

Executive summary

ANGLO AMERICAN IN PERU:

Extractivism, effects and corporate networks



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ANGLO AMERICAN EN EL PERÚ:

Extractivismo, efectos y redes empresariales



Anglo American in Peru: extractivism, effects and corporate networks

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'Nos quitaron la última fuente de agua que nos quedaba'¹

'They took from us the last water source that we had left'

Lucio Flores

President of FACAREMOQ

¹ References Anglo American's diversion of the Asana river



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Foreword

A *nglo American in Peru: extractivism, effects and corporate networks* is the result of cooperation between Peruvian and international organisations. Its object is to analyse the Quellaveco mining project, located in Moquegua, southern Peru. It also provides an overview of the socio-environmental problems that are faced in the Moquegua department.

Quellaveco has been in operation since 2022 and is jointly owned by mining corporations Anglo American and Mitsubishi, with the former as majority shareholder and operator. For many years, Quellaveco has been presented as a ‘model’ project where technological innovation helps to limit environmental damage. Nevertheless, it has also been questioned by social organisations and communities in Moquegua, who have experienced negative impacts on their land, rivers, and likely their health. This investigation presents official documentation and empirical evidence on the Quellaveco mining project. It also connects Moquegua’s environmental problems with the incidence of extractivism in the region.

The initiative behind this investigation arose in 2019 from collaborative work between Derechos Humanos y Medio Ambiente (DHUMA), which is a member of the Red Muqui network; and Terra Justa, which in turn is a member of London Mining Network. In the context of actions related to Anglo American’s shareholder Annual General Meetings (AGM), both Terra Justa and DHUMA undertook the process of contacting and forming relations with social leaders and community environmental monitors. From the start, therefore, the investigation has been connected to the voices of communities and families who coexist with mining and suffer its effects. From early on, the investigation was supported by London Mining Network, whose work focuses on solidarity with communities and workers impacted by mining companies linked to the UK. In 2023, Red Muqui became part of the team and led the consolidation of research. Red Muqui’s involvement also made it possible to strengthen relationships with social leaders in Moquegua. Among them, particular recognition is due to Lucio Flores and Freddy Cárdenas, whose documentation of the Quellaveco project over many years has been essential to the investigation. It is also pertinent to thank Ground Lab at the Architectural Association and University College London’s Landscape Architecture master’s programme, for their assistance in producing some of the maps and figures.

From 2020 and in the context of this inter-institutional articulation, work was done to research and present questions about Quellaveco at Anglo American’s London AGMs. In February 2025, Red Muqui and the Agrarian and Environmental Federation of Moquegua (FACAREMOQ) joined hands with LMN to do this in person, in London. However, as before, the company’s responses were unsatisfactory and shed no light on the situation in Moquegua. Faced with Anglo American’s refusal to engage, Red Muqui, FACAREMOQ and Misereor filed a complaint at Germany’s Federal Office of Economics and Export Control (BAFA). The complaint was aimed at Aurubis, a

transnational company that is Germany's largest copper smelter and which sourced copper concentrates from the Quellaveco mine². As the team argued before BAFA, Aurubis was failing to meet the due diligence requirements for its supply chain, with violations of human and environmental rights in the Tumilaca basin located downstream from Quellaveco.

Responsibility for the impacts of copper extraction in Moquegua also exists in the United Kingdom. This is not only because Anglo American is a British-capital firm, but also because of policies approved by the UK government. In November 2025, the UK launched a new Critical Minerals Strategy, to secure metals that mostly serve to fuel its military industry and the growth of Artificial Intelligence. In the strategy, the government identifies copper as a mineral in expansion and predicts that by 2035 annual demand for it will double. It is not explained, however, where this huge volume of minerals will be sourced, and what kind of impacts extraction has in territories like Moquegua. The UK government's policies are in line with others promoted across the Global North, as countries race to secure access to critical minerals and boost a new global wave of mega-mining.

This publication closes an inter-institutional process that has developed over many years. Simultaneously, however, it opens new possibilities and commitments oriented towards finding justice. The investigation's value does not lie in publication but in the possibility of real change for inhabitants of Moquegua, and – eminently among them – the communities and families that have struggled against large-scale mining for so many years and who continue to bear its real cost.

Derechos Humanos y Medio Ambiente
Red Muqui
TerraJusta
London Mining Network

² Verified via Veritraid.

Introduction

This document is an executive summary of the investigation titled *Anglo American in Peru: extractivism, effects and corporate networks*, which is centred on the analysis of the Quellaveco mining project operated by Anglo American Quellaveco S.A. (AAQ) as well as the broader socio-environmental problems faced in Moquegua. The study questions narratives that present Quellaveco as a model of sustainable and technologically advanced ‘modern’ mining. It argues, instead, that the project reproduces structural features of extractivism, which are exacerbated at present by the Global North’s energy transition and the attendant rise in the demand for minerals, which has triggered an unprecedented expansion of mining in the Global South (Azamar, 2024).

The present investigation is inscribed in the context of Latin American political ecology, understood as a theoretical and practical domain nourished by Latin American critical thinking and by experiences of resistance in the face of plunder (Alimonda, 2017). The authors, therefore, do not just produce knowledge but also relate to environmental activism (Martinez Alier, 2015). They also engage in the re-politicisation of life, the re-definition of the meaning of existence, and the appropriation of nature (Machado, 2017). Likewise, political ecology drives the construction of critical thinking and political action (Leff, 2006), while remaining tethered to historical processes, socio-environmental conflicts, power relations and the ecological impacts on ecosystems (Alimonda, 2017; Roig, 2004). Its object of analysis goes beyond socio-environmental conflicts and power dynamics, and extends to the ecological realm and impacts on ecosystems (Walker, 2005).

From this point of view, extractivisms today constitute a central analytical axis (McCarthy et al., 2015), especially in the context of the energy transition, where discourses of mining as sustainable or ‘green’ are driven by a demand for critical or strategic minerals (Azamar, 2024). This process moreover, increases the metabolism of societies with a high energy consumption (Neyra, 2020). In this investigation, extractivisms are understood as forms of high-volume, high-intensity natural resource extraction that are primarily aimed at the export of raw materials with little or no processing (Gudynas, 2013). Extractivisms are not limited to mining, but can include industrial fisheries, monocrop farming and the extraction of fossil fuels (Gudynas, 2013). Extractivisms, moreover, involve a pattern of power that structures, organises and regulates the social field (Machado, 2018b) and configures political, economic and legal systems, even altering identity and cultural imaginaries (De Echave et al., 2022). Mining, on the other hand, is defined as the selective extraction of mineral substances from the Earth’s crust, for their transformation into raw or mineral products as well as energy products (Herrera, 2017). In a simpler definition it is also understood as the activity oriented to the extraction of minerals (Hartman & Mutmansky, 2002). In the case of Peru, mining involves geological exploration, extraction of metallic and non-metallic materials, and the metallurgical processing of the extracted materials (Rodriguez et al., 2023). ‘Mega-mining’, according to Gudynas (2015) occurs when extracted minerals and their ecological rucksack combined exceed 1 million metric tonnes per year.

Parting from these bases, the investigation also incorporates the notion of group composition to examine the complex network of power relations, services, institutions and structures that sustain an extractivist operation across time. This concept is nourished by political ecology, extractivism theory and the concept of corporate state capture (Martinez, 2025). In addition, it is useful in the examination of how political and economic elites participate in the public affairs and territorial expansion of this kind of project, a dynamic that has been widely documented in studies of corporate power (Durand, 2016). The investigation, then, analyses the mining dynamic of AAQ in Quellaveco along three axes – extraction, impacts and group composition – with the end goal of determining if its operations can be described as extractivist. To this purpose a hybrid exploratory-explicative methodology is employed; this involves a non-experimental, longitudinal design and the use of case studies. The investigation derives much of its information from 111 documents from the health sector, drinking water suppliers, sector authorities, public records and communal sources, focused on Moquegua and especially on the Tumilaca sub-basin, and others where the main components of the Quellaveco project are being developed. The case of Quellaveco was selected in response to demands from FACAREMOQ, as well as the previous collective actions carried out by DHUMA, Terra Justa and LMN.

The investigation locates the case of Quellaveco in the wider context of expansion of large-scale mining in Latin America, where extractive projects are promoted as engines of economic growth, but also generate socio-environmental conflicts and pressures on ecosystems (Conde & le Billon, 2017). In this context Quellaveco becomes an emblematic case, as much due to its scale as to the corporate narrative that presents it as a ‘100% digital mine’³ that minimizes environmental damage. The study, however, shows that this narrative is empirically questionable.

The investigation is also relevant in the present context of Moquegua, which is marked by social conflicts over Anglo American’s failure to act on its commitments. Among these is Agreement 11 from the 2012 Moquegua Roundtable which promised the construction of a storage system for 2.5 million cubic metres of water in the Asana river, upstream from Anglo American’s engineered diversion. More than a decade on, Anglo American has not delivered on this measure of compensation. This has generated criticism from social organisations in the region and has exposed the limitations of the dialogue process including a lack of real participation in the making of decisions fundamental to life and land. Anglo American argues that the dam is not viable due to technical reasons, but social organisations and the population of Moquegua at large interpret this as a failure to uphold the agreement. This failure must be understood in the context of a broader discussion about the fulfillment of the 26 items agreed to by Anglo American in 2012.

³ ‘100 % digital’, in AAQ’s corporate discourse, refers to the integral automatization of operations, digital twin, system interoperability and the centralised control of processes.

The issue of unkept agreements is compounded by the particularly sensitive matter of water quality and its effects on health. As this investigation proceeds to show, the presence of heavy metals in sources of water for human consumption constitutes an alarming indicator that goes beyond the environmental sphere, and towards considerations of public health. Conflicts in Moquegua concern not only timeframes and infrastructure, but also profound worry over the population's living conditions and wellbeing.

This investigation offers empirical and conceptual tools to understand the extractive, environmental, sanitary and corporate tensions that occur across the Quellaveco mining project. Chapter I introduces the context and location of Quellaveco. Chapters II, III and IV present results pertaining to each specific axis: extraction, impacts and group composition. Finally, chapters V and VI contain conclusions and recommendations.

Context and location of Quellaveco

The Quellaveco project is an open-pit mine that exploits a copper and molybdenum deposit associated with Paleocene-era intrusive rocks, located within Peru's XIII metallogenic strip (OEFA, 2021a). From a geological standpoint, Quellaveco is located in an area with a high concentration of minerals like copper, molybdenum and associated compounds, which occur close to the surface but also in deeper layers. The superficial parts of the deposit are affected by natural mineral transport and oxidation; the deeper zones concentrate the principal mineral deposits. The area selected for waste dumps contains volcanic rocks covered by more recent mineral layers (OEFA, 2021a).

Since the approval of its first Environmental Impacts Assessment (EIA) in 2000, the Quellaveco project has undergone multiple changes. Initially the projected daily extraction was 64,000 tonnes, with the possibility of increasing that to 120,000 tonnes. The lifespan of the project was estimated at 44 years. However, four subsequent Modifications of the Environmental Impacts Assessment (MEIA⁴) have altered central aspects of the project, including the locations of the plant, the access and export routes, the water system, and energy infrastructure, the capacity of the Vizcachas dam, and the ore processing volume, which has risen to 127,500 tonnes per day. (Knight Piesold Consultores S.A., 2014; OEFA 2021a). Although the EIA was approved in the year 2000, construction of the mine began in 2018, 26 years after it was privatised and acquired by AAQ, and 80 years after the discovery of the mineral deposits (Anglo American, 2025a). In 2024, the company initiated paperwork for a fifth MEIA. Among the changes proposed by this amendment is an increase in the sizes of the open pit and the sterile materials dump.

1. Location of Quellaveco

The project is located in the province of Mariscal Nieto, department of Moquegua, in the south of Peru (Knight Piesold Consultores S.A., 2014). It contains five areas of operation, each with specific functions and infrastructure.

⁴'Modificatoria del Estudio de Impacto Ambiental' in Spanish (translator's note).

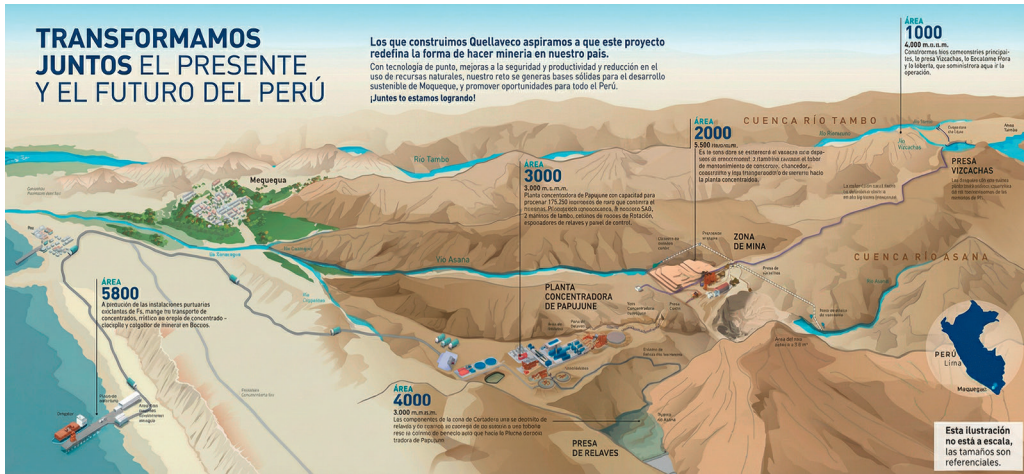


Figure 1. Map of areas of Quellaveco, as per AAQ.

Note. Taken from: 'Quellaveco: conoce nuestra unidad minera en Moquegua'. Spanish version available at: <https://peru.angloamerican.com/quellaveco/el-proyecto.aspx>

The high-altitude Area 1000 contains the Vizcachas dam, the Titire river intake, the water conveyance pipeline, the Pelluta camp and other auxiliary installations. Area 2000 is the mining zone and it contains the Quellaveco open pit, the primary crushing plant, the sterile material dumps, the diversion of the Asana river, campsites, haul roads and other complementary facilities. Area 3000 is where the concentrator plant

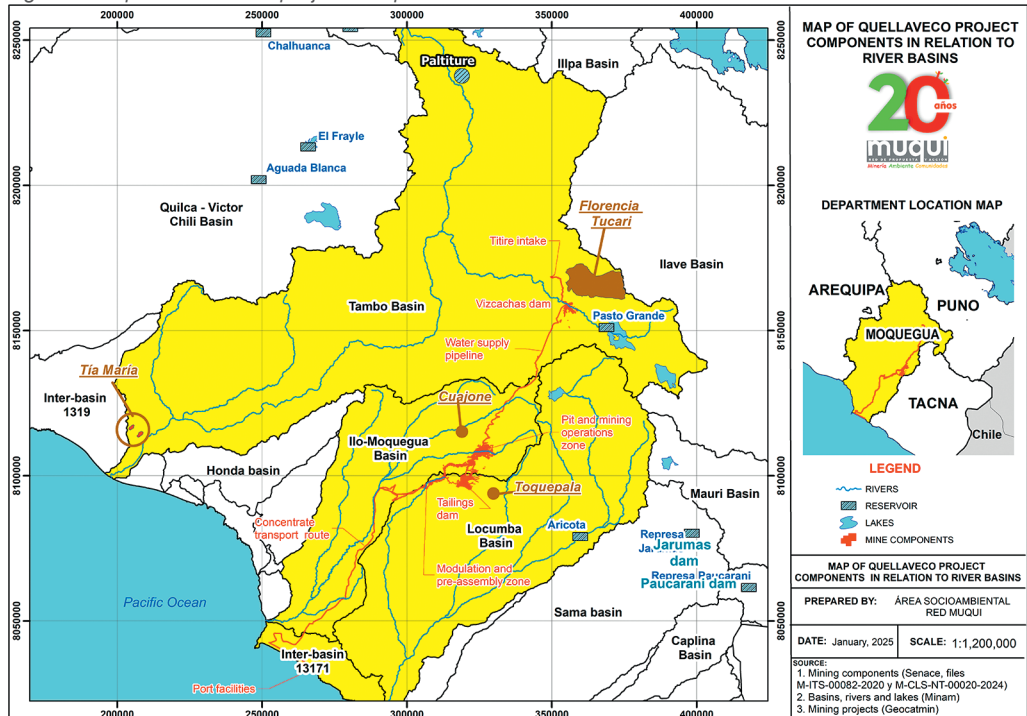


Figure 2. Anglo American's port in Ilo, Moquegua. Source: El Foco

is located, as well as the Salviani and Caracoles camps, and the power supply line between Montalvo and Papujune. Meanwhile, Area 4000 or 'Cortadera' includes the tailings, the Cortadera camp, the tailings conveyance system, and the water recovery system. Finally, Area 5800 is where transport, storage and shiploading infrastructure is located (Knight Piesold Consultores, S.A., 2014; Anglo American, 2024).

The principal components of the Quellaveco mining project are spread across four river basins (and their adjacent areas). These components include the Vizcachas dam, the Titire river intake, the mine pit, the mining operations zone, the tailings dam, the transport routes for mineral concentrates and the port facilities. However, Quellaveco is not the only project in this territory: the same river basins contain Southern Copper Corporation's Toquepala and Cuajone mines; Aruntani's Florencia Tucari mining unit; the Tía María project; and critical water infrastructure. Together, this concentration of mining projects and infrastructure places Moquegua's territory under considerable extractive stress.

Figure 3. Map of Quellaveco project components in relation to river basins.



Anglo American's extractivism

This second chapter constitutes the investigation's analytic crux, as it evaluates the extent to which the Quellaveco mining project can be described as extractivist. The chapter focuses on five factors, as understood within the theoretical context of extractivism: volume of extraction, environmental intensity, non-processed resources and the destination of exports.

1. Volume of extraction at Quellaveco

The volume of material removed during the construction, pre-mining, and mining phases of the Quellaveco project is 2,508.10 Metric megatonnes (Mt). Over the project's entire lifespan, the expected fine metal recovery is 7.2 Mt in the case of copper and 0.24 Mt in the case of molybdenum⁵. Moreover it is expected that over this 30-year period, 43.44 Mt of dry copper concentrate and 0.308 Mt of dry molybdenum concentrate will be produced⁶. These figures can be used to calculate Quellaveco's efficiency:

- To obtain one tonne of molybdenum concentrate, approximately 8,143 tonnes of ore must be processed (1:8,143).
- To obtain one tonne of copper concentrate, 348 tonnes of material must be processed (1:348).

These numbers indicate a large-scale extractive metabolism: enormous volumes of material must be processed in order to obtain a minimal fraction of exportable concentrate, which also includes other minerals in addition to copper and molybdenum – such as silver, gold, arsenic, cobalt, among others – that are removed overseas, where the concentrates are refined. This dynamic keeps Peru in the role of raw materials exporter, as confirmed by literature on extractivism (Gudynas, 2015; Machado, 2018a; Neyra, 2020).

⁵ Taking into account a mineral fineness grade of 0.018%, as per the mining plan in MEIA IV.

⁶ In order to calculate an average of Quellaveco's annual production, figures were taken from 2023 and 2024, as at this time the mine was operating in a stable manner. 2022 was not considered because it was the year that production began. However, at the closure of this investigation data for 2025 was still incomplete. Based on this data, average annual production was estimated at around 1.448 million tonnes of copper concentrate and 0.0102 million tonnes of molybdenum concentrate. However, these figures should be regarded as approximate, as they are derived from records provided by the company itself and may vary depending on the quality of the ore and operating conditions. Furthermore, production could change over time as the project progresses and reserves are depleted. These figures, therefore, represent a reference average and not a definitive projection for the entire life of the mine.

Comparison between material removed during construction, pre-mining and mining; and processed material in the form of export-ready copper and molybdenum concentrates, over the project's lifespan.

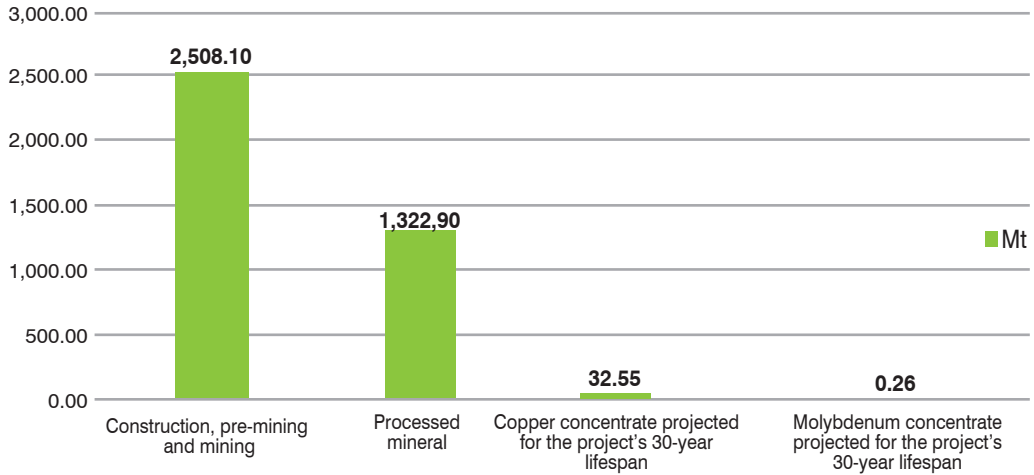


Figure 4. Comparison between material removed during construction, pre-mining and mining; and processed material in the form of export-ready copper and molybdenum concentrates, over the project's lifespan.

Comparing Quellaveco's total projected removal (2508.1 Mt) with the municipal solid waste (MSW) generated in Latin America over 9 years (2367 Mt)⁷ it is possible to see that a mining operation of Quellaveco's scale can mobilise similar volumes of material as the urban waste, over a decade, of an entire region. This comparison evinces the high environmental intensity of the mining carried out by AAQ in Quellaveco.

Comparison between material removed by Quellaveco and the production of MSW in Latin America

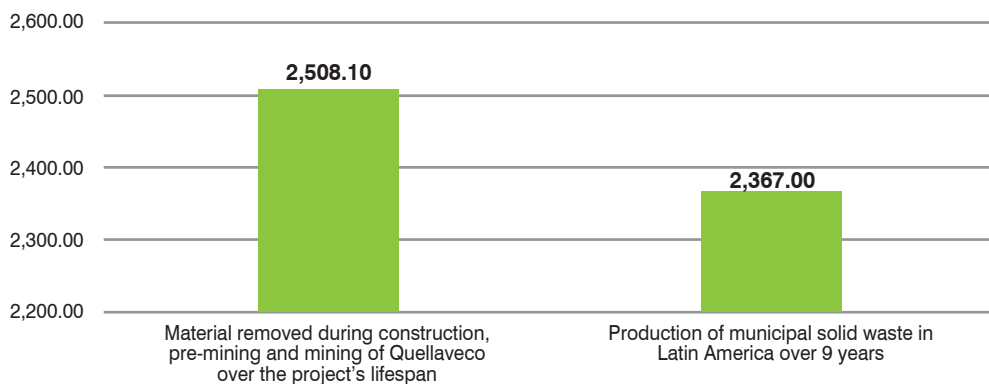


Figure 5. Comparison between material removed by AAQ and the production of municipal solid waste in Latin America.

⁷ Alarcón Montero et al. (2023) report that MSW generation in Latin America stood at 230 Mt in 2021, and project that it will reach 296 Mt by 2030. Based on these figures, an annual average of 263 Mt of MSW was estimated for the period 2021–2030. Under this linear projection, the region would produce approximately 2,367 Mt of MSW in nine years.

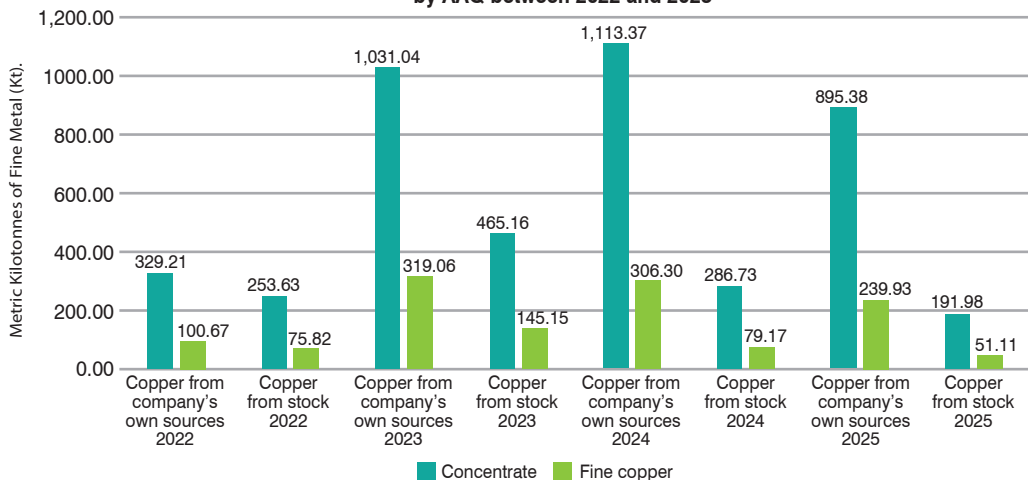
1.1. Underreporting of mineral extraction in Quellaveco

To determine the extent of the Peruvian Ministry of Energy and Mines (MINEM)'s statistical underreporting of mineral extraction in Quellaveco, data ranging from October 2022 to September 2025 was analysed. During this period, AAQ reports that minerals transformed into copper concentrate came from two sources: the company's 'own sources' and 'stock'⁸.

1.1.1. Underreporting of copper extraction

MINEM's annual statistics only account for fine copper obtained through direct extraction, which between 2022 and 2024 amounted to 726.03 metric kilotonnes (Kt) of fine copper (MINEM, 2023, 2024, 2025a). However, this figure excludes the 300.14 Kt of fine copper generated from mineralised stock processed at the same plant during the same period. If both sources are considered, AAQ is found to have produced a total of 1,026.16 Kt of fine copper⁹. Further, the Mining Yearbook does not include the volume of copper concentrate produced by AAQ, which for the period in question amounts to 3,479.15 dry metric kilotonnes. Records for copper concentrate are again divided between products of direct extraction (2473.62 Kt) and products derived from processed stock (1005.53 Kt) which are not included in the official statistics.

Figure 6. Volume of dry copper concentrate and fine copper in dry kilotonnes, as reported by AAQ between 2022 and 2025
Volume of dry copper concentrate and fine copper in kilotonnes as reported by AAQ between 2022 and 2025



October 2022 and September 2025.

Note. Graph is based on SAIP¹⁰ request, file number N° 4147741.

⁸ In ESTAMIN, 'own sources' refers to ore extracted and processed during the same reporting period; this figure is taken as the official production of the mining unit. In contrast, 'stock' identifies ore extracted in previous periods and stored in stockpiles, which is subsequently processed; although 'stock' is recorded in ESTAMIN as part of the processing, it is not included in the annual mining production statistics.

⁹ The term 'production' is used in order to more accurately reflect MINEM's terminology.

¹⁰ 'Solicitud de Acceso a la Información Pública' – Spanish for Public Information Access Request (translator's note).

1.1.2. Underreporting of molybdenum extraction

Since 2023, AAQ has also reported molybdenum production. For that year, the company officially recorded a production of 3.38 Kt of fine molybdenum and ranked fifth nationally, while in 2024 it reported 5.67 Kt and rose to fourth place. However, as with copper, these figures are an underestimation: in 2023 AAQ produced 1.16 Kt from stock and in 2024 it produced 0.56 Kt. In total, 1.72 Kt of fine molybdenum were omitted from official results in the period between 2023 and 2024. For the entire period analysed, AAQ recorded 28.13 Kt of molybdenum concentrate, of which 14.8 Kt correspond to fine molybdenum.

Volume of fine molybdenum in dry kilotonnes, as reported by AAQ between 2022 and 2025

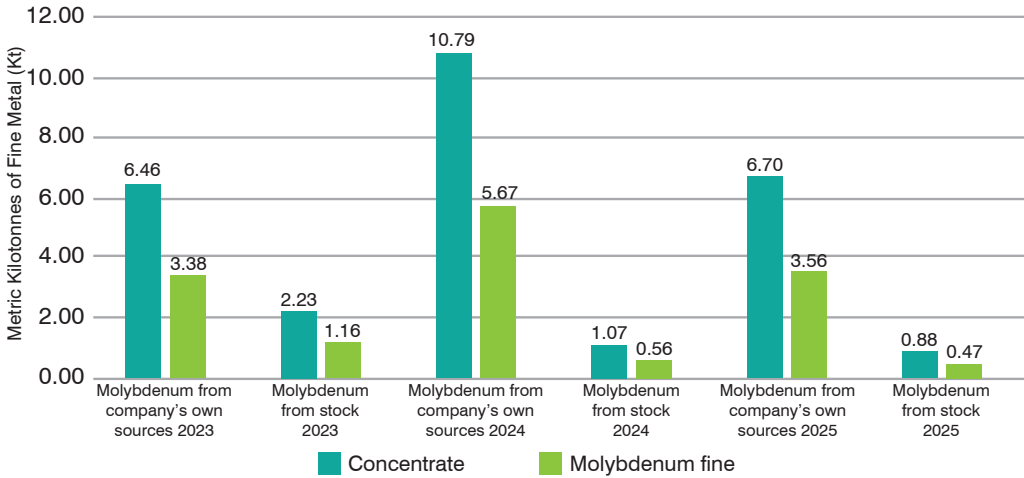


Figure 7. Volume of dry molybdenum concentrate and fine molybdenum in dry kilotonnes as reported by AAQ between May 2023 and September 2025.

Note. Graph is based on SAIP request, file number 4147741.

1.1.3. Potential occurrence of other metals and rare earths

Although Quellaveco’s main activity is the production of copper and molybdenum concentrates, records from the National Superintendency of Customs and Tax Administration (SUNAT)¹¹ show that the company also exports gold and silver. Based on the available information, however, it was not possible to calculate the production amount.

Furthermore, there are indications that Quellaveco’s concentrates may contain other valuable minerals or elements that have not been assessed in sufficient detail. An assessment of particulate matter within the area of influence identified cerium, as well as minerals associated with rare earths (OEFA, 2024a). Similarly, CooperAcción (2024) noted that copper concentrates may contain metals such as cobalt, vanadium, tellurium, gallium and indium, the value of which is not recorded in Peru and could be exploited by refineries abroad. Further investigation is necessary to determine the quantity of these minerals in Quellaveco’s concentrates, and their economic value.

¹¹ Information obtained through SAIP sent to SUNAT, under file N° 678700.

2. Environmental intensity

2.1. Impacts on flora and fauna

Quellaveco's high environmental impact is shown by the quantity and diversity of species that have been affected in areas occupied by project components: 54 species of fauna and 10 of flora in the Cortadera zone (Knight Piésold Consultores S.A., 2000b); 52 of fauna and 107 of flora along the access routes (Knight Piésold Consultores S.A., 2000c); and 63 of fauna and 10 of flora in the mining operations zone (Knight Piésold Consultores S.A., 2000a). Key species of fauna that are affected include the guanaco; taruca or Peruvian guemal; Andean Mountain cat; and amphibians of the genus *Telmatobius*. Impacts on vegetation were considered 'irrelevant' by AAQ (Knight Piésold Consultores S.A., 2000c). However, the high-Andean ecosystems of Quellaveco are adjacent to headwaters essential to the supply of water for agriculture and human consumption in both rural and urban areas located further downstream. In terms of environmental intensity, a prominent effect of the mining project is the irreversible loss of 7 km of aquatic habitat, due to the diversion of the Asana river. This has directly affected species such as *Telmatobius peruvianus*¹² (OEFA, 2021a).

Figure 8. *Telmatobius peruvianus* (registry of research-grade citizen science; iNaturalist/GBIF)

Source: Photograph by Florangel Condo, iNaturalist (Obs. 141528862), Tacna, Peru, September 2019.



Licence: CC BY-NC.

¹² See figure 8.

2.1.1. Shortcomings in species identification in AAQ's areas of influence

The investigation found that environmental studies of Quellaveco may have underestimated the area's biodiversity. For example the lesser grison (*Galictis Cuja*) was not included in the project's baseline but was sighted by OEFA (2021a). This suggests that other species and ecosystems could have been omitted in AAQ's surveys which would have lead to an underestimation of the mining project's impacts. The situation contradicts AAQ's image as promoter of conservation, and indicates the need for more rigorous and long-term environmental studies.

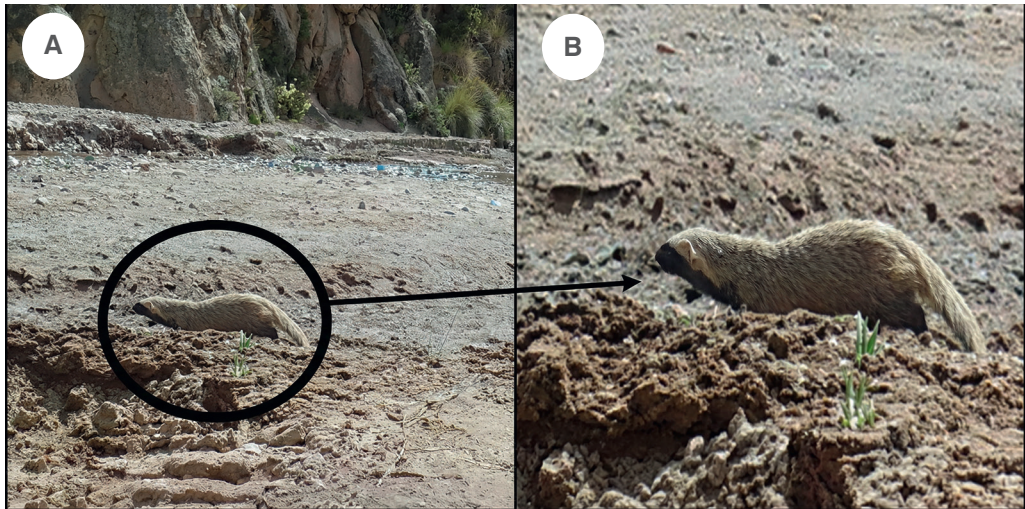


Figure 9. Lesser grison (*Galictis cuja*) registered by trail camera CT-QUELLA-19. A) Panoramic view of the site where the grison was sighted. B) Photograph of the grison

2.2. Reagents, energy and mine tailings

Quellaveco's high environmental intensity is also manifest in its use of reagents, of which it is projected to consume 127 Kt per year (with lime representing the vast majority) (Knight Piésold Consultores S.A., 2014). Over a 30-year time-span, this implies the use of approximately 3.8 million tonnes of chemical reagents. Additionally, energy usage at Quellaveco amounted to 1.51 million Megawatt hours (MWh) (Knight Piésold Consultores S.A., 2014) equivalent to 1,514 Gigawatt hours (GWh), a figure which represents approximately 55% of all electricity distributed in the Moquegua department¹³.

The environmental intensity of Quellaveco is also exemplified by the area occupied by mine tailings, which at 10.5 square kilometers¹⁴ and it is equivalent to the size of 1470 football pitches.

¹³ This comparison is for illustrative purposes only, as the project's electricity comes from SEIN (Peru's national grid). According to statistics from 2022, the sale of electric energy in Moquegua reached 2,758 GWh (MINEM, 2022).

¹⁴ Calculation based on the sum of the final areas of the tailings pond. For further information, see Knight Piésold Consultores S.A., 2000b, and Knight Piésold Consultores S.A., 2014.

2.3. Water usage

According to information from the National Water Authority (Autoridad Nacional del Agua, ANA)¹⁵, Anglo American Quellaveco currently holds three water licenses¹⁶. Together they provide AAQ with a maximum granted volume of 30,180,992.62 m³ of water per year.

Nº	Resolution	Sources	User	Maximum volume usable (m ³ /year)
1	RD 0623-2022-ANA-AAA.CO Date: 25/08/2022	Rainfall, springs, seepage and groundwater	AAQ Quellaveco S.A.	3,967,035.62
2	RD 0624-2022-ANA-AAA.CO Date: 25/08/2022	Titire and Vizcachas rivers	AAQ Quellaveco S.A.	22,080,000.00
3	RA 0072-2000-ANA Date: 22/08/2000	Cortadera ravine	Minera Quellaveco S.A.	4,133,957.00
TOTAL				30,180,992.62

Table 1. Water use rights, as held by AAQ S.A. and Minera Quellaveco S.A.

These volumes show the relative importance of the Titire-Vizcachas transfer, which at 22 million cubic metres (MCM) accounts for 73.16% of the water used in Quellaveco's operations. Trailing behind are the Cortadera stream which accounts for 13.70% and the combination of rainfall, springs, seepage and groundwater which accounts for 13.14%. Together they complete the total maximum volume granted to the company (30 MCM).

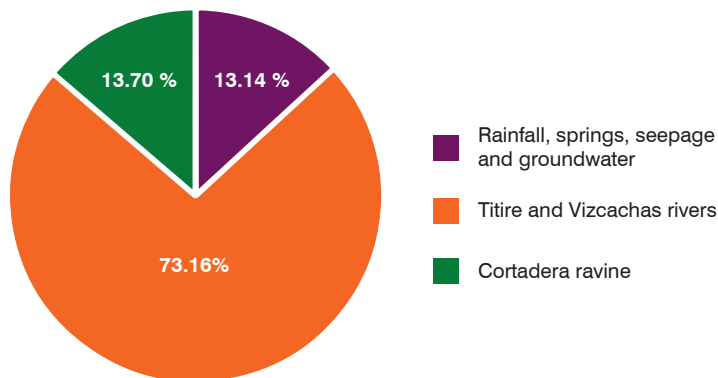


Figure 10. Percentage by source of maximum yearly volume of water granted.

¹⁵ Information obtained through SAIP: CUT 50999-2025.

¹⁶ A water use licence is granted by ANA to allow the use of a specified volume of water from a particular source for a specific purpose. These licences have no expiry date: they are valid for life provided the licence holder complies with the conditions of use.

2.3.1. Water usage at Quellaveco; water for human consumption and agriculture

According to the Water Resources Utilization Plan (2023–2024), the volume of water used in the entire Ilo-Moquegua basin (where Quellaveco is located) is to 98.5 cubic hectometers per year (hm^3/year). Of this figure, 87% corresponds to the agricultural sector, with 77.0 hm^3 being used in Moquegua and 5.4 hm^3 in Torata. Population use represents 16.0 hm^3 (16%), and industrial use is marginal, with just 0.03 hm^3 . To cover this demand, the plan identifies a water deficit of $-44.6 \text{ hm}^3/\text{year}$, which is compensated through regulated discharges (up to $39.8 \text{ hm}^3/\text{year}$) from the Pasto Grande reservoir (ANA, 2023).

The maximum volumes granted to AAQ reach $30.18 \text{ hm}^3/\text{year}$ and the average amount needed for its operations is 22.08 hm^3 . Both of these figures dwarf the 6.39 hm^3 needed by Entidad Prestadora de Servicios de Saneamiento (EPS) to supply Moquegua’s drinking water. The volume assigned to AAQ is 4.7 times greater than that produced by EPS, and the amount required for operation is 3.4 times higher.

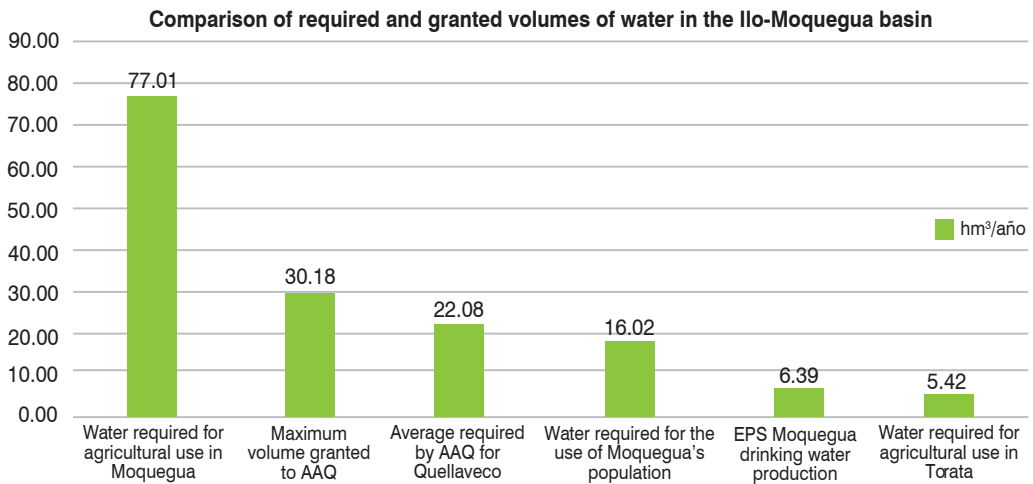


Figure 11. Comparison of required and granted volumes of water in the Ilo-Moquegua basin. Note. Prepared based on ANA (2000, 2022b, 2022a, 2023), EPS Moquegua S.A. (2024), Knight Piesold Consultores S.A. (2014).

Given that 6.39 hm^3 supplies 70,000 inhabitants (EPS Moquegua S.A., 2024), the volume granted to Anglo American could supply 330,000 people, and the volume required for its operations could supply 240,000 people. These differences highlight an unequal and asymmetric distribution of water resources in a basin with a deficit of $-44.6 \text{ hm}^3/\text{year}$, where agriculture is the priority use and population supply remains limited. Furthermore, the $22.08 \text{ hm}^3/\text{year}$ needed for mining operations represents more than half of the volume that the Pasto Grande dam must release to cover the deficit in the Ilo–Moquegua basin (ANA, 2023) This adds huge stress in a context where water is already scarce and contested.



Figure 12. Farmers harvesting their crops in the Tumulaca valley. Source: El Foco

2.3.2. The diversion of the Asana river and its consequences for Moquegua’s water security

According to Anglo American, the diversion of the Asana river is intended as a measure for the river’s ‘protection’. However, in practice it leads to water insecurity for Moquegua.

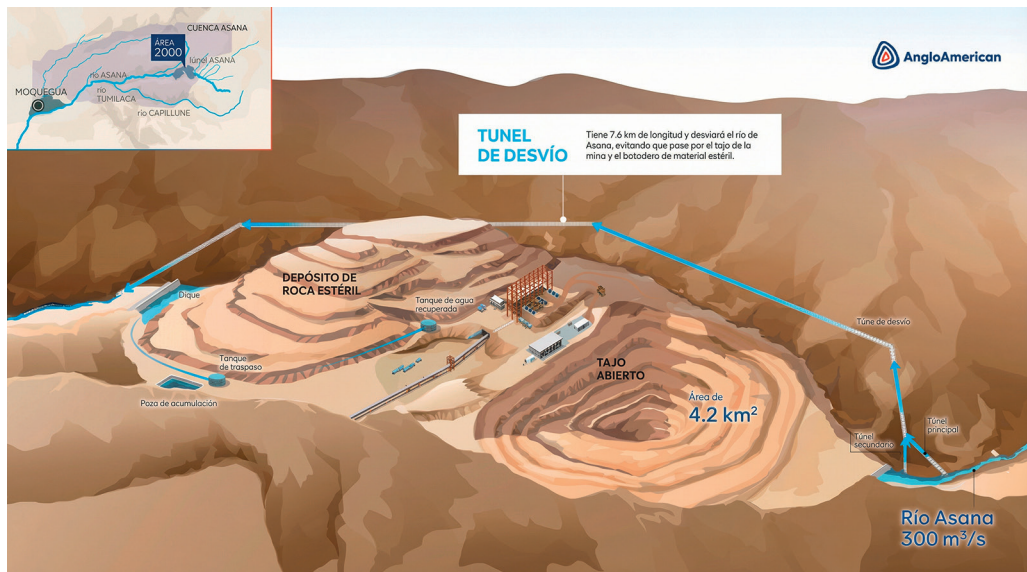


Figure 13. In AAQ’s terms, ‘the barrier and tunnel that will protect the Asana River.’ Note. Spanish version available in AngloAmerican (2025e).

The modification of the Asana's course generated impacts for both humans and ecosystems. Construction of the artificial course reduced the presence of sensitive species, degraded the river's ecological quality, and caused the loss of at least 7 km of aquatic habitat, resulting in irreversible impacts on species such as the *Telmatobius peruvianus* frog (OEFA, 2021a). Since the Asana river is part of the same system that supplies Moquegua downstream, its alteration also affects the availability of water for human consumption.

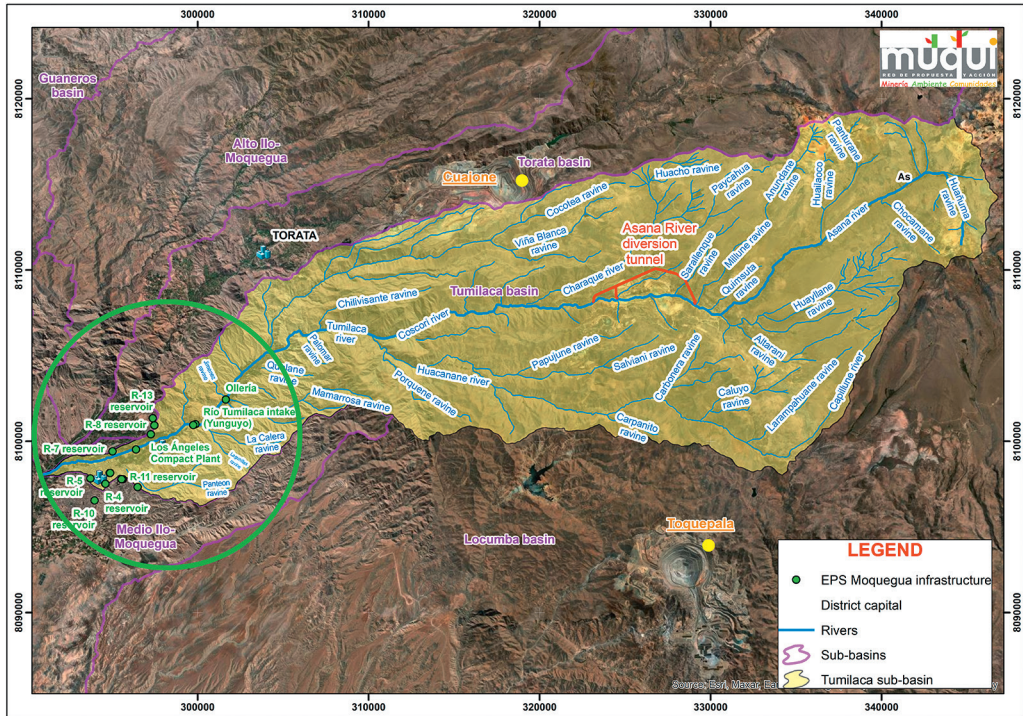


Figure 14. The green circle shows the location of the Moquegua and Samegua districts, as well as the raw water intake, supply, and treatment infrastructure of EPS Moquegua. The Cuzjone and Toquepala mining projects are indicated by yellow dots. The Asana River diversion tunnel is highlighted in red, located over the main river channel of the Tumilaca River sub-basin.

Water for human consumption in Moquegua comes from the Pasto Grande reservoir, which supplies surface water to the Chen Chen Drinking Water Treatment Plant (DWTP); and from the Tumilaca River, fed by the Asana, which supplies both surface and groundwater to the Yunguyo DWTP (EPS Moquegua S.A., 2022; SUNASS, 2019). It is important to note that EPS Moquegua supplies water for human consumption to 65,899 people (EPS Moquegua S.A., 2022).

Table 2. Water sources for the supply of EPS Moquegua S.A.'s Water Treatment Plants (PTAP¹⁷).

Water source	Production unit	Catchment type	Catchment structure
PERPG Pasto Grande	PTAP Chen Chen	Surface	Canal de Pasto Grande
Tumilaca river	PTAP Yunguyo	Surface	Intake
Tumilaca river	Ollería infiltration galleries	Groundwater	Perforated conduit
Tumilaca river	Ollería infiltration galleries	Groundwater	Perforated conduit

Source: EPS Moquegua S.A. (2022, p.20).

2.3.2.1. Changes in hydrogeological dynamics

OEFA studies (2019a) demonstrated that groundwater level lines near the Asana river occurred close to the ground surface, indicating that groundwater flow was directed towards the Asana River and its tributary streams. This confirms the interconnection between surface water and groundwater, where the groundwater divide followed a pattern similar to that of surface waters.

The changes caused by the diversion of the Asana River modified the movement of groundwater. As a result, water flows appeared in the old river course, and 22 leakage zones were detected along the diversion tunnel, associated with natural faults and fractures in the terrain. Although these leaks did not alter the water quality or the biological conditions of the river, OEFA warned of the need for permanent maintenance of the tunnel, especially in areas where its lining showed signs of deterioration (OEFA, 2019a).

The diversion of the Asana, therefore, has impacted the balance of water and ecological systems in the sub-basin. In this regard, the United Nations Office for Project Services (UNOPS) had already warned that AAQ's studies were insufficient, and that a more robust diagnosis of impacts on the environment and water resources was necessary (UNOPS, 2013).

2.3.2.2. Contested water: EPS Moquegua, AAQ, Pasto Grande, and climate change

In Moquegua, water demand has exceeded natural availability for years, and the implemented solutions have not been effective. In some cases, in fact, they have generated new conflicts (EPS Moquegua S.A., 2022).

¹⁷ From Spanish: Planta de Tratamiento de Agua Potable (translator's note).

Added to this is the transformation of the territory. Between 2000 and 2016, the Tumilaca River sub-basin experienced a significant increase in human activity, particularly mining and agriculture. The area occupied by mining nearly quadrupled, going from 215.27 to 892.56 hectares, during that period (EPS Moquegua S.A., 2022). This trend has intensified with the operation of large-scale projects like Quellaveco.

Furthermore, the two main water sources for Moquegua face constant problems. The Pasto Grande reservoir contains heavy metals, which complicates water treatment at the Chen Chen plant (EPS Moquegua S.A., 2012). Meanwhile, the high turbidity of the Tumilaca River limits the operation of the Yunguyo plant, especially during extreme weather events (EPS Moquegua S.A., 2022). Moquegua’s main supply sources, then, face environmental problems affecting the quality of water for human and agricultural consumption.

2.3.2.3. Heavy metals in water for human consumption in Moquegua¹⁸

According to assessments by the Moquegua Regional Health Directorate (DIRESA), drinking water in the Tumilaca river sub-basin is significantly impacted by metal pollution. Between 2021 and 2024, 120 sampling points recorded abnormal concentrations of aluminium (86 cases) and iron (28), as well as arsenic, manganese, and lead in smaller proportions.

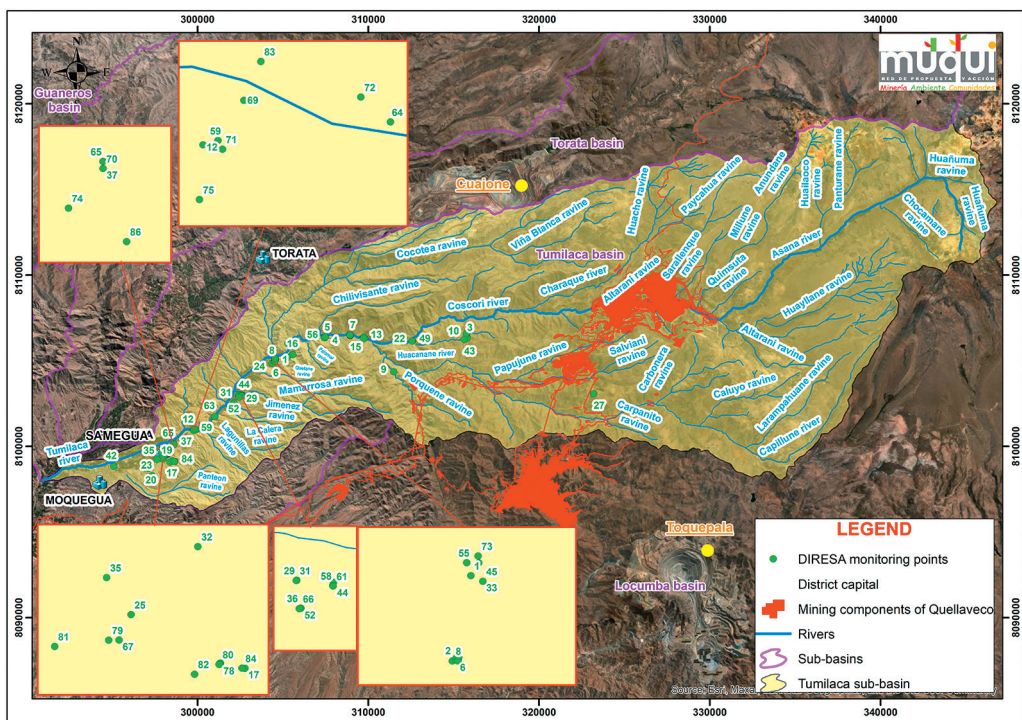


Figure 15. Map of sampling points for drinking water that exceeded safe aluminium concentrations, as established by Supreme Decree N° 031-2021-SA (the regulation for drinking water quality).

¹⁸ This section is based on information provided to FACAREMOQ on a CD via Carta Simple N° 058-2025-GRM-DIRESA/DR-R-AIP dated 18 August 2025. The information was subsequently forwarded by FACAREMOQ to Red Muqui for processing and analysis.

In the case of aluminium, concentrations exceeded the regulatory limit by up to 41.3 times, affecting reservoirs, households, intakes, and health facilities in villages such as El Molino, Pocata, El Común, and Tumilaca. This distribution shows that the presence of aluminium was not restricted to intake sources but persisted throughout the storage and distribution system, directly affecting the water that reaches homes.

Even though several of these abnormalities occur downstream from AAQ's mining operations, to date there are no conclusive studies that prove a direct causal relationship between the operations and the presence of metals in drinking water. Therefore, it is essential to develop research that differentiates the possible contribution of mining activities from natural processes.

Similarly to aluminium, the presence of iron occurred mostly downstream from AAQ's mining operations. However, this alone is not sufficient grounds to establish a direct causal relationship. It remains the case that studies on the origin and dynamics of the metal's presence in the water system are required.

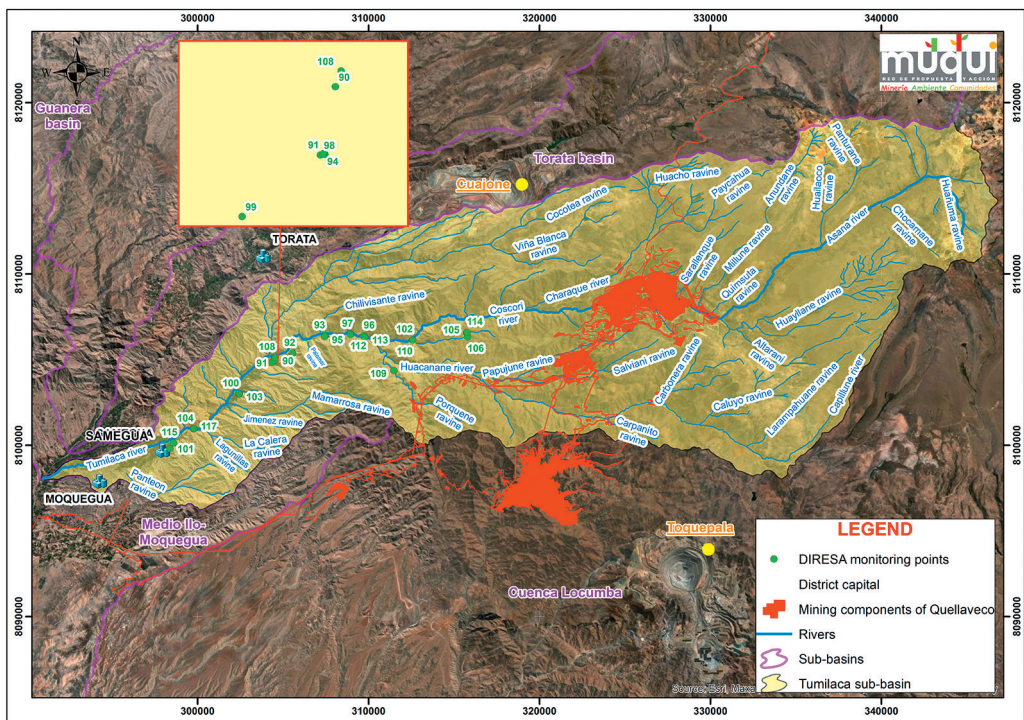


Figure 16. Map of drinking water sampling points that exceeded iron concentrations, as established by Supreme Decree N° 031-2021-SA, the regulation for drinking water quality.

Abnormal concentrations of manganese and lead were located downstream of the Tumilaca sub-basin and AAQ's operations; in the case of arsenic, two points were located downstream and one upstream.

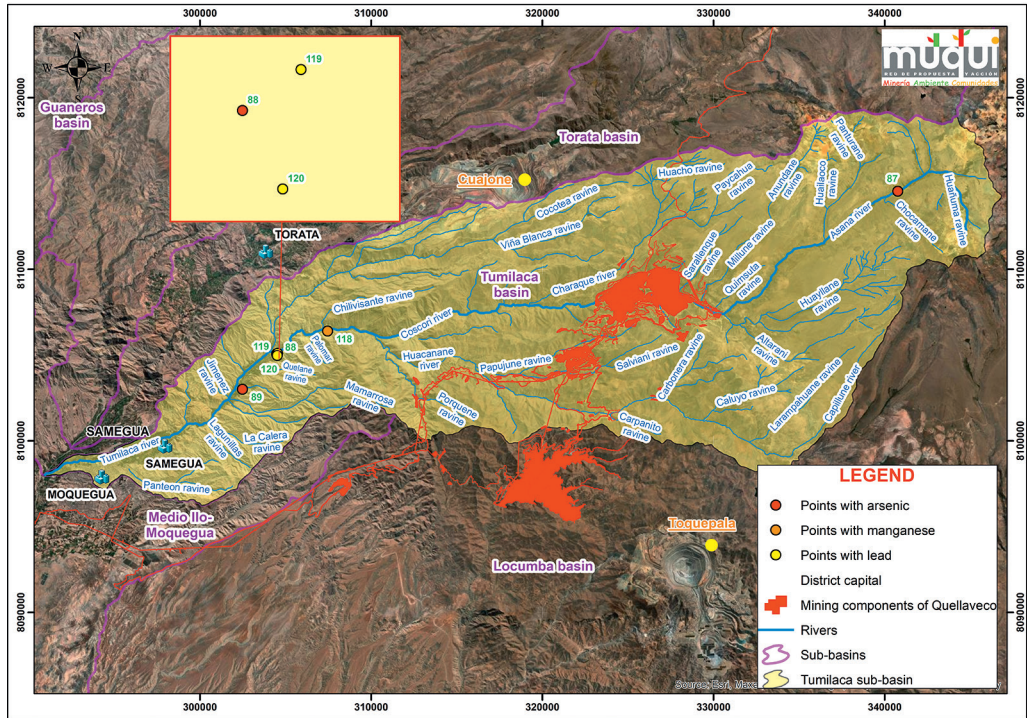


Figure 17. Map of drinking water sampling points that exceeded safe concentrations of arsenic (red), manganese (orange), and lead (yellow) established in Supreme Decree N° 031-2021-SA, the regulation for drinking water quality.

In summary, the Tumilaca sub-basin faces a situation of increased water insecurity, and is located at the juncture of contamination, climate variability, and territorial transformation pressures. DIRESA monitoring confirmed repeated occurrence of unsafe levels of aluminium, iron, arsenic, lead, and manganese in drinking water. Although, causal studies are still lacking, the spatial coincidence between affected areas and mining intervention zones underscores the need to strengthen environmental surveillance, information transparency, and independent evaluation to guarantee the right to safe water in Moquegua.

2.3.2.4. Population exposure to heavy metals

In 2019, the Moquegua Regional Health Directorate¹⁹ (2021) identified arsenic in the urine of 59 students from 8 schools in the provinces of Mariscal Nieto and Moquegua. Of this total, 53 were under 12 years old and 6 were older. The results showed that 74.5% (44 students) presented urine arsenic concentrations above reference values, indicating exposure.

¹⁹ Gerencia Regional de Salud de Moquegua (translator's note).

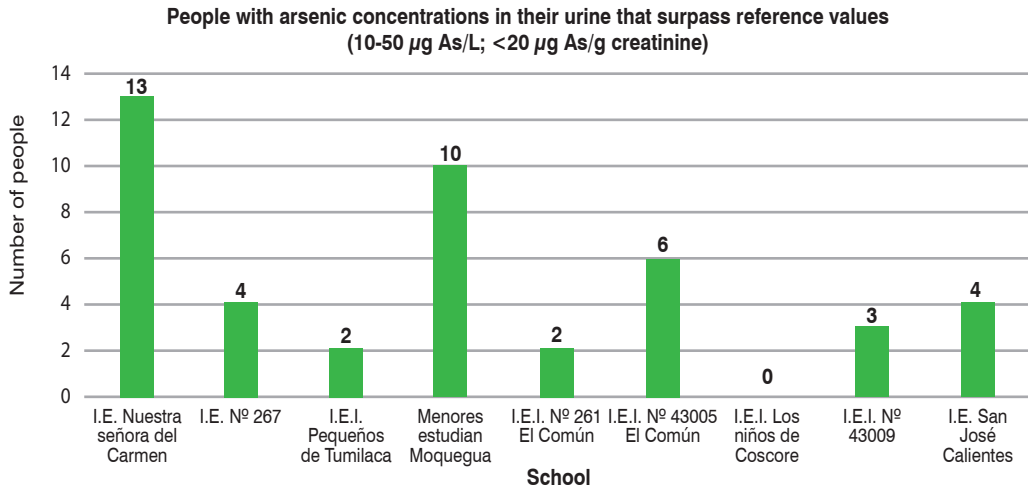


Figure 18. Individuals from schools with urine arsenic concentrations above established reference values. Note. Graph based on Gerencia Regional de Salud de Moquegua (2021).

Subsequently, in 2021, evaluations were conducted on 112 people in the localities of El Molino and El Común²⁰. The results showed that 50% (56 people) presented urine arsenic concentrations above reference values (Moquegua Regional Health Management, 2021). When disaggregating the results by life stage, it was observed that the highest number of cases was concentrated among children (33), followed by adults (13), adolescents (7), and youth (3).

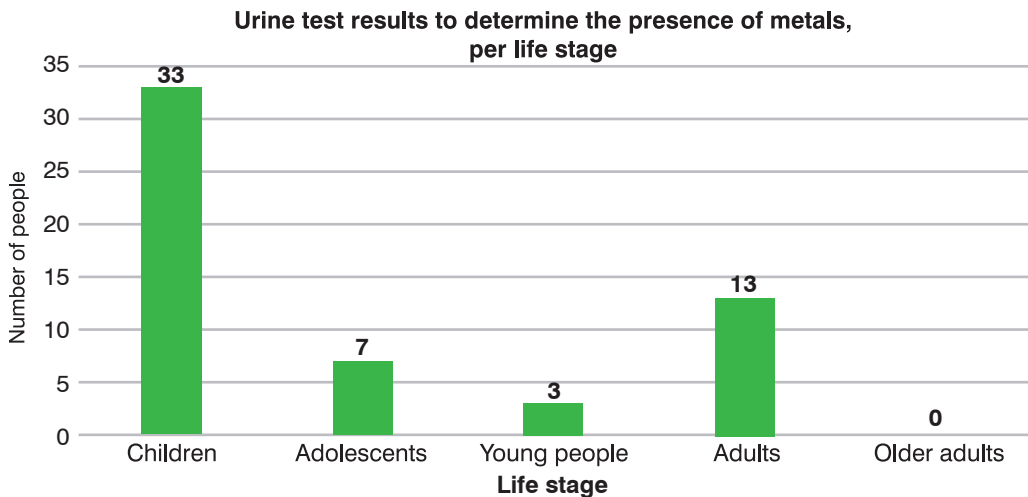


Figure 19. Urine evaluation results to determine the presence of arsenic in individuals by life stage in the district of Tumlaca. Note. Prepared based on Moquegua Regional Health Management (2021).

²⁰ According to the original document, Oficio N° 1203-2021-GRM-GERESA/GR-SGIESP-UFCVP, 'centro poblado Tumlaca' refers to the centros poblados of El Común and El Molino.

In 2025, cases of people with abnormal levels of arsenic in their bodies were again recorded in areas located downstream of the Tumilaca sub-basin. In El Molino, 41 cases were identified, including 27 boys and girls; in El Común, 16 exposed persons were reported; and in the district of Moquegua, 12 children with arsenic concentrations above permitted levels were detected (DIRESA de Moquegua, 2025). This situation had already been observed in 2024, when cases were also reported in El Común and El Molino (DIRESA de Moquegua, 2024).

Together, the data shows a persistent and even growing problem of arsenic exposure in these populations. It is urgent for independent research to more accurately determine the sources of the arsenic, and for measures to be put in place to mitigate risks to public health.

3. Unprocessed resources

SUNAT records show that AAQ exported copper concentrate²¹ and that it exported molybdenum concentrate between 2023 and 2024²². The data confirms that AAQ combines primary materials with high 'ecological rucksack' materials in its exports, a dynamic which reinforces the extractive enclave character of Peru. The country's role, in the framework of AAQ's operations, continues to be that of provider of raw materials with little or no processing.

4. Export destination

Between 2022 and 2024, copper exports²³ were directed to eight countries, with China standing out and receiving 66.4% of the total (Figure 20).

In the case of molybdenum²⁴, exports were also distributed among eight destinations, with China, Chile, and the United States being the main receivers and together accounting for 86% of the exported volume (Figure 21).

In terms of export volume, between 2022 and 2024 Quellaveco processed 3,479.14 Kt of copper concentrate, 70.8% (2,463 Kt) of which was exported, while 29.2% (1,016.14 Kt) did not enter the export circuit during the analysed period. In the case of molybdenum, 20.55 Kt of concentrate was processed between 2023 and 2024, 83.1% (17.08 Kt) of which was exported, leaving 16.9% (3.47 Kt) outside the export circuit.

These results align with what was proposed by Gudynas (2015), who considers activities extractivist if they direct more than 50% of their production to the external market. In the case of Quellaveco, the export percentages for both copper and molybdenum far exceed this threshold and evince the project's extractivist orientation.

21 Information obtained via SAIP sent to SUNAT (file number 88044966).

22 Information obtained via SAIP sent to SUNAT (file number 6787700).

23 Information obtained via SAIP sent to SUNAT (file number 88044966).

24 Information obtained via SAIP sent to SUNAT (file number 6787700).

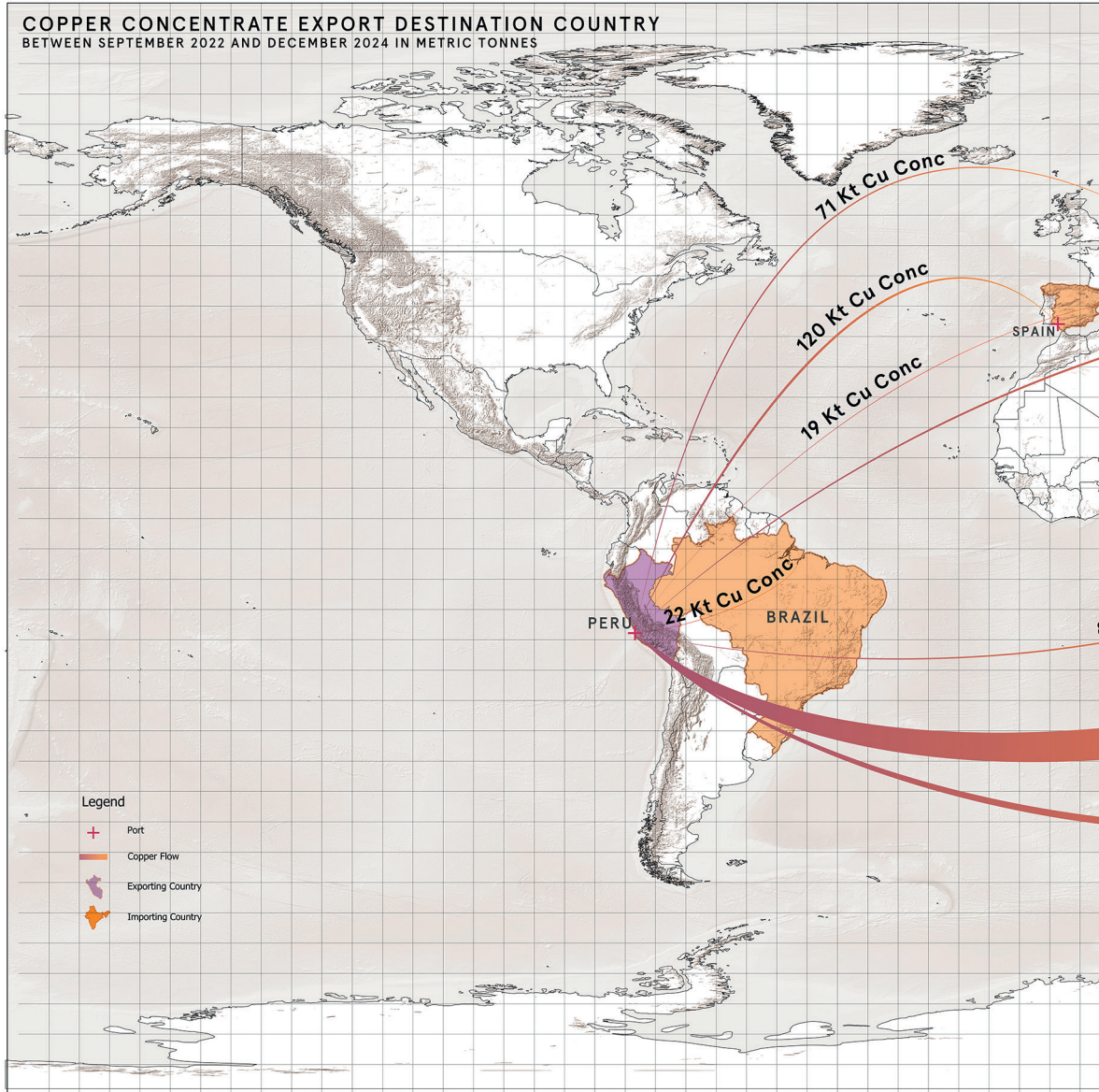
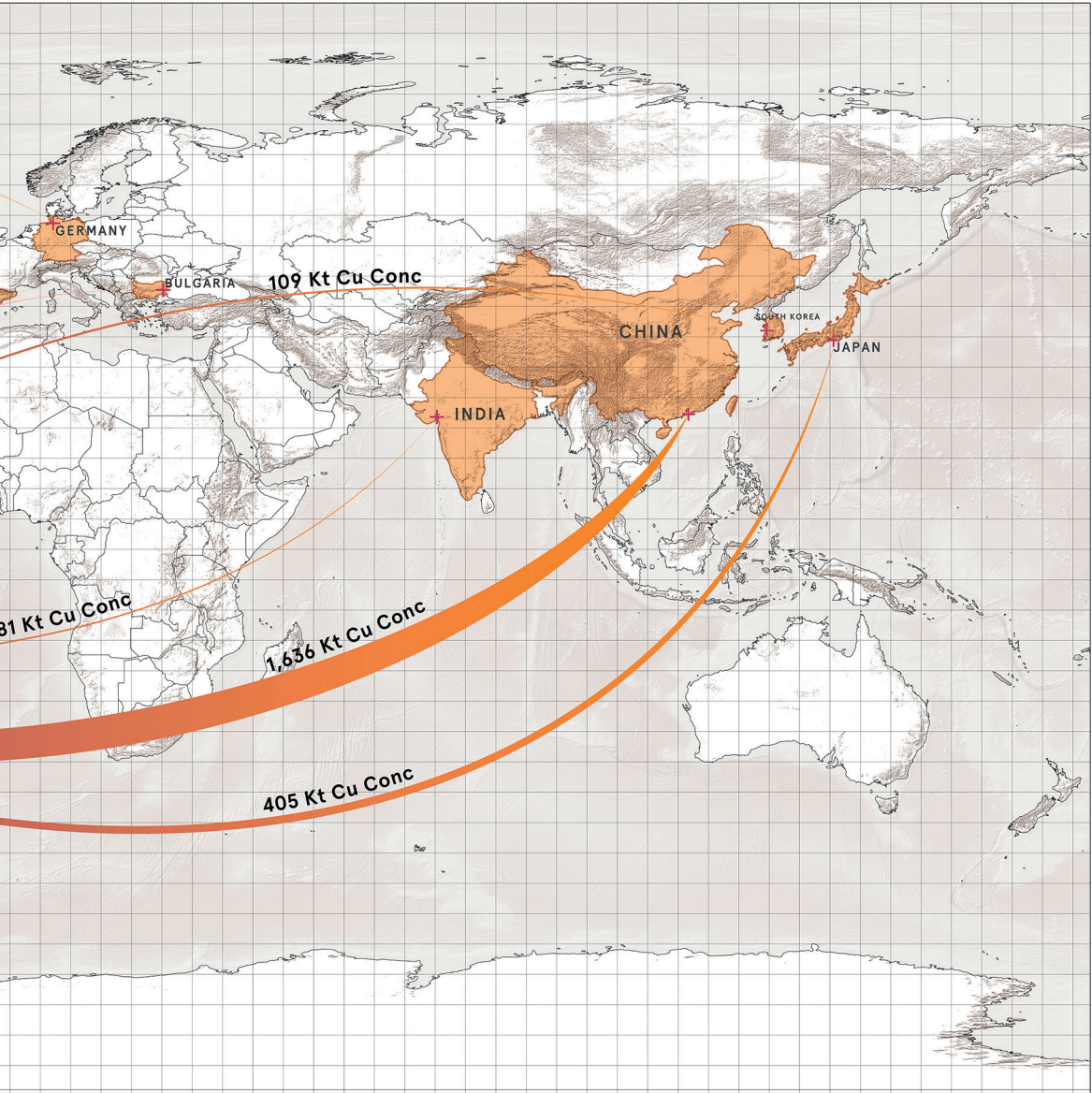


Figure 20. Route of copper concentrate exported by AAQ between 2022 and 2024. Source: Huang Y. & Jiménez, F. (2025). *Quellaveco: The unseen cost of clean energy in the Global North*. Academic project, Architectural Association School of Architecture, AA Landscape Urbanism.



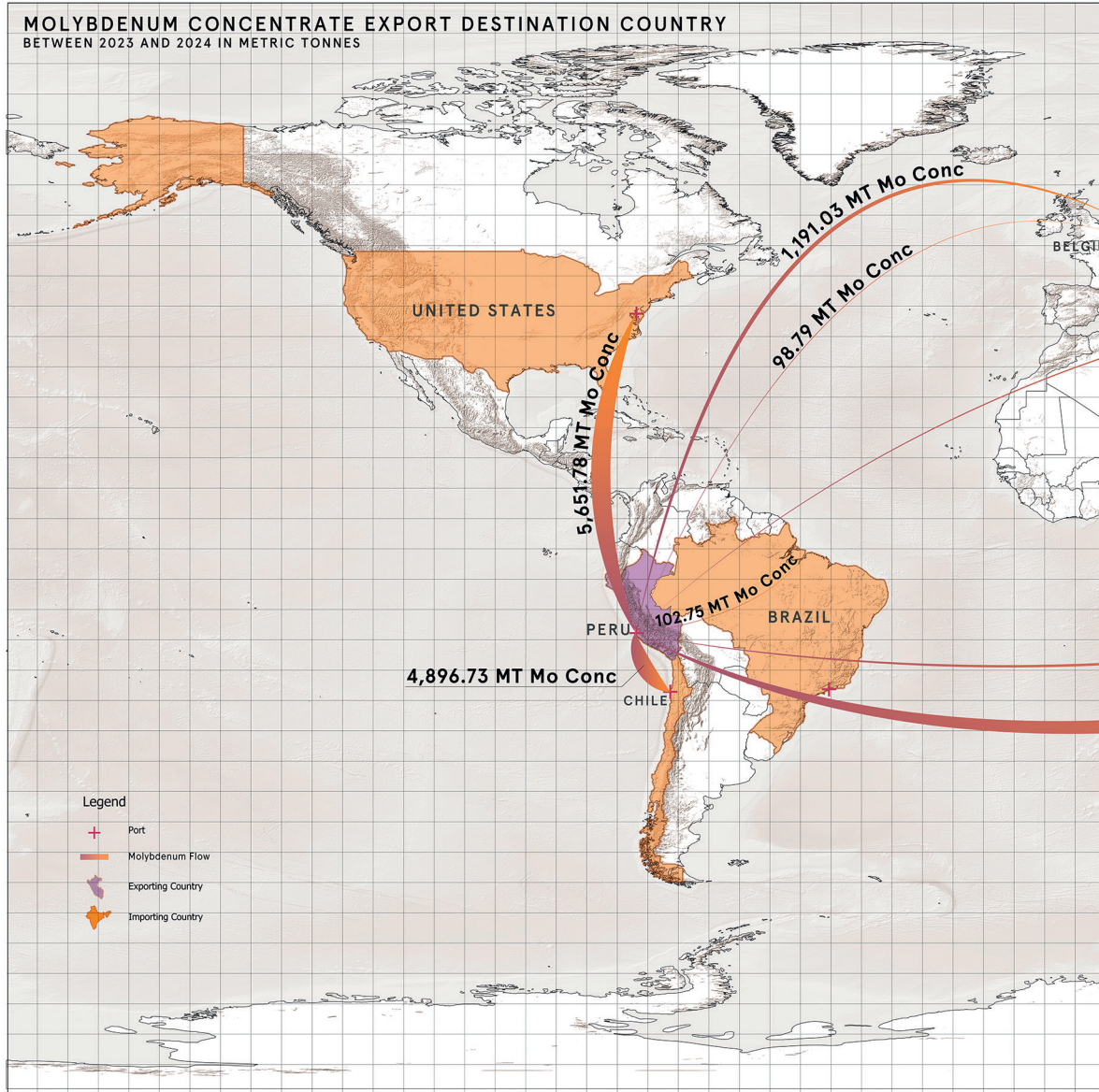
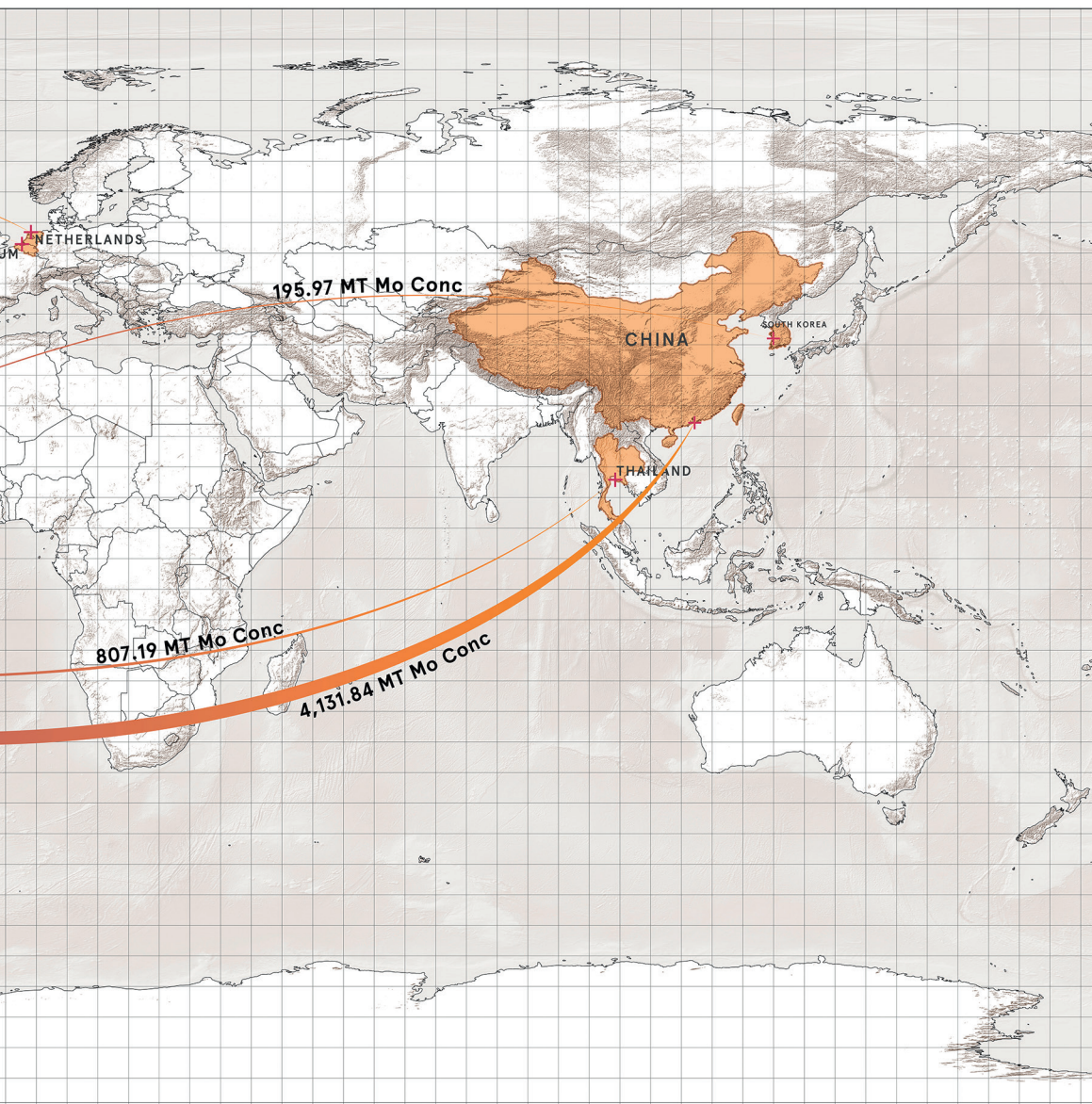


Figure 21. Route of molybdenum concentrate exported by AAQ between 2023 and 2024. Source: Huang Y. & Jiménez, F. (2025). Quellaveco: The unseen cost of clean energy in the Global North. Academic project, Architectural Association School of Architecture, AA Landscape Urbanism.



5. Quellaveco as expression of Anglo American's extractivism

Based on the elements analyzed, the investigation concludes that Quellaveco functions as an extractivist project. This is supported by the magnitude of extracted resource volumes, the high degree of environmental pressure, the export of minerals with minimal processing, and the predominant orientation of its production towards the external market.

Furthermore, although the company presents Quellaveco as a modern, digital, and highly technified mine, the evidence shows that the structural logic of the project remains the same. Technology coexists with traditional intensive extraction practices, strong pressures on ecosystems, and a marked dependence on international markets.

Quellaveco is therefore as an emblematic case of extractivism: a project that generates economic accumulation while deepening the transformation of ecosystems and generating water, environmental, and social risks for the population of Moquegua.

Impacts

Having demonstrated that Quellaveco operates under an extractivist logic, the investigation turns to the mine's impacts on territory, environment, and people. To this end, it adopts a broader perspective that distinguishes between local effects, impacts that transcend the immediate area of influence, and effects that accumulate over time. This approach allows for a more precise understanding of how mining activity transforms the territory at different scales.

1. Local effects

AAQ presents Quellaveco as the largest mining investment in Peru, a '100% digital' operation under the FutureSmart Mining™ approach, and a benchmark for sustainable mining (AngloAmerican, 2025d). Keeping AAQ's narrative in mind, this section analyses the local effects of its mining activities. In what follows, local effects are defined as those occurring in the project's immediate area of influence as well as in adjacent territories. Impacts surveyed include ecosystem, technological, and social alterations (Gudynas, 2015).

1.1. Quellaveco as a source of PM10 and SPM

Between October and November 2023, OEFA carried out a Causal Environmental Assessment (CEA) at Quellaveco. This study identified that the main sources of particulate matter (PM10) and settleable particulate matter (SPM) emissions were the primary crushing plant, the Quellaveco pit, internal roads (particularly section 4), and the sterile materials dump (SMD). These findings suggest that PM10 and SPM generated by mining activities at Quellaveco are responsible for an increase in copper and molybdenum concentrations in soil, oregano crops, and tola shrublands (OEFA, 2024a).

1.1.1. Transport of particulate matter and settleable material

The analysis of airborne contaminant transport identified three levels of influence on particle dispersion (OEFA, 2024a):

1. **High:** higher concentration and deposition of particulate matter, primarily in the mining zone.
2. **Moderate:** medium dispersion with lower accumulation.
3. **Low:** minimal arrival of particles.

It was then shown that PM₁₀ was concentrated mainly in the mining area and dispersed towards the south-east and south-west, affecting oregano crops, although with lower intensity compared to the mining zone.

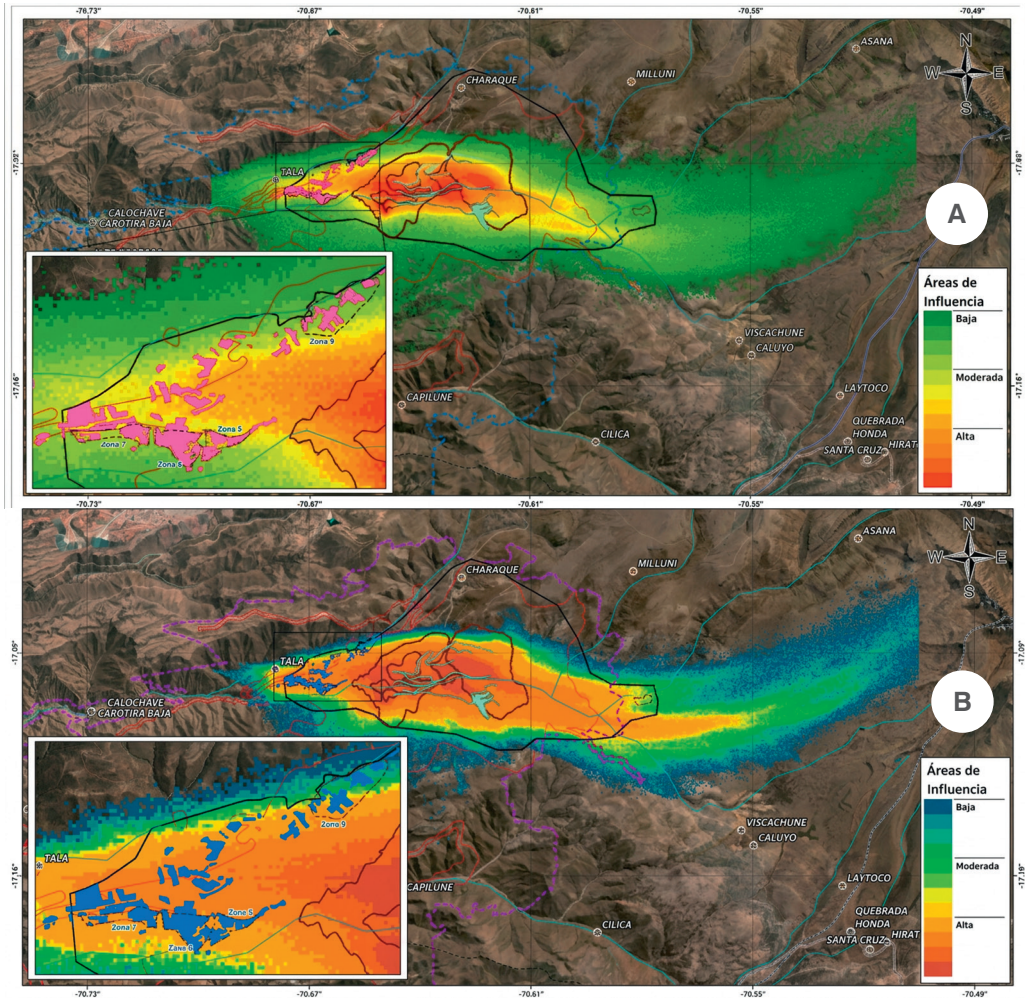


Figure 22. Area of influence for PM₁₀ (A) and Areas of influence for settleable particulate matter (B). Note. Taken from OEFA, 2024, pp. 105 and 106.

1.1.2. Metals in oregano crops

The research identified that particulate matter generated by Quellaveco's operations affects oregano crops situated approximately 1.2 kilometres away²⁵, and up to 1.8 km in the case of SPM. The crops registered an increase in copper and molybdenum, as measured in plant tissues. In the case of copper, levels exceeded values harmful to oregano growth; in the case of molybdenum they remained within the safe range (OEFA, 2024a).

²⁵ Considering as limit of Quellaveco's operations the sterile materials dump that is farthest from section 6.

Furthermore, the presence of lead and other minerals was identified in the vegetation of the area and in settled dust, representing a possible risk to biodiversity and public health. This makes it necessary to expand the spatial scope of assessments and strengthen emission control measures to reduce environmental effects.

1.1.3. Plausible hypothesis: impacts from PM10 and SPM

Although OEFA (2024a) does not explicitly state this, an overlap is observed between stretches of the Asana river and areas of particle dispersion. This is particularly important because the Asana River supplies water for human consumption and agricultural use to the Tumilaca valley, the district of Samegua, and part of the city of Moquegua.



Figure 23. Panoramic photograph of particulate matter at Quellaveco operations. Source: Red Muqui.

In the case of PM10, the high and moderate influence zones covered sections of the Asana River both upstream and downstream from its diversion. In the case of SPM, the overlap was even greater, as both sectors of the Asana were located within the high influence area, which even reached part of the Altarani River before its confluence with the Asana. In spatial terms, PM10 dispersion extended up to 4 km to the west and 10 km to the north-east, while SPM dispersion reached 3.5 km to the west and 10.5 km to the north-east.

Particulate matter can enter rivers and accumulate in their water, soils and riverbeds, where it is subsequently remobilised by natural processes. In this scenario, the Asana and Altarani rivers would have an additional source of metal pollution. It is therefore necessary for research on this matter to continue.

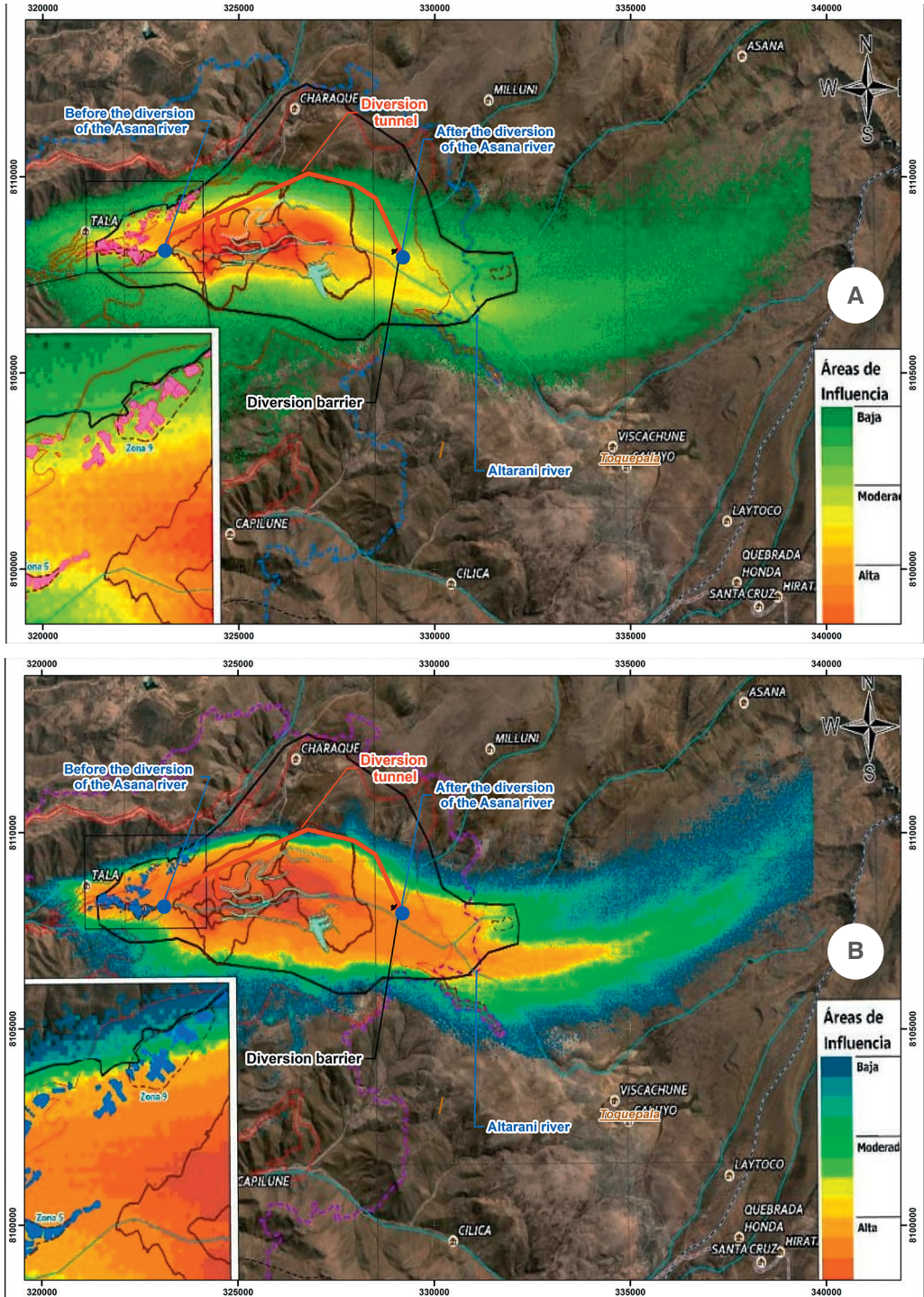


Figure 24. Location of the areas before and after the diversion of the Asana River in relation to the particle dispersion influence areas. Map a) shows PM10 and map b) shows SPM.

1.2. Impacts on the Asana river due to sediments

Contamination of the Asana river has also been recorded due to accumulation of fine sediments in surrounding areas. Although channels were constructed to divert rainwater and prevent the transport of materials into the river, erosion occurred in a quarry located very close to its course. Here, rainfall washed away the accumulated material and obstructed a drainage channel as well as weakened protection structures. The end result was that sand, gravel and fine material entered the Asana river (OEFA, 2021a).

1.3. Leaks in the vicinity of the tailings pool

Quellaveco's impacts are not limited to areas near the mine's operations or near the Asana river: they have also been recorded in the Cortadera zone, specifically near the tailings pool. In this sector, two leaks have been detected. The first leak emanated from the base of Tower 1, discharging contact water towards the Cortadera ravine. The other originated in the slope of the fill material and traveled in the same direction (OEFA, 2021b). Both of the leaks are classified as industrial wastewater due to their origin in mining processes.

1.4. Increase of copper levels in sediments associated with construction activities in Sarallénque

An increase in mineral concentrations has also been reported in the Sarallénque canal.

Although no significant alterations in water quality were detected, the concentrations of copper found in the sediments exceeded the reference values established in the Canadian guidelines used by OEFA (2021a). According to the assessment, this increase in copper was directly related to Quellaveco's construction activities in the Sarallénque intake area, where removal of material exposed rocks with copper mineralisation.

1.5. Increase in metals in water and sediments of the Sarallénque canal

A lack of adequate protection on the hillside adjacent to the Sarallénque canal means that rockfall has been recorded in several sections of the slope. This has not only affected the water but has also increased the concentration of metals – especially copper, lead and molybdenum – in the canal's sediments.

The mobilisation of these materials has favoured the release of other elements such as sodium, aluminium, calcium, iron, potassium, and magnesium. At certain times, copper concentrations exceeded permitted levels, which could pose a significant pollution risk in the area (OEFA, 2021a). OEFA's assessment ruled out the possibility of these metals originating from natural sources in the Sarallénque stream, and concluded that the elevated levels were directly related to activities developed by Quellaveco.

1.6. Not ‘accidents’ but inevitable consequences of the Quellaveco mining project

From the perspective of the literature on extractivism, so-called mining ‘accidents’ are not isolated events, but predictable outcomes of large-scale, highly complex and high-impact projects like Quellaveco (Gudynas, 2015).

This investigation has found 67 instances where AAQ failed to meet environmental obligations. Although several of these were subsequently corrected or archived, they do show that, despite Anglo American’s discourse of Quellaveco being a modern, digital and intelligent mine, the project reproduces problems characteristic of large-scale extractivist mining.

These events have been grouped into five main categories: dispersion of mineral and tailings; emission of particulate matter; risks to water; failures in infrastructure and industrial management; and community and socio-environmental breaches.

1.6.1. Patterns of inevitable consequences in Quellaveco

The five categories identified show that incidents are not isolated, but a consistent pattern of environmental and social non-compliance that matches Gudynas’ (2015) notion of ‘inevitable consequences’ of high-intensity extractivism. In third and fourth-generation operations like Quellaveco, impacts do not constitute exceptional anomalies, but predictable results of a large-scale, high-intensity, and technologically complex extractivist model. This is reflected in the fact that, of the 67 identified events, 47 concluded with a recommendation to initiate an Administrative Sanctioning Procedure (ASP). Of the remainder, 1 resulted in corrective measures; 1 in follow-ups; 4 in verification, 1 in communication and 13 were archived.

Contrasting these findings with the OEFA record, it is observed that between 2012 and 2023, 17 ASP linked to Quellaveco were processed. Of these, 15 are concluded, 1 was appealed, and 1 remains in progress under conditions of confidentiality. Among the concluded procedures, 7 have a final sanction, for a total of 532.72 UIT²⁶. The highest sanction corresponds to file 1310-2020-OEFA/DFAI/PAS, with 348.157 UIT. Collectively, the final sanctions amount to S/ 2,283,077.95.

These results are especially worrying because Quellaveco only began its operations in 2022. Despite being presented as a digitised, automated, and remotely operated mine, the evidence shows that technology has not been sufficient to prevent impacts or ensure environmental compliance, as it has coexisted with recurrent equipment failures, operational deficiencies, and infrastructural problems.

²⁶ ‘Unidad Impositiva Tributaria’, a unit used in Peru to calculate taxes, penalties, fines and other tax-related matters. Historic values of UIT extracted from SUNAT, available at: <https://www.sunat.gob.pe/indicestaxas/uit.html>. Information about fines was obtained from SAIP sent to OEFA (file number 2025-E01-121094). Information obtained from OEFA includes a list of concluded and currently pending administrative penalty proceedings against the company ANGLO AMERICAN QUELLAVECO S.A., as of 23 September 2025.

The documented events are distributed continuously between 2012 and 2024, indicating that the effects did not begin with the exploitation phase, but were already present before the start of extraction and intensified in subsequent years. Likewise, in numerous cases, AAQ remedied breaches only after OEFA inspections, which evidences a pattern of reactive rather than preventive compliance.

1.6.1.1. AAQ vs OEFA

AAQ's responses also reveal a pattern. In various inspection reports, AAQ maintained that its measures were sufficient or that the findings lacked conclusive evidence, even going so far as dismissing OEFA's observations as the product of a 'simple viewing' or as lacking 'technical criteria' (OEFA, 2025; OEFA, 2023d; OEFA, 2023c). However, OEFA supported its verifications with images, videos, meteorological records, and monitoring results that contradict such defences.

An illustrative case is the accumulation of dust in oregano crops in Tala. In an inspection, OEFA found air quality to be within Environmental Quality Standards (EQS). However, they did observe the presence of accumulated dust on leaves, verified that blasting reached agricultural zones, and recorded testimonies from community members reporting eye and nasal irritation associated with the daily removal of particulate matter (OEFA, 2023d). This demonstrates that the absence of measured abnormalities does not equate to the absence of effects, especially in the face of chronic and cumulative impacts.

Another relevant element is AAQ's repeated non-compliance on the same impact front. The clearest example is the presence of minerals from the conveyor belt in the Papujune riverbed and in an unnamed stream, verified in 2022 and again in 2024 (OEFA, 2023a; OEFA, 2025). This recurrence prompted the recommendation to initiate an ASP in 2024 and suggests the existence of a structural weakness in the mineral transport and containment system, rather than an isolated episode.

It must also be considered that each verified event constitutes only a specific piece of evidence in time. OEFA identifies the impact only when it carries out field inspections, and given the limited frequency of these inspections in large-scale projects, it is reasonable to infer that impacts may have been occurring for weeks or months before they are documented. This recalls the importance of independent, continuous, and broad coverage supervision of high-intensity mining operations.

Analysed jointly, the 67 identified events show a pattern of persistent environmental and social harm. Even in a mine that is presented as '100% digital' and as a model of modern mining, the evidence indicates that technology does not eliminate harms, but coexists with them. Quellaveco reproduces structural features of extractivism such as cumulative impacts, material dispersion, water pollution, and social conflict.

1.7. Conflict around the Quellaveco project

For three decades, Quellaveco has exhibited the tensions that are typical of large-scale mining in the Andean south: disputes over water in fragile basins, distrust in environmental evaluation and enforcement procedures, promises of employment and local development that are difficult to verify, and state intervention that combined roundtables, supervision, and reactive responses to protest escalations.

1.7.1. Conflict and observations on roundtables

Social conflict surrounding Quellaveco was reported as early as 2009 (Defensoría del Pueblo, 2019a). In response to the population's demands, in March 2011 a roundtable was installed in Moquegua by the regional government of Martín Vizcarra. The table included representatives of the national government, AAQ and civil society actors. It addressed three main axes—water resources, environment, and social responsibility—and concluded in 2012 with 26 agreements (World Bank, 2015).

Although the balance of these agreements requires specific analysis, this investigation underscores that the table fulfilled a central political function: generating the conditions of social legitimacy necessary for the construction of the Quellaveco project. In practice, the agreements operated as a validation mechanism for the development of the mine.

In general terms, roundtables are usually installed when a social conflict has escalated and a space for negotiation between its main actors is sought. Although they are presented as bona fide mechanisms aimed at building consensus, in practice they often become space for direct negotiation, and include technical and development commissions (Oficina Nacional de Diálogo y Sostenibilidad & Presidencia del Consejo de Ministros de la República del Perú, 2013).

In the case of Moquegua, several of the items agreed to in 2012 remained unfulfilled, giving rise to new conflicts in 2019. This situation is not exceptional in Peru: conflicts often recur after roundtable discussions due to companies failing to act on established commitments. Instead of providing solutions to the population's concerns, these spaces seem to generate commitments that are not carried out and which serve to postpone attention to the underlying conflicts (Observatorio de Conflictos Mineros de América Latina, 2019). An emblematic case is Agreement 11, relating to the construction of the Asana river dam, which was never materialised by AAQ.

1.8. Appropriation and control of territory²⁷

Quellaveco has also had effects on local territory. As AAQ expanded its control over land, part of the population was forced to spend time and resources negotiating with the

²⁷ The reconstruction of land acquisition processes was limited by the redaction of information in the files provided by MINEM and SENACE. This made it impossible to independently verify the full list of transactions associated with the project. This restriction is in itself a relevant finding, as it shows the mining sector's lack of transparency when it comes to territorial governance.

company. According to MEIA IV, AAQ came to concentrate 30,847.55 hectares of surface rights (Knight Piesold Consultores S.A., 2014), a process that involved the relocation of small agriculturalists (Knight Piésold Consultores S.A., 2000a). Although part of the official information provided by MINEM and the National Service for Environmental Certification of Sustainable Investments (SENACE) was censored, two reviewed sales contracts show acquisitions at very low prices per square metre: S/ 0.026²⁸ in 1995 and S/ 0.465²⁹ in 2008. AAQ's territorial control, therefore, was consolidated through low-value purchases and controversial legal processes. In some cases, there have also been allegations of intimidation by the company.

1.8.1. AAQ and the Tobala family

The case of the Tobala family stands out among complaints over land appropriation. In 2007, AAQ entered into a purchase agreement with Simeón Tobala —92 years old, ill, and with presumed cognitive incapacity—over the Chilota and Chilota I estates, which covered 1,289.65 hectares and were located in a strategic zone for the project³⁰. The USD 100,000³¹ offered by AAQ was approximately equivalent to USD 0.00443 or Soles/ 0.0139 per square metre³². While AAQ upheld the validity of the contract and protested the failure to deliver the estate, the family alleged that Simeón lacked legal capacity to carry out such an act and requested its nullity³³. The case resulted in a prolonged judicial and administrative dispute, which included civil and criminal proceedings, constitutional protection actions³⁴, and a petition before the Inter-American Commission on Human Rights (IACHR)³⁵.

1.8.2. Intervention and evictions in grazing areas: the Coyla Case³⁶

In August 2011, José Coyla reported to the Congress Presidency that he and other pastoralists had been displaced from the Samanape grasslands where Quellaveco project facilities are located. According to Coyla's complaint, the operation was carried out by some 40 people including AAQ personnel, National Police officers and workers of SIRIUS, a contracted security company. Coyla was told that the

28 Deed of sale between the campesino community of Tumilaca, Pocata, Coscore y Tala and AAQ, in fojas B-N° 0804651 to B-N° 0804656, folios 031451 to 031456.

29 Deed of sale between the campesino community of Tumilaca, Pocata, Coscore y Tala and AAQ, between fojas 1234291 and 1234236.

30 According to file N° 00955-2009-0-2801-JM-CI-01.

31 According to file N° 00398-2009-0-2801-JM-CI-02.

32 Based on an exchange rate of S/. 3.13 to the dollar in 2007. This figure is taken from the Central Reserve Bank of Peru's historical exchange rate data for the period 2000–2024:

<https://estadisticas.bcrp.gob.pe/estadisticas/series/anuales/tipo-de-cambio-sol-usd>

33 According to the testimony of the Tobala family.

34 'Acciones de amparo' in the Peruvian legal system.

35 As stated in the case submission form sent to the IACHR by the Tobala family.

36 As stated in report N° 727-2012 -MEM-DGM-DPM, in which "the Secretary-General of the Presidency of the Council of Ministers requests that the relevant assessments and report regarding the request by Mr José Luis Coayla Coayla for the suspension and investigation of the company Anglo American Quellaveco S.A. – a complaint he had submitted to the Presidency of the Congress of the Republic – be forwarded to that secretariat" in response oficio múltiple N° 972-2012-PCM-SG/OCF

grasslands were company land and even had his tools and belongings placed in a police vehicle, a fact that is recorded in a Police Intervention Act dated 8 August 2011. Coyla argued that he held a land title in SUNARP (Public Records) and requested the suspension and investigation of AAQ's actions. However, MINEM responded that it had no competence to investigate allegations of usurpation or land conflicts, specifying that such cases are the responsibility of the Police, the Public Prosecutor's Office, and the Judiciary. It also recalled that a mining concession does not by itself grant rights over the surface land.

1.9. Priority conservation sites at risk

Another local effect linked to AAQ is the weakening of protections for priority conservation zones. As the Quellaveco project continued to develop, areas of high biological value became increasingly exposed to mining concessions and impacts from sediments and dust. In 2012, these sites were designated zones of regional public interest. Their area was calculated at 436490.47 hectares³⁷, which is 27.6% of Moquegua's territory (MINAM, 2013).

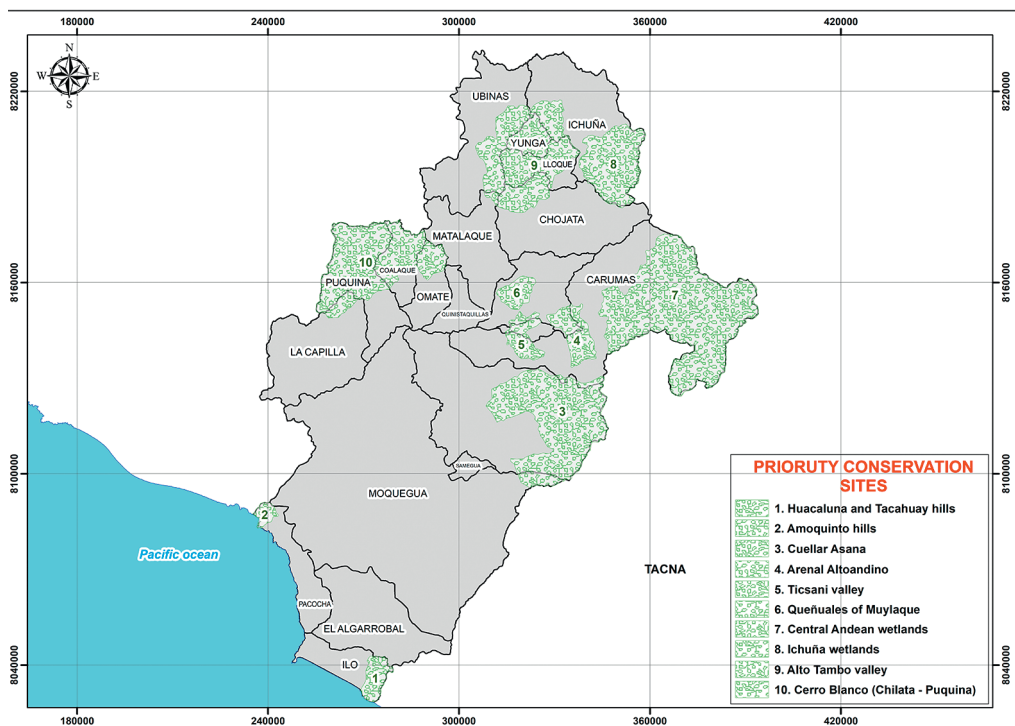


Figure 25. Priority conservation sites in relation to districts of the Moquegua department. Note. Map based on 37 Calculation carried out in QGIS on the basis of MINAM (2013). Diagnóstico de la Diversidad Biológica de la Región Moquegua.

on MINAM (2013).

Cuellar Asana and the Wetlands of the Central Andes are two of the priority zones most affected by the Quellaveco project. AAQ's concessions overlapped with 55.5% of the Cuellar de Asana. Moreover both areas contain key elements of the project's infrastructure, including the Vizcachas dam, the transfer pipeline, the concentrator plant, waste dumps, part of the pit, and a significant portion of the tailings pool. Tailings in particular constitute a serious risk as they can become long-term environmental liabilities.

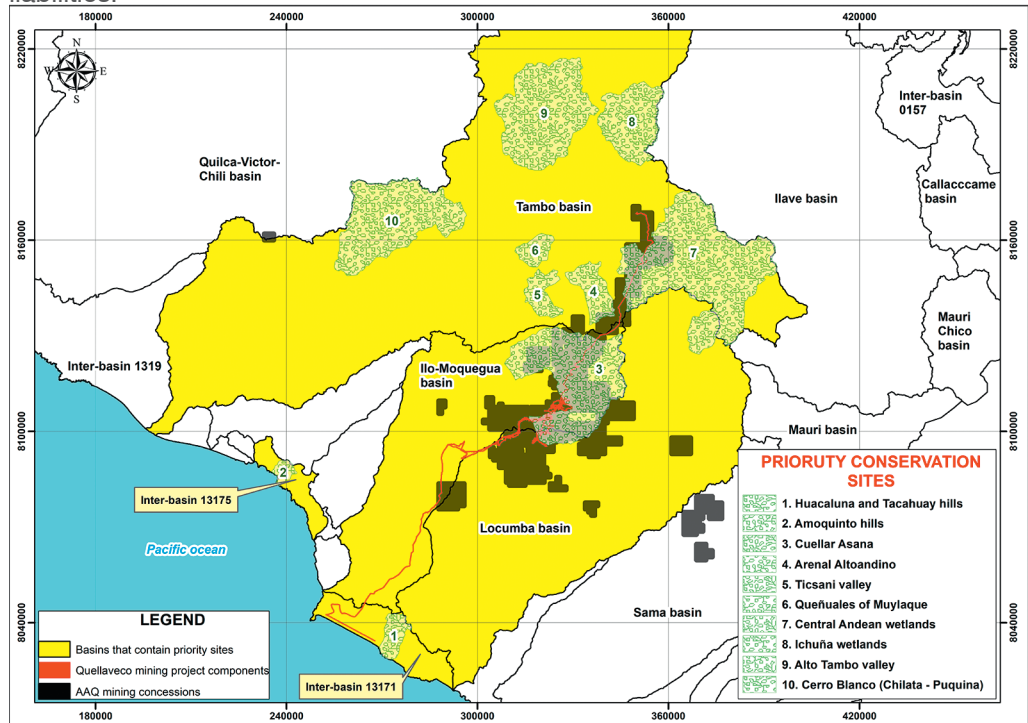


Figure 26. Priority conservation sites in relation to watershed level and AAQ mining components. Note. Map based on MINAM (2013), SENACE via files M-ITS-00082-2020 and M-CLS-NT-00020-2024, ANA watershed delimitation, and GEOCATMIN information.

1.9.1. Possible impacts due to particle dispersion in priority zones

The sidelining of discussions regarding priority conservation zones in Moquegua has led to these areas becoming more exposed to mining, and to impacts receiving less public attention. In the Cuellar de Asana, for example, a zone of high ecological value containing species such as *queñuales*, *yaretales*, and *tolares* formations that overlap with zones of dust and sediment dispersion, as shown by OEFA (2024a). The at-risk ecosystem provides refuge for wildlife and fulfills key functions such as soil protection and carbon capture (MINAM, 2013).

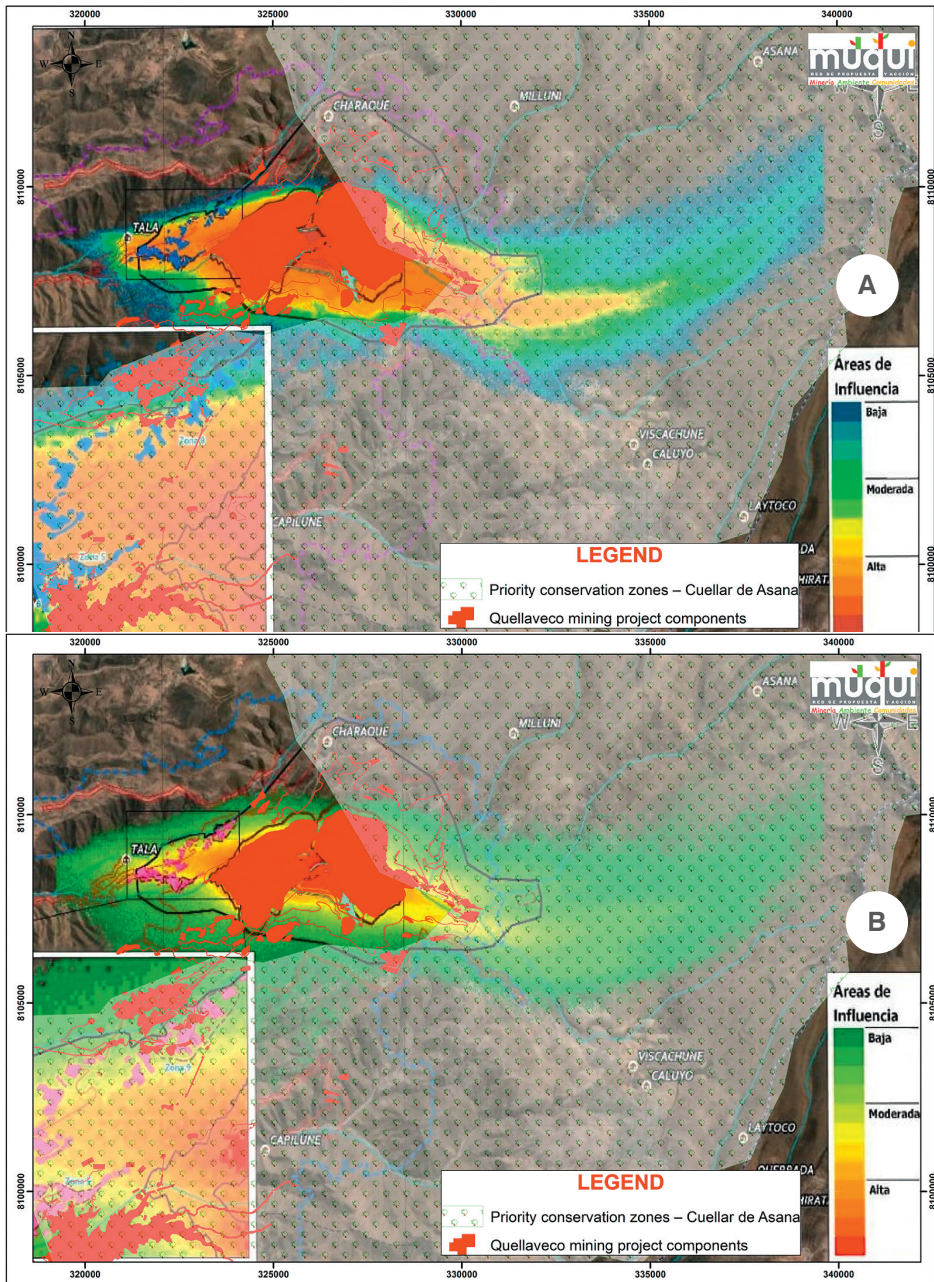


Figure 27. Dispersion of settleable particulate matter over a section of the priority zone known as Cuellar de Asana (A) and dispersion of particulate matter over the same zone (B).

Dispersion models show that Cuellar de Asana is located within the influence area of particulate matter from Quellaveco, which constitutes a potential risk. However direct measurement of soil and vegetation is still needed in order to ascertain the severity of damage.

1.10. Anglo American’s mining concessions

A request for access to public information (Solicitud de acceso a la informacion publica, SAIP) request sent to the Regional Health Authority of Moquegua (DIRESA) provided UTM geographical coordinates of drinking water sources, as well as monitoring results from between 2021 and 2025³⁸. This data was combined with the mining concessions registry available at GEOCATMIN system (downloaded 2 December 2025) in order to analyse overlaps.

The results showed that Anglo American, through its two legal names—Anglo American Peru S.A. (AAP) and Anglo American Quellaveco S.A. (AAQ)—maintains a total of 423 mining concessions in Peru at the closure of this investigation: 235 corresponded to AAP and 188 to AAQ. The analysis by concession status reveals clear differences in the role played by each company. AAQ concentrates the majority of concessions with active rights, with 184 formalised concessions linked mainly to Quellaveco project operations. In contrast, AAP registers 136 granted concessions but stands out for a considerable volume of concessions with rights in progress (53) and extinguished rights (46), suggesting that this company operates primarily as an exploratory arm, administering and streamlining concessions in various regions of the country. AAQ, for its part, shows almost no administrative involvement, with only three concessions in progress and one classified as “other”.

The analysis showed that Moquegua concentrates the highest density of mining concessions, with 193, 187 of which had been granted and 6 were in progress, confirming the predominance of the Quellaveco project. At a second level were Ancash, Apurimac, and Huancavelica, with a considerable but more dispersed presence. In contrast, Ayacucho, Tacna, Junín, Cajamarca, Cusco, and La Libertad recorded fewer concessions with a higher fraction having extinguished rights or rights in progress.

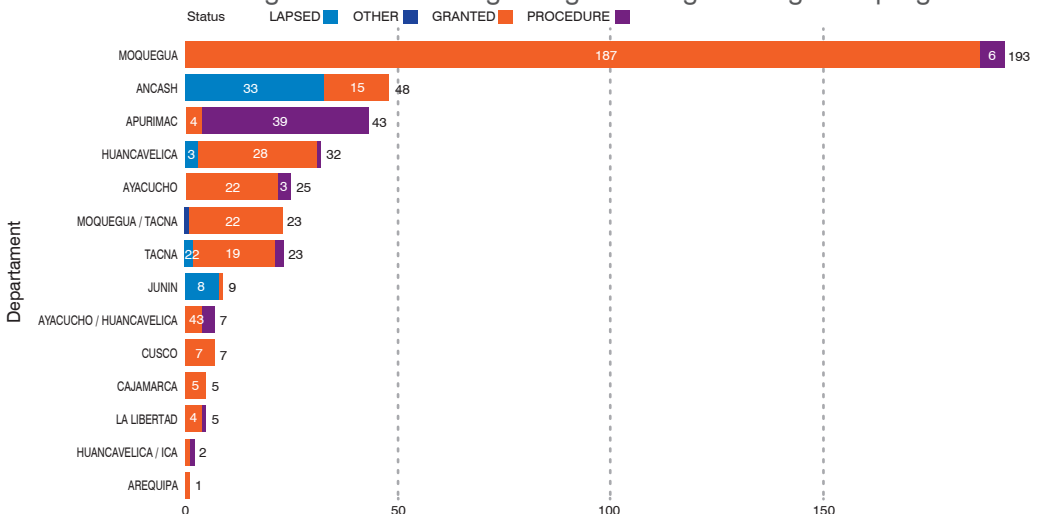


Figure 28. Mining concessions registered under Anglo American Peru S.A. and Anglo American Quellaveco S.A. by department and status. Note. Graph is based on information regarding the mining cadastre, obtained from GEOCATMIN on 2 December 2025.

38 Information provided to FACAREMOQ on a CD via Carta Simple N° 058-2025-GRM-DIRESA/DR-R-AIP dated 18 August 2025. The information was subsequently forwarded by FACAREMOQ to Red Muqui for processing and analysis.

1.10.1. Overlap of Anglo American mining concessions with sources of water for human consumption

Of the set of concessions held by AAQ and AAP, 13 overlap directly with 91 sources for human consumption monitored by DIRESA³⁹. It is clear that the overlap is extensive. A particularly high concentration of sources, moreover, is found in the DORALUZ and CARACOLES concessions.

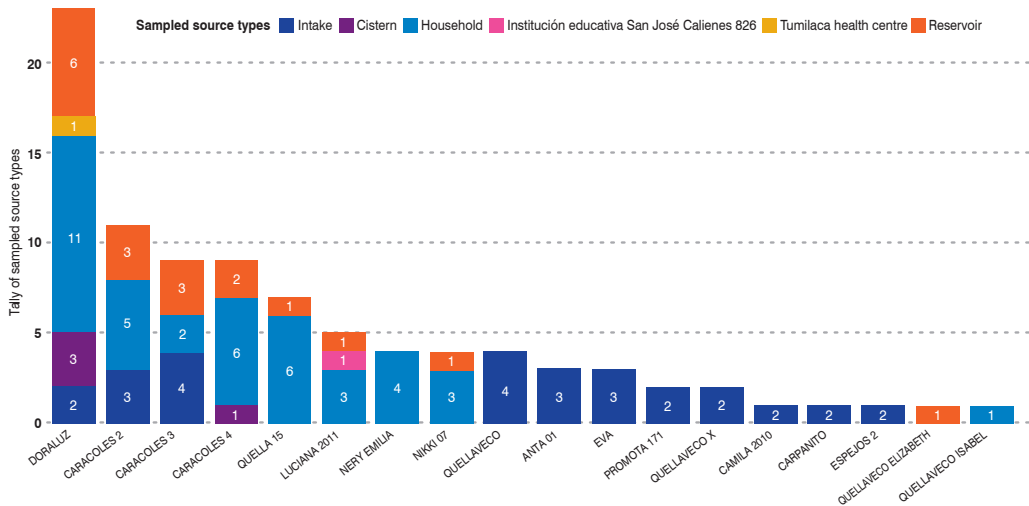


Figure 29. AAQ mining concessions overlaid with sources of drinking water monitored by DIRESA between 2021 and 2025.

The results show a significant overlap between AAQ’s mining concessions and monitoring points for drinking water. Between 2021 and 2025, 41 households, 26 intakes, and 18 reservoirs were recorded within these concessions, in addition to 4 cisterns, the Institución Educativa San José Calientes 826⁴⁰, and the Tumilaca health post, all linked to water supply and essential services.

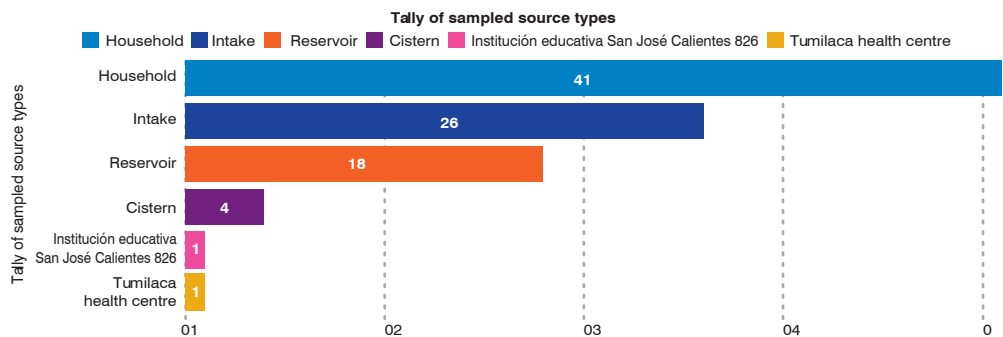


Figure 30. Types of sources of water for human consumption located within areas concessioned by AAQ.

³⁹ According to the processing of data from GEOCATMIN and from the annexes to Letter No. 058-2025-GRM-DIRESA/DR-R-AIP, dated 18 August 2025.

⁴⁰ A primary school (translator’s note).

This overlap of mining concessions did not only affect households, but also drinking water intakes and reservoirs, posing a risk to water security. This issue has already been recognised judicially in Peru: in 2025, a court in Loreto warned that a mining concession over the Nanay River basin threatened the right to drinking water for the population of Iquitos (Poder Judicial del Perú, 2025). Given that there is a precedent, it is important that the findings are communicated to the local population.

2. Cumulative effects

This section addresses cumulative impacts, understood as those emerging from the spatial and temporal convergence of multiple mining projects, along with their support infrastructures and even mixed natural and anthropogenic factors, as in the case of Florencia Tucari.

2.1. Mining concessions in Moquegua

At the closure of the investigation, the Moquegua department recorded 1,461 mining concessions, covering 45.09%⁴¹ of the departmental territory. This indicates high extractivist pressure.

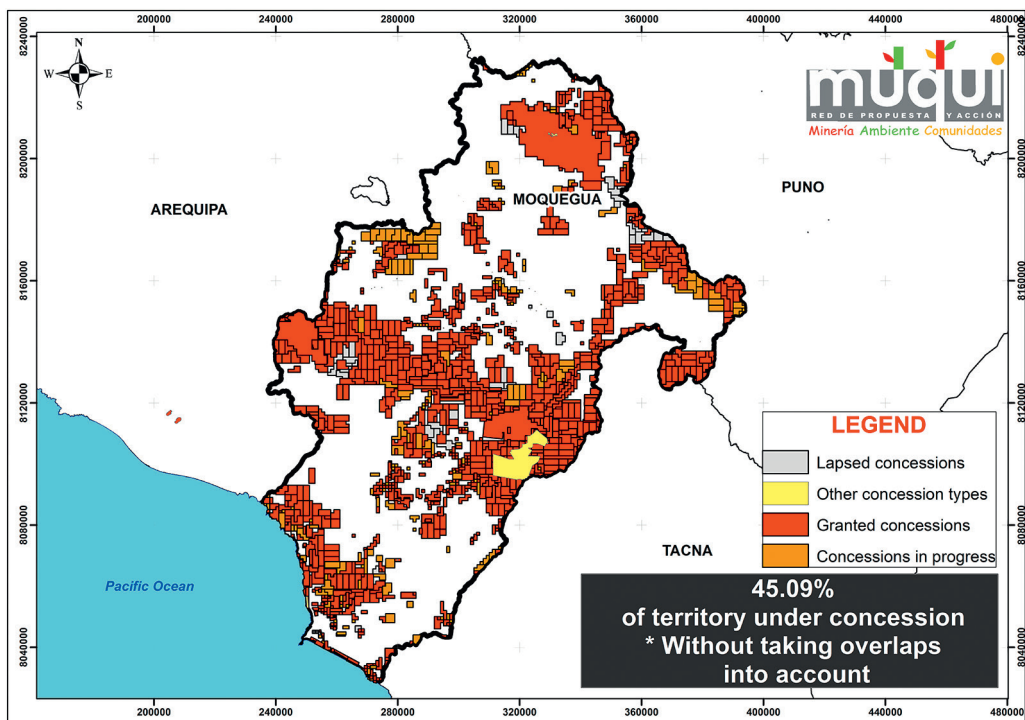


Figure 31. Map of mining concessions in the Moquegua department.

⁴¹ Data analysis carried out using information from the GEOCATMIN mining cadastre (2 December 2025). The percentage was calculated without taking into account the overlap of mining concessions.

Although there were 383 holders of mining concessions in Moquegua, a small proportion of companies concentrated a large share of the concessions. Anglo American Quellaveco S.A. stands out as the main actor, with 184 concessions, followed by Vale Exploration Peru S.A.C. and Southern Peru Copper Corporation. This shows that the region's mining map is dominated by a few actors with strong territorial control, which is in line with Moquegua's strategic character in the national extractive model.

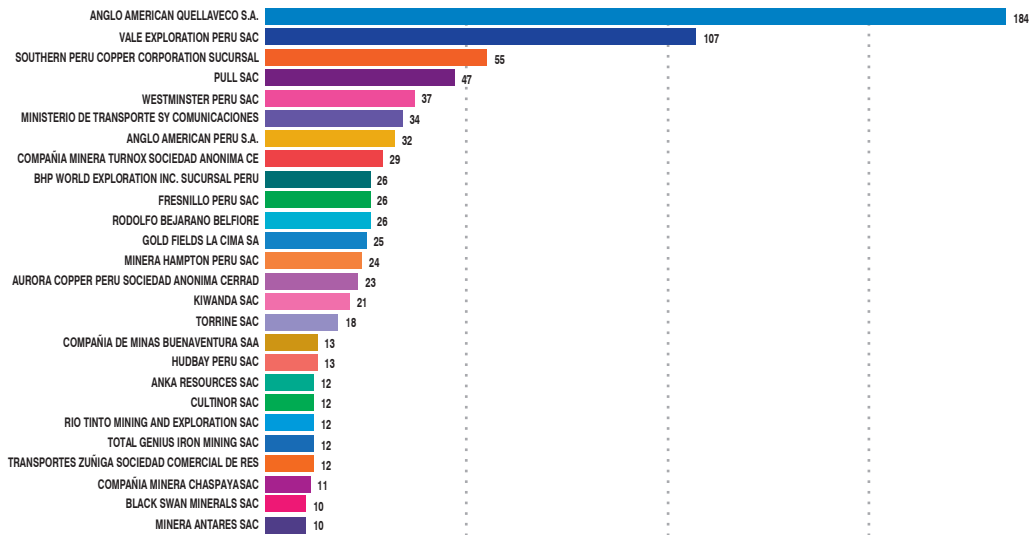


Figure 32. Actors with more than 9 mining concessions in the Moquegua department.

The analysis of the status of concessions in Moquegua shows that, out of 1461 mining concessions registered department-wide, 78.2% (1142) have been granted, which reflects the mining sector's high degree of consolidation. 15.1% (220) were in progress, reflecting active administrative processes aimed at the expansion of mining rights. A much smaller group corresponded to extinguished concessions (55, equivalent to 3.7%). Finally, 44 concessions (3.0%) were placed under the category of 'other'.

2.2. Mining concessions over priority sites

Cumulatively, it was identified that 1,200 mining concessions overlapped with Moquegua's 10 priority conservation sites⁴². There is, moreover, a disproportionate concentration of mining concessions over certain priority sites, particularly in Cuellar de Asana, configuring scenarios of high pressure on ecosystems that are strategic for water regulation, biodiversity conservation, and the provision of ecosystem services.

⁴² The analysis was carried out using data from the mining cadastre available on GEOCATMIN as of 2 December 2025.

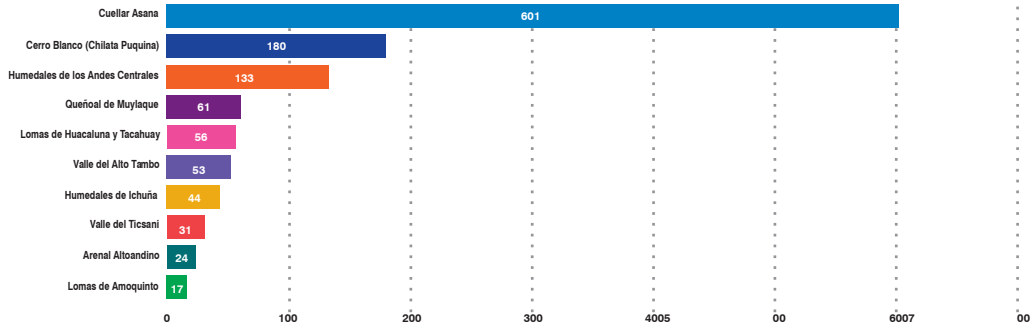


Figure 33. Number of mining concessions per priority site.

Furthermore, the spatial overlap between Moquegua’s priority conservation zones (outlined in green) and active mining concessions (outlined in red) shows that more than half (54.60%) of priority site areas have been granted as mining concessions.

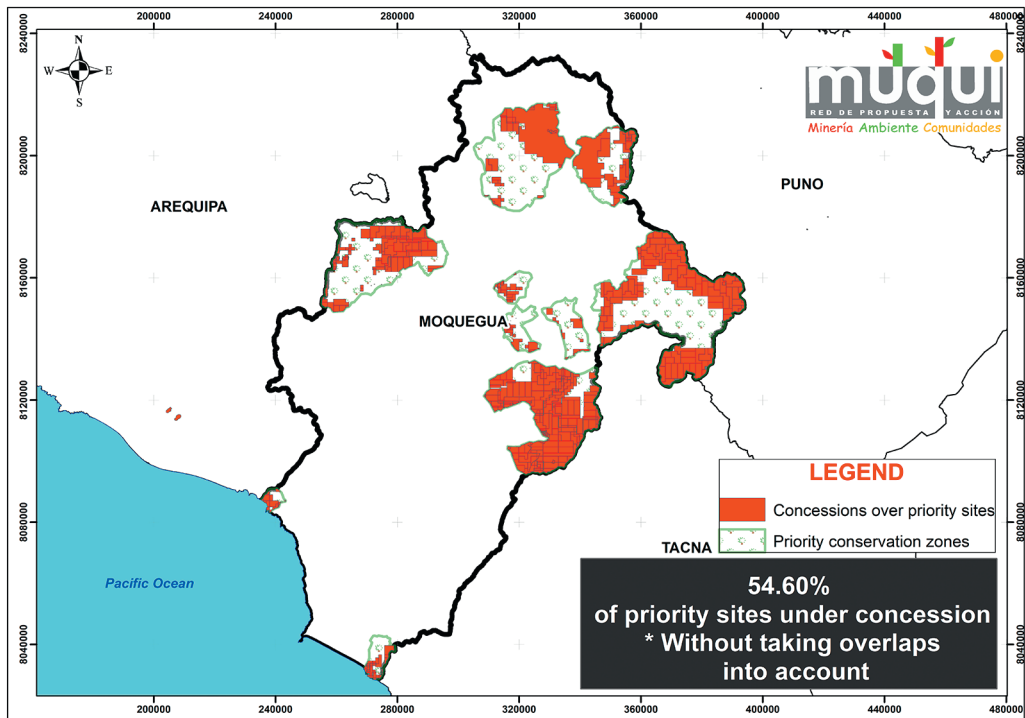


Figure 34. Map showing the overlap of mining concessions and priority sites in Moquegua.

The character of concessions across Moquegua’s 10 priority conservation sites is not uniform. Some areas are dominated by a few large companies, while in others concessions are distributed among many small actors. This reveals that priority conservation sites face differing levels of mining pressure, which affects their management and protection in distinct ways.

2.3. Mining concessions over sources of water for human consumption

The investigation identified 276 sources of water for human consumption within the mining concessions of 34 companies⁴³. Among the sources were households, reservoirs, intakes, treatment plants, and other essential services. The findings demonstrate that in Moquegua mining activity overlaps with key water supply infrastructure, representing a significant risk to water security and the continuity of drinking water supply services.

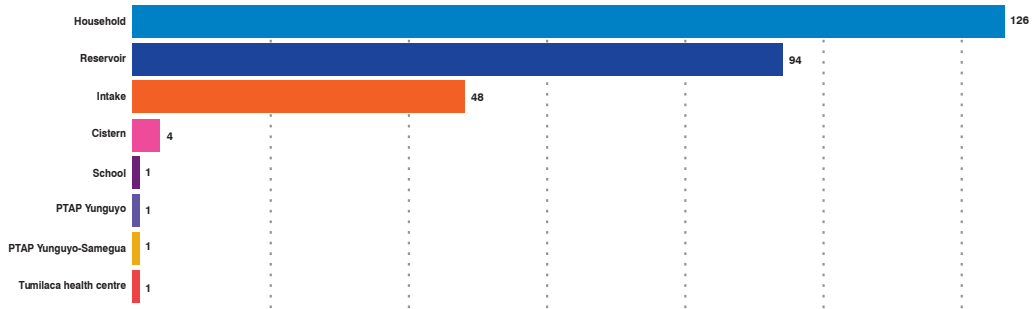


Figure 35. Type of drinking water source within areas granted as concessions for mining activities.

According to analysis of concession holders, AAQ presents the greatest overlap between its concessions and water sources for human consumption, with 84 points identified. It is followed by Vale Exploration Peru S.A.C. with 39, and Compañía de Minas Buenaventura S.A.A. with 33.

Although overlaps also exist in concessions held by other small and medium-sized enterprises, the results indicate that the highest concentration lies within lands conceded to a small group of large actors. This is consistent with these actors’ scale of operation and territorial presence in Moquegua. A thorough assessment of water risks associated with these specific companies is needed.

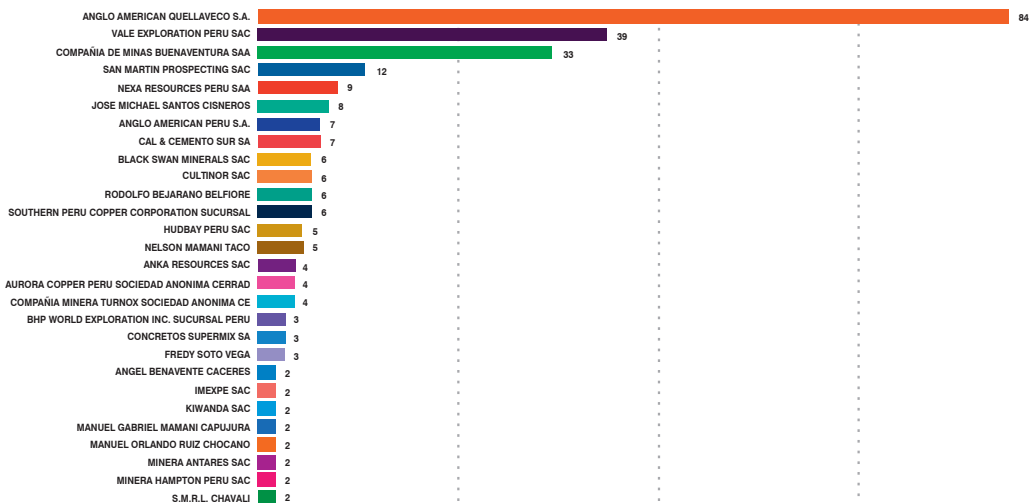


Figure 36. Actors with more than two sources of water for human consumption within their mining concessions

⁴³ Analysis included water sources for human consumption located in the department of Moquegua that overlap spatially with concession areas and with the monitoring points recorded by Diresa between 2021 and 2025.

2.4. Mining projects and project portfolio in Moquegua⁴⁴

There are 13 mining projects in Moquegua, the majority of which exploit metals – particularly copper, gold, silver and molybdenum. Main actors include Southern, Anglo American, and Buenaventura. Non-metallic mining has a smaller presence and operates on a smaller scale (Gestión, 2013). Although, the region presents a diverse mining landscape, it is clearly oriented towards the expansion of large-scale metallic operations.

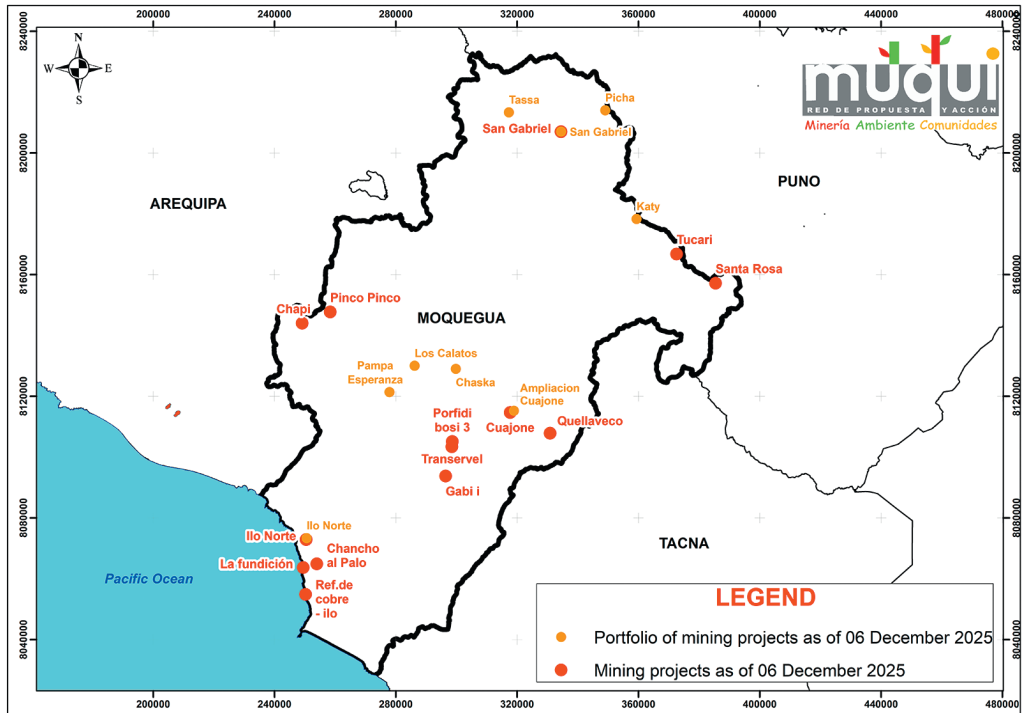


Figure 37. Map of mining projects and project portfolio in Moquegua (accessed 6 December 2025). The location of specific projects was extracted from different sources, as per the following: Katy project (Anddes, 2025); Chancho al Palo project (MINEM, 2025c); mining project portfolio (MINEM, 2025b); Santa Rosa project (OEFA, 2015); Ilo Norte project (RumboMinero, 2018); Pinco Pinco project (Gestión, 2013); Chaska project (MINEM, 2025d); Pampa Esperanza project (RumboMinero, 2022); Tassa project (MINEM, 2010); Picha project (RumboMinero, 2025).

2.4.1. Precedents of mining pollution in Moquegua

The Florencia Tucari mining unit, operated by Aruntani S.A.C. and located in Carumas, Moquegua, conducted open-pit mining from 2005 and extracted gold from a high-sulphidation epithermal deposit. The mine is currently in post-closure stage. An Environmental Causality Assessment (EAC⁴⁵) conducted by OEFA concluded in 2020 that various components of this operation affected soil, water, and sediment quality (OEFA, 2020b). This case is particularly relevant because the water diversion for Quellaveco's

⁴⁴ The compilation of mining projects and the project portfolio in Moquegua was drawn up using data from GEOCATMIN (6 December 2025), supplemented by various institutional and documentary sources. It is important to note that the ownership of mining projects may have changed at the closure of this investigation, owing to the frequency of sales, mergers, acquisitions and transfers of mining rights between companies in the sector.

⁴⁵ Evaluación Ambiental de Causalidad (translator's note).

operations originates from the Titire River, which is affected by contamination generated by Aruntani. According to OEFA, the contamination manifested in the form of acidification processes, reddish colouration of rivers and sediments, metal bioaccumulation, and the presence of metals such as aluminium, iron, manganese, arsenic, copper, cadmium, lead, mercury, and zinc (OEFA, 2020b). Furthermore, the transport of contaminants extended at least 62.64 km downstream, with some possibly reaching the Tambo river – in which case, ageing, further research is warranted⁴⁶.

2.4.1.1. Aruntani and the pollution of Pasto Grande

The Aruntani case is a representative example of the environmental impacts of mining in Moquegua. Its operations at the Santa Rosa unit polluted the Pasto Grande reservoir, a strategic infrastructure for mitigating water deficits and supplying agricultural and human consumption demands in Moquegua (ANA, 2023). The impact is particularly serious considering that one of the main water intake sources for population use comes from the Pasto Grande canal (EPS Moquegua S.A., 2022). Contamination also reached the Pastara River, a tributary feeding the Pasto Grande lagoon, a reservoir intended to secure water availability for Moquegua and Tambo (Consorcio V-5, 2012).

After the closure of Florencia Tucari, OEFA identified the presence of contaminants linked not only to Aruntani but also to Pavico and Cacachara (OEFA, 2015). Although part of the Cacachara River's pollution dates back to the 19th century, the recent impact of the Pasto Grande reservoir has been intensified by deglaciation, which exposes mineralised surfaces and favours sulphide oxidation processes and the natural generation of sulphuric acid, contributing to the deterioration of water quality (Consorcio V-5, 2012; OEFA, 2015).

This is compounded by the fact that the closure plan for Santa Rosa was drawn up by MDH, a company that belongs to the Aruntani Group (Martínez, 2025). MDH has developed other projects with impacts on key water sources for local communities: Anabi, in Cusco, where soils, rivers, and sediments were affected (OEFA, 2020c); Apumayo, in Ayacucho, where the Auquiato stream was contaminated (OEFA, 2017a); Utunsa, between Cusco and Apurímac, where potential contamination risks associated with hydrogeological conditions were identified (OEFA, 2020a); and Arasi, in Puno, where rivers and sediments of the Llallimayo basin were contaminated (Martínez, 2025).

2.4.1.2. The case of Southern Peru Copper Corporation (SPCC)

A study conducted by Balbín et al. (1995) demonstrated that SPCC operations generated cumulative and systemic impacts on water, air, ecosystems, agriculture, and human health in southern Peru. Water contamination in Aricota; the disposal of tailings into the Locumba, Ite, and the sea; and emissions from the Ilo smelter, reflect the magnitude of an extractive model that subordinated environmental protection and the lives of local people to copper production.

The environmental impacts described by Balbín et al. (1995) regarding Southern Peru Copper Corporation cannot be considered resolved. Although some visible effects of

⁴⁶ The distance was calculated in QGIS, taking into account water monitoring points and other sites where OEFA has demonstrated that increases in metal levels were linked to the Tucari mining operation.

the past, such as the presence of tailings on the coast on the coast or the prevalence of dense smelter fumes, have diminished over time, recent OEFA assessments show that contamination processes associated with mining activity persist in Cuajone and Toquepala. In Cuajone, metals were identified in air, soils, settled dust, and in surface and ground water. Acid water leaks linked to the Torata Oeste waste dump were also identified. In Toquepala, signs of leaks, springs with contaminants exceeding Environmental Quality Standards (ECA), and sediments with arsenic and copper above international reference values were detected (OEFA, 2018a; OEFA, 2018b). These findings indicate that historical contamination has not disappeared but persists in less visible, yet equally harmful, forms.

In this context, the Aruntani case shows that mining pressure on the environment in Moquegua is neither isolated or exclusive to SPCC and Quellaveco. The case of the Pasto Grande reservoir shows that different mining operators have contributed to the deterioration of a water system that is vital for agriculture, human consumption, and ecosystems. Historical and recent evidence shows, then, that Moquegua faces a persistent and cumulative environmental problem, in which mining continues to act as a factor of hydrological, ecological, and social alteration (Balbín et al., 1995; OEFA, 2018a; OEFA, 2018b).

2.5. Enduring emergency in Moquegua regarding drinking water that contains heavy metals (2021–2025)⁴⁷

The issue surrounding the presence of heavy metals in water, air, soil and even drinking water supply systems is clear, indicating that Moquegua faces an emergency. For the period between 2021 and 2025, 790 out of 27,180 laboratory results for water intended for human consumption exceeded the Maximum Permissible Limits (MPL) established by regulations. Twelve metals were found in concentrations higher than the MPL: aluminium, arsenic, boron, cadmium, chromium, iron, manganese, mercury, nickel, lead, sodium, and uranium.

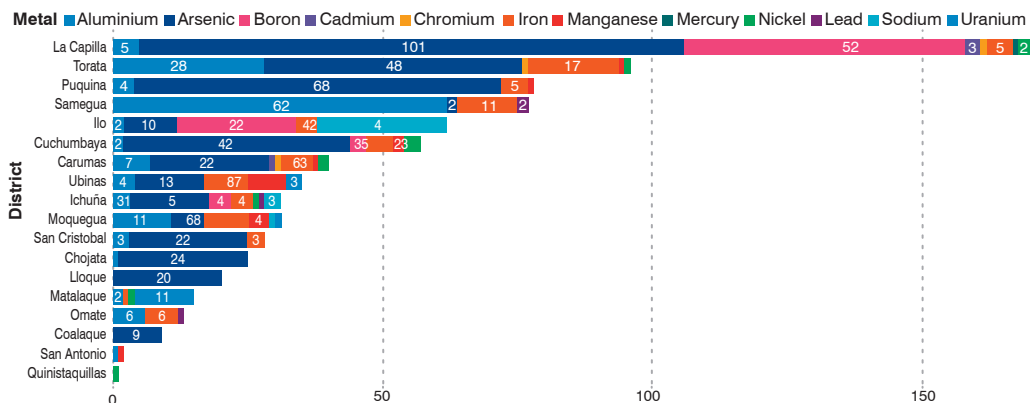


Figure 38. Number of laboratory results, by district, that exceeded the Maximum Permissible Limits (MPL) of the Regulation on Water Quality for Human Consumption⁴⁸, between 2021 and 2025

47 This section is based on information provided to FACAREMOQ on a CD via Carta Simple N° 058-2025-GRM-DIRESA/DR-R-AIP dated 18 August 2025. The information was subsequently forwarded by FACAREMOQ to Red Muqui for processing and analysis.

48 Reglamento de Calidad del Agua para Consumo Humano (translator's note).

Collectively, the results show persistent contamination of Moquegua's drinking water. The metals and elements that were detected most frequently were arsenic, aluminium, iron and boron. 18 of the evaluated districts were structurally affected: La Capilla, Torata, Puquina, Samegua, Ilo, Cuchumbaya, Carumas, Ubinas, Ichuña, Moquegua, San Cristóbal, Chojata, Lloque, Matalaque, Omate, Coalaque, San Antonio and Quinistaquillas – this is 85% of the districts that were surveyed. On the other hand, data was lacking for three districts (Pacocha, El Algarrobal and Yunga)⁴⁹.

Although with less frequency, mercury, uranium, lead and cadmium were also detected in water for human consumption. These elements are highly toxic and can pose significant risks to public health even if only present in small doses (World Health Organization, 2017). Several of these metals, in fact, have historically been associated with cases of human poisoning (Balali-Mood et al., 2021).

It is now urgent to determine whether pollution of drinking water emanates from natural or from human-related sources such as mining, as this will help orient monitoring procedures, locate responsibility and enact public policies that guarantee the right to safe water.

The situation is particularly serious because the majority of abnormalities were recorded in water destined for human consumption – mainly in homes, reservoirs and public network connections. The metals were detected in both groundwater and surface water. Crucially, they were also found in drinking water treatment plants (DWTP), both at the inlet and outlet of the system. Contaminants, therefore, have even reached infrastructure designed to guarantee the safety of drinking water.

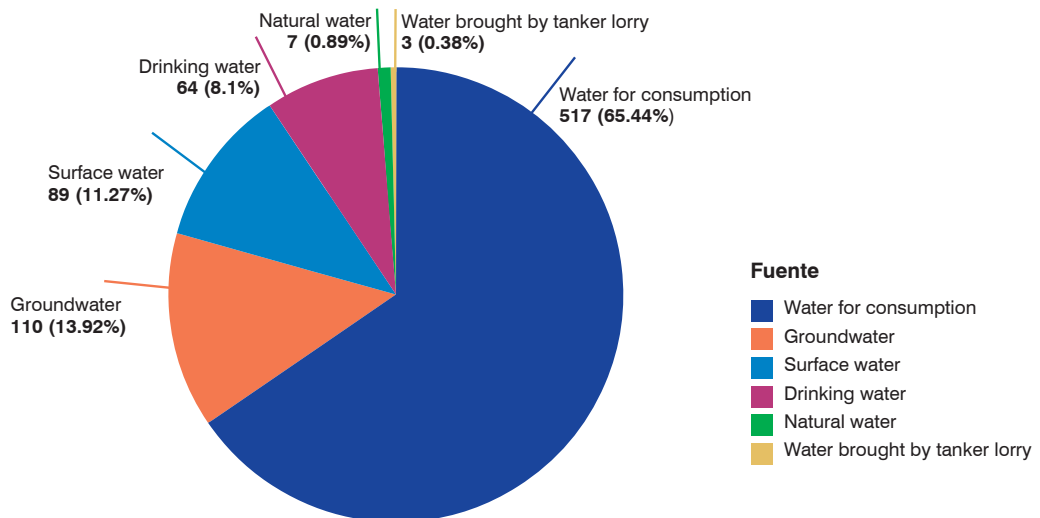


Figure 39. Number of laboratory results by water source that exceeded the Maximum Permissible Limits (MPL) of the Regulation on Water Quality for Human Consumption between 2021 and 2025

⁴⁹ The data provided by DIRESA did not include figures for these three districts. Consequently, the fact that these three districts are not mentioned in the study should not be interpreted as an indication that they were unaffected, but rather as a lack of available data for processing and analysis

Among the plants with the highest values were Chen Chen, Cata Catas, Pampa Inalámbrica, Yunguyo, Samegua and Torata, where arsenic, aluminium, iron, boron, manganese and sodium were identified. Moreover, abnormalities were detected in 253 reservoirs of water for human consumption. Collectively, these findings indicate grave problems with the quality of water reaching the urban and peri-urban population of Moquegua, and therefore a significant public health risk.

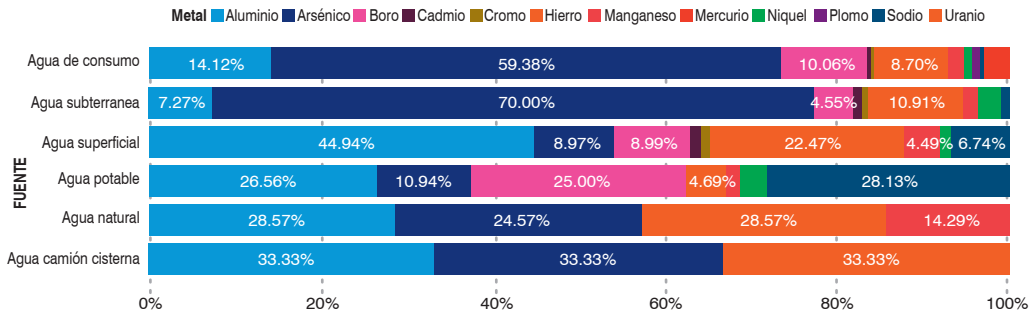


Figure 40. Percentage of metal exceedances by water source for human consumption between 2021 and 2025

2.6. Exposure to heavy metals, metalloids and other toxic chemical substances in Moquegua

The figures on human exposure to heavy metals, metalloids and other toxic chemical substances in Moquegua highlight the severity of the structural contamination affecting the health of thousands of people. In 2025, a DIRESA report, obtained via a SAIP request submitted by FACAREMOQ, showed that 715 out of 842 urine arsenic samples — equivalent to 84.9% — exceeded reference values in 18 districts and 86 villages of the department (DIRESA de Moquegua, 2025). The highest records were concentrated in Ilo and Puquina, followed by Samegua, San Cristóbal and Torata. The other affected districts are Torata, Coalaque, Chojata, La Capilla, Lloque, Cuchumbaya, Ichuña, Matalaque, Ubinas, Omate, Quinistaquillas, Moquegua, Cambrune and Carumas. As was the case in section 2.5, information was not available for El Algarrobal, Pacocha and Yunga.

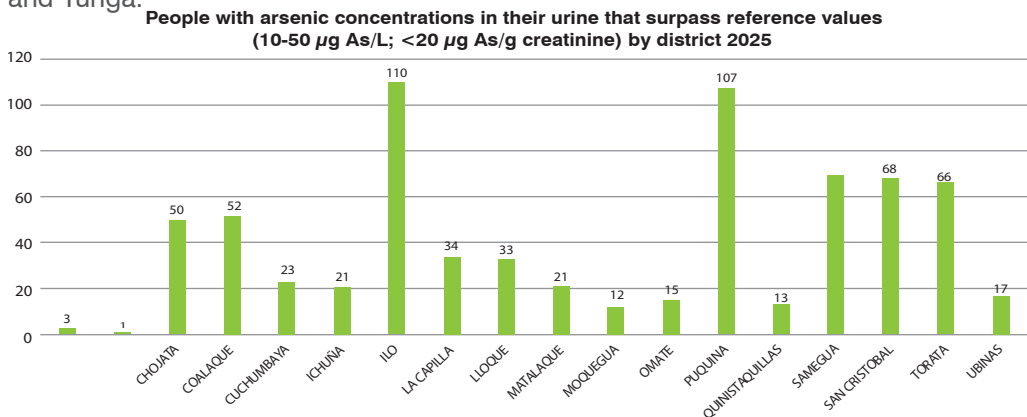


Figure 41. Population exceeding reference values for urine arsenic by district in the Moquegua region, 2025. Note. Compiled from DIRESA de Moquegua (2025)

The cases or 5% and older adults for 6 of the cases or 1%. In summary, children and adolescents are disproportionately affected by arsenic exposure, which suggests that young people are more vulnerable.

In 2024, DIRESA de Moquegua reported that 334 out of 395 urine arsenic samples (84.5%) exceeded reference values in 10 districts and 36 centros poblados of the department (DIRESA de Moquegua, 2024). Puquina concentrated the highest number of cases, followed by Chojata, Carumas and Lloque, evidencing an unequal territorial distribution of exposure. The age analysis, once more, showed particularly severe impacts on children: those aged 0 to 11 years concentrated 262 cases (78%), followed by adolescents aged 12 to 17 years with 50 cases (15%) and adults with 22 cases (7%). The data is clear that arsenic exposure affects mainly children and adolescents. It is therefore urgent that environmental monitoring and public health actions target this group.

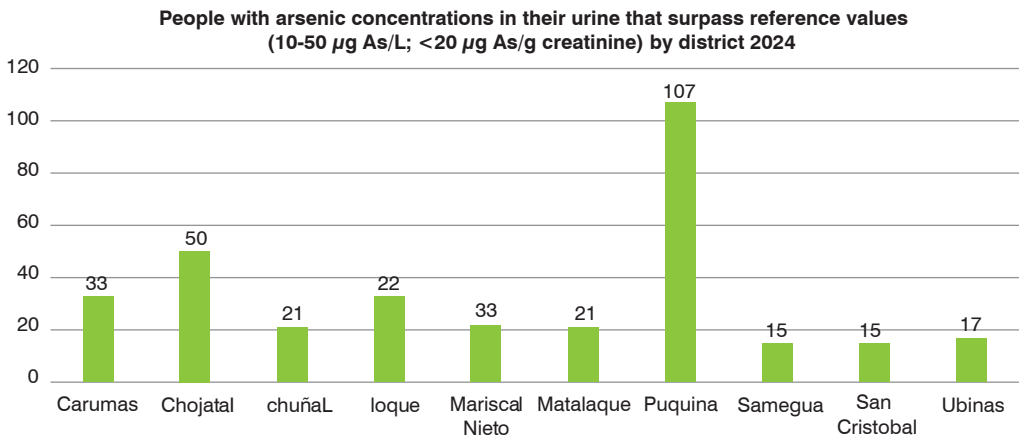


Figure 42. Population exceeding reference values for urine arsenic by district in Moquegua, 2024. Note. Compiled from DIRESA de Moquegua (2024)

3. Spillover effects

Quellaveco also generates spillover effects, which transcend local impacts or the project's direct physical footprint. These effects are expressed in institutional, political, discursive and territorial dimensions:

- **Weakening of land-use planning and ecological-economic zoning (EEZ):** Extractivist expansion has coincided with a reduction in the capacity of land-use planning, ecological and economic zoning (ZEE) and environmental oversight to regulate land-use and prevent socio-environmental conflicts.
- **State intermediation and political legitimisation:** The State has not just mediated in conflicts, but has actively legitimised Quellaveco as an actor, through dialogue tables, compensation mechanisms and support for strategic authorisations.

- **Corporate insertion in educational spaces:** It was observed identified that AAQ promotional material was distributed in schools and universities. This could influence knowledge production and reinforce corporate narratives about mining.
- **Displacement of health in public discourse:** Despite the existence of findings on metal exposure and environmental risks, health issues have lost currency in regional public debates.
- **Reconfiguration of water governance:** The diversion of the Asana River and other hydraulic interventions show a normalisation of intensive modifications to watercourses in a context of structural water deficit.
- **Dicursive hiding of conflicts:** the image of Quellaveco as a ‘low-impact digital mine’ may contribute to reducing the public visibility of environmental impacts and the conflicts that they generate.
- **Displacement of the debate on water stress and climate:** Institutional narratives tend to minimise water scarcity and climate vulnerability, despite the water deficit and regional ecological deterioration.

These spillover effects show that Quellaveco’s impacts extend beyond the physical territory to institutions, public discourse, policy and ways of managing water, health and environmental risk in Moquegua.

Group composition of Anglo American

Quellaveco is not only sustained by its infrastructure and technology, but also by a network of corporate, legal, financial and organisational relations that enable its continuity and expansion. Analysing this network permits a better understanding of how the project maintains its extractivist logic and how it broadens its influence on the land, the State and society (Martínez, 2025).

1. Anglo American's corporate networks

1.1. Anglo American Quellaveco S.A.

Anglo American Quellaveco S.A. is constituted as the central operating unit of the Quellaveco mining project. It was founded in 1993 as 'Minera Quellaveco S.A.' by two Chilean companies – Minera de Mantos Blancos S.A. and Sociedad Minera Industrial y Comercial – (SUNARP, 2024e) both of which had legal representation in Peru (SUNARP 2024i). The company's financial history demonstrates a sustained increase in capital, which according to the latest registers has reached USD 2.3 billion (SUNARP, 2024b). In 2007 it began operating under its current name. The expansion of Quellaveco reflects the project's strategic importance within Anglo American's global portfolio of investments.

The analysis shows that representatives from law firm Rubio Leguía Normand (RLN) were present at crucial moments in the legal and corporate history of Minera Quellaveco S.A. (and later that of Anglo American Quellaveco S.A.). This included legal representation, secretarial work and participation in board meetings (Estudio Rubio Leguía, 2024). In addition, Alfonso Rubio Feijóo – a founding member of RLN – helped draft the first constitution of Minera Quellaveco S.A. He was also a founder and the CEO of Minera Majaz S.A. (SUNARP 2024h) which illustrates the mobility of professional and legal elites within the Peruvian mining sector.

Further, in 2019 AAQ signed a Legal Stability Agreement⁵⁰ with the Peruvian State – again with assistance from RLN – which allowed it to prevent changes to its tax regime (SUNARP, 2024b). Moreover, before its corporate re-structuring, Quellaveco received capital from from the International Finance Corporation (IFC) which shows that the company had international pretensions from an early stage (SUNARP, 2024f; DesdeAdentro, 2023).

⁵⁰ Convenio de Estabilidad Jurídica (translator's note).

Finally, AAQ's boards and management have included professionals with a career in large mining companies and business associations. Links have been observed with Mitsubishi, Glencore, Minsur, BHP Billiton, Newmont, Xstrata, Antapaccay, Las Bambas, Chinalco, Antamina and SNMPE. Quellaveco, therefore, relies on a highly specialised managerial and corporate network (Anglo American, 2018; SUNARP, 2024g; Sociedad Minera Corona S.A., 2021; Durand, 2016).

1.2. Anglo American Perú S.A.

Anglo American Perú S.A. was founded in 1999 by Minorco Peru Holding LTD and by Amsa Limited, both of which were legally represented by Enrique Normand Sparks and by the estate of Alfonso Rubio Feijóo, represented by Pedro Rubio Feijóo. This company operates as a corporate support unit for Anglo American's operations in the country. The evolution of its capital from PEN 21 million to PEN 160 million, evinces its increasing relevance within the group's organisational structure (SUNARP 2024d).

Recent board members include professionals with a career in several mining companies, as well as lawyers linked to specialised firms such as RLN. Initially the company was constituted as AAQ Exploration Peru S.A., but in 2013 it adopted its current name. It is important to mention that Pedro Rubio Feijóo, the brother of Alfonso Rubio Feijóo is the current national and international director of Credicorp (CREDICORP, 2024). Although this does not prove a relationship between Anglo American and Credicorp, it does illustrate the movement of economic elites between the financial and extractive sectors – a movement that is relevant and could be explored in further research.

1.3. Asociación Quellaveco

Founded in 2010, Asociación Quellaveco finances and manages social responsibility programmes (SUNARP, 2024c). Its first board was composed of professionals with experience in public administration, community relations and corporate matters, as well as in mining companies such as Antamina, Río Tinto, Glencore, Minsur, BHP Billiton, Newmont and Southern Peru Copper Corporation.

1.4. Anglo American Marketing Perú S.A.

Founded in 2019, this company broadens the corporate presence of Anglo American in Peru and has the function of providing commercial support (SUNARP, 2024a). The growth of its capital – from Peruvian Soles (PEN) 1000 to PEN 10 million in 2024 – (SUNARP 2024a) indicates a quick consolidation.

1.5 Composition of AAQ in Peru

The systematisation of registry information (SUNARP) and documents obtained through an access request sent to MINEM (file N.º 4144622) shows that Anglo American Perú S.A. and Anglo American Quellaveco S.A. are formally linked to 359 contractors and 102 mining contractors.

Although the existence of this network does not suggest that all of these companies form a single business group, it does point to a functional conglomerate made up

by providers, consultancies, legal firms, and engineering and specialist services firms which allow the smooth running of the mining project. This entanglement confirms Martínez's (2025) ecobiopolitical thesis: large-scale extractivist mining depends on diversified support networks that reproduce its extractive model across different dimensions – technical, political, social and territorial. Quellaveco, therefore, should not be regarded as a singular unit but as an articulated node within an extensive and dynamic corporate extractive architecture.

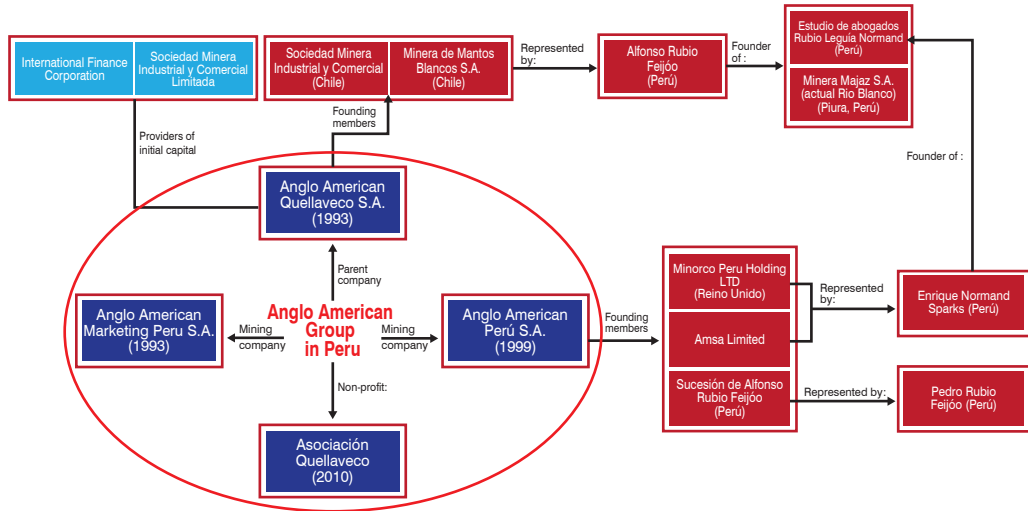


Figure 43. AAQ Group in Peru
 Note. Diagram by Red Muqui.

Conclusions

The investigation concludes that Anglo American Quellaveco operates as a large-scale extractivist project that fully reproduces the structural dynamics of Peruvian extractivism. In relation to the investigation's first specific goal, Quellaveco's operations meet the four theoretical requirements for extractivism: high volumes of extraction, high environmental intensity, minimal processing and a production that is mainly oriented towards exports. This warrants the affirmation that the project's technological sophistication does not alter its extractivist logic, which is merely reformulated under a discourse of efficiency and innovation.

In relation to the second specific objective, the study has shown that Quellaveco forms part of a multidimensional system of local, cumulative and spillover effects. These effects include persistent impacts on ecosystems, water, air and hydro-social stability, as well as historical extractivist pressure on fragile territories, sources of water for human consumption and populations exposed to toxic metals. In addition to this, Quellaveco reconfigures legal frameworks, stimulates institutional agreements and participates in political disputes, which shows that extractivism operates, too, as a power regime.

With respect to the third specific goal, the investigation engaged in a partial reconstruction of the organisational architecture that sustains AAQ in Peru. The coexistence of multiple companies, intervention of specialised law firms, participation of international investors and articulation of an extensive network of contractors show that Quellaveco relies on a corporate network that is as wide as it is diverse, and which guarantees the technical legal and operative continuity of the project.

Finally, results confirm that the sustainability of projects like Quellaveco cannot be judged on their technological merits, but on their capacity to coexist with fragile ecosystems, respect ecological and social limits of the territory and guarantee fundamental rights such as access to safe water. In this context, the study underscores the necessity to strengthen land-use planning instruments, autonomous environmental monitoring and the independent production of knowledge, as well as to open a national debate on the ecological limits of extractivism in a context of water crises and climate change.

Recommendations

On the basis of this study's findings, it is recommended that environmental monitoring and evaluation of large-scale mining projects be strengthened through the use of multi-temporal baselines; independent re-evaluation of fauna, flora, air quality and particulate matter; as well as research on soil, crops and the possible deposition of contaminants in rivers (like the Asana).

In parallel, it should also be a priority to broaden and to stabilise the monitoring of water for human consumption; to develop independent causality assessments for metals present in water, soil, sediments, crops and people; to strengthen epidemiological vigilance, especially with respect to at-risk groups such as children and adolescents who are chronically exposed to arsenic. As long as scientific uncertainty on the sources of contamination exists, the State should apply a precautionary principle and evaluate preventive restrictions on large-scale mining operations, prioritising public health and the human right to water.

It is also recommended that the technical, financial and operative autonomy of OEFA is protected; that the system of EIA approval is amended to incorporate independent audits and second opinions; and for land-use planning and the Ecological and Economic Zoning (ZEE) to be reinstated as binding instruments in public policy.

Additionally it is necessary to consolidate a water governance that is based on watersheds, with an active participation from communities, agricultural users, water suppliers and environmental entities. In the economic and institutional domain, it is also important to independently investigate Quellaveco's copper and molybdenum concentrates, and to strengthen the analytical capacity of SUNAT with respect to rare earths and strategic minerals present in mineral concentrates.

Finally, it is recommended that legal action be considered for cases in which mining concessions overlap with sources of water for human consumption; for free prior and informed consent be implemented before any expansions or substantive modifications of the Quellaveco project and to guarantee effective participation of adjacent populations in decisions that involve environmental risks.

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This book shows that Quellaveco, despite presenting itself as a digital and highly technological mine, reproduces the structural dynamics of extractivism in Peru under new forms of technological legitimation and corporate networks.

