

# Lafarge North America Projet On-Line Mining

## Case study

### LOGIMINE SYSTEM BRINGS REAL-TIME CONTROL TO RAVENA CEMENT PLANT QUARRY

*On March of 2004, Lafarge North America selected Logimine to develop an On-Line Mining (OLM) system. The OLM project is designed to assist in optimizing all aspects of the quarrying activities by tracking production and quality key performance indicators (KPIs) of the raw materials sent to the cement plant. The Lafarge Ravena Cement Quarry site piloted the implementation of the first OLM project, along with Logimine which supplied the control software PCC4 (Primary Command Center, Version 4) and all the associated hardware.*

The Logimine PCC4 software is configured to manage, in real-time, the quarry cement raw materials in terms of location, quality and quantity. The concept is to capture the key information (or KPIs) from the drills, the loaders and the hauling units - each vehicle being equipped with a GPS system and a communication device. The software captures in real-time the origin and the quality and weight of the material, the loader and truck cycles, the productivity data and the material destination. This information is collected automatically to populate a database that is readily available on the Intranet WEB.

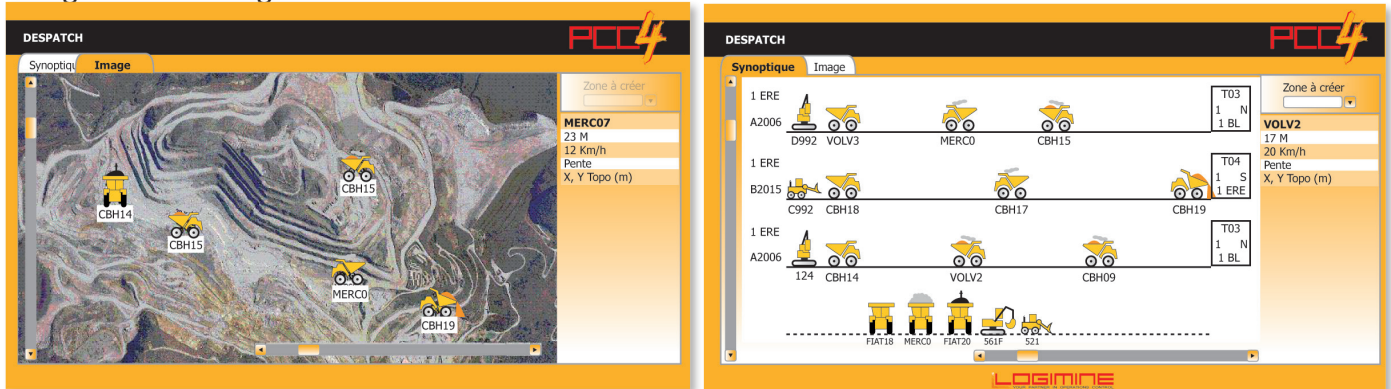


Loading activity at the Lafarge Ravena Cement Plant Quarry



## SIMULTANEOUS ACCESS AND CENTRALIZED SOFTWARE

The simultaneous access was a real challenge for Logimine. It implied to develop centralized software and a specified system architecture designed by the Raw Materials Engineers (RME) of the Lafarge Centre of Technical Services (CTS), located in Montréal. An unlimited number of Lafarge personnel may log on simultaneously, provided they have the right to access. The application has to manage information in real-time from many sites in the Lafarge Cement Division. Any other sites of any other divisions of Lafarge can be configured and linked to it as well.



## INTERESTING FEATURES FOR A CEMENT QUARRY

An interesting feature for a cement quarry is that the data is very reliable. For instance, the loading device bucket can be located at a centimetric level and the material weight can be measured at +/- 1%. Equipped



cement plant loaders can also be part of the monitored fleet to capture the complete cement production key performance indicators. The system is a way to link the quarry activities to the cement plant process control activities. The new PCC4 allows the monitoring of almost all activities related to the Cement Plant Quarry Total Quality Management and this, in real-time, from any office and to any site.

The quarry managers can configure their own dedicated KPIs, including linking the material quality from a geological model or from laboratory data to current GPS (X, Y, Z) coordinates, the centimetric digging precision, the overload occurrences and the fuel control activities, such as excessive waiting time and idling time alarm.

Another interesting aspect is the fact that a quarry manager can use the Logimine system to manage the operational activities from any computer screen via an Intranet WEB platform. Daily operational updates and changes can be accomplished by utilizing the PCC4 office software for each quarry or site and the

information is sent in real-time to each machine.

## QUICK RETURNS



One year into the project, we are confident that the PCC4 software will provide its worth. The site supervisors can find all the useful functions in one package straightforward compact system. From their desk, the quarry managers control the whole operation using their own computer screen. They can see the exact field location of each machine; they can see each of the drills on their respective bench; they can watch each of the loaders digging the assigned material (sources) quality; and each truck hauling its weight to the planned dump, feeders or crusher (destinations). At any time during the shift, with just a click of a mouse, the quarry manager can reassign the material and/or the equipment to match the current needs and information

Robert Ethier from the Lafarge Centre of Technical Services of North America

*“Lafarge partners with Logimine for two main reasons: the software, for the most part, is an open system and the Logimine system is a very competitive and unique all in ‘one box or all in one stop’ management solution. We (Lafarge and Logimine) worked hard to make the system run as needed for a Cement Plant Quarry. I appreciate the flexibility of the Logimine software and hardware. I am amazed to see how easy it is for our operators to interact with it. I can say that Logimine has assisted us in implementing our On-Line Mining Project. We continue to fine-tune these installations and we are confident that it will reach our economical and process expectations”, comments Robert Ethier, Leader, OLM Project, LNA.*

## EXPANSION PLAN

Two other sites are equipped with the Logimine system. One site controls the floor level at a centimetric level. The other site, to get this application, has the loaders equipped with a link to the on-line belt analyzer located after the primary crusher to track the chemistry of the transported materials. There are many ways to supervise a cement quarry or site production units in real-time using the Logimine system. Over time, the PCC4 application is expected to evolve to meet Lafarge’s requirements, including the capacity to continuously predict the quality of the cement raw material sent to the raw mill, as well as its accurate proportion and exact weight. It should also help with the planning of the blast. We plan to equip specific cement plant loaders with the precise measuring system in the cement plant and eventually in the aggregate plants.

This quality and productivity remote tracking system is configured to match Lafarge’s needs and to connect the quarry to the plant in real-time. This should allow for the first time a full traceability of the cement from the quarry to the customer silos and applications.



*"We integrate a Total Quality Management approach in everything we do. Each client site has unique characteristics and requirements and our ethos is to deliver an equally unique level of service. Our display terminals and software modules are all designed and developed in-house, they are configured to specific requirements and expandable to accommodate for future needs", states Bruno Laforgue, Managing Director of Logimine.*

## ABOUT LOGIMINE

Logimine specializes in open air mining control systems. It develops, designs, manufactures and integrates operations control software (PCC4), embedded hardware and instrumentation (L2X Series) and wireless network and real-time communication systems. Its systems enable real-time X, Y, Z coordinates tracking of any type of vehicle movements, time, distance, breakdowns, availability and management of dispatch, loading, drilling and blasting activities, as well as quality and stock.

The company was founded in 1997 by Bruno Laforgue, who has over 18 years experience in the mining industry and employs a small team of highly qualified and experienced engineers. The Logimine system is used on five continents and has helped clients increase their operational productivity by up to 30% while optimizing quality control.

Logimine's new generation of PCC4 (Primary Command Center, Version 4) offers a range of modules to address real and specific needs, whatever the size of the operation. The ACTIV module provides a basic control solution that can be extended with the addition of specific modules, such as DESPATCH, STOCK & QUALITY CONTROL, DRILLING & BLASTING, STATS & REPORTING, and ADMIN for easy system configuration. PCC4 integrates the latest technologies to ensure efficient and robust networking, as well as high-speed user interfaces and application flexibility. The system is powerful and cost effective, with low deployment and maintenance costs.

## ABOUT LAFARGE

Lafarge is the world leader in building materials, with top-ranking positions in all of its businesses: Cement, Aggregates & Concrete and Gypsum. With 90,000 employees, Lafarge is present in 76 countries. Lafarge is the only company in the construction materials sector to be listed in the '100 Global Most Sustainable Corporations in the World'. Lafarge has been committed to sustainable development for many years, pursuing a strategy that combines industrial know-how with performance, value creation, respect for employees and local cultures, environmental protection and the conservation of natural resources and energy.

Lafarge is committed to developing ever more innovative products and solutions which generate value for the building industry and reduce environmental impact. To this end, the Group boasts the world's leading building materials research facility near Lyon, France and employs over 500 people worldwide in Research & Development. Lafarge also works in close partnership with architects, engineers and users of its materials to push back the limits of its products and promote more sustainable construction methods which limit the environmental and human impact of construction while guaranteeing the highest quality in terms of aesthetics and durability. Over the past 15 years, the Group has taken part in a number of joint experiments and innovative architectural projects around the world.

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