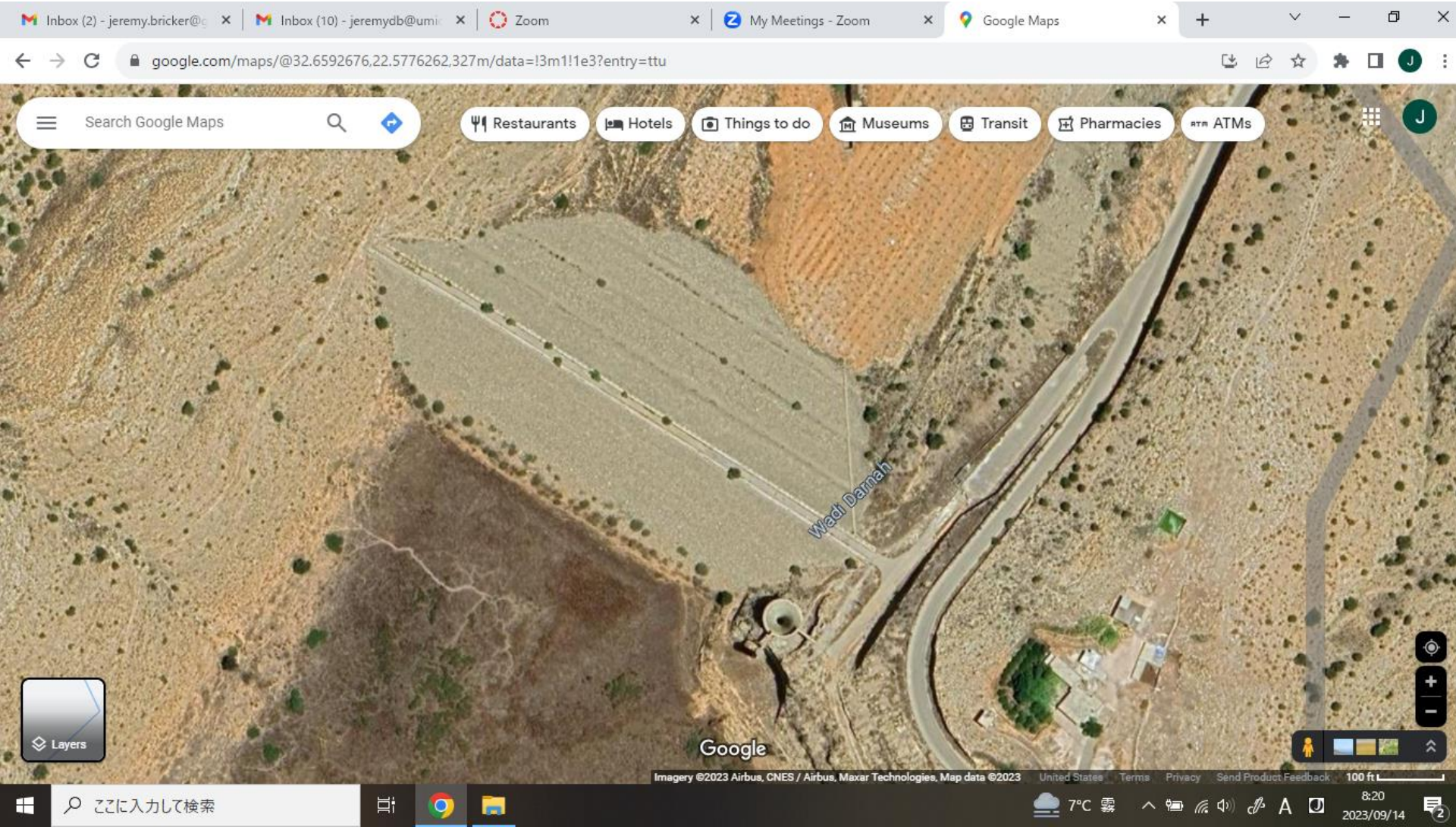
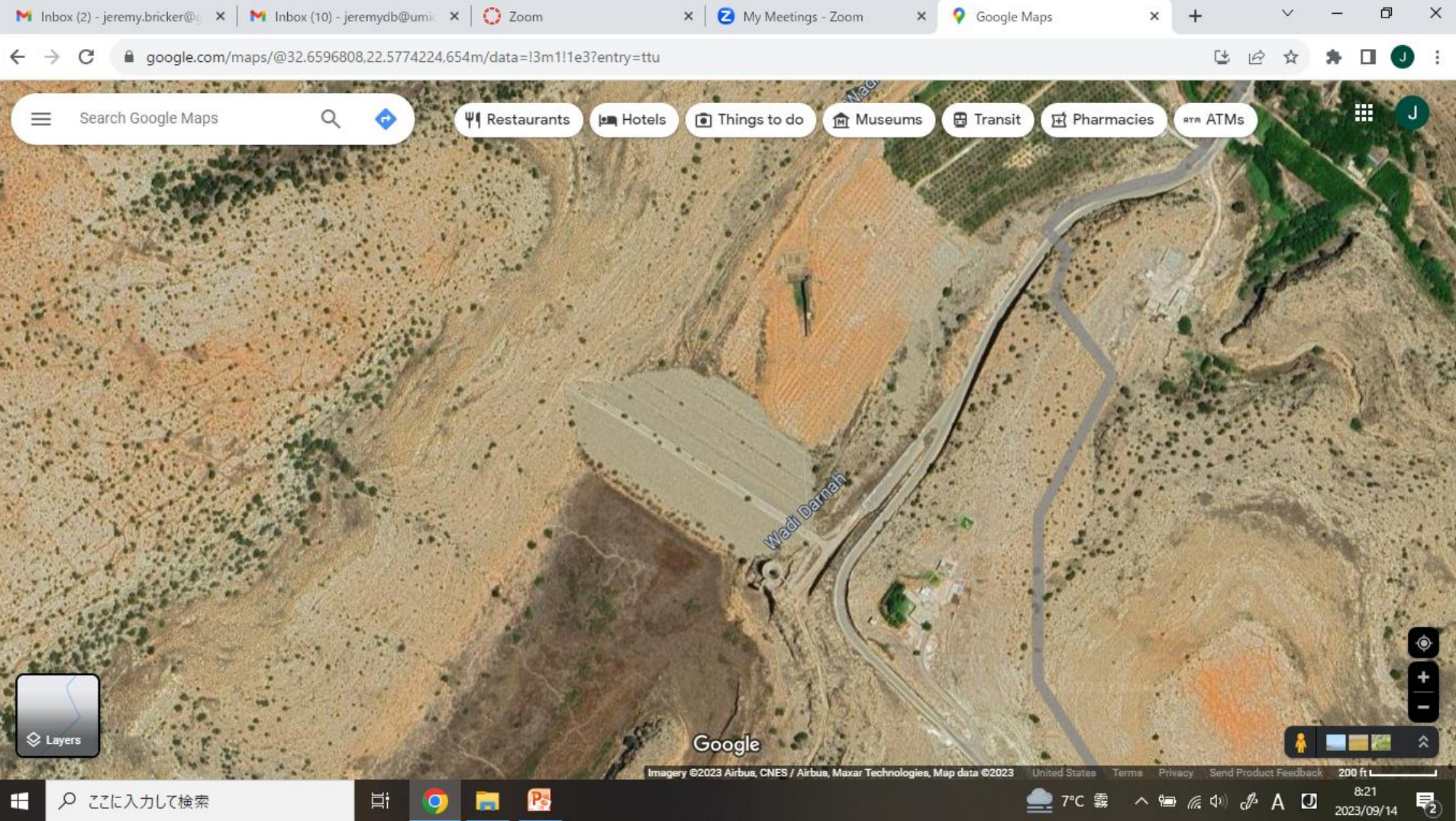


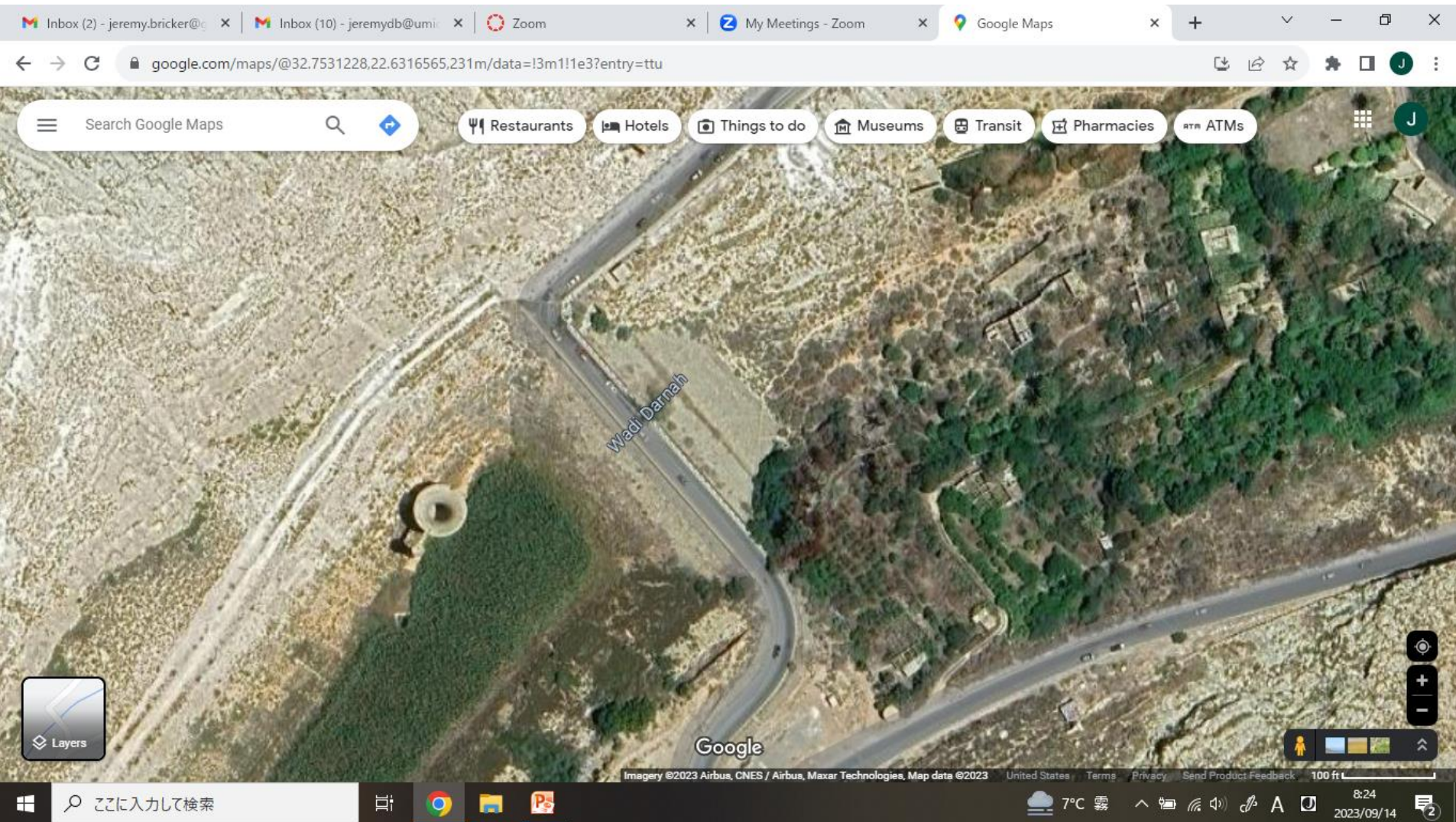
Upstream dam: zoned (clay core) earthen embankment, ungated bell mouth spillway on right bank hillside



Upstream dam

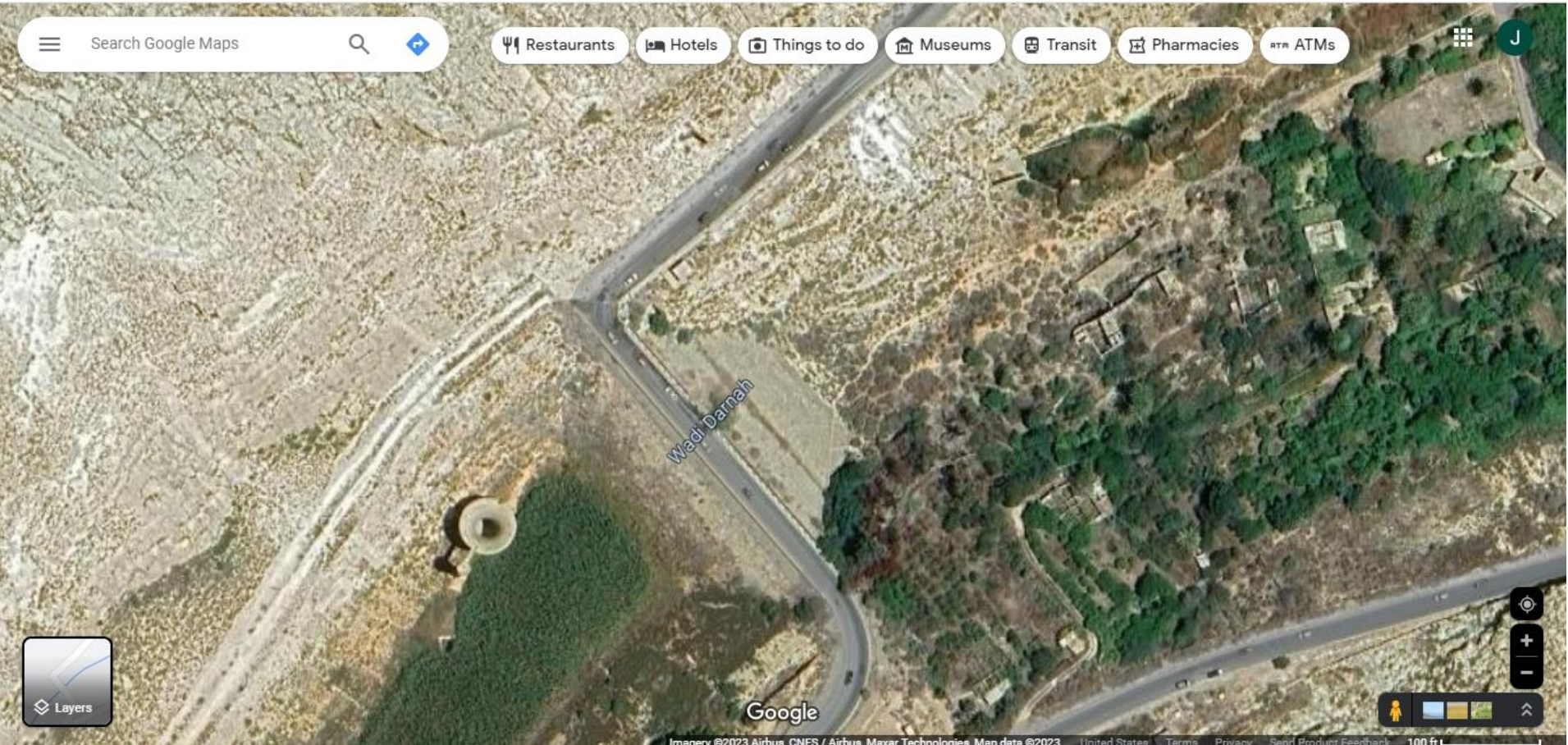


Downstream dam: earthen embankment (likely clay core, but I could not find photos or plans), ungated bell mouth spillway on left bank hillside.



Downstream dam

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NEAR DERNA, LIBYA

Earthen dam with clay core

Upstream dam

Bell-mouth spillway inlet

Downstream scour hole

Cellphone video appears to show the remains of a dam near to Libya's eastern city of Derna that has been washed away by floodwaters.



Likely, the incoming flowrate was too large for the spillway to pass without the water level overtopping the earthen dam. Once an earthen dam is overtopped, it scours away quickly, as seen here. Don't know whether the spillway was designed too small for the historical 10,000 year flood, or if the historical 10,000 year flood is not longer accurate due to climate change, or if this was a freak event with return period greater than 10,000 years. The result was over 5,000 deaths.



Spillway outlet with energy dissipaters

About a quarter of Derna, home to around 125,000 inhabitants, was wiped out after dams burst on Sunday night when Mediterranean storm Daniel caused flash flooding, the authorities said.





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Spillway outlet with energy dissipaters

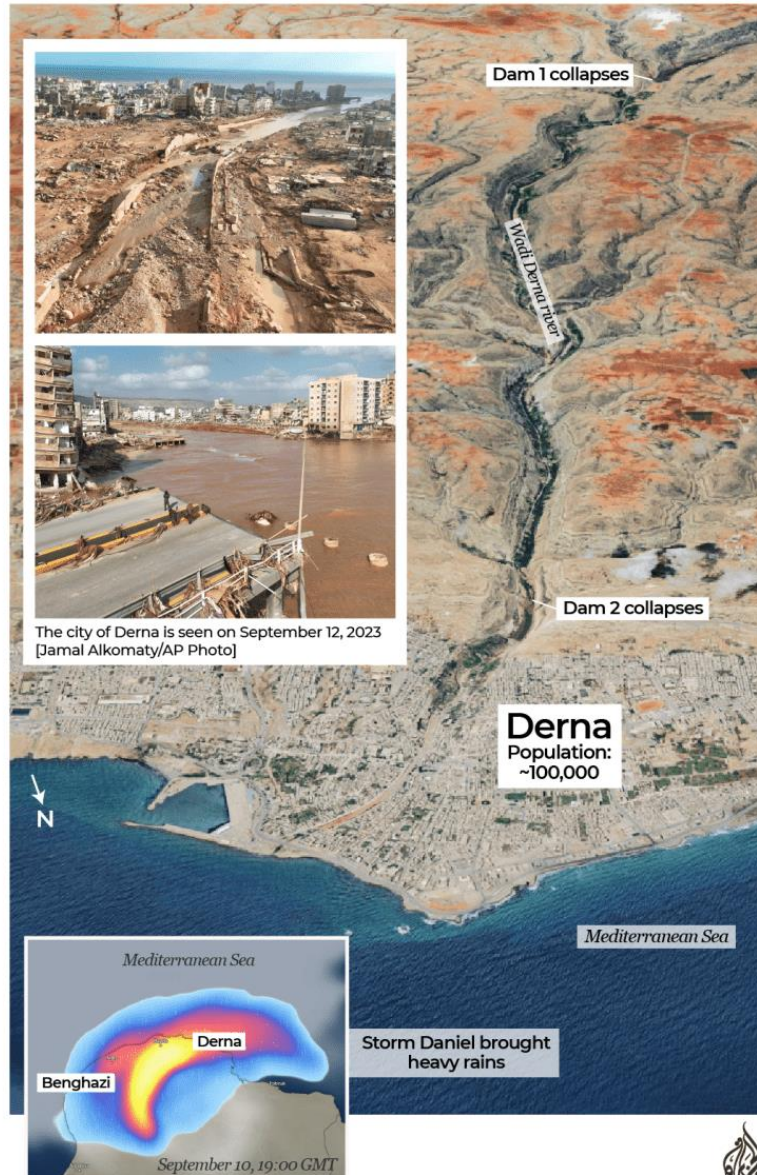


[https://www.aljazeera.com/news/2023/9/13/
why-did-dernas-dams-break-when-storm-
daniel-hit-libya](https://www.aljazeera.com/news/2023/9/13/why-did-dernas-dams-break-when-storm-daniel-hit-libya)

LIBYA

Thousands dead, missing in eastern Libya

More than 5,000 people are reported dead after flooding caused by Storm Daniel swept away entire neighbourhoods in eastern Libya. The city of Derna is hardest hit after two dams burst and inundated it.



<https://www.bbc.com/news/world-africa-66785466>

