>> Dr. Chrissy Henderson: Welcome to our Corrosion Webinar series. My name is Dr. Chrissy Henderson and I will be hosting today's webinar. This event is put on by the Materials and Corrosion Laboratory within Reclamation's Technical Service Center, located in Denver, Colorado. We host corrosion related-webinars every year to share, with you, topics in cathodic protection, coatings, geosynthetics, and hazardous materials. Today's event is our second of three webinars that are part of our series focusing on the Rehabilitation of El Vado Dam. Today's presentation will be a summary of the hazardous materials assessment and mitigation to El Vado Dam to address coatings removal and disposal of structures designated for removal and disposal. Before we get started, we need to go over a couple of housekeeping items. We are hosting today's Corrosion Webinar using Microsoft Teams Live Events and it is recording the presentation. If you would not like to be part of the live recording, then you are free to leave at this time. This recording will be available after this webinar is over through the webinar link you received in your email. During the presentation, go ahead, feel free to ask any questions as they come up. There is a live Q&A chat feature. Click on the Q&A icon—it looks like a little chat bubble with a question mark inside—to access this feature. We will be monitoring all of the questions and hold a Q&A session at the end of this presentation. With that, I'm going to go ahead and welcome our hazardous materials team. Brianna Herner... is the newest addition to our Hazardous Materials group. She started off as an intern in 2020. And we liked her work, so she was hired on. She graduated from the University of Denver with a bachelor's in environmental science and a minor in GIS. Kevin Kelly is a research chemist and has his PhD in environmental chemistry from the University of Colorado Boulder. Kevin has worked on many environmental compliance and management projects for Reclamation. And Lise Pederson is a professional chemical engineer. She has worked for private industry and the federal government, designing systems to monitor and remediate contaminated surface and groundwater. She provides technical advice and support on chemical contamination and hazardous materials for Reclamation projects. I will go ahead and begin the slides. This is our hazardous materials team. So, El Vado Dam is located on the Chama River in north central New Mexico. The construction was completed in 1935 by the Middle Rio Grande Conservancy District. Reclamation actually did not own this dam until the 1950s. The faceplate and spillway are both steel lined. And they needed hazardous materials to be addressed during rehabilitation. What I'm gonna do is a quick recap from the first webinar in this El Vado Dam series. And that one covered the geomembrane. One of the issues with El Vado Dam is that it's not in the best location. Geological instability, seepage issues, and erosion... are some of the major contributing factors for the need for this rehabilitation work. The fact that it's in the middle of a natural landslide zone is very problematic. It's also one of the few steel faced rockfill dams in the country. And the spillway is also steel faced. Essentially what we were seeing with El Vado Dam is that there was a lot of substantial settlement along the dam. The expansion cracks... Expansion cracks were forming in the joints of the faceplate. And it actually was allowing water to seep through. And because it was a rockfill dam, it was actually creating voids underneath the faceplate that were not supposed to be there. So a lot of times, the water jetting—you would get the water in and it would start to sweep up the sand, the fines, any of the smaller particles, and wash them out. And you didn't have them as part of your major backfill material. So, a lot of deformations and distress are occurring on the faceplate. You can actually see them especially—

they're especially dramatic here on the left side of the dam that you see in the circle. And they're pretty significant. What's interesting, though, is that the steel plating has not lost very much of its thickness, using ultrasonic testing. So, we will be saving the steel. And the geomembrane was important because it is being used to reduce the seepage issues. The PVC geomembrane that was selected—and the last webinar really went into a lot of the testing to determine what kind of geomembrane was being used. And in this case, the top 88% of the dam will be lined. You can actually see it in the green. But the geomembrane is going to tie into the hazardous materials work that will be shared with you in this webinar. We also—Based on records, we could only find that maybe there was a coatings replacement in the 1950s. Kind of tells you the era of the coating. It also means it's got a lot of degradation to it and stuff like that. So... Just not a lot of records out there. So, that's kind of what we're going by, for a lot of our—when it was coated and things like that. So, I'm gonna go ahead and hand this webinar off to Brianna. And she will begin the background section.

>> Brianna Herner: Awesome. Thank you, Chrissy. Good morning, everybody. I would like to start off by giving you all a general overview of what the hazardous materials process for our group looks like. So normally we start off with someone contacting either our group's supervisor, Jessica Torrey, or reaching out to me, Kevin, or Lise personally for hazmat help on a project. We will then put together an estimate of how much time and money we need to complete our work based on the scope of the project. We will then work with the team lead to determine what different structures at a facility and what materials may require a hazardous materials survey. That could be anywhere from a pipeline coating, to a gate on a dam, to even electrical insulation on wiring. The hazmat team will then perform a site visit to collect the samples that we determined were required. And then we will send those samples to an analytical laboratory for testing to determine what hazardous materials are present. Once we get the results back from the lab, we incorporate those in a survey report and various contract documents. And estimates for how much things such as an asbestos abatement may cost for a contractor. Next slide, please, Chrissy. Hazmat generally fits in fairly early in the design process. As you can see here, we generally like to get our work done at about the 30% final design milestone. which is approximately when 30% of those design documents should be done. This normally gives us enough time to complete our survey, get sample results back from the lab, and to start writing the lab report and any contract documents that deal with hazardous materials. So the earlier we get involved in a project, the better. Next slide, please. When we perform a hazardous material survey, there's a bunch of different tools that we might use. Sometimes a paint scraper, a chisel, and a razor blade will get the job done. But within the past year we've started experimenting. with using an oscillating tool, which is the photo on the bottom left, or a needle scaler, which is the photo on the bottom right. Those two can be really helpful when a coating doesn't want to come off. There's a bit more power behind those then with the traditional paint scraper. We also collect our samples using a paper pocket collector, which we then use to pour the sample into the zip top plastic sample bags. There's a couple of different items of personal protective equipment that we tend to wear. One of the most important ones is a half face respirator with magenta cartridges. That is super important if we are taking samples that might have asbestos in them. We also generally wear gloves, whether those are lab gloves or work gloves, depending on which tool we are using. And safety glasses. Next slide. When we collect samples, there are a few different things that we can have them analyzed for. Asbestos is a big deal and it's heavily regulated. When we take asbestos samples, we generally need about 5 grams for the lab to be able to analyze it. When we take asbestos samples, we also have to take multiple samples from the same type of material. We also can test for regulated metals, which tend to be 8 metals that are regulated under the Resource Conservation and Recovery Act. That is a federal regulation. However, if you go to California, there's actually 17 regulated metals that we will test for. We also can test for PCBs, which is a polychlorinated biphenyl. And sometimes we will have coal tar coatings which can have polycyclic aromatic hydrocarbons in them. Metals, PCBs, and coal tar coatings all tend to require about 30 grams per sample for the lab to be able to analyze them. Next slide, please. Alright. Now we're going to get more in-depth on hazardous materials specific to El Vado Dam. Next slide. So, there are two different projects we're going to talk about and reference to hazardous materials. I would like to note that both projects are for hazardous materials, but the hazardous materials work was required for two completely different projects for two completely different reasons. The first one we're going to talk about relates to the last webinar, where there are geomembrane attachments on the damn faceplate. The coatings needed to be removed prior to the geomembrane attachments. Therefore, we needed to assess the coating to see if there were any hazardous materials present. And then remove that coating so the geomembrane attachment could be put on. The second project deals with the removal of equipment—the spillway, gate, chute, bridge, and actuator. First, we needed to assess what hazardous materials were included in those different pieces of infrastructure that were slated to be removed. And then we needed to determine what regulations applied and how to properly dispose of that infrastructure. Next slide, please. I would now like to hand this webinar off to Dr. Kevin Kelly, who is gonna talk about the specific hazardous materials project with the dam faceplate.

>> Dr. Kevin Kelly: Thank you, Brianna. Good morning everybody. I'm talking about the faceplate at El Vado. You might recall there's plan to put a geomembrane on the faceplate because we still want to protect that steel faceplate. There's still quite a bit of a thickness still remaining. So, we'd like to be able to prevent it from further corrosion or deterioration. And the plan is to put a geomembrane across that faceplate. If you take a close look at the faceplate, you can see that in some areas, there's still quite a bit of coating leftover. Some of that gray color. There's still quite a bit of coating still there. And some other areas, there's quite a bit of corrosion. So, what we wanted to do before we get that far to installing the geomembrane on the faceplate—we have a need to determine if there are any hazardous materials in the coating. So on the next slide, you can see that what we did was taking a look at some of the areas where attachment—maybe a fix—on the faceplate. And you can see a couple of people, couple of guys working on that faceplate there. And you can see what looks like a strip, a metal strip. Those are the attachments that will be going on the surface on that faceplate. But before you can do that, you have to make sure that the surface is well-prepared. It has to be smooth, has to be clean of any debris, any coating that's on the faceplate before you can put that attachment on there. They're not trying to remove the coating on the whole entire faceplate. They just want to remove a small amount of coating just in the area where they're gonna put the attachment on there. And so, for that reason, we need to find out what kind of hazardous materials might be present in the coating on the faceplate. So, in the next slide... What I did was—I went out there and collected a sample, similar to what Brianna was talking about, and what you might hear at the end of this presentation. There is a procedure for how we collect a sample to determine if there are hazardous materials in the sample. For coatings, we simply take a representative area, trying to find a spot that has all of the coating—all the different layers of that coating on the surface of the faceplate. Collecting in a pocket collector, scraping. There are different ways of collecting a sample. You can use a scraper. Maybe a needle scaler or oscillating tool, whichever is your preference. Whichever is the easiest way to do it for you. But you want to collect it into a ziploc bag. Take that sample and send it to a lab. But make sure that you have photo documentation. Keep track of exactly where you collect your sample. Because, as you will see later on in the presentation, there could be multiple locations, multiple features. So you want to be clear in your survey report, exactly where you collected your sample from. So take a photo, take a photo where you collect the sample. So, after you ship the sample to the lab, the lab will come back with a lab report, which is on the next slide. Basically, this is the analytical result from the lab. This lab is called Pace Analytical, but there are many labs out there that you can use. And they will send you the result of their analysis of the coating sample you sent to them. What you see here are 8 metals. We call them "RCRA 8" metals. RCRA- R, C, R, A. It stands for the "Resource Conservation and Recovery Act." This is an EPA federal regulation. The EPA, the Environmental Protection Agency, is the agency responsible for enforcing the regulation under that law. And according to the EPA, if you have a need to test a waste stream for toxicity characteristics, you need to be able to analyze for 8 metals. So, like Brianna mentioned, some states are more strict. California, for example, has 17 metals. But in New Mexico, they default to the federal standard with just 8 metals. And you can see that here on the lab report. Arsenic, barium, cadmium, chromium, lead, selenium, silver, and mercury. As you can see here in the lab report, lead is by far the most concentrated of the 8 metals that we found in the coating on the faceplate. at El Vado. So therefore, if somebody were to come out there and remove that coating and generate a solid waste stream, it is very likely that it will also be classified as a hazardous waste stream. And therefore, it falls under the RCRA regulations for the removal and disposal of the hazardous waste stream. So as you go into the next slide... We thought that, well, what are some ways how we can remove coating off of that faceplate in preparation for putting on the attachments for the geomembrane? So, we thought that, well, we could use a wire brush and blast the paint off. Or maybe a media, abrasive blasting. Or, there are a variety of different ways how you could take the coating off. We thought that, well, because of the situation being sloped, a sloping surface, and we're outdoors, we thought that maybe we should try a chemical paint stripper. So, here in the picture, you can see one that's called Blue Bear. And Blue Bear is made by a company called Franmar. I think I pronounced that correctly. But here in the United States, there are quite a few different ones out there. Quite a few different paint chemical strippers that you can use. But this one we tried out, Blue Bear. Because they make the claim that this stuff will be able to bind up lead. So, in other words, not only do you remove the coating off, it will also bind up the hazardous material, the lead, to make it non-hazardous. So, you solve two problems at the same time. Removal of the coating and making it non-hazardous in the waste stream. So we thought we would try it out on a small scale to see how it worked. And it's called Blue Bear 690PB, which stands for lead paint remover. As you can see on the next slide, we decided to test it out. We followed the instructions from the manufacturer of Blue Bear. We mixed two different powders together to mix up this chemical stripper. And then we applied it onto the surface where there is a lot of coating still remaining on the surface. And we leave it on there for a short period of time in accordance with the instructions provided by the manufacturer. And we let it sit there for a little while. And then we scraped it off. That's basically the procedure, how to do it. And we wanted to see how effective it is for removing the coating. But you can see on the next slide... we tested it all out. We found that it works very well at removing the gray topcoat. But it did not work very well at removing the primer underneath the gray coating. We're not sure why. So we decided to do a second application of Blue Bear, apply that directly onto the primer. Now, the primer looks orange. You can see in the picture. And maybe at one time, I think it might have been a red lead primer, possibly that got oxidized over time or something. But right now it's orange. And even with the second application of this Blue Bear onto that primer, it still did not remove the primer. The primer still stayed there. We only got a little bit of it off. So we collected as much sample as we can and we put it inside this Ball jar instead of a ziploc bag because it's very gooey, sticky stuff. So we used Ball jars in this case. Put the sample in there. And we sent it to the lab. And we asked the lab to perform a special kind of chemical analysis in the lab to determine how to characterize a waste stream if somebody wanted to do something like this using Blue Bear. So, on the next slide... What you see here are two lab reports. On the left-hand side, is the original paint sample, you know the coating sample, with no treatment of any kind. You remember, I took a paint scraper and I scraped it into a pocket collector, put it in a ziploc bag, sent that to the lab, and that's the result they sent back, on the left-hand side here. And remember that lead is 118,000 milligrams per kilogram. So, that's how much milligrams of lead per kilogram of the sample itself. And the sample is just coating, nothing else. On the right-hand side, you can see the result after the Blue Bear treatment. That would be the Ball jar sample that I sent to the lab. And we want to know if that stuff could remove the coating and at the same time, bind up the hazardous materials in here, especially lead, because lead is very high. 118,000 milligrams per kilogram. So you can see here, everything expressed in milligrams per liter. And the reason for that is because it's a different analytical method called TCLP, which is EPA Method 1311. TCLP stands for Toxicity Characteristic Leaching Procedure. So the lab will take your sample and they will simulate a landfill with rainwater. If it rains and the rainwater leaches through the landfill, it may pick up some of these metals and leach out of it. So, this is the way the EPA requires samples to be characterized according to their TCLP EPA Method 1311. And you can see here, the concentration of those metals are all very low. Lead went from 118,000 milligrams per kilogram in the bulk sample down to 3.7 milligrams per liter in the leach—in the leachate. So what that means is that according to the EPA, if lead is below 5 milligrams per liter, it is considered to be non-hazardous on the basis of lead. All the other metals were also very low. Now some of them were not detected, which stands for ND. And that means not detected at all, very low number. So, that means that therefore it would be a non-hazardous waste stream. However, keep in mind that Blue Bear did not work on the primer. The primer did not come off. So for us, we decided that that would not be the best way to remove the coating off of the surface. They probably will have to do something different. Maybe some kind of a media abrasive blasting or wire brush or something in order to be able to clean the surface perfectly smooth and ready to go for the attachment of the geomembrane. So, on the next slide, if you were to do some sort of a traditional coating removal—suppose you do a media blasting or whatever you use on the feature—normally, most people, when they're trying to do a containment, they would do some kind of a poly plastic containment. You can see in the picture here, various different poly plastic containments that people may use when they are trying to remove coating or also when they're trying to recoat something. They do it in the same containment. So like, for example, at Flatiron, on the lower left corner of the slide, you can see the Flatiron Powerplant penstocks. Well, the pipe itself could serve as the containment, and all you need then is the poly structure on the top where you have access to the pipe. That way you can make sure that anything that's being removed from the inside of the pipe—maybe it's a coal tar liner or maybe it's some kind of a coating liner in there—will not come outside of the pipe and release to the environment. Or sometimes if you are inside a facility—like at Yellowtail, where they're trying to do a rewind project there on one of the generators at Yellowtail. They had a need to recoat the head cover. So, again, you can see several pictures over there. You can see one in the middle. On the top there is a structure that they built. A 2x4 construction with poly plastic over it. They also have a couple of small rooms outside of it that allow people to come inside the small rooms in order to doff or don their personal protection equipment, the suit and stuff, before they go inside. Also when they come back out, they need to take everything back off so you don't bring contamination with you when you come out. So there is like a process for how you do that. And you also have a ventilation system, which is that red dust tube that connects to the containment. And basically what you're trying to do is, you're trying to ventilate the air out for the protection of the workers. But also you want to capture the dust, particulates that might be flying around in the air. So you want to create a negative pressure on that containment so that if any air is leaking, it's going to be leaking into the containment, not outside of the containment. And then you capture all the particulates or dust that are coming out through HEPA filters. So, those are traditional types of containment. Sometimes you might be able to do glove bag containment. So if I have just a small surface area, say for example a spot repair, I might not need to build a 2x4 construction containment. Maybe something a lot smaller. You could get a glove bag. And you can see that in the lower right picture with three workers working on a large glove bag, trying to remove something off of a pipe. You might be able to do something like that for removing a small surface area. So those are the traditional way of how to do containment. However, on the next slide—We find that, well, at El Vado, it's gonna be kind of tricky. You know, for one thing, it's going to be outdoors. And you're gonna have wind. It's got water. It's got temperature extremes. We're not so sure if traditional containment will work that well at El Vado. And also, you're going to be in the outdoors. If anything goes wrong, you're going to contaminate the water, the ground. You're gonna contaminate the environment. You're already outdoors. You're not inside a pipe or anything like that. Also, because they're trying to use those attachments for the geomembrane at different areas across the faceplate—they're not trying to remove all the coating on the faceplate—just the area where they have the attachment. There seems to be a need, then, for a mobile containment. You don't want to build a containment that goes all the way across the faceplate. I suppose you could, that's possible. But that would be a lot of work if you're only going to remove some of the coating but not all of the coating. So I think there will be more of a need there for a mobile containment. Some kind of a containment system that could be mobile—move from one spot to another spot as you go across the faceplate. And also at El Vado, there's a slope. It's not a flat surface, so that makes it a little bit more difficult to build a traditional form of containment at El Vado. So we had contractors—we communicated with the contractors and said, How are we going to do this? The Blue Bear doesn't work too good. Chemical stripping probably would not be an option. Well, the discussion came up with the idea of using a vacuum blasting workhead, which you can see here in the picture. Now that, basically, is a workhead. And you can do media abrasive blasting through that workhead. And at the same time, you can attach a vacuum hose that will suck out the debris while you are removing the coating, corrosion, or whatever might be on the surface, all at the same time. We think that that's probably gonna be the most viable way to do this at El Vado. But we don't decide that for the contractor. When the contractor is bidding on the project—as Brianna explained earlier before—when we come up with survey data, we simply pass that information on to potential bidders. And potential bidders, they decide what would be the best way to do it. As long as they meet our requirements—Contain it. Remove it. Dispose it. According to the regulation—they can do whatever they want. But it seemed to me that that's probably the most likely way how they might do the coating removal and contain the coating which will also be removed through this vacuum blasting workhead. Okay. And so on the next slide, I think that we're ready then to transition to talk about the other features at El Vado that're also being removed and disposed of. And I believe that I will be handing this back to Brianna to go ahead and talk about the remaining features at El Vado. Thank you.

>> Brianna Herner: Thank you, Kevin. Chrissy, next slide, please. Thank you. So, the second hazardous materials project we're gonna tell you all about is the removal of the steel lined spillway, chute, radial gate, bridge, and actuators. At the beginning of this project, before we did our survey, we needed to know what hazardous components were present in these materials so that we could determine how to properly dispose of them. Next slide. Here are some samples that we pulled from this equipment. Here you can see the emergency radial gate coating, which is an off-white color. On the right picture, you can see the sample bag where Lise took the coating sample. Next slide. We also had to sample the coating underneath the bridge, which was over the emergency spillway gate. Our lab results showed that the coating here was likely coal tar. Next slide. We also had to take an oil sample from the spillway radial gate actuator. So this also got tested for PCBs, which can often be found in used oil. Next slide. Here we have a sample of a summary table, that we will often put in our reports, that summarize what results we got back from the lab. All the X's indicate that that sample tested positive. So, as you can see here, every single sample that was collected tested positive for regulated metals. The samples that were tested for asbestos tested negative. And some of the samples tested positive for PCBs. And the two samples that were assumed to be coal tar, and were therefore tested for PAHs, were indeed positive, indicating that they likely are coal tar. Next slide. So, what do we do with the project now? We have our results back from the lab. Well, these lab results can help us determine the level of care that is required during the removal and disposal process depending on different environmental and worker safety regulations under the EPA and OSHA. There's also state level regulations that we need to pay attention to. When it comes to disposing of equipment, if there is no asbestos found, a removed coating may be sent to a hazardous waste or a solid waste landfill, depending on a certain EPA test method that occurs. This is the test that Kevin previously spoke about, where it determines how a component might leach at a landfill. If the metal equipment that is being disposed of does not have the coating being removed at all, then that metal equipment may be recycled as scrap metal, even if the coating has regulated metals, in the state of New Mexico. I would also like to point out that state regulations always take precedence over federal regulations. There are various environmental regulations that we must follow. We will always follow federal regulations, but there are sometimes state regulations that are more strict. And if those state regulations exist, you must follow the state ones. Next slide, please. So, what does this mean for that El Vado equipment that is set to be disposed of? The radial gate can be recycled as scrap metal because the coating is being left in place and is not being removed. Spillway is fine to be removed, and the new one that they will install will actually be concrete. The non-metal components from the bridge can go to a normal landfill. And then the metal from the bridge can go to a scrap metal recycler. The hydraulic oil from the actuators are actually a hazardous waste though, because the metal concentration found in them are above a certain regulatory limit. Next slide. As an update on this El Vado rehabilitation project that we've been speaking about—We are currently in the grouting phase right now. Or moving—excuse me—We're in the mobilization phase, soon, hopefully, moving into the grouting phase of this project. As you can see, this project has a several years long timeline. So it'll take a while to get there, but we're happy to have the hazardous materials start on it. Next slide. As an overview of the capabilities of the hazardous materials personnel in our lab group—we have technical expertise that can relate to regulations and disposal requirements for hazardous materials. We can also assist with surveys, like the two we spoke about earlier today. We can give recommendations, design specifications, quantity estimates for things such as asbestos abatement. We can provide construction support, such as those for submittals. We can also help out with environmental compliance audits, environmental site assessments, waste minimization, and disposal for labs. Next slide. And I believe I am now handing this back off to Chrissy. Thank you.

>> Dr. Chrissy Henderson: Thank you very much, both Kevin and Brianna. So, we're going to go ahead and enter the Q&A session of this webinar. If you have questions, go ahead and use that Q&A box to submit them. And I will begin grabbing... some questions. Don't be shy, you're free to submit your questions to the Q&A box. Alright, here's one—what kind of certifications do you need in order to do the hazardous material sampling? So, either one of you are free to answer that one.

>> Dr. Kevin Kelly: Well, I can go ahead and take this if that's okay with Brianna. Yeah, okay. Well, certification. If you are doing asbestos—and a lot of coatings thye do contain asbestos. Sometimes they add that there on purpose. They add that to the coating as a binder to give it some tensile strength. Sometimes the asbestos might be there by accident because they used a co-occurring mineral. So, you do have to have a certification under a law that's called "AHERA." A, H, E, R, A. And that law does have a, what they call a Model Accreditation Program. So it depends on what you are doing. There are different types of certifications that are required. If you are the designer, they have a certification for that. If you are the supervisor, that's a different certification. If you are a worker, doing the work, then you have the worker. There's also building inspector. Building inspector is another certification. So for asbestos, a lot of times, the state will require you to have this if you are doing work on a public facility. And so, public facility means you might have a contractor that comes to work. On El Vado—therefore, El Vado is a public facility. It will be accessed by other people besides just us. So you do have to have a certification in asbestos. As far as the other types of certifications, like for example lead-based paint certification, we are not required to be certified for that. Because we're not going into family housing or a daycare, school, that kind of thing. This is our own facility, El Vado. But it is a good idea to take the training. Even though they focus on just lead. Because lead is the one that has a lot of impact on children. So they come up with regulations dealing with lead-based paint. They do have a certification for that, but it is not absolutely required for us to do the—or the contractor—to have that for working at El Vado. Because it is not considered a child-occupied facility. But they do have a certification and the training is great. You should still take the training if you can. So, those are the kind of certifications as far as the material itself. You know, dealing with—Oh—I think that's all I have for that.

>> Dr. Chrissy Henderson: Here's another question. Have you successfully used the Blue Bear product on other projects?

>> Dr. Kevin Kelly: No, we have not yet tried Blue Bear anywhere else. El Vado is the one and only place where we tried Blue Bear. It would be interesting though. I think we should try that. Because there are a lot of other places that have the same kind of primer like we saw at El Vado. And we want to know if that—is that going to be the same everywhere else that has the same primer? It's pretty common, that type of primer. But we also want to try out different kinds of coatings. That will be interesting to see, you know, if anybody wants to do, like, a small spot repair. Or if they have coating over a bolt and they're trying to take a bolt out, but they're not trying to remove all of the coating, just the coating that's on the bolt. You know, something really small. I think that something like Blue Bear might work very well. And I would suspect that indoors, the coatings may be a little bit different than the coatings that are outdoors at El Vado. So, I would like to try that. And that's something that maybe we're trying do that later.

>> Dr. Chrissy Henderson: Great, I have another question. How does the TCLP test work?

>> Dr. Kevin Kelly: Uh, I can answer that question. TCLP—that is, Toxicity Characteristic Leaching Procedure. It's EPA Method 1311. And basically what they do is, they take your sample and then mix it with water that has acetic acid. And they'll trust the pH to mimic, or simulate, rain. Okay. So rain is a little bit acidic when it falls out of the atmosphere because it's mixing with carbon dioxide. So there is a carbonic acid reaction inside the water that makes rainwater slightly acidic. So they simulate that. Because if it's raining on a landfill, and that water is percolating through the ground and the landfill, it might pick something up—like lead, for example—and leach the lead out of the landfill and impact the groundwater or a river downstream, or something else. So the EPA came up with a simulation that a chemistry lab can do, called TCLP. They take one part of your sample and 20 parts of this acetic acid solution, and they mix it together in a rotary device. Basically it's a shaker. And your sample, it's getting mixed up with this simulated rainwater in a rotary device over a period of time. And then they have a little, uh, valve on there where they let all the liquid come back out. And they capture that liquid. It's called the leachate. Just like it would be in a landfill. And they then take that leachate over to the analytical lab and analyze for lead, for example. Probably by ICP mass spec. or some kind of analytical instrumentation. And they analyze for the metal. Keep in mind that TCLP is not just metal. There's also a lot of organic—a lot of organic compounds. Quite a few semi-volatile organic compounds on there. Some volatile organic compounds. So it depends on what you're analyzing for. There might be slight differences in the procedure, how they do that. But for the lead, it's pretty straightforward. It's a 20:1 ratio, they collect the leachate, analyze by ICP mass spec., and they give you what the concentration of lead is in the leachate. And the EPA has a Target Analyte List. And the action level for each one of those analytes on the TCLP list. For lead, it's 5 milligrams per liter. So, if you have a sample that goes through the leaching procedure resulting in more than 5 milligrams per liter, then any waste stream you generate will be considered hazardous according to the EPA. So that's how the TCLP works.

>> Dr. Chrissy Henderson: Alright, I have another question. Did you determine the name of the primer and/or its chemical composition? And Kevin, I think I'm going to hand that one to you.

>> Dr. Kevin Kelly: Okay, no, I do not determine the full composition. No. All I'm worried about is the toxicity characteristics. So, all I'm doing is just trying to analyze what might make it toxic. So, there's a lot of things that are in coatings that are not hazardous, like filler. You know, other kinds of materials... talc powder... Uhh. You know, other stuff they put in there that are not toxic. So, I only analyze just for the toxicity characteristics of the coating itself. It would have been nice if, like Chrissy said, back in the 1950s when they put that coating on there on the faceplate—and it looks like that was the last time that they put coating—if they had a material safety data sheet or a manufacturer's specification of the paint. You know, the coating materials they used. Then we could've just gone by that. That would've been the easiest way to do it. If they had a complete listing. But you will find that for Reclamation, we've been using coatings since about 1905 all the way through up to the present time. Anything that's really old, say before around 1990 or before, chances are, you are not gonna find those sheets. You're not gonna find the manufacturer's specs that tell you what's in the coating. So, almost always, we have to go out there and collect the sample. And send the sample out. And then find out if it's toxic or not. So, I guess, short answer is—no, we do not determine the name of the primer or the chemical composition, like the brand name, or anything like that. We don't go that far. We just try to determine the toxicity characteristics of it. That's all we do, really.

>> Dr. Chrissy Henderson: Alright. Well, that is all the time that we have today for questions. So if any of you on the webinar have any remaining questions, please feel free to reach out to any member of our hazardous materials team, or myself, and I will make sure to get it to one of the members. Also, keep an eye out for the next webinar in our three-part series on coatings and cathodic protection at El Vado Dam. Thank you very much, everybody, for joining us today.