



Concrete Sawing & Drilling Association

2009 CSDA ROUNDTABLES

Slurry Recycling

**World of Concrete 2009
Las Vegas, Nevada
February 5, 2009**

CONCRETE SAWING & DRILLING ASSOCIATION
11001 Danka Way North, Suite 1 • St. Petersburg, FL 33716
Tel: 727-577-5004 • Fax: 727-577-5012
www.cdda.org

CSDA ROUNDTABLE: SLURRY RECYCLING
WORLD OF CONCRETE 2009

Moderators: Ron Culgin
Pro Cut, Inc.
Waltham, Massachusetts
Tel: 781-899-0006 / email: rculgin@procompanies.com

Tim Beckman
Cutting Edge Services Corporation
Batavia, Ohio
Tel: 513-388-0199 / email: beckman@cuttingedgeservices.com

Mark Critchfield
Slurry Solutions
Columbia, Missouri
Tel: 573-445-2683 / email: info@slurrysolutions.com

Mike Stangel
Alar Engineering Corporation
Mokena, Illinois
Tel: 708-479-6100 / email: mikes@alarcorp.com

Introduction

Ron Culgin: Welcome to the Concrete Sawing and Drilling Association's green roundtable on slurry recycling. My name is Ron Culgin, and I'm with Pro-Cut Concrete Cutting in Boston, Massachusetts, and my co-moderators for today are Tim Beckman with Cutting Edge Services in Ohio; to my right, Mark Critchfield with Slurry Solutions in Missouri; to my left and Mike Stangel of Alar Corporation in Illinois.

Many of you already know CSDA, but for those who are unfamiliar with the association, the Concrete Sawing and Drilling Association is a non-profit trade association of contractors, manufacturers and affiliated members from the construction and renovation industry. The CSDA mission is to promote a selection of professional sawing and drilling contractors and their methods. Sawing and drilling with diamond tools offers the industry many benefits, including low project costs. Precise cutting preserves structural integrity, reduces downtime, noise, dust and debris. Founded in 1972, CSDA has 550 international member companies

Sustainable "green" building construction is a very hot subject. Many cities, towns and property owners are requiring projects to be built to the U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) standards. Contractors are looking favorably to companies that can contribute to the ultimate goal of LEED points.

The purpose of this roundtable discussion is to share our collective experiences with the issue of concrete slurry containment and recycling. We have a series of subjects. I will pose the subject question, then each table will spend 15 minutes discussing. Each table will select a representative to share the experiences of that table.

Question 1 – Discuss examples of applications that require slurry containment and collection.

Whatever your personal or professional experiences are with slurry containment/collection, whether you're in the concrete business, saw cutting business or slurry wall construction. Whatever your experience is in having to contain or collect slurry. Discuss these examples for about 15 minutes.

At the end of that discussion period, we'll have a representative from each table speak about that table's experiences. If you would like to appoint a representative from your table that will get up and speak into the microphone on the mic stand in the middle of the room. We'll go around table-by-table.

Table 1: Hello. I've been in the industry for over 24 years. I started out working for Penhall International, the largest cutter in Minnesota, and for the last 13 years I've had my own business selling products. At our table we have people from Oregon, South Dakota, California and Minnesota. There is also a re-seller and manufacturer of Crusader vacuums. What we think is, in Minnesota, for over 24 years we've just been dumping the slurry wherever. In California they are really cracking down. In Oregon they are starting to crack down and in Minnesota, in just the last 12 months, I've just been hearing a lot. OSHA is coming out, and the big Samstone trucks are charging a fee for every load that they dump. It's here. Slurry is a problem, and we need something to take care of it. We are all thinking that it's coming, and if there is a solution to the problem we all have to jump on the bandwagon, because if we don't we are going to be forced to anyway. We think that we can turn this into a revenue builder, where you have your bit for sawing and then a fee for slurry removal, and the people that don't like it, I think will eventually do it. It's not something we want to do, because even on a little saw job of 100 feet you have 55 gallons of water. But if it is something that we have to address, we might as well turn it into a profit for our industry. Thank you.

Culgin: So let me ask you, the people at your table, what segments of the market are they in? In other words, what are their applications? Are they concrete cutters?

Table 1: We are all professional concrete cutters in South Dakota, California, Oregon. My Oregon guy said that he has actually been hauling it [slurry] away just as a service, because he can say "Hi, we cut concrete and we haul it away already. We're trying to be a little cleaner." My South Dakota guy has been looking into things because it hasn't really been an issue, and for me personally, it is just now coming up. Bernie at Crusader, he has been coming up with a lot of interesting products. He has a 30-gallon drum where it pumps the slurry out of the door 200 feet down, and I know he has a bag that will separate the slurry and the water. All of us are just starting to see it. Now in Minnesota they are cracking down. Thank you.

Table 2: Eddie and I are professional cutters and drillers at airports. Bill has been in the industry sawing his entire life, and George is in the industry selling products, trying to make a living with the problem. One thing I think about as we talk, is to this point a little bit of common sense still needs to be used on whether you pick it up wet or dry. If you wait until it is dry, it certainly becomes less of a problem. Although, in certain metropolitan areas it needs to be picked up wet. Vacuums would be the best way, and now the industry will pursue how to separate the solids from the water, reuse the water and take the solids somewhere else. We are in a decade, an era, right now that maybe we should look at cutting costs instead of raising costs in our industry. I think we ought to discuss that a little bit.

Culgin: So another concrete cutter, as far as applications. Is there anyone in the room who has an application to control, collect or recycle slurry that is not in the concrete cutting business? So mostly saw cutters here? So most people in this room are in the concrete cutting business. There is a fellow that has a product for the concrete delivery trucks, so concrete supply.

Dialogue not available. Participant did not speak into microphone.

Culgin: Ok, another extension of the cutting business—polishing and grinding.

Table 3: On our table we have again, typical cutters doing wall sawing, flat sawing and core drilling. We also have some highway grinding, grooving and slot cutters in the highway market, and some polishing like Mike said. All things that we are struggling with [slurry], what do you do with this stuff?

Culgin: I thought there were going to be a couple of people here representing the hydro-demolition side of the business. That's certainly another application that's not concrete cutting. It's a little bit unique. Certainly anybody that deals with slurry wall construction, another segment of the construction business that generates an enormous amount of slurry. Grinding and grooving, another extension of the saw cutting business.

Question 2 - What methods do you use to decant or filter slurry water?

This is where we hope to get some innovative homemade designs, and certainly there are a number of people here who have professional, fairly technical equipment. So hopefully we will get some ideas on what people are using, whether it's manufactured, store-bought equipment or their own homemade equipment. Maybe an answer is that you dump it in the ground? That's probably a method that is going to have to stop here real soon. If we can take 10 minutes, I think 10 minutes is more than enough time, if you could discuss the methods that you folks use to decant or filter slurry water. Just to give you a heads-up, the next question deals with disposal methods and precautions, and the issue of whether or not concrete slurry is hazardous. So there is a little bit of an overlap there, I understand, so let's stick to the methods that you use to decant or filter slurry water.

Culgin: Maybe we could start with this table right here in front again? You are officially Table 1.

Table 1: At Table 1, our methods are dumping it on the ground, dumping it down the sewer, taking it back to the place where we take our concrete when it's broke or just dump it on the pile where we drop off our concrete. Our South Dakota guy, he has his vacuums and lets the sediment settle on the bottom and dumps off the top. You know how fun it is to pick out what's hard on the bottom. That's the methods, thank you.

Culgin: That's pretty honest. I have to admit that's our method at home. Not very technical! Anyone else from this table?

Table 2: My friend makes a pit, looks like a loading dock when it goes down. I'm not sure it's legitimate or legal or whatever, I'm not going to mention any names here, and they have a hole that goes into the ground that's beneath grade. They put a hay bale down and the water goes through it and then it's a solid, so they're getting rid of the water. They try to put it on the dump truck and take it to the removal site, but now they're trying to stop that. I don't know the solution, that's why I'm here to hear this.

Culgin: At least that's an extension of letting it just seep into the ground. It's a pit, and there's some filtration going on there. Anyone from this table?

Table 3: I own a concrete cutting business. This table here is from the West Coast—Washington and California. If you're not associated with the Bay Area, we have a real problem up there. The first time you get a warning, second time you get a \$15,000 fine for anything that goes down the storm drain. So we're trying to be as innovative as we can. We feel, at this table, that we have two problems. One is the collection of the slurry. The collection has been no big deal, everybody knows you put it in a barrel, you vacuum it up and take it back to the yard. The problem is where does it go from there? The second problem I think we have is that you have to separate the slurry from the water, otherwise you're wasting money. Someone has to come out, and you can use a truck to pump it out. Safety Clean will do that in our area for 80 cents a gallon. I don't like to do that, so we've been separating the water. If you leave the barrel set for a while where you get 25% slurry, 75% water, 60/40 or however you want to put it, that water can be reused. It's easy to reuse that water, and I know there's some outer factors working on that. So we've run all kinds of different ways. We've run the pit type thing, where you try to skim off the water and reuse the water. You can put it back in your truck for reuse, but you've got to control the pH or it's going to eat your operator's hands, feet, everything else. We've tried mixing it with base rock to dry it up, our dumps will take it in a dry form. We've tried everything we possibly can. We know we have a problem, in fact, it's those two problems. I think you're going to end up with two bi-products. One is the recycled water that you can reuse and the other bi-product is going to be the slurry. I think sooner or later, someone's going to figure out if we can use that bi-product. A third problem that we didn't discuss that I just flashed on right now, is if you mix your asphalt slurry with your concrete slurry, you now have a different product. So concrete slurry, as far as I know, is biodegradable. It's not hazardous. Asphalt slurry is a different story; it's got petroleum in it so it's a whole new bag. Thank you.

Culgin: That's a good point. So you could contaminate a load of concrete slurry water by mixing it with asphalt slurry water, which as you say is petroleum-based. Ok, thanks. Yes?

Table 4: Hello everyone. I'm in a little bit of a different industry; we collect the water from concrete trucks when they wash out, not a whole lot. There's a gentleman that has something called Concrete Washout, where they wash the stuff into the job site. He has some system where he is able to process the water and throw it away. So Concrete Washout has some sort of solution to make it neutral. There's another gentleman called John Niland, who used to play for the Dallas Cowboys, and now he's with Arrow-Magnolia. They have a system where they just add acid and bring it back to a [pH] 7, so if you were talking about people's hands. So it's a very cheap system because acid is cheap. So he's got a way to do that. I'm wanting to collect water from pumpers and from houses as well, and job site water and bring it back to the concrete industry. They were saying that they produce about 20,000 gallons per vehicle per day in those six vehicles, but that's free water for some of you guys and what you were saying. Water is going to become expensive. I think the concrete industry can work out a way to put cement of that water back into concrete loads quite easily by neutralizing it to a 7, and not worrying about fines and things like that. So those are kind of the things we're dealing with slurry water on the concrete side. I know that Arrow-Magnolia has a way to make it go back to neutral, and the Concrete Washout guy has a way to collect a lot of water and then make it so that he can put it down the sewer legally. You might want to ask one of those two guys if that would work for you.

Culgin: All right, thanks. How about the table in the center of the room here, anyone there?

Table 5: Our table here is mostly made up of grinding and grooving people, so we have a little different issues. Basically, in the past we have used centrifuges and built filter presses. We've also used lined and unlined retention pods. Some of the other guys have used what you may call a daisy chain, where they bucket-to-bucket to filter it out. The last one we had was clarifying tanks with polymer additives, and there are several companies that have processing equipment that we've worked with, with some success. But it is a cost; it's a huge cost to our industry.

Table 7: *First part of dialogue delivered without microphone . . .* and the rest of them are lucky enough to be somewhere they don't have to worry about it yet.

Culgin: Actually, that's one of the questions coming up—what part of the country are you from and what sort of regulations are you seeing? The regulations are the same; it's the enforcement that's different. Regulations are federal for the most part, but there's way different enforcement on the East Coast than there is on the West Coast for example.

Tim Beckman: I'm Tim Beckman with Cutting Edge, and I'll say something about homemade methods. Then we'll turn it over to a couple of folks at moderation here, with their systems, to say something about what they do and perhaps give you directions on how to find their booth. I've been wire sawing for 26 years, and our locations are generally in more confined areas—within a nuclear plant or dam or something more confined. I don't work out on the open roads. I'm used to having to get rid of slurry, and our primary methods are to settle it out. You can settle slurry overnight in a barrel or large tank, but after a little bit of settlement we usually run it through some homemade filter systems, disposable filter systems you can buy and so forth. We're not buying a professional system. I'm looking at the parties up here and the others at the show here for other things better than what I do, but we do settle it out and recycle the water back to our operation. If you're not familiar with wire sawing, you don't have to take out all of those fines as much as you would if you're dealing with core drills and other devices where you have seals that you can interfere with if you don't take your fines out. I think we touched on another issue. The gentleman mentioned pH control, so be aware that when you get into recycling, your pH is going to go up. Now it's becoming a caustic matter that's got another issue, you can burn your skin and so forth. So you do have to add acid or do some form of dilution to deal with high pH's. Again, some homemade settlement with barrels, tanks and so forth and filters. We've been doing pretty good with it, but are always looking for better improvements. And for better improvements, maybe we'll hear first from Mark.

Mark Critchfield: My name is Mark Critchfield. This is our second year at the World of Concrete. We introduced what we call a pressure filter. It's a slurry filter that uses basically a pneumatic, air-driven system. A filter press that has individual polypropylene plates with polypropylene filter media in between. It goes down about five microns, so it's a pretty clean end result. This is not new technology, but it's new based on the size and the portability of the units that are available. This process and the filter business has been around since the '20s, normally in the big water treatment plants, municipalities. It's on a terrific scale, three- to four-foot filter blades. What we've come up with, and what we see as a need in our business is a portable version. Portable and an almost automatic system, where you can take it to the job site or you can also bring the slurry back to your yard. The basic principle is to take a pneumatic diaphragm pump, and pump it in through the center of the polypropylene filter plates. The voids between the plates are filled with the solid and then the water leeches through, and then is drained out by gravity to another storage tank or recycled back to the equipment. The solids build up under pressure. The air compressor is about 100 psi, and as that thing fills it packs it tighter and tighter, and as the machine fills it will fill to a point where it just cannot get anymore solids into it. The machine will shut itself off. You open the filter press, the cakes will drop out and then the process is repeated. You close the filter blades, start the process again. Normally in this unit that we have, is approximately 100-150 gallons per hour and, like I said, down to five microns.

Very clean water, and the cakes that are coming out there we estimate are somewhere between 15-20% moisture content, so they're a very dry, non-flowable, bi-product that can be legitimately thrown into the dumpster, it's normal construction waste. There are no dump issues. The water would be possibly borderline, slightly high on the pH. This can easily be put down the storm sewer by shocking it, like you would with swimming pool chemicals or fresh water will dilute it. So you can reuse it, dispose of the water and then dispose of the solids. This process is just a process called dewatering.

Culgin: Right Mark, thanks. Mark's company is Golz. This is something on the more sophisticated side than what most of us are using right now. Mark's equipment is up and running in his booth, What booth are you in? 30112 if you want to see Mark's equipment in operation.

Mike Stengal: Hello, I'm Mike Stengal. I'm with Alar Water Recycling Systems out of Chicago, Illinois. I'm here with Tauna Prince from Liebherr Corporation. We have just got into the cutting and drilling association method. We were asked by Scott Eilken over at Quality Saw and Seal out of the Chicago- based area to handle some of the wastewater. The concern that they had was based on cost. They were a grinding, grooving and sawing operation, where they had to haul away their waste water at a cost of somewhere at 44 cents a gallon. There are other waste management areas in Illinois where you cannot haul or dispose of your wastewater in Illinois; you have to go to Indiana and dump in a quarry. The local waste management was charging 78 cents per gallon, plus the pH adjustment, before you bring it over to the quarry. Now when they grind and groove, they may be generating thousands of gallons per minute for their grinding, grooving and sawing operations, but they wait until that wastewater becomes spent. So if they are running a 60,000 square-yard operation at full bore they are going to be going six days a week. After a certain period of time their water becomes spent, and that spent water is then hauled away. When you have spent water, you're dealing with a lot of suspended solids. You can get anywhere, if you're looking at specific gravity, about a 1.2 specific gravity, 200,000 parts per million or 20% raw solid content by weight. When you try and pH adjust something of that magnitude, you're using a lot of chemical in order to pH adjust. You have to get permission to dispose of that wastewater at that quarry. The cost per hour to drive a truck, according to the U.S. Department [of Transportation], if you had a pump truck and it's hauling over to a certain area and you're driving through traffic, not only are you paying 78 cents plus pH adjustment, you're also paying somewhere in the area of about \$85 an hour to have a driver drive to that facility, wait at that facility, dump at that facility and then drive back. If you're in the California area, drive time is huge. You don't go by miles, you go by hours. How many hours does it take me to get to this point to the next point? So now your cost per gallon has increased. We've heard that some areas, for disposal at a waste facility, can generate anywhere from a dollar to \$2 or \$3 per gallon. With a 60,000 square yard operation running six days a week at full bore, with both grinders and saws going at the same time, they'll generate about 24,000 gallons a week of spent waste water. That's 24,000 gallons a week, starting a \$1 per gallon. So there's a huge cost in that, and basically what do you do with the water has been the major question. Dewatering is an excellent process. We've put together a process for their saw operation that handled the dewatering aspect of removing the solid cement fines from the water. The water was 100% recyclable water. It came at a 1.00 specific gravity, ½ micron filtration. Excellent for the saw applications. However, during the process they found that there was another issue. They would pump and suck up the wastewater in 2,000-gallon tanker trucks, but there was huge sediment that was forming at the base of it. So they needed to use what would be likened to a fire hose of about 1,000 gallons of extra water, and they were using city water because they didn't have recycled water, to blast out these chips, what we would call concrete rocks or concrete fines, not the cement powder. So that's where Liebherr Corporation was introduced to put in a pre-system, and I'm going to let Tauna talk about that and then we'll talk about the back-up area of that, along with the costs.

Tauna Prince: Hi, my name is Tauna Prince and I rep for Liebherr Concrete Technology, and I just want to give you a brief overview about why I'm here. We manufacture a concrete reclaimer. It is designed specifically for the removal of the solids from slurry water, and we feel we have a product that might be able to help you. I have a sample here that came from Quality Saw and Seal. This is the finished product that ran through our reclaimer. We were able to get almost 95% of the material that was solids that was put into our reclaimer, and came out in this type of form. It all accumulated in one area, the water is dealt with in another area, and you start to see a closed-loop system. You're recycling the solids and recycling the water. So I just wanted to let you know that this is what Liebherr is doing. I have some information up here if you'd like to see it. We have some diagrams, some information, I can give you our booth number and you can come see this reclaimer, I have one at the booth if you're interested. Thank you.

Stangel: The Alar system that we designed with the folks at Liebherr was to help prevent the lined pits. We have a project, or Liebherr does have a project, that's going on in Lake Tahoe where, according to the Central Valley Water Quality Control Board, to put a lined pit into the ground and to meet all the regulations, is \$125,000. In the Illinois area or in the Midwest, that same lined pit, to meet all the regulation, is about \$45,000. The question comes that, after you're done you can't take it with you. So you've just spent a large capital cost so you have to incorporate it. Well, what Liebherr and Alar has put together is a fully mobile system. No ground containment whatsoever. The wastewater comes into the tanker truck that is vacuumed up. It dumps into the Liebherr system and the Liebherr system accepts the slurry water. The concrete chips, or what we would call the concrete fines, concrete rocks and pebbles larger than 1/8 of an inch, are reclaimed and this is the result of that. This is the heavy stuff that falls right to the bottom. This is what you're using a front-end loader to dredge, or you're shoveling out and that. This is taking care of that portion of it. But you still have a cement fine water, which are the fines and the powders. That cement fines slurry water is then pumped from the Liebherr system to an aboveground tank, which is to be trailer-mounted or a frac tank that you can rent. That tank is under agitation, so you're constantly mixing, keeping those solids in suspension and then pumping it over to a dewatering system. The dewatering system that we provide over at Alar is a rotary vacuum drum system that uses diatomaceous earth. It's the same material you'd use for a pool filter to separate the solids from the water. The water comes out at 1/2 micron clean, clear water, and the dry solids come off at about 20% moisture content and are easily transferred over to landfill. There's even some possibility of recycling the concrete chips that are created from the Liebherr system, but the water is 100% recycled. So what they're doing over at Quality Saw is they're not having the machines follow their machines there. They're leasing a parcel of land, putting a pup tent over the entire operation and allowing their concrete companies to come by, dump and have clean water. They don't have the travel issues, and they don't have the cost issue. The cost issue to run a Liebherr system, and Alar system, full operation and dispose of the solids, is an estimated 10-15 cents per gallon. So we're going from about a dollar per gallon to about 10-15 cents per gallon in order to save that company money. And ultimately what they can do is not only get a system that would handle their own personal waste water, but put it to a central location so that other people in the industry that have got other bids, can bring their waste water over, and perhaps they can do it for a certain different cost over there. Please visit us, we're at booth N1471.

Culgin: Thanks very much Mike. I might suggest that their combined efforts are probably a great application, a great solution for people who are generating more than the fine slurry that the concrete cutters are producing. In particular, the people that are doing hydro-demolition and are collecting really coarse material. So slurry and small chips of concrete. Their combined efforts sound like it would work really nice in that application. And highway grinding, which is that example. And in hydro-demolition they're generating even a larger chip.

Question 3 - What state are you from or what country are you from? What sort of regulations or restrictions are you seeing?

Has anyone been fined? Has anyone been stopped from dumping? Has anyone been tapped on the shoulder? Have general contractors said 'Listen, I don't know what the regulations are but you can't just dump that in the ground. I need you to take it with you'? And I suspect some areas of the country, typically the West Coast, tends to be stricter that way. So I suspect we'll see regulations a little stricter on the West coast as maybe towards the Midwest or on the East coast. So take 10 minutes if you would, and discuss the issue of what sort of regulations and restrictions are you seeing.

Culgin: What kind of regulations and restrictions are you seeing? How about Table 1? You guys have been so good.

Table 1: Once again, we've got Minnesota, Oregon, South Dakota and California. In Minnesota we're starting to see some crackdown on regulations with the concrete trucks. Right now on all job sites, they have to, whatever's left, they have to put in a basket and take back to the plant. It's a \$40 fee and all the concrete that's being mixed, in other words they're starting to crack down. We're just seeing it in the last 12 months. In Oregon there hasn't been a lot of enforcement but they've been taking the product back with them. And in South Dakota it's basically the same thing. In California, the San Luis Obispo area, it's a very conscious, green area. Right now they are fining \$1,500, and then I heard that \$15,000 number before too. After we all just kind of talked about it, when one person said that the rules apply the same, it's just the enforcement. The EPA and the DEQ, the Department of Environmental Quality, checks the storm sewers. Environmental Protection Agency, that's what we're seeing. It's just kind of coming up based on where you live, I guess. I know they're going after all the box stores and all the big jobs, high-profile jobs. Walmart, when they grind the floors and the big stadiums, that kind of thing. They're kind of going after what they can right now. Thank you.

Table 2: We're in Tempe, Arizona. We don't do any cutting, we're a distributor. We sell vacuums. Well we've seen that they're not fining slurry yet, but I do know that Maricopa County has hired about 40 new inspectors because they're enforcing dust. Dust is a big issue, and we get a ton of dust storms. How ironic. We all know that slurry in a dust form is like makeup. It's a real fine dust powder, so if they're fining people for tracking out on job sites and creating that miniscule dust, slurry in a dust form is going to be huge. I've heard of fines up to \$25,000 for track out on some high-profile job sites with Kitchell. Charlie is in Colorado. Right now, as far as he knows, there's no fining there. In job specs they're requiring for you to pick it up and dispose of your slurry. Bill's in Dallas. Like we've talked about before, it seems like a lot of dump sites are not wanting to take the slurry form anymore, but still no fines in Dallas. Henry is in Inland Empire in California. It's still kind of like some parts of the country. Not as much as the West coast, where they're stricter. And Eddie, you do work in the Bay Area, right? Ok. So you work all over the place in airports, but airports aren't fining yet. At least some of them aren't. That's all we have.

Prince: I just completed my certification for the National Ready-mix Concrete Association, and the instructor's an expert in EPA regulation. He claims that about four years ago, the EPA had a special task force put together specifically targeting the concrete industry. Now of course, he was talking on a more ready-mix level, but they were hitting pre-castors, and you guys are next. They're looking for a high pH from the rejected concrete, from the water or the solids. Even the cement fines. They're going to be starting to target any type of recycling yards that are taking this wet or dried high-PH material. They started it four years ago, it was supposed to be a five-year task force but it got a late start. Well this was just announced, over the next two years

they're going to go from plant-to-plant and start fining and writing them up. I know of several fines from that industry alone, and they were very, very significant fines due to pH and any type of processed water. So whoever said earlier that they're coming was correct.

Table 3: We got Washington and California again. Washington seems to be experiencing having the city request a permit or some type of statement about how and where slurry is being disposed of. I'm experiencing in San Jose right now, I've been in escrow on a building that's had environmental issues for about a year now (the land has environmental issues), and of course it opened my eyes to the Storm Water Pollution Prevention plan that I have to create. And if I'm going to be on site with slurry, I'm sure they're going to be interested in where my slurry is going to go. In addition to that, they wanted to find out how many gallons I was going to disperse down the sewer, which flows to the water treatment plant. However, if I go over a certain amount of gallons, then I've got to buy a permit for that. So we're running into, in the Bay Area especially, we're running into some very stiff regulations. We have no choice but to comply with what the paperback writers are writing for regulations. It's unfortunate for us, but it is unfortunate for the consumer because the consumers are going to have to suffer the expense.

Culgin: So it sounds like permits being required may be a thing of the future, and possibly manifests for tracking loose material, treating it more like a hazardous material.

Stangel: A lot of folks here are talking about their state regulations. The major area here is the federal regulation. The EPA is what regulates what can and cannot go into U.S. waters. That includes wetlands. The states have to enforce it. Now a lot of folks say that there might be some areas where there's not a lot of enforcement going on, but in Illinois we have the whistleblower act. If you have an employee who knows that you are doing something wrong, they can report you to the federal government. The lawsuit that comes from the federal government, a percentage of that goes to the whistleblower. In Illinois there was a \$6.5 million lawsuit where the whistleblower retained \$2.6 million of profit from it. Illinois right now, as I listen to the radio driving to work, there are lawyers who are saying 'you can get hundreds, maybe millions of dollars if you blow the whistle on your company.' So that's something that you definitely want to take a look at as far as regulation goes, that it may not be a regulatory agency in your neighborhood or in your state, but somebody in your own backyard. And it's definitely something you want to take into consideration. It's EPA, it's federal regulations. Federal regulations say that fines can reach up to \$27,000 per day if the U.S. EPA becomes involved. In Illinois, waterway discharge fines go to \$10,000 per day plus \$10 per gallon. If your wastewater truck is on the roadside, and you're discharging illegally, you also have to be responsible for digging it up. There's a situation in Michigan where an innocent bystander or a good Samaritan was driving behind a truck that was doing some spread-rate discharge. You cannot do that in Michigan. He took his camera phone, took a picture, that company went out of business. So it's not just the regulatory agencies that are out there, it's the public and possibly your own employees. Something to look out for.

Table 6: We talked about the different states. The contractors here have probably worked in about every state in the country. One thing that Scott says, he's been in the middle of this as much as anybody, is he's still really vague on what are the rules, what are the potential fines? And that is kind of what I'm seeing, and I think that's the struggle. Yes there's rules, but yes how enforceable are they and when are they doing it? And then there's a big gray area, that's kind of like I've felt dealing with the DOT a little bit. What is real, you know?

Culgin: Well I think, like Mike said, the regulations are in place, and they're probably not that gray to an official from the DEP or the EPA. So I think we just need to be prepared, because when they show up they're not going to hear that you were unclear on what you should be doing with your wastewater. So, they're there. The laws are there, federal, and I think it's a question of enforcement. In this group, I thought it might be good to hear that people had been fined as a wake-up call to the rest of us. Maybe learn from someone's experiences. So I think that the enforcement has been slow to come, but for sure the laws are there. Anyone else?

Table 7: Actually we represent Illinois, Utah and Canada. We're from California, and actually in the mid-'90s, we were fined. We got it easy because we had an attorney, but it was the fish and game who actually came after us. Even though we were working for a city, fish and game came out and said 'No, I'm sorry. We're going to fine you.' We couldn't dump it on the general contractor. We didn't get the total bill; they went after them at that point, but nowadays that's not going to happen. If you create it, it's yours. You own it until it's gone. Recycle it, clean it, whatever you're going to do. You can't dump it on anyone else anymore. We got away with \$3,000 instead of the \$45,000 indictment put in my mailbox, but that was years ago. That was over 10 years ago, so they're not playing around anymore. They know what they're doing and they're coming after us.

Beckman: A couple of things we haven't touched on, I thought I'd throw a couple of items out. Some of us cut bridge piers, under and above water. So you've probably found situations where you're highly enforced for collection above water, but when you're cutting the pier below water there aren't any reasonable ways to collect it. So they sort of look the other way, even in my great state of Washington where they're very tight on some bridge work we're doing. They don't know what to do, or what we're doing underwater. So I'm not sure when they'll ever crack down on that issue. I've forgotten my other point, we'll move on!

Culgin: If we don't have anymore comments on that question, we'll move on.

Question 4 - Are you familiar with the standards for acceptable pH levels for disposal of wastewater, and is concrete slurry hazardous material?

Table 1: We have what we think are some good collective guesses. This is what we all kind of came up with. That the pH of water is neutral at 7, and hand soap is a 9, and we're guessing that we think that slurry is maybe a 14. Are we just going to touch on the pH now, or what we think is in slurry? Ok. So the first thing is we were just talking about pH and that 7 is neutral and 9 is hand soap, but we have a Hazmat fireman here and the pH of Coca Cola is 1. It's very bad. So, can this be dumped down drains? Probably not. I guess the worst spill, I know we're laughing but this next one is going to really blow your mind. Right here our Hazmat guy, the worst spill, where was it again? Rapid City, South Dakota. It was a real bad spill, and it was grape juice. So it's not just the pH that could be bad, it's what it's made of. We were guessing that slurry is alkaline with the lime and the porcelain, and we think that in colder climates with the additives and the calcium that it's a problem in the slurry. Then, we had a really good question. If we knew what we were doing and how bad it is, when we dump it down the storm drain, is that really causing the most problems? We know it's a problem, and it kind of would be nice if someone was in the know of what we're really doing.

Table 2: Are the fines only for pH levels, that people have heard?

Culgin: I don't know. I will throw that out for anybody that has any knowledge.

Stangel: There are a couple of areas where you'd have suspended solids and then you'd also have pH. But in California because of the, what I call the Erin Brokovich initiative, is the chrome 6. The metals in the wastewater that become an issue in some real sensitive areas where it absolutely cannot be sent out, but the metals would be contained in those solids. Well, the EPA is going to set an acceptable level of pH, typically between 6 and 10 would be the EPA. I don't have that exact number there, but the states regulate what can and cannot go into the ground water or wastewater treatment. So the EPA would be your higher standard. That goes to the state, then to the local, then to the town.

Prince: In the ready-mix industry it's about 12.8 pH before they are rejected, that's concrete.

Beckman: I just remember what I wanted to add. On a couple of recent dam projects even if we ran river water through our heat exchanger we were not allowed to dump it back to the river. You figure that one out. We had to run the water offshore, off into another settling area so it would dissipate through the soils before it got back to the river. So they're not only extremely concerned, this was just a river in one of the projects in North Carolina, another one in Maryland. It had nothing to do with temperature, and nothing to do with concrete. Now it's true the heat exchanger is cooling oil, so they're concerned about the possibility of any oil seepage to the water. But instead of allowing us to sample it, they wouldn't take it off. EPA.

Stangel: And it is the equipment oil too, that they're concerned about. If you do a wash down of your equipment at a certain area, their major concern may not be the water itself but any possibility that there would be anti-freeze or oils, or anything else that's on your trucks that ultimately would be washed down into the waste water treatment plant or the storm sewers. Even if there are trace amounts of it.

Beckman: So when you're cooling your equipment, you might think about the interest to go to air cooling on your heat exchangers. There's impetus for that now, versus having to deal with water and have to get rid of the water.

Table 1: We were talking about earlier, is pH the only issue. Let me read this little short paragraph on mandatory compliance. You have to comply. In 1972, amendments to the clean water act prohibits discharge of any pollution into the navigable waters of the U.S. from the point source, unless the discharge is authorized by a National Pollutant Discharge Elimination System (NPDES) permit. It was first thought that the pollution primarily came from industrial activities, but over time it became more evident that the storm water run off from construction sites was also a significant contributor to the water quality problems. Construction sites generally contribute 10-20 times more sediment than agricultural lands, and 1,000-2,000 times more than forest lands. During a short period of time, construction sites can contribute more sediment than can be deposited over several decades, causing physical and biological harm to national waters.

Table 2: At Denver International Airport, we have a group of EPA people that are becoming more and more predominant. And so we ask, how do we get caught and what the rules are? Well there are a couple of things that have come up. We have a storm system, a waste system and a sewer system that takes the water away from the facility. If you're using storm water and you have a truck, a water truck, that you're using, Denver Water had coordinated it; you can't put it in the storm system. So you have to go and find a water source that isn't treated in any way. And it can't go in the sanitary sewer system. So, as the regulations come down and they're defined, those people are dictating where you get your water and where you put it. Last year they almost made a contractor pick up chlorinated Denver water. Almost made him vacuum it up. I don't know if that helps or not, but that is a story.

Culgin: Well sure, it's more insight. Not necessarily clarification, maybe more confusion, but certainly insight. Anyone down there, third table? Anyone else, center table? Back of the room? All right, that looks like it for that question.

Question 5 – SPCC is the acronym for Spill Prevention Control and Countermeasure and the acronym SWPPP stands for Storm Water Pollution Prevention Plan.

What do you know about these plans? So you may be very well on a job site generating waste water, slurry, and you're collecting it and you're filtering it and adjusting the pH. You're doing everything you're supposed to be doing, except you don't have a written plan. You don't have a written plan for spill prevention control and countermeasure. Now that all sounds like a lot of bullcrap to us, but you're absolutely required to have that. We had an inspector on our site, who fined us for lack of having a plan in the event of a spill. Now, all our oil drums were labeled and properly contained, so they went through all the lids and labels and things, and most of that was fine. But one of the things they fined us for was the lack of having a plan in the event we spilled a drum of oil. It sounds crazy. There was a contractor in our town building a school, and he was cited on three different school projects in Massachusetts for lack of having a Storm Water Pollution Prevention Plan. So his site contractor had hay bales in place, he had his silt fence in place. They were apparently doing the right thing, but they were fined for lack of having a written plan. We're subject to those kinds of regulations. So maybe I sort of answered my own question in that explanation. Among you, who are familiar with these plans? If anybody has been fined, if anybody's ever been asked for a plan. If maybe this is the first time you have ever heard of these acronyms, and we'll share those experiences with the group. Your familiarity with these acronyms that I spoke of, and whether or not these regulations are being enforced in your area.

Table 1: We're from Rapid City, South Dakota. I'm also a firefighter for the city of Rapid City, and I'm on their Hazmat team. So I've seen the acronyms before in that context. I work at our airport, so our airport has about a 2.5-inch binder that's our spill plan. The only time I've seen it on any job sites though, hasn't been for the small jobs that we typically do. It's when, for us, one of our large contractors goes in and does an entire job, like a new mall or something like that. Then they'll have to have that spill plan in place. But I've never seen it, and none of us at this table have ever seen it, for the jobs that we've actually done.

Culgin: Ok that's good to know. And so it is probably, more likely, going to be directed toward the general contractor. Whether he back-charges you if he's fined or not. Depends on the contractor and your relationship with that contractor. And for sure they're more likely to fine larger projects than they are an addition to a hospital or something, for sure.

Stangel: I've been listening a lot that there's a lot of folks that are doing airport work, and I was just going through, I was looking up the water initiative program, and one of the main areas they talk about is documentation. This was a US versus the Highway Department of Transportation, and this happened in 2006. The alleged violations included storm water discharges from HDOT's roadways, it's airports and various construction sites. The storm water discharges included a variety of pollutants, including sediment, oil and grease, petroleum hydrocarbons, solvents, paints, chromium, copper, lead and zinc. The penalty was \$2.1 million. The feds charged them \$600,000 penalty. The state and local penalty was \$400,000 and the SEP cost was over a million dollars. That would be for them to generate special projects. But the main area of these enforcement cases is the fact that they went in and looked for documentation. If you don't have documentation, they're going to look a little further to see why you don't have documentation. Very important stuff.

Table 3: We're in San Jose, California. What we're running into often enough is that our general contractor calls us and we need to go through their safety program, and sign up to all their rules and regulations, and get stickers on your hat and all that good stuff in order for us to perform our duties on site. This means that we need to know all that they need to know, so that we can react. That's what's happening for us.

Culgin: So education, awareness. Hopefully we've accomplished that here today, just making us all more aware. This blue sheet, if you'll fill it out, that would be wonderful. If you are already a member of CSDA, if you could put your name and company that would be great. There will be a transcript of today's discussion that will be posted to the CSDA Website at www.csda.org. If you'd like to recap this discussion, that is where to go. The CSDA booth here at the show is booth S11131, if anybody wants to drop by the CSDA booth. Also in the back of the room we have CSDA membership applications. So if any of you people are interested in joining CSDA, there are quite a few handouts. Also, available for purchase is a document entitled "Chemical Characterization of Concrete Slurry Samples and Development of guidelines for Slurry Management. This is a 62-page report that was the result of an independent study contracted by CSDA in 1999. I strongly recommend that you have a copy in your office library. If you are ever called on the carpet, it is a valuable publication to have.

Beckman: In preparation for our roundtable, we ran into a couple of folks here to help us out. I happened to pick up a card, I saw something about Slurry King at the show. Let's let Dave say a couple of words, and if somebody else would like to step up and say something that hasn't been mentioned, you're more than welcome to.

Table 3: Slurry King. I passed out a few cards there. What this is, is a small stationary unit that's for a job site. And it does pretty much what all the other units do. Our talks today have been about how to get water out, but in my travels we're just starting to touch on the real problem. What do you do with the sludge? The sludge is the real money pit as far as disposal, and until we get some ideas on how to encapsulate it and turn it into a bi-product we're back just to dumping as usual. That's about all I've got for right now.

Culgin: Dave, thank you. Slurry King also has a booth here if you'd like to see his product. Booth S22112.

Table 3: And I did want to ask if anyone had been approached by any of the new chemical companies trying to introduce a chemical makeup to make this slurry set up? There's one company in Denver that is turning the slurry into four by eight panels four inches thick. It actually looks like pumice but they are using it for an "R" factor. They're still in R & D.

Beckman: One more thought you might make a note of, is there are ad-mixers and things you can put in your slurry mix to settle out the solids. Normally referred to as flocculents. We didn't prepare anything on this subject, but you should be aware that there are things you can add that will really help your solids settle out quickly, and get quicker use of that water.

Culgin: Ok. Did I miss anything? I want to thank you for being here today and hopefully you found it informative, and something educational for you to go home with. Thanks again.

END