

ON-LINE MOISTURE ANALYSIS TECHNOLOGY

CASE STUDIES

NICKEL ORE



Product: **NICKEL ORE** Model: **MA-500**

Company: **Queensland Nickel, Townsville Qld Australia**

Profile:

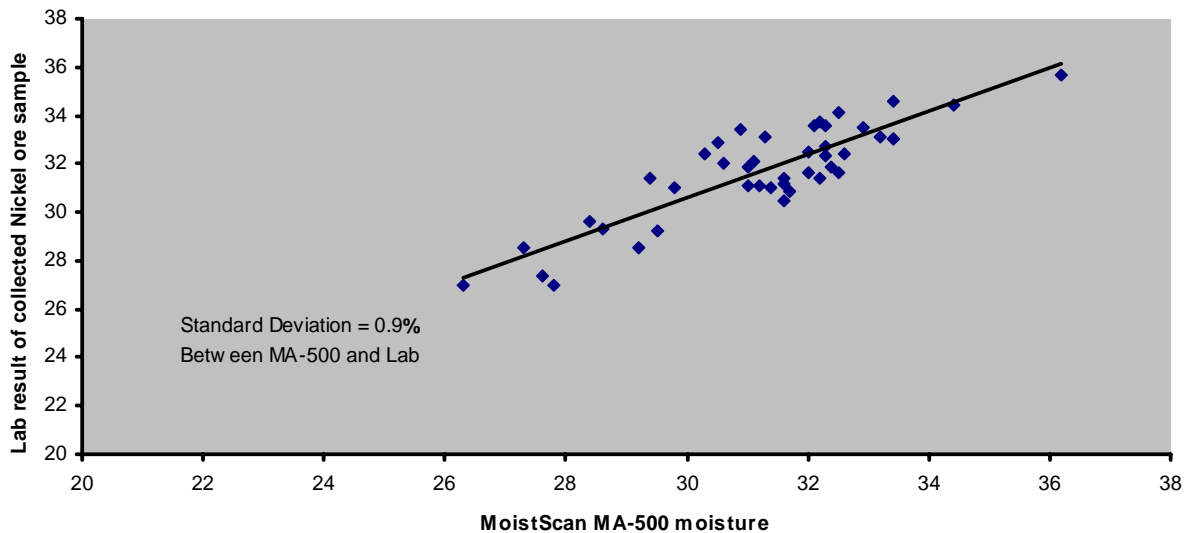
QNI is the Queensland Nickel Business unit of BHP Billiton, the world's leading diversified natural resources company. QNI refines imported nickel ore into a range of nickel products and a specialty cobalt product at its Yabulu refinery near Townsville, North Queensland. The plant has an annual production capacity of 30,000 tonnes of nickel and 2,000 tonnes of cobalt. QNI has installed an MoistScan® MA-500 at its Yabulu refinery to measure the moisture content of nickel ore as it feeds a dryer prior to processing. The MoistScan performance was verified by taking two samples from the moving conveyor and analysing each sample within different laboratories. There is no mechanical sampling devices hence all sampling was conducted by stop belt sampling of ore from the conveyor. This sample was then compared with the 1 minute rolling average of the analyser. The conclusion of the sampling program was that the MoistScan displayed an equivalent accuracy to that of either the two laboratories.



MA-500 Installation on NICKEL ORE

Results:

MoistScan MA-500 moisture vs Laboratory results of collected Nickel ore samples



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Product: **NICKEL ORE**

Model: **MA-500HD**

Company: **Leinster WA, Australia**

Profile:

Leinster Nickel Operations are located 370 kms north of Kalgoorlie in Western Australia. The Leinster Nickel Operations have a total ore reserve of 22.8 million tonnes (underground) grading 1.7% nickel and 4.4mt (open cut) grading 1.8% nickel. It has a total resource of 43.6mt (underground) grading 2.2% and 180.4mt (open cut) grading 0.6%. In 2003, Leinster produced 41,806 tonnes of nickel-in-concentrate.

Leinster installed a **Moistscan® MA-500HD** on the primary crusher discharge conveyor facility for the purpose of product mass reconciliation. The adjacent image shows the installed analyser. The MA-500HD was successfully calibrated on this conveyor and will be relocated to the SAG mill feed conveyor supplying similar material at a consistent 500TPH.

The analyser was commission in Jan 2005, and after the initial calibration indicated an accuracy of better than 0.4% total moisture. Being a "run of mine" application that analyser had to analyser large particle size variations as can be shown in the second picture below.

Over the next two years WMC is planning a low-risk incremental upgrade that will add at least another 25,000 tonnes of production for an expected capital cost of just \$7 to \$8 per pound of additional annual production.

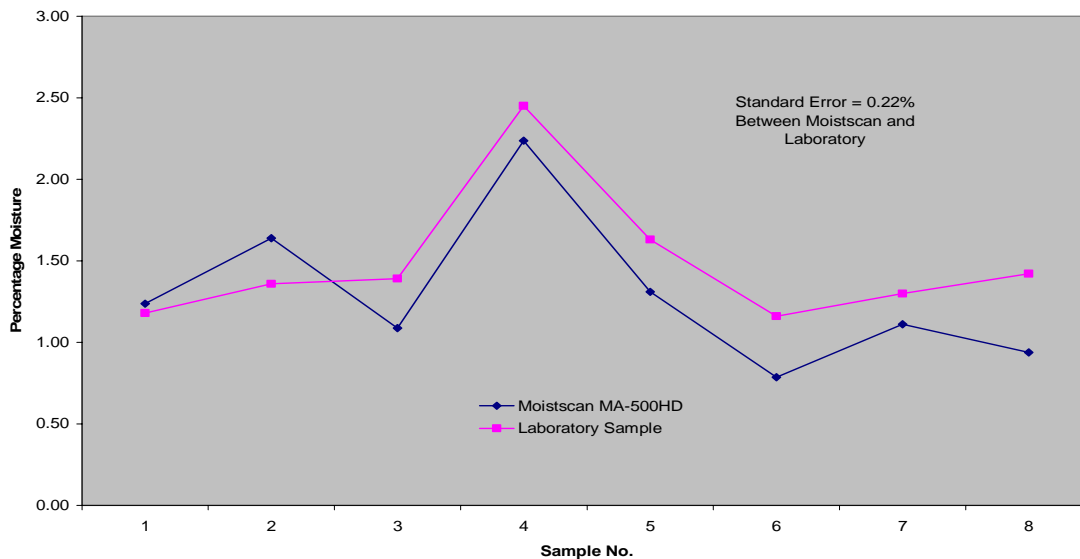


MA-500HD Installation on NICKEL ORE



Results:

Leinster Moistscan MA-500HD



Product: **NICKEL ORE**

Model: **MA-500 & MA-500HD**

Company: **SLN - NEW CALEDONIA**

Profile:

Société Le Nickel (SLN) is a subsidiary of the French company Eramet, the world's largest producer of ferronickel (an alloy used to make stainless steel). SLN operates four nickel mines in New Caledonia and one smelter located at Doniambo near the city of Noumea.

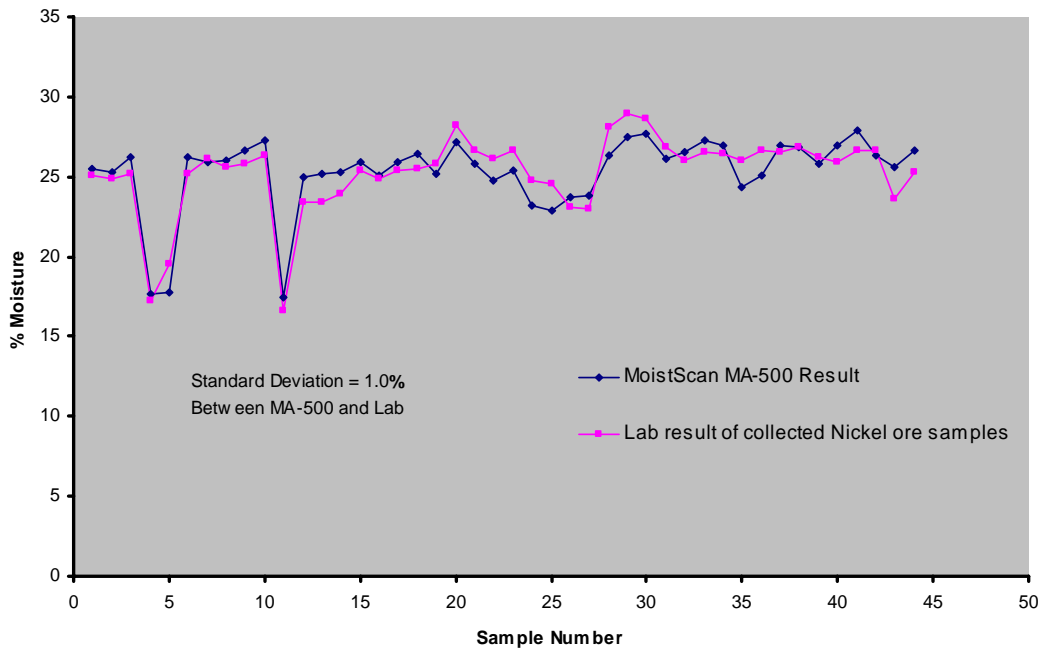
The Doniambo smelter processes approximately three(3) million tonnes of crude ore each year, making it the world's largest FerroNickel producing plant. A MoistScan® MA-500 has been trialled at Doniambo to measure the moisture content of nickel ore as it enters and exits the drying kilns. This information is used for process control. The MoistScan® units were proven using a program of stop belt samples. The 1 min rolling average of the MoistScan™ was recorded, the belt then stopped and a series of increments of ore taken from the belt to make a single sample.



MA-500 Installation at SLN – New Caledonia

Results:

Tracking Plot of MoistScan MA-500 and Laboratory results of collected Nickel ore samples



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Product: **NICKEL ORE**

Model: **MA-500**

Company: **SLN, Népoui, New Caledonia**

Profile:

Following the installation previous successful gauges in New Caledonia, a third analyser was purchased and installed at Népoui. The analyser has been installed following a vacuum filter to monitor the performance of the filter. SLN has since placed an order for 2 more MA-500HD analysers to be installed in early 2005 bringing the total of analysers installed to 5.



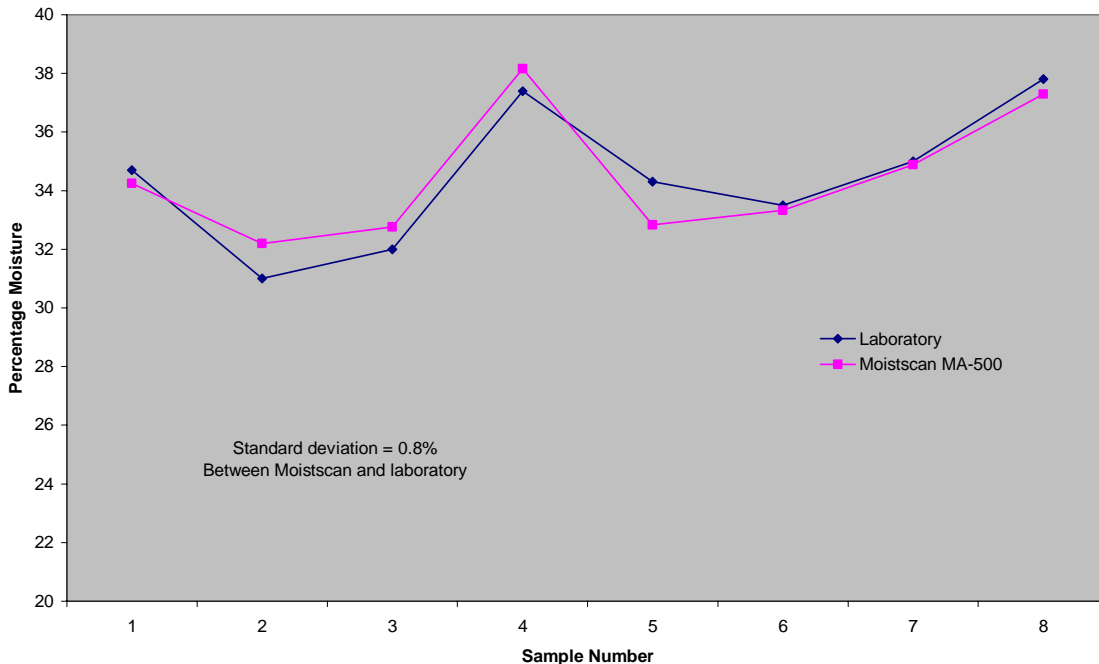
MA-500 Installation at SLN - New Caledonia

SLN's operations in New-Caledonia



Results:

Moistscan MA-500 vrs Nickel sample collected from filter press



Some of the hundreds of MoistScan® installations...



South Africa: Moistscan MA-500 installed for ISCOR



BRAZIL: MA-500 installation .NICKEL ORE



Christmas Island: Ammonium Phosphate installation using MA-500

Ammonium Phosphate MA-500



Hunter Valley N.S.W. Australia Coal installation using MA-500.

COAL MA-500



Century Mine: AUSTRALIA MA-500HD. Zinc Concentrate

Gregory Coal Mine: AUSTRALIA MA-500HD. Thick bed COAL



COAL MA-500HD