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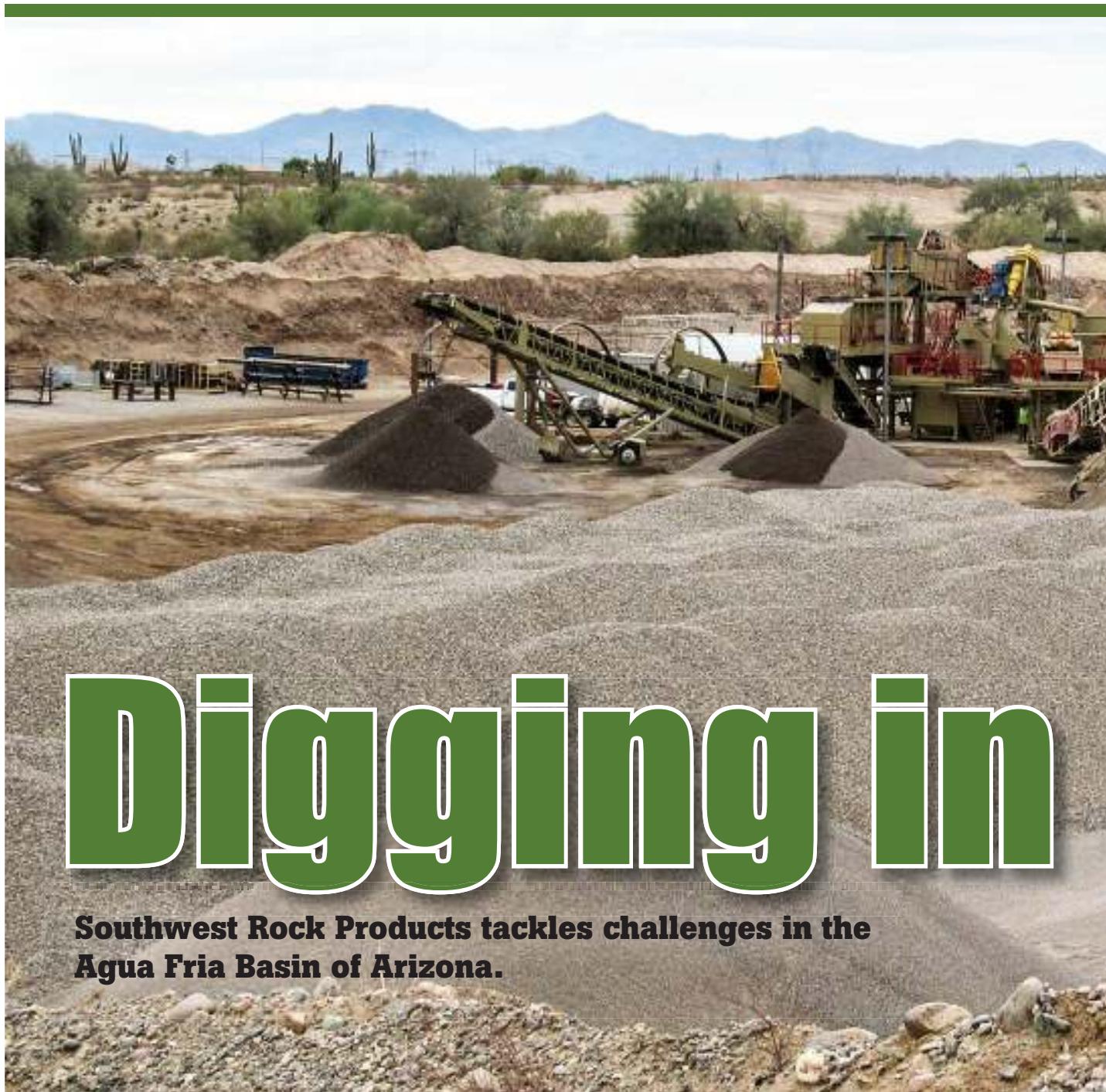
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Digging in

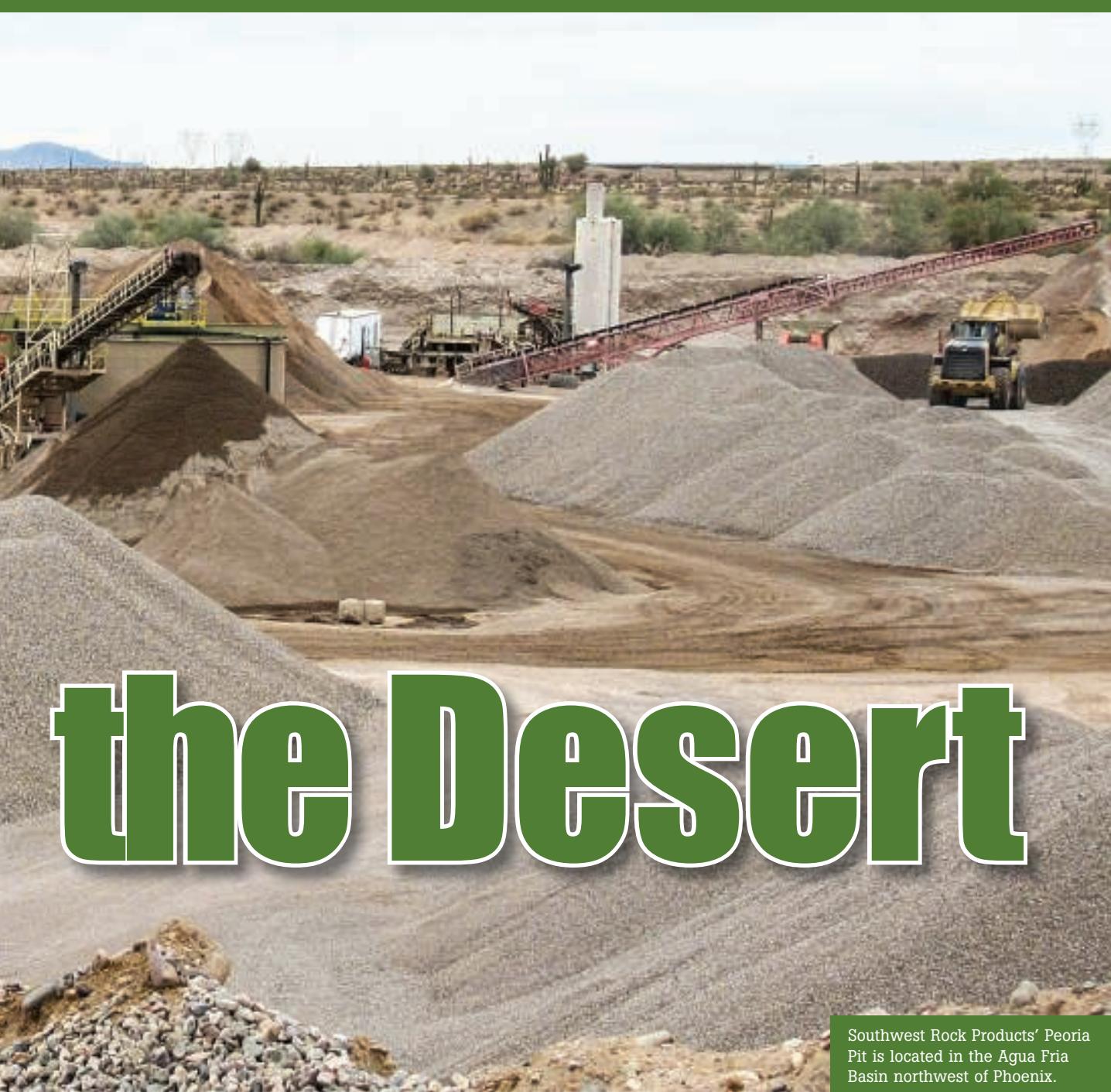
Southwest Rock Products tackles challenges in the Agua Fria Basin of Arizona.

Just northwest of Phoenix in the town of Peoria, Ariz., is a fairly new Southwest Rock Products sand and gravel operation. The pit has been there since 1978, but Southwest Rock Products didn't purchase it until 2015. After the acquisition,

the company set about upgrading the operation and improving the quality of the material produced there.

Southwest Rock Products has expanded quite a bit in the Phoenix area over the past few years. "There are 11 active mining operations, and a few of

these operations started new just within the last few years," says John Palmer, environmental, health and safety director for Southwest Rock Products. "Most of our operations are portable. Increased portability means that we can quickly and efficiently provide aggregate material to



the Desert

Southwest Rock Products' Peoria Pit is located in the Agua Fria Basin northwest of Phoenix.

customers across the valley and state."

The Peoria Pit, however, is set up to be more permanent, thanks, in part, to Core Ready Mix, a concrete company that has a batch plant on the site. "A large portion of the washed products that we produce go to Core's batch

plant," Palmer explains. "To be able to sustain their need for aggregates, we have to have a crushing spread and a wash plant at the site full time."

Dealing with challenges

When Southwest Rock Products began

mining the pit in 2015, some culturally sensitive areas were identified. The land being mined is located in the Agua Fria Basin, which is an area that has seen Native American activity for more than a thousand years. This means no mining can be done in the areas



The 40-foot thickener tank allows the operation to reclaim and reuse up to 90 percent of the water from the wash plant.

where Native American relics have been found until the Arizona Historical Society has determined their significance. The quarry is currently working with an archaeological company to come up with a game plan to clear these areas in order to mine them.

Another challenge the operation faces is the quality of the material contained in the Agua Fria Basin. According to Materials Manager David Beckel, the Peoria Pit presents challenges because of the “tough clay” that is a component of the soil makeup of the area.

“The investment of Southwest Rock Products in the proper processing equipment, both in the crushing and washing of the product, as well as the stringent quality control testing, has allowed the company to produce high-quality aggregates at the Peoria Pit,” Beckel explains.

New homes seem to be popping up closer and closer to the Peoria Pit, which presents a challenge on the environmental side of things. Local planning and zoning departments don’t help with this issue, as they sometimes allow the construction of homes right up

to the property boundary of the mining operations.

“We have a quarry in north Phoenix that has been there for years, and the city allowed homes to be built right next to the property,” Palmer notes. “We share a common wall with a few houses. Situations like that make complaints from the residents a greater possibility. As long as we follow the rules and stay within our air permit limits, we have no issues.”

Currently, houses near the Peoria Pit are separated by the dry Agua Fria River, but the operation could suffer the same fate as the north Phoenix location in the future with the explosion of new home construction and the relative openness of the area.

Upgrading the plant

When Southwest Rock Products took possession of the property, it needed some cleanup and a bit of organization. The company determined that a wash plant was needed. Plans were drawn up, and Chris Reinesch, Sr., owner of the company, came out to determine where the wash plant should be located

within the pit. Once that was decided, construction of the wash plant began in April 2015 and was completed by the end of July that same year.

Of course, as with all new plants, it took a few months to iron out the wrinkles once it was up and running. “It didn’t take long to construct, but we ran into some quality control issues with the materials, so we kept having to modify the plant,” Palmer explains. “Now, it has been in for almost two years, and it’s where it needs to be. So, we’re just fine tuning it to get higher production and better-quality material.”

Production Manager Sean Clifford designed the wash plant and oversaw its construction. Clifford started in the aggregates business as an equipment operator in 1992 and joined Southwest Rock Products in 1999. He became a supervisor within two years and is now in charge of nine crushing and screening plants and three wash plants, including the units at the Peoria Pit.

“It’s quite the wash plant,” Clifford says. “It has a tunnel feeder, log washer, screen, two attrition cells from Phoenix Processing, a sand screw, a concrete screw, and a coarse material washer. I don’t know anybody in the valley that has two Phoenix Processing attrition cells of that size. They’re like vertical log washers. They beat all the clay down out of the sand.”

Concrete sand goes into a tank, is pumped up into the cyclone, and then goes to the two attrition cells. After that, it goes through a sand screw and across the dewatering screen before being carried up the stackers to be stockpiled. The dirty water from the plant goes to the 40-foot thickener tank, where it mixes with a polymer to make the fines settle to the bottom. The fines, which look a lot like chocolate pudding by this time, are pumped through a hose to a fines pond in the bottom of the pit, and the clean water is recirculated back to the wash plant. The thickener tank allows the operation to reclaim and reuse up to 90 percent of the water from the wash plant.

“When we first got the wash plant,

instead of the thickener tank, it had an alta flow, which looks like a silo," Clifford explains. "But with the volume of water we were putting into it, it couldn't separate the fines from the water fast enough. It was too small, so we added the 40-foot thickener tank."

The wash plant allows the operation to produce a multitude of materials ranging in size from non-spec aggregate base course to concrete sand, bedding sand, mortar sand, 3/8-inch reject chips, 1/2-inch rock, 1-1/2-inch rock, 1-inch to 3-inch track-out rock, and 57 rock.

The portable crusher spread in the pit doesn't take up much space. It consists of a primary jaw crusher, a secondary cone crusher, and a screen. Material is fed to the jaw crusher by a loader and then circulated to the screen, with oversize going on to the secondary cone crusher and, eventually, back to the screen and into stockpiles.

Plans were in place to move the crusher spread to a new location on the other side of the creek so it could mine another stretch without disturbing the Native American areas, the creek, or the flood plain. Since the spread is portable, the move was expected to take only a couple of days.

The entire operation is run by a crew of only six employees, including Connor Carhart, the plant manager. Carhart worked his way up from welder to plant manager and assisted Clifford with construction of the wash plant. He attributes the Peoria Pit's success to the quality of his employees.

"Each employee who works at this facility is integral to the daily operations," Carhart says. "We are fortunate to have great employees at this plant that work safe, work hard, and understand how important their role in the daily operations is to the success of the site. They truly are the life-blood of the company."

Addressing safety

"MSHA has pretty strict safety standards, and I try to stay ahead of the curve," Palmer notes. "The workplace exam rule is changing the middle of this year. We're trying to comply with that now,



The wash plant includes two Phoenix Processing attrition cells that beat all the clay out of the sand.

as opposed to waiting until we're forced to do it. I've spoken with some MSHA inspectors, and they're still unsure of how it's going to be regulated, so there's a lot of mystery and questions."

Palmer works closely with Clifford and Carhart to make sure all the employees have the training and equipment they need to do their jobs safely. They cover a different safety topic every week, ranging from housekeeping safety to lockout/tagout refresher training. They also discuss any fatalities or serious accident alerts that MSHA releases.

All the initial and annual MSHA training is handled by Palmer, whether it's new miner training, training for experienced miners, or the annual refresher training. "We go over first aid and CPR, which is very important to us," Palmer explains. "About half of our MSHA annual training is based on that, making sure everyone knows exactly what to do in case of an emergency. The rest is reviewing MSHA-related accidents and fatalities, working on pre-shift equipment inspections, and workplace examinations. This year, for our annual

refresher training, we will have an MSHA inspector come and speak with the group. We want to make sure everyone is prepared for properly inspecting their plant and equipment each day. MSHA inspectors constantly preach that, if we do a proper work-place exam and pre-shift equipment inspection, we've probably knocked out 99 percent of the situations that could result in a citation. That's why we concentrate on that."

Environmental compliance

A significant portion of Maricopa County, the county in which Peoria Pit is located, has been deemed a "nonattainment" area for PM₁₀ by the U.S. Environmental Protection Agency and the Arizona Department of Environmental Quality (ADEQ). PM₁₀ is particulate material 10 microns or smaller, which includes soot, dust, and other small bits of solid material released into the air.

"The air quality permit that we have through the ADEQ has strict requirements on crushing and screening operations to control dust pollution," Palmer says. "These measures include regular dirt road watering, installing water spray bars on material transfer points of the crushing and screening plant, and keeping below production throughput limits."

ADEQ also performs regular compliance inspections to ensure that the company is adhering to its permit conditions. "We take pride in the fact that ADEQ inspectors are always pleased with how our site looks upon their arrival for a compliance inspection," Palmer adds. "These inspections are always unannounced to ensure that we are complying all of the time and not just when they are on site."

Core Materials also must comply with air quality regulations. It has a permit through Maricopa County, which conducts regular inspections of its operations. This means that the county's eyes are on Southwest Rock Product's operation as well.



After leaving the attrition cells, sand travels through a sand screw and across the dewatering screen before being carried up the radial stacker to be stockpiled.

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“Having air quality regulators constantly watching your operations makes environmental compliance an absolute must.” Palmer notes. “All of our employees are well trained in dust control practices at the Peoria Pit, because one slip up could lead to notices of violation and fines being issued.”

Outlook for the future

Just driving to the pit, one can see all the construction in the area. It seems to be primarily new home construction, but there are plans for new complexes and the expansion of a large home-furnishing supplier to the area. The city’s residents approved a 127,000-square foot health care complex in Peoria that should start construction soon. Also, IKEA has chosen the west valley for the location of its second store in Arizona.

The city of Peoria is planning to annex approximately 1,553 acres of land in the area from Maricopa

A large portion of the washed products produced at Peoria Pit goes to Core Ready Mix, a concrete company with a batch plant on site.

Advertisement for Curry Supply Co. featuring a logo, slogan 'YOUR JOBS. OUR TRUCKS.', and images of various commercial service vehicles. The logo is a stylized red 'CS' with wings, and the slogan is in large, bold letters. Below the slogan is the tagline 'Built. Financed. Delivered. Serviced. Guaranteed.' The advertisement shows three vehicles: a white water tanker truck, a white utility truck, and a yellow concrete mixer truck. The background is a construction site with a large red crane arm.

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County. This could potentially be great for a company dealing in construction aggregates.

"We anticipate the addition of paved roads, new access points to the 303 freeway, and the possibility of

additional residential, commercial, and industrial activity in the area," Palmer says. "If the annexation goes through, we will be in a perfect position to assist with the development of the infrastructure and buildings for this project." **AM**

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*Josh Magrath,
Director of Business
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Equipment List

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- Caterpillar 980M front-end loader
- Caterpillar D8T dozer
- Caterpillar TL943 telescopic forklift
- Sterling dump truck
- Kenworth water truck
- International weld trucks (2)
- Snorkelift man-lift
- Caterpillar SR4 generators (2)
- Stroughton generator van
- Svedala Hydrocone H-4000 crusher
- JCI 6' x 20' screens (2)
- GreyStone 44" screw
- GreyStone 36" x 18' log washer
- Eagle 44" screw
- Eagle 24" sand screw
- Cavex cyclone
- KPI-JCI dewaterer
- Phoenix AS 70 attrition cell
- Phoenix AS 35 attrition cell
- Emerson water feed pump
- Perissinotto sand pump
- Perissinotto vertical pump
- Perissinotto fines/under-flow pump
- Fisher 36" x 62' conveyors (7)
- Reuter 30" x 60' conveyors (2)
- Dakota tunnel conveyor
- Hilltop 36" x 60' conveyor
- Masaba 30" x 60' conveyor
- Goodfellow 36" x 60' conveyor
- Helmik 30" x 80' conveyor
- Superior 30" x 60' conveyor
- Fisher 30" x 100' Stacker conveyor
- Fisher 30" x 130' Stacker conveyor
- Fisher 36" x 130' Stacker conveyor
- Cline 12,000-gallon tank
- Southwestern Scale 6070 LPC