

ABEL Pumps **Case Study** - Western USA Gold Mining Site

EODD pumps available through SANDPIPER & ABEL

Application Profile: Electrically powered Diaphragm Pump EM-100 for Thickener Underflow

Industry: Gold Mining

Product Produced: Gold



If Nevada was a separate country it would be the world's 3rd or 4th largest gold producer. Many gold properties are located in North Central Nevada generally along the I-80 corridor stretching from Carlin in the east to Winnemucca in the Northwest. Gold production in Nevada began as early as 1965. The faulted terrain running northwest to southeast from Carlin became known as the Carlin Trend. The Carlin Trend is the most prolific goldfield in the Western Hemisphere.

Many gold operations process their ore through autogenous grinding mills. Ground ore is classified for size through hydro-cyclone separators. The coarse material is reground through ball mills. Sized materials are sent through a flotation process where the sulfide minerals are separated and concentrated (flotation concentrates) and sent to a thickener/filter press circuit prior to roasting.

The thickener/filter press circuit reduces the amount of water in the flotation concentrate and is typically pumped using horizontal centrifugal pumps. The use of this type of pump can be counter-productive because water must be added on the thickener cone bottom to assist transport by the pump. Also, gland seal water must be added to the centrifugal pumps in the two pumping stages. In total, the volume of water introduced back into the thickened underflow fed to the filter press can be increased by as much as 25%.

One plant replaced their centrifugal thickener underflow pumps with ABEL series EM 100 electromechanical diaphragm pumps. Cone water additions and gland seal water were no longer required thus significantly reducing water usage. In addition, the maintenance costs associated with the thickener underflow pumps was greatly reduced.

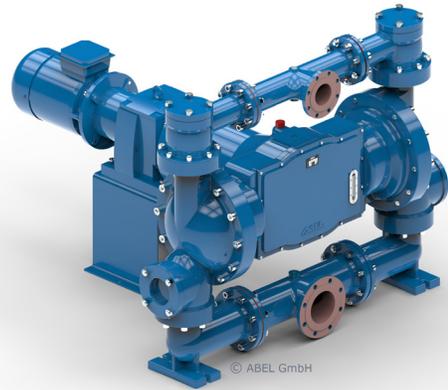
This same plant's filter press feed pumps had also originally been centrifugal slurry pumps. Wear on the centrifugal pumps was considerable with pump wet ends



EM Pump as Thickener Underflow Pump

wearing out as often as every two weeks, and costing as much as \$ 20,000 each time. Down-time and lost production mounted with each repeated occurrence. To mitigate the problem, the centrifugal filter press feed pumps were supplemented by ABEL series HMD-G-80-1000 piston-diaphragm pumps. The ABEL pumps employ a hydraulically balanced elastomeric diaphragm, ideal for moving abrasive slurry at higher pressures. By working in parallel, the centrifugal pump “fast-fills” the filter press at lower pressures, then hands over consolidation of the press cycle to the ABEL. The resulting pump maintenance costs and down-time were greatly reduced. Filter cake quality was improved due to the positive displacement action of the ABEL pump.

In early 2011, the same plant added another thickener and filter press process train to increase their gold production. ABEL EM 100 pumps were specified for thickener underflow. To further increase efficiencies at this plant, ABEL provided piston diaphragm pumps in other applications. The full ABEL line can help to solve many difficult slurry applications in mining process plants. Warren Rupp and ABEL together can improve your mining process.



Electromechanical Diaphragm Pump EM 100



Tailings thickener



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