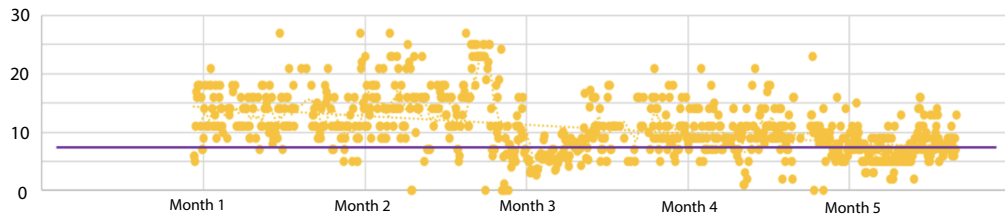
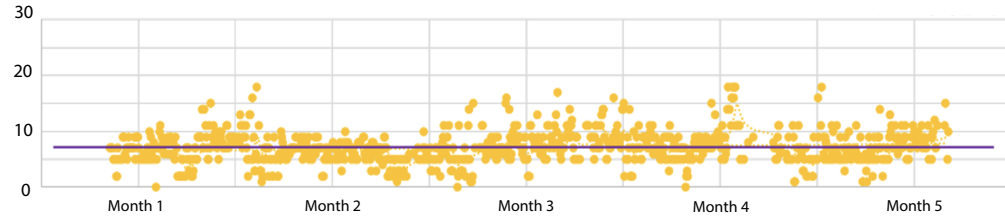




Carbon concentration with manual movement - Carbon concentration g/L in tank



Carbon concentration with automated movement - Carbon concentration g/L in tank



Higher sampling accuracy = Higher gold recoveries



The Carbon Scout and OLGA at Goldfields

"Here at Tropicana, the Carbon Scout was originally utilised to maintain an even distribution of carbon throughout our CIL circuit targeting 0.01ppm Au to tails which has been achieved over a long period now. Its function has now evolved to automate the movement of carbon at months end to the front of the circuit reducing fill time of the acid wash column and increasing the number of strips each month which reduces our overall circuit inventory"

John Robinson

Superintendent: Metallurgy

AngloGold Ashanti

# GEKKO CARBON SCOUT

Higher recoveries • Enhanced safety • Improved process control



Smarter Together



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# Improve safety, accuracy and consistency of carbon concentration measurements in CIL/CIP circuits



The Carbon Scout measures pH, DO, density and gold concentration. This unique technology helps gold mine operators optimise process plant efficiency and reduce soluble gold losses.

The self-contained device collects slurry samples from CIL/CIP tanks to determine the distribution of the activated carbon in the pulp for each tank, to an accuracy of  $\pm 0.5$  grams of carbon per litre of pulp.

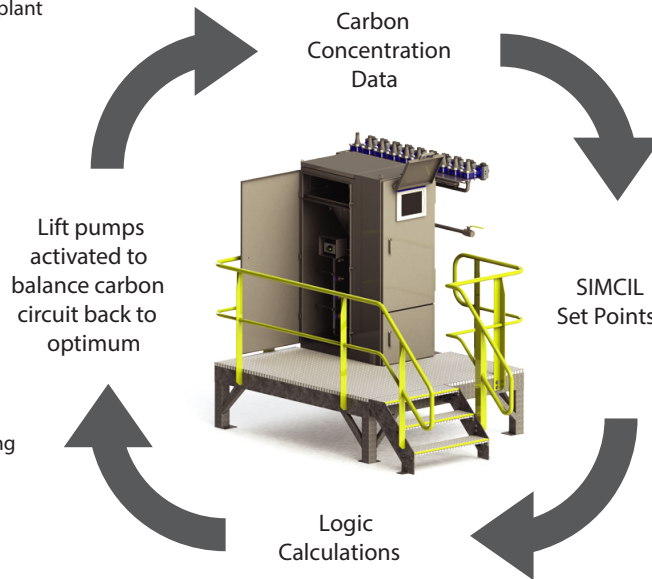
The machine improves the accuracy, regularity and consistency of carbon density measurements in CIL/CIP circuits.

The Carbon Scout also enhances safety by minimising possible exposure to HCN gas and reducing the need for manual handling of samples.

Constructed of stainless steel, the ground level system enhances operator efficiency by removing the need to undertake time consuming manual sampling and provides a single point sampling station.

## UNIQUE SOLUTION

- Online detection of Carbon concentration
- In circuit density measurements
- Measure gold on carbon for real time gold circuit inventory
- pH and Dissolved Oxygen measurements
- Single point of measurement for up to 16 CIL/CIP tanks
- Samples 10 times more slurry than manual sampling to improve accuracy
- Integratable to process control systems such as SCADA
- Ground level sampling system for easy collection of GIC samples and enhanced safety
- Programmable sampling frequency
- Lease + service packages for higher ROI



## AUTOMATED OPTIMISATION PROCESS INCREASES PROFITS

Gekko offers simulated CIP modelling (SIMCIL) as developed by AMIRA/P420 project as part of its Carbon Scout service package.

Carbon density data generated within the Carbon Scout is compared to the optimum density set points derived by SIMCIL modelling.

This data undergoes logic based calculations that provide electronic feedback via the processing plant's control system (SCADA) to automatically control the operation of lift pumps, which are utilised to forward carbon media in the CIP/CIP tanks of the circuit.

This optimisation system can contribute to a reduction in soluble gold losses and provide Critical information on required carbon stripping volumes.

## ECONOMIC GAINS FROM REDUCING SOLUBLE GOLD LOSS TO TAILS

Throughput (tonnes/annum)	Solution Loss (g Au/t solution)					
		0.003	0.005	0.007	0.01	0.02
1,000,000	ounces	96	161	225	322	643
	value	\$230K	\$386K	\$540K	\$772K	\$1.5M
5,000,000	ounces	482	804	1,125	1,608	3,215
	value	\$1.2M	\$1.9M	\$2.7M	\$3.9M	\$7.7M
10,000,000	ounces	965	1,608	2,250	3,215	6,431
	value	\$2.3M	\$3.9M	\$5.4M	\$7.7M	\$15.4M
20,000,000	ounces	1,929	3,215	4,502	6,431	12,862
	value	\$4.6M	\$7.7M	\$10.8M	\$15.4M	\$30.9M

### Notes:

1. Assumes 50% w/w pulp density in tails - lower pulp density will result in higher losses
2. Assumes gold price AUD\$2,400/ounce
3. Figures are gross losses - often reduced by process water recycling

## XRF available to measure gold on carbon for real time gold circuit inventory

Manual samples vs Carbon Scout data

