NIOSH Dose Reconstruction Project
Worker Outreach Meeting with Former Workers from the Blockson Chemical Company

Meeting Date:
January 25, 2007, 7:00 p.m.

Meeting with:
Former workers from the Blockson Chemical Plant, Joliet, Illinois

Attendees:

Name	Organization	Name	Organization
name withheld	Blockson Chemical	Matt McFee	Oak Ridge Associated Universities (ORAU) Team
name withheld		name withheld	
name withheld		name withheld	
name withheld		name withheld	
name withheld		name withheld	
name withheld		name withheld	
name withheld		name withheld	
name withheld		name withheld	
name withheld		name withheld	
name withheld	Petitioner for Blockson SEC	name withheld	Olin
name withheld		name withheld	
name withheld	Blockson	name withheld	
name withheld		name withheld	Blockson
Wanda Munn	Advisory Board on Radiation and Worker Health (ABRWH)	name withheld	Blockson
Chick Phillips	Sanford Cohen & Associates	name withheld	Blockson
name withheld	Olin	name withheld	Blockson

NIOSH/ORAU Team:
Stuart Hinnefeld, National Institute for Occupational Safety and Health (NIOSH), Office of Compensation Analysis and Support (OCAS)

Thomas Tomes, NIOSH/OCAS

Laurie Breyer, NIOSH/OCAS

Mark Lewis, Oak Ridge Associated Universities (ORAU) Team

Mary Elliott, ORAU Team

Proceedings:
Mr. Lewis convened the meeting at 7:00 p.m. by welcoming the attendees and thanking them for coming to the meeting. He noted that many of the attendees had come to the meeting the previous evening and thanked them for returning.

Mr. Lewis introduced himself and described his background as a long-time union employee at a Department of Energy (DOE) nuclear facility. He is currently on leave of absence to work as an outreach liaison for the National Institute for Occupational Safety and Health (NIOSH) Dose Reconstruction Project. The NIOSH project is part of the Energy Employees Occupational Illness Compensation Program Act (EEOICPA), which compensates current and former workers in the nationwide DOE nuclear weapons complex who may have become ill as a result of exposure to radiation during their employment.

Mr. Lewis noted that many of the attendees were survivors of former Blockson workers and asked them to remember that the main purpose of the meeting was to hear from the former workers about the daily

operations and safety practices that were in place at the plant during the contract period. The information from the workers may help the NIOSH/ORAU Team to improve the site profile for the Blockson Company, as well as the Special Exposure Cohort (SEC) Petition Evaluation Report. He encouraged the survivors to first allow the workers to share their experiences. The survivors would be given the opportunity to share their stories after the workers finished.

Mr. Lewis stated that a court reporter was present to make a transcript of the meeting, which was also being recorded by the NIOSH/ORAU Team so the minutes would accurately reflect the proceedings. He introduced Mr. Stuart Hinnefeld of NIOSH.

Mr. Hinnefeld stated that his organization is a branch of the Centers for Disease Control (CDC), a division of the United States Department of Health and Human Services (DHHS). NIOSH is tasked with fulfilling the Department's responsibilities with respect to EEOICPA radiation dose reconstruction. EEOICPA is a program established by Congress to compensate employees who performed work in the nuclear weapons industry for DOE and its predecessors, the Atomic Energy Commission (AEC) and the Manhattan Engineer District (MED), for illnesses related to their occupational exposures to radiation and other hazards.

The Blockson Chemical Company was under contract with the AEC from 1951 to 1962 to recover uranium from phosphate ore. Former workers from the Blockson plant are eligible for compensation under Subtitle B of EEOICPA for cancers related to radiation exposure or silicosis or berylliosis. While the latter illnesses are easier to identify, it is more difficult to prove that a cancer is specifically caused by radiation. The law set up a specific scientific method to determine whether the cancers are "as likely as not" to have been related to the workers' occupational radiation exposures. This calculation is called the probability of causation (POC) and is based on the radiation dose that a worker received over the course of his or her career. The POC must be 50 percent or greater for the worker or survivors to receive the compensation.

The Act is written to make every effort to be favorable to the claimant. One aspect of this involves the use of a very high estimate of the POC instead of the likely value. This high estimate is compared to the background probability to determine which is greater or more likely. During dose reconstruction, if there are gaps in the worker's radiation dose records, or if there is no information available, NIOSH assumes that the worker received the highest dose on record for the worker's employment period. Despite these extra measures for claimant-favorable dose reconstruction, less than one-third of all claims that have dose reconstructions are compensable. This is a nationwide statistic that includes sites like Hanford and Savannah River that were engaged in long-term plutonium and uranium operations.

Mr. Hinnefeld stated that since NIOSH only has the authority to perform radiation dose reconstructions for Subtitle B cancer claims, the Team can only answer questions regarding related topics. NIOSH is willing to hear comments or questions on any topic about Blockson, but may not be able to comment on other topics.

Mr. Hinnefeld is a health physicist at NIOSH. He introduced his colleagues: Mr. Tom Tomes, also a health physicist, and Ms. Laurie Breyer, a communications specialist who counsels SEC petitioners during that process. He noted that Ms. Wanda Munn, a member of the Advisory Board on Radiation and Worker Health (ABRWH), was in attendance. The Board oversees the work done at NIOSH. At the

December ABRWH meeting in Naperville, Senator Obama requested an outreach meeting so that NIOSH could learn first-hand about the AEC contract work at Blockson. Mr. Hinnefeld also acknowledged the presence of Chick Phillips of Sanford Cohen and Associates, a contractor to the Board.

Mr. Hinnefeld stated that the former workers in attendance at the previous evening's meeting had conveyed very clearly that there had been no safety measures at Blockson Chemical during the contract period. There was no radiation protection program and the workers did not have protective clothing or equipment in what was described as a very dusty environment. NIOSH is interested in hearing from

people who actually worked at the site about the work that they did, as well as the raw materials that were present at the site, how the materials were processed, and how the company handled the waste materials that were generated. After the workers are finished speaking, NIOSH will take survivors' questions and comments, and ask specific questions to get additional information for the Blockson documents.

Mr. Hinnefeld introduced [name withheld], describing him as an interested party in EEOICPA processes at facilities in southern Illinois. [name withheld] greeted the attendees and briefly described his involvement in two other Atomic Weapons Employer (AWE) sites in southern Illinois that are filing SEC petitions: General Steel Industries in Granite City and Dow Chemical in Madison. His role would be to help Mr. Lewis moderate the meeting. He would also brief Senator Obama's office regarding the outcome of the meeting.

Mr. Lewis thanked [name withheld] for his remarks. He queried the attendees regarding how many former Blockson workers were present and counted three. He asked [Former Worker #1], who had been present at the previous evenings meeting to begin the discussion.

Comment from Former Worker #1:
I just about talked myself out last night. I don't know what more I can say that I didn't say last night, but will say this. I feel that last night's meeting was the best that we ever had. The others were more for the company's benefit. They didn't feel that we needed to know anything. I don't care if he is a politician or who he is. We did not get any answers from that type of meeting.

But last night, these people showed that they do have an interest in the people who worked out there, not the people who ran the company. The people who ran it didn't give two hoots out of hell for you and you can see right now that that is a true statement. I didn't make it up.

I know that (name withheld) has a lot of information. I wish that I could have saved mine, but I had a fire in 2003 and everything went up in smoke. I had quite a collection of things that I would have been proud to bring up here to show. I am going to leave it up to (name withheld) to come up and say a few words.

Comment from Former Worker #2:
Good evening. My name is (name withheld). I worked at Olin Chemical from 1973 until its closure in 1991. At this time, for the record, I'd like to present the Board with the radon flux testing results from the gyp pile. I have a copy, so this is for you. I have also submitted some other documents to you, including topsoil testing results of a test field in New Lenox, Illinois showing that the application of phosphate fertilizer from one of Olin's total retention ponds (TRPs) did, in fact, have radiological numbers rising.

Last night's meeting was the most productive meeting ever because the people that actually worked there during that contract got to tell it like it was. They told how the pumps were reused throughout the site. They told how the equipment was taken down and used throughout the site to completely contaminate that whole property.

I talked last night about the technology that is available to the United States Government today. They have tested and flown over the Radium Dial Company in Ottawa, Illinois, and pinpointed the hot spots of radiation there. I am sure that if they do the same thing on that Blockson/Olin property on Patterson Road, they can come up with some conclusions there, too.
In regards to the gyp pile, that's an issue that Will County just passed. It is a Waste Management issue. Waste Management needs room to expand their landfills. In turn, they are going to tackle a 23 million dollar venture to cap that gyp pile. Capping the gyp pile is not a bad idea. But, when *The Joliet Herald News* makes a statement that in the future your children can play on this pile, that is abhorrent – that is like Love Canal, these stories you see on TV. Capping the pile would be beneficial to the community for any winds that may come across and blow radiation into this area because that pile has low-level radiation. That is all I have to say on that right now.

Mr. Lewis:

The other gentleman said he was kind of shy but I would like for him to come up and speak, the other worker. Come on up, please.

Comment from Former Worker #3:
I started there in 1958. About all I can remember about safety in the beginning is being in the labor shack, getting our orders, what we were going to do for the day, and the last three words were, "Be safe, guys." I don't believe that there were any safety glasses or hard hat helmets or filters for your mouth or any of that stuff. That didn't come until later years.

I worked in Building 55 with the labor gangs after they shut it down, sweeping it out; cleaning it out, trying to get the dust down from the I-beams, and then, finally, hosing it out, cleaning it up. And I worked for 26 ½ years in high-grade fertilizer dry phosphate, which produced a heck of a lot of dust. Other than that, I was by those gypsum ponds for a couple years working heavy equipment, a bay loader. Other than that, I will answer anything you want to ask.

[name withheld]:
Did you ever work in Building 55 at all?

Response from Former Worker #3:
I worked there a lot with the labor gangs, sweeping and shoveling. After they shut down, we all went in there to clean up.

[name withheld]:
How about before the shut down?

Response from Former Worker #3:
No. I think that there were armed guards at the door that disallowed unauthorized personnel while it was running.

[name withheld]:
Last night, we heard that some of the people went between the two parts of the plant. It wasn't just one single group of people inside. But you didn't have access to that building, is that right?

Response from Former Worker #3:
Not while it was running.

[name withheld]:
I am very interested in your concept of what was going on in Building 55.

Response from Former Worker #3:
None of us ever talked about it. I was "the kid" and I remained "the kid." Nothing was ever said. All you did was complain about what job you were doing or whatever was going on. I believe that Building 55 shut down before I started there in 1958.

[name withheld]:
But after you came to work at Blockson, did you hear any comments or talk about anything that had gone on there?

Response from Former Worker #3:
No. In later years, we heard scuttlebutt about so-called radiation in the ground, even outside the building wherever you walked, but…

[name withheld]:
How about the term "yellowcake"?

Response from Former Worker #3:
I have heard "yellow dust." I don't know about "yellowcake."

[name withheld]:
Did you see any yellow dust in 1958?

Response from Former Worker #3:

At that age, I really wasn't observant enough. I could have cared less. I just did the job and got out of there.

[name withheld]:
Well, let me ask you a more direct question. Were you aware while you worked there that the plant was producing uranium oxide for the Atomic Energy Commission and the U.S. Government?

Response from Former Worker #3:
I had no recollection of that until later years when I heard the older guys talk about what they did in there when it was in operation. I was surprised.

[name withheld]:
How about just the general revelation that phosphate rock from Florida, in particular, was a source of uranium that the Government wanted?

Response from Former Worker #3:
No, because I worked in it every single day – three shifts, triple, back and forth. All I did was my job. I had no idea of any radiation in any part of the plant.

[name withheld]:
There was a part of the process that we have heard about where the rock is pressed and then initially extracted in acid. That is the beginning of the wet stream. I know that you said you worked mostly in the dry part of the operation.

Response from Former Worker #3:
That's right.

[name withheld]:
That extraction process, you know, was going on inside of Building 55, so I thought people may have talked about it – the old-timers.

Response from Former Worker #3:
My job was a little different from the average. As I said, I worked for 26 ½ years in high-grade fertilizer, which was dry, crushed phosphate. I worked all alone in the building for the entire shift. Nobody else was there. In fact, it got to the point where some of the foremen would yell or hit on the I-beam with a pipe to get my attention before he come in because I almost did harm to a few of them when they yelled behind me.

[name withheld]:
Let me ask you this. We also talked last night. We tried to get an idea – did get some good ideas – about the general number of people that were working in the plant. During your 26 years, what would you say was an estimate of the people working?

Response from Former Worker #3:
I had 38 years, just 26 years in that one building.

[name withheld]:
Well, over that period of time, what would be the number of the work force at Blockson/Olin?

Response from Former Worker #3:
If I were to guess, I think it was 750, counting company personnel too.

[name withheld]:
Okay. Was that the total number of people?

Response from Former Worker #3:
I am pulling that number out of the air because I believe that somebody mentioned it to me while I was

working there.

[name withheld]:
But, I mean, does that seem like a reasonable number to you?

Response from Former Worker #3:
To me, any number would seem reasonable. I never took a tally. I didn't care. I just worked and wanted my paycheck and to get to out of there.

[name withheld]:
Okay. And, just for the record, there was no reason for you to ever wear a film badge, a radiation badge or anything?

Response from Former Worker #3:
Never…

[name withheld]:
In the 38 years that you worked there, did you see anybody that wore any kind of a badge?

Response from Former Worker #3:
No. They could have walked right by me, and I wouldn't have paid any attention.

[name withheld]:
And you were never tested for any kind of uranium in your urine or anything like that?

Response from Former Worker #3:
No. I have had skin cancer. The dermatologist took a couple out of me, but other than that, no.

[name withheld]:
Okay. All right then.

Response from Former Worker #3:
Thank you.

Response from Former Worker #1:
There were 600 employees.

[name withheld]:
600?

Mr. Lewis:
He didn't seem too shy, did he? Do we have any other former workers here?

Conversation with the son and daughter of a former worker:

Comment from the son:
I have a list here that shows how many actual employees there were in 1966.

Comment from the daughter:
That's not administrative, that's just the workers.

Mr. Lewis:
This shows that there were 420 workers in 1966.

Response from the son:
That might give you a close idea of what you had in 1958.

Mr. Lewis:
Did your dad work there? Do you want to speak? I want to open the meeting up to everybody else now that we have heard from the former workers.

Response from the daughter:
This is a list that someone gave me. These are pictures that we took of Olin that actually show the contaminated water. These were the retention ponds that I spoke of at the last meeting. And, actually, I

thought they were retention ponds, but they are where they buried radioactive material. The wildlife was dying, so they put water over it to make it look like ponds. That is what my older brother said that my dad told him. He is the oldest in our family.

Response from the son:
That's what we hear but we don't know if that's true.

[name withheld]:
When you say "contaminated water," are you talking about ground water?

Response from the daughter:
No, these were all the ponds. If you look through the pictures, you can see the piping that goes into a lot of them. There are the pipes, right there.

[name withheld]:
And when were these photographs taken?

Response from the daughter:
These photos were taken on March 30, 2003, after this whole ordeal began.

Response from the son:
There is one with trees. The trees out there look the same in June as they do in March, they won't grow leaves.

Response from the daughter:
This one shows the towers that are completely rusted out. My father said that anybody who bought a brand-new car… The car lasted nine months because if they parked it on the lot, it was completely, totally rusted out within nine months. Once in awhile, we went with our grandmother to pick up my father because he didn't drive. Here is a picture that shows the sidewalk where my dad would wait for us. He would walk all the way to the end of the sidewalk and the minute we pulled in to get him, he would say, "Get the hell out of here fast."

[name withheld]:
Can I ask you a question about these ponds? I see they are behind the fence. Did people have access to these?

Response from the daughter:
I was out there today and the gate was wide open.

Response from Former Worker #1:
No. They sold that stuff after it dried up. They had what they called a mud cap. And you go in there and you (inaudible) and put it in trucks and they take it away. I never did find out where it went. But, after the plant shut down, everything went to hell.

[name withheld]:
But, I mean, right here. I do know that at Weldon Spring, which I am familiar with – in that old quarry, which was filled with 55-gallon drums of thorium, uranium and all that – there are many stories of kids coming down there to play. Kids basically can't stay away from places like this. But was this fence really effective in keeping people out?

Response from Former Worker #1:
Yes, when the plant was running.

[name withheld]:
But I mean after.

Response from the daughter:
Yes, because there was a guy standing there with a shotgun so that the wildlife wouldn't go in there and drink the water. My father stood there with a shotgun. They had a little trailer and he worked anywhere from 8 to 16 hours a day. If he worked an 8-hour shift, he sat in that unheated trailer or stood outside of it

with a shotgun. If any wildlife went near the ponds, he shot the gun into the air to scare them away. He didn't shoot the wildlife.

[name withheld]:
Well, actually, I am interested in that. So, he did that because he knew [that the water was radioactive]?

Response from the daughter:
No. They respected their supervisors and they did what they were told. Just like [Former Worker #3] said, nobody asked any questions.

[name withheld]:
But I am trying to understand why the supervisor told him that that was necessary?

Response from the daughter:
They never asked. As I said, they respected their supervisors. They had families to feed and they didn't want to lose their jobs.

[name withheld]:
I understand.

Response from the daughter:
A lot of guys that did question it were told shut up, go do your job or lose it. So, they either kept quiet and continued on with their job or they either quit or retired or were fired. Up until approximately 1970, that sheet was updated by a gentleman who actually worked there. I can't remember who it was, but then his son continued on with the checkmarks, checking the obituaries. Everyone that died from Olin died from cancer.

[name withheld]:
Now, this is a seniority list from May 2, 1966. Have you submitted this to NIOSH?

Response from the daughter:
No, I have not. You can have that copy. I have another copy at home of everything that I sent to NIOSH.

[name withheld]:
Would you mind writing your name on there so that NIOSH can contact you?

Response from the daughter:
I will write my name on there. My father's name is on that list. Here is a picture that shows that gate wide open.

[name withheld]:
Are these pictures that NIOSH can have for the record?

Response from the daughter:
No, I can make copies if they want to pay for them but I think that I have paid enough money to get all this information. These are the only copies of these pictures and I am not going to give them up. Here is another picture of the pipes coming out into the ponds. There is another photo that says "Contaminated Water" with the Olin tank right behind it.

[name withheld]:
We heard some people talk last night of what this represented. What was your understanding of what this liquid was?

Response from the daughter:
My understanding is that this was where they buried all the extra uranium and stuff that came out. When the National Wildlife Association came down on them because the wildlife was dying, they filled it in with water to make it look like a pond.

[name withheld]:
And this water was piped in from where?

Response from the daughter:
It came from Building 55 and everywhere else on Olin property.

[name withheld]:
That's what we are trying to get. Was this effluent from the wet process of Building 55?

Response from the daughter:
As far as I understand, yes.

Response from Former Worker #1:
No, it was not from Building 55. That was from monosodium and disodium and quarry. They pumped the excess over there because after it dried up, they sold that mud. I don't know if they still have the machine out there. I know that two years ago it was still sitting in there because somebody else took over the clean up. We had three of them and I know that they cleaned up the two real fast.

[name withheld]:
Let me ask you this. At many sites, some sites, let's say, that had ponds like this that held effluent, they called them raffinate pits. Did you all ever hear that term?

Response from Former Worker #1:
I have never heard that term.

[name withheld]:
Did you think that water was radioactive?

Response from Former Worker #1:
No, I didn't.

[name withheld]:
And what came from Building 40, did you think that was part of the phosphate extract, the acid extract? Maybe I need to understand this. Why would they extract the rock with acid and then pump it into those ponds? Why didn't they process it?

Response from Former Worker #1:
When it went to the ponds, it was mixed with 90 percent water.

[name withheld]:
So it was diluted?

Response from Former Worker #1:
They knew it was bad, but we didn't. As I said last night, they never told us anything. When they built Building 55, we all asked "What's that going to be?" I don't know how many different versions we heard, but it was never to extract uranium.

[name withheld]:
Could you tell us a few of the things that you all were told about Building 55? I think that is of great interest.

Response from Former Worker #1:
I know that at one time the union asked what was going to go in there. Once they said that it was going to be a warehouse because of its size. Another time they asked the company why they were putting presses into the building. The company man said that they were going to be making a new product. He said that if the process worked, then things would be good. So, you see, they would tell you anything, but never the truth.

[name withheld]:
Just so you don't feel entirely lonesome, at the Weldon Spring Uranium Feed Materials Plant that was built by the Atomic Energy Commission, the local people in town were told that it was a fertilizer plant. Many hikers that I know that used to hike by that property wondered what it was. Anyway, it was a common practice not to tell. In those days, "uranium" was not a word that the Atomic Energy

Commission liked people who worked and contracted for them to use at all. Thank you very much.

Comment from the daughter of a former worker:
I don't know if any of the other workers would remember this, but I asked my oldest brother tonight and he said that there are still some bombs stored on government property out on Route 53, which would probably be the arsenal property. He said that the bunkers are still there on some fenced-in property. That's all contaminated too.

[name withheld]:
Thank you for bringing these. If you find any benevolent friends, I think pictures are excellent documentation. If Mr. Hinnefeld would like these, I think it is excellent to send in that kind of documentation. I think that all of that documentation is good for the record.

Mr. Lewis:
This is good interaction. Does anybody else want to speak? You are welcome to do so. This is your time now. Any time that a former worker wants to say something, please don't feel limited to the topics in the handout. If anyone else has anything to say, please come on up.

Comment from Former Worker #3:
The only thing that I could add is that the reason the person was up at the ponds with a shotgun was to chase all the waterfowl out of the half dozen ponds. Before there was someone up there with a gun, there were so many waterfowl that landed in the water. Their feathers absorbed the acidic water so that they couldn't get back out of the ponds. It killed them, they went right under. I saw that happen.

Mr. Lewis:
Somebody was doing the waterfowl a favor, shooting to scare them away. Does anyone else have something to say? I know that some of the people wanted to speak. Come on up. Would you state your name please?

Comment from the son of a former worker:
My name is (name withheld). Maybe some of the old-timers remember my father (name withheld), who worked at Blockson from 1933 until his retirement. I prepared a statement so I would remember what I wanted to say.

Except for several years from 1961 to 1965 when some of the people were moved out east to New Haven, my dad was at the plant the entire time of the contract. He started as a chemist in the 1930s and worked his way up, so he held various positions. When Dad came home every day, we heard everything. If I had recorded or written everything down, I could have written a gigantic book about Blockson Chemical. It was (name withheld) did this, or we bought this, or (names withheld) did that. There was so much going on. When I heard these things, it struck me that – of course, after World War II and the atomic bomb, we all thought, "Oh, good heavens, what is this?" We were little kids in grade school.

One day we were in the kitchen and we were talking about this for some reason. My dad casually said – and I remember this as clear as a bell – "We are working with atomic energy over at the plant." I said, "What, Dad – out at Blockson? That's a soap factory. What in the world?" I remember that we were all taken aback by the idea that they were working with atomic energy. He just casually mentioned it and his attitude was – we were all shocked, but with him it was no big deal. It was like they were refinishing furniture or something. He was just completely laid back, but he did say "atomic energy." We were completely surprised about that. He never mentioned it again. Whether it was secrecy or no big deal, it just was not a topic that came up.

Now, when they were building [name withheld] Acid Plant… That was a different thing. We got a blow-by-blow description of that every day. When that didn't work out right, it was nicknamed [name withheld] Folly. That is the kind of thing that we heard.

But the atomic energy thing was either secret or just no big deal. I am a little bit surprised that all this came out like this, that we now know a lot more than we did then. I don't know how much my dad knew.

Maybe he was just carrying on the idea that there was something secret or no big deal. He may have never even gone into the plant because he was associated with the phosphate rock.

A couple of the comments that people have made here have struck a chord with me, like the phosphate rock from Florida. I remember my dad making a couple of business trips to Florida specifically for the phosphate rock. I just thought it was something that they used to make Tide. They processed the phosphate rock and shipped it out in railroad cars, and then they put it in Tide boxes or something. There was never any mention that this phosphate rock was for anything but making phosphate detergents.

One little thing about the cars – I remember that, too. Nobody drove a good car out there for the same reason. You drove a beater to Blockson because of all the acid. There may have been all kinds of things there. You didn't drive a nice, shiny car out there and park it.

So that was my one point, that my dad mentioned that he did know about it, but he did not seem to think that it was a big concern, and maybe it wasn't. I don't know whether the company really knew or nobody knew. It seemed that my dad's impression was that it was just no big deal. He only mentioned it once.

I dug around in my file and found a portrait of [name withheld], if anybody would like to reminisce. Otherwise, thank you for your attention.

I must add that I worked there in the hydrofluoric acid plant, just messed around in the lab. I had no idea about any of this other stuff. That was the summer of 1972 but I have no knowledge about the atomic thing. By that time it was history.

Mr. Lewis:
Thank you. Who else would like to talk about some things their family members may have talked about that happened at the plant?

Question from an unidentified attendee:
Is it a known fact that they were extracting uranium from phosphoric rock? That is not an argument, right?

Mr. Hinnefeld:
That is not an argument.

Response:
That is what I didn't understand.

Mr. Hinnefeld:
The phosphate rock contains a little bit of uranium as it occurs in the ground.

Comment from the daughter of a former worker:
My father was (name withheld). I just talked to my mother today. When my dad was dying of lung cancer in 2002, [name withheld] contacted my dad because of his security clearance for Building 55. He asked my dad if he would help with the situation. My father was so sick that he said, no, he couldn't do it. He didn't want to do it because he was just so sick. But Mom sat there and wrote down things that my dad said, such as "We were extracting uranium from phosphoric rock." I didn't know that they were even questioning each other about it. I didn't bring it. I didn't know if you knew that for sure, but my dad did tell my mother that. Do you know that?

Mr. Hinnefeld:
Yes, absolutely.

Response:
So you know that there were 30 people, operators in Building 55 and that, at one time, there were three shifts with four workers in there for each shift?

Mr. Hinnefeld:
That is right. That is pretty consistent with what we have heard. We have also heard that the maintenance people and other workers from other parts of the plant would have to go in to work on the equipment.

Response:
She told me that. I don't know if you needed to know that.

Mr. Hinnefeld:
Any piece of information is great. It is very clear in the record that Blockson took that little bit of uranium and extracted it.

Response:
He was hired by [name withheld] in the 1950s and he worked until 1969. He worked in that building and helped construct it, beginning in 1950 until they closed that building in 1961.

Mr. Hinnefeld:
In 1961 or 1962, I believe.

Response:
He said that they did away with all that at that time.

[name withheld]:
There were 11 such plants in the United States that did exactly that same kind of work: Texas City, Texas…

Response:
All he ever told me is that they made Tide soap.

[name withheld]:
Uranium extraction was a general activity supported by the Atomic Energy Commission because it turned out to be a pretty efficient process to get uranium from the acid extraction that was going on anyway.

Response:
He knew that they were taking uranium from the phosphate rock. They didn't warn them of that. He didn't know that there was a problem.

Mr. Hinnefeld:
In the 1950s and actually going somewhat later, uranium plants in the DOE were treated much the same as chemical plants. DOE plants like Weldon Springs that [name withheld] referred to and a sister plant close to Cincinnati that I am familiar with. The hazards associated with uranium were largely considered to be chemical hazards. Uranium is, in fact, chemically toxic as well. It can have the same kind of toxic effect as lead poisoning. For a long time, the radioactive hazard associated with uranium was considered a secondary hazard to the chemical problems associated with those plants. So, it can be said that the radiation hazard associated with uranium was not considered in the same light as it would be today. The material was not handled the way it would be today. I don't think that it just happened at Blockson, but it may have been more acute at these private companies that did this work for the AEC than it was at the DOE sites.

Based on my own experience, I think that there was a general sense in the DOE system that although the uranium was radioactive, because it is not very radioactive the radiation hazard was not considered great enough to shield it. Even today, the philosophy is that there is very little reason to shield the uranium because the radiation does not travel very far from it but you certainly don't want to inhale it. In the early days, the inhalation issues were probably not even considered.

Mr. Lewis:
(Name withheld) you mentioned some things to me out in the hall a while ago. Would you like to say something?

Comment from the daughter of a former worker:
I am (name withheld) and (name withheld) is my dad. Today I talked to him about the meeting last night and he was very interested. There are a couple of things that he wanted to have the former workers clarify. He said that he worked on the river unloading these barges. They unloaded approximately one barge per 8-hour shift or about two and a half barges in a 24-hour period, usually a couple of barges of

rock and then a barge of soda ash, just to give you an idea of how much product was coming into the plant. In addition to the barges, there were railroad cars coming in, too. The phosphate rock was dumped at the west end of Building 40, and the soda ash was dumped at the east end. They were dumping one to two cars of soda ash about every eight hours. He said that maybe four to eight cars of phosphate rock would come in every so often.

He also said that they had "aeravators" that took the rock and the soda ash to the tops of six 100-foot tall silos. A lot of dust was created by those aeravators, which "vacuumed" the rock right up to the top of the silos. All this dust was in addition to what was coming in from other areas.
I don't know if the rest of you can address these things or even if you know anything about them. He told me that when the river was too high, they had to rely on the railroad cars. If something else went wrong, they would go back and forth. That is why deliveries were made by the railroad and the river. At some point in time, they had so much material that they actually just dumped it in a big pile in the middle of the plant so that they could get to it when they had time.

Mr. Lewis:
Does anything that she said strike a chord with any of you? Can you concur with that?

Comment from Former Worker #1:
I worked on the dock for six years, unloading soda ash, rock and sulfur. We would unload a barge of rock in seven and a half hours and sometimes in six and a half hours. It was all according to the traffic in the river. When they opened the locks, all that water would come down and move that barge so that a crane operator would have to push on his bucket and hold it up against the dock because the only thing that kept it there was the cable. If the barge was too far out there, it was "goodbye barge." We lost one once.

The crane put the rock into a big hopper and then it was taken up into the silos on the belt. They had different buttons up there that were used to send the rock to one silo and the soda ash to another. The sulfur just went outside because that thing was murder anyway. But it had nothing to do with the water getting high. The only time the water got high is when they opened the locks.

We unloaded the barges. There were two shifts with four men on each shift: a crane operator, an oiler, and two cleaners. The cleaners used a small thing that had a bucket in front of it to push the soda ash and sulfur out to where the crane operator could get to it because all the hoppers were covered. We had to go down and uncover them. There were a lot of times that we almost lost guys down there. I will get to the phosphate pretty soon.
We had to sweep those barges. The soda ash barge had to be swept and the rock barge had to be swept. There were no muzzles (respirators). No way in hell did we have a muzzle when we swept those barges. The only time we had a muzzle was when we had to go push the sulfur up for the crane operator to pick up with his bucket. We didn't have to sweep that thing. That's one good reason. But we did have to push the sulfur up because the crane operator could not get down into the corners because the boom could only go so far. But that's about all I can tell you about life on the dock because I was there for six years.

Question from the daughter of a former worker:
Did you use bobcats?

Response from Former Worker #1:
Well, it wasn't called a "bobcat."

Response from Former Worker #2:
Yes, but they had a name for it because I turned one of them over.

During the time that I was employed at Olin, they also stored the surplus phosphate rock on the ground. Once the hydrofluoric acid plant shut down, between the silos and the hydrofluoric acid plant, once it was knocked down, it was no longer there, Olin blacktopped a massive area over where (name withheld) would unload sulfuric acid trucks, where the trucks would come in from the steel mills and they would pump to the sulfuric acid storage tank. Olin over-bought or over-inventoried phosphate rock and they

created a massive pile there.

At one time, the pile was at least 60 feet tall by almost half the size of a football field and we covered it with tarps. Some of the labor gang went to the junkyard and got all these old tires. We unloaded all these old tires, which were full of mosquitoes and water and we threw them all up on this pile. We lashed them all together to hold it down so the wind wouldn't do anything. That pile sat there for a few years until they finally depleted the inventory on that phosphate rock. But that was inventoried on-site while I was there, sometime probably around 1979.

I have a couple other items here: They did the radiological survey on this plant in 1978. The introduction says – I am not going to read it all because it tends to be overbearing – "These investigations involve historical data and the results of a radiological survey conducted at the site. Presently there is not enough information and evidence to specifically determine if the contamination at the site is directly related to the DOE's predecessors' activities at the site. It cannot be determined if the contamination at the site is due to the uranium recoveries of the AEC or the result of normal phosphate ore processes now being operated by Olin Corporation." What's wrong with the statement that I just read?

[name withheld]:
While you are reading this, can you state for the record the title and number of that report? We need to know what you are reading.

Response from Former Worker #2:
The title is *Authoritative Review, Former Blockson Chemical Company, Joliet, Illinois, Introduction and Summary*. The next paragraph is background information on Blockson. There is no document number. It says here that they couldn't tell the difference between the DOE or the AEC activities on site and Olin's normal activities. So what they are saying is that Olin's normal activities were running a radioactive site. If they are trying to say that it isn't the Atomic Energy Commission's fault or Department of Energy's fault, then the readings that they are getting could be Olin's fault, so the bottom line is that the site is dirty. That is the gist of this paragraph. You are supposed to just think, "Oh, it wasn't this and it wasn't this. It was just Olin Corporation's normal processes." That is totally unacceptable.

Another highlight (from the *Authoritative Review*): "At the end of 1955, Blockson had produced a total of 1,221,470 pounds of uranium concentrate for the AEC." The production records that you received from [name withheld] this evening don't show that.

When I read all this information that I received through the Freedom of Information Act, I came up with a couple of names. One name was [name withheld], who was one of the original signers of the contract with [name withheld]. Over at the pilot lab, they whipped up some oxidizing agent to concentrate the uranium from the phosphate ore that got a big bang for the buck and he signed. [name withheld] was with the Atomic Energy Commission at the time of your old mines. I was able to contact him before he passed. He had a Web site, [name withheld], where he described his entire life in the mining industry. Perhaps you have heard of it.

My first e-mail on August 31st, 2003 read:
"Dear Sir, I read with much interest of your article on uranium concentration in Joliet (because he specified it in Part 6 of his documentation) at the then Blockson Chemical, later Olin Chemical. I was an employee there from 1973 until its closure in 1991. I worked in this building many times in the 1970s and 1980s. Did you ever see the building in production? I have some mimeographed photos of construction and the drum filling station, filters and others. All the old filters that the Kelly ran remained in, used up on the steel-grated second floor. Many of the people who worked there died of various cancers.
"Also, in your article you mentioned a pilot plant that was up and running before the actual Building 55 was constructed. Do you remember how long the pilot plant ran and where it was located on the property? I am trying to help the surviving spouses and children with some information, especially an employee list of those who worked in Building 55 during the contract. I am looking forward to hearing from you."

His response:
"Hi, (name withheld), I took your message to Microsoft Word in the largest so I could see it better. No, I never saw the full production plant – although I did see and study the construction drawings. It is sad that we did not know enough back then of the hazards of radiation. I was exposed going through many different mines and mills and the yellowcake sampling at the AEC compound in Grand Junction. My office there, in an old cabin, contained lots of uranium ore and mineral samples."

This letter from this gentleman led me to [name withheld] , who took over for[name withheld] . He was involved with the production of yellowcake for the AEC. Frank sent me this letter before he passed in 2003:
"Dear (name withheld), Enclosed are the two papers by Stoltz and Barr that I promised to send you. I hope Emil Stoltz's paper will answer some of your questions."

At the time, my questions were "Where, exactly, was this uranium concentrated, and how was it concentrated?" Based on my knowledge of the plant, I was missing something. I didn't know if it was coming from the pure mud, if it was coming off the gyp pile. But he sent me the Stoltz and Barr papers.

I will read on:
"Note: The plant start-up was August 15th, 1952 – just 17 months after research on the program began. That would have put the start-up of research about March 15th, 1951. I would guess that the pilot plant started in late summer 1951 and probably ran at least until the plant design construction was completed. It may have been used beyond that date to test proposed process changes, et cetera. My data on the new recovery plant operation shows production from 9/52 to 6/60, a total of 118.3 tons of U_3O_8 was recovered at the cost to the AEC of $2,157,156 or $9.11 per pound; a very good cost at that time compared with other uranium recoveries from phosphoric acid plants elsewhere. I have no info on radiation surveys, et cetera. Hope this helps you."

The post-script regarding my other question about the gyp pile said that it contained very little of the uranium from the solution. The gyp contains most of the radium (Ra-226) present in the rock feed to acid digestion. So that's the information that I have. You will have that in your possession from [name withheld]. Thank you.

Mr. Lewis:
That is quite extensive research. I appreciate your sharing that with us. You brought some papers in, and we appreciate that, too. Does anyone else have anything that they would like to come up and share?

Comment from the son-in-law of a former worker:
First of all, I'd like to thank all of you. I agree with the guy who said that yesterday's meeting was one of the best that we have ever had. Certainly, tonight is very nice also compared to the other meetings.
My father-in-law worked at Olin. He worked many overtime hours. By the way, I really don't think what I am going to say here now is going to be much benefit to NIOSH, but I think it needs to be said. I do have some concerns. My father-in-law had two forms of cancer. He had lung cancer and skin cancer. When I met my wife, my future mother-in-law had just gotten through a bout of some very serious cancer of her own. She had breast cancer.

What we all have heard at all of these meetings that I have attended are some rather scary things about nuclear energy, about the uranium and thorium that these workers, many of them World War II survivors, were exposed to.

What I noticed in yesterday's meeting is something that I think maybe the City Council, if they were here, should be listening to. But what I am about to say is all the people that worked at Olin were covered in all this powder – white powder, yellow powder. It would go home. It would get to the basements. It would permeate the houses. So my wife has been exposed. My brother-in-law has been exposed.

We have, by tonight's seniority roster, over 400 people working at Olin at any one time. That's a lot of people going home, having their laundry done. The question that I want to ask, and I think it is a very

good question, would be directed to Stuart. And, Stuart, I believe that you said that your credentials – that you are involved with nuclear safety, is that correct?

Mr. Hinnefeld:
That is right.

Question:
Would you think that if anybody visited these homes throughout Joliet and the surrounding area, and went into these little basement areas like the one where my mother-in-law did her clothes with a little ringer washing machine – I would see her shaking out the clothes – do you think that those areas would still have traces of yellowcake, as you call it, or nuclear [evidence] of any kind?

Mr. Hinnefeld:
It is hard to speculate about things that happened so long ago. This is something that my agency has no authority to deal with.

Response:
I understand that.

Mr. Hinnefeld:
But from my training and background, I would think that it really would depend on the part of the plant where the person worked. The person came home covered with what has been described as white powder, which was probably the color of the rock.

Response from Former Worker #1:
Gray. That would be soda ash.

Mr. Hinnefeld:
Soda ash would be white. Those materials, as they came in, would have had very small concentrations of radioactive material, if any. I think that if the fact that those materials went home on the workers' clothes and on their belongings, that it is a vanishingly small risk from those rock materials as they came in. Dirt itself has some uranium in it – about 10 parts per billion, I think. I believe that kind of dust would represent essentially no harm and that it would probably not be detectable because it is so similar to the dirt and dust that you would have around the house anyway. Maybe it would be a little more than that, but it is not concentrated radioactive material. But the yellowcake and the yellow powder… If people came home covered with yellow powder, it was the concentrated uranium product. It could have been taken home and it may have been detectable at that time. But it would be hard for me to imagine now, almost 45 years after the last concentration of the uranium recovery operations occurred, that it would still be detectable in someone's home, just because of the normal cleaning and tracking [in a home]. It would behave like other dirt and dust and I think it would probably be gone. I am strictly speculating.

Question:
But there is still the possibility that there was some risk, especially at the time between 1952 and 1961?

Mr. Hinnefeld:
In my occupation, we say that any radiation exposure increases your risk of cancer. The research evidence is not so precise that you can tell whether very low levels of exposure have an effect at all. Therefore, it is prudent to assume that any level of radiation exposure involves some additional risk. I believe that there was a potential for what I would characterize as very small exposure in the home – certainly smaller than a person working in a radiological environment would be expected to receive – if people brought home the yellowcake material. That would be how I would characterize it. I may be speaking out of school here because this is my personal opinion. This should not be represented as NIOSH's opinion because I am not speaking for NIOSH here. You have asked me this question based on my background, and that is how I have answered.

Response from Former Worker #2:
I appreciate your answer. I am sure that it is an honest answer. It would be interesting to know though

how many employees' spouses also wound up with cancer. We have only been dealing with employees. My mother-in-law was one of them for sure.

Mr. Hinnefeld:
I understand, but that is an emotional issue. Not only can I not make a comment about it, I am completely uninformed on that issue. Our agency is really not in a position to learn anything about that, based upon what we have authority to do. We don't have any way of providing a better answer.

Response:
With your education, would you say that it was not a good idea to have those people go home with anything on their clothing? Of course, nobody knew anything about it at the time.

Mr. Hinnefeld:
Well, I was not in the industry in the 1950s and 1960s. My career started in the 1980s.

Response:
Nobody knew about it at the time. It was all secret, unfortunately.

Mr. Hinnefeld:
During my career, there would have been more stringent contamination control of a uranium production process to make sure the uranium stayed in what we would call the radiological area, in the work area. I was not in the field in the 1950s and 1960s, so I don't really know how people behaved around uranium plants during that time.

Response:
I appreciate your time.

Comment from the daughter of a former worker:
My father was an employee of Blockson or Olin Chemical from 1955 to 1966. I just wanted to say to the gentleman who spoke before me, as far as my father working there, he would come home, go directly to the basement, and remove all his clothing before he even came into the house.

I personally was at that plant as a child. My dad would go get his paychecks every Thursday, so we would take a ride. So I went in there to the payroll office with him. I do remember going in there. When the family went, we had to roll up all the windows on the car so we wouldn't breathe it.

He would come home with the car covered with this stuff. We didn't know what it was. He worked on the railroad cars. Back in the 1950s, they didn't have all the precautionary measures that we have now. They knew nothing, absolutely nothing.

My family – my father died in 1983, not from cancer but from heart. My mother died in 1998 from heart. My sister passed away in 2003 from lung cancer. I am not saying that this is affiliated with anything in regards to Blockson Chemical, but this is my family history.

My other question is for the doctor. The other health effects besides cancer, when there is radiation exposure, would that bother the heart or naturally the lungs or anything like that?

[name withheld]:
The answer to both questions is yes. I think that I need to address this law. Under Title or Part B, the only illnesses that are compensated are cancers (with the exclusion of one type of chronic lymphocytic leukemia) and some people who have been exposed to silica dust or who have been sensitized to beryllium metal or have chronic beryllium lung disease. So under Part B, radiation-induced illnesses are limited to those for compensation purposes. Under Part E, which applies to people who have worked in DOE sites, a number of radiation-induced illnesses can be compensated. And, for instance, in my field, which is pathology, I have a book at home, a textbook, probably two and a half inches thick, on radiation pathology by Dr. Fagardo and two other authors who – Bobby Anderson and so forth, who have a lot of experience. There are chapters in that book on every organ in the body related to radiation-induced illnesses.

So under Part E, the burden of proof is a little different than in Part B. You know, you have to get a physician to say that the probability of causation, that your illness was contributed to or caused by radiation is the test there. So many other conditions are actually covered for DOE employees that are not covered by the so-called Atomic Weapons Employer sites who were mainly contractors for the Atomic Energy Commission. So, for instance, our two sites in southern Illinois and Blockson and so forth, are AWE sites.

But the general answer in a biologic sense is that yes indeed radiation, for example, of the lungs causes pulmonary fibrosis. It causes damage to blood vessels. It of course causes lung cancers, both benign and pre-malignant lesions and malignant lesions. In the heart, radiation causes coronary artery disease. In fact, the title page of my book on radiation pathology shows, of all things, not a human tumor, a cancer, but it shows a coronary artery with almost clogged off completely by atherosclerosis. So a condition that most people and many people in Stuart's field might deny is related to radiation exposure. And yet there is voluminous evidence that it is.

So I think what you have to say about this law is that there are certainly compromises that were made to get it passed. Those other illnesses are only covered for a part of the work force and they were people who worked in DOE-owned plants. So my own personal opinion is this is a very unfair part of the law, but I am sure it was a political compromise that is not scientifically justified. Politically, it must have been a trade-off between having some kind of compensation program and compensating everyone.

Mr. Lewis:
Thanks, Doctor. Does anyone else have anything to say?

Comment from the daughter of a former worker:
My father was (name withheld). One thing I brought up last month was the potential for error in calculating the probability of causation, what type of factor that would be. I have done quite a bit of my own research on this. I will just read a little bit of this paragraph from *Radon and Lung Cancer*. I believe that I answered my own question when I reread some of the information. Basically, I will just read the one paragraph or part of it. It says, "Early risk models were found to be inadequate, and even the more sophisticated models now being used may not be able to predict a course of the complex processes leading to death from lung cancer. The presently proposed models, however, give predictions differing by probably not much more than a factor of 4 for total lifetime lung cancer."

I don't know how you would interpret that factor of 4, but I looked at it this way: My father's probability of causation was roughly 40 percent, dividing that by four, giving you an upward number of 10. A degree of number 10 to play with could have been possibly 50 percent or 30 percent, either way. I don't know if there are any other comments or if there is another way of interpreting that?

Mr. Hinnefeld:
I can tell you how uncertainty in that risk model is incorporated into the program – "model" meaning a complicated set of calculations that translates the radiation dose into a probability of cancer and takes into account the uncertainty in that translation of that risk factor. The people who put these together may not be the smartest people, but they keep up with radiation research, will evaluate what are – what does this risk really look like. We don't know precisely how much risk is associated with radiation dose, as your pamphlet says. We don't know precisely what it is, so we account for that uncertainty range in our calculations. The calculation for probability of causation is actually many, many, many calculations repeated several times. It takes into account the uncertainty in the risk in that you choose one value of the risk randomly based upon how the risk distribution looks like each time you do the calculation. Instead of getting just one result, you get 2,000 results for your probability of causation. The probability of causation value that is selected for determining compensability is the one at the 99th percentile of that risk model. That means that, of those 2,000 calculations that were done, 99 percent of them are below the value that is selected. The uncertainty in the risk model is incorporated into the program in that fashion. We agree that the risk values are not precisely known. But what is done to allow for that is called the Monte Carlo

technique where the calculation is done many times, and each time its is done, a particular risk value is sampled according to the distribution. It is chosen randomly from the risk distribution, the uncertainty of the risk distribution. Hopefully, that is helpful. I can talk to you more about it later and try to explain it better if you want. But it is a fact, and we don't argue the fact that the risk is not precisely known.

Mr. Lewis:
Is there anybody else here who wants to say anything? You can talk to us later if you don't want to speak in public.

Comment from the daughter of a former worker:
I just have one more question. Yesterday, I heard Mr. Hinnefeld say that NIOSH had some urine samples from back in that era. I just want to know how they have that if there were no records.

Mr. Hinnefeld:
We did get some records from the Department of Energy about the work that was done here. Included in those records were several sheets of urine sample results for 20-some odd people.

Mr. Tomes:
We have data for 25 people.

Mr. Hinnefeld:
There were about 25 different names. The name of the person was on there and the date that they left the urine sample, and the uranium concentration in the urine sample. These people were sampled at regular intervals, generally twice per year. Some people may only have given one sample, but many of them gave multiple samples over about a three or four year period. All that information is in the records from the Department of Energy.

Question:
Do you know what years?

Mr. Hinnefeld:
The records are from 1954 through 1958. The results were typical of what you would expect in a uranium processing plant. There was detectable uranium in quite a number of the samples, but not necessarily in all the samples. They weren't outrageously high compared to uranium operations, but there was some uranium in the urine.

Comment:
Every worker we heard from said they never took a urinalysis.

Mr. Hinnefeld:
That struck me as a little strange. As I said, we have results from maybe 25 people out of the hundred and hundreds that worked here.

Question:
Are they still alive?

Mr. Hinnefeld:
We don't know. You see, we don't really know those 25 people. There may be some on the list who were claimants, but I don't really know if any of them are still alive.

[name withheld]:
Did you all make an effort to find that out if the people who gave urine samples were from the group that worked in Building 55? You know, in other words, does that data make sense with what we know? I mean, one thing that could be done is for those claims to be checked against people who filed claims with the Department of Labor and to see what they said during their CATI interviews, what their jobs were and where they were.

Mr. Hinnefeld:
Well, we have done some of that. My understanding is that these people did work in Building 55, but that

doesn't necessarily mean that everybody who worked in Building 55 left samples, but it seems that these people did.

[name withheld]:
Well, I mean, I am not trying to second-guess anybody. But just to say – to enhance people's credibility in that data, it seems like it would be a reassurance to contact one or two people who had urine samples, if any of them are still alive. Something you can determine, and find out from them proactively with telephone interviews about the urine sampling program. So far in our meetings, we have heard nobody who was even aware of the urine sampling.

Mr. Tomes:
We have identified a few of the people who submitted urine samples. We have reports from various days from 1954 to 1958 by names, last name and first initial. We talked to one worker who operated a filter press in Building 55. As would be expected, he had somewhat high results when compared with other workers. One of the workers was identified as a supervisor through reports and from talking with some of the other workers on the list. We identified another as a chemist that submitted one or two samples over the four-year period. We also have identified a couple of the others, but I can't give you the details on those. I don't remember.

[name withheld]:
Well, I am just making a general comment that it seems like, among the things that could be done, is that every single person who has a urinalysis uranium sample, that a check could be made through the Department of Labor what their job was and did they work in Building 55. So you should be able to get a tally for of those urine samples how many people indicated they worked in Building 55. And then it would seem to me, since the Department of Labor has a complete list of people with claims, you could pretty easily check whether the people with the urine -- uranium urinalyses had filed a claim. Certainly try to contact everyone.

Mr. Tomes:
We get more information every day, just as we have today and last night. One of the gentlemen last night did say that he left urine samples. The first man who spoke said that he was a maintenance man. I don't know if everybody caught that, but he did say that he left urine samples when he worked in the building. He was a regular worker in Building 55 and he probably -- (inaudible). I don't know.
NIOSH received roughly 113 or 130 claims from the Department of Labor. I can't remember exactly how many. I personally have checked every name that we had against those lists.

[name withheld]:
How many people with claims that went to NIOSH – how many people are accounted for on the urine sample list as people who submitted claims to NIOSH?

Mr. Tomes:
I am pretty confident of three names. There are a couple of others that I can't be sure of, not knowing the first name, but I am pretty confident of three names.

[name withheld]:
So, roughly ten percent of the people who had urine values recorded for uranium wound up with a claim at NIOSH. The question is, if I understand the numbers, approximately ten percent of the people who had urine samples submitted on the list that we have, of those 30 people, only three wound up having a claim submitted to NIOSH for dose reconstruction. Is that approximately correct?

Mr. Tomes:
That is approximately correct, yes.

Mr. Hinnefeld:
There could have been five, which would be 20 percent.

[name withheld]:
I guess that you could look at that a number of different ways, but it seems to me that it would indicate that a relatively low number of people who worked in Building 55 submitted claims. So it sounds like we don't have a very good representation of claimants among the people who worked in Building 55.

Mr. Tomes:
That is one interpretation. There is --

[name withheld]:
I am asking you how you look at it.

Mr. Tomes:
The way I look at it, Blockson sent a letter to the Chicago Operations Office (COO) near Argonne requesting urinalysis services in 1953. COO replied and forwarded that letter on to the Health and Safety Laboratory (HASL) in New York, and advised Blockson that HASL would provide the services for them. The letter stated that Blockson wanted urinalysis services for roughly 20 people engaged in the uranium operations and the numbers in our list generally match up with that.

[name withheld]:
And those letters, did they contain people's names? I'm not sure what you mean when you say that they generally match up with that list. Do you mean the numbers?

Mr. Tomes:
Yes, the numbers.

[name withheld]:
Well, just a comment, 30 versus 20.

Mr. Hinnefeld:
We had samples for 25 workers.

Mr. Tomes:
Some of them had samples submitted regularly, and some of them just had one or two, three, four.

[name withheld]:
Well, it certainly seems to me that the people who submitted samples regularly would be worth certainly the extra effort to try to contact them. You don't feel that you could contact them if they had not filed a claim? I mean, you have the data. You know their names. So is that possible?

Mr. Hinnefeld:
I don't really know. We generally work in the environment of our claimant population, so I don't know today, standing here. I would have to get advice from others in the office about whether we could pursue other people in this way.

Question from an unidentified attendee:
Why wouldn't you?

Mr. Hinnefeld:
We have obtained information in our research that is subject to protection by the Privacy Act. There are certain limitations as to what we can do with that information. It might be okay to do this. It could very well be.

Question from the daughter of a former worker:
You gave the years 1953 to when?

Mr. Tomes:
The data is from 1954 to 1958.

Response:
My father was employed there at that time. Would you have a list of names so I could see if my father had given a sample?

Mr. Tomes:
I don't have it with me but if you give me your name, I can check when I go back to the office.

Response:
I will do that before I leave.

Question from the daughter of a former worker:
Are you only going to be looking at who was tested that worked in Building 55? It seems strange to me. My father worked at Blockson and I know of one friend who is still alive. Everyone else has died of one type or another of cancer. All these people are here. I mean, that's why we are here, because they have all died of cancer. They were exposed in one way or another. They may not have worked all in Building 55, but the whole area. It is a known fact to the people of Joliet. It has been in *The Joliet Herald News* that Waste Management is buying this ground and eventually, in five years or whatever, they want to make it into a playground. This is why everyone is here. We have all lost loved ones.

I had a heart attack when I was 40. My dad worked there, he lived there. He came home. My mother has had a blood disorder. I didn't even think about that until tonight, that maybe there is a correlation here and probably in this whole room and you had more people here last night.

How many workers are actually alive? This is what you need to go after, statistically. You need to take Building 55 and get all the data you can from that. Then see who was tested from there – look at all the urine samples. I happen to be in the health field, so I may be more interested in the medical aspects of everything and, obviously, I think about a lot of this with my father. But I don't think that you have enough statistics and I don't think that you can say your dose reconstruction when these people all were working in that every day.

My father told my mother that he left there because it was not a safe, healthy environment anymore. He was offered another job at less pay but he took it because he knew. People were dying and they were going to all their wakes and funerals. These were fellows who he worked with. Everyone in Joliet, they were all blue collar workers and they are all gone.

I remember when my father was at Provena St. Joe's Hospital. There were a few men who had worked at Blockson who were there dying of cancer at the same time. W are not all here because it is a joke or it is just something we want to sit and reminisce about. It is real. It was real.

Mr. Hinnefeld:
I certainly understand and I sympathize.

Response:
My father was (name withheld). He worked there when there were many – (names withheld). He was there for, I don't know exactly the years, but it was in the 1960s. He left around 1966.

[name withheld]:
Stuart, may I make this comment? I can promise you, and I will say that, speaking for Senator Obama's staff and the Senator, I think the point of this special meeting is to get at the bottom of the data that we have. That's real data that is directly related to dose reconstruction. And so we will put this as a formal request to you in writing, but I believe that your urinalysis data should be cross-checked in every possible way against all the claimants at DOL for Blockson – against this seniority list of 406 people that you were given tonight. We need to validate that urine data as extensively as possible as to where those people worked in the plant. I mean, that would be, for example, if you – it would really be very interesting if you could identify that half of those of those 30 people did not work in Building 55.

Apparently, what we lack is any documentation. I mean, I understand the letters, but something must have prompted those letters and the requests that HASL do urinalyses. There has to be some rationale for a urinalysis program. It would be quite interesting to know whether the people who requested that thought in terms of just people in Building 55 or people in the entire wet waste stream where the uranium was

concentrated. So it seems to me all that this is really database work, both at NIOSH and at DOL.

Mr. Hinnefeld:
It is database work if you are talking about what was the rationale about who they selected to give urine samples. If you are talking about that, it is finding a document that gives the reason why they wanted these people to be sampled.

[name withheld]:
That would be one way.

Mr. Hinnefeld:
We have that here, but you can certainly convey whatever request to us that you want.

[name withheld]:
I just want to put it on the record. We definitely will do that. It would seem to me that what would be a reasonable way to break down those 30 samples, is people who are known, for example, from their CATI interview to have worked in Building 55, building – people who are known not to have worked in Building 55 exclusively. And then, there may well be a group of people who are not represented in the claims database at all but, for instance, appear on another list as a documented person employed at Blockson/Olin. For instance, I am certain that not all 403 people on the seniority list have filed claims.

Mr. Hinnefeld:
Correct. In all likelihood, not all 25 of the workers for whom we have sample data have filed claims. In order to file a claim you have to have had cancer.

[name withheld]:
I am saying that we could break it down. We could identify among those people with urine samples, where they worked according to the rest of your records, right? I mean…

Mr. Hinnefeld:
We can do that if they are claimants.

[name withheld]:
That's right.

Mr. Hinnefeld:
If they are claimants and we can identify them, it may be because we have the last name and first initial on the urine sample. But that may not be completely descriptive because if we do find a claimant that matches, there may be more than one person with that last name and first initial. So if they are a claimant, we could find out what we can from that. If they are not claimants, we might be able to strike home on those people who left those samples 50 years ago.

Comment from an unidentified attendee:
Well, tonight you have been given a list of 406 people who worked at the plant. You could check your data against that list.

Mr. Hinnefeld:
That seniority list gives a first name, not just a first initial. It could give us a first name by checking against this list. But then you still have the private detective task of finding the people on this list only because we have their name and know that they were alive in 1958.

[name withheld]:
Well, I will mention that at both General Steel and Dow Chemical, as the process went on, as we were uncovering information for Special Exposure Cohort, various people came forward. And by now at each site, we probably have a half dozen seniority lists from different time periods where a lot of the names overlap. There was a lot of long-term employment, but also some turnovers. So I am just saying that you can only work with the things you have, but it seems to me that you have some resources to further stratify those 30 people. It would be interesting to ask the question, "Do the people who worked in

Building 55 have higher urine values for uranium than the people who did not work in Building 55?"

Comment from Former Worker #2:
In regards to the urinalysis program, there was one when I was employed at Olin in 1973. During that time frame, I was a sodium fluoride granular dryer operator/packaging operator. We were required to give a urinalysis approximately two times a year, more or less. We gave them a sample when we left on Friday at 3:00 or 4:00 p.m. and when we returned to work on the following Wednesday – we worked seven days, then were off five – we would give another urine sample to (name withheld), who was the nurse at that time, and they would run the urinalyses for the people who worked in the fluoride buildings throughout the plant. They were using the results to make sure that you did not retain too much fluoride in your body, that you were wearing your dust mask correctly, and other safety issues like whether you were using proper hygiene and that you weren't eating your sandwiches with poison all over your hands. During the time frame of the uranium contract, there could very well have been some urinalyses going on for the fluoride workers as well.

My question: When I was tested for the fluoride exposure through the urinalysis studies, was I also tested for something else or not? I do have all my documentation because I requested it when I left the fluoride process and moved further on in the plant. But one wonders. This was all out of Stamford, Connecticut, at Olin's Toxicology and Hygiene Departments, which conducted these studies. This was in the beginning of the EPA when more and more laws came out for environmental issues and more OSHA protection for the worker, at the time it became stronger and stronger.

[name withheld]:
So this is Olin Corporation's Stamford, Connecticut Laboratory?

Response:
I believe that it was their corporate office in Stamford.

[name withheld]:
It is quite interesting that the framers of this law were wise enough to foresee the fact that there were going to be instances where private employers, the AWE sites, may not be so willing to give up their records for this program to help document things. There is a subpoena power written into this Act that is afforded to NIOSH.

Mr. Hinnefeld:
The Department of Labor has the subpoena power.

[name withheld]:
Is NIOSH excluded?

Mr. Hinnefeld:
They may subpoena things for us.

[name withheld]:
Larry Elliott told me on the phone three days ago that NIOSH had that power.

Mr. Hinnefeld:
The only time it has been used, we had to get the Department of Labor to do it for us.

[name withheld]:
But it can be done?

Mr. Hinnefeld:
We had to get the Department of Labor to do it for us.

[name withheld]:
Well, I want this on the record that Larry Elliott, who is the head of OCAS at NIOSH, told me that it could be done and, in fact, with Dow Chemical would be done if they were not forthcoming with records.

Ms. Breyer:
This is Laurie Breyer from NIOSH, as well. I just wanted to clarify that on that phone call Larry said we would ask the Department of Labor to subpoena those records for us from Dow Midland if Dow Midland would not provide them to us. We also clarified that NIOSH cannot subpoena the Department of Energy, but we can request that the Department of Labor subpoena those records for us.

[name withheld]:
Right. That's the point I am trying to make though is that these records of urinalyses and so forth exist. They still could be subpoenaed.

Mr. Hinnefeld:
Just so we are all clear, [Former Worker #2] was talking about a urine sample for fluoride in the 1970s. That will not help NIOSH. We are looking at uranium exposure, so a fluoride result will not help. If the Olin Corporation had uranium urinalyses past 1958 and they have those records, then we could pursue them in that fashion. That would be something that we could do if there are records. But just so we are clear, there is nothing so far that has been said tonight that would lead us to believe that they have records. If we approach them, they may have them, but we don't know that they would because he is talking about fluoride results.

[name withheld]:
What I am getting at is that part of those uranium urinalyses were done during the Olin Chemical's ownership period, right? Olin bought Blockson Chemical in 1955. When did you say that the request went to the Health and Safety Lab?

Mr. Tomes:
1953 – I don't remember what month.

[name withheld]:
So that was while Blockson still owned the plant, but then, but you do have urine samples through 1958?

Mr. Tomes
Yes.

[name withheld]:
Well, that would be at least three years while Olin Corporation owned the plant. So what I am saying is it may very well be that when Olin bought the plant, maybe they inherited the Blockson records, particularly with the urine testing program.

So, you know, I think that will be one of the parts of our request, to actually look for those records and at least, as Mr. Elliott is doing, which seems the wise and prudent way to further ask Dow Midland. But I am saying to ask Olin Corporation right now. And then, you know, with the possibility that if those exist and they are not forthcoming, maybe the subpoena power of the Department of Labor could be used. But we need to pull out all the stops to get that information. I think that's the point. So I understand that this is different information from a different era but it indicates that later on, at least, Olin Corporation was testing urine for fluoride.

Comment from Former Worker #2:
In regards to health and welfare, [Former Worker #1], you may remember this. (Name withheld) challenged (name withheld) to have a morbidity and mortality study done on-site because everyone was getting ill. I have those statistics in my possession. I believe that [name withheld] has presented the morbidity and mortality study to NIOSH in the file. Also, in the 1967 site survey that was done, that was asked to be done, it does not say one word about Building 55 at all. But, getting back to the morbidity and mortality study, there were actually names and illnesses listed. They were listed if the person was still on the payroll or was on long-term disability. The study was done at the request of International Chemical Workers Local 4 to Olin Chemical. (Name withheld) was the Industrial Relations Manager at the time. The union demanded that we knew who was sick and why they were sick. The study, the data was

generated and presented to the president of the union. You should have that in the file packet. It is not going to be grandiose. It is going to be very small.

[name withheld]:
And that's been submitted now to Olin?

Response from Former Worker #2:
I believe that NIOSH has that in their possession as of this evening. Also, as a matter of fact, I have in my possession all of the contracts that even preclude 1946 for the International Chemical Workers Union. They were surrendered to me when the union got in a bind a couple of years ago. I was able to acquire all the contracts, the mimeographs and everything.

[name withheld]:
May I ask you a question about that? We have looked at the union contracts at both General Steel and Dow. (Inaudible) And I was struck that there is a lot of very, very useful information there about safety and all sorts of rules and regulations. However, any mention of the radioactive material is conspicuously omitted from those contracts. Is that true of yours as well?

Response from Former Worker #2:
I went through every single one of them and found nothing. What I presented NIOSH with last night was some parts of the contract that required the FBI clearance for Building 55.

[name withheld]:
And that was a union contract?

Response from Former Worker #2:
That was written into the union contract.

[name withheld]:
That's interesting. That's good. You are ahead at least of both of the sites that I am involved in.

Mr. Hinnefeld:
I want to be clear on where those documents are if someone provided them last night.

Response from Former Worker #2:
I brought them to the table. When you said last night it was three days ago that you heard there was never a union at Olin, I pulled up a couple of copies and brought them up to the table for your review. It was just a picture of the FBI clearance, a rough form that was needed for that at that time. So, as far as any other information within all those union contracts that I read through, I found nothing.

Mr. Tomes:
I have those.

Response from Former Worker #2:
Thank you.

Mr. Lewis:
There is a lot of information going back and forth here. Does anybody else have anything that they would like to mention?

Question from Former Worker #3:
Did you or someone say that heart problems could be attributed to the radiation?

Mr. Lewis:
[name withheld] talked about that.

Comment from Former Worker #3:
I didn't mention any of that. About a year before I retired, one day the foreman suggested I should go home because I didn't look well. I said, "That's okay, I can make it." I stayed until the shift ended at midnight. That happened to be the day – I think it was in 1996 – that we had that heavy, heavy rain. When I got home, I looked down into the basement and I saw about six or eight inches of water for the first time

ever. I said, "The heck with it. I will get it in the morning when I wake up." When I woke up, I showered, got dressed, got in the car, drove myself to St. Joe's Emergency Room. I remember parking in the emergency parking lot. But the next thing I remember, I was flat on my back on a gurney coming out of surgery. When they brought me out of surgery and I came to, they were taking me to the third-floor recovery room. One of the nurses was looking at the heart monitor and she yelled at the other nurses, "Take this man up to fourth floor Cardiac Intensive Care immediately. How do you feel, sir?" I said, "I feel fine. What's wrong?" Everybody was running around because the numbers were high on the monitor. They took me up there and I was there for 11 days and nights for what I thought was just a simple appendectomy. Apparently, it wasn't.

The next day the doctor came in and she kind of laughed, tried to make humor for me, I guess because I didn't look that good. She laughed and said, "You should have waited another day or two. We could have saved you thousands of dollars." I said, "What do you mean?" She said, "Well, when I cut you open for the emergency appendectomy, you were packed solid with gangrene." So that's why I brought up the question.

That's my comment about the radiation, not knowing. I heard somebody mention heart [conditions] – and from that day on, I have been going to a heart doctor because he said that I was in heart failure, that my heart had defibrillated, was off beat. Got that?

[name withheld]:
You have to understand that heart disease, coronary artery disease is very common among our population. All I am saying is that there is epidemiologic evidence that radiation can both accelerate and worsen coronary artery disease, or atherosclerosis.

Question from Former Worker #3:
Could it have had an effect on the appendix, as well?

[name withheld]:
Experimental radiation studies would be in animals and that kind of thing. The most intense study of radiation effects on the human body has been that of the atomic bomb survivors at Hiroshima and Nagasaki. A large number of those patients underwent autopsies and have had tissue examinations. There has been a long-standing – since 1957, I think – an active cooperative program between the Japanese and the American governments to look at that pathology. From that study, there is a huge amount of data on the pathology of almost every organ in the body.

Question from Former Worker #3:
I don't imagine that there is any mention of gangrene or the possibility that radiation could cause gangrene either. Isn't that a kind of cancerous growth?

[name withheld]:
No, gangrene results when the blood supply to an organ has been cut off and the tissues die. For instance, in diabetes, the toes may turn black from gangrene when the tissues have died.

Comment from Former Worker #3:
A couple of years ago, they told me I had diabetes, too. The doctor said that I have neuropathy.

[name withheld]:
I didn't mean to imply in any way that a large percentage of heart disease was due to radiation. But the best study that I know on the effects of radiation and heart disease in humans was a study of women with breast cancer. Somebody was smart enough to ask the following question, if you have breast cancer in one breast and you receive radiation treatment, then the other side of the chest is blocked off so the radiation part is only to that side. And, of course, the heart is on the left side of the chest. They reasoned that people who had cancer of the left breast and had radiation would have a higher instance of coronary artery disease than people who had radiation treatment of the right breast for cancer. In fact, that's what the study showed, that there was a higher instance, so the radiation was the difference.

That really goes back to something that Mr. Hinnefeld said earlier. This law does not address epidemiologic studies. People have talked about the comparative studies of different effects of radiation on the body. There have been a large number of those studies and many of them have been carried out by researchers at ORAU, NIOSH and the Department of Energy, but that's not really a function under this particular law.

Response:
Well, when you mentioned the word 'heart,' it caught my attention.

[name withheld]:
Good, I am glad that it did.

Comment from Former Worker #1:
I don't know if this was brought up last night or not. I don't recall hearing it while I was here. I had to leave early. We had to clean those tanks in Building 40, where all this acid and all this other stuff came in. We had to get into the tanks with a sledgehammer and bust that stuff off the walls. Even though it was wet when it was running, it dried out by the time we got in there to work on it. A lot of us worked overtime to clean that. I don't care how healthy you are, when you work in one of those tanks without a muzzle (respirator) after eight hours of other work, and you go in there and sledge that stuff out with a sledgehammer, you are going to get something. So, I don't know, maybe that will help you in your things on uranium.

[name withheld]:
I am assuming that that sledge work created a lot of dust.

Response from Former Worker #1:
Yes, definitely.

Mr. Lewis:
Every time we have one of these meetings, no matter where we are in the country, I want to get information to people about the Resource Center that you can go through to file claims. Most of you probably already know the number or that you can go through them, but I got the impression last night that a lot of people were going directly to Cleveland (to the DOL District Office). There is a DOL Resource Center in Paducah, Kentucky. They are there to help with your claims, to help you file and with other issues for claimants. I wanted to give you that toll-free number: 1-866-534-0599 in Paducah, Kentucky. They called me today to tell me that some people called them today from this site. That was good.

[name withheld]:
Can you repeat that number?

Mr. Lewis:
Yes. It is 1-866-534-0599. They are a Resource Center to help you out as you file.

Question from Former Worker #2:
Do you need any additional information about what [Former Worker #1] was saying about cleaning up the digester and the tank?

Mr. Lewis:
It couldn't hurt.

Comment from Former Worker #2:
Back in the phosphate production building, Building 40, once a digester became fouled or so full of mud it was no longer cost effective for it to continue precipitating phosphoric acid into the next vessel, it was shut down and manually pumped out. Once the digester was empty, tank entry could commence. A sniff test was done on the digester in our presence – this is my time frame now, from 1973 to 1991. Manual lockouts were applied to equipment to de-energize the equipment in our storage and our entrance lock was last going on. As a precaution, the first-floor area under the digester was roped off and a sawdust dike

was made around this area where the spill was going to occur. The keystone to this, all of our sawdust was stored on the north side inside Building 55, one of the hot spots, because it was a dry storage bone yard and in close proximity to Department 40.
We were assigned a vessel and confirmed the assignment. The safety equipment we wore consisted of size 12 rubber galoshes – the same kind I wore as a child in the – a yellow rain suit consisting of coats and pants, an MSA respirator with acid mist filters, a face shield, rubber gloves, hard hat, glasses, and sometimes monogoggles.

The work detail was two men in, two men out. You stayed 20 minutes in, 20 minutes out. One person was always our tank watch person that never left our sight when we were inside the vessel. The first job was to install an access ladder and secure and cover the agitator blades, which were inside the tanks and became razor sharp from the mud being agitated in it.

Once we opened the access plate on the bottom of the digester, there could be anywhere from six inches to two feet of mud in there ready to come out and get you. You loosened all the bolts, you swung one away, and nothing still came out. You took a long rod and you stood away from the tank at an angle, and you prodded this with a rod until the stuff inside the tank became pliable enough for it to come out and, boy, you got out of the way quick because it went all over the place. When that settled, we went in to begin our work inside this digester.

Next, we would shovel the remaining mud from the floor. This time we are talking mud. We are not talking dry material. This was removed through the access opening, which was approximately 12 inches in diameter. The tank size was approximately 12 feet in diameter by 12 feet deep. When the floor was sufficiently cleaned, the next task was to attack the upper walls and ceiling of the digester. This is where the dry powder comes in. All this growth and mushroom-looking stuff (like the top of a car battery) went on up there. There would be tons of stuff overhead. The tank tops were made out of creosoted four-by-tens. We were always told never to walk on these tank tops because they could collapse at any time.

We would take a long, narrow, small jackhammer to the ceiling and all this stuff would fall down, sometimes half the size of a car. We would have to move out of the way or get smashed by this stuff. We would pulverize that further with hand tools and shovel it out the hole onto the floor.

Later on, around 1980, new scrubbers were added to each digester line. We were never told just what they scrubbed. Dust and fumes, I guess. Sometimes I would assist operators in hand-cleaning them, also. The scrubber system was on top of the roof of Building 40. It was like fiberglass ductwork with quench sprays and had to be cleaned.

We were talking about [name withheld] (from the Florida Institute on Phosphate Research) last night. I asked him if there were any radiological issues in working on the vessels. He didn't see that there were any issues there, but NIOSH seems to think that there could be some radon in this first digester.

Mr. Hinnefeld:
There would be some radiation going on there.

Response:
That's right. That mud would be concentrated up in the scrubber ductwork where the quench sprays were located. We had to open up the access panels and hand clean them with scrapers and throw that on the roof, and take it away in wheelbarrows. The day after we finished cleaning the vessels, a couple of us would be assigned to go back and clean up that containment. We had to line the wheelbarrows with an empty bag or the mud wouldn't come out. There had to be something in the wheelbarrow to break the suction. We would shovel up wheelbarrow after wheelbarrow and take it to a dump station outside the building where a handler would pick it up and take it to a waste dump in another part of the plant. So, that in essence was that. Thank you.

Mr. Lewis:
We like to see one worker's comments lead to the reaction from another. That kind of interaction is very

good. You didn't work at the same time but it brings about other comments. Does anybody else have anything else that could help us put the past together?

Question from an unidentified speaker:
I missed the meeting with Senator Obama, so I feel like I am missing a lot here. Do we have to refile our claims?

Mr. Hinnefeld:
No, if you filed a claim in the past, you don't have to file again. As we mentioned last night, due to the additional research we are doing, we will be revaluating all the claims that have been done so far to see if they need to be changed. It is not necessary to submit your claim again.

Question from an unidentified attendee:
I got a notice in the mail last week that my claim was denied. Will it be reviewed?

Mr. Hinnefeld:
Your claim will be re-evaluated. Now, I can't say that these are all going to change. I don't know if the outcome will change, but we are going to reevaluate all the claims that have been done so far based on the additional research we are doing now.

Question from the daughter of a former worker:
Are they going to include all the people that are outside Building 55, because my father did go into 55?

Mr. Hinnefeld:
The work assignment did not have to be Building 55. Anyone who worked at Blockson is allowed to file a claim.

Response:
But it sounds like everything is being based on Building 55 and people who worked in Building 55, and not anyone else who worked anywhere else in Blockson.

Mr. Hinnefeld:
Our additional research includes looking at – trying to quantify -- exposures that occurred due to these other materials as well, not just to the uranium that was purified in Building 55.

Question:
Is it true what the doctor says? That radiation can affect people in different ways? I mean, not different ways. Somebody can absorb faster than somebody else does and it takes a longer time for someone else's symptoms to show up by being exposed, even going into Building 55 periodically through his work life.

Mr. Hinnefeld:
Well, I am not quite sure I understand the question.

Response:
Let's just say that two different people's bodies may absorb things differently.

Mr. Hinnefeld:
Yes, there are personal variations between individuals. The program is based on population average and uses, as I said earlier, not the most likely value of the probability, but that high-end percentile of the probability to allow for the fact that not everybody is average.

Response:
I can just remember that my dad's car was the same as what everybody else said. The car was covered with black spots, and the paint would be eaten away within a short time. His clothes would come home with holes in them. I am just wondering if my mother doing the wash – she died from leukemia, myeloid leukemia, but she had breast cancer, too. My dad died from lung cancer.

Mr. Hinnefeld:
I really can't offer you any more than I already have.

Question:
The urinalysis for that four-year period, if it was 20 percent uranium, if they continued to work for the next four years, did [the result] go up, did it stay the same?

Mr. Hinnefeld:
Well, that's a pretty good question.

Question:
We don't have any records, remember?

Question from the daughter of a former worker:
I just have one thing to say. This concerns me. I am listening to everybody speak here, and I know nothing about radiation or beryllium or anything, so I can't compete with scientists and technologists. But all I know is that my dad worked there for 10 years during those most critical years, 1951 to 1968. He died at the age 39 full of cancer. Yet your dose reconstruction was a ridiculously low number saying that he wasn't even close to 50 percent.
But listening to all of this here, that animals were dying and cars were rusting, I just don't understand how any of this that we have all heard from the last three years is going to help me by refiling to increase this dose reconstruction. I am not hearing anything different than we have already heard for three years. So what is it that we are starting all over and doing again now that is going to increase our chances of increasing this dose reconstruction?

Mr. Hinnefeld:
There are two key things that are being done. The first is that we have to evaluate the non-uranium materials that were at the site – look at what the other materials that were present and potential exposures from those. The other thing is that we have to evaluate the radon levels to make sure that we have the right values for radon.

Question:
Do you foresee those numbers spiking?

Mr. Hinnefeld:
I really hate to speculate what is going to happen. I am really not in a position to guess. I don't think the numbers will go down, but I am not in a position to guess what the magnitude of the changes could be. Much of what we have heard described – clothes falling apart, cars not lasting – is probably attributable to chemicals that were used. They were using pretty harsh chemicals there, as well.

Question:
And those harsh chemicals can cause cancer?

Mr. Hinnefeld:
Well, they can, but unfortunately that causative agent is not part of the law that we can work under. NIOSH is only involved with the part of the law that addresses radiation and cancer.

Question from Former Worker #2:
With your level of expertise, since I started working there in 1973, would you say that I would have been safe from radiation as an employee in 1973?

Mr. Hinnefeld:
Well, again, I would be speculating, but I would say that by 1973 the radiation risk was pretty low because they were no longer trying to concentrate any of those materials anywhere. In my field, we never say that it is nonexistent, but I would say it was pretty low.

Question from Former Worker #2:
The phosphate industry, which is primarily in Florida, do you have any statistics for cancer rates for Plant City, Florida where these phosphate fertilizers were and these giant gyp piles exist?

Mr. Hinnefeld:
I don't have any. Some of that work may have been done but I don't know of any.

Question from the Blockson SEC Petitioner:
I just have one quick question. Both of those two things that you listed make sense. What are you going to do? Are you going to take into serious consideration the fact that the production amount varied greatly? I know that at the Advisory Board meeting back in December, one of the four key concerns of the Board members was that the NIOSH evaluation was based on the 50,000 pounds per year production limit, which put the total production estimate at about two million over that 10-year period.

Mr. Hinnefeld:
We are researching that issue. Production amounts are also one of the items being researched.

Question from Former Worker #1:
Does the phosphate rock have to be crushed for any uranium to get out of it?

Mr. Hinnefeld:
Well, the phosphate rock has a very small amount of uranium bound up in the rock. The thing to think about is how dusty is the thing I am dealing with. If you have dust from the rock, some small portion of that dust is going to be uranium. If it is not dusty, then there is no real potential exposure there. There is a small enough amount of uranium that the direct radiation hazard is practically nonexistent.

[name withheld]:
May I make what I hope is a helpful comment? This law is only based on the effects of radiation, but it is very important to understand that not only chemicals but physical agents and, in particular in this context, silica is a potent carcinogen particularly of lung cancer.

Question from an unidentified attendee:
What was that?

[name withheld]:
Yes, silica – sand. Silicosis is compensated under Title B in certain workers in certain tunnel environments in certain locations. But the fact of the matter is that in many of these plants and in particular at Blockson and other sites with extremely dusty environments, particulates of all kinds, asbestos, very toxic chemicals at Blockson, I mean, sulfuric acid, things like that, that there were many carcinogens in the environment.

To be perfectly honest with everybody, the state of science today is that it is exceedingly difficult to calculate the exact risk for any single carcinogen. When you put two together, the models become enormously complex. I think anybody in the field would say that the level of uncertainty rises tremendously.

So we are just entering the era in science where you can take two known carcinogens and in any way reliably assign a relative risk to each of those two things.

So really in fact in the real world when you see people with lung cancer, you know, you are dealing – and the models do take into account effects such as smoking, for instance – but, you know, you are dealing with a multi-factorial etiology of that disease. And the level of uncertainty is really some of the things we all argue about.

The people who construct the models have one view of the world and it is the best guesstimate that they can make. But you really must understand that a lot of this modeling is done with data that's not real because it doesn't exist. You know, there are no film badge data at Blockson. So that kind of thing has to be reconstructed in the virtual sense from other centers.

The answers are not really straightforward, you know, and when we talk about risk, all that means is that in large, large population studies and really it takes, often – unless the effect is extremely powerful – it takes a number of participants in the order of 100,000 to reach statistical significance. So in these

mortality studies that have been widespread on nuclear workers throughout the country, there is a lot of controversy about the results of those studies. Part of the reason is that there are a relatively small number of people involved.

And so if you take a disease like cancer that is very prevalent in the population, you have to see a major effect of purported carcinogen to bump that rate up above the population average. And then, even further confounding, is the fact that in a lot of the nuclear sites the worker population was young and healthy.

And so that's a well-known effect in epidemiologic statistics that the healthy worker effect actually shows just for the fact that if you compare young healthy men with the general population where there are increased incidence of heart disease, cancer, stroke, et cetera, that in general young workers will be better, their mortality will be lower.

And so, if you want to see an increase above the population average, then you have to have a very powerful carcinogenic effect. That kind of epidemiologic study has not been done on this kind of workers like in Blockson. The number of people is very small in a statistical sense, so it is a tough problem but this law doesn't really address that, actually.

Mr. Lewis:
Does anyone else have anything they would like to add?

Question from an audience member:
I have been involved at a couple of other sites. I heard something tonight that is really kind of interesting. And I really never did have a factor on it. What does urinalysis -- if you find uranium in the urinalysis, what does that do to the claimant's possibility of being compensated? Was does that mean exactly? If they had another approved cancer and then this comes up, this information, what does this new information do to the probability of causation?

Mr. Hinnefeld:
Uranium urinalysis results allow you to quantify how much uranium the person had in their system. – Essentially, the uranium was taken out by the blood and, therefore, distributed through the body. The urinalysis allows you to quantify how much uranium got into them somehow. And once you have that data, it gives you a good way to quantify what radiation dose they received to various organs. It provides a method for estimating an internal dose.

Question:
If someone had a 30 percent probability of causation, the claim would be denied. Now, the new evidence apparently becomes available. Would it change to 35 percent, 40 percent?

Mr. Hinnefeld:
Well, if the urine data yielded a dose value that was higher than what had been calculated before, then yes it would go up. If a urinalysis value indicated that the person had actually less uranium in their system than what we had believed before, then the number would go down. So the presence of a urinalysis result by itself doesn't give you enough to predict what effect that would have on a dose reconstruction.

Question:
Does it help or does it hurt? Does it do both?

Mr. Hinnefeld:
It is hard to say what it would do. It provides evidence. It provides a good way of quantifying things.

Comment:
There was another comment about – what are the different radiological concerns that you have at this site? Phosphate rock… I heard you say radon.

Mr. Hinnefeld:
Our concern is uranium and the materials that occur in the uranium decay chain, so there is a thorium isotope in there. There is radium-226 and there is radon after that. Theoretically, there are a couple of

long-lived daughters of radon that may be around as well.

Response:
What would they be?

Mr. Hinnefeld:
Lead-210 certainly comes to mind. Then there is usually a little bit of thorium-232, although quite a bit less than uranium.

Question:
That was really kind of interesting. It sounds like there was acid in there. What does sulfuric acid on that kind of rock cause?

Mr. Hinnefeld:
Well, the acid dissolves the rock, but it doesn't change the characteristics very often. It would either dissolve or it wouldn't.

Question:
It doesn't create anything else?

Mr. Hinnefeld:
No, a chemical will not change one radiological material into another.

Response:
I thought I read something about polonium.

Mr. Hinnefeld:
Polonium is one of the radon decay products.

Response from Former Worker #2:
That's found on the gyp pile.

Mr. Hinnefeld:
Yes. The radon chain, there is a big long list of them. But, yes, polonium is in that chain. That would be part of what we are addressing. I said radon and decay products, maybe a couple along the line.

Comment:
I am a little curious to find out what happens. This part of the program is new to me. But we do know there are chemical materials there as well.

Mr. Hinnefeld:
They won't change the radiological characteristics of what you have. It changes the physical and chemical characteristics but it won't change one radiological material into another. A chemical won't do that.

Mr. Lewis:
I want to thank everybody. It is getting late. Is there anything else you would like to say?

Question from an unidentified speaker:
I have a question. Joliet is noted to have the radon in the water. Is there a reason why? Is it because of the drop off from Blockson Chemical in the water system?

Mr. Hinnefeld:
I am not familiar with Joliet's business. Normally, radon in water systems is due to the rock formation of the aquifer where the water comes from. It depends on what is in the rock that your water aquifer is in. If it is high in radium, then it will be higher in radon than an aquifer that is low in radium.

Question:
I wasn't here last night, but I heard from somebody else who was that they said that some of the collection of dust or something from the filtration system was dumped into the sewers in Joliet along into the river, and it was dumped into our system. Joliet finally told them they couldn't do it any longer. Then they found another way, which then ended up in your ponds or pools or whatever. Is that stuff soaking into the ground and causing our problem?

Mr. Hinnefeld:
I would suggest that if the Joliet water system has high radon, this plant would not be the cause of that. The radon content of the water could be because of the aquifer that the water is drawn from or if it was drawn from the river, it would be from what is in the river that it is directly drawn from. I just don't see any way it would be plausible for this site's operation to have a significant effect on the entire water supply of Joliet.

Comment from Former Worker #2:
I actually went after the same question that she asked. I found a thesis that someone did on the effects of a phosphogypsum stack on an aquifer. Under the correct conditions, a phosphogypsum stack or gyp pile can affect the aquifer with radon. Is it going to spoil this whole area to where we all (inaudible) for the past 20 years? No. But can it affect it or spike it a little bit? Possibly. This whole area sits on sandstone. Sandstone has cracks and fissures. That whole area where Olin was located was all quarry area.

Mr. Lewis:
I really appreciate the former workers coming out to talk to us so we could get a better picture. Who would know better than the workers from the shop floor? I appreciate hearing from the survivors and everybody else, too. I really think that you have done yourselves and your coworkers a favor. We will stick around for a while to try to answer any questions that you may have.

Mr. Lewis adjourned the meeting at approximately 9:45 p.m.