## The legacy of mine de-watering


An aerial view of Newmont's Gold Quarry pit

What will be the water legacy of today's gold mines? When mining stops at Newmont's Gold Quarry operation, after buildings are torn down and people move away, what will remain on the landscape? Will future generations look at the area north of Carlin and say "how could they have let this happen?" or will they travel there specifically to recreate, using a lake created by bygone mining?

Paul Pettit is Senior Environmental Manager for Newmont's Carlin Operations. His answer is "The legacy of the Gold Quarry pit will be a good quality pit lake offering multiple uses for recreation. Future generations will say the gold mining in this area was worth it and left behind new assets."

To mine beneath the surface, Newmont has lowered the ground water table so water does not flow into the Gold Quarry pit and the adjacent Chukar Underground mine. Constant pumping of ground water has lowered the water table almost 800 feet at its lowest point, creating what is called a cone of depression. The earth surrounding mining operations has been sucked dry in a cone shape extending 12 miles to the Southeast and Northwest, and six miles in the opposite directions. This ground water comes from deeper bedrock, but sands, clays and gravels near the surface continue to hold water. Faults create the oblong shape of this cone of depression.

This drawdown of ground water may reduce the flow in the nearby Humboldt River, although this effect has not been measured. Newmont keeps careful watch on 40-50 nearby springs but these are on higher ground, with water coming from nearby mountains and the drawdown has not affected them.

Thousands of gallons of water are pumped from the ground every minute, pumping that has gone on for years. Of this water, 22% is used in the mining and milling operations. During summer, 22% is used to irrigate the Hadley Fields closer to Carlin. These hay meadows are then grazed by cattle from the Newmont owned TS Ranch. Some of the water is stored in the Maggie Creek Reservoir. This reservoir was built for flood control, but the ground water table beneath this reservoir has risen some four to 20 feet in a mound extending toward Carlin.

Most of the pumped water, 54% or roughly 10-14,000 gallons per minute, is released into Maggie Creek and flows into the Humboldt River. The lower reaches of Maggie Creek used to dry up in late summer and fall, but the creek now flows year round. A flow station located in Palisade Canyon shows a slightly higher base river flow during fall, when river flow is typically lowest.

When mining ceases at Gold Quarry and the pumps are shut off, ground water will immediately begin refilling the cone, flooding the underground workings and the pit. Newmont estimates it will take 30-40

years to fill 90% of the empty pit. Evaporation from this new lake and less inflow will slow the last filling. It will require about 100 years to completely fill this new lake, once pumps stop.

Maggie Creek's flow near Carlin will immediately drop, perhaps to a lower level than before mining. It will return to an intermittent stream. The Humboldt's base flow will be reduced for 10-30 years, but the TS Ranch owns water rights and Newmont's plan is to reduce the ranch's use of river water in compensation for the reduced river flow.

Critics say the pit lake will evaporate too much water, the ground water table will never return to normal and therefore, the lake will never fill. Paul assured me the pit will fill and in 100 years, visitors will find a lake full of clear, clean water. It will be obviously man-made, very deep with steep walls, but it will be an asset. Personally, I plan on sticking around long enough to see if he is right.

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