Report of Results and Recommendations of Soil Analysis of the School Grounds of Educational Institution N° 22006, Castrovirreyna District and Province Huancavelica Region, Peru

Sample Collection Date: November 6, 2025

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The Environmental Health Council (EHC) is a U.S.-based nonprofit organization dedicated to identifying, evaluating, and remediating the effects of environmental toxins on affected communities. We work through a combination of scientific assessment, advocacy, and collaboration with communities and authorities to promote environmental and public health.

Within the framework of the EHC's objectives, the soil adjacent to the school grounds of Educational Institution N° 22006, in Castrovirreyna District and Province, Huancavelica Region, Peru, was sampled and evaluated. The technical evaluation aimed to:

- Determine whether contamination from colonial and/or national period refining operations had left behind heavy metal pollution (known as "legacy contamination") and to establish the levels of arsenic (As), mercury (Hg), and lead (Pb) in the soils.
- Compare them with the Environmental Quality Standards (ECAs) established by the Peruvian government (Supreme Decree N° 011-2017-MINAM) for residential/park soils.
- Determine the potential health risk to the student and professional community.
- Propose technical recommendations based on the findings.

Three soil samples were collected in Castrovirreyna (CAS-R-4 through CAS-R-6).
The analysis was conducted using a portable X-ray fluorescence (XRF) spectrometer (SciAps model X550), with results expressed in parts per million (ppm or mg/kg) to evaluate the presence of arsenic (As), mercury (Hg), and lead (Pb). These were prioritized due to their high toxicological relevance typically associated with mining activities.

The ECAs for soils for residential/park use are as follows:

- **Arsenic (As):** 50 mg/kg (ppm)
- **Mercury (Hg):** 6.6 mg/kg (ppm)
- **Lead (Pb):** 140 mg/kg (ppm)

Soil Sample Results:

The attached table presents the results of the soil assessment.

- **Arsenic (As):** The result from the sample CAS-R-4 shows contamination at 123 ppm, exceeding the ECA by 2.4 times.

- **Mercury (Hg):** Mercury was not detected above the detection limit of about 5 ppm.

- **Lead (Pb):** The result from sample CAS-R-4 shows contamination at 242 ppm, exceeding the ECA by 1.7 times.

Areas of Concern

Contamination was detected in two of the three heavy metals analyzed (arsenic and lead), located on the school grounds, representing a potential risk of exposure to students and staff at the school. The results also suggests that there may be more widespread contamination on or around the school grounds that warrant further research.

- **Arsenic (As):** All sample results exceeded the ECA. Arsenic is a highly toxic metalloid with proven carcinogenic and neurotoxic effects.

- **Lead (Pb):** Two (CAS-R-4 and CAS-R-6) of the three samples exceeded the ECA. Lead is particularly dangerous for children, as it affects neurological and cognitive development.

- **Mercury (Hg):** No sample results on the school grounds indicated mercury above the ECA. This is favorable however given the presence of other metals on the grounds it does not exclude the need for additional assessment.

Conclusions

1. Of three samples analyzed on the school ground, five were above the ECAs established in Supreme Decree N° 011-2017-MINAM (Environmental Quality Standards for soils for residential/park use).

2. Significant exceedances were detected: arsenic (As) at 2.4 times the ECA and lead (Pb) at 1.7 times the ECA.

3. There is a potential health risk to the school community, especially considering the toxicity of arsenic and lead. Because the dataset is very limited, additional assessment on the school grounds is needed to better understand the potential risk of exposure to the school community.

Recommendations

1. Immediately restrict access to the area of the school where the contaminated soil was found.

2. Conduct additional sampling and analysis in different areas adjacent to and on the school grounds where there is exposed soil.

3. Inform educational and health authorities of the findings.

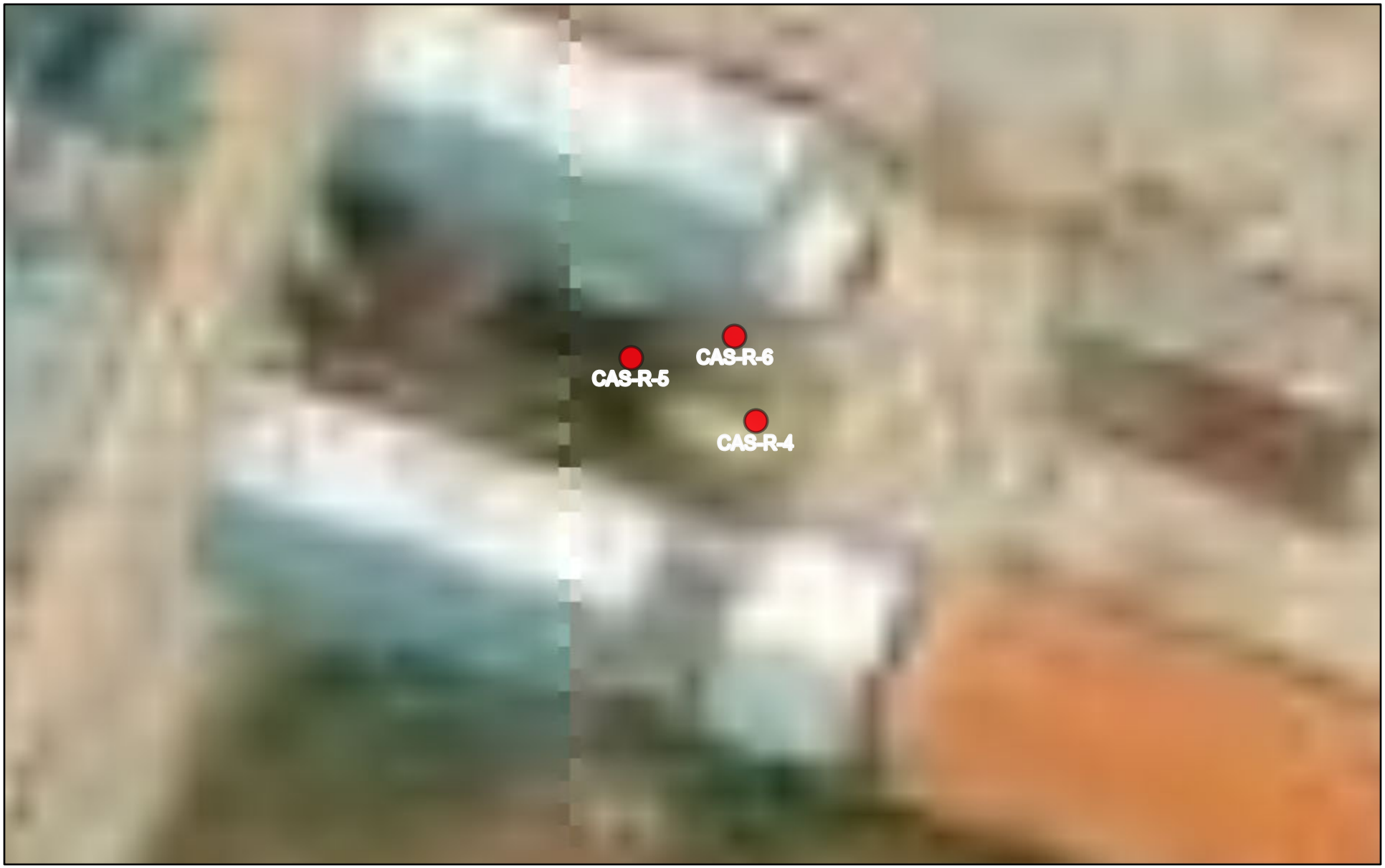
Attachments

Table – Soil Results
Figure – Sample Locations

Soil Sample Analysis Results for IE 22006 Castrovirreyna, Huancavelica, Peru

Sample	Sampling Location IE 22006 Castrovirreyna	As (ppm)	Hg (ppm)	Pb (ppm)
EI 22006 CAS - R - 4	School Grounds	123	ND	242
EI 22006 CAS - R - 5	School Grounds	76	ND	134
EI 22006 CAS - R - 6	School Grounds	95	ND	176
ECA		50	6.6	140
Note:	ppm - parts per million or milligrams per kilogram (mg/kg) ECA - Environmental Quality Standard per MINAM, Supreme Decree No. 011-2017 ND - Not detected Red shaded cells indicate that the sample result is above the respective ECA			

Educational Institution N° 22006, Castrovirreyna District and Province Huancavelica Region, Peru



2/8/2026

Castro Results with coordinates

World Imagery

Low Resolution 15m Imagery

Citations

1:289

0 0 0 0.01 mi

0 0 0.01 0.01 km

Source: Esri, Vantor, Earthstar Geographics, and the GIS User Community