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HAZARD FACTORS OF TAILINGS IMPOUNDMENTS IN THE SIVERSKY DONETS BASIN IN THE ZONE OF ARMED CONFLICT

There are at least three hazardous industrial facilities located within the Lysychansk–Rubizhne–Severodonetsk industrial complex: storage tanks at the Rubizhansky Barvnyk LLC plant, settling tanks containing highly mineralized waste from soda ash production at the Lysychansk Soda Plant, and settling tanks at PJSC Severodonetsk Association Azot. Despite the fact that the first two enterprises have been non-operational for many years, no proper reclamation of the sites has been conducted. Even prior to the full-scale invasion, there were reports of untreated wastewater discharges through the territory of Rubizhansky Barvnyk LLC, along with evidence of increased groundwater hardness and mineralization.

The wastewater treatment facilities of Rubizhanske VUVKG discharged both untreated and partially treated wastewater—amounting to 2.075 million cubic meters in 2021. That year, violations of maximum permissible concentrations (MPC) for pollutants in wastewater were documented. In 2022, the enterprise underwent inspection due to suspicions of discharging untreated wastewater onto the territory of the defunct Rubizhansky Barvnyk LLC plant, from which it entered the Siverskyi Donets River. PJSC Severodonetsk Association Azot is one of Ukraine’s largest chemical enterprises, located in Severodonetsk, Luhansk region. The plant operates in the chemical manufacturing sector, producing ammonia, nitrogen-based fertilizers, organic alcohols and acids, household chemicals, polymer products, and polymer films. As a city-forming enterprise, its treatment facilities handle both its own industrial wastewater and the domestic wastewater of Severodonetsk. The facility had four sludge storage tanks that had been in operation for 40 to 49 years:

- Industrial wastewater sludge tank (No. 1);
- Sludge tank (No. 2);
- Decarbonization station sludge tank (No. 3);
- Physical-chemical treatment slag tank (No. 4).

During the battles for Severodonetsk, approximately 80% of the city's residential and infrastructure facilities were destroyed by Russian forces. PJSC Severodonetsk Association Azot, which had served as a shelter for about 500 civilians at different times, suffered heavy shelling.

Since the establishment of the occupation regime in the city, data on the volume of untreated wastewater entering the Siverskyi Donets River has become inaccessible. However, it is evident that this situation is contributing to a localized ecological disaster and significantly worsening the chemical and bacteriological quality of water across a wide area. This is particularly alarming given the potential for low water levels in the river due to the destruction of the Oskil Reservoir, which had previously balanced water supply needs for the Luhansk and Donetsk regions.

Therefore, the safety of tailings and hazardous waste facilities located in active combat zones, temporarily occupied, or blockaded areas requires both national and international intervention. This should include:

- the creation of an interdepartmental working group involving representatives of central authorities (Ministry of Environmental Protection and Natural Resources of Ukraine, Ministry of Defense, State Emergency Service of Ukraine) and international organizations;
- the demining of affected sites and surrounding areas;
- consideration of relocating military positions away from high-risk facilities;
- the establishment of a standardized procedure for coordinating ceasefire or “silence” regimes in combat-affected zones, through the development of regulatory legal acts outlining the stages and responsible parties for ensuring safe access.

The existence of both internal and external risk factors associated with tailings facilities suggests a significant potential for emergency impacts on water bodies. A low level of environmental preparedness at such sites may lead to the widespread dissemination of pollutants through the hydrographic network, escalating environmental consequences from a national to a transboundary scale.