



AMERICAN INSTITUTE OF MINING,  
METALLURGICAL, AND PETROLEUM ENGINEERS

## ORAL HISTORY PROGRAM

**Jessica Kogel: A Force for Good in the Mining Industry**

## PREFACE

The following oral history is the result of a recorded interview with Jessica Kogel conducted by Vanessa Santos on March 2, 2022. This interview is part of the AIME Oral History Program.

## ABSTRACT

Growing up in White Clay Creek, Pennsylvania, Jessica Kogel began her fascination with minerals as a child. Her journey into the mining industry would begin, in full, as she took her first steps into geology and paleontology undergraduate degrees at Smith College in Northampton, Massachusetts and, later, at the University of California, Berkeley. Kogel would go on to earn her PhD studying bentonite at Indiana University Bloomington in Bloomington, Indiana. Kogel has had an extraordinary career. Starting out as a crystalline silica consultant in Chicago, Kogel would begin her mining journey as the first high-level woman at Thiele Kaolin Company before expanding her career horizons at Imerys and, finally, earning the position of Associate Director of Mining at the National Institute for Occupational Safety and Health (NIOSH). Kogel has spent her long and varied career as a member of several professional organizations, most notably, serving as president of AIME's Member Society, SME, in 2013. Kogel has dedicated her life's work to developing new mining processes and products as well as improving the occupational health and safety for miners around the United States.

Readers are asked to bear in mind that they are reading a transcript of the spoken word, rather than written prose. The following transcript has been reviewed, edited, and approved by the narrator.

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## **PART 1**

### **00:15 Introduction**

Santos:

I'm Vanessa Santos. I'm here for the AIME Oral History [Capture Program] on March 2nd, 2022, to interview my close friend and colleague Jessica Kogel. Jessica and I have known each other for more than 20 years. We're both geologists, and we're both in industrial minerals. So, it's my pleasure to be here today.

### **00:43 Early Life in Landenburg, Pennsylvania – Playing in the Mud**

Santos:

So, Jessica, to start out with, we're going to start at the big beginning on way back when and how [and] where you grew up, and what was your intro into life?

Kogel:

I grew up in Southeastern Pennsylvania, and, at the time, it was a very rural area, lots of farms and also the nation's mushroom growing headquarters. It may still be, I don't know. So, lots of mushroom houses. Since I'm here as a geologist and somebody who eventually made my way into the mining industry, when I look back at where I grew up, I think it really maybe was preordained that I would end up studying clay and then working for much of my career in the kaolin industry. That's because I grew up on the White Clay Creek, named for the white clay mineral, kaolin, which was abundant in the area. And, there was even a town near where I grew up named Kaolin, Delaware. It was in that semicircle where Delaware, Pennsylvania and Maryland come together, just north of the Mason-Dixon line.

So, there were also dairy farms in the area. My parents weren't working farmers, but we were living on a dairy farm with an old kaolin pit behind the barn. And, I played for hours in that kaolin pit, just absolutely loved it. And so, I think where I grew up had something to do with where I ended up professionally. Those were formative years of playing in the mud.

Santos:

Your parents were from the area?

Kogel:

Actually, they weren't; they were actually from the Midwest, and they moved east because they were aspiring painters. They finished their undergraduate degrees at the University of Missouri in Columbia and then started east, heading towards New York to become artists. And then, they started their family and moved to Pennsylvania because my father had gotten a job at the Delaware Art Museum where he was the curator. That's how we ended up there.

Vanessa Santos:

Okay. So, that must have been great out there in the woods, in the nature, at the dairy—

Kogel:

In the nature, lots of nature around it. Yeah, I actually could mention that where I grew up you can still go to today. It's the White Clay Creek Preserve, and it's about 2000 acres of beautiful Southeastern Pennsylvania woodlands. The house is no longer there, but the woods that I played in, and probably the kaolin pit, is even still there.

Santos:

Because were they mining the clay?

Kogel:

No, I don't know why that pit was there. I've gone online, and I've researched history books to see, but I can tell you that kaolin mining did take place in the area, commercial kaolin mining including an underground kaolin mine. And, it was actually the only underground kaolin mine in the U.S., as far as I know. I think that was back in the 1800s.

#### **04:05 Early Career Influences – The Artists Around Me**

Santos:

Okay. That's neat. All right, so that is a good start to get into geology. So, what else do you think kind of influenced you to that?

Kogel:

I had a lot of people that were around me as I was growing up that took me to various places that influenced me and stimulated my curiosity. For example, there was an old canal, and there were a number of brick factories that were along this canal, because it was a great source of raw materials for making bricks. We would go to the brick yards because one of my parents' friends was an artist, and he actually made brick walls. And, he would carve those brick walls into these beautiful three-dimensional pieces that banks and other businesses in the area, for example, would commission him to create for their lobby and that sort of thing.

My grandmother also had a strong interest in rocks and minerals, and she did a lot with lapidary. She would take me out hunting for mineral specimens, and I would also go down to the basement with her and watch all that came out of her tumbler. Those are just some examples, but it just seemed that I was surrounded by a lot of people who opened up this whole side of life to me. And, I was fascinated by it as a kid.

Santos:

To look at everything that's around, all the natural things that are influencing to art, and then, of course later, to influence science.

Kogel:

Exactly. And, I think it was really interesting for me because I did come from a family of artists, and I always felt a little bit like a black sheep in the family. My parents are artists, my brother is a photographer, all of my siblings and the people who were closest to me had some foot in the art world. And, here I came along, and I was really interested in creativity and the art world, but I had this real fascination for the natural world and science. And so, I was influenced by both as a child. But, eventually at some point, I had to make a decision: which direction am I going to go?

### **06:21 Inspiration for a PhD – Geology, the Creative Science**

Santos:

But, I think you and I had spoken before about how we think of geology as kind of being the creative science?

Kogel:

Exactly. I'm sort of amazed that I went off to college and knew I wanted to be a scientist. And, actually, when I was in sixth grade, I think it was, I had decided that I was going to get a PhD. I didn't know in what, I didn't know exactly why.

Santos:

Because you knew there was a PhD.

Kogel:

Right. And, I've thought about that a lot. I thought, why in the world, in sixth grade, did I think I wanted a PhD? I think it's because I was influenced by friends of my parents who worked at DuPont, at the experimental station. And, one friend in particular would come to our home, and he would bring with him all sorts of what I would describe as experiments that he would then share with us in our living room. And, I became just fascinated by this whole process of science. And so—

Santos:

Like what kind of experiments?

Kogel:

Oh, I remember him bringing these beakers, and there was nylon, and he was pouring things into beakers and creating nylon. And, he helped me with my science fair project. I made a heart that really pumped. A mechanical heart. So, I thought I was going to go into biology. But, that's where I got the idea about science, but I didn't know geology as a discipline existed. So, I go off to college, and my freshman year, first semester,

somebody said to me "Hey, you might want to take a geology class." And so, I did and loved it, and the rest is history.

### **08:01 Pursuing Degrees in Geology and Paleontology – Amazing Professors at Smith and Berkeley**

Santos:

So, where was that? Were you—

Kogel:

That was at Smith College. And, I had just amazing professors there, and it was a really stimulating environment; it was a really exciting place to be. Despite that, I only stayed there for two years and got pretty serious about geology after those two years and knew that that was probably what I was going to go ahead and pursue more advanced degrees in, because I just found it so inspiring. I was just kind of awestruck by geology and understanding the earth, how to read the earth, and I'm sure you went through a very similar sort of transformation after you started getting into geology. So, I transferred and left Smith and ended up at Berkeley. And so, that's where I ended up doing my undergraduate in geology. And, I also got a degree in paleontology.

Santos:

And, I think there were some pretty famous folk over there at Berkeley?

Kogel:

Yes. Berkeley was a really amazing place to be as a geologist and as a student. There are a lot of Nobel laureates at Berkeley, and you had a sense of I'm walking around this campus of really amazing intellectuals that have had a super impact on the world as we know it. And, at the time that I was in the geology department, there was a big controversy going on. This was right after Alvarez and Alvarez, a father/son research team, had come up with the asteroid impact hypothesis, the KT boundary. And so, the pale—

Santos:

So, he was one of your professors?

Kogel:

He was one of my professors in the geology department. And then, there was a separate paleontology department. And, one of my other professors in the paleontology department was Bill Clemens. While I was listening to lectures [in my stratigraphy class] from Walter Alvarez about the asteroid impact and the rapid extinction of the dinosaurs and the Iridium anomaly, Professor Bill Clemens in the [paleontology] department was saying, "No, no, no, no, that's not what happened." And, he really was a very strong advocate for the opposite hypothesis, which is that it was not a catastrophic event, but

it was a gradual event. And so, it was really exciting to be in both departments at that time and to hear this scientific debate.

### **10:24 Expeditions in Paleontology - How Herbes de Provence Can Change Attitudes**

Kogel:

But, it got even more interesting because my first summer, I guess after my sophomore year, I was looking for something to do for the summer. And, I knew that Bill Clemens had a field crew that he took every summer out to Montana to collect early mammalian fossils out of the Hell Creek formation. I thought, wow, that would be really exciting to do. So, I approached him one day in his office, and I knocked a little bit timidly, because he was this man of stature.

Santos:

Famous guy.

Kogel:

Famous guy,

right. I was this little lowly undergrad. So, I knocked on his door, and I said, "Professor Clemens, I would really love the opportunity to come with you to Montana. Are you accepting members for your field crew this summer? And, if you are, would you consider me?" And, he sat there—and he had a beard, I remember—and he would do this.  
[pantomimes stroking beard]

Santos:

They all had beards.

Kogel:

Yeah. And, he said, "Young lady," -- I was taking his class, maybe he said my name, but I think he said -- "Young lady, I don't take women into the field. I don't believe in that." And, I was so unprepared for that response -- I thought I'd get maybe a yes or a no, my field crew is full, or something like that -- that my mouth just hung open. Because I had never encountered a situation where, because I was a woman there was this door that wasn't open to me just by virtue of gender. And so, I didn't respond, I just walked away. And then, a couple of weeks later he caught me after class and he said, stroking his beard, "Young lady, I've reconsidered." And, I didn't know what he was referring to exactly at first. And, he said, "I will take you." And, he said, "But, under one condition." I said, "What's that?" He goes, "I need somebody to cook for the crew."

Santos:

And, you're one of those who have—

Kogel:



I know how to cook. I said okay. And, he paid me to cook. And, we lived on a ranch in Montana with a little, well not a little, wood stove. There was an old Shepherd's cabin with a large wood stove. And, I don't think we cooked on wood, but I don't remember it. Maybe we did.

Santos:

Stoked it.

Kogel:

Stoked it every morning. But, I'd get up before everybody else, and I'd make the bacon and the eggs and the whole nine yards. And, I remember the first time I had put the food out in front of him, and he eats his food. And, he's like this [pantomimes stroking beard], and he goes, "Young lady, what did you do to these eggs?" So, I come from the East Coast, and my parents were cooks, and I had used— I don't know why— I brought Herbes de Provence with me.

Santos:

Because who would?

Kogel:

So, I'm putting Herbes de Provence [on his scrambled eggs]—He'd probably never had that before. But, the point of this story is that I had the most amazing field season because he was working very closely with Jack Horner, also a very, very famous paleontologist. In that summer, we had Jack Horner come with his field crew, so we worked together in the field. This is when Jack Horner was first putting out this idea that dinosaurs were maternal and that they nested. And, he'd been [finding dinosaur] nests [with eggs in them]. So, he came to our part of Montana to see if he could find some dinosaur nests.

That's what we were going out and looking for with him, which was all very exciting. And then, Walter Alvarez shows up, and there's this sort of cold war going on right? The reason Walter Alvarez was there is because he wanted to collect a sequence of samples through terrestrial sediments and look for the Iridium anomaly at the KT boundary, and the Hell Creek Formation actually crosses the KT. Actually, I think the top of the Hell Creek is the KT. And so, I was the one, because I was a geology student, who went out with Walter Alvarez to collect this KT boundary sample. And, guess what they found? It was the first terrestrial sample with the Iridium anomaly because his whole—

Santos:

At that location!

Kogel:

Yeah. In the world. And so, I got to collect that with him and that was very exciting. And then, National Geographic is also on the scene because of Jack Horner's work and how

that was capturing the nation's imagination. And so, I thought being a geologist was incredibly glamorous. Then, we had a helicopter flying in beer at one point, because Jack Horner was interviewed by the Wall Street Journal. He says, "Well one thing, we don't have enough beer here." And so, Anheuser-Busch or somebody flew... It was crazy. So anyway, it was very, very, very exciting and—

Santos:

Some of the most famous geologists of the time, for sure.

Kogel:

Yeah. It was incredible. And, pretty far away from mining I have to say. But, at the time, I was open to whatever opportunities were in front of me; I was hoping to capture and to just pursue them. And, that's what I did.

Santos:

So, Herbes de Provence can change everything.

Kogel:

That's right.

Santos:

So, he got over the fact that there was a.....

Kogel:

And, he invited me back after that.

Santos:

Oh really? To the next season. That'd be awesome. Yes, we have to do conversion, slowly, I think. Okay, I know that's super exciting.

### **16:06 Moving on to Grad School – Softrock vs Hardrock Geology**

Santos:

That's right. So, apparently Herbes de Provence can change everybody's attitude about anything.

Kogel:

Absolutely. And, it can open doors to who knows what. So, always carry your Herbes de Provence with you. That would be my advice.

Santos:

So, you finished the field season-

Kogel:

Finished the field season, got to go back for at least one, maybe part of a second one after that. And then, after that I graduated, it was time to figure out where I was going to go to grad school.

Santos:

What are we going to be when we grow up?

Kogel:

What are we going to be when we grow up? I've had so much fun so far, but what am I going to do next?

Santos:

All right. So then, how did that play out?

Kogel:

Yeah, so I had been in California for what, four years. I took a year off and then—

Santos:

Well, wait, I'm going to go there. What did you do in your—

Kogel:

Oh, so, [during my year off,] I got my California residency so that I could go to Berkeley and not pay tuition, of course. I took some time off, and then I did the double major. So, I ended up being there for four years and decided that I'd learned California geology, but it was time to learn geology from another part of the country. So, I did not apply to any graduate schools in the west. I didn't really know where I wanted to focus my future, in terms of being a geologist. Was I softrock, was I hardrock? And, this reminds me, one of the things that I didn't get to say earlier that I wanted to mention about geology is, I love the fact that geology is an inexact science that really invites creativity.

And so, for me, I knew I wanted to stick with geology in graduate school because it gave me a creative outlook—an outlet I should say, as well as being very much embedded in science. And, at the time, geology was going through a transition from being a descriptive science to a very quantitative science. And that was important to me as well. So, anyway, a little bit of a segue there, but I just wanted to bring that in.

Geology like medicine or any other field is a vast, vast, vast world, as you know. And so, I could have gone into any one of a number of different sub-disciplines. And so, I figured I was a softrock geologist, and that's where I wanted to really focus my efforts.

Because of my interest in paleontology, historical geology, all of those sorts of things. I applied to some softrock geology schools that had a reputation for having really strong programs but also broad programs. So that, as I refined my interests, I could then pursue them at that school without having to transfer, because I didn't want to do that. So, I applied to three different schools, and I went to the school that gave me the best financial package, and that was Indiana University in Bloomington. I made my way to Bloomington from Berkeley, which is a big shift.

Santos:

That's a big shift.

Kogel:

Big shift. I loved the Bay Area, I loved being at Berkeley. It was a hotbed of all kinds of things, And, I embraced all those things, and I moved to the Midwest and hadn't lived in the Midwest. But, my parents are from the Midwest. So, in a sense, it was like coming home, but it couldn't have been more different than living on either the East Coast or the West Coast.

Santos:

And, Bloomington is not a big town.

Kogel:

It is not, this is true. Limestone country, beautiful place. It was a difficult transition though, going from kind of a major metropolitan area to—

Santos:

And, you knew no one there.

Kogel:

I really didn't. I had gone to interview, and I'd met a few people, and I went to Indiana's field camp. And, I guess that's why I applied to Indiana because I had such a fantastic experience in the Tobacco Root Mountains in Montana at Indiana's field camp. But, I thought, well, I'm going to apply there for graduate school because there must be something good at that school because they have such a great field camp. So, off I went, and I started taking classes in various— well, mostly physical chemistry and things like that. I didn't get to take too much geology right away. But then, eventually, I made my way around to geology. And, one of the courses I took was clay mineralogy with John Droste. And, I took that because one of my professors at Berkeley was Richard Hay, who'd worked a lot in Olduvai Gorge with the Leakeys. [And, he introduced me to weathered volcanics and the joys of clay minerals which are the main weathering product of volcanics.]

So, he was the one that introduced me to clay minerals. And, I was really, really interested in clay minerals and weathering of hard rock to produce clay minerals. So, I

took that class, and Haydn Murray was a guest lecturer. He was the chairman of the department at the time. And, eventually I became one of Haydn Murray's many PhD students. He had a large group of students at the time, and I think there were nine of us, between his PhD students and his Masters' students. That's really when I started... I mean still I didn't really know much about mining, quite honestly. But, I think making the choice to become his PhD student is what put me on track [for a career in the mining industry.]

### **21:11 Becoming a PhD Student – Focusing on Bentonite**

Santos:

And, Dr. Murray at that time was going everywhere, working as a consultant for mining companies.

Kogel:

Exactly. So, he had, at that time, left Georgia Kaolin Company. He was executive vice president when he left the company, had really strong connections in the industry, was very, very well respected. And then, once he came to IU, they brought him in as chairman. And, he continued with his consulting for many of the various companies that he had interactions with when he was at Georgia Kaolin Company. I think he was there for 17 years, something like that.

Santos:

And, worldwide.

Kogel:

And, worldwide. Yeah. He worked all over the world. So, he really opened that world up to his students, and he was just such a generous person. He really felt that his career had been so successful, and he had had so many rewards that he wanted to share with his students. And so, he was just incredibly generous with all of us, and he made sure all of us had an opportunity to share in the consulting, to meet all of the industry people out there in industrial minerals. As soon as I finished my PhD, I was getting phone calls from many of the companies, because, if you were a Haydn Murray student, you always had an interview, because we were well trained in his laboratory.

Santos:

Yes, because he had a full running laboratory there. So, what kind of clays did you specialize in for your PhD?

Kogel:

So, for my PhD, I focused on bentonite, and I was really fascinated by bentonite. My field area was Montana and South Dakota and in Wyoming. I worked on the [Clayspur Bentonite], that's one of the marker beds. It's a Cretaceous bentonite, and it's one of the most commercially produced of the bentonite beds in that region in the United

States for sodium bentonite. I wanted to understand the origin of that bed and what happened geologically to result in these really widely dispersed sodium bentonites, because you don't find sodium bentonite really anywhere else in the world and particularly not of that quality. So, something unique had to have happened. I used oxygen isotope chemistry, rare-earth element chemistry, and trace elements [to understand the geochemical conditions that led to the alteration of the volcanic ash to sodium bentonite.]

I also looked at the physical properties. I was really interested in understanding how the physical properties of the montmorillonite then translated—well, actually, I should say it the other way around, how the fundamental properties of the mineral then translated into the physical properties [of the bentonite]. So, I was really interested in how the chemistry of a particular strata then related to its end use and its application. It's very much in the field of applied clay mineralogy, if you want to get really specific. And so, once I finished my PhD, I then, once I got into the profession, started working in other minerals as well. But, I'll say my first true love [was montmorillonite.] It sounds really strange, right?

Santos:

We love clay.

Kogel:

I love smectite, I love montmorillonite, but yeah, just fascinating material, really fascinating material.

Santos:

I mean, to me, there's almost, for all the industrial minerals, nothing so complex or so challenging as the clays.

Kogel:

Very complex, very challenging. I mean, just even something as simple as identifying which clay mineral you're working with; you get into these weird mixed layer clay materials. I mean, so many, it's a fascinating, fascinating field. And, the fact that you can take these minerals and then use them in so many different end applications, whether it's ceramics, fiberglass, paper, the list goes on and on—plastics, I mean, we can spend the next five minutes—so, yeah. And, that just makes them to me really, really, really interesting materials, and easy to spend a lifetime pursuing better knowledge and understanding of them. And then, using that knowledge to create new products, which is what I ended up doing, and processes as well.

## **25:52 Transitioning into Industry – Breaking Ground in Consulting**

Santos:

Yes. All right. So, you did transition to industry.

Kogel:

I did.

Santos:

How did that go?

Kogel:

It was really interesting. So, I started out in a consulting company in Chicago, McCrone. You may have heard of McCrone. And, they hired me because crystalline silica, at the time, was just sort of hitting the streets as something that we needed to be thinking about. It was a known carcinogen, and companies were really trying to understand how much crystalline silica was in their product. And, as you know, quartz is the main form of crystalline silica, and of course, quartz is ubiquitous. So, really, everybody had to be concerned about this, and, particularly, the industrial minerals folks. Those producers were basically—many of them were mining just quartz. So, obviously, they had to understand the health impacts, and they had to understand: How do we measure it accurately and all those sorts of things?

So, I was hired by McCrone to set up their laboratory and their program for testing crystalline silica in bulk materials, basically, whether it was soil, it could be industrial mineral products, really anything that you could grind up into a powder form and put into an X-ray diffractometer.

Santos:

And, I just want to point out that your paper on this, on the identification, this is still one of the real go-to. I mean, this was the incredible—I mean, this is how it's done essentially, the way you did that.

Kogel:

Yeah. And, it was really exciting work. It felt groundbreaking. And, I remember going to conferences and presenting. And, I remember the debates that sort of reminded me of the Alvarez Clemens debates. Right? And, there's debates wherever you go, I guess, in science. But, it was an exciting time. And, I remember, after about three years of being at McCrone, thinking to myself, "This is exciting, but I want to do something different. I don't want to be in consulting." I felt frustrated. I felt like I was never really able to be on the inside of a problem. I was always just providing partial solutions. And, oftentimes, companies, that's how they treat consultants. They don't want to give them the whole picture.

### **28:41 Finding a New Job at Thiele Kaolin Company**

Kogel:

And, I wanted to have a bigger picture, because I thought I could contribute more. And so, I wanted to work directly for the industry. And so, at that time, I started looking for

opportunities to do that. And, I talked to Haydn Murray and asked him to let me know if he knew of any opportunities.

Santos:

Get the word out.

Kogel:

Anything out there. And, he did. There was a job at Thiele Kaolin Company in Georgia. At the time, we're living in Chicago and have a young family, and loved Chicago and had a great life there. So, the idea of moving and uprooting the family and going to Georgia was difficult.

Santos:

And, not just Georgia, but middle Georgia.

Kogel:

Very, very rural.

Santos:

Rural Georgia.

Kogel:

You know well.

Santos:

Yes.

Kogel:

Yes. And so, I went and interviewed for the job, and I thought, "Oh, my gosh. This is the perfect job for me. This is what I've trained for." And, I loved so many things about the South too: the weather, the scents, the landscape, the history, the food, the barbecue.

Santos:

Yes, shrimps.

Kogel:

I loved all that. And, I remember leaving the interview and just crying because I was just like, "What am I going to do? I have to uproot my family." And so, I turned the job down, actually.



Santos:

Really?

Kogel:

I did, yeah. I just thought, "I can't do this right now." And, they were very patient with me. And, about a year later, they called me, and they said, "Are you still interested in the job?"

Santos:

Wow.

Kogel:

And, another year of water had gone under my bridge, and I was still doing crystalline silica analysis, and I was still feeling that itch to get to something different. And, I thought, "Okay, it's decision-making time. And, can we do this?" And, we did it. And, the way we did it, we said, "We can do anything for a year."

Santos:

Exactly.

Kogel:

We'll move to Georgia for a year. It will be a stepping stone, and we'll go off, and we'll do something else. 35 years later, we're still in Georgia.

Santos:

It's a different world, but it's a cool-

Kogel:

It's a great place. Yeah, I've been really happy there.

### **30:39 Moving into the Mining Industry, and Getting Involved in Professional Societies**

Kogel:

Yeah. So, I might add another little Haydn Murray segue here, related to mining because I don't think you've asked me. And, maybe you're going to? But, I'm going to ask the question of myself. Mining -- so I came into mining through Haydn Murray, but there was a very specific incident that led to it. And, we might talk about this later when we talk about professional societies, too. But, it was really when I was one of his PhD students, I came into my office. We each had a desk in the laboratory. And, there was this magazine sitting on my desk, and it said "Mining Engineering" on it. And then, there

was an application for membership. And, I'm like, "Mining Engineering? What is this?" Why would I apply for this? I had no idea, no idea at all.

Santos:

What is mining engineering?

Kogel:

What is mining engineering? I'm a geologist. What do I have to do with that? And so, I looked around, and everybody had one of these on their desk. And, I thought, "Okay. And where did this come from? Why is it here?" So, I went to Dr. Murray's office down on the first floor and knocked on his door and said, "Did you put this on my desk? And, can you tell me a little more about it?" And, he said, "Yeah. You should fill that out, and I'll pay for it." That's all he said. And, I left and I thought, "Well, when Haydn Murray speaks, you do."

Santos:

Yes. I mean, in retrospect, again, for students to be in professional organizations—

Kogel:

Exactly, exactly.

Santos:

That's an important thing.

Kogel:

It is. And, I didn't know this at the time, of course. So, I went back to my office and did what he instructed me to do, and I didn't ask any more questions about it. And, I thought, "Well, he's giving me this advice. I'm going to follow it. He knows better than I do."

Santos:

So, teachable.

Kogel:

And, he's paying for it. So, what does it matter? So, I fill it out, and then the next thing I know is, I don't know, I started getting the magazine. It took a couple months. It didn't happen right away. This was back in the old days when you mailed things. I think we had fax then. So, eventually, I get my first Mining Engineering magazine. I don't even know if it was called that then. And, it was the issue that has the president's interview in it, and the picture of the incoming, our new president, and it was Haydn Murray. I was like, "Well, who knew?"

Santos:

I know this guy....

Kogel:

And, then I'm like, "Hmm, maybe that's why he wanted us to be in this organization." And then, soon after that, I got this thing called The Blue Book. Do you remember The Blue Book?

Santos:

No.

Kogel:

So, years ago, if you were on a committee at SME, they had this thing called The Blue Book. And, it listed all of the committees and the names of the people who were the committee members, as well as the chair, and the blah, blah.

Santos:

Yes.

Kogel:

So, I got The Blue Book, and I'm like, "Why am I getting this?" And, I started going through, and it was not a phone book thick, but it was Sandersville phone book thick. Sandersville, Georgia's not a big town. But anyway, I start going through it, and my name's in there for this committee. And, it was the student member affairs committee, and I'm like, "Hmm, I've never been to a meeting. I myself am a student. I've been assigned to a committee. How did that happen?" And, I just thought, "Well, I've got to go to the meeting then."

Santos:

Yes. The way of the world.

Kogel:

And, it was probably '86 or '87. I don't remember what year he was president, but somewhere in that timeframe. And, that meeting was in Salt Lake City, where we are today.

Santos:

Okay. There we go.

Kogel:

Yep. And so, I flew into Salt Lake City, went to the student member affairs committee meeting, met George Luxbacher for the first time. I remember meeting George. Now he and I work together. And, there were many other people around that table. Oh, let me see. Who else? I can see faces, but names aren't coming to me at the moment. They will though. When they do, I'll come back to it. And, I was a little timid and a little bit sort of trying to feel my way and understand what it was all about; but, I got involved in that committee. That led to involvement in other committees.

And, when they see a volunteer that's actually going to show up and get things done, suddenly you have all these things landing in your lap. I was sort of maybe naïve enough to—

Santos:

Meeting people, yes.

Kogel:

To start accepting more volunteer invitations.

Santos:

I think it still works that way. You get put on a committee.

Kogel:

It definitely does. Or, if you don't show up for the nominating committee, you definitely get put on the committee.

Santos:

That's right.

Kogel:

And so, before I know it, after many, many, many, many years, I got more and more involved in SME, and I learned what a mining engineer was. I started figuring out what mining is. I started working for a mining company. And then, it took me a number of years before I felt completely at home in that profession; but people really always supported me. They embraced me. They welcomed me.

### **36:02 Working in Mining – Working as a Woman at a New Level**

Santos:

Even in the mines?

Kogel:

They mentored me. Even in the mines, and when I first came to Georgia, there was a little bit of—I was thinking about, "Okay, here's this woman. I'm coming to this rural part of Georgia. I'm working in an industry that's male dominated," and really still is. It's much better now than it was then. But, I come into this company that's family owned, and in some ways, old fashioned, and in other ways, I would say even leading edge. But, I was really concerned about how I was going to fit in there both professionally and socially.

They'd never hired a woman at my level in the organization who was there for a technical role. And so, I knew I was kind of paving the way at the company. And, Thiele was just a wonderful company to work for, and it was sort of like a family. They wanted their new employees to see all aspects of the business. So, I spent my first three months at the company rotating to every single department in the company.

Santos:

Good deal.

Kogel:

And, working in those departments, which was fantastic. And so, I was out in the mining department. I was in the exploration department and the lands department. I was with the finance folks, marketing, and then I was, of course, out in the plant. And, I remember being out in the plant and going out there, to the control room for my first day of my tour of duty in the plant. And, I go into the control room, and this guy looks at me, and he kind of sizes me up. And, he goes, "I heard you have more degrees than a thermometer."

Santos:

That's Georgia speak now.

Kogel:

And, I said, "Well, yes, sir. I guess so." Meanwhile, he's sitting where you are. Right? And, over him is this calendar. You know what's on the calendar?

Santos:

The ubiquitous calendar.

Kogel:

The ubiquitous calendar that was in every control room. And, I'm looking at him, and I'm looking at the calendar. And, I'm like, "All right. How's this relationship going to go?" Well, he warmed up to me pretty quickly, and we had a great relationship. And, my time at Thiele, I think I was there, I've lost count of exactly how many years, but it was close to 15 years.

Santos:

Wow.

Kogel:

And, I just felt comfortable in that company wherever I went. And, I think people respected me —I had credibility because I'd rotated through all those departments, and I respected them.

Santos:

Right, right. Yes.

Kogel:

I built these relationships, and people were willing to accept me.

Santos:

And then, I guess, essentially bringing something to the table, which maybe they didn't have before.

Kogel:

Yep, exactly, yeah. I still was the only woman. I mean, I remember many, many, many meetings where I was the only woman in the meeting. And, that was true at SME, too. And so, that was sometimes a little bit of a challenge for me, but I learned to have a voice, and I learned to be in those rooms and make sure that I was able to, like I say, have a voice and make contributions. That was most important to me. And, sometimes it meant listening, sometimes that meant being very outspoken about things.

### **39:24 Involvement in Other Professional Organizations**

Santos:

So, besides SME, what about some of the other—I mean, to see the benefit of getting that, what other professional organizations?

Kogel:

So, I have been involved in several, SME the longest, I would say, as well as the Clay Minerals Society. That's a much smaller organization: mostly academics and professionals and government employees are the membership of that organization. And, it's very much focused on clay minerals science and applied clay mineralogy and that sort of thing.

Santos:

A continuing education.

Kogel:

Yeah, yeah. I would say those are the two main organizations that have been the backbone of my professional life. There are other organizations that I've been involved in as a member, AIPG is another example. But, I didn't really get as involved in those organizations from a volunteer and leadership perspective as I did in SME and the Clay Minerals Society.

#### **40:31 Getting the Itch - Moving to Imerys and NIOSH**

Santos:

Yes. Okay. So, you were there at Thiele for that many years. But then, you decided you needed a change.

Kogel:

I did. Yeah. So, after about 15 years, I was in the research and development department. I was working on developing new processes, new products, as I alluded to earlier, a lot of really, really, really interesting things. I got to patent some processes and just a lot of really rewarding experiences throughout. But, at some point, I got that itch again. And, I thought, "Okay, I've spent 15 years in kaolin," and kaolin is a fascinating mineral, but I wanted more. And, I wanted an experience that not only exposed me to new minerals, but to other parts of the world. Thiele had North American operations. They had some small satellite operations in Europe, but that was about it.

So, it was somewhat of a more constrained experience, let me put it that way, than what I really wanted for the next part of my professional life. I had reached that mid profession point where I wanted something that was broader. So, I went over to Imerys. And, Imerys is also a kaolin mining company in Georgia, but they do much, much more. It's a publicly held company headquartered in France. I don't know how many minerals they mine, but it's all of the industrial minerals all over the world. And, I can't quote the statistics anymore, because I was with Imerys up until six years ago, or seven now. [So, my memory of production statistics is fading.] Actually, it's been seven years since I left Imerys. And, I was with Imerys for about 13 years, I think. Yeah.

And so, while I was at Imerys, I got to get involved in other minerals, and I got to go to other parts of the world. And, that was something that I was looking for; so, I was broadening my experience. And really, for me, it was taking my expertise that I'd developed and using it to do greater and greater good, have more and more impact. Because I think, ultimately, when I think back to that sixth grader who wanted a PhD, at that point—Who was that little girl? I wanted a PhD because I wanted to have impact. I wanted to do something. I wanted to change the world. I had this sort of desire. And, maybe that goes back to watching the astronauts land on the moon or something. I don't know.

And, I really wanted that, and I knew I needed to have these experiences that reached new territory for me personally to give me the stimulation, but also to allow me to take knowledge I developed, and use it in other areas. And, that's what Imerys gave me, and it really stretched me in ways that I don't know that I would've experienced elsewhere. And also, I had just really tremendous exposure to many new things and a lot of very

rewarding experiences there. But then, the itch happened again. And so, once the itch started, I started looking around thinking, "Okay, I'm on the home stretch of my career. And, this is sort of the last maybe 10 years, and what do I want to do with my capstone?" And, that's really how I looked at it, the capstone that would then maybe turn into the landing pad for retirement.

And so, I got this phone call. I was looking around, and I was talking to different head hunters, and I was trying to establish what I wanted next, honestly. What's out there?

Santos:

There's an idea.

Kogel:

Yeah. What would I like to see for the next part of my life? And, where can I contribute the most? It had to be a good fit. And so, I got this phone call, and it was an SME member. And, this is where professional networking becomes so important.

Santos:

Yes, so important.

Kogel:

One of our past presidents, who's now a dear friend, called me. And, he said to me, "Would you consider a job with the federal government?" And, I said, "Well, I've never really thought about that before, but I'm all ears. Tell me about it." And so, we spent the next 45 minutes or so talking about this opportunity. And, he says, "Well, it's a high-level position. And, it would be focused on health and safety, occupational health and safety." And, it was the associate director for mining at NIOSH. And, I knew the position well because I had known Jeff Kohler, who had it previous to me. And so, I knew Jeff also through SME, and I knew NIOSH just because everybody knows NIOSH, especially if they're doing crystalline silica and the kind of work I'd been doing throughout most of my career. And so, I said, "Yeah, I'm interested enough to learn more about this."

Santos:

And, they were after you. I mean, you were bringing industry experience, research experience. Yeah.

Kogel:

Yeah. And, incidentally, I'd just finished coming off my—I'd just finished as president Of [SME]

Santos:

We're going to talk about that.



Kogel:

Okay. I'll put that aside. Yeah, so I learned more and more about this government opportunity. And, I thought, "Wow, there's something really unique about the government that I didn't experience in the private sector," and, that is—and the timing was just right for me—that I could go to the government and do science for social good. And, I was in a place where that was really what I wanted to do. I didn't want to do science for better profit, which is sort of how it started to feel in the private sector.

Santos:

Yes.

Kogel:

Not that that had been my experience the whole time, and it hadn't.

Santos:

But, companies do evolve, and that's—

Kogel:

That's sort of how things work. Right?

Santos:

Yes.

Kogel:

And, you have your quarterly budget meetings, and budget became more and more [of a driver and consideration than scientific pursuit.] And, I was overseeing a lot of mining operations. I had a big budget for that because of [the high cost of overburden removal and mine development]. I was also doing all of the reserve reporting, and I was trying to make sure that we were mining our reserves for long-term sustainability. When you run up against a short-term budget, then sometimes there's conflict there.

Santos:

Conflict, yes.

Kogel:

Yeah. And, I thought, "Okay, I'm going to give this government thing a go." And, I knew a little, I mean, I knew occupational health and safety because I had been practicing it. We do every day in the mines. And so, I felt very comfortable in that arena. I felt fairly comfortable in the government only because my husband was a retired federal government employee, still is. I lived through all of his trials and tribulations and all the good things and the bad things that come with a government job because—

Santos:

Which is good to go into with your eyes wide open.

Kogel:

Absolutely. Yeah, so I'd heard his stories, and I knew what he'd gone through. And so, I felt really well positioned to go into that kind of environment and be successful.

Santos:

And, at that higher level, it is almost like you can have that bigger impact.

Kogel:

Yeah, exactly. Well, and that's exactly right. And, I really, for the first time in my whole life as a professional, felt that every day I was going to work doing something that saved people's lives and doing something that improved people's quality of life, by protecting them in the workplace. And so, it's been just a fabulous place to be. It's such a good fit for me. I think everything that happened before led me to this place. And, I just landed in it sort of because somebody else saw that I could be a good fit for it. I didn't see it.

Kogel:

And, that's sort of been the story of my life. I haven't always had the confidence or the self-awareness to see how I can fit into something where other people have, and they've sort of urged me in a new direction. And, I've always had the sense to listen and to consider [new ideas and directions]. I always listened, and I took these suggestions seriously, and I think that was really important for me.

Santos:

I think in the benefit of the government—I mean, they're benefiting from all that you could bring to the table, which might've been not the case of someone who'd been there forever, something like that.

Kogel:

I think I brought a fresh look at things because, for my particular position, the people in the past who have been in that position or in that role have been mining engineers. I'm a geologist, so I have a slightly different way of looking at things. But, let's face it, all of the occupational safety and health hazards, all of the risk comes from the geology.

Santos:

That's right.

Kogel:

It's the minerals that you're breathing. It's the geology and the competence of the rock that determines whether or not you're going to have a roof fall. So, it all comes back to geology in the end. And so, from that perspective, even though they haven't had geologists in my position in the past, a geologist is very well suited for the role. The other thing that I bring was the industry experience and industrial minerals.

Santos:

And a world view.

### **50:23 Pivoting from Coal to Industrial Minerals**

Kogel:

And a world view, yes. And, industrial minerals, I think, was important because NIOSH, up until fairly recently, has really focused on coal, particularly at the Pittsburgh Mining Research Division.

Santos:

Coal.

Kogel:

As we know, coal in this country has undergone a significant transformation. There are many fewer coal mines, fewer coal miners, still major occupational health and safety sorts of challenges for us to deal with, particularly amongst the retired coal miners. But, NIOSH, as a research organization, needed to really start pivoting their research away from coal and into other fields. And so, industrial minerals is one that really works as something to pivot towards, so, really, metal, nonmetal, in general. But, every state has an aggregates quarry. Right?

Santos:

Yes. Right.

Kogel:

And so-

Santos:

And all different kinds.

Kogel:

They have all different kinds.

Santos:

Underground, surface, gravel, hard rock. Yes.

Kogel:

Yeah. So, I think all of those things made it a good fit for me and where I could really bring some value.

Santos:

I mean, even the coal part of it has changed, with more out-of-seam mining and different deposits that they're looking at.

Kogel:

Exactly.

Santos:

Yeah.

Kogel:

Yeah. And, I think right now we're seeing a huge transition; it's right upon us right now with the energy transition.

Santos:

For sure.

## **PART 2**

### **00:42 The Future of Mining**

Kogel:

And, I would be so fascinated to be alive another 100 years to look back on what's going to happen with mining. It's going to change fundamentally in the next 10, 15 years. And, it's—

Santos:

And we thought it wouldn't happen, but it is.

Kogel:

No. I think the impacts that we can have as a profession now are like nothing we've ever seen before. And, I hope we're prepared for that and that we're positioned to recognize that and that we can really take the bull by the horns and really change the perception of mining.

Santos:

Yes. I mean, it comes down to, I mean, right. As you said, right now, it's almost we have a different view of my experience, and I'm sure you, of how we view mining and how we want people to know about mining, and how it can be sustainable.

Kogel:

Exactly. And, that's an area I'm glad you brought that up, Vanessa, because sustainable mining and sustainable development is something that I have been really interested in and have been very involved in through a number of different kind of activities that I've volunteered for. A lot of this is volunteer work that I find the most rewarding. And, I really believe that mining is just something that needs—I mean, I think we're getting more and more sustainable. And, I think the perception of mining is starting to change just a little bit, but mines are really starting to take this the next step.

If you look at what the Rio Tintos are doing, I mean, all of the major global metals mining companies, they're really taking this whole idea and concept of, I'm going to call it “green mining” in terms of their energy sources or how they're using water and closed systems. I mean, I can name a lot of different examples. But, we're seeing more and more of this sort of thing happening out there in the private sector. And, I think this is so, so very important, but we don't talk about it enough.

We have so many really, really amazing creative—and I use that word very purposely—examples, a lot of ingenuity. And, I often have said to people, if I had to get in a capsule and fly to Mars or to the moon or whatever to escape something on Earth, I'd want to take just mining engineers with me, because I know we would survive and thrive and do it well because mining engineers are people that figure out how to solve very difficult problems. And, the issue now is we don't have enough resources to meet the needs of our growing population, whether that's mineral resources or water resources or what they may be. Environmental protection is so important.

Obviously, if you mine, you're impacting the environment. I mean we know that, but you can also mine in a way that you're impacting the environment, but it's a short-term impact. And then, you extract value, and you restore it to something as good as, or preferably better than, it had been prior to the mining operation. Something that the local community can be proud of. Something that can generate revenue for the local community, can generate a healthy environment for the local community, whatever it may be, whatever of value that community wants. We have the power to do that. And, we do do that, but we don't talk enough about it.

Santos:

I mean, and that kind of goes to even how I think we talked about before, about the business of mining and how they look at the people that work for them or how they look at the community.

Kogel:

Yeah.

Santos:

So, how that changes and maybe in our careers, how we've seen that. We've kind of done that all along at our level, but maybe now it's becoming bigger.

Kogel:

I think it's becoming bigger. And, I think you're right. I think one thing that's really important is if we're going to do sustainable mining or however you want to call it, I don't care what the word is. It has to occur at all levels within the mining business or the mining operation.

Absolutely at the C-suite, and oftentimes that's where it starts. And, I think you can see that's what's happening at all the major companies, you've got to do that if you're going to have your social license to mine. But, it then has to come through to the day-to-day operations as well. Because if you aren't making decisions in the day-to-day operations that really push this idea of doing things in an environmentally—I don't want to say friendly as much—conscious—

Santos:

Responsible, yeah.

Kogel:

And, responsible way, then you're missing the boat.

It's just a word or words. And, it's maybe your report that you put out annually, but you really got to be doing it every day. You have to operationalize this. And, I think we're seeing that transition. And, I think many companies have made that transition. But, it's a generational thing, too. I mean, you alluded to that over our time in the industry, I've always said that miners and mining engineers and geologists who work in the mining industry are all environmentalists in some way. And, we all love—

Santos:

We want to do a good job.

Kogel:

Can I say we love the earth? We're all tree-huggers. Yeah, we want to take care of the earth. We want to take care of our communities. We're not out there to make it worse. That's not our objective and never has been, but things do happen. And, there are some legacy issues that we still are living through and we're still dealing with, and we will continue to. And, really, the idea is to try to head those off at the pass. But, mistakes were made, and it's not just true of mining. You look at any industry. The chemical industry—I mean, we can name lots of examples. And, I don't think any of these were necessarily made deliberately.

And, we see this in the area of health and safety, too, where sometimes mistakes were made, sometimes maybe shortcuts were taken, because people didn't understand the risk or really what was at stake.

And so, it's really about communicating clearly the science, it's about engaging the workers and empowering the workers so that they understand the risk to them as individuals, so that they can then play their role and take their part, take responsibility for themselves and their coworkers.

So, there are a lot of things we can do. And, I kind of see all of this kind of coming together in this whole ES and G area. And, at the same time, we can become the example to the rest of the world of how to mine these minerals sustainably, so that they can then be used in our electric cars, our windmills or solar panels, what have you, and—

Santos:

Export that technology.

Kogel:

Yeah, and so I think we play this dual role in this space. That's very exciting. Mining engineers, as I say, are the most inventive people. They like to go off and invent. They don't want to be out there being the spokesperson.

Kogel:

None of us want to do that, really.

Santos:

That's right.

Kogel:

So, I think we need to start being better at—

Santos:

Messaging.

Kogel:

Messaging. Yeah.

Santos:

Yes.

Kogel:

Messaging from the heart, too.

Santos:

Yes.

Kogel:

Because this is real, there's a real passion.

Santos:

Yeah.

### **08:30 Why Are You in Mining?**

Kogel:

It's because I love the people. It really comes back to the people in this industry. And, I've just found them just stimulating and fantastic. And, here we are.

### **08:57 Goals and Accomplishments at NIOSH**

Santos:

So, you're still at NIOSH, and maybe we could talk about some of the goals you set out when you got there and what you feel like some of your accomplishments have been there.

Kogel:

Sure. So, when I got to NIOSH, I did what I think a lot of people do in a position like mine, just spent time getting to know the organization. I tried to meet with each employee. I couldn't meet with everybody individually because that would've taken me a lot of time. So I would do small groups of 10 and just try to understand how people perceived the organization, what was working, what wasn't, that sort of thing.

And, at the same time, I know the industry because I come from the industry and also because of my involvement in SME. So, I felt like I had the knowledge base to really assess what was working well at NIOSH and where we needed to continue to focus and where we maybe needed to make some changes. And, one of the things I observed was that we are the National Institute of Occupational Safety and Health. I really felt that we had safety nailed. We develop these really amazing engineering controls and monitoring devices. We're doing sophisticated safety-oriented mine design, we've kind of broadened our concept for that. All of those things really come back to safety.

If you're going to parse the world into safety versus health, I feel like there is much more to do in the area of health, even though we have done tremendous work in the



area of dust exposure, engineering controls and monitoring devices that have been introduced into the mines and saved lives, no doubt. We need to take it another step by elevating health research to the point of where it is equivalent to where we are with safety today.

So, that was one of the things that I looked at and identified as an area where we could make very important contributions.

So, what we did in response to that is we developed this miner health program that's still in its inception phase, and it's not something new that I came up with. As a matter of fact, NIOSH tried to do something similar before I came on board, but they ran into issues. And so, I met with the director of the institute, John Howard, who gave me a little bit of background history about what had perhaps not been done as well as it could have been the first time around, when they tried to launch this new miner health program that was to assess the baseline health of miners and then make sure that all miners retire with good health, so they could have long retirements.

Black lung is a great example, pneumoconiosis, and we have so many other examples that our miners, can be exposed to. [Things besides coal dust such as crystalline silica or asbestos or noise over exposures that] can really change, shorten, and, maybe, reduce the quality of miners' lives. So, that's the thing that we want to avoid. This program in its first time out of the gate didn't bring the stakeholders on board during its early inception; so, it failed. Stakeholders include the industry, mining community, academia, other government agencies, local as well as federal, and suppliers. I forgot to mention another major one, which is the unions, organized labor.

All of the stakeholders have slightly different perspectives, they have different needs, they have different agendas. They have different priorities. When they first started to launch this program right before I came to NIOSH, it was announced in the federal register, but we had never really met with the stakeholders.

Normally we would have met with the stakeholders. We convene some sort of workshop, or whatever it may be, to say, "This is something NIOSH is preparing to do. We would like your input. What are your priorities? What are your interests?" As far as I understand, that didn't happen or it didn't happen to the degree that maybe it needed to have happened. And so, at that point, the program was, basically, put on hold.

Santos:

No buy-in, essentially, at that stage yet.

Kogel:

Right, no buy-in at that stage. I came in, I didn't even know that this existed; but then, I identified health as something we needed to be more focused on. And then, I got this other back story. And so, we changed how we approached it, which is why I say it still is in its inception because we want buy-in every step of the way. We actually convened a meeting of all of our stakeholders. We had the national academies facilitate that meeting in Washington, and it was a really interesting thing. It was more of a listening session for us. And, we got to hear about all the things we didn't do well the first time,

which was really important. It was sort of cathartic for them, really important for us to hear and understand. And so, we took all that information and then we relaunched a renewed program that had actually very different goals in the end, based on stakeholder input.

And so, we've had a number of meetings, stakeholders all sitting in the room. Some stakeholders are pushing one priority versus another group of stakeholders that have another priority, and we're trying to get all of that brought together in an integrated, comprehensive program.

So, we're going through that process. It's actually being led out of the Spokane Mining Research Division. And, we have a research agenda on our website that's there for the public or anybody to view. And, in this day and age of opiate overuse, of suicides rising, fatigue, heat stress, lots of different health issues beyond black lung and some of the things that we're all familiar with are now part of this program. And, they're priorities for our stakeholders. So, I think it's a really exciting time for this program. And, I think we're going to continue to take this very kind of deliberate, thoughtful, stepwise process where we bring our stakeholders along with us.

Actually, it's more, they're leading us. It's their program. These are federal dollars. We will make the program happen, but we want it to be what they need. And, really, industry is key here. And so, we come to SME, and we'll put on a session. And, we'll have people from industry present what they're doing for their workers. And, it's really been great to hear the conversations in the room and the dialogue that gets going and to see the excitement and the passion of the people who are leading these programs within individual companies.

Santos:

So, not adversarial anymore. I mean, again, it's to their interest, to the mining industry's interest to, again, have that long-term healthy people and attracting people.

Kogel:

Yeah, exactly.

Kogel:

Yeah. So, that was one thing. The other ones I already discussed, and that is coal is still incredibly important. We still have many coal miners that we have to help in terms of addressing issues, long term chronic issues, particularly related to dust exposure. But, we also need to broaden our research and continue to push that envelope into new areas. And, I think we've made a lot of really good steps, and that's developing new relationships with parts of the industry that we didn't have in the past. I think that's where my industrial minerals background helps. Though, we, before I came along, had really strong relationships with several leading industrial minerals companies who very much saw us as a research partner, which is what we seek to do.

We want to partner with industry. We want to partner with universities. And, I guess that would be another area. We have what we call the extramural program. And, with

the passage of the MINER Act, we had funds that came to NIOSH that were then to be used for contracts and grants, that were then awarded to both universities as well as companies in the private sector. There's a whole part of that contract program that goes towards what we call the capacity build program, where we're building capacity within the mining engineering community in the United States, because there was a real concern at the time that the MINER Act was passed, that we didn't have the capacity in the United States to really address some of the major issues in ventilation or ground control. For example,

Santos:

That's "bods" essentially.

Kogel:

That's what?

Santos:

Bodies.

Kogel:

Yeah, bodies. Yeah, exactly. So, we were having fewer and fewer mining engineering programs. They were shutting down for various reasons: the one at Berkeley did. That was actually where I first heard of mining; never saw myself in that industry, but I had at least heard of it. So, I think the capacity building has been tremendously successful. We have had, I don't know—George Luxbacher also here at this meeting, he is the person who is in charge of that program, and he could quote the statistics off the top of his head. I wish I had them—as far as the total number of PhD students and professors that have been the recipients of these contracts over the life of this program, which has been over 10 years now. It's been very, very successful.

And, actually, NIOSH has not only had the benefit of the science and the engineering that has come as a result of these contracts, but also, we've been able to hire some of the students that have been supported on these contracts, because they learn about NIOSH and the work we do, and they want to work for us.

Santos:

There you go.

Kogel:

We learn about them, and, suddenly, we've created a pipeline; that was not, as far as I know, the original intent. But, that's one of the benefits we've realized. So, that's another area that we have been expanding our ability to do. We have world class research facilities. We have world class researchers that are federal government employees that work in our program. But, we can't do it all. And, it is a broad field,

even though it seems really narrow. Because mining's a small community; it is a very broad field and there's a lot of challenging science and engineering that has to happen.

So, we have to rely on the universities to really accomplish what we want to accomplish. Our mission is to make sure that there are no mining fatalities and reduce illnesses, chronic illnesses. We can't do that by ourselves. We have to rely very heavily on both our intramural and our extramural program. And, that's something that we're continuing to expand and grow. We're doing more grants, and it's all just, I think, in the end, going to mean that we have a safer and healthier mining workforce. And, that's what we're after.

Kogel:

So, those are some examples. I think those are probably the main things.

Kogel:

Yes.

Santos:

Yeah. That's a lot.

Kogel:

Yeah.

Santos:

It's a lot.

Kogel:

Well, we've got some fantastic people who are passionate about making sure we get things done—and we do get a lot of things done—and that's not because of me, that's because of the people that work in the program and really have a strong drive and passion for this work. [The scientists and engineers that work on mining research at NIOSH are very smart, innovative, and dedicated.]

Santos:

Yes. Excellent.

Kogel:

Yeah.

## **22:07 Involvement in SME as President**

Santos:

Okay. Well, let's talk a little bit about SME because, right between Imerys and NIOSH, that's when you were president at the SME.

Kogel:

Yes. My presidential year was 2013, and we had our annual meeting in Salt Lake City.

Santos:

Salt Lake City!

Kogel:

Yeah, Salt Lake City keeps coming up. My first time I went to SME was Salt Lake City.

Santos:

That was your presidential year...

Kogel:

My presidential year. We're here now. Yeah, so Salt Lake City, there's something about Salt Lake City. So, that was, yeah, that was a tremendous year. I had the opportunity to travel all over the world for SME.

Santos:

I think almost more than anyone of the other—

Kogel:

I think that might be true.

Santos:

Yes.

Kogel:

Yeah, I was on the road a lot.

Santos:

All right. So, let's name some of those places you got to go and some of those people you got to—

Kogel:

Sure. So, we went to South America, we went to Peru and Chile more than once and met oftentimes with student chapters.

Santos:

I mean, that's the thing about SME that we have incredibly strong, I think Peruvian and Chilean.

Kogel:

Yes, we do. [Because SME has so many members and activities occurring in South America, during my year as SME president, we established an SME office in Peru to both serve existing members and grow membership in that region. It has been very successful. And, we have seen a significant growth in membership since establishing that office, which has been very capably and professionally run by an organization called Engine Zone. They have done a tremendous job reaching out to students and supporting the growth and activities of student chapters.]

Santos:

Student chapters.

Kogel:

Yeah. So, then there were trips to South Africa, to, let me see, that was Cape Town. Yes. I've made several trips to South Africa. I'm trying to remember which one was SME. It was Cape Town. I went to Australia, went to London, that was for a conference. Went to Greece. I went to Mexico.

The purpose of these trips was to meet with members and to participate in conferences. Sometimes, it was to meet and interact with student chapters, as I mentioned, oftentimes both of those things, if we could combine them both. It was really about getting out to meet the membership and also to meet with executive directors and presidents of other major mining organizations globally. And, there's actually a group that's been meeting for a number of years, and they have a name which I've forgotten. [International Council on Mining and Metals (ICMM)]

Santos:

Did I have it written here?

Kogel:

Its membership includes the major professional organizations in Australia, South Africa, US, I think the UK, except I'm not sure they're officially on board. They were sort of not, when I was president.

Santos:

The Extractive Industry Geology Conference?

Kogel:

The company that I worked for, Imerys, had big operations in Cornwall. But, they, like many countries in the world, historically, had a lot of coal mining, for example. And, tin mining is not what it used to be. A lot of things are on a downward trajectory in terms of the numbers of mines and mineral production in England, which is why they may not have been as involved in the Global Mining Association. Where else? I feel like I'm leaving out somewhere.

Santos:

Didn't you go to Morocco as well?

Kogel:

That was later. That was not for SME, but that was about the same time. That was actually for the Colorado School of Mines. That was really interesting. I got to teach a two-week course there. I actually traveled all over, but it was—

Santos:

Phosphate.

Kogel:

Pardon?

Santos:

Phosphate.

Kogel:

Yes, that's exactly right. And, I talked for, or taught this group of, what, maybe 30 people, about exploration geology, particularly for phosphate and also some broader sorts of applications, like just industrial minerals in general [crosstalk 01:19:59]

Santos:

Particular sedimentary deposits, clay, right?

Kogel:

So, that was a really fun experience, I really enjoyed that. So, that was for OCP. And, I spent some time in Marrakesh and Casablanca, and then traveled around to some other areas while I was there to have the opportunity to see that part of the world.

Santos:

So, just, yes.

Kogel:

So colorful and so interesting.

Santos:

So, presidency during not COVID, so, yeah. That you can—

Kogel:

Thank God, yeah. But, it was just, again, an experience that I never thought would land in my lap.

Santos:

And, that you were the second woman president—

Kogel:

That's right. I was the second woman president of SME, yeah. It was just tremendous. It was really, really rewarding. And—

Santos:

And, you had a lot of support from your company at that time?

Kogel:

Absolutely. Imerys basically said, go do what you need to do, take as much time as you need to take.

Santos:

Whoa.

Kogel:

Yeah, no, it was tremendous. They were really incredibly generous that way and so I got tremendous support, and I got tremendous support from SME staff, from Dave Kanagy, the Executive Director. He was such a pleasure to travel with and to work with for that year. I would love to have that kind of experience—I mean, you can't have that experience every year, because it was just so wonderful—

Santos:

Exhausting.

Kogel:



Yes, it was exhausting but stimulating.

Santos:

That's right.

Kogel:

But, yeah, I mean, in some ways, it was sort of a pinnacle for me. It really was.

### **27:39 Current Involvement in SME**

Santos:

But, you say that, but you're still pretty heavily involved in SME.

Kogel:

Yeah, I am, but not to the same degree. And now, I'm really enjoying, just sort of being a little bit behind the scenes—

Santos:

Because it is your community?

Kogel:

Less involved. But, you know, I think, this morning, I went to the Past Presidents' Breakfast. And, I said to the presidents there, that SME is my second family. And, it really feels that way. So, I'm glad that I've had the longstanding kind of professional involvement. And, it was like I said before, when the doors open and there's an opportunity, walk through it, don't look back. And, that's probably what led me to the presidency, and that was never an ambition for me. And, honestly, I, like so many women in particular, suffer from the imposter syndrome, and to imagine myself as the president of this organization? Never thought of it.

### **28:40 My Supporters**

Santos:

We could talk about some of your [other presidents]— you mentioned George, but also some of the other folks, like Nik.

Kogel:

Nikhil Trivedi. He's been a great mentor for me. He was president when I was nominated. So, he was the one who called me to say, we'd like you to consider being president of SME, because the current president chairs the nominating committee. And, he's just been there for me all along and—

Santos:

And, talk about a collaborative person—

Kogel:

Oh, yeah.

Santos:

[Crosstalk] Of course.

Kogel:

I've learned so much from him. I really look up to him and how he interacts with people, just his manner. But then, there's also the technical side as well. I've learned many, many things from him, and I think he's helped open doors for me, maybe doors I don't even know that he helped open, honestly. And, Frank Alsobrook, and you remember Frank? He was somebody else. And so, I worked with Nikhil and Frank and Stan Krukowski—

Santos:

Stan; let's mention that tome, shall we?

Kogel:

So, the four of us worked together, we slaved, maybe, is the right word—

Santos:

I think that's the word.

Kogel:

For a number of years, I think it was a four-year project. And, it was the seventh edition of Industrial Minerals & Rocks, which is, as you know, being in the industrial minerals' world, the kind of go-to technical reference for industrial minerals.

Santos:

It is the reference—

Kogel:

Reference, for marketing, for technical information for geology, mineralogy, what have I left out?

Santos:

How many chapters in there?

Kogel:

Probably just over 100 chapters. And, it's this thick. Yeah, no, that was another experience that—again, it was a volunteer experience.

I think I brought up the idea that we needed a seventh edition at a meeting, and I said, "Okay, so, the last time this was published, it was edited by Don Carr." Don Carr was, at the time, I think, at the Geological Survey, the Indiana Geological Survey in Bloomington. So, I knew Don because, at the time, I was also in Bloomington. And, I think he was the state geologist? I think he must have been.

Santos:

I think so.

Kogel:

I think so. I don't know that—I'm going to have to fact check that. But anyway, I knew of this book, and I knew that Don had done it. And, I really respected this book. And, I knew that it was a much consulted and much revered tome, let's call it. And so, I think I brought up at some meeting I was sitting in that, "Hey, you know, it's been 10 years. Isn't it time to revise it?" And, I think everybody around the table said, "Yeah, it is. So, you're going to do it, right?"

Santos:

See how that works?

Kogel:

Yeah, exactly. And, I think I was like, yeah, I'm going to do it. But, I've got a full-time job, I have three children—I didn't say this out loud, this is all happening in my head—full-time job, hour and a half commute each way to work, a husband who is either in medical school or just starting residency, and three children. And, I thought, hmm, this sounds like a really fascinating, really interesting project that I would give anything to be involved in. But, I don't have the bandwidth to carry this load, you know? So, I recruited some of my supporters. And so, it was me, it was Nikhil Trivedi, it was Stan Krukowski and Frank Alsobrook. And so, we divvied it up and all did it together. [We could not have done it without the support of SME staff. Jane Olivier was of paramount importance. She heads up the publications at SME and does an amazing job.]

Santos:

And, it was at least four years?

Kogel:

It was at least four years and a lot of people, 110 authors, something like that. It was—talk about herding cats.

Santos:

Yes. "Please submit your portion—"

Kogel:

Please herd my cats. Somehow it feels like, but I've just had a lot of mentors that have helped me. And, the other one that I alluded to earlier, the past president that called me about the NIOSH job, that was Mike Karmis.

Santos:

There you go—

Kogel:

And, he's been another one who's just been always there supporting me, always kind of urging me to do things that maybe I didn't see as something that I had the background or the credibility to take on. And, the minute there was somebody there kind of cheering me on, I was willing [crosstalk 01:27:37] and ready do it. And, I was like, my mother kept—and still says to me—you have to learn to say no.

Santos:

That's right. That's right.

Kogel:

I'm learning.

### **34:11 Attracting People to the Mining Industry**

Santos:

Whoa. Well, we've covered a lot. Okay. So, I think we did sort of want to chat in general about, I mean, we did talk about the industry, but maybe to go back to attracting people to the industry. And, I mean, we talked about sustainability and things like that.

Kogel:

Yeah. So, I think it's a real issue for us. I think everybody's talking about it. How do we make mining as a profession attractive? The mining engineering departments, are seeing enrollments fall, and that's, obviously, our pipeline to our workforce. This isn't a new problem, this is something that's been going on for a while, and it's a well-established trend. It really is about the perception of mining and people don't know that mining exists—I'm a great example, right. It was a long time before I figured out what mining

was. And then, I ended up being in it, and I would never look back. But, how do you get people introduced to mining?

Kogel:

So, if somebody's trying to pick a profession, or even they're in school and they want to be an engineer, are they even thinking about mining engineering? Well, if they're on a campus that doesn't have mining engineering, they definitely aren't. And, if there is a mining engineering department on campus, they probably still aren't. When I was SME President, I would go to the student reception and I would talk to the students, And, I would ask them, "So, how did you get into mining engineering?" And, I would say at least 50 to 70%, I wasn't keeping numbers, but somewhere in that ballpark, would tell me that, "Well, I started out in another engineering discipline."

Kogel:

It might have been civil, for example, might have been mechanical. And, they said, "I just found it so dry and not that interesting. But my roommate was a mining engineer, and I heard them talk about their classes." Or, somehow, they had some connection to mining engineering, and they found out about it. And then, they would take a course, and then they'd be hooked. Almost every one of them would say to me, mining engineering is so interesting because it involves all of the engineering disciplines. And, they loved the fact that it was this integrative sort of discipline on its own. And, they also, many of them, said that through mining, they can make a real difference in the world. I hear that message over and over and over again from the younger generation. They want a job that will allow them to do something that has a substantial impact in the world.

Kogel:

And, it sounds a little bit like how I felt when I was coming into it, and they see mining engineering as that vehicle. But, you've got to somehow get people to that point of understanding and knowledge about mining engineering. And, I don't know how you do that. For so many people, whether it's the media or what they're reading in their school textbooks or seeing in movies, mining is rarely portrayed as something interesting, as something technically challenging—

Santos:

Moral.

Kogel:

Moral, yeah, however you want to put it. Mining gets a really bad representation. And so, people don't see it as a viable career path—it's written off. And, honestly, that's how it was for me. And, I remember, as you know, that radical Berkeley student I was. I remember saying to myself, "I will never work for oil and gas or mining."

Santos:

Until you do.

Kogel:

Until I did.

Santos:

Yeah.

Kogel:

Well, eventually, you grow up, but it took me a while to get there. So, I think it's making those connections. I think it's changing the way that the whole world perceives mining so that there's a better, like you said earlier, the messaging has to happen.

### **38:26 The Positive Impacts of Mining**

Santos:

Remember that story you told me before, Jessica, about how you had a friend who said that maybe someday there won't have to be any mining.

Kogel:

Yeah, I do remember that story, very well. That was a story where I was with a friend of my mother's. And, we were just chatting—she had learned I was a geologist. And, the conversation started out with her asking me, "What university do you work for?" And, I said, "Well, actually I don't work for a university." And, at that point, I sort of let the conversation die. And, I'd been doing that for decades and decades and decades. And, I was just almost ashamed to say I worked in the mining industry. And, I suddenly realized that that's not the way to handle this, that—

Santos:

And, that's not even true—

Kogel:

And, that's not even true! As somebody who loves this industry, really respects this industry, and believes in this industry for what it can do, positive things that it can do for society, for the environment, etcetera.

I have to be the spokesperson. So, fortunately, I then said, after hesitating, "I work in the mining industry", I was kind of proud of myself for finally overcoming that. And, she then made this comment to me, she said, "Well, why do we have to have mining? Because can't we synthesize all the minerals?" Anyway, she said something like that, can't we synthesize all the minerals that we need, anyway? And it really was eye-opening to me, because this was a woman who was very well educated. And, she wasn't in a scientific field, but she, I think, was very knowledgeable, understood how the world

worked. But, she had no concept about raw materials, where they come from, why mining is necessary, how minerals are used. And so, I used that as an opportunity to educate her a little bit and to talk about minerals and how they're used.

And, at that time, we happened to be walking, where were we? We were somewhere in Italy. And, we were walking down this ancient medieval street with frescos on the walls of the churches and that sort of thing. And, I was able to just start pointing out to her that the reason we have these beautiful cathedrals and the reason we can have frescos and the paintings that are in all of the art museums—

Santos:

The roads we're on—

Kogel:

Yes, the roads, exactly. So, I was able to give her all these examples and say, "We couldn't do that without minerals." These are all materials that were sourced from the ground. And then, I think I probably told her what we all say, "If it can't be grown, it has to be mined." And, I said, "If you think about it, that's the case."

And, I don't know if I swayed her or changed her in any way. I said, "Yeah, we can synthesize some things, but as far as the cost and even the environmental impact of synthesizing things, because it takes tremendous energy, that could be more damaging than mining". And, I said, "And, mining is a temporary use." And, if we're doing mining correctly, we're restoring that land, as you and I talked about earlier. So, these are the sorts of conversations that we need to be willing to have. And, if we can start changing the perception, that's when people start supporting mining, that's when younger generations start wanting to be in this industry professionally. And, that may happen with this green revolution that I was talking about, with this energy transition. I mean, look what Tesla's doing, supply chains are going to change.

Santos:

Yes. They have to.

Kogel:

They have to, and we're going to see companies suddenly, like Tesla, this innovative company that everybody looks at and is super high tech, is like talking about mining, right?

Santos:

Yes, having to have some agreement that they're—

Kogel:

And, having agreements with mines and having their own mines. This going to start changing things.

Santos:

I think so, yeah.

Kogel:

And, again, we've got to be looking at this as an opportunity because that's what it is. That's what it is.

Santos:

True.

Kogel:

So, somebody might say, "Hey, I work for Elon Musk. I work in his mine."

### **43:03 Summing Up a Career in a Few Words**

Santos:

That's right. That's right. Okay. Whoa. So, I think we talked about so much. Let's see, maybe this is the point where you can sum up your career, and they say two or three words. But, I don't think two or three words is necessary.

Kogel:

No, I'm going to use one word. Actually, it's two. So, the thing that I would say about my career, if I were to use one word, is that it's been fun. And, that was for me really important, as long as I went to work and was having fun doing what I was doing, that was good. Having fun meant that it was challenging, that I had the opportunity to do something that was positive and good for the greater world. And, that was, in some way, inspirational. So, challenging, inspirational, doing good. That's more than three words.

Santos:

Yes. But, that's a message, I guess, that we could take to people coming up or people that are coming in.

Kogel:

Yeah. It's so rewarding. And, really, when I say doing good, that's probably rewarding, right? Maybe summarize that as rewarding. We each define rewarding differently, but, I think, rewarding could cover that.

Santos:

Yes.



Kogel:

So, yeah.

Santos:

Okay. All right. Is there anything else you want to say for some concluding?

Kogel:

Gosh, well, I mean, this has been really very, very interesting to go back down memory lane and revisit some of these things. And, I want to thank you, Vanessa, for coming on this little journey with me this afternoon. [crosstalk]

Santos:

Super pleasure.

Kogel:

Yeah. It's been really fun. And, to think that there's something special about Salt Lake City, we have to unlock that mystery.

Santos:

That's right. So, Salt Lake City and Georgia where we first met, a bazillion years ago.

Kogel:

That's right. A bazillion years went by in a flash.

Santos:

That's right.

Kogel:

We both had brown hair then, that's—

Santos:

That's right. Okay. Well thanks so much, Jessica. That's super, that's great. I think anyone can watch this [oral] history and maybe learn something and feel something and appreciate something.

Kogel:

No, thank you.

Santos:

Thank you.

Kogel:

All right.