

TA-BDV416

## 'WET PROCESSING' CHALLENGES

by Paul Smith



It's no secret that aggregates must meet tighter specification requirements today compared to past years. Between ever-tightening restrictions on pavement design, a growing demand for industrial materials and emerging markets for desired materials like frac sand, the trend for tighter product envelopes is undoubtedly likely to accelerate as we progress.

We all realize that today's aggregate specifications are under more scrutiny than ever. Specific to sand products, the gradation "envelope" is much tighter and there is generally a requirement to eliminate any undesirable materials present in a deposit, such as dirt and clay.

Whereas separating and sizing material used to yield the necessary results in many projects, today's producers are faced with the need to classify as well as clean material unlike ever before. Depending on the process, the use of water will generally be required to properly classify and clean material in what we refer to as "wet processing."

As an industry, we are faced with some significant challenges that are shifting the way we process. One of the most common issues I have seen is the depletion of natural resources – right where many of the fixed "wet processing" facilities are currently located.

It's no secret many of the deposits that were generally considered the most desirable in terms of natural cleanliness and gradation were "cherry-picked" decades ago. Unfortunately, many of these higher-quality resources have been or will soon be depleted, or they're no longer available due to population creep or environmental legislation.

Accordingly, we are now being forced to mine the more remote, less desirable deposits that we had excluded years before. These deposits are typically problematic in that the material is further out of spec in terms of gradation, or it's significantly dirty or contaminated – or both.

In most cases, such material requires significantly more processing to meet spec. For example, these deposits may be extremely high in silt or have an excess "bubble" of mid-range fine material that a screen or a rising current cannot separate. Or, they may have a large amount of clay or shale

mixed in the material that cannot simply be rinsed off the stone, yet it requires some form of friction to break down the material before it can be eliminated.

More often than not, the material will have a combination of gradation and cleanliness issues that must be dealt with.

Adding to the burden, these deposits are generally not as close to the asphalt drum or batch plant as the permanent plants are. Thus, the material must be generally processed remotely and hauled in from greater distances.

From a technology standpoint, the classification of fine materials compared to traditional screening is an entirely different process. In many cases, there is a need to separate excess 100 mesh and smaller material while keeping the coarser sand in order to meet the spec. Or, depending upon the product being made in relation to the gradation of material being processed, some excess mid-range material sometimes needs to be extracted while maintaining the quantity of coarse and fine particles.

As for 1/4 in. and greater "stone," depending on the undesirable materials that need to be disposed, sometimes the material can simply be rinsed. But in more extreme cases, it must be scrubbed or even run through a crusher before it can be sufficiently extracted.

Classifying sand and rinsing or scrubbing stone? This creates some predicaments for our portable producers.

Yet, for the opportunist willing to take on these challenges, it creates an exciting business opportunity for them. It goes without saying that the more challenging the process, the fewer number of competitors there will be vying for the same work. Some very lucrative niches are still available for those willing to embrace portable processing in a market that is sure to grow.

## PORTABLE SYSTEMS

Over the past 15 years I have seen "wash plants" evolve from simple systems consisting of a vibrating wet screen paired with a sand screw to much more elaborate systems that include complete portable classifying systems, coarse

material scrubbers and log washers, classifying systems and fines recovery plants.

The engineering that has gone into these plants has been nothing short of spectacular when one considers the type of processing, as well as the productivity and quality control that can be squeezed into a package that can be relocated quite rapidly and safely. On-plant PLCs (programmable logic controllers), pre-plumbed water systems and setup functions put a lot of the art into the science.

Of course, there is still the issue of water. Some communities will make it difficult to access a permit to tap into a water source for the purpose of producing aggregate products, while others will be equally stringent on dealing with the wastewater. Again, technology today is making it easier to mitigate some of these issues.

Fortunately, there are machines specifically designed to reduce or capture a large amount of the water used by the more conventional process. For example, depending upon application conditions, hydrocyclones can require less water than the conventional sand screw, and dewatering screens reduce the amount of water loss being returned to the settling pond.

Whereas in the past it wasn't feasible to scrub coarse material in a portable setup, recent innovations have installed blade mills and coarse material washers on portable carriers to tackle the dirtier deposits.

With the right mindset and toolbox, portable producers can look at these deposits with a different pair of glasses than the stationary producer who passed over them decades ago. What was once considered undesirable can now be seen as a reserve or perhaps even a potential gold mine.