



# In the Coal Fields of Wyoming, wi4 Mesh Solutions are Mining Enhanced Efficiency, Productivity and Profitability

## Company Overview: Leading International Mining Organization

In the coal mining fields in the barren plains of eastern and southeastern Wyoming, one of the most successful mining operations in the world is adapting advanced technology to solve typical strip mining communications and productivity challenges. Together with its long-time service provider, 3-DP of Scottsdale, Arizona, the company is adapting Motorola's wi4 Mesh solutions in a wide variety of applications that are improving communications, efficiency and productivity in three surface coal mining sites in Wyoming and one in Montana.

## The Challenge: Consolidate disparate legacy systems into one cohesive, collaborative network.

In these four surface coal mines, over the years, the company accumulated a large portfolio of legacy applications including VHF, UHF, 900 MHz, 2.4 MHz, 5.2 MHz and a variety of proprietary systems. Most of these disparate applications were not up to Ethernet standards and were much too slow to drive the increased productivity the company needed. Over more than 200 miles of windswept, desolate mining country, the company needed to connect hundreds and hundreds of assets in real-time. These include mega-sized haul trucks with half million-pound payloads, bulldozers, drilling equipment and the 110-car trains (with each car carrying 100 tons of coal) that leave the sites several times a day. To bring these multiple systems into a single network, the company needed a highly reliable, highly available technology that provided less than 50 milliseconds of latency.

## The Solution: Unified high-speed wireless network for all mission-critical, high-availability applications.

The company and 3D-P chose a solution that combined 3D-P's proprietary OHI (Obsolete Hardware Interface) with wi4 Mesh and wi4 Fixed solutions for information backhaul to a central command center. With the OHI performing all protocol conversions, 3D-P inserted mesh radios and end-user applications into assets to enable faster, more efficient connectivity between hundreds and hundreds of machines and devices that roam 5-to-10-mile mine sites day in and day out.

Each of the Wyoming and Montana coal mine sites has been outfitted with Motorola's MOTOMESH™ Solo solution enabled with Mobility Enabled Access (MEA). The company chose mesh because it needed technology that enabled a network offering exceptionally high availability, fast and easy deployment and, most important of all, fast switching for assets continually roaming the vast mining environment. (WiFi solutions, for example, were not chosen because

## CUSTOMER PROFILE

### Company

Global mining organization, Wyoming, USA

### Industry

Manufacturing / Mining

### MOTOwi4™ Solution

- wi4 Mesh Solution
- wi4 Fixed Solution
- MEA technology

### Solution Features

- High-speed broadband connectivity
- Mobility
- Network consolidation

### Benefits

- Decreased asset downtime
- Centralized monitoring and control
- Increased productivity
- Unified network platform

"We worked with our client and Motorola and created a unified pipeline for the monitoring and control of all our client's mission-critical, high-availability applications. The results are excellent, with well-documented cost savings in man-hours, asset downtime, total network control and decreased cost of ownership."

— Greg Bazar, *International Sales Manager, 3D-P*

"For us, asset downtime is a major obstacle to efficiency and to a better bottom line. Taking an asset offline to travel to a meeting in the field, or to download a huge file, costs money. For most assets, \$50 or more a minute. For some assets, such as our huge draglines, it can amount to \$1,000 a minute. Our mesh system virtually eliminates most asset downtime."

— *Manager, Mine Monitoring and Control Group*

### OHI: BRINGING LEGACY HARDWARE UP TO SPEED

3D-P's OHI (Obsolete Hardware Interface) allows mining companies to get their data when and where they need it. A hardware platform that integrates legacy and obsolete hardware to modern communications networks, OHI provides a robust communications platform for a variety of mining and industrial environments. All OHI systems are based on open standards to allow for maximum upgrade and re-configuration flexibility and to enable seamless connectivity of virtually any old or new in-pit system with high-speed broadband radio solutions.

they cannot switch access points fast enough or with low enough latency to make the solution workable.)

Think of this Motorola solution as an OnStar-type system for mining vehicles and machinery. Assets are empowered by a multi-layered radio interface that enables a variety of leading-edge capabilities including the ability to remotely track equipment, collect and transmit data, monitor statistics and allow encryption at the machine level for added security.

The wi4 Mesh network also provides GPS-enabled screens that deliver real-time data that leaves no doubt about crucial questions such as to precisely where to drill and exactly how much explosives to use in a specific location. The system allows vibration tracking that makes sure blasting operations are within regulatory guidelines and are not causing damage to surrounding areas.

#### The Benefits: Faster throughput, greater control and increased productivity.

The benefits the company has gained from its new wi4 Mesh network are perhaps most dramatically seen by comparing the old ways of doing business with the new ways. For example:

With the previous 900 MHz systems, equipment pattern and diagnostic data transmission could take hours and frequently failed. Engineers often spent hours personally monitoring a download.

Worse, they could wind up having to locate the asset in the field, drive 30 minutes or more to its location, spend up to an hour downloading the file (causing the machine to be down at more than \$50 a minute), then drive back. Now, the data can be sent over the mesh network in less than a minute, while the engineer can immediately move on to the next project. The savings in man-hours alone are impressive.

An operator of a blasters truck—the vehicle that loads explosives into the blast hole—that needed to report or receive new information had to stop working and physically meet another vehicle or asset out in the field to exchange data in person. Now the driver has a 3D-P OHI based, ruggedized Windows PC with touch screen on the mesh network in the cab, allowing him to send reports and receive new data instantly... without having to leave his current location.

Another dramatic difference is in radio performance. Legacy systems, such as 900 MHz radios at 4500 to 9600 baud, have been replaced in hundreds of assets by MOTOMESH systems. These radios provide 300 times the bandwidth and system latency has gone from around 2000 milliseconds to between 15 and 20 milliseconds. Consolidating all systems into one network has also substantially improved control, allowing all four Wyoming mine sites to be managed from a centralized location at company headquarters.



**MOTOROLA**

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