

Gold Heap Leach Carbon Fines Prevention – Why is My Leach Pad Black?

- 1-1.5% Increase In Gold Production Due To 30% Additional Area Under Leach
- 300% Increase In Captured Fine Carbon Particles At ADR Plant,
- Prevented Leach Pad Emitters Plugging With Carbon Fines

Background

It was visually apparent that this heap leach pad was covered in carbon when visiting this USA gold producer. The initial visit with the chief metallurgist was to size fresh carbon, but it was determined that their carbon safety screens, static screens at 35 mesh (500 µm) aperture, were constantly pegging and allowing fines to continue onto the leach pad where they could block the line at y-splitters, emitters, and sequester carbon on the leach pad when in contact with cyanide liquor leaching the gold.

Solution

Five Derrick dual motor linear motion fine screening machines were installed to capture the fine carbon particles in the ADR plant. When combined with anti-blinding 200 mesh (75 µm) Sandwich™ wire screen panels, the Derrick machines are successfully processing 15,000 gpm (3,400 m³/hr) and preventing the carbon fines from being transported with the barren cyanide leaching solution.



Carbon fines visible on the top of heap leach pad at USA gold producer

INVESTMENT (\$USD)	Year 1	Year 2	Year 3	Total
Capital and Installation Cost (5 machines)	\$764,000	\$0	\$0	\$764,000
OpEx (screens and parts, estimated)	\$24,000	\$28,680	\$28,680	\$81,360
OpEx (Power, \$0.24/kWh @ 330 Days/Yr)	\$35,640	\$35,640	\$35,640	\$106,920
Total Annual Cost	\$823,640	\$64,320	\$64,320	\$952,280

RETURN (\$USD)	Year 1	Year 2	Year 3	Total	ROI (3-Yr)	Payback (Months)
Savings metric - (Increased gold recovery 1.0%)	\$1,800,000	\$1,800,000	\$1,800,000	\$5,400,000	467%	5.1
Savings metric - (Increased gold recovery 1.5%)	\$2,700,000	\$2,700,000	\$2,700,000	\$8,100,000	751%	3.4

Note: assumed \$1,200/ozt gold at operation of 150,000 ozt/Yr (as of Dec 2018)

Operations:

- Reduce the risk of damaging the pumps, which may result in plant shutdowns during the advancement of carbon in the columns. Save time and effort of operators to prevent sumps from running barren. Now, Derrick high frequency vibratory screens do not blind and only require one operator during carbon transfer to advance carbon between the columns.
- Operators report that “the Derrick screens just work” which allow them to focus on other activities/issues.

Better Leach Pad Performance:

- Increase carbon fines recovery by over 300% since the installation because of reducing the screen aperture opening from 35 mesh (500 μm) to 200 mesh (75 μm).
- Improve leach liquor flow performance at target rate through downstream emitters by preventing plugging of pipe Y- splitters, emitters due to carbon fines.
- 1 - 1.5% increase in annual production by increasing the possible area under leach by \sim 30% due to longer drip emitter life with better coverage permitting greater residual leach production.

Conclusion

This customer definitively experienced an improved and consistent flow performance of leach liquor to the pad, increasing the possible leaching area by 30% that provided a 1 - 1.5% improvement in gold recovery by utilizing Derrick dual motor vibrating screens with anti-blinding screen surfaces. These machines are capable of high volumetric flows while screening at very fine apertures to capture the carbon fines in the ADR plant.



Derrick dual motor linear motion fine screening machines



Captured carbon fines

For more information, please contact your local Derrick sales representative.

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