

WATER MANAGEMENT

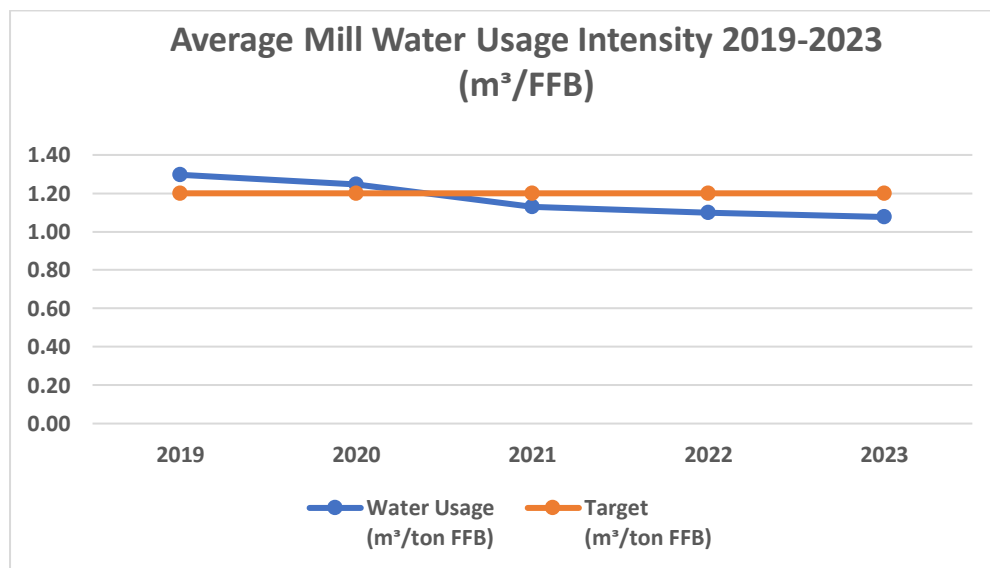
Since water is a limited resource, we have taken extensive steps to protect the quality and accessibility of surface water and groundwater for our company and the community around it.

For our upstream industrial uses, such as steam generation, pesticide mixing, seedling irrigation, and home uses like cleaning and cooking, we take surface water and groundwater. We take care to ensure that our upstream operations are not situated in water-stressed areas by using the World Resources Institute's [Aqueduct](#) tool to evaluate water-related risks.

At Mills, our upstream water usage intensity for 2023 was 1.08 cubic meters per tonne of FFB processed (m³/FFB). In comparison to 2019, water usage from 2021 appears to be less. However, we have achieved our yearly goal of maintaining the intensity of our water usage at or below 1.2 m³/FFB.

Average mill water usage intensity 2019-2023 (m³/MT FFB)

Tahun	Water Usage (m ³ /ton FFB)	Target (m ³ /ton FFB)
2019	1,30	1,20
2020	1,25	1,20
2021	1,13	1,20
2022	1,10	1,20
2023	1,08	1,20



WASTE MANAGEMENT

Being a 100% zero-waste mill operator makes AEP proud. All of the non-hazardous waste that our unit processes produce is recycled and used again. Every waste generated by our operations is recognized, classified as either gas, liquid, or solid, and managed in accordance with our standard operating procedures (SOPs).

Oil palm fronds and trunks that are left over after trimming and replanting are used as organic fertilizer in the soil at our plantations. Our boilers are fuelled by solid waste from our mills, which includes shells, palm fiber, and empty fruit bunches (EFB). At our plantations, decanter solids are recycled and used as organic fertilizer before being sent to our treatment ponds, liquid waste from our mills—more especially, POME—is sent to our methane capture facilities to produce power. We have set waste management procedures for the handling and disposal of hazardous waste from our unit activities, such as spent lubricants, batteries, containers, and drums, to reduce the danger of pollution. Our hazardous garbage is all disposed of by suppliers with government licenses. To guarantee and encourage appropriate trash management and separation, we also conduct frequent training and instruction sessions for our employees.

Maintaining water quality

1. We treat POME before discharging it to prevent damage to surrounding water sources and groundwater resources. Chemical and biological oxygen demand (BOD) and COD levels are closely monitored and maintained below the national legal standards of 350 ppm for COD in waterways, 100 ppm for BOD in waterways, and 5,000 ppm for BOD in land applications (AEP commits to keep BOD and COD levels within legal limits). In 2023, we reached these standards at our unit operations, and non-compliance was never experienced. We keep an eye on the amounts of nitrogen and phosphorus at the units in the inlet and outlet of rivers that pass through our concessions.

DELIVER POSITIVE ENVIRONMENTAL IMPACTS

	Measurement unit / breakdown	Standard	2019	2020	2021	2022	2023
Effluent discharge							
BOD levels river discharge - Sumatra	mg/l	100 ¹⁾	75	82	83	52	55
BOD levels river discharge - Kalimantan	mg/l	100 ¹⁾					
BOD levels land application - Sumatra	mg/l	5000 ²⁾	2,447	1,622	2,073	1,252	745
BOD levels land application - Kalimantan	mg/l	5000 ²⁾	620	560	590	540	652
COD levels river discharge - Sumatra	mg/l	350 ¹⁾	226	266	250	190	168
COD levels river discharge - Kalimantan	mg/l	350 ¹⁾					
COD levels land application - Sumatra	mg/l	-	4,760	3,206	4,861	2,838	2,179
COD levels land application - Kalimantan	mg/l	-	1,900	2,000	2,654	1,958	2,010
Total volume of treated effluent discharged into rivers - Sumatra	m³	-	43,644	52,166	27,999	8,775	6,515
Total volume of treated effluent discharged into rivers - Kalimantan	m³	-					
Total volume of treated effluent applied to land - Sumatra	m³	-	187,295	148,578	158,339	137,813	129,713
Total volume of treated effluent applied to land - Kalimantan	m³	-	132,954	173,400	209,806	215,682	246,918
Phosphorus and nitrogen in water courses							
P - level inlet - Sumatra	mg/l	0,2 ³⁾	0.016	0.048	0.058	0.062	0.051
P - level outlet - Sumatra	mg/l	0,2 ³⁾	0.014	0.059	0.053	0.115	0.064
P - level inlet - Kalimantan	mg/l	0,2 ³⁾	0.066	0.120	0.076	0.114	0.086
P - level outlet - Kalimantan	mg/l	0,2 ³⁾	0.072	0.110	0.170	0.159	0.109
N - level inlet - Sumatra	mg/l	15 ³⁾	0.929	2.401	2.882	3.188	2.924
N - level outlet - Sumatra	mg/l	15 ³⁾	0.332	1.726	2.689	3.732	3.292
N - level inlet - Kalimantan	mg/l	15 ³⁾	2.620	2.675	2.605	1.980	2.364
N - level outlet - Kalimantan	mg/l	15 ³⁾	3.255	3.025	3.105	2.630	3.335
¹⁾ Regulation of the Minister of Environment of the Republic of Indonesia Number 5 of 2014							
²⁾ Decree of the State Minister for the Environment Number 28 of 2003							
³⁾ Republic of Indonesia Government Regulation Number 22 of 2021 (Class 2)							

Commitment to protecting natural waterways through buffer zones.

AEP's commitment to protecting natural waterways through buffer zones involves establishing areas of vegetation, often called riparian buffers, along the edges of streams, rivers, and other water bodies. We are concerned for several important ecological functions:

- Managing the Water Quality Improvement with plants in the buffer zones to absorb and break down many pollutants. Which is a buffer zone that filters out pollutants, such as sediments, nutrients, and chemicals, from surface runoff before they reach water bodies.
- Enrich Vegetation in buffer zones to stabilize soil with their roots, reducing erosion and sedimentation in waterways. So, by planting native vegetation and taking other necessary steps to establish the buffers.
- Ensure buffer zones provide critical habitats for a variety of wildlife, including birds, insects, and aquatic species. They offer food, shelter, and breeding grounds.

AEP Educating and involving local communities in the importance and benefits of buffer zones can foster stewardship and compliance. Furthermore, AEP's Commitment to the protection of natural waterways through buffer zones is a crucial step in ensuring the long-term health and sustainability of aquatic ecosystems and the services they provide to both nature and human communities.

For Management and Maintenance:

- AEP monitors the buffer zones regularly to evaluate their efficacy and overall health.
- Create and carry out maintenance programs afterward to control invasive species, restore damaged plants, and guarantee continued functionality.
- In order to guarantee continual improvement, modify management procedures in response to outcomes monitoring and shifting circumstances.



AEP riparian zone in Alno Agro Utama

Signboards



Signboards in riparian zone areas provide employees and communities with information about how to protect the river.

Plant trees in the riparian zone to enrich the area.



Each semester, the river conducts laboratory tests to verify the water quality and to complete the matrix of EIA documents.



Conduct regular monitoring to assess the health and effectiveness of the buffer zones.
Develop and implement maintenance plans to manage invasive species, replace damaged vegetation, and ensure ongoing functionality.

