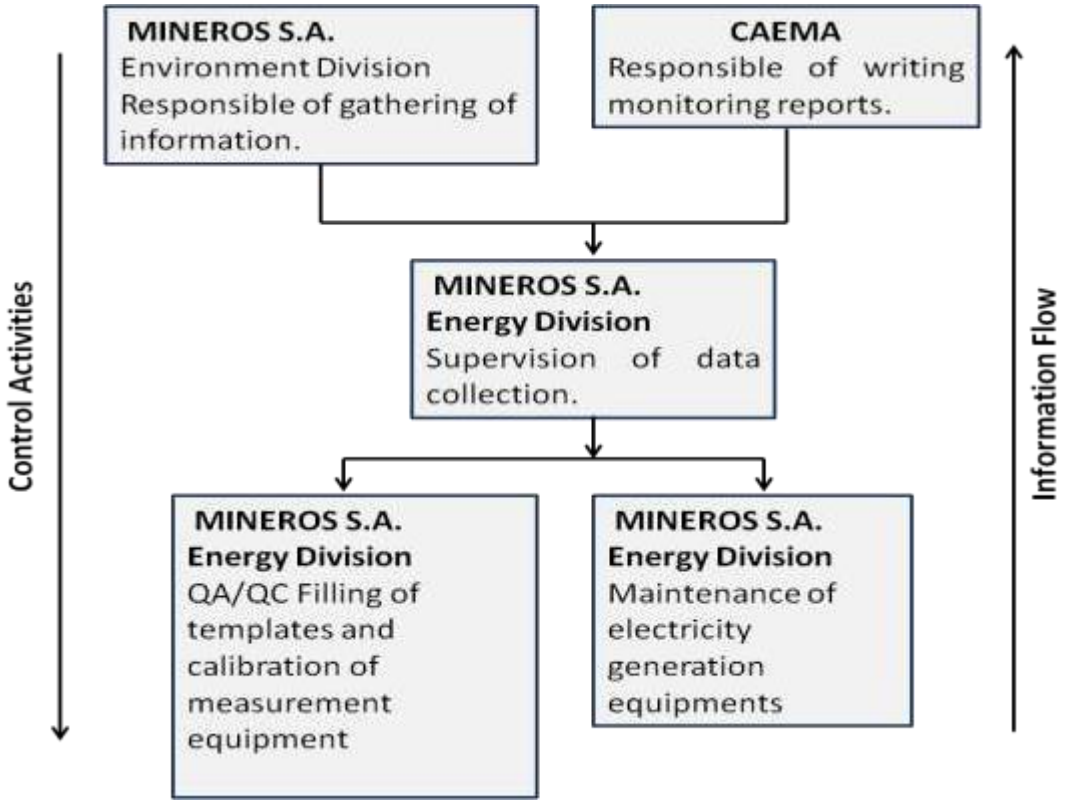


Figure 12. Organizational Structure

Monitoring and data storage:

Data to be monitored is specified in Section B.7.1. MINEROS ALUVIAL S.A.S. BIC is responsible for consolidating and storing the primary data collected; a copy of this data is sent to CAEMA who will periodically review it to verify its consistency.

Both CAEMA and MINEROS ALUVIAL S.A.S. BIC stores data electronically, and regular backups are performed. Data is stored for at least two (2) years after crediting period.

CAEMA and Mineros Aluvial S.A.S. BIC shall develop procedures for collecting the variables in the event of contingencies.

Quality Assurance and Control:

All equipment are inspected periodically according to the standards required by the equipment to ensure the accuracy of data collection. Mineros Aluvial S.A.S. BIC monitors technology suppliers to offer their staff training in the operation of the equipment purchased. Mineros Aluvial S.A.S. BIC keeps equipment calibration and maintenance records.

SECTION C. Start date, crediting period type and duration

C.1. Start date of project activity

>>

In the context of a CDM project activity, the earliest date at which real action of the Providencia III: 9.11MW Small Hydro Power Generation Plant activity began was on 30th September 2011 when Bancolombia (Acting on behalf of MINEROS ALUVIAL S.A.S. BIC) and Andritz Hydro S.A.S. signed the purchase order for the delivery off the electricity generation equipment.

C.2. Expected operational lifetime of project activity

>>

30 years

C.3. Crediting period of project activity

C.3.1. Type of crediting period

>>

Seven years (twice renewable). This is the second crediting period.

C.3.2. Start date of crediting period

>>

The start date of crediting period is 12/03/2022.

C.3.3. Duration of crediting period

>>

7 years (renewable twice)

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

>>

Mineros Aluvial S.A.S. BIC has an Environmental Management Plan for the construction and operation of the Providencia III PCH that determines the most critical environmental impacts and provides measures for their prevention, control, mitigation and/or compensation during the stages of construction, operation and closure of each PCH.

Mineros Aluvial S.A.S. BIC presented such environmental management plan to CORANTIOQUIA, the competent environmental authority relevant to the project area. CORANTIOQUIA granted permissions for the use of water resources, forestry, soil, etc. and at the same time issued permits for the dumping and disposal of the solid waste generated during operation of the projects.

The project activity involved the construction and operation of the Providencia III PCH, a run-of-the-river plant, requiring no reservoir or large civil works. The operation of the PCH generates the following positive impacts:

- Renewable energy to replace energy from fossil fuels reduces emissions of greenhouse gases and polluting gas with local effects.
- Aeration of the water by the turbine helps improve the quality of water resources by increasing the concentration of oxygen dissolved in the water.
- The creation of new sources of employment produces a positive impact on the socio- economic environment of the population located in the area of influence of the projects.
- A positive effect in terms of quality of life for the surrounding communities with new opportunities for stable employment, training and access to better quality electricity.
- The contribution to the conservation and sustainability of the river basin where the project takes place.
- Slope and forest intervention during the construction of the PCH under the Environmental Management Plan, approved by CORANTIOQUIA, establishes the revegetation and reforestation of the affected areas.
- Flow rate regulation to avoid disasters due to flooding. Although the PCH does not have a reservoir, the catchment and channeling of the stream to the turbine serve as means to regulate flow and creates traps to attenuate torrential phenomena and the dragging of stones and sludge in that stretch of the river..

The most significant negative impacts are:

- The production of discharge and solid waste during the construction and operation of the generator plant. These are handled and disposed of in accordance with the provisions of the Environmental Management Plan and with current environmental regulations.
- Noise created by the operation of the PCH. The noise is measured periodically to determine compliance with environmental regulations regarding the maximum permissible standards.

No significant environmental impacts are expected during implementation.

D.2. Environmental impact assessment

>>

No environmental impact assessment was performed to grant license to operate; however, all permits, authorizations and concessions had been granted by the respective regional environmental authority. Mineros Aluvial S.A.S. BIC is in compliance with of all of them.

SECTION E. Local stakeholder consultation

E.1. Modalities for local stakeholder consultation

>>

THE NETWORKING EVENT OF THE PROVIDENCIA I AND PROVIDENCIA III PROJECTS. Presentation held in the Educational Institution of the township of Charcón, in Anorí, Antioquia, on September 15, 2011

Review: The social consultation event regarding the Providencia I and III CDM projects was conducted to fruition within the parameters of the UNFCCC and as per the requirements established by the Ministry of Environment and Territorial Development (MADT). Photographic record of the event is available (see attached CD). The presentation of the PDD before the public representative, the invitations to the agencies and the community, and the public presentation of the project were carried out in accordance with resolution 2734 of 2010 by the MADT. Attendance was 150 people, exceeding by more than 50% the expectations of the event organizers. Most importantly, the signed surveys of 93 individuals were obtained, most of them, confirming support for Providencia III, no opposition to the project was observed.

Participants: Assistance sheet signed by 150 people as they entered (attached). The day of networking began at 10:45 am and ended at 1:30 pm.

Special guests: Mayor of Anorí - Antioquia (Dr. Nicolás Herón), Public Representative (Carolina Peláez), Commander of the Fourteenth Brigade (Colonel Edgar Ferrucio Correa Coppola), Director of CSR (Dr. Jaime Jaramillo), Regional Director Corantiquia (Eng. Juan Carlos Marín), Chairman of the Anorí Council (Juan Fernando Barrientos Gómez).

Annexes: The invitations to the social consultation are attached, as well as the Assistance Sheet and the surveys completed by some of the community.

E.2. Summary of comments received

>>

It can be concluded that the *Providencia III* project enjoys a high degree of acceptance among the population, those who in its implementation can envision progress for the municipality of Anorí and the areas of El Charcón, Usurá, Providencia and Toná due to, among others, the social and employment benefits, obtained from the construction and operation of the project. *¨This project is of great interest to the community, because it can bring many opportunities¨* María Marleny Muñoz Rodríguez, a resident of Anorí.

While some confusion existed in the community while completing the survey, this confusion was due to an overload of the contracted staff that faced the overwhelming welcome of the event, unexpected even to event organizers.

As for concerns that arose after the event and were reflected in the survey, such as the case of Mr. Edis Manuel Piñedas Jaraba, the Mineros Aluvial S.A.S. BIC company commits to providing comprehensive and adequate information in the Mayor's Office in the municipality of Anorí, ensuring the community full understanding regarding the *Providencia III* project.

Afer all the special guests had spoken, ample space was provided the comunity to pose questions and clarify any queries regarding the *Providencia I and III* projects.

Following is a transcript of the inquiries, which arose during the event

have

Question: ¿What impacts will the projects on flooding?

Answer: Flooding will be prevented and there will be a network of hydrologic monitoring. Should a high water phenomenon occur, it will be detected and the necessary alarms will be activated, thus avoiding possible flooding.

The project involves a decrease of minor risks, for example, lower sediments (trees, etc.), because these things can hinder the dam.

Question: How will the population benefit from the areas of influence in matters of employment? Answer: Local employment has been and will continue to be a policy of Mineros Aluvial S.A.S. BIC We will consider those who live in the area of project influence as a priority (areas of Toná, Providencia, Usura, and the town of El Charcón) when generating employment. When we are unsuccessful finding someone in that area due to the requirements for filling the position, we will look in a broader region. Similarly, we will provide necessary training so that in the medium-term we may have the necessary manpower. It should be noted that to solicit their services and apply for jobs, intermediaries are not necessary. MINEROS ALUVIAL S.A.S. BIC has commissioned to Mr. Ivan Darío Casas to attend all job applications needed to accomplish the project.

At this point, Mr. Iván Darío Casas (Mineros Aluvial S.A.S. BIC project manager) introduced himself saying that he is the one who will channel the concerns of the project regarding employment and will relate directly with the community. Iván Darío Casas is the contact person within the company to handle the requests made by the community.

Mineros Aluvial S.A.S. BIC continues to support social investment. For example, for the health station, which was a very felt necessity we approved the endowment of this station per the hospital's request. This donation was made official the day of social consultation.

Question: In what way does the Company commit to offer the technicians and technologists in our towns solutions?

Answer: We will generate employment opportunities within our possibilities; we will also seek ways to continue training these young people. With the resumes of members of the community who seek work on the project, the company has created a database, priority will be given to those with the profiles required by the company and who live in the areas of El Charcón, Providencia , Toná and Usurá.

Question: How does the Company undertake environmental education topics?

Answer: The Environmental Management Plan submitted to Corantioquia includes specific subjects of training regarding environmental education both for people involved in the project and those who are not related to it. Special attention will be given for this training to children attending schools in the townships nearest the project.

Question: What will be the most significant impacts?

Answer: Construction and assembly: the arrival of trucks, movement of people, but we will seek to manage them so they are not so high. Once the work is done, the river will flow through a tunnel and thus generates electricity. There may be noise generated,

but not enough to cause discomfort. Other positive impacts include the creation of work within the districts close to the project and the support of small and medium enterprises to provide the services required by the project.

Question: What will the company offer the community?
We are seeking associates to find the solution to certain problems which you may have and which are in our power to resolve, by working together.

Question: Are you looking for headquarters for the community representatives (Junta de Acción Comunal)?
Answer: We have not decided yet to co-finance the community center, because this will be a joint endeavor among community representatives, the local government an MINEROS ALUVIAL S.A.S. BIC that will depend on prioritized actions along with the community where the works will make the investment.

Question: How can the Company support the electrification of villages in the area of influence? Answer: Mineros Aluvial S.A.S. BIC will generate the electricity, however, it is necessary to establish clear agreements with transporters and distributors of electricity for residential use. It has been proposed that we convene with the EPM, the Office of the Governor of Antioquia, the Mayor's Office and other leaders to deliver this supply through companies endorsed to do so.

The Mayor of Anorí, Nicolás Herón: We have met with EPM and some areas have been benefited. Various projects have been submitted but institutions are weary of entering these areas due to issues of public order. The community has already guaranteed their safety and is waiting for an answer from EPM.

E.3. Consideration of comments received

>>

During the networking event, the community issued the above questions verbally and were answered directly by the Mineros S.A and Corantioquia representatives. Answers by Mineros Aluvial S.A.S. BIC were published on the message boards of the public defense offices of the municipality of Anorí.

SECTION F. Approval and authorization

>>

Letter of Approval issued on October 8, 2012.

All participants listed in the PDD are included in the same letter of approval.

Appendix 1. Contact information of project participants

Organization name	Mineros Aluvial S.A.S. BIC
Country	Colombia
Address	Carrera 43A # 14-109 floor 6. Nova Tempo. 050021 Medellín, Antioquia
Telephone	(574) 2665757
Fax	(574) 2666995
E-mail	santiago.cardona@mineros.com.co>
Website	www.mineros.com.co
Contact person	Santiago Cardona

Organization name	The Andean Centre for Economics in the Environment – CAEMA/ACEE
Country	Colombia
Address	Cra. 3 No. 11 – 55., 111711 Bogotá D.C.
Telephone	(57) 1 341 3277
Fax	
E-mail	thomas.black.a@gmail.com
Website	www.andeancenter.com
Contact person	Thomas H. Black A.

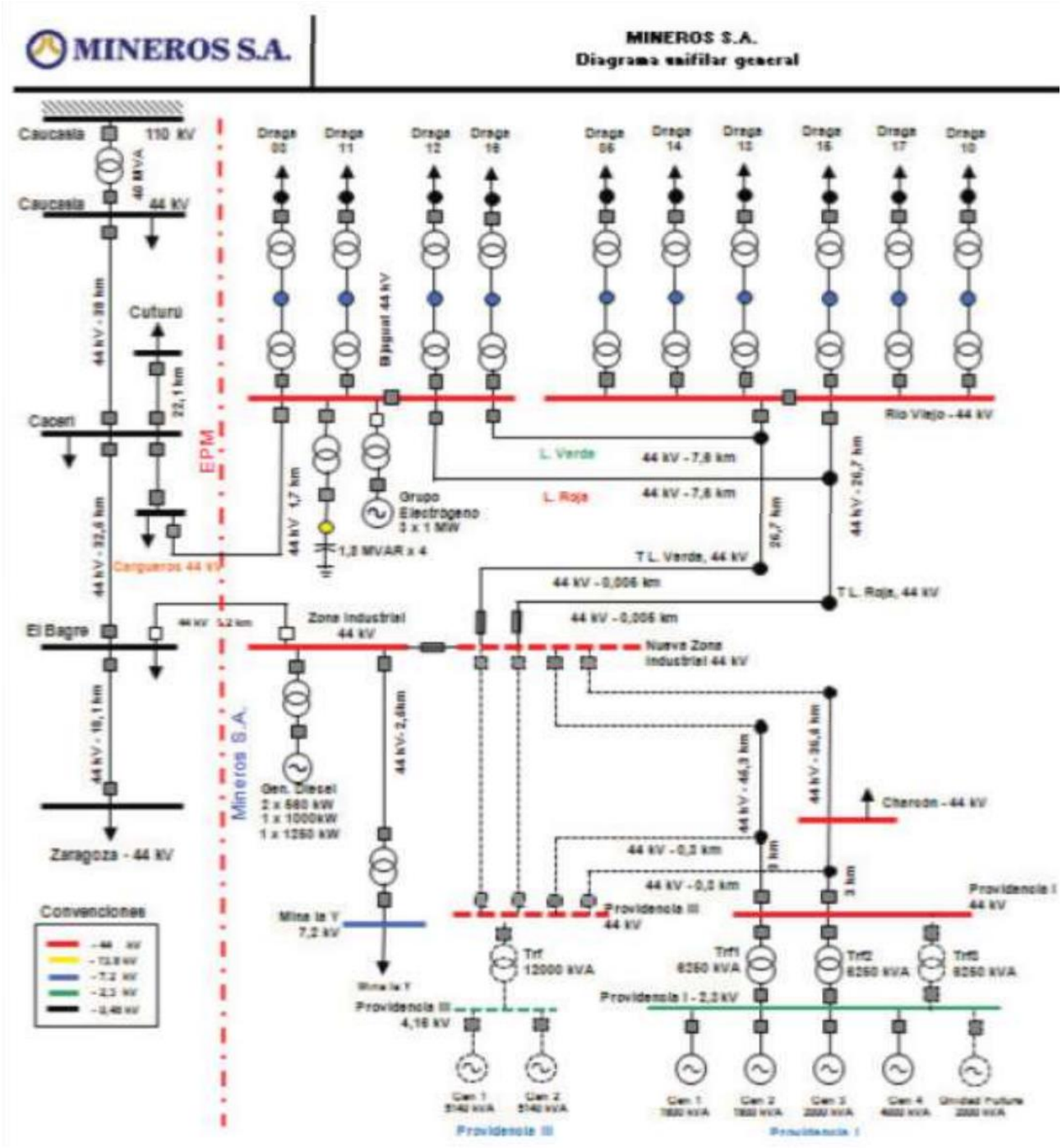
Appendix 2. Affirmation regarding public funding

No public funding is requested for this project

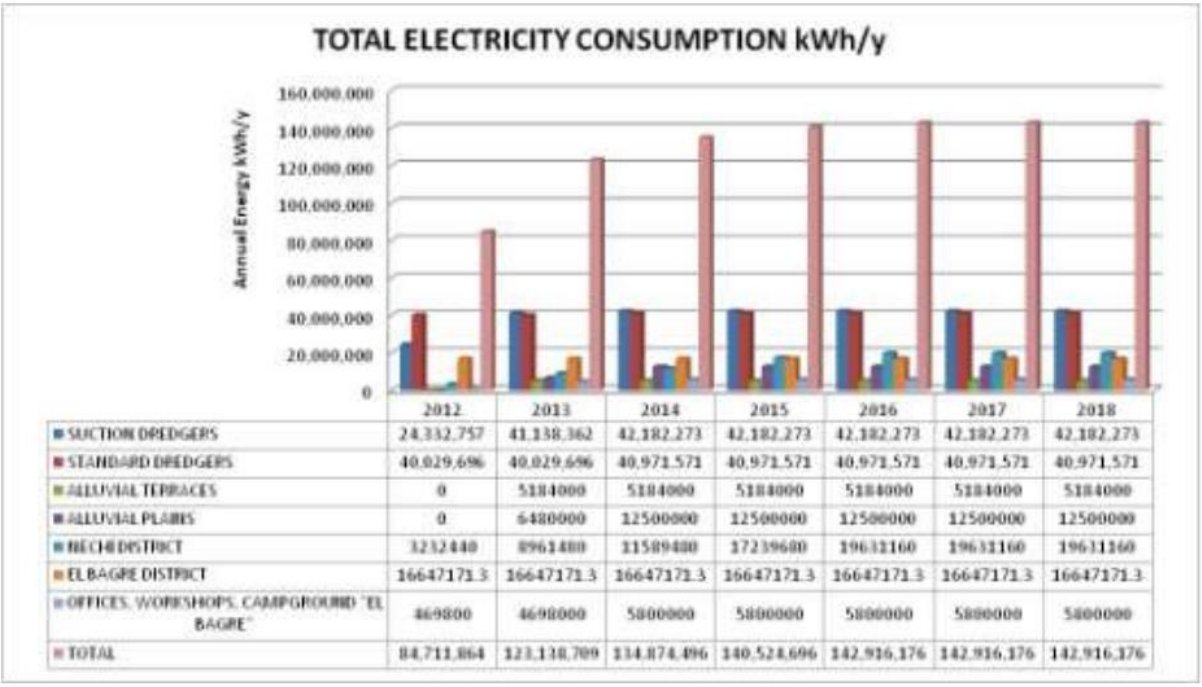
Appendix 3. Applicability of methodologies and standardized baselines

BASELINE INFORMATION

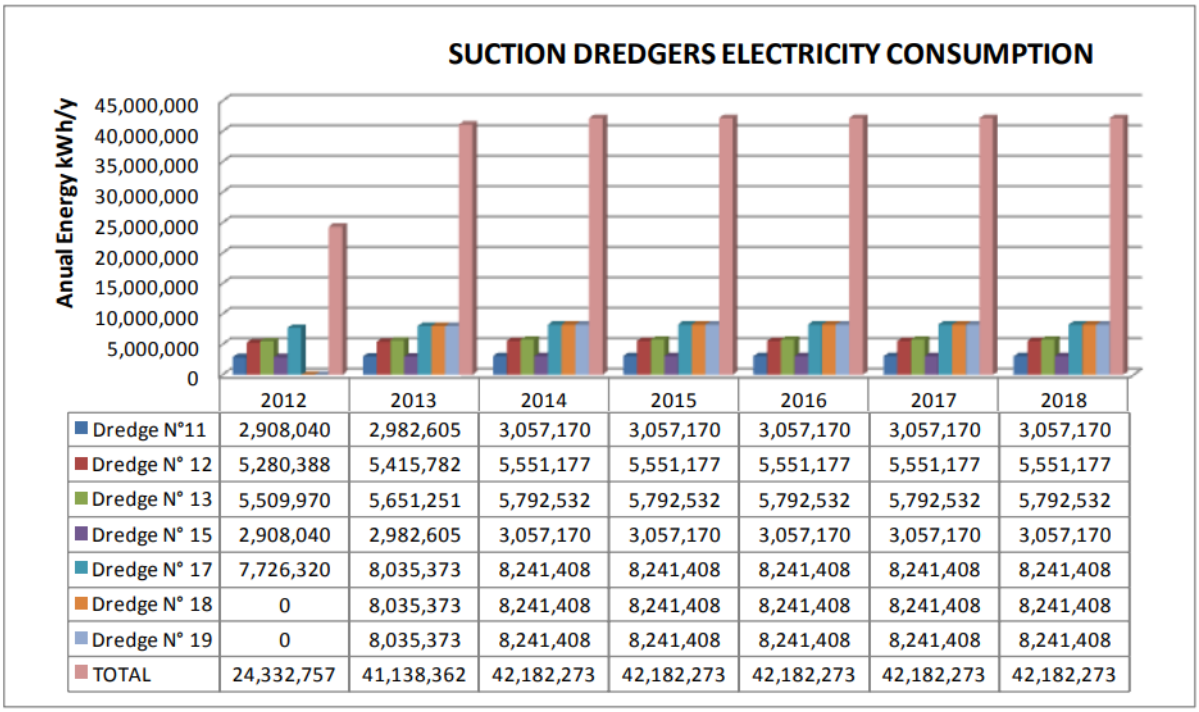
1. Basic topology of the electric system connecting the Providecia III project to the regional small grid and to the national electricity grid.


MINEROS S.A.
Diagrama unifilar general
Caucasia
110 kV
40 MVA
Caucasia
44 kV
44 kV - 39 km
Cuturú
22,1 km
Caserí
44 kV - 32,6 km
Canguros 44 kV
El Bagre
44 kV - 18,1 km
Zaragoza - 44 kV
EPM
Mineros S.A.
Draga 03
Draga 11
Draga 12
Draga 16
Draga 06
Draga 14
Draga 13
Draga 15
Draga 17
Draga 10
Bajagual 44 kV
Río Viejo - 44 kV
L. Verde
44 kV - 7,8 km
L. Roja
44 kV - 7,8 km
44 kV - 1,7 km
Grupo Electrogeno
3 x 1 MW
1,2 MVAR x 4
T L. Verde, 44 kV
44 kV - 0,006 km
T L. Roja, 44 kV
44 kV - 0,006 km
Zona Industrial
44 kV
Nueva Zona
Industrial 44 kV
Gen. Diesel
2 x 660 kW
1 x 1000kW
1 x 1250 kW
44 kV- 2,6km
44 kV - 44,3 km
44 kV - 36,4 km
Cherodn - 44 kV
44 kV - 0,3 km
44 kV - 0,3 km
Providencia III
44 kV
Providencia I
44 kV
Mina la V
7,2 kV
Trf
12000 kVA
Trf1
6250 kVA
Trf2
6250 kVA
Trf3
6250 kVA
Providencia III
4,16 kV
Providencia I - 2,3 kV
Gen 1
5140 kVA
Gen 2
5140 kVA
Gen 1
Gen 2
Gen 3
Gen 4
Unidad Futura
Providencia III
Providencia I
Convenciones

2. Electricity consumption to be displaced from the grid by the Providencia III SHP plant project:

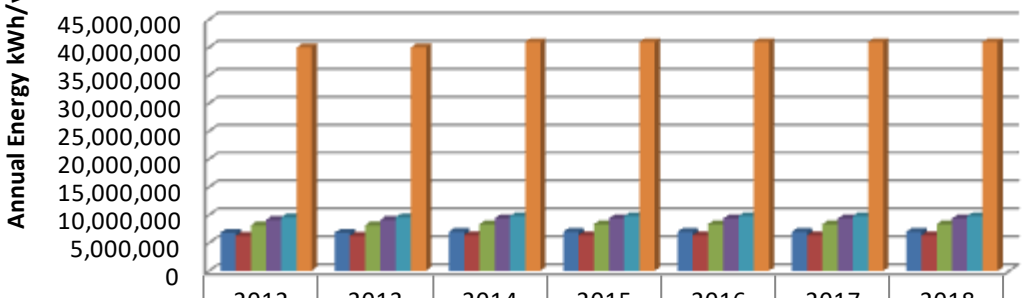


	2012	2013	2014	2015	2016	2017	2018
SUCTION DREDGERS	24,332,757	41,138,362	42,182,273	42,182,273	42,182,273	42,182,273	42,182,273
STANDARD DREDGERS	40,029,696	40,029,696	40,971,571	40,971,571	40,971,571	40,971,571	40,971,571
ALLUVIAL TERRACES	0	5184000	5184000	5184000	5184000	5184000	5184000
ALLUVIAL PLAINS	0	6480000	12500000	12500000	12500000	12500000	12500000
RECHI DISTRICT	1232440	8961480	11589480	17239680	19631160	19631160	19631160
EL BAGRE DISTRICT	16647171.3	16647171.3	16647171.3	16647171.3	16647171.3	16647171.3	16647171.3
OFFICES, WORKSHOPS, CAMPGROUND "EL BAGRE"	469800	4698000	5800000	5800000	5800000	5800000	5800000
TOTAL	84,711,864	123,138,709	134,874,496	140,524,696	142,916,176	142,916,176	142,916,176



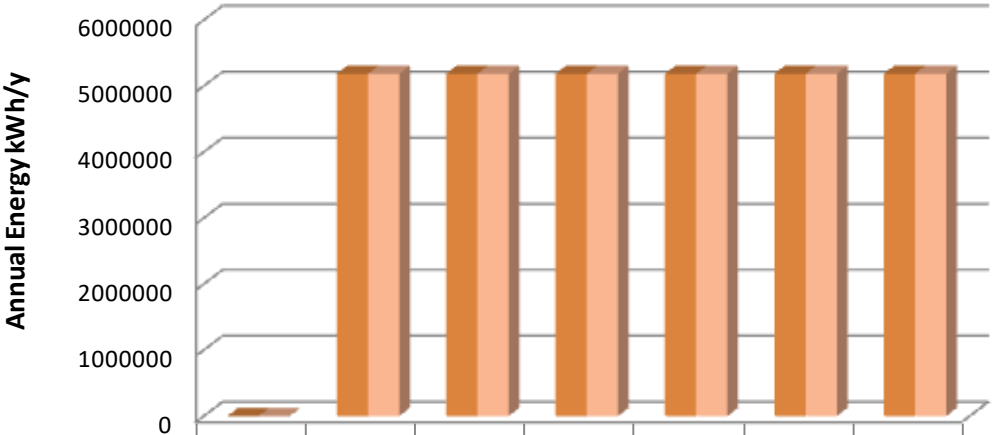
	2012	2013	2014	2015	2016	2017	2018
Dredge N°11	2,908,040	2,982,605	3,057,170	3,057,170	3,057,170	3,057,170	3,057,170
Dredge N° 12	5,280,388	5,415,782	5,551,177	5,551,177	5,551,177	5,551,177	5,551,177
Dredge N° 13	5,509,970	5,651,251	5,792,532	5,792,532	5,792,532	5,792,532	5,792,532
Dredge N° 15	2,908,040	2,982,605	3,057,170	3,057,170	3,057,170	3,057,170	3,057,170
Dredge N° 17	7,726,320	8,035,373	8,241,408	8,241,408	8,241,408	8,241,408	8,241,408
Dredge N° 18	0	8,035,373	8,241,408	8,241,408	8,241,408	8,241,408	8,241,408
Dredge N° 19	0	8,035,373	8,241,408	8,241,408	8,241,408	8,241,408	8,241,408
TOTAL	24,332,757	41,138,362	42,182,273	42,182,273	42,182,273	42,182,273	42,182,273

STANDARD DREDGERS ELECTRICITY CONSUMPTION



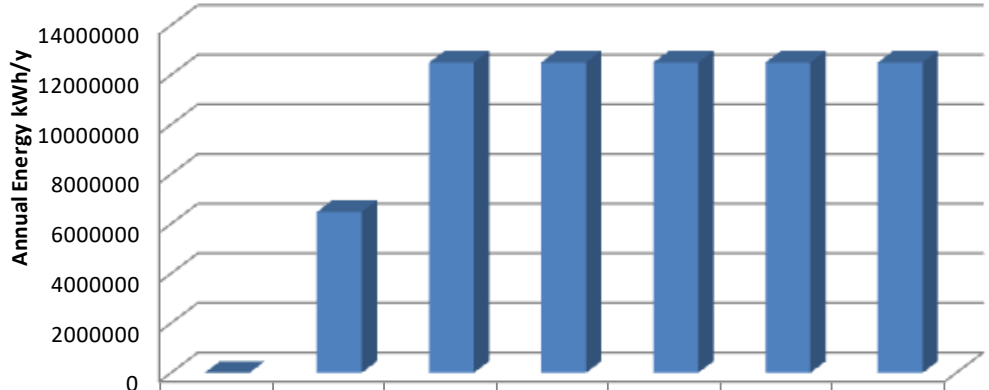
	2012	2013	2014	2015	2016	2017	2018
Dredge N° 3	6,838,406	6,838,406	6,999,310	6,999,310	6,999,310	6,999,310	6,999,310
Dredge N° 5	6,254,640	6,254,640	6,401,808	6,401,808	6,401,808	6,401,808	6,401,808
Dredge N° 10	8,172,730	8,172,730	8,365,029	8,365,029	8,365,029	8,365,029	8,365,029
Dredge N° 14	9,173,472	9,173,472	9,389,318	9,389,318	9,389,318	9,389,318	9,389,318
Dredge N° 16	9,590,448	9,590,448	9,816,106	9,816,106	9,816,106	9,816,106	9,816,106
TOTAL	40,029,69	40,029,69	40,971,57	40,971,57	40,971,57	40,971,57	40,971,57

ELECTRICITY CONSUMPTION IN ALLUVIAL TERRACES

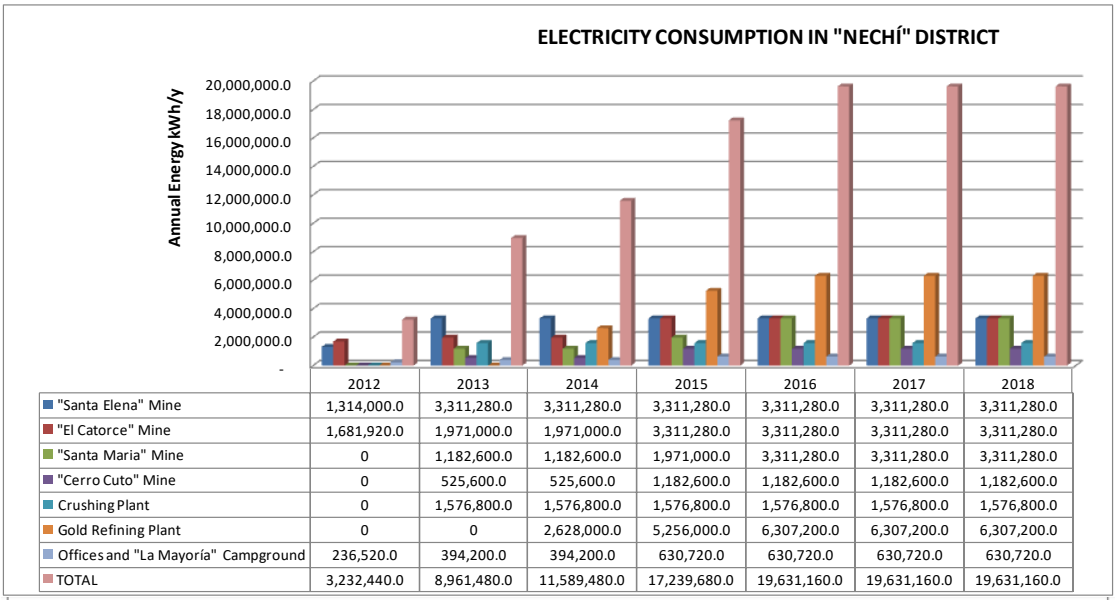


	2012	2013	2014	2015	2016	2017	2018
Alluvial Terraces	0	5184000	5184000	5184000	5184000	5184000	5184000
TOTAL	0	5184000	5184000	5184000	5184000	5184000	5184000

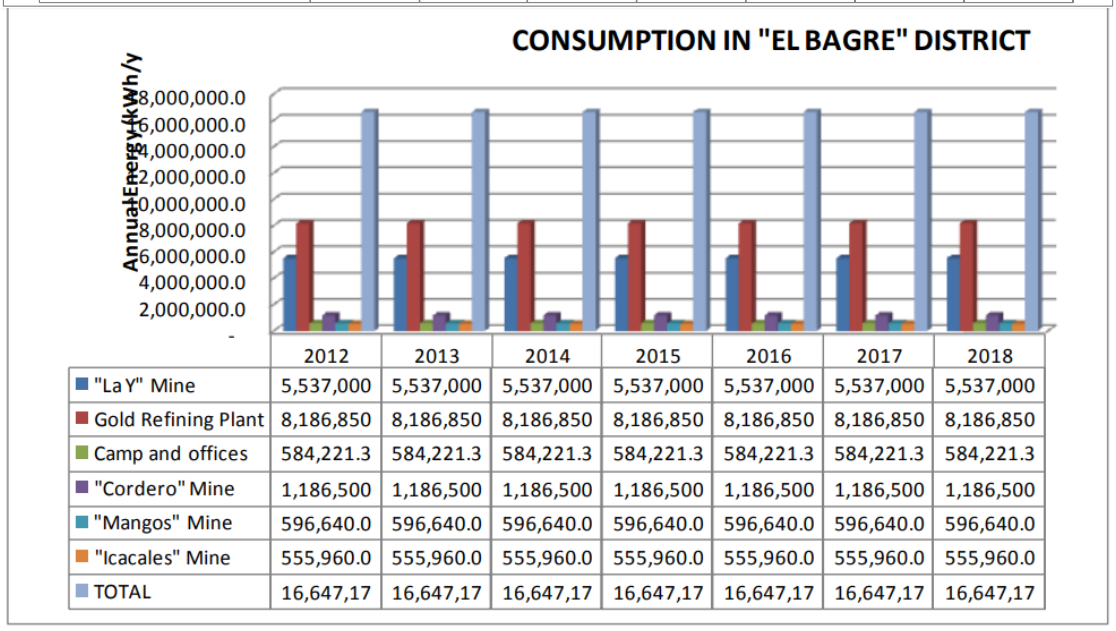
ALLUVIAL PLAINS ELECTRICITY CONSUMPTION



	2012	2013	2014	2015	2016	2017	2018
Alluvial Plains	0	6480000	12500000	12500000	12500000	12500000	12500000



	2012	2013	2014	2015	2016	2017	2018
"Santa Elena" Mine	1,314,000.0	3,311,280.0	3,311,280.0	3,311,280.0	3,311,280.0	3,311,280.0	3,311,280.0
"El Catorce" Mine	1,681,920.0	1,971,000.0	1,971,000.0	3,311,280.0	3,311,280.0	3,311,280.0	3,311,280.0
"Santa Maria" Mine	0	1,182,600.0	1,182,600.0	1,971,000.0	3,311,280.0	3,311,280.0	3,311,280.0
"Cerro Cuto" Mine	0	525,600.0	525,600.0	1,182,600.0	1,182,600.0	1,182,600.0	1,182,600.0
Crushing Plant	0	1,576,800.0	1,576,800.0	1,576,800.0	1,576,800.0	1,576,800.0	1,576,800.0
Gold Refining Plant	0	0	2,628,000.0	5,256,000.0	6,307,200.0	6,307,200.0	6,307,200.0
Offices and "La Mayoría" Campground	236,520.0	394,200.0	394,200.0	630,720.0	630,720.0	630,720.0	630,720.0
TOTAL	3,232,440.0	8,961,480.0	11,589,480.0	17,239,680.0	19,631,160.0	19,631,160.0	19,631,160.0



	2012	2013	2014	2015	2016	2017	2018
"La Y" Mine	5,537,000	5,537,000	5,537,000	5,537,000	5,537,000	5,537,000	5,537,000
Gold Refining Plant	8,186,850	8,186,850	8,186,850	8,186,850	8,186,850	8,186,850	8,186,850
Camp and offices	584,221.3	584,221.3	584,221.3	584,221.3	584,221.3	584,221.3	584,221.3
"Cordero" Mine	1,186,500	1,186,500	1,186,500	1,186,500	1,186,500	1,186,500	1,186,500
"Mangos" Mine	596,640.0	596,640.0	596,640.0	596,640.0	596,640.0	596,640.0	596,640.0
"Icacales" Mine	555,960.0	555,960.0	555,960.0	555,960.0	555,960.0	555,960.0	555,960.0
TOTAL	16,647,17	16,647,17	16,647,17	16,647,17	16,647,17	16,647,17	16,647,17

Name of the project	Description
SUCTION DREDGERS	"Dragas de succión" stands for suction dredgers. These suction dredgers clear the field for the spoon dredgers that remove sediments from the river. In 2013 Mineros Aluvial S.A.S. BIC started operations of 2 new suction dredgers to increase efficiency of the gold recovery process. The suction dredgers were purchased by Mineros Aluvial S.A.S. BIC at present the import process of the dredgers is under development.
STANDARD DREDGERS	This Project comprises 5 dredging machines already in place and operating. The electricity consumption of this dredging machines served for calculating electricity consumption from other projects.
ALLUVIAL TERRACES	This Project seeks to recover gold in areas were illegal mining is OPERATED. This project seeks, also, to serve as a demonstrative project to show small miners that the mining activity can be performed in an environmental sound way.
ALLUVIAL PLAINS	This project seeks to place new mining activities in areas that are considered as marginal by Mineros Aluvial S.A.S. BIC. This

<table>
<tr><td></td><td>areas have not been perceived as economically feasible due to access conditions and studies have shown a low level of gold reservoirs. A modification of the spoon dredgers is under development taking into account the way that dredgers would be transported. This project comprises 9 marginal reserves blocks.</td></tr>
<tr><td>NECHÍ DISTRICT</td><td>Includes 4 exploitation mines, 1 crushing facility and a 1 refining facility.</td></tr>
<tr><td>EL BAGRE DISTRICT</td><td>This project comprises 1 exploitation mine, with 3 mines under exploration. It also includes a gold refining facility and offices. Though these mines are located by the side of the river, they are operated by means of a tunnel that can reach a 100 mts in depth. This is also a new concept for alluvial gold mining activities.</td></tr>
<tr><td>OFFICES, WORKSHOPS, AND “EL BAGRE” CAMPGRAOUND</td><td>Electricity consumption in the refining facilities and administrative offices in the “Distrito El Bagre” area are as follows:
<table>
<tr><th>Annual Electricity Consumption</th><th>Refining Facility</th><th>Camp and Offices</th></tr>
<tr><td>KWH AÑO REAL</td><td>7,245,000</td><td>517,010</td></tr>
<tr><td>KWH A AÑO + PERDIDAS DEL (13%)</td><td>8,186,850</td><td>584,221.3</td></tr>
</table>
Electricity consumption in the refining facilities and administrative offices in the “Distrito Nechí” area are as follows:
<table>
<tr><th>ELECTRICITY DEMAND</th><th>2012 kva</th><th>2013 kva</th><th>2014 kva</th><th>2015 kva</th><th>2016 kva</th><th>2017 kva</th></tr>
<tr><td>Planta de trituración</td><td>80</td><td>300</td><td>300</td><td>300</td><td>300</td><td>300</td></tr>
<tr><td>Planta Beneficio</td><td></td><td></td><td></td><td>1,000</td><td>1,200</td><td>1,200</td></tr>
<tr><td>Oficina mas campamento La Mayoría, de 25 a 50 personas.</td><td>45</td><td>75</td><td>75</td><td>120</td><td>120</td><td>120</td></tr>
<tr><td>TOTAL</td><td>695</td><td>1,705</td><td>1,705</td><td>2,980</td><td>3,435</td><td>3,435</td></tr>
</table>
</td></tr>
</table>

3. Historical electricity consumption of administrative facilities and dredging machines at Mineros Aluvial S.A.S. BIC

	2008			
	Providencia kW	**Diesel kW**	**Interconex 1 at Zona Industrial substation kW**	**Net electricity consumption kW**
Jan	5,405,380	-	-990,235	4,415,145
Feb	5,226,907	-	-819,502	4,407,405
Mar	4,340,559	76,512	-631,172	3,785,899
Apr	5,019,507	8,800	-751,120	**A.** 4,277,187
May	5,222,203	-	-857,262	4,364,961
Jun	5,377,214	-	-830,036	4,547,178

Jul	5,377,995	-	-988,928	4,389,067	
Aug	4,853,070	41,150	-703,451	4,231,919	
Sep	5,524,001	3,700	-888,974	4,638,727	
Oct	5,177,977	400	-836,680	4,341,697	
Nov	5,251,224	-	-901,376	4,436,739	
Dec	5,338,115	-	-602,723	4,648,501	
	2009				
	Providencia kW	**Diesel kW**	**Interconex 1 at Zona Industrial substation kW**	**Interconex 2 at Bijagual substation kW**	**Net electricity consumption kW**
Jan	5,468,625	-	-1,289,359	411,902	4,591,168
Feb	4,727,782	-	-869,306	1,243,651	5,102,127
Mar	4,930,158	-	-870,970	1,575,303	5,634,491
Apr	4,878,033	-	-1,228,681	1,509,894	5,159,246
May	5,273,225	14,620	-666,135	967,285	5,588,995
Jun	5,162,153	-	0	531,556	5,693,709
Jul	4,663,623	4,470	0	647,971	5,316,064
Aug	5,328,352	-	0	612,706	5,941,058
Sep	4,851,669	21,196	0	468,907	5,341,772
Oct	4,893,096	-	0	549,479	5,442,575
Nov	4,797,806	-	0	555,812	5,353,618
Dec	4,797,806	28,150	0	783,311	4,930,074
	2010				
	Providencia kW	**Diesel kW**	**Interconex 2 at Bijagual substation kW**	**Net electricity consumption kW**	
Jan	3,909,048		1,051,655	4,960,703	
Feb	3,047,005	135,594	1,401,362	4,583,961	
Mar	4,774,364	5,950	1,270,642	6,050,956	
Apr	4,699,740	39,349	1,422,158	6,161,247	
May	4,730,832	44,723	1,531,245	6,306,800	
Jun	4,955,581	54,130	1,429,262	6,438,973	
Jul	4,080,285	71,430	1,957,773	6,109,488	
Aug	4,167,390	298,756	1,821,607	6,287,753	
Sep	3,340,708	113,310	1,869,370	5,323,388	
Oct	5,189,060	87,025	2,004,288	7,280,373	
Nov	2,467,288	356,470	2,227,913	5,051,671	
Dec	2,913,685	198,360	2,213,938	5,325,983	
	2011				

	Providencia kW	Diesel kW	Interconex 2 at Bijagual substation kW	Net electricity consumption kW	
Jan	4,107,661	19,220	1,974,119	6,101,000	
Feb	4,151,971	40,350	2,101,888	6,294,209	
Mar	3,568,497	303,300	2,540,980	6,412,777	
Apr	3,533,414	225,473	2,210,750	5,969,637	
May	4,228,594	-	2,503,974	6,732,568	
Jun	4,883,506	17,990	2,035,320	6,936,816	
Jul	2,632,753	767,610	2,614,744	6,015,107	
Aug	4,356,493	4,650	2,031,068	6,392,211	
Sep	4,772,626	30,071	2,216,578	7,019,275	
Oct	2.877.124	796,933	3,228,177	6,902,234	
Nov	1.211.958	1,196,060	2,862,687	5,270,705	
Dec	4.977.776	2,450	1,766,248	6,746,474	

4. Current electricity connections from the *Providencia SHP* plant to the small MINEROS ALUVIAL S.A.S. BIC grid and to the national electricity grid

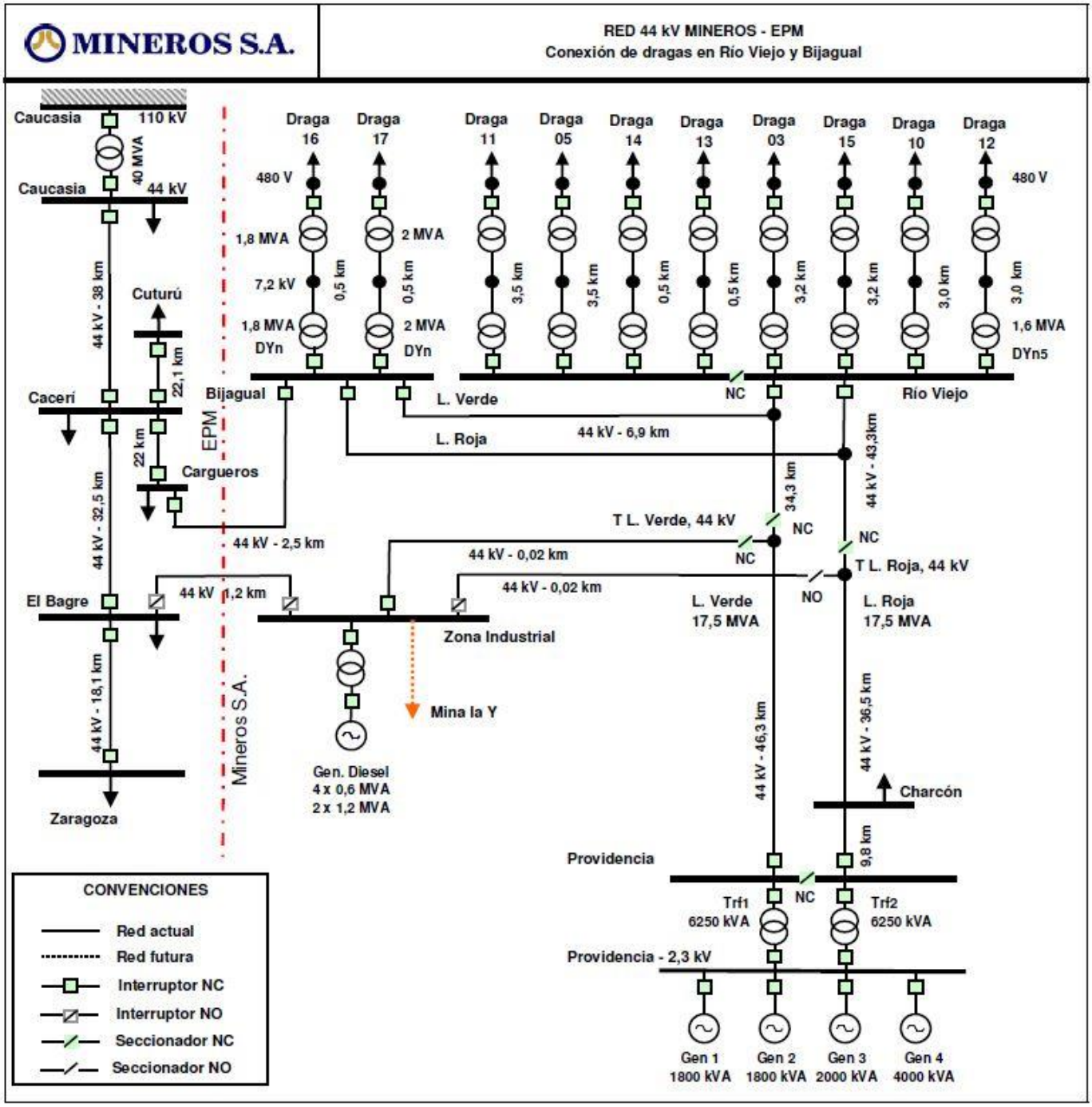


Figura 1. Topología de la red de transmisión de MINEROS interconectada con EPM

Appendix 4. Further background information on ex ante calculation of emission reductions

Please refer to Section B.6.3. and the attached excel sheet entitled “Emission reduction Calculation PIII v4 Nov291112.xls”.

Appendix 5. Further background information on monitoring plan

All related monitoring information can be found at section B.7.2

Appendix 6. Summary report of comments received from local stakeholders

Opening by the Director of Corporate Social Responsibility (CSR) of Mineros Aluvial S.A.S. BIC: Dr. Jaime Jaramillo

The Director of CSR began his presentation by greeting the community present as well as the special guests. Following, he explained who Mineros Aluvial S.A.S. BIC is and it gold mining tradition, as well as their need to generate energy development through the Providencia III project to allow Mineros Aluvial S.A.S. BIC to fulfill their plans in terms of growth.

Figure 13. Dr. Jaime Jaramillo, Director of CSR

He then explained in a clear manner why it was decided to undertake the improvement and expansion of generation framed within the neighboring areas around el Charcón, aluding to the need to strengthen the supply of electricity to the subregion, especially to towns located at the fringes of the interconnected network.

Opening by the Mayor of Anorí: Dr. Nicolás Herón Arango

Figure 14. Dr. Nicolás Herón, Alcalde del municipio de Anorí, Antioquia

The mayor of Anorí began by thanking the community for its excellent attendance to this networking event. The Mayor, Nicolás Herón Arango expressed his support of the *Providencia I and III* projects and highlighted the benefits these would generate for the community. He then issued two recommendations regarding the development of the *Providencia I and III* projects:

- The first, referred to the fact that all projects undertaken in the area, should be seen from a different perspective: The perspective of regional development through new jobs in contrast to the old perspective of welfarism by the company.

- The second was a request to Mineros S.A to shar nd implement the projects with the communities and presidents of the JAC - especially those from Usurá, Charcón, Toná and Providencia, to form a committee between the community, the administration, law enforcement and different actors in the area, the Mayor

of the municipality of Anorí requested that *"all efforts be articulated so they can be acknowledged and legitimized by all. Maintain constant communication with the presidents of the entire area, not only with those in Charcón¨*.

His speech ended with a commitment to the *Providence I and III* projects by the administration, which offered its accompaniment, as necessary, and participation in joint processes.

Speech by the Regional Director of the local environmental authority (Corantioquia): Eng. Juan Carlos Marín

Figure 15. Eng. Juan Carlos Marín, Regional Director of Corantoquia

At the start of his speech, Juan Carlos Marín gave an explanation about who Corantioquia is and what their role is in the management of natural resources. In retrospection, he thanked Mineros Aluvial S.A.S. BIC for the invitation to participate in the networking of the Projects.

He then presented in an orderly and prompt fashion the paperwork required for a project like *Providencia III*. Among those, he mentioned: a water concession, disposal permit, forest harvesting permit, a mining permit for dragging material and a license to extract material.

He also mentioned that at present, Mineros Aluvial S.A.S. BIC had requested 18 environmental permits (six water concession permits, six disposal permits, a forest harvesting permit and one for dragging material).

At the end of his speech, he highlighted the specific characteristics of this type of projects, agreeing that the user should take measures to compensate and mitigate any impacts, and thus explained, these projects are of great importance and retain all the requirements of environmental regulation.

Words from the Director of the Corporate Environmental Division of Mineros Aluvial S.A.S. BIC: Eng. Carlos Castaño

Figure 16: Eng. Carlos Castaño, Director of the Corporate Department of Environment

At the beginning of his speech, the Director of the Corporate Environmental Division explained the environmental regulatory framework under which these projects were governed. Similarly, he spoke of Mineros Aluvial S.A.S. BIC's environmental and social responsibility and the example set by them as a mining company.

¨The challenge is to work in the best way possible and make no environmental impact" Director of the Corporate Environmental Division.

He then emphasized the fact that the two new centrals are based on clean technologies. Finally, he requested the participation of the community, the State and Mineros Aluvial S.A.S. BIC to head all the challenges, which may arise, making clear that only this way could they reach the proposed goals.

Explanation of the project by the Regional Director of hydroelectric projects of Mineros Aluvial S.A.S. BIC: Eng. Juan Carlos Meza.

Engineer Meza gave a detailed explanation of the work that took place to achieve the capacity increase in Providencia III. He also presented the technical characteristics of the equipment and where these would be located on the territory. Juan Carlos Meza made it clear that because of their positioning, no area would flood because of the Providencia III project. He then called attention to the discharge areas.

Figura 17: Eng. Juan Carlos Meza, Technical Director of the Providencia III hydroelectric project by Mineros S.A

In conclusion, he informed the community that the road between Charcón and Toná would be improved and equally, two new bridges would be built and two other existing bridges would be repaired, these works would service the community.

Explanation of the project by the Technical Advisor to the CDM Project: Eng. Juan Carlos Caycedo

At the beginning of his speech, he spoke about climate change and the effects it generates. He reviewed the elements that make up the Environmental Management Plan (PMA) and the result of the assessment of the main impacts that would be perceived by the community during the project construction and its subsequent operation. Ing. Caycedo concludes that based on the PMA that all the aspects that suggest a risk to the community have been assessed and each has an action plan and a contingency measure. Therefore, the Providencia III hydroelectric project would not create negative impacts for the community, on the contrary, the works serve as flow rate regulators and will protect the community from future flooding like the one experienced in 1998. Additionally, the project ensures that *"An ecological flow will be left behind to maintain the natural flow".*

Figure 18. Ing. Juan Carlos Caicedo, CAEMA

At the end of presentations by each one of the special guests and representatives of Mineros S.A, the support of the community regarding the project was evaluated through a survey. The surveys discussed in this document were collected during the Providence I project social consultation on September 15, 2011, in the municipality Anori, in Antioquia.

These were completed by a section of the community in direct or indirect contact with the corporate activities of Mineros Aluvial S.A.S. BIC, therefore, the results can serve as a basis to establish the degree of acceptance, by area residents, of the *Providencia III* project.

It is essential to highlight the large number of participants in the meeting organized by Mineros Aluvial S.A.S. BIC, which exceeded the expected participation by 50% (150 participants). For most, the *Providencia III* project has a high relevance, as is the case of Enith Yohana Ramírez Jaramillo, who lives in Liberia: *"Accept my most sincere support. I am very happy because this project generates employment and development ¨.*

Figure 19 shows the results that correspond to the third question in the *Providence III* survey (see attached survey form). During the survey evaluation contradictions were found in the answers to this question. Although 20 people answered the previous question negatively, contradictions were found in the answers, for example, eight of the respondents in spite of their negative response to the impact of the project responded that the community could benefit from the *Providencia III* project. This is the case of

Mr. Daniel José Hoyos Peves, a resident of Liberia, *¨people could benefit from this project and it is something we need¨*. Of this group, four others explained that they were not affected by the project or did not belong to the association. Six of the remaining 20 made no comments on how they'd be affected, and lastly, of the remaining two, the former referred to the space occupied by the company - the question did not obtain further justification, and the latter responds negatively due to lack of information. See the section, Questions by the Public for answers to other questions asked during the consultation day and answered in the surveys.

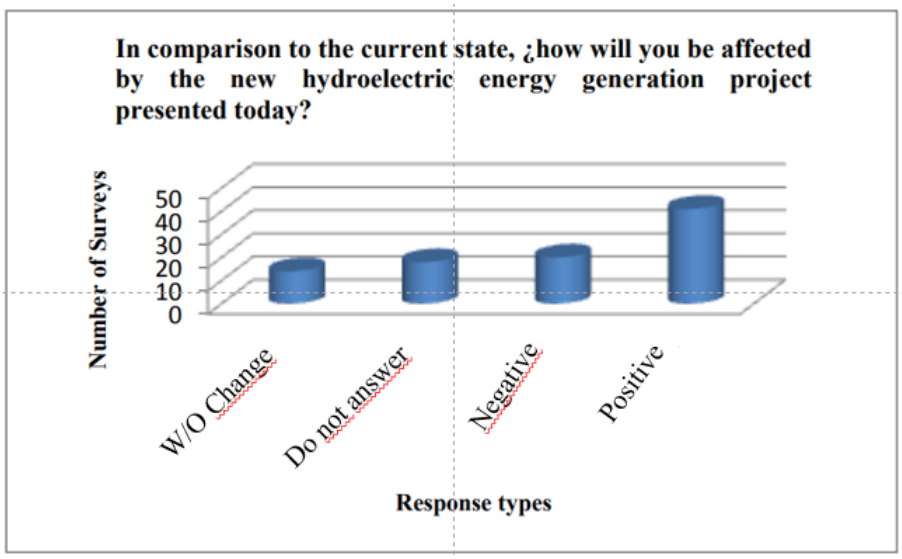


Figure 19: Effect on the community by the development of the Providencia III Hydroelectric project

The second graphic presents the results corresponding to the fourth *Providencia III* survey question (see annexed surveys).

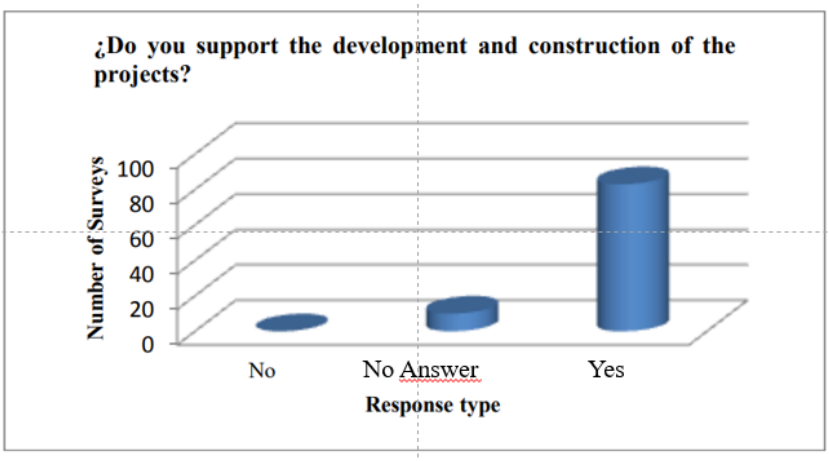


Figure 20: Community acceptance of the development of the Providencia I Hydroelectric project.

The 80 people surveyed responded positively in support of the *Providencia III* project. For most of the participants in the social consultation, this project will mean new job opportunities as well as improvements to their municipality, as is the case of Mrs. Alba Lucelis Patito Hernández, who lives in Charcón, she refers to *Providencia III* as follows: *"I agree with all projects that benefit the community¨*. It must be noted that only one respondent refused to support Mineros Aluvial S.A.S. BIC, however the respondent did not specify why not.

Appendix 7. Summary of post-registration changes

1. **Permanent increase in capacity at the commissioning of the Pelton turbine**. When finished Validation and registration of this project activity, technical features of the Pelton turbine to be installed was not fixed yet since negotiation haven't finished completely. At the closing of the negotiation it was possible to improve installed capacity of the turbine without increasing price. Therefore, decision of accepting the new improved turbine was intuitive.
   Impact of the PRC. The scale and type of the project activity do not change once applied the PRC. Also methodology will continue being the same but updated from version 2 to version 3; all components of the methodology are calculated and supported on the same manner with the application of this PRC. No increase in costs were incurred for the implementation of the project. Barriers the project activity overcame during implementation are the same as those described for the project activity. Accuracy for the monitoring of electricity generation is high, as MINEROS ALUVIAL S.A.S. BIC improved data custody and storage of information.
2. **Use of the yearly Colombian grid emissions factor billed by UPME instead of a fixed emissions factor**. A fixed emissions factor of 0.28 tCO2e/MWh do not represent the real contribution to emission reductions considering that UPME emission factor for 2019 equals 0.388 and it has been higher in previous years.
   Impact of the PRC. A fixed emissions factor of 0.28 tCO2e/MWh do not represent the real contribution to emission reductions considering that UPME emission factor for 2019 equals 0.388 and it has been higher in previous years. It is expected an increase by around 30% in the amount of emission reductions since average emission factors released by UPME during the crediting period are a 30% higher than the one used for ex-ante estimations.
3. **Change in the starting of the crediting period**. PPs request moving the date of the starting of the crediting period from 25/05/2013 to 12/03/2015. This is due to delay in the

commissioning of the SHP plant having restrictions in arrival, transport, and guerrilla attacks that prevented on time commissioning of the power plant.

Impact of the PRC. Since the only result of this PRC is to not consider the time the project activity was not operational due to delay in implementation of the project, Additionality of the project, baseline and monitoring plan remains the same.

4. **Temporary change to the monitoring plan for parameter Electricity Generation ($EG_{Pj,y}$).** Monitoring of $EG_{Pj,y}$ requires demonstration of net electricity supplied to the grid. For electricity produced on Providencia III exists a small amount used to light installations (including kitchen service for workers and habitational use, as well as, offices lighting further named as auxiliary services). Supply of electricity to operational and temporal living of workers installations is fed through a 180kVA transformer which is also fed from the 14000kVA transformer which supply electricity to the Mineros Aluvial S.A.S. BIC minigrid. Since the instrument for metering auxiliary services electricity consumption was not installed, it is proposed a conservative discount for calculating the net electricity supplied to the minigrid. Since the maximum electricity supply to the auxiliary services area passes through the 180kVA coming from the main transformer with a 14000 kVA capacity, therefore, the maximum electricity supply to the auxiliary services area would account for 1.286% (180/14000) out of the 100% electricity passing through the 14000kVA transformer. Hence, total electricity supplied to the Mineros S.A minigrid will account for 100-1.286=98.784% of the total electricity generated at Providencia III. It is solicited that for the reporting of electricity generation from Providencia III, gross electricity measured be multiplied by 0.98784 to find net electricity supplied to the Mineros Minigrid. This is a temporary change starting on 16 Feb. 2013, during the first crediting period to be fixed by the end of 2020 an electricity meter will be installed to metering Auxiliary Services electricity consumption, which is expected will account for a much lesser consumption. The electricity meter to be installed will be connected to the data gathering and reporting actually in place.

Impact of PRC. A decrease in emission reductions is expected seeking conservatism of calculations. Once the new meter is installed, monitoring parameters will remain unchanged.

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Document information

Version	*Date*	*Description*
11.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Make editorial improvements.
10.1	28 June 2017	Revision to make editorial improvement.
10.0	7 June 2017	Revision to: • Improve consistency with the "CDM project standard for project activities" and with the PoA-DD and CPA-DD forms; • Make editorial improvement.
09.0	24 May 2017	Revision to: • Ensure consistency with the "CDM project standard for project activities" (CDM-EB93-A04-STAN) (version 01.0); • Incorporate the "Project design document form for small-scale CDM project activities" (CDM-SSC-PDD-FORM); • Make editorial improvement.

Version	*Date*	*Description*
08.0	22 July 2016	EB 90, Annex 1 Revision to include provisions related to automatically additional project activities.
07.0	15 April 2016	Revision to ensure consistency with the “Standard: Applicability of sectoral scopes” (CDM-EB88-A04-STAN) (version 01.0).
06.0	9 March 2015	Revision to: • Include provisions related to statement on erroneous inclusion of a CPA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Provisions related to the Host Party; • Make editorial improvement.
05.0	25 June 2014	Revision to: • Include the Attachment: Instructions for filling out the project design document form for CDM project activities (these instructions supersede the "Guidelines for completing the project design document form" (Version 01.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the project activity in B.7.4 and Appendix 1; • Change the reference number from F-CDM-PDD to CDM-PDD-FORM; • Make editorial improvement.
04.1	11 April 2012	Editorial revision to change version 02 line in history box from Annex 06 to Annex 06b.
04.0	13 March 2012	Revision required to ensure consistency with the “Guidelines for completing the project design document form for CDM project activities” (EB 66, Annex 8).
03.0	26 July 2006	EB 25, Annex 15
02.0	14 June 2004	EB 14, Annex 06b
01.0	03 August 2002	EB 05, Paragraph 12 Initial adoption.

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