

Water as a weapon of war: Analysis of the Kakhovka Dam explosion

What happened?

On the night of 6 June 2023, the dam and hydroelectric power plant at Nova Kakhovka, a city in Ukraine's south under Russian occupation since last year, was destroyed.¹

According to the Kherson Prosecutor's Office, their investigation found that on 6 June 2023, at around 03:00 EET (UTC+3), Russian forces used explosives to destroy the dam, causing the water level to rise.² According to Ukrainian authorities, the dam was damaged beyond repair.³

What is the background?

The hydroelectric power plant in Nova Kakhovka has been occupied by the Russian forces since the beginning of Russia's full-scale invasion.⁴

On 22 October 2022, President of Ukraine Volodymyr Zelenskyy reported that the dam at Nova Kakhovka had been mined by the Russian military.⁵

According to information published by a Ukrainian media outlet reporting on military affairs, the destruction of the dam was carried out by the 205th Russian Motorised Rifle Brigade.⁶

Before destroying the dam, occupying Russian forces artificially raised the water level to a record 17.5 m, leaving the gates closed. This can be observed on an open-source chart published by Hydroweb which has monitored the water level of Lake Kakhovka over recent years.⁷

1 https://t.me/V_Zelenskiy_official/6479

2 <https://t.me/phogovua/1975>

3 https://uhe.gov.ua/media_tsentr/novyny/cherez-pidriv-kakhovskoi-ges-e-zagroza-pidtoplennya-energoobektiv-prote

4 https://uk.m.wikipedia.org/wiki/%D0%9A%D0%B0%D1%85%D0%BE%D0%B2%D1%81%D1%8C%D0%BA%D0%B0_%D0%93%D0%95%D0%A1

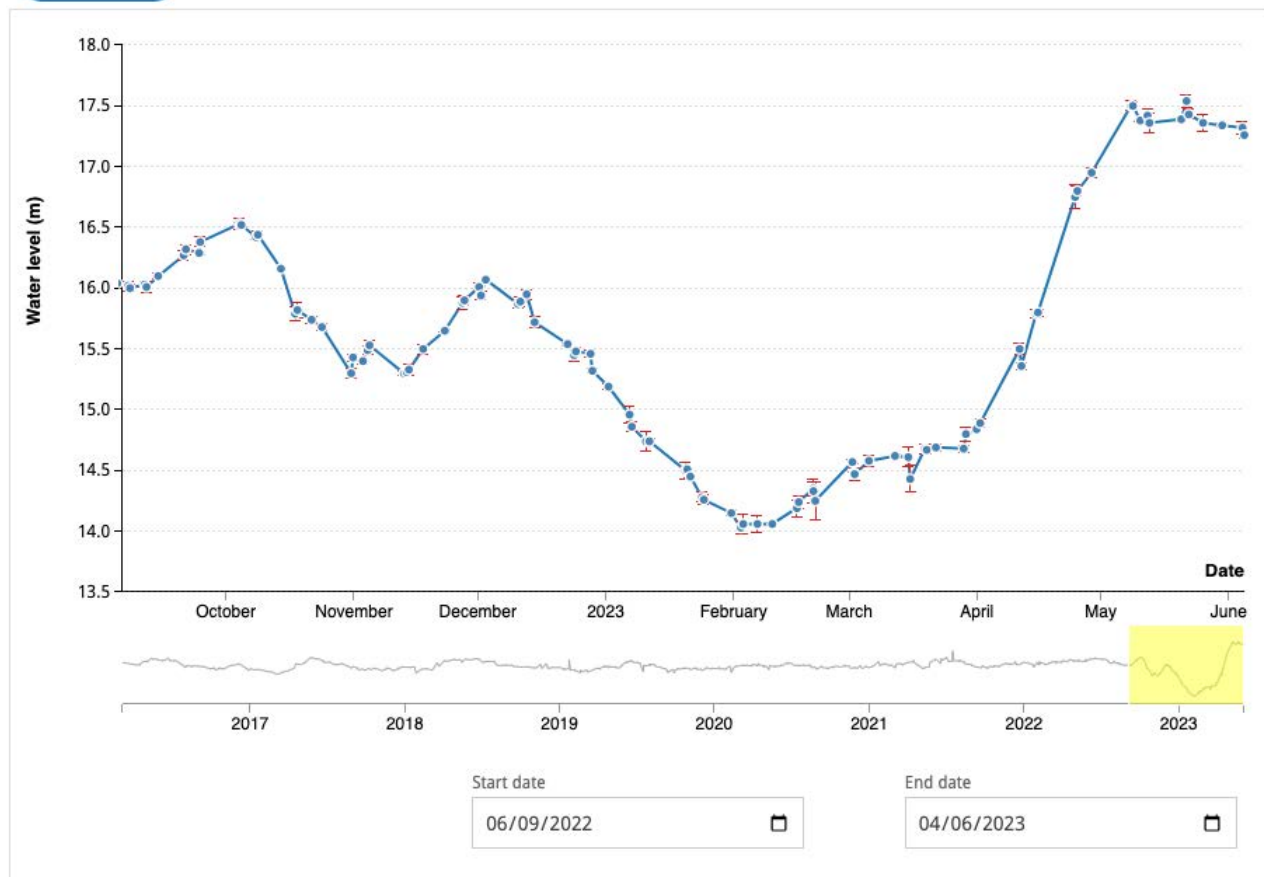
5 <https://suspilne.media/299532-rosijski-okupanti-zaminuvali-dambu-ta-agregati-kahovskoi-ges-zelenskij/>

6 <https://twitter.com/EuromaidanPR/status/1666017818825859072>
https://t.me/mototroopers_205/377

7 https://hydroweb.theia-land.fr/hydroweb/view/L_kakhovka?lang=en

Lake Kakhovka

Water level (m)



Source: https://hydroweb.theia-land.fr/hydroweb/view/L_kakhovka?lang=en.

Who is responsible?

There are three conflicting versions of the events which led to the destruction of the dam at Nova Kakhovka.

According to Ukrhydroenergo, the state-run hydropower generating company, the dam was destroyed due to the detonation of explosives inside the engine room of the facility. Ukrhydroenergo representatives have stated that due to irreparable damage to the dam they expect the reservoir to be completely emptied within the next four days.⁸ President Zelenskyy condemned the incident, emphasizing that "It is physically impossible to blow it up somehow from the outside, by shelling. It was mined by the Russian occupiers."⁹ The version of the destruction caused from the inside of the dam structure has been backed by international experts.¹⁰

Meanwhile, representatives of Russian-installed authorities in Kherson Oblast have accused Ukraine of shelling the dam overnight, resulting in the destruction of valves, which led to an uncontrolled discharge

8 <https://ghostarchive.org/archive/lzGBp>

9 <https://archive.ph/mQZyw>

10 https://www.nytimes.com/2023/06/06/world/europe/ukraine-kakhovka-dam-russia.html?fbclid=IwAR2nWejKzW0XBjSCcUoOxji-uCzakCkFM2NZH8sr_veZb8U7rvtoPCl9Mvg

of water.¹¹ The Kremlin likewise denied the allegations that Russia was responsible for the explosion at the Kakhovka Hydroelectric Power Plant. Dmitry Peskov, Vladimir Putin's spokesperson, claimed that the facility's destruction was the outcome of a deliberate sabotage operation orchestrated by the "Kyiv regime".¹²

A third explanation posited by some open-source intelligence (OSINT) analysts and journalists who analysed satellite images taken prior to the destruction of the dam and theorised that the dam's collapse was the result of pre-existing damage. Evan Hill¹³ and Christopher Miller¹⁴ of *The Washington Post* and *The Financial Times*, respectively, highlighted damage that was visible between 28 May and 5 June at sections of the bridge crossing the dam and its sluice gates. These satellite photos also showed water flowing over the top of the dam in the past week.

While hydroelectric power plants are not specifically built to withstand shelling, they are engineered to be resilient and capable of withstanding powerful external forces, such as floods and earthquakes. This suggests that the dam was most likely destroyed by explosives placed within it by an individual or individuals who had prior access. In November of last year, Russia's armed forces carried out an explosion on the bridge over the dam with the intention of impeding the advance of Ukrainian forces across the Dnipro. This incident lends weight to the likelihood of the eventual destruction of the dam being the result of sabotage by Russian forces. Moreover, independent Ukrainian war crimes investigators from Truth Hounds have highlighted that Russian authorities and state-controlled media outlets have been conducting a large-scale disinformation campaign aimed at accusing the Ukrainian authorities of intending to destroy the dam – a tactic commonly used by the Russian regime before committing large-scale atrocities.¹⁵

What are the immediate consequences?

As a result of the dam's destruction, some 80 settlements have already been flooded or are facing the risk of flooding in the coming days.¹⁶ According to experts, this flooding will affect approximately 100 km² downstream of the power plant.¹⁷ According to the Ukrainian Ministry of Energy, the flood risk extends to a number of energy facilities in Kherson Oblast.¹⁸

Ukrainian authorities began evacuating civilians from Ukrainian government-controlled territories on Kherson Oblast's right bank. As of 18:00 EET on 6 June 2022, over 2 500 people had been evacuated by police and volunteers.¹⁹ The Ukrainian Ministry of Internal Affairs reported that, while the evacuation was being carried out, Russian forces conducted mortar and artillery attacks on Kherson.²⁰

11 <https://archive.ph/RP1Bv>

12 <https://archive.ph/m6vul>

13 <https://archive.ph/kukEc>

14 <https://archive.ph/gTng2>

15 <https://truth-hounds.org/en/cases/detonation-of-the-kakhovka-hpp/?fbclid=IwAR1swSsBt84mEDM1xNP3ZaHYdRwVAWx0Myjti-F9OpKiKzbKNgzyoLlwCPo>

16 https://t.me/Denys_Smyhal/5316

17 <https://suspilne.media/498304-osusenna-vodoshovisa-zniknenna-jogo-flori-i-fauni-zarazenna-vodi-naslidki-pidrivu-dambi-kahovskoi-ges/>

18 <https://t.me/UkraineNow/34196>

19 <https://t.me/olexandrprokudin/603>

20 https://t.me/mvs_ukraine/25984

Flooding has already resulted in the deaths of most of the animals housed at the Kazkova Dibrova Zoo in Nova Kakhovka.²¹

An uncontrolled decrease of the water level of the Kakhovka reservoir, caused by the dam's destruction, also poses a serious threat to the Zaporizhzhia Nuclear Power Plant, Europe's largest nuclear facility. This is because water from the reservoir is necessary to maintain the normal functioning of turbine capacitors and safety systems at the power plant.²²

What are the long-term consequences?

In an interview with IPHR, Dr Brendan Duprey, an international expert and director of the Sustainability Kazakhstan Research Institute, called the situation in Kherson Oblast an environmental disaster.

The supply of water to Crimea and the south of Kherson Oblast will be cut off, depriving many thousands of people of access to clean water. Water supply to field irrigation systems in the Kherson, Dnipropetrovsk, and Zaporizhia oblasts will likewise be disrupted. Many cities and villages that receive water from the Kakhovka Canal will be left without drinking water. Without sufficient access to water, metallurgical facilities in the south of Ukraine will be forced to suspend their operations.

A colossal amount of fresh water will flow into the Black Sea, affecting the salinity of the Dnipro Delta. This will affect plants and animals that can only survive in water within a certain range of salinity. The reservoir's native fauna includes more than 150 species of zooplankton and 180 species of invertebrates, which, due to the rapid release of water are unable to migrate and are therefore doomed to perish. This applies especially to crustaceans, molluscs, and worms. Shallow-water coastal vegetation, meanwhile, will dry up and die.

Taking into account the shallowing of the reservoir and excluding significant land reclamation efforts, we can expect not only a return of climatic conditions in Kherson Oblast and northern Crimea to those of 70 years ago (sandy deserts replacing fertile agricultural land, extreme high temperatures, and sand storms), but also a general rise in temperature, droughts, and a significant decrease in precipitation across the wider area. This will likely result in hundreds of thousands of people becoming ecological refugees in the years ahead. In sum, the consequences of Russia's actions will be catastrophic for populations across southeastern Ukraine.

What is the legal qualification of the incident?

Under international humanitarian law, dams cannot be made an object of attack as they enjoy special protection as installations containing dangerous forces. Specifically, by destroying the Kakhovka Dam, Russia's armed forces violated Article 56 of the Additional Protocol (I) to the Geneva Conventions, which prohibits attacks on works or installations containing dangerous forces, namely dams, even where these objects may be military objectives, if such an attack could cause the release of dangerous forces and result in severe losses among the civilian population. This provision constitutes part of customary international humanitarian law²³ and imposes an *absolute* prohibition on such attacks even if they were to comply with rules of proportionality and distinction.²⁴

21 <https://www.instagram.com/p/CtJmyxGNhBz/?igshid=MzRIODBiNWFIZA==>

22 <https://t.me/ukrhydroenergo/3606>

23 Rule 42, Customary IHL

24 <https://lieber.westpoint.edu/attacking-dams-part-ii-1977-additional-protocols/>

In addition, due to the dam's destruction, it is now impossible to investigate war crimes committed in the flooded territories, as access to crime sites, including damaged homes, places of unlawful detention, and mass graves, is now indefinitely restricted, while some evidence will be physically destroyed by the flooding. Such actions may therefore constitute a further violation of Article 146 of the Geneva Convention (IV), which obliges both warring parties to investigate grave breaches of international humanitarian law and prosecute those responsible. Such grave breaches include wilful killing, torture or inhuman treatment, extensive destruction and appropriation of property, unlawful deportation or transfer, unlawful confinement, among others. All of the breaches mentioned have reportedly been committed by occupying Russian forces. As such, Russia's actions may indicate an intention to disrupt future investigations and destroy evidence.

Under international criminal law, Russia's actions should be prosecuted under Article 8(2)(b)(iv) as the war crime of intentionally launching an attack in the knowledge that such an attack will cause incidental loss of life or injury to civilians, damage to civilian objects, or widespread, long-term, and severe damage to the natural environment which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated. The term "widespread" here means damage to an area of several hundred square kilometres. Meanwhile, "long-term" damage is to be measured in years or decades. "Severe" damage can consist of serious or significant disruption or harm to human life and natural economic resources. The consequences of the dam's destruction as described above, such as the flooding of 100 km² of Kherson Oblast downstream from the dam, including dozens of settlements, and the long-term consequences that will follow, allow us to conclude that this attack should have been expected to cause deaths and injuries of civilians in the affected area, as well as damage to civilian objects and to the environment.

The intentional nature of the attack is evident from the fact that the dam was under Russian occupation for more than a year and that they exercised full control over it. Further proof of Russia's intention to destroy the dam is recently adopted legislation which permits the Russian authorities to decline to investigate accidents at dangerous facilities that occurred as a result of military hostilities until 1 January 2028.²⁵

25 <https://theins.ru/news/262336?fbclid=IwAR3mtqS0ubhK7quFT8ioxdYvt2aq1BF3rs5WFZjIDYWQH7vzGgh4f-ZEaKc>