US ARMY CORPS OF ENGINEERS
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In the Matter of: +

NIAGARA FALLS STORAGE SITE +

Formerly Utilized Sites Remedial
Action Program + June 8, 2011

Remedial Investigation Report
Addendum

Lewiston-Porter, New York
+- +

Transcript of meeting held in the above-entitled matter at Lewiston Senior Center 4361 Lower River Road, Youngstown, New York 14174 on June 8, 2011 at 6:00 p.m pursuant to notice.

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P R O C E E D I N G S

ARLEEN KREUSCH: Please take your seat. Make sure you've filled out your name plate so that we know who you are. There's markers here and there throughout the room. If you did not sign in we would like it if you could because we use the information on the sign-in sheets for our mailing list and our electronic mailing list. Everyone should have received a folder. If you did not, please make sure you go and get one at the sign-in table. And we have copies of tonight's presentation. And I've been told to let you know that the slide numbers may be off –- There's also a comment card, if you would like to –- if you have any questions tonight, you can fill out the comment card. And we have a copy of the fact sheet that's on the remedial investigation report addendum that we're going to be talking about tonight. I would also like to let you know that there are emergency exits where you came in at the sign-in table, and two in the back and the restrooms are on my right. And now I would like to introduce Mr. John Busse who is the program manager for the Niagara Falls Storage Site and LOOW.

MR. JOHN BUSSE: Thanks, Arleen. I want to thank everybody for coming out tonight. I know it's a beautiful night. We've had a lot of rain lately so I do thank you. Tonight we're going to talk about the RIR Addendum and the report that we recently released. This report was prepared in response to the several stakeholder and community comments we got on the 2007 release. So I hope that you found that, -- or find that, our report adequately addressed several of the comments that were received and hopefully have met your needs. At this time I'd like to just introduce the Corps team. Go around the room here, I guess. We have Michelle Barker, our regional technical specialist, Jane Staten, project engineer for Niagara Falls Storage Site, Karen, Dr. Karen Keil, our risk assessor, Jim Stakowski, the project engineer for LOOW, Neil Miller, health physicist, Harold Leggett, our on-site con rep at the Niagara Falls Storage Site, Jeff Hall, chief of environmental engineering, and did I forget anyone? We have Arleen and Natalie, our outreach specialists, Bruce Sanders, our public affairs officer, as well as Andrew Kornacki in the back, a public affairs officer, as well as Robert Berkshire, strategic planner. Sorry. Sorry about that. So without further ado, I'd like to turn over the presentation to Hallie Serazin from SAIC to get it started.

HALLIE SERAZIN: Good evening. The purpose of today's workshop is to present a brief overview of activities conducted for the RI Addendum and key findings of that investigation. The RI Addendum covers work that was conducted at the site to provide more information on the type and distribution of contamination in groundwater, to provide more information on the potential for off-site migration, to confirm that the interim waste containment structure is functioning as designed, and to further investigate the possibility for plutonium and other fission products at the site. Finally we will present a brief summary of ongoing and future activities related to the Niagara Falls Feasibility Study.

We will begin by reviewing where the NFSS is in the Comprehensive Environmental Response Compensation and Liability, or CERCLA, Act process. We will then move on to present RI Addendum results for three groundwater areas of interest, and those are the Baker-Smith Area, the Acidification Area and the IWCS Area. Questions will be taken from the audience following the presentation of each topic. At the conclusion of the presentation we will invite you to come up and take a look at posters which show information from both the RI and the RI Addendum and while you're reviewing the posters the NFSS project team will be available to respond directly to your questions. You may also submit questions using the comment cards in your packet, or you can email us, and we'll give you that address at the tail end of the presentation.

So let's start with some site history. In 1942 the US Government acquired approximately 7,500 acres of land here in northwestern New York State and constructed a TNT production plant known as the Lake Ontario Ordinance Work or LOOW. Production of TNT at the LOOW was short-lived and ended a year later in 1943. In 1944 the Manhattan Engineer District was granted use of a portion of the LOOW for storage of radioactive residues. Residues are the material leftover after processing uranium ore which was -- the uranium was removed and used in the atomic bomb, in construction of the atomic bomb. The radioactivity comes from the natural decay of uranium in that ore.

The decision to store radioactive residues on a portion of the LOOW created the Niagara Falls Storage Site and between 1944 and 1954 the (Manhattan Engineer District) MED and its successor agencies periodically shipped radioactive residues and materials to the Niagara Falls Storage Site, which is shown here on the slide in blue. Just to orient you, here's the NFSS, the brown or tan area is the LOOW and we're meeting here tonight right around here, at the Lewiston Senior Center. The Corps is required by law to comply with CERCLA in conducting Formerly Utilized Sites Remedial Action Program cleanup work. The CERCLA program lays out a systematic process for identifying, investigating and cleaning up hazardous waste sites. This graphic shows where we are in that process. The purpose of the RI is to define the nature and extent of contamination and to evaluate potential risks to human health and the environment.

The next step in the CERCLA process is the Feasibility Study. During the Feasibility Study multiple remedial alternatives to address the contamination will be evaluated. Multiple remedial alternatives will be considered so that the best one can be selected. Several technical memoranda are currently being produced as part of the initial Feasibility study efforts for the IWCS operable unit. An RI report for the Niagara Falls Storage Site was issued in 2007. Additional RI efforts were conducted to address areas where more data was needed and to address stakeholder comments. The findings of these additional efforts are presented in the RI Addendum and are the main topic of tonight’s workshop.

The NFSS RI included sampling results for soil, surface water, sediment and groundwater. The report also included a baseline risk assessment and a groundwater contaminant fate and transport model. The RI was used to decide where more information was needed to understand current conditions as well as to prepare for evaluating remedial alternatives. The additional information needed was obtained through investigations conducted during 2008 and 2009 and the results from that most recent investigation were compiled and evaluated and presented in the RI Addendum which was released in April of 2011.

Comments on the 2007 RI submitted by the local, state, and federal regulatory agencies as well as the community cover a wide range of topics and form the basis for the RI Addendum investigations. These photos show soil sampling and well installation conducted during the RI Addendum field work. Responses to the stakeholder comments on the RI have been posted on the project website. The address for the project website is in your meeting materials and will also be posted later.

Tonight we will be discussing the key RI Addendum topics which were selected based on public comments as well as topics that have the greatest potential impact for human health and the environment. These topics are listed on the slide. The Corps would like you to be aware of additional RI

Addendum topics that will not be covered in detail during tonight's presentation but that are covered in the RI Addendum document. These topics include additional evaluation of the Niagara Falls Storage Site background data sets, screening of recent Environmental Surveillance Program data, review of radiological results from samples collected during the LOOW Underground Utilities Remedial Investigation, review of railroad ballast, building core and road core samples and presentation of supplemental documentation requested by RI reviewers.

Let's begin by taking a look at the nature and extent of groundwater contamination. First, Eric Evans representing Hydro Geologic, or HGL, will present a hypothetical example of groundwater modeling that shows the predicted behavior of contaminants in groundwater over time. Eric will also be presenting groundwater modeling results for each of the groundwater areas of interest as we proceed through the presentation topics. Eric.

JOHN BUSSE: In my excitement to get things started I failed to introduce the team that helped us put together the reports. From SAIC we have Hallie Serazin who you already met. Eric Evans from HGL. Dave Kulikowski from AVESI Mr. Stephen Connor from SAIC, Ellen Rager from SAIC and then Laurie Obloy from SAIC, in the back as well. So I apologize for that.

ERIC EVANS: Thanks. Now, there are several different mechanisms that result in groundwater contamination. One of the most common methods that can result in groundwater contamination is when rain water intersects waste materials that are either on the land surface or buried in the shallow subsurface. When the rain water hits waste materials that can dissolve, contaminants in the waste and the rain water, either then can run off to surface water bodies, evaporate, or a portion of it migrates down to the water table and can impact clean groundwater. And the water table is just the location within the ground where below that particular location all the void spaces in the rocks, and in the soil, are filled with water. So I'm going to show just a real brief animation that kind of demonstrates some of the processes that are present when groundwater contamination occurs. What you're going to see on the animation, it's a hypothetical site. I forgot to point that out. It's nothing similar to the Niagara Falls Storage Site. The materials underneath the site are sands, very permeable, very different than the clay materials that are very impermeable beneath the Niagara Falls Storage Site.

It's also a hypothetical wood treating site. So as rain hits the surface, you can see all the arrows that represent surface water runoff. So you could see the surface water was running off and impacting this ditch and this creek right here. As animation shifts, you can see a slice into the subsurface. So remember there is waste in subsurface here, and here, and as rain hits the ground some of it infiltrates into the subsurface, picks up contamination. It moves primarily vertically, typically in the unsaturated portion of the subsurface. Once it hits the water table which is defined as this plane right here, it has a more horizontal component of flow which is seen in the slides, mixing with clean water. A plume is developing in this case. In this hypothetical example, the plume eventually migrates over to the surface water body where it’s captured by the surface water. Next slide.

Now, at the Niagara Falls Storage Site we developed a groundwater model that simulates a lot of the processes that were described on the previous slide, and what we use, we typically use groundwater models for a couple different reasons. One, when we want to gain a better understanding of groundwater flow or contaminant migration at a particular site, we’ll develop a model and use it for, to give us a better understanding. The other time we typically use models is when we want to make predictions into the future. So I'm going to spend I guess the next four or five slides describing the groundwater model that we developed for the Niagara Falls Storage Site and the surrounding area. We've described this before at previous public meetings so this is just going to be an overview. But we developed a groundwater model that simulates groundwater flow and contaminant transport for a 38,000 acre area, which extends to Lake Ontario. First of all, the Niagara Falls Storage Site is right there. Lake Ontario is on one edge of the model. We have the Niagara River along the western edge. The Niagara escarpment is down here, and this is just the groundwater flow path. When we construct the model, we construct it using something called a MOD HMS (SIC), which is a piece of groundwater modeling software. We have to overlay a grid onto the site. It's called a computational grid. And at each grid element, that's what shown in this kind of gray area, you can't make out the little elements of the grid very well, but the center of each computational element in the grid, the model calculates groundwater elevations, groundwater velocities, contaminant concentrations at each of those cells. And you notice that the coloring is a little bit different right around the Niagara Falls Storage Site and that's because the grid spacing is a lot finer in that area because we need a lot higher resolution in this area of interest. So the grid spacing is for 25 feet in that area.

Now, the model was originally completed in 2007. We recently updated it to incorporate new data that was collected as part of the additional RI work that was recently performed, and I’ll talk a little bit about that going forward. Next slide.

Now, the model, it simulates flow and transport in three dimensions, so it’s critically important to really understand the subsurface geology. Groundwater moves differently through clay as compared to sand. It moves -- all things being equal, groundwater moves a lot faster in sand and gravel than it will in clay. So it’s really important to know what the subsurface materials are like, what the geometry is like through the various geologic units, what’s the elevation. Needed all that to develop the model. At the Niagara Falls Storage Site the two most, I guess, critical units in terms of groundwater flow and contaminant transport are these upper two units. We have the upper clay till, and this is just a strata column, it just shows the geologic units in kind of a cross sectional view and this is a three dimensional view of that. So we have the upper clay till or UCT and the glacial lacustrine clay, or GLC. Both these are predominantly clay. Water doesn't move through there very quickly. The upper clay till has some sand lenses that are discontinuous within it. The glacial lacustrine clay is what we call an aquitard. It's a very impermeable unit that really restricts the flow of groundwater between two units, being this upper clay till unit and this –– (inaudible) –lower water-bearing zone traveling here below. Next slide. As I mentioned we have a computational grid which we do these calculations, and all the different calculations on, and there is a spatial component which you saw on the one slide. But there is also a vertical component, so there are different layers of the model, and essentially there are four layers of the model and they represent the different geologic units in the subsurface.

Once the model was constructed we also –- we verified its accuracy using actual site specific data, mainly water level information that we got from –- (inaudible) -- to demonstrate that it was accurately predicting site conditions. Then we used it to perform several predictive simulations. We used the model to do several baseline scenarios, and baseline, I mean that's current conditions. Our baseline simulations involve simulating a wide range of contaminants. Assuming that the maintenance on the cap continues as it continues today. Somebody's out there mowing the cap, compacting and fixing, making sure there is no subsidence.

We also did several hypothetical worst case scenario simulations such as inadvertent penetration of IWCS. Somebody comes out there, jumps over the fence with a drill rig and drills several holes in the cap and underlying concrete. That's what that simulation is. Earthquake disrupts both the clay cap and underlying unit below, and then we simulated what would happen if the cap was breached, if there was a large scale breach of the cap that wasn't contained. Going forward we'll also be using the model to do predictive simulations as part of the Feasibility Study. We can use the model now, it's constructed to evaluate "what if" scenarios for the development and evaluation of remedial alternatives focused on the Niagara Falls Storage Site.

Now, in terms of the updates to the model, there's three main sets of revisions that we made to the model based on new RI data. As Hallie mentioned, we have a lot of new water quality data that were collected recently and that's in the IWCS, the Acidification Area and the Baker-Smith Area. So we have a lot better understanding of what the contaminant distribution is in those three areas. So we've updated the model to reflect that new data. That's one of the things that need to be inputted for the model. We need to know what the current water quality is, what the contaminant concentrations are right now. So some of the maps that we'll be showing later on showing contaminant distribution we input into the model, and that was kind of a starting point for our simulations.

We also did some additional work focused on some of the sand lenses in the upper clay till. That's been an issue of concern; those sand lenses serve as preferential pathways for groundwater flow and contaminant transport from IWCS or other areas of the site. We did a statistical study as part of our initial work on the project and we used all the data collected from bore holes, looked at how the sand lenses were distributed across the site, used statistical technique to evaluate how interconnected these sand lenses are. Based on that Statistical study the sand lenses on average are interconnected at lateral distances from 15 to 20 feet. We also looked at a lot of geologic data in the form of cross sections and found that that was like, that was probably the case based on the information that we had.

Recently we had a lot more bore hole data in those areas that I discussed before so we revised our cross sections using that new data and evaluated whether that was in agreement with our previous conclusion or whether we needed to adopt our original hypothesis.

We also looked at some data that, geologic data that were collected when they did the trenching of the clay dike around IWCS. There was a geologist out there that was writing descriptions of what he saw as a trench for the soils in that area. And what we found from both cross-sections and the observations of the excavations during the dike construction is that our previous hypothesis about the sand lens continuity is correct. We don’t think that they’re interconnected over very great distances. They seem to be fairly isolated features of the subsurface and are not pathways for contaminant migration over great distances.

But nonetheless, in the model revision we did incorporate some of the sand lens data into the model so in areas where we did see a sand lens we represented that sand lens in the model as a higher hydraulic lens, they’re typically fairly small because they’re not very –- (inaudible) --

Finally, the last update that we did is, we revised how we simulated the solvents, PCE, TCE, DCE, vinyl chloride in the Acidification Area. Initially we just represented them in the model by initializing the contaminate distribution.

Now we represent these solvents by assigning a constant concentration source term in the model. I'll explain that a little bit more when we go through an animation on the Acidification Area. Next slide. I'll turn it over to Dave Kulikowski.

DAVE KULIKOWSKI: A data gap that was identified in the RI report was the extent of groundwater contamination along the northern and the western boundaries of the site. So this slide shows the general areas of interest where additional field investigation was conducted; that was in 2009 and 2010. So we looked at the Baker-Smith Area, we looked at the Acidification Area, and the IWCS Area. So although groundwater is not used for drinking water at the site, groundwater samples are compared to drinking water standards as a way to identify areas where contamination is a concern. Now, as we move forward in the presentation we'll be referring to areas of groundwater contamination rather than calling them groundwater plumes. We received a comment from the New York State Department of Environmental Conservation stating that the contamination in a well was more of a point source and ~~the~~ a collection of these points does not constitute a plume. Rather it makes up an area of contamination. So no more plumes from now on, just areas of contamination. Next slide.

To enhance our understanding of groundwater contamination in the three areas of interest, the Corps completed the following tasks. First of all, 23 temporary wells were installed in the three groundwater areas of interest. Groundwater sampling results collected from these temporary well points and in addition to other site characteristics were used to determine which well locations should be converted to permanent monitoring wells. The resulting 10 permanent monitoring wells are being used to monitor groundwater quality and ensure the protection of human health and the environment.

Secondly, soil and groundwater sampling was conducted in all three investigated areas to further refine the extent of groundwater contamination. Shown in the picture on this slide, soil borings were scanned for radioactivity prior to sampling. Additionally, soil gap samples were collected to address potential on-site exposure to organic solvents in soil and groundwater. Third, the extent of groundwater contamination was updated based on newly acquired groundwater sample results. And finally, the groundwater flow and transfer model was updated to further evaluate the extent of groundwater contamination. Next slide.

The Baker-Smith Area right here is located in the northwest corner of the NFSS Site. During LOOW operations a pipe shop and a machine shop, a welding shop, and a storehouse were located in the Baker-Smith Area. The area was later used as a residue storage area for L30, K65 and old atomic power laboratory waste. It's currently the area bordered by the NFSS perimeter fence to the north and to the west. This figure shows the groundwater contamination area identified during the 2007 RI. The blue dots, those identify the existing RI wells that were used to produce this contamination area. Next.

So, six new sampling locations in the Baker-Smith Area were installed as temporary well points to further refine the extent of contamination of groundwater. Three well locations, shown as the dark green bordered circles right here, those were converted to permanent monitoring wells, and they can be used to monitor the area of groundwater contamination along the northern property boundary in the future. The three remaining new locations, those are the bright green dots, those were temporary well points. Next slide.

So by comparing the area of groundwater contamination shown on the previous slide, which was more of this circular area that we had, with the updated area of groundwater contamination, you can see that the area of dissolved total uranium in groundwater at the Baker-Smith

Area, it’s actually a little more narrow than once thought, and it doesn’t extend as far as to the south as we had it before. So on this figure, and all of the groundwater quality maps in this presentation, the hollow and filled circles represent groundwater that meets the drinking water standards. The hollow circles are below the background level and the filled circles are above background but they’re below the drinking water standard. And then the filled triangles, those show the ones that were above the drinking water standards.

So during the RI, the sampling results indicated that dissolved total uranium is present in groundwater in one well to the northwest of the property boundary. It is at a concentration of 37.5 micrograms per liter, and that’s above the background level of 16.7 micrograms per liter and slightly above the uranium safe drinking water standard of 30 micrograms per liter. Also, concentrations of developed total uranium slightly above the drinking water standard were observed at the other wells along the northern property boundaries, the new ones that we put in, we had higher concentrations.

Now, three monitoring wells that were installed, they’re approximately 620 feet north of the NFSS property boundary, they were sampled in July 2009 as part of the LOOW Phase 4 Remedial Investigation. Uranium in these wells were below background and the safe drinking water standard. So based on this information it can be inferred that uranium contamination of groundwater is bounded to within the Town of Lewiston property, the former LOOW wastewater treatment plant property area. Now, remember groundwater is not a source of drinking water in this area and measures are underway to restrict public access to this area as well. And the Corps plans to perform additional field activities in support of continuing monitoring of groundwater contamination for the Baker-Smith Area. Now I’m going to turn it back over to Eric and he’s going to show a model of the area.

ERIC EVANS: I’m going to show an animation showing some modeling results for uranium 238 and the shape of, the distribution of U238 is a little bit different than the map that Dave previously showed. That was for total uranium. In the groundwater model we actually have to simulate the various uranium isotopes because the model simulates both radioactive decay and ingrowth. So as uranium decays another radio isotope concentration goes up. So in order to simulate that process we have to simulate the individual isotopes.

So just to kind of set up the animation, this is a map view showing initial uranium 238 distributions. We have the property boundary here. Color scale showing the range of concentration going everywhere from .5 to 500 picocuries per liter, groundwater flow just to the northwest, and then we have a time counter right here. And the simulations, all the simulations that we performed go out to 10,000 years. This animation shows the entire time period. Some of the other ones I'm going to show later in the presentation have been truncated. But you'll see that this is a fairly boring animation. There is not much plume improvement. You have to look at it very, very closely. Over the course of zero to 10,000 years the model is predicting that the lateral movement of uranium, it's very slight. And this is because of a couple reasons. One, groundwater flow in this area is very slow. It flows through the clay at a very slow rate. And also the clay materials within the upper clay till absorb uranium. The uranium will absorb somewhat onto the clay particles. So what the model predicts is, we don't anticipate to see much significant plume growth pertaining to the property boundary. And I think with that we can have an open discussion.

ARLEEN KREUSCH: Does anyone here have any questions on the Baker-Smith Area?

JERRY WOLFGANG: (Totally inaudible because he is not on a microphone)

ARLEEN KREUSCH: Could you repeat that question, please, and could you state your name so that the Court Recorder can hear you?

JERRY WOLFGANG: Yeah. Jerry Wolfgang, (Inaudible) --of the Town of Lewiston. If I remember correctly when those pipes were sealed by the highway commissioner a number of years ago at that treatment plant site, there was a complete cutting off of any flow to the river at that point, and they were sealed. Is it possible that that's within your area?

MS. HALLIE SERAZIN: No. If you're referring to the Town of Lewiston wastewater treatment plant –

JERRY WOLFGANG: Right.

MS. HALLIE SERAZIN: –- that's actually north of the Baker-Smith Area. Those three additional wells that we installed are actually off the NFSS property but they were installed as part of that investigation which is currently ongoing. As far as pipelines that ran to the river from the wastewater treatment plant, some of that work was investigated as part of the LOOW underground utilities remedial investigation or the LOOW UURI and some of that data, some of the samples that were collected for the LOOW report were split. The Corps team for Niagara Falls went out and split some of those samples and did radiological analysis for those samples and results of that are reported in the RI Addendum. So you could go back out to the report and look for that data. There was nothing that would be a real red flag. But you know, you're welcome to go out and investigate further.

JERRY WOLFGANG: Thank you.

ARLEEN KREUSCH: Do we have copies of that report here tonight, no?

HALLIE SERAZIN: RI Addendum.

ARLEEN KREUSCH: Could someone show Mr. Wolfgang where he needs to look for the report later, after the meeting?

DR. KAREN KEIL: I just want to add, I don't -- there is no pipeline traversing to that area from --

HALLIE SERAZIN:: Through the Baker-Smith, right. It would be further north, right.

DR. KAREN KEIL: Further north and further to the east but not through that area –

ARLEEN KREUSCH: That was Dr. Karen Keil.

TIM MASTERS: Didn't he say though when he was talking, the last gentleman, that the three wells that were placed to the north where the last site was, that that area had unsafe drinking water?

HALLIE SERAZIN: There is currently one well associated with the Baker-Smith Area off the NFS property which does exceed the drinking water. It would be north of the fence line.

TIM MASTERS: (Inaudible not on microphone)

HALLIE SERAZIN: The three wells to the -- north, the three, the three ones at the top were all below background, so in fact we know that that area of contamination has been bounded to the north. It does not extend that way.

ARLEEN KREUSCH: Can we go back to that map, just explain again?

HALLIE SERAZIN: Okay. So it's these three up here and you can see that they're open circles indicating less than background.

ARLEEN KREUSCH: Which one is the one that's above drinking water standards?

HALLIE SERAZIN: This is the one that's above the drinking water standard-- there's two right in that vicinity but only one is off the site of the property. And I might point out that groundwater is not used as a drinking water source in this area. Yes.

AMY WITRYOL: Amy Witryol just to follow up on Mr. Wolfgang's questions. I have a couple. First of all, just to clarify, the north side of the Baker-Smith Area is property now owned by the Town of Lewiston, correct?

UNIDENTIFIED VOICE: Yes.

AMY WITRYOL: It's a vicinity property.

UNIDENTIFIED FEMALE VOICE: That's correct.

AMY WITRYOL: Okay. The FUDS investigation that's winding up with respect to the health and safety protocol from the FUDS investigation, were there any detections of any elevated radiation in groundwater or soil or surface water, any media on the Town of Lewiston site in this past year?

HALLIE SERAZIN: Jeff, would you like to address –- I can't speak to that myself.

AMY WITRYOL: Okay. So none of the, nothing in the investigation, no investigative waste water, nothing was elevated.

UNIDENTIFIED MALE VOICE: Correct.

AMY WITRYOL: Okay. The next question was regarding the background levels. The drinking water standard for uranium to the best of my recollection is about 10 times higher than the background level established by the Department of Energy on the site. So to suggest to us that only detections above the safe drinking water standard are reflective of contamination from former Department of Energy or Department of Defense use is a comment that I would strongly object to. That's not how we establish background. And it doesn't certainly help in establishing what’s happening to contamination on the site in terms of tracking the migration. But again, just to reconfirm, with respect to the entirety of the FUDS investigation in the past year on the Town of Lewiston site, no elevation of radiation of any kind in any media there or equipment used in that investigation was detected. Just want to be sure.

JIM STACHOWSKI: No, there wasn’t.

AMY WITRYOL: Okay.

JIM STACHOWSKI: And during the investigation there was continuous monitoring for worker safety.

ARLEEN KREUSCH: Right. Jim, you’re not going to show up on the tape for the meeting if you don’t use the mike. This is Jim Stachowski. Thank you.

JIM STACHOWSKI: The short answer to your question, Amy, is no, there wasn’t any elevated radioactive measurements or radio nuclides detected. And I did want to state further that during the investigation as part of the health and safety protocol that the contractor uses, there’s continuous monitoring of the work area and of the soil cores. And the results of that work also did not show elevated readings.

AMY WITRYOL: Okay. So the water, the equipment used on the site, nothing had any elevated radiation at all.

JIM STACHOWSKI: Correct.

AMY WITRYOL: Okay.

HALLIE SERAZIN: Amy, I'd like to address the first part of your statement.

AMY WITRYOL: Yes.

HALLIE SERAZIN: The background level is indicated here. The background level for total uranium in background groundwater for the Niagara Falls Storage Site is 16.7(micrograms per liter).

AMY WITRYOL: Okay.

HALLIE SERAZIN: And then the drinking water standard is 30 (micrograms per liter). So it's roughly twice, not five times. But beyond that, I don't think we're suggesting that an exceedence of the maximum, or the maximum contaminant level or a drinking water standard is really the only way to delineate an area of impact. We're using that as a benchmark value. We're not saying that anything below that is insignificant. In fact, that's why we included the background values in this plume -- or not plume, I'm sorry, area of contamination delineation.

AMY WITRYOL: Well, thank you for that clarification but I would also take issue with the background level of 16.7 (micrograms per liter).

HALLIE SERAZIN: Well, that's another issue.

AMY WITRYOL: Well, it's a very important issue in terms of determining contamination and migration on this site now and in the future because the Department of Energy was at something like 3 picocuries per liter and early on in this investigation, I think just a few years ago, the Army Corps added and impacted well to its background analysis and came up with 9, so it's quite surprising to see now that we're up to 16.7.

HALLIE SERAZIN: The measurement that you're quoting is picocuries per liter?

AMY WITRYOL: I'm pretty sure it was picocuries.

HALLIE SERAZIN: That would not be a measure for total uranium. That would be a measure for a specific isotope of uranium.

AMY WITRYOL: No, it was for total dissolved uranium to the best of my recollection. But you know, I don't have the -- I didn't bring any reports with me, but certainly I was surprised to see a background level that high compared to what we've seen previously from the Corps and what we saw from the Department of Energy long before this all started, before contamination developed to the extent that it's developed now. I'll put it that way.

KAREN KEIL: Yes, I think –- (Inaudible not on microphone) --

AMY WITRYOL: I remember the (Restoration Advisory Board) RAB submitted a document on that and I don’t recall where the response was memorialized.

KAREN KEIL: (Inaudible)

AMY WITRYOL: Right. Well, we’ll take a look at it and if there’s a reasonable explanation, great, but I would flag that as an issue of concern and significant question.

ARLEEN KREUSCH: Nona McQuay.

NONA McQUAY: Yes. I’m Nona McQuay, speaking on behalf of the Town of Lewiston, a member of the RAB. I am questioning the Baker-Smith Area, am I correct, that that is within the Town of Lewiston boundary? Are these maps oriented north-south?

HALLIE SERAZIN: Yes, they are. The Baker-Smith Area is actually part of the 191-acre Niagara Falls Storage Site, so it would be government owned.

NONA McQUAY: It’s government owned.

HALLIE SERAZIN: It would be owned by the Department of Energy, yes.

NONA McQUAY: Except for the small area north of the boundary line?

HALLIE SERAZIN: No. That dark line that you see here is the boundary for the Niagara Falls Storage Site.

NONA McQUAY: Right. My question is, given that this, and I'm going to call it a plume, but I understand your area of contamination is unlikely to change over the next 10,000 years and it is above drinking standards. The speaker who talked about it mentioned a way to control public access and prevent this being used for drinking water. Could that speaker give more details on how that will happen?

JOHN BUSSE: What we're currently doing now is we have a project ongoing working with the Town of Lewiston basically to make the site more secure, putting up fences to restrict access to that property. We're taking out some of the structures, removing some of the structures, putting grates over some of the structures. Keep in mind that this site is still being investigated under FUDS, and will be further addressed at a later time, but we are doing, restricting access to the site in coordination with the Town of Lewiston.

NONA McQUAY: Will there be any signage or it's just restricted access?

JOHN BUSSE: There will be signage. Fencing has already been placed up. There's barbed wire on the fence as well. We're doing our best to keep people out of that area.

NONA McQUAY: Thank you.

JOHN BUSSE: You're welcome.

KAREN KEIL: Can I just clarify? I was going to –- say that when it was part of the former LOOW, that was one area that was part of the TNT plant area. The Niagara Falls Storage Site now, so that Baker-Smith area, it straddles the border between Niagara Falls Storage Site and the Town of Lewiston property. So maybe that's where some of the confusion is. So you're right, it is partly on both properties. The area that was formerly known as the Baker-Smith Area.

ARLEEN KREUSCH: Ann Roberts.

ANN ROBERTS: Ann Roberts. Just to add to that, Nona, half of the property owned by the Town of Lewiston is actually in the Town of Porter. So Baker-Smith straddles the NFSS and what Lewiston owns, but the property that Lewiston owns, it straddles Porter and Lewiston.

ARLEEN KREUSCH: Ann, a last question and then we'll move on in the presentation.

ANN ROBERTS: I'm conscious that I shouldn't really take up too much time because I did have an opportunity to speak with the Army Corps last week over the phone, but I couldn't help just making a comment. The levels of the uranium in groundwater that you're looking at here, I think the highest you're quoting is 35 (micrograms per liter), but south of the interim waste containment structure, the RI detected levels of about a thousand (micrograms per liter). And that particular area has not been investigated. The RI Addendum did not do any further sampling. So the area south and east of the interim waste containment structure, the levels of uranium are far in excess and as far as I'm concerned it's suggestively pitch (sic).

ARLEEN KREUSCH: Okay. Is this about the Baker-Smith Area, because we've got other topics --to cover.

ANN ROBERTS: No, I was only making a comment but I want people to realize, and I don't want to take up time, but if I look at what you've produced for the RI and I look at what you produced for the RI Addendum there is a vast difference in terms of where people's focus should be on leakage. If somebody – anybody would like a handout afterwards to show what the area of concern is. Basically there are three points which are of the order a thousand micrograms per liter.

HALLIE SERAZIN: Ann, we do intend to cover that a little later.

ANN ROBERTS: Right, right, but I just want people to realize that when we're talking about low levels of uranium in that particular area, there are levels of a thousand (micrograms per liter) south that haven't been investigated.

HALLIE SERAZIN: And I think this warranted further investigation just due to its proximity to the site boundary, but yes, we will address your concern for the IWCS vicinity as well.

ARLEEN KREUSCH: Okay. Let's move on with the presentation. Dr. Boeck?

DR. BOECK: Just a reference back to the previous slide. On the left-hand side there, there are some hashed in areas, what do those represent?

HALLIE SERAZIN: Those are former structures like the foundations from former buildings.

DR. BOECK: And what are the two parallel ones inside that area of interest?

HALLIE SERAZIN: Are you talking about these ones down here?

DR. BOECK: No. Up, crossing the borderline.

HALLIE SERAZIN: These two specifically?

DR. BOECK: Yes.

HALLIE SERAZIN: Do you know that?

DR. BOECK: They're railroad siding. This is where they loaded and unloaded material including uranium materials. That's an obvious place to look for contamination and spills.

HALLIE SERAZIN: Yeah, and so it makes sense. Thank you.

ARLEEN KREUSCH: Okay. Thank you. Now we'll move on to the next part of the presentation.

DAVE KULIKOWSKI: And now we're moving on to the Acidification Area. So the Acidification Area is shown in the upper left of this 1944 photo. It's located along the north central portion of the NFSS property. During LOOW operation materials related to the manufacture of TNT were stored in this area. In the 1950s uranium rods were stored in nearby buildings. So as part of the RI Addendum activities groundwater, soil and soil sampling were conducted in this area to further investigate the presence of dissolved uranium and also organic solvents. And although the source of the organic solvents was not established their presence may be due to past storage activities of the military or the Atomic Energy Commission. So as you can see in this photo, this area of the NFSS was heavily industrialized and contamination currently observed here is likely the result of these past site operations.

This figure shows the dissolved total uranium groundwater contamination identified during the 2007 RI. The blue dots identify the existing RI wells used to define the extent of the contamination, so using all of these dots this was the extent of the dissolved total uranium. So we did additional studies in the RI Addendum. Next slide.

Eight new sampling locations were installed in the Acidification Area to further refine the extent of contamination. Six were installed as temporary well points. Those are the green dots. And then the two well locations shown as green quartered dots were converted to permanent monitoring wells, and again, these can be used to monitor future groundwater contamination. Next slide.

So here’s the updated distribution of dissolved total uranium in groundwater. So during activities conducted for the RI Addendum the area of local dissolved total uranium contamination was identified in groundwater along the northern property boundary. So it will be identified, we had this one down here before, now we’ve identified this one when we put the new wells in.

All our sampling results indicate that the dissolved total uranium, at its present level, is greater than the background level of 16.7 micrograms per liter, and the safe drinking water standard of 30 micrograms per liter in these two areas of groundwater contamination. So again on this figure the hollow and filled circles represent groundwater that meets the drinking water standard. The hollow circles are below the background and then the filled circles are above background but below the drinking water standard. The triangles show groundwater above the drinking water standard. None of the uranium samples collected in the Acidification Area were more than double the drinking water standard. So the northwestern extent of this groundwater contamination is not known. However, groundwater is not used as a source of drinking water and if public access is restricted to the north of this area by the Chemical Waste Management, CWM Chemical Services, the Corps does plan to perform additional field activities in support of continued monitoring of groundwater contamination in this area. Next slide.

Now I’m moving on to organics. During the 2007 RI the southeast to northwest trending area of organic compound contamination in groundwater was identified in this area. So here’s our organic plume. This localized area of groundwater contamination contains organic solvents including tetrachlorethylene which is also known as PCE and its degradation products from the natural breakdown of PCE.

Groundwater contaminated by PCE and its degradation products that were above this drinking water standard is within the NFSS site boundaries. So this figure, this shows the PCE groundwater contamination identified during the 2007 RI. The blue dots identify the existing RI wells and then these are the new dots. So let’s move on to the new interpretation. Remember the old groundwater area was like this and now it’s extended out a little bit with the additional points. So the current distribution of PCE in groundwater is shown here. On this figure the hollow circles, now they’re below the drinking water standard, which is 5 micrograms per liter, and the filled circles are above the drinking water standard.

The reason we use the drinking standard, there’s no background level for PCE. The RI Addendum sampling results indicate that PCE and its degradation products are present in both surface and subsurface soil within the boundary of the groundwater contamination area. So they’re also in the soil. The source of this organic groundwater contamination is near the central portion of the acidification area so it’s high there, where a visible dense non aqueous liquid was observed during sampling activity. Basically when they pulled the soil core out they said it was a black smelly oily sheen on the soil. You could tell that it degraded because it was black, it was broken down, so it's degraded PCE. So the area of organic compound groundwater contamination extends to within approximately 150 feet of the northern property boundary but it does not extend offsite.

So the Corps currently monitors the organic compound groundwater contamination through the Environmental Surveillance Program by collecting semi-annual groundwater samples from monitoring wells north of the groundwater -- contaminated groundwater area. So again, it's important to note that groundwater is not used as a source of drinking water and CWM Chemical Services property is located to the north where public access is restricted. In the future the Balance of Plant Feasibility Study will address the remedial alternatives for the source of the organic contamination. Now I want to turn it back over to Eric for a graphic representation.

ERIC EVANS: We did model simulations for the PCE and also the other solvents in this area. As Dave indicated, PCE is found commonly with other solvents or can be found with other solvents, but also it degrades under natural conditions into other solvents such as TCE, DCE and vinyl chloride. And all those are found at this location. And that degradation occurs typically through microbial activity in the subsurface. So the simulations we updated as part of the recent modeling efforts, and as I indicated before, we changed how we simulated the source of contamination in this area. Dave indicated what they found with the drilling is they found pretty much pure TCE – excuse me, PCE, that wasn't dissolved in the groundwater. It was PCE in its pure form, pure solvent form. And as groundwater goes around pure PCE it will slowly dissolve it and then the dissolved portion of it would migrate away and it would slowly deplete the pure PCE source form. But in our model, the way we represent it is we assume that the PCE source would always be present in the ground over the 10,000 year simulation. It's always going to have a contribution to dissolve groundwater contamination in that area, and the primary reason why we set up the model run that way is we wanted to see what the maximum potential extent of PCE contamination could be in an area of acidification, well, in the Acidification Area. So to show, this particular animation is going to show the, ~~all~~ the model simulation through the 500 years. After around 180 years there's not really ~~a~~ any change in the different concentrations. This animation we're going to show again a map view showing the PCE concentration. We have a color scale here, the PC concentration on the color scale ranges from .5 to 500,000 micrograms per liter. This is very high. We also have cross sections A to A prime and B to B prime that basically slices through the subsurface along this line and along this line. So it's taking a look through the ground surface along these slices. And again, groundwater flows to the northwest. What we see initially, the groundwater plume contracts and then once we get to about 180 years, this is what we see. We have the source of contamination right in here which is where they found the DNAPL or the pure product. You can see pure product. And the plume no longer migrates. So basically it's because the groundwater velocity is so low in this area, the rate of degradation limits the plume -- excuse me, well, the plume movement after it gets to this location right here. So we don't expect to see the lateral migration, significant lateral migration of the PCE. We see the same thing for the other solvents that are present in this area. We do see a little bit of vertical migration at this location of these cross sections at the highest concentration area. At the end of the simulation, after 500 years we do see low levels on the order of 5 ppb or 5 micrograms per liter along this line and a little bit higher in the Glacio Lacustrine clay along this line right here, that area here. At this point I think we have another discussion.

ARLEEN KREUSCH: Okay. Please let me remind you all that you need to say your name before you speak so that the Court Recorder hears the question. Does anyone have any questions on the Acidification Area part of the presentation? Ann Roberts.

ANN ROBERTS: Very briefly. Is there any more information about the role of those pipelines. Is there any interaction between the groundwater plume area, the Acidification Area, the underground sewers, et cetera, because there does seem to be quite a dense network of pipelines there.

HALLIE SERAZIN: I'm not aware of pipelines in this area.

ANN ROBERTS: Looking at the map, there's plenty of pipelines shown.

MICHELLE BARKER: Michelle Barker. Yes, there are a lot of pipelines in that area. A lot of the acid sewer lines, the sanitary line. It's very densely populated with those lines, and as part of the remedial investigation we did sample a lot of the manholes associated with those lines. Unfortunately I don't recall at this minute what was found. I think maybe minute in one of the manholes, but that is something that we would look at during the RI to see if there is any interaction between the two, and I apologize for not knowing offhand what those results were.

HALLIE SERAZIN: That was not the focus of the RI Addendum, the pipelines themselves. We were trying to delineate the plume.

ANN ROBERTS: Right. But from memory what the RI report said was that it appeared to be some interaction between the correlation between the plume and where the pipelines were. So I just wondered whether that had been factored into your RI Addendum investigation. I think my concern really is that you keep talking about modeling for groundwater movement but from previous occasions when I've asked, does the groundwater model take into account the underground pipelines?

DAVE KULIKOWSKI: It does not. During the RI Addendum we did place points -- actually go back another -- yes. We were looking for -- we placed points to track some of these pipelines -- there was like a pipeline and we thought, well, maybe there's a sand channel going up that way and we'll be able to get the PCE before it goes off site. So we did put that northern point in. But that one turned out to be clean. And the dirtiest ones were things to the northwest. So we did take pipelines into account with the placement of those points, and we found that there was no conduit. We thought for sure we'd find one up to the north but we did not. We were surprised to find everything going that way, which is more of a groundwater control than a pipeline control.

ANN ROBERTS: Thank you.

~~HALLIE SERAZIN~~ ARLEEN KREUSCH: Dr. Boeck.

DR. BOECK: Could we go back one slide? I see a lot of open circles on that slide, and that indicates that the uranium is less than background. How is it there are no samples at background level, if that's in fact the real background for this site?

DAVE KULIKOWSKI: You mean there's no samples at 16.7 (micrograms per liter), is that --it?

DR. BOECK: No. If this is really the background of the site and these locations are uncontaminated, how come they're not at background?

MICHELLE BARKER: I think I understand what he is saying. So the background is 16.7 (micrograms per liter)so you would expect them to either be at background or above background. The way we develop the background data set is, there's always a range, natural variability with background, and even though we say background is 16.7 (micrograms per liter), I believe we calculated it at the 95% upper tolerance limit of that data set. So there will be some variability and I think that reflects the variability of our background data set, as many are.

KAREN KEIL: That's the upper end of the background. Obviously there's everything from non-detect up to that 16.7 (micrograms per liter). It's the upper end of the background. That's the line we were drawing, from the upper end of the background end, you know, impacted by the site.

DR. BOECK: Okay. So this would be the extreme end of the background.

~~HALLIE SERAZIN~~ KAREN KEIL: Yes.

DR. BOECK: Thank you.

ARLEEN KREUSCH: Additional questions? Mr. Masters.

MR. TIMOTHY MASTERS: When you made that model, just out of curiosity, if I put a hundred foot high mountain on the right side of your site and an 80 acre lake on the left side of your site, will that affect groundwater migration

ERIC EVANS: It could. I mean, sure. If you had, groundwater flow is governed by pressure differences, so if you have a mountain where you have water levels –

MR. MASTERS: Well, I believe that's what we're building right now. And we've got a mountain getting bigger and I have a clay mine immediately to the left, that's almost 80 acres.

ERIC EVANS: It really, it depends on whether they're letting the water build up. I mean, if you -- you have to build up water in that mountain. If you have a mountain that the water level in the mountain is at the same level it was before you built the mountain it's not going to have an impact. And it depends, on the same token it depends on whether you're pumping water from that lake. I mean, if it's just a lake and it's just a reflection of the water table, it's not going to change the pressure difference across the mountain or the lake. It's just going to -- you have to pump the water down and then it will increase groundwater velocity.

MR. MASTERS: Right. What happens is, whenever they have to take clay out of the mine, if the lake is full and they put four six-inch pumps out there to take the level down to nothing and then start mining the clay. Then it's just constant back and forth. That's why I'm curious, did you enter that equation into your model?

ERIC EVANS: We didn't, we didn't look at that difference. I know we looked at some pumping over at the CWM at different points in time and the pumping over there didn't make much difference in terms of --

MR. MASTERS: Well, I'm not talking about CWM, I'm talking about the yard mine that's directly west of your site.

ERIC EVANS: Okay.

MICHELLE BARKER: We do collect water levels every quarter on the site as part of the Environmental Surveillance Program. And what we've noticed about the interaction in that western area of the site when it's dry out, there is obviously some water in there and it acts as a recharge point. We've noticed that what it does is, it slightly redirects groundwater flow in that western area from the northwest a little north, but it hasn't been a contributor as far as the actual gradient of the flow or with the speed of the flow in that area, and similar to when we looked at Modern and the potential impacts associated with Modern pumping, the pumping has more of a localized impact associated with it. So anything further away, we don't see that variability but in some of the water level maps. We have noticed a slight shift in that groundwater flow direction in that area.

ARLEEN KREUSCH: Additional questions? Okay. Let's move on to the next part of the presentation.

AMY WITRYOL: Arleen, just one clarification on the -- the 95% variability, how is that established on background and does that mean that the low and high ends are somewhere between 1.6 and 30 picocuries per liter?

KAREN KEIL: You take the distribution of all the background samples, it’s roughly a bell curve, and you look at the 95th percentile at the upper end. It’s a calculated value so it’s depending on how many data points you have, and the variability between them. The calculated value can be above the maximum value in background, in which case we use the maximum –- (inaudible) –- in background, in which case --(Inaudible)–- background. So it’s the lower of the 95th percentile of the –- (inaudible) -- or (Inaudible) -- So in some cases it can be the upper, the greatest detection found in the groundwater in our background reference data check.

AMY WITRYOL: Do you know what the range was offhand?

KAREN KEIL: I don’t know. I mean a few, probably a few, more than a few –- (inaudible) –- 16.7 might have been closer. It’s table 13.1 of the RI.

HAROLD SPECTOR: What I was saying about the UTL, 95% UTL is supposed to represent a value –- (inaudible –

ARLEEN KREUSCH: That was Harold Spector.

KAREN KEIL: (Inaudible) --

ARLEEN KREUSCH: Okay. Let’s start the next area of the presentation.

DAVE KULIKOWSKI: All right. Now moving on to the

IWCS. So this slide shows the area of dissolved total uranium present in groundwater near the IWCS defined in the 2007 RI. And the blue dots are all of the RI wells. Basically we had a plume here. We had an area of groundwater contamination on the west side not reaching the west drainage ditch, and that was a main focus of concern. We had this northern area and then the southern area. And this is where the real high concentrations are down here, so we had this southern plume, all right. Next slide.

During the RI Addendum field activities four temporary well points and five current monitoring wells were installed in the vicinity of the IWCS and you can see the green dots are the temporary wells. Here's one. Then you run up this side and then the monitoring wells are here, and there's one to the south. And speaking of the south, in our initial interpretations pipeline water samples were used to estimate the extent of dissolved total uranium in groundwater in this southern plume. However, it appears to be a poor approximation ~~to it~~ tool because the pipeline doesn't show what's in the groundwater. So for this reason sample data collected from pipelines and manholes have been excluded from the updated groundwater results and we'll show that on the next slide.

So this slide shows the current understanding of where dissolved total uranium occurs in groundwater. So again on the circle, the circles, the filled and hollow circles represent groundwater that meets the drinking water standard. The hollow circles are below background. Filled are above background but below the drinking water standard. And the triangles are groundwater that's above the drinking water standard.

The extent of groundwater contamination along the west side of the IWCS is well characterized and delineated using densely spaced sampling points. So along this area here we have a lot of points to define that area. And the groundwater contamination on the west side of the IWCS identified during early phases of the RI, it remains unchanged, so that area of contamination pretty much stayed the same. The concentration of the uranium detected in the wells and temporary well points between the IWCS and the west drainage ditch in this area are less than ~~on your~~ or near background. And then recent surface water sampling results from 2008 to 2010 indicate that dissolved total uranium concentrations are currently below the background level at three sampling locations along the west drainage ditch.

Now we're going to move to the southern area. By excluding the pipeline data that we said was a poor approximation tool, dissolved total uranium in groundwater south of the IWCS is now interpreted to be more constrained to the southern portion of the IWCS, in their former building 409.

RI Addendum sampling results indicate that the dissolved total uranium groundwater contamination extends further to the northwest. However, contamination does not extend to the west drainage ditch. So this area of contamination was once two individual points, two individual areas and now they're coalescing into one because we put additional points in there.

Available site operation information and environmental investigative data indicate that groundwater contamination ~~near~~ surrounding the IWCS is the result of historic site operations and past waste storage practices. Most of the soil contamination that contribute to the current groundwater contamination was removed in the remedial efforts performed by the Department of Energy in the 1980s suggesting that waste stored inside the IWCS is not contributing to groundwater contamination. This will be discussed later in the presentation.

So one of the focuses of the RI Addendum, based on comments, not a lot of people -- you know, we had these high concentrations but not a lot of comments, wanted to look at this area down here, so we focused attention here, we focused attention here. So moving forward we know there’s high concentrations here, but remember, groundwater is moving in a northerly direction so we didn’t expect to find a lot of contamination on the southern boundary. So although data indicated that the IWCS is performing as designed, the Corps does intend to install additional monitoring wells south of the IWCS as part of the field work for the Balance of Plant Feasibility Study. Specifically the Corps would like to further investigate the area of one sampling point that’s at TWPA33 exhibiting elevated concentration of uranium in groundwater. That’s that high spot down there that Ann was saying was around a thousand (micrograms per liter). Last week the Corps had a conference call with some members of the community and asked these community members to identify locations south of the IWCS where they would like to see additional wells installed. These community members readily accepted the Corps’ offer, and the Corps looks forward to receiving their input. So this is still an area of concern. We did not focus here during the RI but this could be the next area of focus. And now Eric is going to model the area.

ERIC EVANS: I'm going to show animation that illustrates the results of a simulation that we did for U-238, in this area. There are three sources of uranium contamination, three different ways contaminants can get introduced into the model. One, we have contamination that currently exists in groundwater right now, as shown right here. The model also simulates contamination that is coming from soil, that represents that. And we also simulate contaminants flushed from IWCS. So that's the third. Now, the distribution of U-238 that's shown on this slide here, it represents our revised understanding of U-238 based on data collected during the recent RI work. And the simulation I'm about to show through this animation goes on for again 10,000 years. Groundwater flow is to the northwest. Also I have two cross sections, B to B' which is this one, and then another cross section that goes east-west that's right here (A to A'). So it's going to show what's happening vertically. Color scale goes from .5 to 500 picocuries per liter. And then we have a time counter up here in this part of the figure. So when we begin the animation I think what you're going to see is fairly high concentrations starting to develop under the IWCS with time, although the IWCS is effective at mitigating the release of contaminants. The model does predict that with time there will be some small amount of infiltration through the cap and the model does predict that there will be some contamination occurring at the water table under the IWCS. I'm going to pause it in a couple places. So this shows, this is at 150 years. So between 100 and 150 years we start seeing a little bit of uranium 238 showing up beneath IWCS. Initially it's a fairly low concentration. So at about 250 years we start seeing a little bit higher concentration directly below the IWCS. And right now it looks like it's moving laterally from here to here. That's not really what's happening. What's happening is that we have vertical migration through the IWCS that's carrying U-238 down to the water table vertically.

ARLEEN KREUSCH: Okay. Before you move any further, the Court Recorder just let me know they need to change the tape so can you hold for just one second?

ERIC EVANS: Sure.

(Off the record.)

ARLEEN KREUSCH: Okay, go ahead.

ERIC EVANS: So now at 400 years you start seeing some significantly higher concentrations being developed probably on the order of 500 picocuries per liter right in this area. So far the models are predicting that the U-238's contained in the upper clay till at the top layer of the model. So now I'm just going to let it run out through -- wait, I think -- yeah, run out through 10,000 years, and you can see that the concentrations continue to get higher in groundwater right below the IWCS. But note, throughout the simulations you don't see much migration laterally. What the model is predicting is that groundwater right beneath IWCS will continue to be impacted but the lateral migration is fairly slow. And this is again primarily due to the fact that the clays are very tight, groundwater velocities are real slow, and the clay also retards or slows the movement of uranium in groundwater. So it's close to the end of the simulation. You do see at the end, you do see a little bit of vertical migration into the deeper units. So the model does predict that there will be impact to groundwater on the property but based on the fact that it's not predicting migration outside the property boundary, the model is predicting that there is not an imminent threat associated with the releases from IWCS within this time period. So I think there's another question period.

ARLEEN KREUSCH: Any questions? Amy, I'm sorry.

AMY WITRYOL: I notice that the slides on the existing areas, slides 31 and 32 are in black and white, and the modeling are in the color coding. I'll never forget when

I first opened up the Remedial Investigation and pulled out the color coded plumes so that I could see the variations in the detection levels very clearly, and I'm sorry that the public tonight doesn't have the same sort of illustration until we look at the theoretical modeling. I'm also very troubled by the comment that there was an investigation done in the addendum on the south side of the cell because there weren't a large number of comments. If we knew that's what it would have taken, we certainly would have been happy to walk around petitions, so on and so forth. But I think between Ann Roberts and the EPA, if I recall correctly, there were questions about the south area of the cell and the need to investigate it, and I do remember very clearly that the public never had an opportunity to see or comment on sampling an analysis plan that was used to prepare this report until after the field work started. And finally, I'd like some clarification on why the pipelines are considered, quote, unquote, a poor approximation tool. If groundwater contamination is actually moving because of these pipelines, if that's the reality, I'm not understanding why we would want to remove reality from the modeling.

DAVE KULIKOWSKI: Okay. Let me go back to your comment about the comments. There were a lot of public comments on the pipelines of the IWCS. There was a major, major set of comments. And, but there weren't a lot of comments regarding migration off-site to the south. So that's what I'm saying there. So our investigation, we didn't put any wells to the south to see if it was going, but we did put, we had like -- could you go back to the slide of the investigative work. And go back again.

All right. So we did investigate the area. I'm going to point these out. There was a concern with this well that we left a data point out, and I'm going to say it was 22 micrograms per liter and why didn't we connect these points together. Well, we put a data point in between those to address that comment. So we did that one. There was pipeline comments here, and so we put a point in here. We put a monitoring well in to monitor that. And so, that's all I was saying in terms of comments. We didn't address this to the south. We know there's a lot of contamination and we know there are a lot of pipelines.

Now, getting to the point about removing pipelines from the plumes. If you look at it in terms of, you're sampling groundwater, and then you're sampling a pipeline. It's almost like sampling two different media, and it's like we were mixing media. And so we wanted to remove the pipeline water which was considered pipe water. It was manhole water. But then you have groundwater. When you sample groundwater there's a whole process of sampling. You know, you do three purge volumes and you make sure the water is -- you know, you do the three purge volumes and then you put it through a filter and all that. But when we sample surface water it's a different process. So it's like comparing almost like apples and oranges. So we've removed those. Now, we're not forgetting about them. We know that those still exist. But that's why we removed them from the plume interpretation.

AMY WITRYOL: Well, is the purpose of the modeling to determine what might happen or is this something from the Barbizon School of Modeling? I'm just not understanding, you know, I can appreciate the point that groundwater moves differently with or without pipelines, but to exclude it from a model that's supposedly going to be a tool to predict how contamination travels in this community is -- I'm still bewildered if not dumbfounded by that. And again, I just want to clarify, my question is, relative to the number of comments is, you know, if you knew the south part of the cell was a problem and that we've got dense pipelines, I'm not understanding why that didn't get investigated in this Addendum which is all we've got going into the Feasibility

Study analysis and then on to the record of decision. Right?

ERIC EVANS: Okay. The model doesn’t, it wasn’t set up to simulate those three pipelines. Given the scale of the model, it’s just not meant for that particular purpose. Now, if there was a pipeline that was below the water table, and wasn’t sealed on either end, or there was some sort of a gravel pack around the pipe, the model would not simulate some fine scale transport that might occur along that pipeline because, really, it was focused on getting the general characteristics on the Niagara Falls Storage Site but also looking at what would be transported off site for great distances. When we first put the model together, we didn’t really know whether plumes would be developed that were much more significant than what we see right now. So that’s why the model extends out to such a large area. But to actually simulate such a small feature like a pipeline, the model is not capable of doing that. It has to be addressed by other means. Sampling.

AMY WITRYOL: So if a member of the community were to ask, where do we go in the Remedial Investigation Addendum to look at how contamination on the site might move over a period of time, given the reality of the site, pipelines and all, where would they go in the RI Addendum to find that?

MICHELLE BARKER: I think one of the answers that might be helpful, and this actually came out of the LOOW underground utility investigation that I know you're familiar with. I'm not sure in hindsight after the LOOW investigation of the pipelines that we would have modeled the pipelines because there is no bedding material, per se, around (pipelines) that would create this sort of transport that you're talking about. Also I guess in the RI where we show the impact of the pipelines is, we assumed in there that whatever was in the lines was already in the groundwater and contaminated it. So that's about the most conservative you can be with the pipelines is to assume that whatever we found within the lines still impacts the area, around it. It was actually in groundwater ready for transport. So we assumed it leaked, whatever was in there leaked out in the RI. But after we received the LOOW report we realized that that bedding material is not anything really to be concerned about. So that's why maybe in hindsight we wouldn't even have included it, if we could, in the model because it wasn't a pathway for consideration and we had already addressed it leaking in the RI.

AMY WITRYOL: So just to be sure I understand. At this juncture you don't consider the pipelines a pathway, because there's no bedding?

MICHELLE BARKER: I'm just saying that transport around the pipeline is, if you're not going to have, as Eric mentioned, sand or gravel or some way where it can actually follow the line, then what's left is what's within the line. So in the RI we assumed whatever was in the line was in groundwater already. So I think that's a conservative assumption based on the information that we have acquired so far.

JANE STATEN: This is Jane Staten. I just wanted to tell you, also I think we mentioned it but maybe you didn't hear, we plan to do additional field work as part of the planned Feasibility Study and we'll be investigating the pipelines and we'll be ~~drilling~~ installing some wells south of the IWCS.

AMY WITRYOL: Well, if there's additional work being done during the Feasibility Study and in combination with the Addendum and the RI, it changes the picture in terms of the Corps' conclusion as to whether or not the cell is leaking. From a process standpoint, I see I missed the earlier slide about going through the CERCLA process but is that, you know, going to be taken into consideration before the record of decision?

JANE STATEN: I think we've established that based on our current data that the cell is performing as designed. These additional wells will be ~~used~~ to determine the source areas south of the cell. It's an area that was used for storage of contaminated material historically and --

AMY WITRYOL: So regardless of that outcome of that investigation it's not going to alter the Corps' belief that the cell is leaking. I'm assuming that when you say it's operating as designed, that the Corps believes that the cell is not leaking.

MICHELLE BARKER: That's correct. Just to add to that, too, though, we do have the surveillance program and the Corps is continually gathering data so we will constantly assess that data on a routine basis to ensure as kind of an additional measure of protection. So it's not just that we're done. You know, there's going to be additional data that's acquired that we'll incorporate into the process as we go.

KAREN KEIL: One more thing about why we do not focus on the southern end of the IWCS. We focus on the northern and western ends because in the RIR Addendum we were looking at bounding any contamination that may look like it was maybe moving off site. And, based on groundwater flow coming from the southeast to the northwest, we were focused on seeing further, the ~~drowngrade~~ downgradient end of that.

AMY WITRYOL: The wells on the south side wouldn't necessarily be going northwest. They may be going towards the central drainage ditch, but I'm going to let others speak. But we've certainly had a lot of discussion in the past under the remedial investigation in terms of the questions about whether or not the cell is leaking. And I haven't heard or seen anything tonight that in my mind fills those gaps or those questions. I'll just leave it at that.

ARLEEN KREUSCH: Ann Roberts.

ANN ROBERTS: I'll make it quick. The groundwater, the direction of the flow south of the IWCS, would that not be to the east toward the central drainage ditch? Your actual environmental surveillance shows it going to the east.

JANE STATEN: There is a high spot on the east side there.

ANN ROBERTS: So my concern is, you have a sample which is very high in uranium and groundwater at that point would flow east, but you haven't done any sampling to the east to track that contamination, and then the environmental surveillance also shows that another well on the east of the IWCS is now becoming contaminated. I think it's up to about 320 picocuries per liter. And that's downgrading to the pipeline, the sanitary sewer. So there seem to be three points all very high in uranium which are connected by pipelines. I think the concern is that contamination is going to escape by the central drainage ditch in that direction, which is a major pathway off-site, and there doesn’t seem to be any consideration of the severity of the uranium detections.

I know you’ve talked about the -- you think it may be storage of materials, but if you look at the footprint of the storage of materials, there is only one point that you have detected high levels of uranium, and that’s close to a pipeline that comes out of the old building 409. So again, there seems to be mounting evidence that the pipelines are playing a major role in helping contamination to move about the site. Well, I’m concerned that the groundwater level doesn’t appear to take into account the central drainage ditch, is that correct?

ERIC EVANS: No. It accounts for the central drainage ditch.

ANN ROBERTS: Including direction of groundwater flow around it, it discharges to the central drainage ditch?

ERIC EVANS: I will have to check. I can find out at one of the breaks. I don’t have the groundwater flow map but I can look that up for you.

ANN ROBERTS: Because that’s a major concern, I think.

ERIC EVANS: But it is in the model and does collect groundwater and it's in the model of the boundary, groundwater does flow to the central drainage ditch. I'll see if I can pull up one of the figures on my computer.

ANN ROBERTS: Right. But you see the concern that there is a pathway for off-site migration, if indeed the pipelines are acting as pathways. For instance, have the water lines been sealed where they come off the NFSS?

HALLIE SERAZIN: Yes. That was discussed at a previous meeting. We had located all the pipelines --

ANN ROBERTS: Water lines?

HALLIE SERAZIN: Water lines? Well, we --

ANN ROBERTS: I'm -- because you didn't investigate the water lines as part of the underground utility investigation.

HALLIE SERAZIN: No, no, no. I know. I'm talking about the perimeter of the NFSS.

ANN ROBERTS: Right.

HALLIE SERAZIN: We did locate, I think there was a total of five lines and those have all been sealed.

ANN ROBERTS: So just to clarify, the water lines have been sealed.

MICHELLE BARKER: No. That was the sanitary sewer and the --

HALLIE SERAZIN: I'm sorry. Those were sanitary sewers.

MICHELLE BARKER: Yeah. The water lines, we didn't investigate during remedial investigation because we focused on lines where there was the most probability of contamination to exist.

ANN ROBERTS: So in theory then there is a pathway, if indeed contamination is entering some of the lines, there are open lines off-site.

MICHELLE BARKER: The water line actually extends onto what is now Modern, so there hadn't been a ~~--inaudible--~~ sever there, because there's landfills on the the Modern site. But it's very clearly documented.

ANN ROBERTS: So would it have gone north on –– (Inaudible) --

MICHELLE BARKER: It may have. We were looking at that in the original construction drawings. It appears that that line did, it sort of went north and east.

ANN ROBERTS: So those lines haven't been sealed.

MICHELLE BARKER: Not to my knowledge, no.

HALLIE SERAZIN: Are you suggesting that the pipeline itself is acting as a conveyance, or that the material around that pipeline would be?

ANN ROBERTS: I think looking at the documentation for the potable water line which passes close to the southeastern corner of the IWCS, that sort of cast iron pipe which would be corroded, there's evidence of corrosion going back 60 years, reports it had been corroded. So there's a possibility you could have material actually going through it, I would have thought.

KAREN KEIL: On the former LOOW we did investigate some of those water lines and they were not really contaminated. The contamination on the former LOOW the lines ~~(inaudible)~~ in the sewer lines, ~~--(inaudible)~~ the acid waste and the other sewer lines.

ANN ROBERTS: Right. But I think there's a difference and this is a fairly active area between the IWCS and the central drainage ditch. That has a big impact.

KAREN KEIL: Keep in mind the central drainage ditch is also –- (inaudible) --

ANN ROBERTS: Are you monitoring it immediately down gradient of the monitoring well which is showing high levels of contamination?

MICHELLE BARKER: We have, the southernmost sample is right coming onto the site, so we do have a down gradient.

ANN ROBERTS: No. I'm talking about if well OW11 is increasing dramatically in the uranium; if you headed northwest towards the central drainage ditch, would that not be a good point to maybe pick up contamination?

MICHELLE BARKER: We do have one sample where the (inaudible) South 31 ditch comes into the central drainage ditch which is just south of that OW11B well. So you could see to the east of the IWCS there's sort of a blue line that comes down and then goes to the right. In that, where that intersects there's environmental surveillance surface water and ~~(inaudible)~~ sediment sample and just to the northeast of that is that OW11B well.

ANN ROBERTS: But if you went in a northwesterly direction from OW11B it would intersect the central drainage ditch a lot further to the north, so you'd have the best chance of detecting contamination moving through.

MICHELLE BARKER: Yeah. There are plumes further north than that. I think it's where the other -- it's not shown on this but it's for the other ditch (South 16 Ditch) which only goes east and west connects, but that's sort of like around the top quarter of where the cell is, a little further north than that.

ANN ROBERTS: I think I'd just like to make the point that the uranium levels we're seeing south and east are far in excess of what's been recorded previously for preexisting contamination. So I think that is a red flag.

JOHN BUSSE: Ann, I'd like to point out that immediately north of the cell we have installed an automatic sampler, and we worked on that sampling plan with the EPA and conferred with I guess Dr. Boeck and Dr. Gardella last summer. So that automatic sampler is installed so if there is a rain event and there's runoff we are picking it up, so just for your awareness.

ANN ROBERTS: But if it's not positioned at exactly the right point are you not going to miss stuff, because it will be diluted?

JOHN BUSSE: It's immediately north of the IWCS so any runoff that would come off or any kind of impacts into that central drainage ditch would be picked up.

KAREN KEIL: We have a total of five sampling points in the central drainage ditch. One right in center there, right when it enters the site, and one at the junction of the South 31 ditch, and at the next ditch up, the South 16 ditch, which is still just below the northern limit of the IWCS, and one right above IWCS and then one as it goes right off-site. So there's five total.

MICHELLE BARKER: And the one that John’s talking about I think is in addition to those five. But we look forward to your input on that area, really, if that’s an area that you’re concerned about.

ARLEEN KREUSCH: Additional questions before we move on?

AMY WITRYOL: Just for the record, I have a lot of questions but I’m going to save them until after the public meeting.

ARLEEN KREUSCH: Okay. Thank you.

HALLIE SERAZIN: Okay. So we received several questions from the community regarding the integrity of the IWCS such as, is the IWCS cap settling, how is the cap maintained to ensure that there is minimal rain water getting in and minimal radon getting out, what is the source of the dissolved uranium in groundwater and areas in the vicinity of the IWCS, and do underground pipelines within the IWCS present a pathway for release of radiological materials placed in the IWCS. The RI Addendum examines several lines of evidence to assess the integrity of the IWCS and we’d like to take a look at each of these activities listed on the slide in a little more detail. So the RI Addendum examined ground surface elevation data collected in the vicinity of the IWCS. Since the IWCS was constructed or completed in 1991 ground surface elevations have been measured four times. Comparison of the results from the first three surveys was presented in the RI, the 2007 RI report. The RI Addendum adds results from the fourth survey and compares results for all four survey events. In this figure you can see the former structures enclosed within the IWCS and the IWCS cutoff walls, and this grid that's laid over it is the survey grid. Samples were taken, or ground surface elevations were measured at the intersection of all those lines. All four survey events showed minimal settling of the IWCS cap. The average change in elevation across all four surveys was plus or minus 1.2 inches, which demonstrates that the IWCS cap is stable.

The RI Addendum included a summary of cap maintenance activities and Environmental Surveillance Program monitoring results. The IWCS cap consists of various layers of material including clay, and is designed so that minimal rain water gets in and minimal radon gets out. Visual cap inspections are conducted at least once a month and to date no issues have been discovered during cap inspections. The cap inspectors look for things like ponded water, visible settling, desiccation cracking, insects or other pests, weeds, burrowing animals, and we haven't found any of those issues to date. A layer of grass covers the IWCS to prevent erosion and desiccation cracking and the grass layer is maintained through aeration, dethatching, fertilization, irrigation and other turf maintenance procedures, some of which you see here.

The NFSS Environmental Surveillance Program was initiated by the Department of Energy in 1981, which was prior to the construction of the IWCS. The program was established to monitor environmental media and ensure protection of human health and the environment. The Environmental Surveillance Program has been expanded over time and currently monitors groundwater, surface water, sediment and air for radiological parameters such as radon and external gamma radiation. Key components of the Environmental Surveillance Program that provide the best indication of cap performance include radon-222 flux monitoring, external gamma radiation monitoring, and radon gas monitoring. The radon-222 flux monitoring is the most direct indicator of cap performance and integrity because it’s measured using radon flux canisters placed directly on the surface of the IWCS. You see one of these, that’s what the radon flux canisters look like and this is a graphic that shows the location of how they are placed on the IWCS. Radon-222 levels are comparable to background levels and demonstrate the continued effectiveness of the IWCS cap in reducing potential for radon migration and exposure. External gamma radiation is monitored using radon detectors located around the IWCS and at the perimeter of the site. One of the contributors to gamma radiation is radium 226 which is currently stored in the IWCS. That external gamma radiation detector is pictured here. It's the right one. The detectors are used to measure external gamma radiation doses and are switched out twice a year. External gamma results continue to be at or near background levels and are well below the Department of Energy guideline levels. Inhalation is the most serious pathway for exposure to radon, so radon gas monitoring is performed at 5.6 feet above ground level, which is the height used to represent the human breathing zone. Radon gas monitoring is conducted using rad track detectors. That's what this looks like right here. It's the white canister here. The top right photo shows one of the detectors being changed out, so you can see how far above the ground it is. And it's right at or within the human breathing zone. Results of the radon gas monitoring continue to be well below the Department of Energy off-site limit.

To evaluate the possibility that wastes stored within the IWCS are contributing to groundwater contamination the RI Addendum included a review of historic aerial photographs and groundwater trending data. This data and the historic evidence indicate that uranium contaminated groundwater in the vicinity of the IWCS is due to activities conducted prior to IWCS construction and these releases were later cut off by installation of the surrounding slurry wall. This figure~~s~~ shows how closely the historic operational areas correlate with existing impacts to groundwater. The figure shows that the Department of Energy estimated -- I’m sorry. The figures shows the area that the Department of Energy estimated to be radiologically contaminated prior to remediation. The area of actual contamination was larger so when the Department of Energy evaluated the contamination the areas that were removed were actually more extensive than what is shown on this figure. These additional removals also match the footprint of the uranium contaminated groundwater. The noted operational releases on the slide here include a suspect area, a suspect spill area north of the IWCS which was identified by radiological surveys of the area. Runoff from the former R-10 pile which is now enclosed in the IWCS but it ran west, spills of pitch blend or uranium ore residues north and east of the IWCS and the surface storage area for contaminated scraps off of the IWCS down there. If the IWCS was performing as designed, groundwater sampling results at wells used to monitor cell integrity would be expected to show increasing concentrations of radio nuclides over time. To further assess this possibility, the RI Addendum looked at long term concentration trends in groundwater using data collected from 1997 through 2010. The RI Addendum looked for evidence of increasing or decreasing trends of uranium and radium in groundwater near the IWCS. No clear trends of increasing radionuclide concentrations were observed in groundwater in the vicinity of the IWCS. This slide shows an example of the graph used to study trends in groundwater. The data for this well, Well A45, shows a declining trend of uranium concentration. Well A45 is located just outside the slurry wall on the northeast corner of the IWCS. Long term trends in groundwater data for total uranium shows steady states and declining concentration levels which is evidence that the IWCS is performing as designed. The Corps plans to conduct additional field activities during the balance of Feasibility Study including an investigation of the integrity of underground utility lines south and east of the IWCS as we’ve just discussed. In the meantime the Corps will continue to closely monitor groundwater contamination near the IWCS as part of the Environmental Surveillance Program. Enhancements already made to the Environmental Surveillance Program in the fall of 2010 include the addition of 21 groundwater monitoring well locations; 17 of these 21 wells are located in the vicinity of the IWCS.

In further evaluating pipelines in the vicinity of the IWCS the RI Addendum first looked at as-built drawings for the former LOOW freshwater treatment plan buildings which are now located in the southern section of the IWCS. These drawings show that the pipelines were built without bedding material which may act as conduits for contaminant release. In addition the drawings show that the LOOW freshwater treatment plant building foundations and connecting pipelines are located in the upper clay till. The clay’s low permeability reduces the potential for contaminant releases outside the pipelines. The RI Addendum also looked at historic photos and engineer drawings for the IWCS. These documents show the pipelines connecting the former -- the former LOOW freshwater treatment plant buildings were removed, filled and the ends plugged. This further reduces the possibility of contaminant migration for the pipelines within the IWCS. During IWCS construction pipelines extending through the, what we now call the cutoff wall, were cut both inside and outside the wall itself and portions of the pipeline were removed, the portions that would have extended through the wall itself. So the pipelines are not transporting contaminants through the IWCS cutoff wall.

As previously mentioned, last week the Corps had a conference call with some members of the community. One item that continues to be a community concern is the pipeline. Again, as part of the field work for the Balance of Plant Feasibility Study the Corps intends to investigate areas in and around the pipelines to address community and stakeholder concerns and to determine whether pipelines may be contributing to groundwater contamination in certain groundwater models, which was the slide we showed, the OW11-B and TWP-A33. Next.

Historic records indicate that between 1952 and 1954 radiological contaminated materials which may have contained plutonium and other fission products were brought to the NFSS from the Knoll’s Atomic Power Lab in Schenectady, New York and from University of Rochester in Rochester, New York. Historic records also indicate that in the late 1950s the majority of the KAPL materials were shipped for burial at Oak Ridge ~~Natural~~ National Laboratory in Tennessee. However, since comments regarding the potential for plutonium and fission products at the NFSS were received the issue was further investigated during the RI Addendum. The predominant radionuclides expected at the NFSS include radionuclides from the decay series for naturally occurring uranium. Since plutonium was not part of these decay series the RI database included limited analysis for plutonium. During the RI plutonium analysis was completed for 59 samples collected from the areas where the KAPL material and the materials from the University of Rochester were known to have been stored, specifically the Baker-Smith Area and building 401. The RI Addendum included plutonium results for an additional 107 samples of various environmental media which were collected to supplement that RI data.

As part of the investigation for plutonium and other fission products, the RI Addendum included a review of available historic records concerning radiological materials brought to the NFSS, results for 17 samples that were collected as part of the RI and were later analyzed for plutonium and those results were inadvertently excluded from the RI. They're reported here. And then also plutonium results for an additional 90 samples collected during the RI Addendum investigations.

In total, during the RI and RI Addendum field investigations, 166 samples of various environmental media were analyzed for plutonium. Plutonium was not detected in any of the 90 RI Addendum samples; 7 of the RI samples were reported as having detectable levels of plutonium which are highlighted on the slide in green. They're in dark triangles but we drew the green circles around them so you could kind of pick them out a little easier. However, 2 of these 7 detects were later recorded as false positive results; 2 other samples showed uncertain results but could not be fully discounted. These 2 samples came from subsurface soil and soil beneath a building ~~foundation~~ slab. The 3 remaining samples were surface samples that contained plutonium at or near levels that you would expect to see due to atmospheric fallout from testing of nuclear weapons and are unrelated to the Niagara Falls Storage Site operations. Whatever the source of the plutonium may be, plutonium concentrations observed at the NFSS do not exceed health risk based levels so it poses little to no risk to humans. Based on the low number and concentration of plutonium detections as well as the analytical uncertainties of the measurements at such low concentrations, plutonium is not believed to be a significant or widespread contaminant at the NFSS. Since the investigation for plutonium provided evidence that its presence on site is negligible, it can be considered a low risk radio nuclide at the NFSS. However, we do intend to continue to analyze for plutonium as we progress into the Feasibility Study.

In preparation for the IWCS Feasibility Study the Corps released fact sheets describing the objective of a series of technical memoranda. Public comments were received on these objectives and the comments are being considered during development of the technical memoranda. The public will once again be provided the opportunity to comment as each technical memoranda is released, and responses to those comments will be posted on the project website and will also be considered during development of the Feasibility Study.

Throughout the remedial process the Corps continues to maintain the website. It will monitor environmental media at the site and report monitoring findings from the Environmental Surveillance Program in its annual report. Now we're open to discussion for any question on those last points.

AMY WITRYOL: Could you go back to slide 42, I think, or 43. The one with the green shaded circles. Okay. I don't have that slide in my hand now.

HALLIE SERAZIN: Right. You don't. This was a last minute addition. Basically it's the slide before it but we added the green highlighting just so that your eye could more easily pick up those 7 detects.

AMY WITRYOL: Could you send us a copy or post it on --

HALLIE SERAZIN: The whole presentation will be posted on the project website.

AMY WITRYOL: Okay. And I had a couple of other comments. There was a slide saying that there was no clear trend in the analysis of groundwater and this, it’s slide 39, selected well A-45. At our last meeting or the meeting before we talked about the need to trend the samples taken in the fall on a different trend line from the samples taken in the spring and the particular well that was being discussed which I think was the well that Ann was referring to earlier between the cell and the central drainage ditch. Those trend lines were going up if they were measured fall to fall to fall to fall to fall, spring to spring to spring to spring to spring, and I remember we talked with Jane and Paul Giardina about that. So I’m a little confused by this particular slide,it conflicts with that data. And to me suggests that the cell is leaking. That’s why I make a point out of it.

HALLIE SERAZIN: This, I mean, granted, we did not separate them seasonally as you suggest, but I think that what we’re showing here is a long term trend and so between 1998 and 2010 you do see seasonal fluctuation there. However, putting all that data together, which you know, the blue, the dashed green line here in the middle, that kind of integrates all those findings statistically, you do see an overall downward trend in this particular well. Yes, Ann.

ANN ROBERTS: Just a comment. I think if you put up on the screen the equivalent analysis for well OW11-B, that’s the one well that has an upward trend. The RI Addendum identifies it as a strong upward trend. The reading that Amy was talking about has actually increased up to 320 (micrograms per liter) now. So to say that there is no increase in trends total uranium in groundwater, I mean, you said in the vicinity of the IWCS. I think really it’s a bit like cherry picking and saying the immediate vicinity. OW11-B is slightly further out but it is linked by pipelines, so I think that gives a false sense of confidence, that you know, it implies that none of the wells are actually showing an upward trend, yet OW11-B is very definitely.

MICHELLE BARKER: Just a point of clarification. OW11-B is definitely showing, it’s an increasing trend. I think we differ in, you know, here we say no increasing trends for uranium for groundwater in the immediate vicinity of the IWCS. I think we feel comfortable saying that because we have wells closer to the south, that are not showing that trend.

So I think that's where we differ in our interpretation of that.

ANN ROBERTS: Just to come back on that, I think the fact that you have so many pipelines abundant in our area means that there could be preferential pathways so you won't pick up the normal contamination the way you normally would because it won't be migrating in the same way. So that doesn't really lessen my concern that because there is a well slightly closer that it hasn't picked up the leakage.

AMY WITRYOL: And I would add to that that if you've got a pipeline, now this is a 30 acre cell, and the dots that we're looking at proportionately on these slides are enormous in comparison to the relative size of the 6-inch well to the size of this 30-acre facility. So if you've got a well further out that's connected by a pipeline and the other end of the pipeline near the IWCS is closer to where the cell is leaking, then any of the other wells around that 30 acre area, I'm not comfortable that just because the closest wells aren't showing contamination, that doesn't give me any comfort.

It reminds me of a comment from a teammate on my high school field hockey team. She played halfback and she said how reassuring it was to know if the ball slipped by her, I was right behind her to let the ball slip by me as well. When I look at the wells, that's kind of how I feel, because it's a very big field out there. So I would urge the Corps to look at, when they look at the pipelines and see these high detections that Ann is looking at, look at the other end of the pipeline and its proximity to the IWCS because I didn't see any wells that would pick up the contamination in those particular pathways.

KAREN KEIL: I think when we talked, Ann, on the phone, we're pointing out here that there's no pipeline that crosses that dike. I mean, all the pipes that have been breached, when the dike was put in, the dike wall, all the pipelines were cut off. So there is no direct pipeline going into the IWCS any longer so there's no direct connection with the pipeline.

AMY WITRYOL: But if you've got the pipeline near the area of the IWCS that's leaking that could be picked up and then more quickly transported it doesn't necessarily mean that the pipeline is attached to the IWCS but if it's attached to an area that's near the IWCS that's leaking, and there's no well in between that area and that particular portion of the well –- (Inaudible) --

JANE STATEN: Hallie, it might be worthwhile to pull up that slide showing all the wells south of the cell, and pointing out some of those, because it's hard to tell from back here. I certainly couldn't read it if I didn't have a hard copy here. Maybe you could point out some of the wells and the concentrations and where they are relative to that temporary well point A-33.

HALLIE SERAZIN: Okay. Here's the well point that seems to be of concern. It's a temporary well point A-33 and it did have a very elevated concentration of total uranium - 958 micrograms per liter. However, if you look just north of that, which would be in the line between the IWCS and that elevated level, we have a well here that has 28.2 (micrograms per liter).

JANE STATEN: And what well is that?

HALLIE SERAZIN: That's OW06-B.

JANE STATEN: Okay. And that is a well that is part of our Environmental Surveillance Program and we did trend that well for uranium and the data shows a downward trend for that particular well. So we've been monitoring that for a long time.

HALLIE SERAZIN: Continuing on down here, now this would be southeast of the well of concern but we're at 19 (micrograms per liter) here. Other ones you see 8.3, 9.2, 8.3 (micrograms per liter) so in this area, I mean, there's a reason that this area of contamination is configured this way.

JANE STATEN: And then maybe you could move up along the east there, there's another well NW --

HALLIE SERAZIN: Which one?

JANE STATEN: MW862, west of OW11-B. On the east side of the IWCS.

HALLIE SERAZIN: Okay. Up on the east side here, this is at 12.6 (micrograms per liter). And we're not disputing that this level out here at OW11-B is elevated. We're saying that we have intermediate wells, wells located between the IWCS and that elevated level that are lower.

ANN ROBERTS: But they are all connected by pipelines, the elevated levels.

HALLIE SERAZIN: You're saying this is connected by --

ANN ROBERTS: I'm saying that the TWP-833 is on a pipeline which is not shown on your diagram. There is another pipeline coming out of building 409 that's not shown.

~~MICHELLE BARKER~~ JANE STATEN: And that leads to the 10-inch water line, I believe.

ANN ROBERTS: And then the 10-inch water line connects further up where it intersects the sanitary sewer. That's were the contamination was highest in the RI. And that is immediately a gradient of the well OW11-B which is now showing 320 picocuries per liter. There is a connection.

AMY WITRYOL: And I'm not sure I agree that there are wells in between the area of leakage of the cell and the southernmost part of that pipeline that comes down, you know, angled like this from the direction of the central drainage ditch and the well of concern, what was it, well OW11-B, Ann? Yeah. So, I mean, if you've got leakage from the building south into that other structure and it picks up the pipeline it bypasses the other wells.

HALLIE SERAZIN: You know, I think these are plausible theories. And I think the Corps –

AMY WITRYOL: And we discussed them a couple of times over the past couple of years so I have to reiterate my disappointment that the public didn't see the Sampling and Analysis Plan before it was instituted and obviously therefore didn't have an opportunity to comment on it, even though we did raise this point before that sampling plan was created.

MICHELLE BARKER: Yes. We're adjusting that now and I know Ann is really actively involved in looking at this area and is going to be sending the Corps some recommended well locations, so in that case this is -- that was the past. This is an opportunity now to adjust the areas that you're concerned with.

AMY WITRYOL: Well, I guess my concern is that the cell is leaking and I was told at the beginning of the meeting that regardless of those conclusions the Army Corps' position is going to continue to be that the cell is not leaking. My tendency is to look at the information and follow where it leads me as opposed to predetermine the outcome. If you've predetermined the outcome that the cell is not leaking I'm wondering why we're going to spend millions of dollars doing that investigation.

HALLIE SERAZIN: Amy, if the concern is that pipelines are acting as a conduit for contamination, that's a different, that's a separate issue from saying that we think the IWCS is leaking, and I think that's what we're trying to point out with the slide. You can't just look at this elevated point and this elevated point and connect the dots. If that is in fact a pipeline that, and we agree that that is a plausible theory, but that particular pipeline does not penetrate into the IWCS. So that's not evidence that the cell itself is leaking.

AMY WITRYOL: Well, I would say that there is no evidence that it's not leaking because the other end of that pipeline connects to another conduit where there is, from what I can see, no well between that southern wall, and if leakage is going south or southeast wouldn't hit any wells before picking up that pipeline and then zooming up towards the central drainage ditch. So I guess again I would reiterate because this didn't get looked at for reasons that are still unclear to me, there's not enough information to conclude that the cell is not leaking.

I mean, it's just troubling that the area that we focused on, not just now but earlier, several times, was somehow overlooked, you know, before coming to this conclusion. And even the agencies, DEC and EPA after the Remedial Investigation concluded that there wasn't enough data to reach the conclusion that the cell is not leaking. And therefore, the precautionary approach predicts us, you know, compels us to say that until you can demonstrate that the cell is not leaking, and we're looking at some very, very high levels, well above what we would expect for preexisting contamination, we should fill those data gaps to demonstrate that the cell isn't leaking.

HALLIE SERAZIN: And I guess I would say that we have a lot of data already, and it's wrong to look at a single well point in isolation. This is a data set. This is an area of contamination and we're trying to understand it. We're trying to figure out where we can optimally drill wells to get the best data, to get the clearest understanding. And that's kind of an ongoing iterative process and it's still ongoing. And you know, we welcome your interest in this and your theories about how contamination is moving and we intend to act on that.

AMY WITRYOL: Well, I appreciate that and I agree with that statement. I still haven't heard an explanation for why the public was excluded from seeing a draft and being able to comment on a Sampling and Analysis Plan, but it sure would go a long way towards giving us an assurance this evening that going forward before data is collected our input is going to be solicited, and in addition I'd like to ask, is there any data, any sampling that's been collected, where the data has not been QC'd and released yet to the public, because we did have some inadvertently excluded data from the last report that has now found its way into this report. Has there been any samples collected under FUDS or FUSRAP related to radiological investigation that has not yet been shared with the public because it hasn't been analyzed or QC'd?

JOHN BUSSE: There are some Environmental Surveillance Program samples that have been collected that are still in the process of being validated. They will be released as soon as the validation is complete and we ~~can~~ do our analysis.

AMY WITRYOL: And when do you expect that?

JOHN BUSSE: I would expect that probably within the next couple months.

AMY WITRYOL: And anything other than the Environment Surveillance data?

JOHN BUSSE: That’s all that I am aware of. That’s all that we have outstanding.

AMY WITRYOL: Okay. And --

JOHN BUSSE: And yes, we are seeking your input on well locations to alleviate some of your concerns regarding the pipelines. We’d like to address that.

AMY WITRYOL: But with respect to any data collection, any investigations, will the public be engaged?

JOHN BUSSE: The public will be engaged.

AMY WITRYOL: In advance as opposed to after the fact?

JOHN BUSSE: We actively sought out, and during our discussions with Ann last week we actually asked for input for well locations so --

AMY WITRYOL: I understand that.

JOHN BUSSE: -- if you guys want to provide those --

AMY WITRYOL: I just want the assurance that what happened on the last Sampling and Analysis Plan regardless of inviting comments on a specific well location that going forward all of the field work for investigation on the site will include solicitation of input from interested stakeholders.

JOHN BUSSE: We will release the sampling plan and seek stakeholder comments.

AMY WITRYOL: Thank you.

JOHN BUSSE: You're welcome.

GUY ~~ZAZAK~~ ZACZEK: Hello. My name is Guy ~~ZAZAK~~ ZACZEK and I'll keep this kind of short. I rarely speak but it's kind of the same statement or question I ask all the time. There's lots of data here and there's many, many intelligent people sitting around the table here trying to digest all this. Okay. A lot of the data you're presenting is in 2-D. In other words, if I take the question that Jerry Wolfgang had, the comments that Tim made in terms of the aquifer, et cetera, Bill Boeck was still talking about, well, this building is the what, off site for the railroad site. You see, I mean just in that one example you have three different data sets all on the same area. I can go and Google maps and I can bring up an intersection on a street and I can get a street view and

I can get pictures of it. The only thing I can't get is sort of like subsurface areas. The trending you did was fantastic. It took many thousands of points and you run it through the computer and it shows you over 10,000 years. But that 3-D model you showed to begin with, although it wasn't of this site specifically, was much better than all of that, because if I can't see there's -- for example, that was, it used to be the sewage treatment plant, a water treatment plant. The pipes there will actually pitch towards the left, towards the treatment plant. So if there is a general movement it's going to go towards the treatment plant versus the water pipes and everything else that could be either which way, but it's got to be disturbed soil even though the bedding material may not be gravel or sand or whatever else. These are complex issues to kind of take a look at, okay. Plus the weather. Plus you're talking about spring and fall. You have a different level of water table going up and down. And when I looked at the trends I didn't look so much at the lateral migration because I didn't expect it to move much, but when you looked at the elevations, okay, over 10,000 years this stuff only went down 40 feet. You know, I'm just thinking, it hit what, it hit the Lockport dolomite and actually what, stopped. That is a little kind of like suspect. Okay. If you go to Fernald, the Fernald site, which is much farther, okay, you can look at it and stand in one area, on the computer obviously, okay, and just click on it and say, give me a 360 view to see what this looks like right now. And you'll see the fence line on one side and you'll see the containment area on another side and you'll see where they're building little things for birds, et cetera, et cetera. It looks pretty good. I congratulate you. Little things, like for example, did you notice that except for one picture everything there showed you which was north. That wasn't like that last year and it certainly wasn't like that a couple years ago. So you have that orientation that's fantastic. But when you bring up these pictures, there are some new people in the room here, okay, they might not notice what are or were those circular structures.

And see how the containment wall goes through it, okay. And you can't put three times more data on that. Four times now we've gone back to this map, right, because we have the most information on there, but having more information is not the answer. Having something that's layered, remember when you looked at the graph and it says it's going down. Okay. And you gave the well number. Nobody can pick a well number and say where that is. But then somebody said, well, that's on the east side of the what, of the unit. Well, that's not where we think the contamination is actually moving. So you get the general idea? If you had a data point where we could go to after this meeting, the website is fantastic, okay, but if I had a website and I could look it, and like for example, originally we were looking at the Baker something area, okay, and this point is on the one side of the black line and the other point is on the other side of the black line. It's called layers. Most of you guys know that, okay. If one layer just said who owned the property, if one layer said, here's where the existing fence is and we might suggest, okay, that no matter who owns the property the fences should be over here. That would be a layer. The subsurface, okay, would be a separate layer put on top of this. Just like with Bill Boeck, okay. We've kind of looked at black and white pictures of this thing over here and really tried to figure out what is this. My opinion is those two parallel buildings, okay, I'm pretty sure, I'm not positive that was the pipe shop. So it could have been offloading of what, materials that actually came in, okay, or it could have been what, some work that was actually done and they brought up, because I used to work at Occidental Chemical, okay, when you bring in pipes they're not exactly clean. And you see where that gives you a different viewpoint of maybe where the source point of this contamination is, because you now have hundreds of thousands of points over time, et cetera, et cetera, but when you reference them they still tend to be in the separate three inch folders, that if you don't go back four or five years, okay, you don't see how they relate together. Does that make a point? It wasn't a question but everyone who's here is very talented and you did a very good section of the presentation, but the more it's melded together, pulled together, then it makes it clearer, okay, in terms of what we're looking at.

Are we looking at the solvents, are we looking at the plutonium, are we looking at products of decay from the uranium, are we looking at radium actually leaving the site because of what's under the cap. Each one could be on the same geographic area but it's a different layer, and all together they tell one story but they're different viewpoints of the same story. And I think when you remediate you use what, the same data sets when you're actually doing a remediation. That's all.

ARLEEN KREUSCH: Thank you, Guy. Dr. Boeck?

DR. BOECK: I have two questions on slides 39 and 40. 39 is an analysis of groundwater trends. Do you have the plaque of the well that was taken as your background well?

JOHN BUSSE: Probably not available.

DR. BOECK: But I was a little surprised to see that the trend is upward on your background well. You might want to check that choice of a background location. And on the next slide, you show around the hashed in area, the preexisting buildings which in fact are in there and buried, and you show the pipeline on the left and the right of 411. What you don't show is that same pipeline going into the area to the north and across the top of that and into the central drainage ditch. That was done in a previous phase of construction and I have not seen diagrams indicating the disposition of that particular pipeline. It's under the R-10 radioactive material, and my guess is it may be in place simply because they didn't want to take the R-10 up. But in the top of that building is a valve pit.

HALLIE SERAZIN: You're saying it's up in here?

DR. BOECK: Yeah. There's a valve pit right in the center of that building. There's a pipeline coming into it and a pipeline leaving it, leading to the central drainage ditch. These were water reservoirs and if you had to empty the reservoir these were the pipes that did it. That's what they're there for. Okay. End of comment.

ARLEEN KREUSCH: Okay. Thank you, Dr. Boeck.

Does anybody have anything to add or respond to Dr. Boeck at all? Okay. Additional questions, comments?

(No response)

JOHN BUSSE: I want to thank everybody for coming out, ~~and~~ Ann, Dr. Boeck, Amy, with all your questions and putting us through the test, I do appreciate it. Keeps us on our toes. I also would like to take this opportunity to introduce Doug Sarno. He has been awarded a contract to serve as the technical facilitator for the Feasibility Study going forward, so during the poster session here at the end if you could introduce yourself to him, maybe get to know him a little bit, I think it would be worthwhile and he'll be a useful asset for us as we move forward on this project. So I thank everybody for coming out and the tea will be available in the back.

ARLEEN KREUSCH: There's cookies and coffee on the side, too, if anyone would like to eat those.

(Meeting concluded)

CERTIFICATE

I, RHETT L. BAKER, certify that the foregoing transcript of proceedings in the matter of US Army Corps of Engineers, Re: Niagara Falls Storage Site Formerly Utilized Sites Remedial Action Program Remedial Investigation Report Addendum.

Held in Lewiston, New York was recorded on a SONY BM-146 Confer Corder, and transcribed from same machine, and is a true and accurate record of the proceedings herein as best as we could do due to the fact that some people were not on microphones properly.

Highlighted text was revised following review of the audio portion of the video meeting record.

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