UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

IN THE THE MATTER OF:	
ROBERT J. HESER, ANDREW HESER, and HESER FARMS, Respondents.	DOCKET NO. CWA-05-2006-0002
Proceeding to Assess a Class II Civil Penalty Under Section (g) of the Clean Water Act, U.S.C. Section 1319(g).	

Hearing held, pursuant to notice, on Wednesday, May 2, 2007, at the hour of 9:00 a.m. at Clinton County Courthouse, 850 Fairfax, Carlyle, Illinois, before HONORABLE WILLIAM B. MORAN, United States Administrative Law Judge.

SULLIVAN REPORTING COMPANY,
By: Carla Boehl, Reporter
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JUDGE MORAN: Good morning. Let's proceed.

The next witness for EPA -- I believe we concluded with Mr. Carlson, yes?

MR. SMALL: Yes.

MS. PELLEGRIN: Yes.

We call Mr. Simon Manoyan at this time.

JUDGE MORAN: Okay. I finally get to meet you. You have been hanging around here for awhile.

Raise your right hand, please, sir.

(Whereupon the witness was duly sworn by the Administrative Law Judge.)

JUDGE MORAN: Have a seat, state your name for us and spell it for the court reporter.

THE WITNESS: Simon Manoyan, M-A-N-O-Y-A-N.

SIMON MANOYAN

called as a witness on behalf of the Complainant, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MS. PELLEGRIN:

Q. Good morning, Mr. Manoyan.

A. Good morning.

Q. Thank you for warming the bench for the last week and a half.

I would like to start with some questions about your educational background, Mr. Manoyan. Do you hold any educational degrees?

A. I do.

Q. What degrees do you hold?

A. A bachelor's and master's of science degree.

Q. Your bachelor's degree, where did you receive that?

A. The University of Illinois at Chicago.

Q. And what was that bachelor of science degree -- what area did you study for that bachelor of science?

A. Thermal dynamics and thermal mechanical

engineering.

Q. And what is thermal dynamics?

A. Thermal dynamics literally means heat's movement, heat transfer.

Q. And what is thermodynamic mechanical engineer?

A. It would be dealing with heat transfer directly. In real world applications it would be heating, ventilation, air conditioning and also refrigeration designs.

Q. What year did you earn your bachelor's of science degree?

A. 1980.

Q. And let's turn to, I believe you said, your master's degree. What was your master's degree in?

A. Hydrogeology and numerical analysis.

Q. Where did you earn that degree?

A. Northeastern Illinois University.

Q. What year was that?

A. 1999.

Q. And, Mr. Manoyan, what is hydrogeology?

A. Hydrogeology deals with subsurface water movement, ground water and its effects.

Q. And what is the numerical analysis?

A. Numerical analysis could be modeling, trend analysis, looking at data and developing opinions.

Q. And you mentioned the term "modeling." Can you explain generally what is modeling?

A. Model is a simulation of real world situations. It is just a simulation. It is not an exact simulation of the real conditions.

Q. And does that have to do with mathematics in any way?

A. Yes, it does.

Q. In what way?

A. Well, you use mathematical formulas to develop your model.

Q. And, let's see, while you were earning your bachelor's degree -- let me back up a second. Did you conduct any research while earning that degree?

A. I did.

Q. And what was that research?

A. That was in regards to geothermal energy and its utilization.

Q. And what was that -- what would that

research entail?

A. It entailed developing and designing a system that would produce electricity for 50,000 people.

Q. And let me ask you about your master's degree. What year did you earn your master's degree, Mr. Manoyan?

A. 1999.

Q. And I am not sure if you said this, but what university was that from?

A. Northeastern Illinois University.

Q. And, let's see, you mention the term -- you defined numerical analysis. What is a real world application for numerical analysis?

A. Well, every day weather broadcasters use them to predict weather conditions.

MR. SMALL: Your Honor, could I ask him please to speak up just a little bit? I am having trouble hearing him.

JUDGE MORAN: Yes, please speak up.

THE WITNESS: A. Weather broadcasters use them every day to predict conditions, whether it's going to rain or the temperatures and so on. So that's one application.

BY MS. PELLEGRIN:

Q. Let me ask you, did you conduct any research while you were studying for your master's degree?

A. Two, two researches.

Q. Let's turn to the first one. What was your first research project?

A. The first one involved a modified water body budget, water budget, for the lower Fox River.

Q. What is a water budget?

A. It's the in-flow and out-flow of the water body system, what's coming into and what is exiting the body.

Q. And what's an example of an in-flow in the water body system?

A. Precipitation will be one. In-flow from ground water would be another.

Q. And what's an example of an out-flow of a water --

A. Out-flow would be evaporation, also the discharge in an outlet.

Q. And when you are doing a water budget, what are you looking for?

A. I am looking for trends, what's happening

within that particular water body system, the temperatures, the rain data, the water levels and so on.

Q. And the water budget analysis, who did that? Who, if anyone, did that water project with you?

A. I received data from USGS, and I was doing this in cooperation with Northeast Illinois University.

Q. And what does the water budget analysis -- what was the purpose or the goals of that project?

A. At that time we were trying to determine water levels in the lower Fox River and also looking at turbidity values to see if the sedimentation was occurring.

Q. And what kind of data did you review for that project?

A. For that particular project, weather data, precipitation data, geological data and historical background data.

Q. What's an example of historical background data?

A. It would be looking around the water body

to see if there is any industries that are cropping up or going out of business, and what effect they would have had on the water body itself.

Q. And what was the results of that lower Fox River project?

A. At that time we determined that water levels were decreasing. As it moved from upstream to downstream temperatures were also increasing.

Q. Let me try, I believe you mentioned two research projects. What was the second research project?

A. The second research was my master's thesis. It entailed developing well-head protection areas.

JUDGE MORAN: Developing what?

A. Well-head protection areas for central Illinois communities.

Q. And what is a well-head protection area?

A. It's an area that needs to be protected for a particular well so that it won't be contaminated.

Q. And what kind of well are you talking about?

A. Community supply wells that could be used

for drinking purposes or food preparation.

Q. And who did this project with you, if anyone?

A. This was in cooperation with IEPA, Illinois Environmental Protection Agency. They essentially contracted Northeastern Illinois University to develop these areas for them.

Q. And what was the purpose of this well-head protection area project?

A. It is to protect the well water for that particular area or various communities.

Q. And what kind of data did you review in regards to this project?

A. Again I used a well log information from loggers, water levels from ISWS, and weather conditions and geologic conditions.

Q. Mr. Manoyan, you mentioned the initials ISWS. What is ISWS?

A. Illinois State Water Survey.

Q. And what is the Illinois State Water Survey?

A. It deals with water issues within the state of Illinois. It is an organization, governmental organization, at state level.

Q. And I believe you mentioned that this involved modeling. How did this involve modeling?

A. It involved three dimensional modeling. Essentially, it is ground water so you need to have more than one dimension. I used a GMS ground water modeling system developed by U.S. Army Corps of Engineers.

Q. And what do you mean by 3D modeling?

A. It is in three dimensions, rather than just one dimension, XYZ.

Q. What do you mean by XYZ?

A. It's the three dimensions. If you look at a cube, it has three dimensions. If you just look at a line, it's just one linear dimension.

Q. Thank you, Mr. Manoyan. What was the results of your research for the well-head protection area?

A. We delineated capture zones for five years for various communities in central Illinois.

Q. And what is a capture zone?

A. It would be the area that needs to be protected, at least for five years.

Q. And who, if anyone, benefitted, if you know, from the resulting research?

A. Water managers, the community itself, the people who are living in it, farmers, everybody.

Q. Mr. Manoyan, after you earned your master's degree did you take any additional -- have you taken any additional courses?

A. I have taken a lot of courses, yes.

JUDGE MORAN: You have taken what?

A. A lot of courses.

Q. And by courses are you talking about training courses?

A. Some of them were training courses. Others were university courses, also.

Q. Okay. And let's talk first about your university courses. What kinds of university courses have you taken since you earned your master's degree?

A. I have taken additional modeling courses and also statistical courses, statistics.

Q. And generally what kinds of modeling courses have you taken?

A. Both surface water modeling and ground water modeling.

Q. Can you give me an approximate number of how many modeling courses you have taken since earning your master's degree?

A. I would say about at least ten.

Q. And I think you mentioned the term "surface water modeling." What is surface water modeling?

A. Surface water entails developing models for rivers, lakes, streams, ponds. It is physical on the surface.

Q. And generally what are you looking for when you are developing surface water modeling?

A. It could involve anywhere from contamination to flow, water levels, the amount of water and movement of water within that water body system.

Q. Mr. Manoyan, I am going to turn now to your employment history. Did you currently -- did you work while you were earning your master's degree?

A. Yes, I was.

Q. And where did you work?

A. Initially, at Northeastern Illinois University and then later on at U.S. EPA.

Q. Okay. Let's turn to your work for Northeastern Illinois University. What did you do there?

A. I was doing lab work in that university.

Q. And just generally what kind of lab work did you do?

A. Sediment analysis, particle size analysis, that type of work.

Q. And let's turn to your work for the U.S. EPA. First of all, how long have you worked for the U.S. EPA?

A. About ten years.

Q. And what did you do initially when you worked for the U.S. EPA?

A. I started working with Great Lakes National Program Office and there I was doing quality assurance for that particular office.

Q. And by quality assurance, what do you mean by that?

A. It's approving or recommending approval for how to do a project by others. In other words, they would submit a project plan, I would review it, and based on a determination whether to approve or not.

Q. And generally what kinds of project plans were you reviewing?

A. It came from various disciplines. By disciplines I mean biologists, geologists. It

involved various projects, and I had to decide whether it was properly being handled or not.

Q. And, let's see, how long did you work on quality assurance while at U.S. EPA?

A. At that time ten months.

Q. And where did you work next?

A. Next I moved to the Standards and Applied Sciences Branch.

Q. And what did you do for the Standards and Applied Sciences Branch?

A. Principally I was one of the modelers that was developing a mine development model in Crandon, Wisconsin.

Q. And before we go into that, what, if any, other roles did you have with the Standards and Applied Sciences Branch?

A. I was a technical contact for Native Americans communities.

JUDGE MORAN: Let me just stop you for a second.

(Whereupon there was then had an off-the-record discussion.)

JUDGE MORAN: Okay. Go ahead.

BY MS. PELLEGRIN:

Q. Let's see, I am sorry. You said you were a technical contact for Native Americans. What did that entail?

A. That entailed giving advice, technical advice, to communities in Michigan and also in Wisconsin. That may have involved giving advice on use of a particular model, solving problems with the model and so on. Also advice on various other projects. It would involve both surface water and ground water.

Q. And, let's see, you mentioned a mine project that you performed. What was that mine project?

A. Crandon mine modeling, actually the Crandon Mine Project.

Q. And first of all, what was the Crandon mine modeling for?

A. Well, in the 1970s zinc and other metals were discovered there, and they wanted to get a permit from various governmental organizations. And we were assessing whether it would have any impact on surrounding communities and lakes and other water bodies.

Q. And what was your role with regard to the

Crandon Mine Project?

A. I was one of the three principal modelers. We were calibrating a model, verifying the model, and then finally making some predictions based on our results.

Q. And I think you may have covered this, but just generally why was modeling needed for this Crandon Mine Project?

A. Well, there were other models being developed by other organizations. Ours was the only surface water model that needed to be done. We were trying to assess the impact had this mine gone in or been placed. That was the reason we were trying to determine whether it had any impacts.

Q. And who was the model performed for?

A. It was mostly for Native Americans. We were in a trust position with them, and we were trying to look out for them, in essence.

Q. And why were Native Americans concerned, if at all, with this kind of mine project?

A. It would have affected them directly. One of the main impacts would have been the food sources within that area, like fishing, wild rice and other food products, would have been impacted,

contaminated. They would have been unusable for them. So it was a big concern.

Q. And, Mr. Manoyan, adopting the surface water model for the Crandon mine, what kind of data did you review?

A. We used weather, precipitation, historical data, cultural data, climate data, almost anything you could think of, we used it. Atmospheric data also.

Q. And, Mr. Manoyan, if I use the term "quantitative data," do you have an understanding of what that term means?

A. Yes, I do.

Q. And what does the term "quantitative data" mean to you?

A. It means real data. It is a number. It is definite. It tells you something about something.

Q. And if I use the term "qualitative" as opposed to quantitative data, do you have an understanding of what that term means?

A. I do.

Q. And what does qualitative data mean?

A. It could be anecdotal data, some historical information, but not a definite data.

Q. And in terms of the Crandon Mine Project, can you give me an example of the type of quantitative data you may have used?

A. Quantitative data would have been weather information, water level information, geological information; it had a number attached to it. So that would be quantitative data.

Q. And can you give me an example of qualitative data you used for the Crandon mine?

A. Well, we used one specific information about wild rice that was being consumed by Native Americans. We didn't have any specific amount for per person usage. We had to develop an idea by using historical information going back to possibly the 1930s. We used several books written by others, not Native Americans, to describe how they harvest it and how much they harvest it and how it was being introduced and so on. And in the end we developed a number for individual consumption. So that would be qualitative data. That eventually turned into quantitative data.

Q. So if I am understanding you correctly, the qualitative data that you gathered in that case would have informed your quantitative data?

A. Yes.

Q. Mr. Manoyan, what were the results of your Crandon Mine Project?

A. Our model predicted that there would be definitely effects on surrounding lakes and streams and also the culture itself.

Q. And was that mine located eventually?

A. No. It was purchased by Native Americans, and they decided that they don't want the mine in.

Q. Let me ask you, moving on to your employment history a little further, how long did you work for the Standards and Applied Sciences Branch?

A. That particular branch eventually became the Water Quality Branch, and I was there until 2005.

Q. And when it became the Water Quality Branch, did your roles change?

A. I also became a technical contact for the State of Ohio. I was also reviewing models for other divisions and other regions.

Q. And when you say you were reviewing models for other divisions and other regions, you said?

A. Right.

Q. What did that entail?
A. A model would be submitted to our branch and I would offer technical comments used in developing an opinion.
Q. And can you give me an example of what kinds of models those were generally?
A. It involved both types of a model, both ground water and surface water models, but mostly surface water models.
Q. And after you worked for the Water Quality Branch where about did you work?
A. Then I moved to the Water Sheds and Wetlands Branch.
Q. And when did you move to the Water Sheds and Wetlands Branch?
A. I'm sorry. Did you say when?
Q. Yes, when.
A. 2005, April, I believe.
Q. And you are currently at the Water Sheds and Wetlands Branch?
A. Yes, I am.
Q. And what is your current title?
A. My title is Environmental Scientist.
Q. And currently what are your primary

responsibilities?

A. Reviewing total daily maximum load reports.

Q. And what does reviewing total maximum daily load reports entail?

A. Well, these reports are being developed for impaired waters within the region, and it calculates loads that's going into the water body system, assessing how much water that could go into a water body without exceeding the water quality standards. Based on those calculations we make a determination as to what needs to be done with that particular water body to reduce incoming pollution and contaminants.

Q. And what is your particular role with regard to reviewing total maximum daily load reports?

A. I look at most of the reports that involve models and basically review what's being done, what's being advocated and decide whether it is applicable for that particular water body.

Q. And, Mr. Manoyan, just generally how much of your current job is related to reviewing models?

JUDGE MORAN: Is related to what?

Q. Related to reviewing models.

A. About 25 percent.

Q. And what kind of modeling generally are you reviewing?

A. Mostly surface water models.

Q. Speaking of models, how many different types of models have you worked with in your experience?

A. All and all I would say I probably would have more familiarity with at least 25 models.

Q. And is there sort of a range of complexity among models?

A. Yes, there is.

Q. And can you explain that some more?

A. Well, you could use a very simple model which would be just a formula, and the other end it would be a very complex model which would require a lot of information beforehand. Those would be the range, very basic and very complex and detailed ones.

Q. And if you know, how does one determine whether to review a simple model or a more complicated model in a particular case?

A. It all depends on the resources you have, the amount of data you have, the modeler, the staff that would have experience. Also it depends on the

expertise of the modeler.

Q. And, Mr. Manoyan, do you know what I mean by the term "running a model"?

A. Yes, I do.

Q. And what does the term "running a model" mean to you?

A. That would be inputting your data into a model. By that I mean in the software, if you are using a software, and doing some calculations, verifications, and finally coming up with some results.

Q. And have you personally run a model before?

A. I have.

Q. And are you familiar with the term "creating a model"?

A. Yes.

Q. And what does that entail, creating a model?

A. First of all, you develop a conceptual model of the site you are going to be modeling. By conceptual model I mean you have to make a lot of assumptions to determine how you could fit that particular area into a mathematical formula. That

would be one of the first steps that you would do. Then you would go to gather data that you would need, and then do a quality assurance check on the data to see if it is representative of the site, and then finally do a calibration of the model to observe data is fitting the predicted results.

Q. And you mentioned how you observe data fitting with your results?

A. Right.

Q. Can you explain what you mean by that?

A. If you have a good match, that means your model is representative and accurate. If you don't, then you need to make more assumptions. You need to get either more data or you have the wrong data and you need to get better data. So that's what I mean by it.

Q. And have you ever personally created a model?

A. Yes, I have.

Q. And what model or models is that?

A. The ones I mentioned earlier, specifically developing well-head protection areas in central Illinois communities. For that purpose I used GMS ground water modeling systems. It is a

three dimensional model.

Q. And I think you mentioned the Crandon Mine. Is that a model that you, if I am terming it correctly, created?

A. We worked on that model. I wasn't specifically developing the model. It was developed by U.S. EPA. We were using the software to calibrate our data to the site conditions.

JUDGE MORAN: But you didn't create that model?

A. I did not.

Q. Okay. And, Mr. Manoyan, can you tell me just generally how reliable are models?

A. Models are as reliable as the data that goes into it and the expertise of the modeler and the resources you have.

Q. Mr. Manoyan, have you ever published any materials?

A. I have.

Q. And what kind of materials have you published generally?

A. I published a report along with others at EPA about the Crandon Mine modeling effort. That's one. And then I also did a report, my Upper

Mississippi River Water Quality Assessment Report.

Q. And I believe we already talked about the Crandon Mine. So I will ask you in terms of the Upper Mississippi River Water Quality Model, what did that publication involve?

A. It involved compiling the data as far back as the 1950s to 2000 at that time. After doing quality assurance on the data itself, I developed some trend analysis using that particular data, and it is available for anyone to use. It was one of the first kind for the upper Mississippi River.

Q. And what kind of data did that project involve?

A. It involved physical, chemical, biological data for the upper Mississippi River. It basically involved water levels, some chemicals, temperature, precipitation data, sedimentation data, and so on. It is a highly complex data set.

Q. And, Mr. Manoyan, you mentioned I think two publications. Were any of those publications peer reviewed?

A. Both were peer reviewed.

Q. Let me ask you, Mr. Manoyan, have you ever received any professional awards?

A. I have.
Q. And what are those awards?
A. I received two bronze medals and also excellence awards from regional administrations.
Q. And what did the excellence awards or awards, what was that for?
A. One was for the Crandon Mine modeling effort. The other one was for the Upper Mississippi River Water Quality Assessment Report, and the final one is about a TMDL for a group.
Q. And by TMDL, just define that term, define that acronym, would you, please?
A. Total maximum daily load.
Q. We talked about that earlier in your testimony. Is that the same thing?
A. Right, same thing.
Q. Mr. Manoyan, I am going to ask you to turn your attention to Complainant's Exhibit 34A.
(Whereupon Complainant's Exhibit 34A was presented for purposes of identification as of this date.)
JUDGE MORAN: It should look familiar to you.
THE WITNESS: Yeah, it does.

BY MS. PELLEGRIN:

Q. Mr. Manoyan, Complainant's Exhibit 34A, can you tell me if you recognize this document?

A. I do.

Q. And what is this document?

A. This is my resume'.

Q. Is it the original or a copy?

A. A copy of it.

Q. And I would like you to page through it and tell me if it is a true -- well, first of all, let me ask you does it accurately reflect your educational background?

A. Yes, it does.

Q. And can I ask you is it a true and accurate and complete copy of your resume'?

A. It is complete except for one date.

Q. And can you please refer to the -- tell me what you are referring to.

A. It's on page 1072. It says Northeastern Illinois University, August 1996. That should be 1980.

Q. The date should be 19 --

A. 80.

Q. Except for the date change is this a

true, accurate and complete copy of your resume'?

A. Yes, it is.

MS. PELLEGRIN: Your Honor, at this time I would like to move to admit Mr. Manoyan's resume' into the record, Exhibit 34A.

MR. NORTHRUP: No objection.

JUDGE MORAN: Okay. Complainant's Exhibit 34A is admitted.

(Whereupon Complainant's Exhibit 34A was admitted into evidence.)

MS. PELLEGRIN: And, Your Honor, at this time I would like you to qualify Mr. Manoyan as an expert in surface water and ground water modeling.

MR. NORTHRUP: No objection.

MR. SMALL: We will waive it.

JUDGE MORAN: Okay. The Respondents have not objected and, therefore, although not exclusively for that reason, the witness is deemed to be an expert for the purposes identified by Ms. Pellegrin.

BY MS. PELLEGRIN:

Q. Mr. Manoyan, were you asked to provide expert testimony here today?

A. Yes, I was.

Q. And what were you asked to provide expert

testimony regarding?

A. In particular, a February 24, 2007, precipitation event, to characterize that event and come to a -- quantify that.

JUDGE MORAN: And to what?

THE WITNESS: Quantify that particular rain event.

JUDGE MORAN: The date again, sir, is February 24 of this year, 2007?

THE WITNESS: Correct.

BY MS. PELLEGRIN:

Q. And, Mr. Manoyan, why is that information needed in this case?

A. I am sorry, could you repeat your question?

Q. Sure. I believe you said the quantification -- you wanted to quantify the February 24, 2007, rain event. Why is that information needed in this particular case?

A. Well, for this particular case previously there were some photos were shown here. It indicated that there was some flooding on those photos. I wanted to see what was happening on that particular date data-wise, just to have an idea as to how much

rain occurred and how long it took to occur and so on.

Q. And were you asked to perform any calculations regarding that rain data?

A. Yes, I was.

Q. And what were you asked to calculate?

A. I was asked to calculate the volume of that precipitation event and also the volumetric flow rate for that particular event.

Q. Let's take those one at a time. First of all, we talked earlier about quantitative data and qualitative data. Speaking of this February 24, 2007, rain event, if you were to describe -- how would you describe a rain event or this particular rain event qualitatively?

A. You could say it rained hard on that day. It may have, but it is meaningless to me. I like to look at the numbers. That would be quantitative, looking at it. Or you would have pictures or something like that, describing that event without using any values attached to it.

Q. And so were you present -- I believe you just said this but for the record, were you present during the testimony of Mr. Daniel Heser when he

described the flows of that particular rain event?

A. Yes, I was.

Q. And in fact, Mr. Manoyan, were you present when Mr. Daniel turned those photographs over to U.S. EPA in this case?

A. I was.

Q. And when and where was that?

A. This was March 8 at the Martin ranch area.

Q. Let me ask, we talked about qualitatively and I believe you said you described it rained hard but you wanted to look at the data?

A. Yes.

Q. Were you able to ascertain information about that rain event quantitatively?

A. Yes, I did.

Q. And how did you do that?

A. I looked up the information on Wunderground Weather Service and obtained the information for that particular day.

JUDGE MORAN: That particular what?

THE WITNESS: Day.

JUDGE MORAN: Day. Sometimes I am not hearing particularly what you are saying. Go ahead.

BY MS. PELLEGRIN:

Q. You mentioned the term "wunderground." Is that wunderground.com?

A. Yes, it is.

Q. And why did you use the data from wunderground.com.

A. I wanted to be consistent with the Respondent's use of that data. So I went to the same source so that there won't be any inconsistencies and bias on my part.

JUDGE MORAN: Just before you ask, would you spell wunderground? Is that WU or WO or how do you spell it?

THE WITNESS: W-U-N-D-E-R ground.

JUDGE MORAN: All one word?

THE WITNESS: All one word.

JUDGE MORAN: Thank you.

BY MS. PELLEGRIN:

Q. And just generally about wunderground, were you able to ascertain any information about where wunderground gets its data?

A. From the National Weather Service.

Q. And, let's see, let me turn your attention to Complainant's Exhibit 38, and

particularly Bates number 1400.

JUDGE MORAN: Bates number what?

MS. PELLEGRIN: 1400.

JUDGE MORAN: For Exhibit 38?

MS. PELLEGRIN: Did I say Exhibit 38? I believe I meant 58, Your Honor, I apologize, Exhibit Number 58.

MR. NORTHRUP: Ms. Pellegrin, where are you at?

MS. PELLEGRIN: Complainant's Exhibit 58.

JUDGE MORAN: Right. The last exhibit I have is 39 in my logs.

MS. PELLEGRIN: Could we go off the record for a second, Your Honor?

JUDGE MORAN: Sure, I am going to take a five-minute break while you handle that.

(Whereupon the hearing was in a short recess.)

JUDGE MORAN: We are ready.

(Whereupon Complainant's Exhibit 58 was presented for purposes of identification as of this date.)

BY MS. PELLEGRIN:

Q. Mr. Manoyan, are you on Complainant's

Exhibit 58?

A. Yes.

Q. Actually, let's look at the whole -- I know I told you to turn to 1400 but I am going to have you turn your attention to 1399 through 1409.

A. 14 what?

Q. 09.

A. Okay.

Q. And, Mr. Manoyan, do you recognize this document?

A. Yes, I do.

Q. What is this document?

A. This is the weather information from wunderground, a study from January 2007. The first couple of pages are monthly calendar-like information. And then on page 1403 is the rain event for February 24, 2007.

Q. Okay. And let's turn our attention to Bates number 1400. And I believe you mentioned a date, February 24, 2007. Is that date on this calendar?

A. Yes, it is.

Q. And let's look at that date on this calendar. And could you explain to me, Mr. Manoyan,

what information is incorporated in that date?

A. For that particular date it gives the temperature, maximum temperature and minimum temperature, actual precipitation and it also gives you average temperatures for that particular date and average precipitation for that day.

Q. And for your purposes, Mr. Manoyan, when you are looking at this data, what are you looking for?

A. Mainly I am interested in the precipitation.

Q. And what is the precipitation for February 24, 2007?

A. It's 0.96 inches.

Q. It doesn't say inches on there. How do you know that it is inches?

A. I think there is -- if you go back to the daily version of this, it says inches.

Q. And, Mr. Manoyan, you mention that you, I think you mentioned, calculated, you wanted to calculate the amount of water?

A. Yes, volume of water for this particular day.

Q. And how did you go about calculating

volume of water for this particular day?

A. I used the distribution, multiplied it by the area of the water shed.

Q. By area of water shed -- actually, Your Honor, I may approach to Exhibit A?

JUDGE MORAN: Sure. And while counsel is doing that, Mr. Manoyan, as I am looking at this Complainant's Exhibit 1400, I don't see anything on this exhibit that tells me that this relates to this area as opposed to, at least from the four corners of this document that, I mean, this could -- as far as I would know, this could involve Bangor, Maine, water, rain precipitation. Is there any way --

THE WITNESS: Yes. If you look at the bottom of the page there is a link. It says Airport KSLO.

JUDGE MORAN: Airport and then KSLO?

THE WITNESS: Yes, in the bottom part of it.

JUDGE MORAN: Yes. And do you know what KSLO is?

THE WITNESS: It stands for Airport at Salem, Illinois.

JUDGE MORAN: Okay. So that's how you know it is related to this area?

THE WITNESS: Yes. I specifically looked for

Salem, Illinois, at this web page.

JUDGE MORAN: Ms. Pellegrin?

BY MS. PELLEGRIN:

Q. And just to clarify, Mr. Manoyan, why did you look for weather data at Salem, Illinois, for this particular site?

A. It was used by the Respondents also. I wanted to have the same information or same site so that there won't be any inconsistencies, or any bias would be introduced by selecting another site.

Q. Okay. And I believe we were -- Mr. Manoyan, you mentioned the term "area of the water shed." If I asked you to approach Exhibit A, could you point out what particular area you are talking about?

A. Yes, I can.

MS. PELLEGRIN: Your Honor, permission for Mr. Manoyan to approach the map.

JUDGE MORAN: Yes.

BY MS. PELLEGRIN:

Q. And then could you point to the area and could you describe for the record the area where you are pointing?

A. I am pointing on Exhibit A almost about

the mid-part of it on the right side. It says Martin Ranch Water Shed. But I wasn't using all of that water shed, just part of that water shed.

Q. And which part specifically?

A. Actually, it would be this part. I am tracing it with my finger to there. It is upstream of the Martin Branch to the impacted site.

Q. And, Mr. Manoyan, you are tracing an area and I believe is the left portion of that area in a different color? What color is that?

A. I am sorry. Left portion?

Q. The figure that you described with your finger, the left most portion of that, there is a line. What color is that for the record?

A. It is blue.

Q. It is blue?

JUDGE MORAN: You know, just as a suggestion, if he just were to draw a broken line, an increment line around that, then that would identify it from other markings on there. Do you see what I mean? Not a continuous line, but just -- that's a suggestion.

MS. PELLEGRIN: That's great. Then I would not use red since it is partly red.

THE WITNESS: Green.

JUDGE MORAN: I am talking about something like on a highway when you see the dividing lines.

THE WITNESS: Right.

(Pause.)

JUDGE MORAN: You might just state for the record what you just did.

THE WITNESS: I used a green marker to trace the area that I was interested in. It specifically contributes to this channel, impacted channel, and upstream of it.

BY MS. PELLEGRIN:

Q. Mr. Manoyan, you may have a seat.

Mr. Manoyan, why are you interested in this particular part, the one you delineated with the broken green line on Exhibit A? Why are you interested in this part for your compilation?

A. This is the area that contributes to Martin Branch above the impacted area and the impacted area itself.

Q. And were you present during the testimony of Ms. Joan Rogers earlier in a part of this hearing?

A. Yes, I was.

Q. And were you present when she delineated

the blue line that forms the left most portion of your broken green line?

A. Yes, I was.

Q. And, Mr. Manoyan, were you present when Ms. Rogers told us what that she had calculated that particular area in acreage?

A. I was. That's 446 acres.

Q. And now you said you calculated the amount of water that fell in that particular area, the area designated within the broken green line, is that correct?

A. Yes.

Q. And how did you calculate the amount, the volume, of rain that fell within that area?

A. The water is a three dimensional value. It is area times the depth of the precipitation.

Q. And again what did you use for the depth of precipitation in this case?

A. .96 and I divided that value by 12 to get to feet portion of it, convert it to feet, actually.

Q. Mr. Manoyan, I am going to ask you to perform that calculation for us on an e-board. Could you do that?

A. I can.

MS. PELLEGRIN: Mr. Moran, I would ask permission for Mr. Manoyan to approach the easel and perform the calculation of the volume of rain that fell into feet.

Can we go off the record for a second?

JUDGE MORAN: Yes, we are off the record.

(Whereupon there was then had an off-the-record discussion.)

JUDGE MORAN: Okay. Go back on the record.

BY MS. PELLEGRIN:

Q. Okay, Mr. Manoyan, before you do anything, I would like -- to keep the record clear, I would like for you to label this Exhibit I.

A. (Marking the exhibit).

(Whereupon EPA Demonstrative Exhibit I was marked for purposes of identification as of this date.)

Q. And, Mr. Manoyan, can you title this document Calculation of Volume?

A. Okay. (Marking the exhibit.)

Q. Okay, Mr. Manoyan, I would like for you to go ahead and perform your calculation. And as you are writing it, please tell us what you are doing.

A. Okay. I am writing down the precipitation depth for 2007. As we have mentioned before, it is .96 inches of rain accumulated for that date. Another component is area which is 446 acres. Volume is area times the depth.

So I converted inches to feet, .96 divided by 12.

Can I use my calculator to do this?

JUDGE MORAN: Sure.

A. I have one. This is .08 feet, equivalent to .96 inches. The area is 446 acres. The volume is 35.68 acre/foot. This is a unit of volume. I could convert this volume to something most of us could understand, if I can.

Q. Yes, please. I don't know what an acre/foot is, Mr. Manoyan. I would appreciate it if you would convert it into something a layperson could understand.

A. Gallons?

Q. Gallons, sure, that would be great.

A. To convert it to gallons I will multiply this number by 325,821, and that would give me the volume in gallons.

MR. SMALL: Could he speak up just a little

bit?

JUDGE MORAN: Yes. Did you not hear that?

MR. SMALL: I couldn't.

JUDGE MORAN: What you just said, Mr. Manoyan, could you repeat that? Because your voice -- first of all, you were squatted down. Speak up and repeat what you just said. You were just saying how you converted it to gallons.

THE WITNESS: I converted 35.6 acres plus to gallons by multiplying it by 325,821. That's the conversion factor.

Can I write the results on a different page so that everyone can see it?

JUDGE MORAN: Sure. Before you speak about that, Mr. Manoyan, what's that last number before the word "gallons." Is that an 8?

THE WITNESS: Eight, sorry.

JUDGE MORAN: Thanks. So why don't you tell us what you did.

THE WITNESS: This number is 11,625,293 gallons.

BY MS. PELLEGRIN:

Q. And is there a number after the decimal point?

A. 28. That's not legible actually.

Q. Okay. Mr. Manoyan, am I understanding you correctly that during -- what you have just done is you have calculated the volume of rain that fell within this particular portion of Martin Branch, upstream and including the site, during this .96 rain event on February 24, 2007?

A. Correct.

Q. Mr. Manoyan, I am going to sort of round my talk about this, round up to 12 million, round down to 11 million, how do you want it?

A. Twelve would be okay.

Q. I'm sorry?

A. Twelve million would be okay, either way.

Q. Now, Mr. Manoyan, am I understanding you that 12 million gallons fell in this water shed during that rain event according to your calculation?

A. Yes.

Q. Now, Mr. Manoyan, let me ask you, do you know, if you know, did all of that rain that fell within this portion of the water shed make it downstream where it goes downstream to Lake Centralia?

A. Eventually. But let's be conservative

about it and say 35 percent of it evaporated, although I think that's a high number. I assume that it is 35 percent. Even 50 percent would be okay.

Q. And, Mr. Manoyan, let me ask you, in your experience have you calculated evaporation rates?

A. I have.

Q. And what would that involve?

A. It would involve looking at the maps of a particular region and determine how much of evaporation is occurring for that particular branch, a particular region or site, and then multiply that number with the amount of water you have.

Q. And what are some factors involved in whether or not or what evaporation rate would you use?

A. Our main one would be temperature. If you have a high enough temperature, it would evaporate more and faster.

Q. And, Mr. Manoyan, you used a couple of numbers, I think. What number do you want to use for your conservative estimate of how much evaporated in this case?

A. I will go with 40 percent.

Q. Okay, 40 percent.

A. Right. It's a big number; we can afford it.

Q. And can you tell me then, I guess, would you reduce that amount by 40 percent?

A. Yes.

Q. For us to perform that calculation?

A. What's left over after 40 percent of reduction is 7.2 million gallons.

Q. Mr. Manoyan, you can have a seat now. Actually, before you sit down, can you label for the record -- this is a two-page Exhibit I. Can you label this page 2 of Exhibit I.

A. (Marking the exhibit).

Q. Can you turn back to the first page and label it page 1?

A. (Marking the exhibit).

JUDGE MORAN: And then when he is done doing that, ask him, if you didn't already, the 7.2, what that represents. You said what it was. You said what's left is 7.2. That 7.2, he can fill in the blanks.

Q. Mr. Manoyan, the number that you came up with, 7.2 million gallons, what does that number represent?

A. That's the amount left after evaporation occurs.

Q. And by left, where, if you know, does that water go when it is left?

A. Well, parts of it will go into the channel. Parts of it will be infiltrated and eventually end up going into Lake Centralia, one way or the other.

Q. And, Mr. Manoyan, I think we have had a couple of different people describing what a water shed is. And can you explain to me what a water shed is in terms of the calculations you just performed.

A. Well, in this particular case, the area that I indicated is a water shed, sub-water shed, of the Martin Branch. It is the amount of water flowing into that area. It goes directly into either the stream itself or the center of that water shed.

JUDGE MORAN: Or what?

THE WITNESS: Center. Which part? I am sorry.

JUDGE MORAN: You trailed off at the end. You said some of it will go into --

THE WITNESS: To the stream.

JUDGE MORAN: Yes, Martin Branch or --

THE WITNESS: Or center of that water shed.
JUDGE MORAN: Or center of the water shed, okay.
THE WITNESS: Collected in the center of the water shed.
BY MS. PELLEGRIN:
Q. And if I use the term "collection point" for the Martin Branch water shed, do you understand what I mean by that term?
JUDGE MORAN: The answer is no, you don't understand, right?
THE WITNESS: A. The answer is no, I don't understand at this point.
BY MS. PELLEGRIN:
Q. Okay. I will move on. Mr. Manoyan, you can have a seat now.
Okay, Mr. Manoyan, you mentioned that you also calculated the volumetric flow rate; is that correct?
A. Yes, that is correct.
Q. And what is a volumetric flow rate, Mr. Manoyan?
A. It is a volume of water moving at one location for a period of time. It's a rate.

Q. And what is the method for calculating volumetric flow rate?

A. There are multiples of methods that you could use to calculate, anywhere from a simple formula to highly complex softwares to calculate it.

Q. And how did you calculate volumetric flow rate in this case?

A. I used rational method to calculate it.

Q. And what is the definition of "rational method"?

A. Rational method is mostly used for small water sheds in urban areas or even in rural areas, farming communities, to calculate flow rate.

Q. And is that a generally accepted method in your field to calculate volumetric flow rates?

A. Yes. If you wanted to get a ballpark figure, then you would do something similar. If you need anything more than that, you would go into complex or more involved methods.

Q. And why did you use the rational method in this case to calculate volumetric flow rates?

A. Again, I wanted to use the same method that was used by the Respondents. I wanted to reduce any personal bias on my part by selecting something

other than what they used.

Q. And when you say "they," could you be more specific what "they" used?

A. The Respondents consultants, I believe it is Rapps Engineering.

Q. Now, Mr. Manoyan, I am not going to ask you any questions about Respondents' calculations or what Rapps Engineering did in this case. But let me just ask you, to your knowledge has Respondent used the rational method to calculate the volumetric flow rate for this specific rain event of February 24, 2007?

A. I am not aware of that.

Q. Now, Mr. Manoyan, the volumetric flow rate, what kind of information do you need in order to calculate the volumetric flow rate?

A. For that particular method I need the area, intensity of the rainfall event and run off coefficient.

Q. Now, let's take these one at a time.

What information did you use for the size of the water shed in calculating the volumetric flow rating?

A. I used the area delineated by one of my

colleagues, Ms. Joan Rogers, and that value is 446 acres.

Q. And, Mr. Manoyan, you previously calculated for us the volume of water that fell during that rain event using 446 acres. Is that the same number that you are using now in this calculation for the volumetric flow rating?

A. Yes, I am.

Q. Now let's talk about, I think, one of the other -- what other information you would need, which was intensity of the rainfall event. Can you tell me what do you mean by intensity of the rainfall event?

A. In laymen's terms it would be how hard it rained, but it has a value attached to it, a number attached to it.

Q. Can you give me an example of a number that would be attached to a rain event, intensity of a rain event?

A. Intensity, let me define that first and then I will give you a number.

Q. What's the definition of intensity?

A. Intensity is the rainfall depth divided by the time it took to occur.

Q. Can you give me an example of what an

intensity would be?

A. It could be anywhere from .1 or maybe even lesser numbers and goes up to 2.5 maybe.

Q. And you said over the period that it falls. How would that be measured?

A. Could you repeat that?

Q. Sure. You said it is the amount of rain that falls, over the period that it falls in. How would the time period that it falls in be measured?

A. It would be when the rain started and ended. That's the time period that I am talking about. Duration, in other words.

Q. Okay. And let's turn your attention again back to Complainant's Exhibit 58. And now this time I would like you to look at Bates number 1403.

A. Okay.

Q. And looking at 1403 through 1409, do you know what these pages contain, 1403 through 1409?

A. This is the specific data for the February 24, 2007, rain event.

Q. And where was this measured?

A. Salem, Illinois.

Q. And again why are you interested in the Salem, Illinois, data?

A. Because it was used by Respondents' consultant.

Q. Okay. Now, in this case can you explain, looking at 1403 through 1409, can you explain using these documents what you mean by intensity for this particular event?

A. For this particular event precipitation amount was about 0.96 inches and the rain started -- on page 1406, if you will look at that page -- it started around 11:05 a.m.

Q. Okay. Mr. Manoyan, I am looking in the center of page. In my copy it is right above the middle of the punch bowl, and it says by Comment at 11:05 going from left to right. Is that what you are referring to?

A. Yes, left to right. At the very end or very right it says .02 inches recorded at that time. Continuing on, this rain event continues until page 1408. Again, same location, middle of the page, 8:28 p.m., and that's when it ended.

Q. And to clarify, Mr. Manoyan, when you are looking at intensity, you are looking at the intensity over what time it fell over a 24-hour period in this case?

A. What time it fell, yes, within a 24-hour period.

Q. And as I am looking at the times between, let's see, 11:05 and 8:28, there seems to be some N/A. I am looking at -- let's see, I am looking at exhibit page 1406 and two lines under 11:05 or two entries under 11:05, three entries rather, at 12:05 p.m., all the way to the right of that line at 12:05 p.m. it says N/A. What does that mean?

A. Not applicable. They don't have any value for that particular time period.

Q. Okay. Do you know why that is?

A. It probably wasn't recorded, but it could also be that there was no rain to be recorded.

Q. Okay. And so when you are looking at 11:05 to 8:28, what do you determine that the intensity is for this particular rain event on February 24, 2007?

A. Again, I was being very conservative. I used those N/A designations as if it rained. I used that time period to be conservative. I didn't just subtract those particular periods from my calculation at the start and end of the rain event.

Q. Okay. And so what did you use for your

start of your rain event, just to be clear?

A. I used 11:05 a.m., continuing until 8:28 p.m.

Q. And if you know, how long -- you did that calculation. How long did that take to fall?

A. It is approximately 9.4 hours. If I had subtracted those N/As from 9.4, it would have been less time.

Q. And if it was less time, would it increase or decrease your number for intensity?

A. It would have increased.

Q. So it is your testimony that if you used a longer period of time, that would have decreased the intensity; and your testimony is that was conservative on your part; is that correct?

A. Yes.

Q. I believe you mentioned the third thing that you looked at, which was the run off coefficient, Mr. Manoyan; is that correct?

A. Run off coefficient, yes.

Q. And what is a run off coefficient?

A. It is run off divided by rainfall.

Q. And how does one go about obtaining a run off coefficient?

A. These are literature values. You could go into a textbook and find this. Also, it is available at internet.

Q. And you say literature values or textbook values, is it common practice to use a textbook to obtain this particular value?

A. Yes, it is.

Q. And when you are talking about run off coefficient, can you tell me what is a run off coefficient determining or encompassing?

A. Well, it factors in land use, the type of land it is, impervious areas, pervious areas, it is all factored in that coefficient. It is a universe.

Q. And for this co efficient what did you use for the run off coefficient in this case?

A. I chose .3 for urban areas. And I also wanted to be consistent again in this case; I used the Rapps Engineering's use of that value also.

Q. And I am sorry, you said you used the amount of coefficient for urban areas?

A. Urban -- not urban, I am sorry. I made a mistake. Agricultural areas, farming communities.

MS. PELLEGRIN: Your Honor, permission for Mr. Manoyan to approach the easel and perform his

calculation for the volumetric flow?

JUDGE MORAN: Sure.

THE WITNESS: I am going to take my calculator just in case.

JUDGE MORAN: Sure.

BY MS. PELLEGRIN:

Q. Mr. Manoyan, I am going to have you flip to a clean page and start out by writing Exhibit J.

A. (Marking the exhibit).

(Whereupon EPA Demonstrative Exhibit J was marked for purposes of identification as of this date.)

JUDGE MORAN: I will have so many wall hangings in my office.

MS. PELLEGRIN: Maybe we will make it to Z by the end of this hearing.

THE WITNESS: All set.

BY MS. PELLEGRIN:

Q. Mr. Manoyan, you mentioned that you used the rational method. Is that a -- can you write -- well, first of all, let's title this document Volumetric Flow Rate.

A. (Marking the exhibit).

Q. Okay. Mr. Manoyan, you mentioned that you used the rational method formula to calculate the volumetric flow rate in this case. What is the formula for the rational method? Can you please write that on Exhibit J?

A. Sure (Marking the exhibit).

Q. And what have you just written for the record, Mr. Manoyan?

A. I said Q is equal to CIA.

Q. Is that the rational method formula?

A. Yes, it is.

Q. What does Q standard for?

A. Q is flow.

Q. Okay. Could you please write Q equals flow?

A. (Marking the exhibit).

Q. And what does C stand for in this formula?

A. Run off coefficient (Marking the exhibit.

Q. What does I stand for?

A. Intensity (Marking the exhibit).

Q. And what does A stand for?

A. A is area (Marking the exhibit).

Q. And for the record could you please

explain what you have written on the first page of Exhibit J?

A. Exhibit J indicates the volumetric flow rate calculation. The formula being used here is rational form method. It is Q equal to CIA. Q is equal to flow, C is run off coefficient, I is intensity, A is area.

Q. Okay. Let's go ahead and turn to what would be page 2 of Exhibit J. And in this case, Mr. Manoyan, you are solving for Q; is that right?

A. Yes.

Q. So what does in this case C stand for?

A. The value of C is equal to .3 and it has no units.

Q. Okay. And that's the run off coefficient?

A. Yes, it is.

Q. And in this case what is I? What is the value of I?

A. I have to calculate that for this particular case. I is equal to rainfall, depth, divided by time. And in this case it is .96 inches divided by 9.4 hours.

Q. And the .96 and 9.4 hours, Mr. Manoyan,

just to remind us, where did you get that from?

A. This is from Wunderground Weather Service.

Q. And if you would like to go ahead and perform that calculation?

A. I can. I is equal to .102 inches per hour.

Q. And what is A equal to in this case?

A. A is equal to 446 acres.

Q. And, Mr. Manoyan, if you so wish, you could turn to the next page if you think you need more room, and calculate for us what the volumetric flow rate of Q is in this case.

A. Okay. I will write down page 3. Q is equal to .3 times .102 inches per hour times the area, 446 acres, and that number is 13.6 Cfs or cubic feet per second.

Q. And, Mr. Manoyan, you have just calculated Q equal to 13.6 cubic feet per second; is that correct?

A. Yes.

Q. And can you put cubic feet per second in something that a layman can understand? I would suggest gallons again or gallons per time.

A. Okay. Let's be consistent, use gallons. I will have to use the conversion factor for gallons which is, let's say, converting factor, it is 7.4805 which means one cubic feet per second equals to 7.4805 gallons per second. So I will just multiply these two numbers to come up with gallons per second. That's 102.1 gallons per second.

Q. And can I ask you one more favor? Can you convert that in to gallons per minute for us?

A. Okay. I will just have to multiply that by 60 because there are 60 seconds in a minute.

Q. Okay. Mr. Manoyan, if I am understanding you correctly, you have just calculated the volumetric flow rate in gallons per minute of this particular February 24, 2007, storm event; is that right?

A. This is correct, yes.

Q. And now, Mr. Manoyan, if we all ever make it out of this courtroom this week sometime, it is summer soon. So I would like you to use an analogy of a backyard swimming pool to show us in layman's terms what that rate of flow looks like. And I will give you -- I have in mind a 30-foot long pool.

A. Let me write that down.

Q. Okay. By, let's say, 15 feet wide, and so that I can reach the top, five feet deep. What would you have to do in order to determine what that volumetric flow rate would look like in a swimming pool?

A. Okay. I need to find the volume of that swimming pool which is the multiplication of the numbers you have given me. These are the dimensions of your swimming pool.

JUDGE MORAN: Let me just stop you. I wasn't paying attention for a second. You are coming up with a swimming pool analogy?

MS. PELLEGRIN: Yes.

JUDGE MORAN: And you have created a swimming pool of these dimensions?

MS. PELLEGRIN: Yes, Your Honor.

THE WITNESS: 30 feet by 15 by 5 feet.

JUDGE MORAN: This would not be one of the circular swimming pools I see in the CVS inserts where you see four people, two adults.

MS. PELLEGRIN: I am envisioning an in-ground swimming pool, Your Honor. Although I am sure it would probably fill one of those pools faster than this size pool.

THE WITNESS: A. Your volume for this particular swimming pool is 2250 cubic feet.

Q. And can you convert that to gallons to be consistent?

A. I can. I have to multiply it by the conversion factor again which was 7.4805. So 2250 times 7.4805 is -- in gallons it is 16,831 gallons.

Q. That's the gallons, that's the volume of the swimming pool I have asked you to calculate; is that correct?

A. Yes, in gallons.

Q. And can you tell me at the volumetric flow rate that you calculated how long would it take to fill up this swimming pool?

A. Going back to the previous page where I calculated the volumetric rate, I have 6125.5 gallons per minute. I need to divide this number by this rate to get the time for you.

JUDGE MORAN: And while he is doing that, I will reassure you we will be getting out of this courtroom on Friday. There is no question about that. The question is whether we will be here on Monday.

MS. PELLEGRIN: I know, Your Honor. And

actually it is summer time soon so I am thinking of swimming pools. Sort of, I would rather be fishing, I would rather be swimming.

JUDGE MORAN: Go catch some minnows down in the Martin Branch, I understand.

MS. PELLEGRIN: Although I don't know if I want to swim in the Martin Branch channel.

Q. Mr. Manoyan, what have you just done here?

A. I have calculated the amount of time it would take with the rate that we have calculated previously. For your swimming pool, it would take 2.7 minutes to either fill or empty.

Q. Okay. And so again backing up a little bit, the volumetric flow rate of the rain event on February 24, 2007, was flowing at such a rate that it would take 2.7 minutes to fill up the swimming pool that I just asked you to calculate for us; is that correct?

A. Yes, that's correct.

Q. And, Mr. Manoyan, I think this will be my last calculation for you. You originally in Exhibit I, I believe, gave us the amount of gallons that this rain would produce and you subtracted the evaporation

rates so you reduced the amount of gallons that this rain would produce. And remind me if you remember, what was that number in the amount of gallons?

A. We end up something 7.2 million gallons.

Q. Okay. Continuing with analogy of this in-ground, non-CVS swimming pool, how many swimming pools would it take -- how many swimming pools would this amount of water fill?

A. I need to divide the 7.2 million gallons by this volume of the swimming pool which is 16,831.1 gallons. I'll go to another page and do that. That number is --

(Pause.)

Q. And, Mr. Manoyan, could you explain what you just calculated?

A. I calculated the number of pools that this 7.2 million gallons of water would translate to using your dimensions. Your dimensions end up being 16,831.1 gallons or one swimming pool. This was the amount left over from that rain event that occurred on February 24, 2007. The number of pools that it would fill would be roughly 428 pools.

Q. Okay. And, Mr. Manoyan, just to clean up, can you please make sure that you label Exhibit

J, pages 1 through whatever it is now you are on, for the record?

JUDGE MORAN: Are you sure you have that right? That's page 4 of the new exhibit, of J?

THE WITNESS: Yes, it is.

JUDGE MORAN: Whatever. But I take it, Mr. Manoyan, that the number of this 427 swimming pools, that would have been filled up whether the Martin Branch had been altered or not. The same thing would have happened on that day.

THE WITNESS: Yes, exactly.

BY MS. PELLEGRIN:

Q. And, Mr. Manoyan, I think you can have a seat now.

And now, Mr. Manoyan, this rain event, the February 24, 2007, event, I believe you testified earlier that you were present when Mr. Daniel Heser testified about the photos he took with his family?

A. Yes, I was.

Q. And, Mr. Manoyan, were you present when Mr. Small was cross-examining Mr. Daniel Heser about this rain event?

A. Yes, I was.

Q. Now, do you remember when Mr. Small asked

Mr. Heser, and I am quoting from page 83 of day three of the transcript,

Mr. Small:

"Q. Okay. Now, I hope you can remember this, but wasn't that a week when it just -- the week before that day -- wasn't it just every day it rained and rained, it rained off and on, it was very unsettling weather that whole week; was it not?

"A. (By Mr. Daniel Heser) That I do not recall."

And my question to you, Mr. Manoyan, is did you have any occasion to determine what the rainfall data was the week before the February 24, 2007, rain event which you quantified for us today?

A. Yes, I did. I looked at the whole month of February 2007.

Q. And what information -- let's go ahead and turn to Complainant's Exhibit 58, again Bates page 1400.

A. Okay. I am there.

Q. And looking at -- let's start with February 24, 2007, on this calendar. For the record can you state what the precipitation event for the week before that day are? Let's see, going up to a

week til Saturday, February 17, what was the rain event?

A. There was no rain event.

Q. Okay. And when was the most recent rain event to the February 24, 2007, rain event?

A. February 12 and 13.

Q. And for the record what were those rain events on February 12? Let's start there.

A. 12th, it was .13 inches.

Q. And the 13th?

A. 13.85 inches.

Q. So it is your testimony that from the 14th through to the 24th, those ten days, according to this rain data there is no precipitation?

A. According to this document, yes, there is no rain event.

Q. All right. And I believe there has been some testimony about -- I believe you testified that you were present on the site of the general area on March 8, 2007?

A. Yes.

Q. And did you have an occasion to review the rainfall data from the February 24, 2007, rain event until the time you were there on March 8, 2007?

A. No, I did not.
Q. I am sorry, you didn't review it at that time?
A. At that time I did not review it.
Q. Since that time have you reviewed that rain data?
A. Yes, I have looked at the data.
Q. And looking again at the February 24, 2007, rain event, let's look at the week after the February 24, 2007, rain event, and I am on Bates page 1400. From the time the rain event occurred on February 24, 2007, and the time you were at the site on March 8, 2007, what, if any, rain event occurred?
A. On March 1 there was .2 inches of rain occur.
Q. .20 inches of rain?
A. Yes.
Q. And is that all the rain?
A. That's all.
Q. Okay. Mr. Manoyan, you calculated the rainfall intensity for .96 inches over, was it 8.9?
A. 9.4 hours.
Q. 9.4 hours. You calculated the intensity of a .96 inch event over 9.4 hours; is that correct?

A. That's correct.

Q. And did you have occasion to determine the frequency of that intensity of rain in this area, the Salem, Illinois, area?

A. Yes, I did.

Q. And how did you go about doing that?

A. I looked at each of the daily precipitation events going back to January of 2002 up to 2006 December, so about roughly about five years of data.

Q. And what data did you use?

A. I used the same resource again, wunderground.com data.

Q. And why did you use the wunderground.com data?

A. It was submitted by the Respondents.

Q. Mr. Manoyan, I am not sure if you have a Respondents' binder up there with you. There should be a Respondents' binder up there with you. It is another black binder. It has just a couple tabs. It just has numbered tabs.

A. Okay. I think I have it.

Q. Turning your attention to Tab 19 in that book?

A. Okay.

Q. And I believe it's Attachment C and it is also number 233, Heser Exhibit Number 233 on Tab 19.

JUDGE MORAN: 233?

MS. PELLEGRIN: Yes, Your Honor.

THE WITNESS: Okay, I am there.

BY MS. PELLEGRIN:

Q. Okay. And, Mr. Manoyan, looking through this to the end of Tab 19 which is Document 393, just flipping through that, is that the Respondents' data that you were referring to?

A. Yes, this is it.

Q. And, Mr. Manoyan, my question earlier was did you figure out what the frequency of this particular intensity event occurring was, and I believe you testified you did back to January 2002?

A. Yes.

Q. And what was the frequency of this kind of .96 over 9.4 hours run at?

A. The intensity of similar or larger was occurring, at least in my count, 52 times within that five-year period.

MS. PELLEGRIN: Your Honor, if I could have a few minutes, I believe I am done. I just want to

review my notes.

JUDGE MORAN: Sure, sure.

(Pause.)

MS. PELLEGRIN: I have no further questions of this witness, Your Honor, at this time.

JUDGE MORAN: Would you like a few minutes before we start cross or are you ready to go?

MR. NORTHRUP: I need a break.

JUDGE MORAN: Okay. We will take a ten-minute break.

(Whereupon the hearing was in a short recess.)

JUDGE MORAN: We are on the record now.

MS. PELLEGRIN: Your Honor, I apologize, I forgot to move to admit Exhibits I and J for Mr. Manoyan. If we could talk to you about it at this time, I would like to take care of that.

MR. NORTH: No objection.

JUDGE MORAN: All right. EPA Demonstrative Exhibits I and J are admitted.

(Whereupon EPA Demonstrative Exhibits I and J were admitted into evidence.)

JUDGE MORAN: That concludes EPA's direct

examination of Mr. Manoyan?

MS. PELLEGRIN: Yes, Your Honor.

JUDGE MORAN: All right. Cross examination?

MR. SMALL: Thank you, Your Honor.

CROSS EXAMINATION

BY MR. SMALL:

Q. Now, I want to make certain I pronounce your name right. Is it Mr. Manoyan?

A. Manoyan.

Q. Mr. Manoyan, okay. If I mispronounce your name, it is not intentional.

Now, Mr. Manoyan, I listened to your testimony, and obviously you have us at a disadvantage because we certainly are not experts in flows of water. But, you know, listening to your testimony, what I got out of it was that in order for your models to be accurate, you had to have accurate information that went into those models; is that correct?

A. That's correct.

Q. And for them to be reliable; is that correct?

A. Yes, representative.

Q. And in order to make some of these

calculations you had to, number one, make an assumption that the portion of the Martin Branch water shed acreage which you calculated to be 446 acres was accurate?

A. I did not calculate that number. It was calculated by the GIS expert at EPA. I think you all met her, Joan Rogers.

Q. Right. So you are making the assumption that Ms. Roger's number of 446 acres is correct?

A. Yes.

Q. Now, I think you were here when Ms. Rogers was on the stand, were you not?

A. I was here.

Q. And do you recall her saying that there was about 30 percent of her calculations that, for one reason or another, might not be correct?

A. She said something to that effect. I don't remember whether it was exactly that number.

Q. So, when we are looking at that acreage on the water shed, it could go either way. It could be 30 percent less or 30 percent more. It is just an assumed figure; correct?

MS. PELLEGRIN: Your Honor, I am going to object to this, I believe, mischaracterization of

Ms. Joan Rogers' testimony. I am happy to have that particular portion read into the transcript, but I don't remember that Ms. Rogers said it could go 30 percent either way in terms of this acreage that she calculated.

JUDGE MORAN: Well, but he is just asking him -- see, the record will reflect what she said and he is just asking this witness to assume that what Ms. Rogers said was that there was a 30 percent margin of error in her calculation. Is that your question?

MR. SMALL: That's correct, Your Honor. She said it could go wrong either way.

JUDGE MORAN: Yeah, so 30 percent, that necessarily implies it could go either way. If she says there is a 30 percent margin of error, then that necessarily implies that it could be 30 percent more or 30 percent less. My point is simply that we need -- it is in Respondents' counsel's interest to be accurate about the percent. But in fact if she said 28 percent, then that's what will control. This is a hypothetical.

MS. PELLEGRIN: Okay. I think the record will reflect what Ms. Rogers said.

JUDGE MORAN: Fine, but that's not my point. Go ahead.

BY MR. SMALL: Thank you, Your Honor.

Q. And likewise on the precipitation amount which was for February 24, '07, you showed .96?

A. Correct.

Q. That was calculated in Salem, Illinois?

A. Uh-huh.

Q. And your assumption is correct that the Respondents used that same figure, but that could be off one way or the other because the precipitation amount was actually taken in Salem, Illinois; is that correct?

A. Yeah, that is correct.

Q. And so if there were other precipitation on the site, that really would have thrown off that figure .96?

A. The answer to that, prior to using that value of .96 I consulted a meteorologist about the storm events. It is again Ms. Joan Rogers. She has a meteorology degree. She explained it this way. There are two types of storm events. F.

One entails fall and winter. The other one is summer and spring. Fall and winter storm

events does not have a lot of variation. It covers a wide area, so that distribution of the rain event or .96 is uniform and at least that is about ten miles wide. So it will encompass Salem in that situation.

Q. And so it is less likely to be off widely in winter?

A. It is less likely to be off by winter, yes.

Q. It could be off some, but in winter it is going to be closer to being accurate than in summer where it might have heavy downpours?

A. In summer it could vary quite a lot, but not in fall and winter storm events.

Q. Okay. If you know, how far is it from the Heser site, Heser L, to the area where the rainfall data is collected?

A. I believe it is somewhere around eight to nine miles.

JUDGE MORAN: Eight to nine?

THE WITNESS: Eight to nine, so it is somewhere within that realm of that ten mile spread.

BY MR. SMALL:

Q. So again back to the basic premise, you get what you put into your formula?

A. Exactly.

Q. If it is inaccurate figures, you are going to come out with a result that is not accurate either?

A. If this .96 is going off, let's say it is .1 instead of .9, then it would be a different value. But I am assuming -- I made the assumption that this .96 is accurate.

Q. I understand it. But also in the acreage, if the acreage is off, that would also throw that calculation off?

A. Well, I have a response to that statement.

JUDGE MORAN: No, but his question is just that, see.

Q. So is it correct that if the acreage was wrong, inaccurate for any reason, that would throw off the results?

A. If it was inaccurate, yes. Any of those components would have affected it.

Q. Now, I think your testimony also was you are making another assumption and that is that there was a 40 percent -- well, first off we assume that we had 12 million gallons. We kind of round it up. But

then I think you gave us a little advantage and you rounded up your evaporation rate to 40 percent; correct?

A. Yeah.

Q. And you mentioned that 40 percent would evaporate and then you said something that I didn't understand. And that was you said some goes to the center of the water shed. What do you mean by that?

A. Well, it's within the area of that delineated area. That's the amount of water that was collected in that area. That's what I mean.

Q. So are you saying some has evaporated, some goes in the soil, some goes to the center and some goes into Martin's Branch, is that what you are saying?

A. All of those areas received .96 inches of rain. It is uniform.

Q. All right.

A. It's within that area that I was calculating the volume.

Q. Now, let's just assume that that area that you were looking at that was Martin's Branch, the particular --

A. The water shed.

Q. The water shed area, if that was all black topped over, let's say there was nothing but black top in that whole area, that wouldn't throw off the calculations as to the amount of rainfall coming down on it; would it?

A. No, the volume would be the same.

Q. It has absolutely nothing to do with any work or whatever is in that area?

A. Exactly. I said that.

Q. So now I would like to go into the volumetric flow rate.

A. Okay.

Q. And again I think you have indicated that was the rational method or what I call, I like your term, ballpark method. That's just kind of a ballpark of how it is flowing; correct?

A. And the rate it is flowing.

Q. And again that formula, that model that you use there, contains the acreage of the particular water shed that you are looking at; right?

A. Correct.

Q. And so again my question is, you know, if that number is off, if that's inaccurate, then that will affect the result of your volumetric flow rate;

correct?

A. That is correct.

Q. Now, you weren't on site, were you, on the Heser L on February 24, '07?

A. I was not.

Q. So you are just picking up this data from, was it, wunder --

A. Wunderground.

Q. Wunderground.com?

A. Correct.

Q. And looking at that data for February 24, '07, and again that is Exhibit 58 and I have to tell you the page, page 1400.

A. I am there.

Q. That appears to be the biggest rainfall event that month; correct?

A. Correct.

Q. Is there any particular reason why you used the biggest rainfall event of the month for your calculations?

A. Yes, there is. Do you want me to say what it is?

Q. I'll -- and was the reason why you chose that date because that was the date that you had

certain pictures from Danny Heser?

A. Yes.

Q. Now, referring to that same sheet.

A. 1400?

Q. Yes, 1400. And this is the question, because I don't know what it means; maybe you do. February 20, if you will look at that?

A. 20, yes.

Q. And in that box on February 20 in the upper right-hand corner it looks like kind of a dark cloud with precipitation of some sort coming out of it; is that right?

A. There is a symbol as you described it.

Q. Is that what you would interpret that to be?

A. Interpret it as what?

Q. Would you interpret that to mean it looks like a cloud with precipitation coming out of it?

A. Yes.

Q. And yet on that date it says precipitation zero; is that correct?

A. That is correct.

Q. Do you know why this document has that cloud with precipitation coming out of it on that

date if there is no precipitation?

A. It may have been a very minute amount, less than, let's say, .001 inches. So it was not recorded.

Q. And are you saying that as a matter of speculation or are you saying that as a matter that you know that to be a fact?

A. I don't know that as a fact, but that's my professional opinion of it.

Q. Okay. Now, you indicated that 52 times in approximately a five-year period there was rainfall events of the same intensity?

A. Correct.

Q. That occurred?

A. Same or more intensity.

Q. Now, these would be at different times of the year; is that correct? They weren't all in the winter.

A. No.

Q. As a matter of fact, most of them would be in the summer?

A. Could have been.

Q. Could have been or are?

A. Well, by summer, define the months for

me.

Q. Let's say spring and summer. Let's go from March, April, May, June, July, August.

A. That is your spring?

Q. That's spring and summer.

A. Okay. Starting from June 31 to August, September 1, is one or most of the driest months. There wasn't much of any rain event occurring.

Q. Let's start with March then.

A. Okay.

Q. Would you typically see big rains in the spring?

A. It varies from year to year.

Q. Can you have a generalization? You know, if your rainfall events generally take place more frequently in what we typically would call spring months --

A. Than August?

Q. Yes, rather than August.

A. Yeah, that's true.

Q. And so would most of these 52 events that you are talking about take place in months that would be spring or early summer?

A. Except for excluding August, I would say

it is spread around the whole year.

Q. Okay.

A. I am excluding August from that statement.

Q. You are saying that it is throughout the whole year?

A. Throughout the whole year.

Q. Other than August?

A. Other than August generally.

Q. The evaporation rates would be higher in the spring and summer?

A. Right.

Q. What would those evaporation rates be approximately?

A. I really gave 40 percent as a conservative value on the other site's benefit. I would say if I were to use 40, then in summer I would use 45 maybe.

MR. NORTHRUP: I have got a few questions in follow up.

CROSS EXAMINATION

BY MR. NORTHRUP:

Q. You talked about as part of your background you performed a water body budget for the

lower Fox River. Do you remember that?

A. Water budget for the lower Fox River, yes.

Q. Water budget for the lower Fox River, okay. What types of data did you collect for that study?

A. Climate data which would include temperature, precipitation; turbidity data, it is how cloudy it is.

Q. How cloudy the water is?

A. Within the water, how cloudy it is. If there is a lot of sediment, it is blurry, it is murky. That's what turbidity defines, actually. Temperature, pH, water levels, flow. It was available to me from USGS, that data.

Q. So did you actually go out in the field and have any of this data collected?

A. No, I did not.

Q. And where did you obtain it again?

A. I obtained it from USGS, another governmental body.

Q. So this was all published data that they had gone out and gotten?

A. Yes, they have collected this data. They

have quality insurance and quality controls on it, and then it would be available for anyone's use.

Q. What was the period of time that you looked at for this water budget study?

A. I said it was 20 years, but I can't recall the exact dates of it. Anywhere from 1970 on to 20 years, 1990.

Q. With respect to your calculation of volume and volumetric flow rate, did you calculate any of those for any of the other water sheds in the Lake Centralia area?

A. I did not.

Q. You indicated you used either a 35 or 40 percent evaporation rate?

A. I was being generous, yes, for that particular time of the year. But, yeah, 35 is what I said or 40, I believe.

Q. And explain to me how evaporation works.

A. Well, it is directly related to temperature. If you have a high enough temperature, part of your volume will evaporate, goes into the atmosphere.

Q. Once the rain hits the ground?

A. Once it hits the ground, yes.

Q. Would you --

A. It would start upon hitting the ground and on. It wouldn't be just an instantaneous thing. It would take some time to evaporate.

Q. Would you apply that evaporation rate if you wanted to calculate how much rain fell actually into the 413 acres of Lake Centralia?

A. Could you repeat that, please?

Q. Would you apply the evaporation rate to the rain that fell directly into Lake Centralia?

A. Yes, there is an evaporation occurring at Lake Centralia at the same time. I didn't calculate anything for Lake Centralia. I was just calculating for the sub-water shed that we mentioned before.

Q. And would that evaporation rate for Lake Centralia be something less than 35?

A. No, it would be similar. It is the same area. It would be the same central value, if not exact.

Q. I think you had calculated that there were 7.2 million gallons after you applied the evaporation rate?

A. Yes.

Q. That fell in the Martin Branch, what I

call the sub-water shed area?

A. Okay.

Q. And you indicated some of that water is infiltrated into the ground; correct?

A. Uh-huh.

Q. You also said that it would eventually make its way to Lake Centralia; do you remember that?

A. Yes.

Q. Have you performed any calculations to determine how long it would take?

A. I did not. I just calculated the volume of water that came down to the sub-water shed in question.

Q. Is that a calculation that you can perform?

A. I can, yes.

Q. But that's probably a more complex calculation?

A. You would need a little more information about that.

Q. What types of information?

A. Anywhere from the soils within the soils, geological information. You would need velocity, volumes, sediments. You would need more information

to calculate that, but that's possible.

Q. Where would you get that information?

A. Various organizations. USGS might have it. ISWS, Illinois State Water Survey. Local NRCS offices would have that information also.

Q. Now, if they didn't have it, you would have to go out to the field to collect that yourself?

A. You can do some field work and then make estimates in regards to that.

Q. Is volumetric flow rate impacted at all by, say, the types of vegetation that's on the ground?

A. Yes. That's factored in with the runoff coefficient. It addresses the land use, vegetation on the land, impervious areas, pervious areas. All of that is factored into the runoff coefficient that I mentioned.

Q. How about issues of gradient or slope? Are they factored into the runoff coefficient?

A. All of that is factored in, yes.

Q. And where do these runoff coefficients come from again?

A. It is available in textbooks. People prior to me for many years collected data and

information, and then they analyzed that data and come up with ranges of values for runoff coefficients.

Q. Do you have any idea whether the runoff coefficients, the numbers that they used, were in any way based on anything around our site, the Heser site?

A. Well, it would be related to the area in the county, so in that sense, yes, it is.

Q. So the County calculates these runoff coefficients?

A. Well, the County has this information for various land use areas. Agricultural communities, the coefficient would be anywhere from .1 to .05. The selection of .3 in this case, I was simulating the same value or using the same value that your consultants used so that there won't be any inconsistencies.

Q. My question, I guess, is how do we know that .01 to .05 is accurate?

A. You don't, actually. You just have to make assumptions. And I assumed, as your consultant did, agricultural areas normally is around .3, and I used the same value.

Q. With respect to the volumetric flow rate, I am trying to envision this. And you said, I think it was 102 gallons per second?

A. It's cubic feet per second.

Q. Cubic feet per second?

A. It that right? Okay, one of those figures.

Q. So does that mean that any time during this storm event, anywhere I stand within the Martin Branch sub-water shed, 102 cubic feet of water is going to be rushing past my feet?

A. Yes, at one point, yes.

Q. At any point at any time?

A. At any point. It is the rate of flow.

JUDGE MORAN: It's the what?

THE WITNESS: Rate of flow.

Q. So under your calculation it doesn't make any difference whether I am standing at a higher elevation or a lower elevation; it is going to be --

A. It is a matter of a finite volume of water and that's the rate it is going to flow with. That's your flow rate.

Q. It's a flow rate. So it doesn't mean when I am standing at the top of the hill 102 gallons

is rushing past me at any given time?

A. It is 102 at any time.

Q. So if I understand correctly then, the physical contours of the land make no difference whatsoever to that calculation of the 102.1 cubic feet?

A. It does not incorporate the slopes for that particular method.

Q. Okay. There are other methods where that is incorporated?

A. For different purposes you could use the slope information.

Q. Would that make the calculation more accurate?

A. No, that calculation is accurate for its purposes.

Q. If you included that other information, that would make it more precise to your specific location?

A. Well, this figure is a ballpark figure. It is not going to be multiples of that figure. It is either going to be 103 or 105 at most if you incorporate that amount for the slopes. But other than that, it is not going to change all that much.

It is not factorial.

MR. NORTHRUP: Nothing further, Your Honor.

JUDGE MORAN: Okay. I am going to ask a few questions before I allow EPA to have any redirect that they may wish to have.

EXAMINATION

BY JUDGE MORAN:

Q. Mr. Manoyan, I take it that earlier when you were talking about the accuracy of this rain data at the Salem station, you said that, if I am correct, you said there is less accuracy in the summer months than in, say, the winter months; is that right?

A. Yes.

Q. And would that be due to what we refer to in climates where the temperature gets really hot you have something called pop up storms that are very localized?

A. To my understanding it is based on the cloud formation for fall and winter. It is Stratus cloud formations that use that, and that kind of cloud formation produces uniform distribution of precipitation.

Q. So you are saying you have a different cloud formation in the summer months?

A. I believe that it was cumulus cloud formation, but I am not exactly sure.

Q. Now, this Salem station, did you say it was eight to ten miles from the Martin Branch?

A. I said seven to eight possibly. I did not measure it.

Q. But was it your testimony that, knowing what rain was recorded at the Salem station, that one could conclude that a location seven miles from there, that that would be reflective of what occurred at least in February of '07?

A. Yes, it did.

Q. And would that be true, sir, if you use Salem as the center point, that in a radius of at least seven miles, wherever you are within that seven mile radius, that would be accurate to tell how much rain fell within that circle that has a seven-mile radius?

A. Well, that seven-mile radius has a diameter of 14 miles. So within that span of 14 miles.

Q. But from the center of the station --

A. From the center, if you go out seven miles, yes, it would be uniform.

Q. So my next question is, well, how far out, if you know, from the Salem station can one accurately predict that the information at Salem would tell you, for instance -- let me give you a hypothetical.

Let's say I am 15 miles away from the Salem station by radius. Would you be able as an expert to say that this would also be an indicator as to the rain or was that too far away from the center point?

A. I am not a meteorologist, so I am assuming that it may be a little different in 15 miles than the ten miles range that I was told.

Q. So are you telling me that someone told you that a ten-mile range is -- that that's a predictor of a ten-mile range and you don't know that of your own, that someone just said to you, oh, yeah, ten miles out, that's a good indicator?

A. No, I was told by a meteorologist that this is the accepted norm, and this is the information that she gave me.

Q. And this was the person who was a witness here earlier?

A. Earlier, yes. She has a meteorology

degree.

Q. So you took it on faith that this ten-mile rule of thumb was a good measure based on what she told you?

A. Yes.

Q. And do you happen to know, sir, was there any or is there any nearer rain station other than Salem closer to Martin Branch, to the area that's in the subject of this -- I mean Martin Branch as it relates to where the Heser property is -- do you know if there is a closer rain station than Salem?

A. I believe Salem is the closest one.

Q. Did you investigate that?

A. I have been told by the meteorologist that it is the closest one.

Q. And when you talked about, I think you said, that 7.2 million gallons of water would have fallen during this period on this particular date after evaporation?

A. After evaporation, yes.

Q. But did you acknowledge that a certain portion of this would be runoff and a certain portion of it would be absorbed by the soil?

A. I said it would be infiltrated into the

soil. But the volume that I was calculating was still going to be 7.2 after evaporation.

Q. Right. But did you ever conduct a calculation or do you know how much of the water that fell on that date would have been absorbed by the soil?

A. Not for that particular date, no.

Q. And so let me see if I have this straight. You have a certain amount of the rain that would fall that would be evaporated, a certain amount that would be absorbed by the soil, but you don't know what that would be?

A. No, I would need information about soil temperatures, whether the ground was frozen, whether it had any vegetation on the ground. All of that is a factor.

Q. So would I be correct that if you know how much -- if you had the figure of how much was evaporated and you assumed a figure of 35 percent but you don't know how much would be absorbed, then is it logical that you could also, not knowing that, that you could not state how much would have run off?

A. I did not say how much would have run off. I just calculated the volume that came down on

that particular day.

Q. And to state the obvious, but tell me if I am wrong, I assume that the volumetric flow rate that you calculated would have been the same regardless of whether Martin Branch had been altered by the Hesers or not?

A. I said it did not matter at this point.

Q. Right. And that the 11 point -- I rounded it off to 11.6 million.

A. That's fine.

Q. So the 11.6 million gallons itself, that also would have been the same obviously whether the Martin Branch had been disturbed or not; correct?

A. That's correct.

JUDGE MORAN: That's all I have to ask you. Now redirect from EPA?

MS. PELLEGRIN: Yes, Your Honor.

REDIRECT EXAMINATION

BY MS. PELLEGRIN:

Q. Just a couple of clarification questions, Mr. Manoyan. Regarding the runoff coefficients, I believe Mr. Small asked you a question about would it matter if this area was black topped. And I just want to clarify, how, if at all, does the runoff

coefficient that you used factor in whether or not this area was black topped?

A. I think, I believe he asked me whether we would have this amount if it had been black topped. I am not exactly sure whether he said runoff coefficient. Runoff coefficient would be different for impervious areas.

Q. And on that same point I would like for you to turn, looking at Respondents' binder, Number 19 again?

A. Okay.

Q. And just to -- I am looking at actually Document Number 212.

A. Okay, I am there.

Q. Okay. And just to be clear, we were talking about where you would -- I asked you a question about where you would get the runoff coefficient. Does this page indicate to you anything about a runoff coefficient?

A. Yes, it does.

Q. And this is -- let's see. Let's turn to the first page of Exhibit 19. Just for the record I would just like for you to read the heading of this document or the letterhead of this document.

A. It says, "Rapps Engineering and Applied Science."

Q. Okay. Now, just for the record can you confirm that this is what appears to be an attachment to the RAPPS letterhead document?

A. Page 212?

Q. Yes.

A. Yes, it is.

Q. And do you see on this page a reference to the same or similar runoff coefficient that you used in your calculation?

A. Yes, there is.

Q. Okay. And can you point out where that is on this page?

A. It is in the middle of that table where it says Cultivated Fields, under the general heading of Bureau Areas?

Q. About the middle of that table, Cultivated Fields?

A. Right. And it has a range from .2 to .4.

Q. I believe it was your testimony that you used the midline of that range, .3; is that correct?

A. Yes.

MS. PELLEGRIN: Okay, Your Honor, I have no

further questions.

JUDGE MORAN: And just for the record, that page on the Heser exhibit has a number of 212 and is that the page, sir, that says Appendix B as in "boy" at the top?

THE WITNESS: Yes, it is.

MR. NORTHRUP: Just one question?

JUDGE MORAN: Sure.

RECROSS EXAMINATION

BY MR. NORTHRUP:

Q. Mr. Manoyan, when you were following up to the judge's question where you were talking about absorption or infiltration of the rain in the soil, you talked about factors that might be important, soil temperature, whether the ground was frozen or vegetated; correct? You remember that?

A. Right.

Q. Does it make a difference of what the level, I guess, pre-existing soil moisture is?

A. Yes, that's also a factor.

Q. If the soil is wet or saturated, you will have less infiltration and more runoff; correct?

A. Correct.

MR. NORTHRUP: That's all.

MS. PELLEGRIN: Nothing further.

JUDGE MORAN: Mr. Manoyan, thank you for your testimony.

(Witness excused.)

You want to take a five-minute break or what?

MS. PELLEGRIN: Yes, please, Your Honor.

JUDGE MORAN: All right. We will go off the record.

(Whereupon there was then had an off-the-record discussion.)

JUDGE MORAN: We will go on the record.

All right. EPA's next witness now?

MS. PELLEGRIN: Yes, we would like to call Wendy Melgin to the stand.

JUDGE MORAN: Wendy is it?

THE WITNESS: Yes.

JUDGE MORAN: Ms. Melgin, raise your right hand.

(Whereupon the witness was duly sworn by Administrative Law Judge Moran.)

Have a seat. And just as I tell the other witnesses, if you will state your name and

spell it for us.

THE WITNESS: My name is Wendy Melgin, M-E-L-G-I-N.

WENDY MELGIN

called as a witness on behalf of Complainant, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MS. PELLEGRIN:

Q. Good morning, Ms. Melgin.

A. Good morning.

Q. And I have got, Ms. Melgin, some questions about your educational background.

A. Okay.

Q. Ms. Melgin, do you have any educational degrees?

A. I do.

Q. And what degrees do you hold?

A. I have a bachelor's in geology and a master's in hydrology and hydrogeology.

Q. Ms. Melgin, can I ask you to either move the mic a little closer to you or move a little closer to the mic?

A. Okay.

JUDGE MORAN: So it is geology and hydrogeology?

THE WITNESS: I have a bachelor's in geology and a master's in hydrology and a master's in hydrogeology.

Q. And let's take first of all your bachelor's degree. Where did you earn your bachelor's degree?

A. At the University of Montana.

Q. And what year was that?

A. 1979.

Q. And first of all explain what geology is?

A. Well, geology is basically the study of rocks, their distribution and occurrence. That's about it.

Q. And what courses -- well, when you were studying for your bachelor's degree in geology what generally, what kind of courses did you take?

A. Well, I started out at the university as a wildlife biology major. So for two years I took courses that were focused on biology, botany, zoology, wet systems biology, microbiology, zoology, all the types of courses that you would take for a wildlife biology degree. And then I took a

paleontology course, and I switched my major to geology and focused on vertebrate-based paleontology.

Q. And what is -- you said vertebrate paleontology. What is that?

A. It is, you know, the fossils of mammals and reptiles, dinosaurs. That's what usually people think about when you talk about paleontology.

Q. And, let's see, you mentioned you had a master's degree in hydrogeology and hydrology; is that correct?

A. That's correct.

Q. And what university was that?

A. That was at the University of Nevada in Reno.

Q. And what year was that?

A. It was 1985.

Q. Now, Ms. Melgin, can you tell us, I guess, the difference between hydrogeology and hydrology?

A. Well, hydrology sort of encompasses hydrogeology into the study. Hydrology is the science of water in all its forms and distributions in and around the earth, underground and above ground. Hydrogeology focuses on the occurrence and

transport of sub-surface water, ground water.

Q. And what kind of courses did you take when you were studying for your master's in hydrology and hydrogeology?

A. Again, I did two different things like I did before. I started where I was going to get a master's in forest hydrology. So I focused on forestry classes. I took all the water shed management, floriculture, forest ecology, all the soil classes. I took a lot of soils. So physics, taxonomy, morphology classification.

And then I took a hydrogeology course and I decided to focus on hydrogeology. That program was -- it was an interdisciplinary program from the engineering, geology and School of Mines and School of Agriculture, so you had to take courses from all three schools to fulfill your requirements for the master's degree.

Q. And I believe did you say School of Mines?

A. School of Mines.

Q. And what is the School of Mines?

A. Well, that's the college at the University of Nevada-Reno that had all of the geology

and petroleum engineering and anything to do with mining engineering and geology, geophysics, everything.

Q. So it is not the School of Minds?

A. No, mines. That would have been a whole another part of school.

Q. Okay. Ms. Melgin, what, if any, research did you conduct while you were earning a master's degree in hydrology and hydrogeology?

A. I did a master's thesis.

Q. And what did that master's thesis entail?

A. I researched the hydrological and chemical pathway of a 200-acre water shed that basically contained a first order stream in the Lake Tahoe Basin where I -- the reason for my research was I was following the pathways and transport of nitrogen through the atmosphere, through the ground, into the water and out into Lake Tahoe. We were trying to determine nutrient transport through all the different hydrologic pathways.

Q. And a couple of follow-up questions. What is a, I think you mentioned, a first order stream. What do you mean by a first order stream just generally?

A. A first order stream is just the smallest of the headwater streams. It has no tributary system.

JUDGE MORAN: You went so quick; first order?

MS. PELLEGRIN: First order.

THE WITNESS: I will slow down. I am fast.

JUDGE MORAN: No, actually she was going too fast, too. I am trying to understand those words, first order.

BY MS. PELLEGRIN:

Q. First order stream. And then that question raises another question, Ms. Melgin. I believe you mentioned headwater streams. What do the headwater streams involve?

A. Headwater streams are those streams at the very top of a water shed that contributes down to the main stem, but they are at the very top.

Q. Okay. I think you also said nitrogen or nitrate transport. What do you mean by that?

A. Well, nitrogen is an element and it is also a plant nutrient. It can cause nutrient pollens in water bodies like lakes, producing excessive algae growth and things like that, in Tahoe or what else there is a problem with, the decreasing clarity of

the lake. So a lot of the research that we were doing around the Tahoe Basin was to determine the water shed inputs that were contributing to the decreased clarity of the lake.

Q. And if you know, what are the results of that research that you had done?

A. We -- the agency that I ended up working for, we developed land use ordinances to protect certain types of land that would contribute more water nutrients to a tributary system to the lake.

Q. And just generally what type of land are you referring to?

A. Riparian corridors and wetlands.

Q. And can you, please, explain how the land ordinances would help affect the land uses you were discussing?

A. Right. We had special designation areas. They were called stream environment zones. And basically that's what they were, wetlands in riparian areas. We had land ordinances to protect those areas. People could not build on those areas, because those were the areas that generated the water, the storm water, from these headwater streams and the wetlands. And the riparian corridors were

shown, through my research and other research in the basin, to absorb nitrogen and nutrients before the water made it to the tributary system and then eventually into Lake Tahoe.

Q. Okay. Let's see, Ms. Melgin, have you taken any courses since earning your master's degree?

A. Yes, I have.

Q. In general what types of courses?

A. Well, I was in a PhD program, two PhD programs. I always do things in twos.

Q. Let's start with the first PhD program. Well, first of all, did you end up earning your PhD?

A. No, I did not.

Q. Let's talk about your first PhD program. What, if any, course -- what kind of courses did you take in that program? I am sorry, let me back up. I am getting ahead of myself here.

Where did you take courses in the first PhD program?

A. At George Mason University in Fairfax, Virginia.

Q. And when was that?

A. That was 1988 through 1990.

Q. And what types of courses did you take at

George Mason University in Fairfax, Virginia?

A. I was in the Environmental Biology and Policy PhD Program, and my whole course work was focused on wetland ecology.

Q. And by wetland ecology what do you mean by that?

A. I mean all the ecological aspects of wetlands. When we talk about ecology, it includes everything, the hydrology, the physical, the chemical, the biological, all aspects of a wetland.

Q. And, let's see, you were there for two years, and then where did you go next?

A. I transferred to the University of California-Davis.

Q. What program did you enter into at the University of California-Davis?

A. It was a PhD program in hydrological science.

Q. And generally what kinds of courses did you take in the hydrological science program at the University of California-Davis?

A. Well, basically at Davis I again focused on ecology, upper level graduate ecology courses, and some hydrologic seminars. I already had all the

hydrology courses from my master's program.

Q. You said hydrologic seminars?

A. Right.

Q. That's just --

A. Seminars on special topics for doctoral students.

Q. And generally what kind of topics would that encompass?

A. We had different topics that would range from hydrobiology. We were looking at how hydrology and biology interact, how you could have stream classification systems and interaction with those. So it just depended on the topic, hydrochemistry.

Q. And what, if any, research did you conduct as a PhD student of hydrology.

A. I only conducted research at George Mason University where I was comparing a created wetlands that the Maryland Department of Transportation created as part of a road project. Their created wetland was a mitigation project, and I was comparing, looking at the soils and the hydrology, to the natural wetlands that I was comparing it to.

Q. Why were you comparing those?

A. We were trying to get the success of

mitigation and trying to compare how long it would take this mitigated wetland, this created wetland, out of uplands, to function as a natural wetland.

Q. And first of all let me get you to define mitigation?

A. Mitigation is your compensatory mitigation. If, for example, you apply for a 404, Section 404, permit to fill in a wetland, you are required to provide mitigation to replace the function of that wetland that was lost.

Q. Okay. And by Section 404 do you mean Section 404 of the Clean Water Act?

A. I do.

Q. And, Ms. Melgin, what was the result of that research into the natural versus created wetlands?

A. Well, I didn't conclude anything. I actually helped a woman that was doing the botanical part and then I transferred to the University of California. So I gave her the data that we collected for her dissertation.

Q. Ms. Melgin, do you hold any professional certifications?

A. I do.

Q. And what is that or what are those?
A. I am a certified professional soil erosion control specialist.
Q. And what is a certified professional erosion control specialist?
A. You pass a series of tests and you basically are certified to provide input on erosion control plans or develop erosion control plans for various projects.
Q. And you said you take a series of tests. Do you have to have any kind of background before you take those tests?
A. Yes.
Q. And what is the background that is required before you can take those tests?
A. There are different backgrounds you could have, engineering, soils, hydrology, plants, as long as you had -- you had to have a combination of educational background and experience.
Q. Ms. Melgin, does that conclude your professional certifications?
A. I think so, yes. Well, other than health and safety hazardous waste training.
Q. And is that part of your -- one of your

job descriptions that you are talking about?

A. It was.

Q. It was. Okay. Ms. Melgin, let's see, have you ever published any materials?

A. Yes, I have.

Q. And generally what kinds of materials have you published?

A. Well, I would say there is three different types, scientific journals, articles that I wrote for the general public, and then -- I had three different types. But I guess the first ones would be the scientific papers that were related to my thesis work. We had quite a few papers that were published with me and other authors on nitrate transport in the Tahoe Basin area. So I had a series of papers dealing with that.

The most recent paper I had was a research paper with the U.S. Forest Service. I was on a national team for the U.S. Forest Service, and we published a two-volume set of best management practices basically for road crossings and wetland and riparian areas. That came out from the Rocky Mountain Research Lab.

I published a lot of articles for the

Lake Tahoe Basin on fertilizer use, appropriate fertilizer use for homeowners. I published -- I was the author of Best Management Practice Handbook, again for homeowners in the Tahoe Basin so they would know what to do with their property so it wouldn't degrade water quality. I wrote a couple of articles about wetlands for the Northern Virginia homeowners, their home builders association, informing them of the different wetland regulations that home builders would have to be aware of, things like that.

Q. I am going to ask you to define some terms here. BMP is best management practice. What is that generally?

A. That is how you generally would control a non-point source of pollution. It is the implementation of best management practices. It can go from temporary construction practices like a straw bale to stop sediment. That would be a BMP. To something very complex like a retaining wall. There is different levels of BMPs depending on what you are trying to do with it.

Q. And you said it is to control non-point sources. What is a non-point source of pollution?

A. A non-point source of pollution is a

diffuse source of pollution. It would be like runoff coming from a parking lot, like we talked about, or from an ag field. You can't go up and identify the exact spot where that is coming from. It may be different than pollution coming from a pipe and you can tell it is discharging right here. That's a point source. A non-point source is what you would try to control with best management practices.

Q. And, let's see, you said you would try to control it with best management practices. Ms. Melgin, if you know, is non-point source pollution controlled or regulated by law?

A. No, it is not. Not -- well, I need to -- there are some under the Storm Water Program that are now regulated by law. There are Phase II permits or end of score permits like the National Pollution Discharge Elimination System Program. So storm water BMPs would be required. The non-point source that we are talking about for agriculture or for urban lands or forestry are not. Those are usually voluntary measures.

Q. Let's see. Are any of -- your publications that you referred to, were any of those peer reviewed?

A. Yes.

Q. And which ones?

A. Oh, well, I think most of them. All the ones for my thesis that were presented or published and presented at conferences. Those you have to submit and then go through a peer review committee and then they decide if your paper is going to be published. Some of the other ones were just for public information or they were the ones that I developed for an agency.

Q. Ms. Melgin, have you earned any academic or professional awards?

A. Yes, I have.

Q. And what are those?

A. It is hard to remember them. Well, I have three bronze medals from EPA. One was from the Office of Research and Development, ORD, for helping to form regional science councils in all the regions that EPA had regional science councils, where we talked about different scientific research. One was when I was in EPA Region 9 in San Francisco, I was a co-chair of the regional science, engineering and steering committee where we developed a whole paper on science in the region and how we were going to

deal with it.

And then most recently, as Mr. Manoyan pointed out, we -- our TMDL received a bronze medal for excellence in our program. And then there was a series of science awards and regional administrative excellence awards and all that kind of thing.

Q. It sounds like they are too numerous to detail?

A. I just -- it's been 15 years.

Q. Okay. Well, let's go through your employment history, Ms. Melgin. First of all, and I am going to go back through your employment history, and I am going to limit it in this case to environmentally related fields. Is that -- do you have an understanding of that term?

A. Oh, sure.

Q. So did you work in environmentally related fields while you were in school in the University of Reno earning your bachelor's degree?

A. In Reno I did, yes.

Q. Where did you work?

A. Well, I worked at the university as one of the research fellows. That's how I conducted my research. I was an employee of the University of

Nevada-Reno, and they paid me to do my research. I also had a position in the summer of -- I was drilling large capacity water wells for a gold mining company in the middle of Nevada where I was the supervising hydrologist, hydrogeologist on the side. I will well logging, drilling cuttings.

Q. Well, what do you mean by well logging, drilling cuttings?

A. Well, when you are drilling through formations, and these were large wells, this was going to be a large gold mine, and we were testing, doing testing of where their best water supply would come from. They would drill a well and I would record the geologic material that was coming out of the well, what would be the best act aquifer for their production.

JUDGE MORAN: Which state was this?

THE WITNESS: Nevada, Levancamp (sp), Nevada. Not a lot out there.

Q. All right. And after that did you work in an environmentally related job?

A. After I graduated from my master's or actually even a couple months before that I was hired by the Tahoe Regional Planning Agency as a

hydrologist.

Q. What did you do for the Tahoe Regional Planning Agency?

A. Well, like I talked about, we had the ordinances that we came up with to protect wetland and riparian areas. We had a program called the Stream Zone Restoration Program which I identified all those areas and then we tried to restore areas that we could. I was in charge of the Interagency Monitoring Program. I ran the Land Capability Program, which basically told people if they could build or expand on their property based on their slope and soil.

Tahoe has very strict environmental regulations, and this agency was a regulatory agency. It was a bi-state agency created by the states of Nevada and California. And we had regulatory control over the Tahoe Basin for the most part.

Q. And I have a few follow-up questions. The Stream Zone Restoration Program, what did that entail?

A. It entailed us going out and identifying areas that could be, that were stream zones, or that's a very specific term to Tahoe, basically

wetland and riparian areas. I would identify those areas. And if they were impaired or degraded, I would note that and we would put that into our restoration plan that these would be great areas to restore for the improvement of water quality.

Q. And let me ask you, you said identify the areas including wetlands, I believe. Are you familiar with the term wetland delineation?

A. Yes.

Q. And is that -- have you performed wetland delineations in that context?

A. Not in that context. We had our own method in the Tahoe Basin.

Q. Have you performed wetland delineations prior or after?

A. Afterwards.

Q. And what do you mean by wetland formation?

A. Well, wetland delineation using the 1987 Army Corps of Engineers Manual.

Q. Similar to what Mr. Carlson and Mr. Lenz testified about?

A. Exactly.

Q. Moving on, after your work with the Tahoe

Regional Planning Agency, where did you work?

A. I went to the National Academy of Sciences in Washington, D.C.

Q. And what did you do for the National Academy of Sciences in Washington, D.C.?

A. I was a staff officer with the Water Science and Technology Ward of the National Research Council.

Q. What were your primary responsibilities there?

A. I ran committees of scientists that were creating, developing National Academy of Sciences publications. So all those NAS, National Academy of Science, publications on any topics. They are the result of a committee's work. I ran those committees.

Q. And just generally what kind of publications were those?

A. We had -- I ran a committee on ground water models and their use in the regulatory arena. And there was a publication and I contributed also to that. I was able to contribute to publications, opportunities in the hydrological sciences committee, and we prepared a publication on the opportunities in

the hydrological sciences.

Ground water recharge in coal mined areas, we did a whole study on both the western and the eastern coal mining field, and how that impacted ground water recharge, and we had a publication on that. So those type of publications.

Q. And again defining the term ground water recharge, what does that mean?

A. Just the amount of water seeping into the ground that was recharging underground aquifers. So what is running off is what is contributing to the ground water.

Q. And after you worked for the National Academy of Sciences, where did you work?

A. Well, I wanted to get back out in the field so I took a job with a consulting field as their primary wetland delineator.

Q. And where was that?

A. It was in western Virginia. It was a small land development company that was primarily a surveying and engineering company for land development, and they were starting an environmental division they hired me as the senior wetland scientist.

Q. And what did your work for that consulting firm entail?

A. Basically, a lot of wetland delineation, preparing permits and submitting those to the Army Corps of Engineers for various applicants.

Q. And is that the time that you used the 1987 Corps manual or whichever manual it was at that time?

A. Yes.

JUDGE MORAN: What was that? You sort of mumbled there. Is that the time of what?

Q. Is that -- at that time were you using the Corps manual to form your wetland delineation?

A. Yes.

Q. And how long did you work in the field for the consulting firm?

A. I worked for them about a year while I was going to George Mason University.

Q. And where did you work after that?

A. After that I transferred to the University of California-Davis. So I went to a consulting firm in Sacramento, California.

Q. And what did you did for the consulting firm in Sacramento, California?

A. Kind of the same thing on a little different scale. Because this was a large, worldwide environmental engineering firm and I was in the office in Sacramento. I was hired again as the senior wetland scientist and I ran a group of wildlife biologists, fishery scientists, botanists, and we performed wetland delineations all throughout California and southern Nevada.

Q. And how long did you work for that consulting firm?

A. About three years.

Q. About three years. And where did you work after that?

A. After that I went to EPA in San Francisco.

Q. In San Francisco. What region is that?

A. EPA Region 9.

Q. And how long were you at Region 9?

A. For seven years.

Q. And what were your -- you had the same total those whole seven years?

A. No.

Q. What were your different titles throughout those seven years?

A. Well, I was hired to the wetland enforcement programs, so I was, like Mr. Carlson, I was a wetland enforcement officer. And I did that for probably a little over two years. And then I transferred to the Ground Water Program and -- well, in the Wetland Enforcement Program -- let me go back to that for a second -- I did all the same type of work that Mr. Carlson described, you know, investigations. I did a lot of wetland delineations. And the Army Corps of Engineers actually had me doing delineations for them. For probably the first six months of the time that I was with EPA, I was basically working for the Army Corps just out in the field conducting delineations. And then just did enforcement and permit reviews and things like that.

But then I went to the ground water section.

Q. And what did you do for the ground water section?

A. I ran a couple of their programs, one called the Sole Source Aquifer Program, just different ground water -- ground water is another sort of non-regulatory program. And we had different programs to promote ground water and the use of

ground water and trying to protect ground water. Like Mr. Manoyan talked about the Well-head Protection Program, that was in the section that I was in.

Q. And, let's see, you are not talking about Mr. Manoyan was in the section you were in?

A. No, no, no. That program, the Well-head Protection Program, was kind of the same work that I did for awhile.

Q. And we are still in Region 9?

A. Right.

Q. And any other titles or positions in Region 9?

A. Yes, one more.

Q. And what was that?

A. I became a regional hydrologist.

Q. And what did your work -- what were your primary responsibilities as a regional hydrologist at Region 9?

A. I was basically providing technical assistance to all the regional programs, for the wetlands program again which I always, even when I moved to a different section, was still providing technical assistance for hydrology soils for them,

through the Drinking Water and Underground Injection Control Program. I spent a lot of time on the Yucca Mountain Nuclear Waste Repository where I assisted with the development of the ground water standard for that.

So it is just a wide variety of anywhere they needed a hydrological person, I would try to provide that.

Q. And after your work at EPA Region 9 where did you work?

A. I moved to EPA Region 5 in Chicago.

Q. And how long were you or have you been at EPA Region 5 in Chicago?

A. Seven years.

Q. And is that continuing to the present?

A. Yes.

JUDGE MORAN: You are about due for another change.

THE WITNESS: Yeah, I know. It used to be three years and now it is --

JUDGE MORAN: Montana, Nevada, California, Virginia. You have got to head down south next.

THE WITNESS: I don't think I could get my husband to move any more.

BY MS. PELLEGRIN:

Q. On that note, where are you from?

A. I am from Michigan originally.

Q. How far away from Chicago are you?

A. Probably an hour, right on the end of Lake Michigan.

Q. How many titles or positions have you had at EPA Region 5 in Chicago?

A. Two.

Q. Two, okay, that's a little simpler this time. Let's talk about the first one. What was that?

A. Hydrologist.

Q. And how long were you a hydrologist for Region 5?

A. Probably a little over two years. I was in the Total Maximum Daily Load Program.

Q. And as a hydrologist in the Total Maximum Daily Load Program -- well, first of all, Mr. Manoyan talked a little bit about that, but I would like you to tell us what the Total Maximum Daily Load Program is.

A. The program is required under Section 303(d) of the Clean Water Act. It requires the State

to develop, not U.S. EPA but the State, to develop TMDL based on a list that they have developed of waters in the state that are considered to be impaired, meaning they are not meeting water quality standards for that state.

When a water has been decided as being impaired, they develop the TMDL report, and a TMDL is basically a calculation of the maximum allowable load that a water body can receive and still meet water quality standards.

Q. Okay. Generally, first of all, what is a water quality standard?

A. A water quality standard is something a state sets. It is a criteria that would protect their designated uses, and I always think of the designated uses as swimmable, fishable, drinkable. So then they set water quality standards to protect those designated uses. And water quality standards can be numerical, like one milligram per liter of something, you can't exceed that. Or it can be narrative; no objectionable algae blooms will occur. That's an example of a narrative standard.

Q. And an impaired water, what is an impaired water?

A. An impaired water would be that it wasn't meeting those standards. It is above one milligram per liter. It has got excessive algae blooms.

Q. And I believe you said the State determines whether a water is impaired?

A. That's correct.

Q. And then what, if anything, does the State do after it determines whether or not a water was impaired?

A. They prepare a list. It is called several different things. It has evolved over the years. But it can be called the TMDL list, it can be called the 303(d) list or it can be called the Integrated Report. So it just depends on the state and how they are preparing that. But basically it is a list that the State submits to EPA every two years that lists the impaired waters in the state that they know of using all readily available data that is monitored.

Q. And I believe you said the State submitted to U.S. EPA. How is the U.S. EPA and the State involved in this program?

A. Well, they submit; we review and approve it.

Q. And I believe you used the term "maximum allowable load"?

A. Uh-huh.

Q. Could you, please, define that generally?

A. Right. The TMDL is not saying that you can't discharge any pollutant load into the stream. It is saying that if you are going to discharge, this is the allowable load that you can discharge and still meet water quality standards. So they are trying to set for the water body how much pollutant it can handle and calculate that as the total maximum daily load.

JUDGE MORAN: Well, since you asked that, I am just curious. That total maximum daily load, does that apply looking at the whole water body or each individual who wants to contribute to the pollution, so to speak?

THE WITNESS: Well, if you are talking about an individual waste water treatment plant --

JUDGE MORAN: Or just what if I am a developer, does that get involved, too?

THE WITNESS: It would as far as the Storm Water Program would be. If you have a construction site, you have to have -- there is storm water

requirements now for that. That would be considered in the point source part of the TMDL calculation.

JUDGE MORAN: So primarily it deals with waste water treatment plants?

THE WITNESS: Right.

JUDGE MORAN: And what they are putting into the water system?

THE WITNESS: Right. Because if you as a landowner would be washing your car or whatever, that would be considered a non-point source of pollution. That's also considered but in a different part than the point source.

BY MS. PELLEGRIN:

Q. And on that note, Ms. Melgin, I believe you talked earlier about point source pollution and non-point source pollution. How does the TMDL Program relate to, let's say first, point source pollution?

A. The point source part of the TMDL -- it is a calculation. That would be the point sources plus the non-point sources plus this margin of safety for uncertainty of data and things like that. So there is always a margin of safety that is attached onto it. So basically it is a combination of the

point and non-point sources.

Q. Okay. Let's see.

JUDGE MORAN: Just so you can plan this, we are coming up on 12:30 in about five minutes. So I assume you are close to asking her to be qualified as an expert for some purposes; right?

MS. PELLEGRIN: Yes, I am not far way from that.

JUDGE MORAN: So when you get to that point, before you begin the substantive testimony, that's when we will take a lunch break.

BY MS. PELLEGRIN:

Q. Okay. Ms. Melgin, I forgot where we are. We are on your first title at Region 5.

A. Correct.

Q. All right. Let's move onto your second title at U.S. EPA Region 5. And that continues to the present time; is that correct?

A. That's correct.

Q. What is that title?

A. I am the deputy branch chief of the Water Sheds and Wetlands Branch.

Q. What does the Water Sheds and Wetlands Branch entail?

A. The Water Sheds and Wetlands Branch is part of the Water Division at EPA Region 5. The other divisions are like Super Pond and Air. The Water Division, we are separated into two branches. Our branch has three programs in it and those programs are the Non-point Source Program, the TMDL Program and the Wetlands Program.

JUDGE MORAN: And what's your title again? You are deputy branch chief of what?

THE WITNESS: Of the Water Sheds and Wetlands Branch.

BY MS. PELLEGRIN:

Q. I am sorry, can you please repeat the three programs? You have Non-point Source, you have TMDL, and what's the third?

A. Wetlands.

Q. And what are your primary responsibilities as the deputy branch chief of the Water Sheds and Wetlands Branch?

A. I separate it into two sort of categories for me. I have the management supervisory duties and then I have technical responsibilities.

Q. Let's take the first one, your management supervisory duties. What do those entail?

A. I manage about 17 people, I think it is, mostly in the TMDL and Non-point Source Programs. I have a couple of the Wetlands people, but not the Wetland Enforcement Group that Mr. Carlson is in. He is supervised directly by the branch chief.

As a manager I deal with all sorts of administrative duties that fall under basic management, but I think another thing that we do is we set the goals and objectives for our branch and the strategy, the branch strategy, and how we are going to conduct our work.

Q. What are the current goals and strategies for this branch?

A. Well, our main goal is to restore impaired water sheds through water quality improvement, and protection and restoration of wetlands.

Q. And how does, going back to the goal which is to restore impaired water sheds through water quality improvement, how does water quality improvement help in terms of your goals of restoring water sheds?

A. How does -- I didn't hear you, Chris.

Q. How does the -- under the goal of

restoring impaired water sheds, how does water quality fit into that?

A. Well, you know, water shed is this all encompassing term that we are seeing depending on the scale. We try to integrate all of our programs and the tools of those programs into a water shed context. So we are looking at using the TMDL Program and all of its implementation that comes after a TMDL report is submitted. Our Section 319 money, which is our non-point source money, and $43 million comes to us and is doled out to the states for non-point source control programs which are basically BMPs. That's a lot of money in our region. It's 243 million nationally.

And the other is the TMDL Program. When I said that, the Wetlands Program, where we are looking at restoration, we are looking at mitigation, we are looking at commenting on different permit applications to get more mitigation or to get better projects with less impact.

Q. Okay. And I believe you mentioned 319, $43 million for non-point source. What does that involve?

A. Well, that's a grant program. And like I

said, we get that money and all the EPA regions get it and that goes to the states. And the states have a non-point source work plan that comes through the region and we approve it, and then entities like water shed groups and other types of organizations will apply to the states for that money if they have a water shed project that they want to stabilize the banks, all toward the improvement of water quality.

Q. And I think you mentioned earlier restoring wetlands. How is restoring wetlands as one of your goals for restoring and improving water sheds, how does that relate?

A. Well, we have -- in a couple of ways. I mean, wetlands improve water quality. Mr. Carlson talked about it. There is a function there that absorbs water, you know, it transforms nutrients. It's the big three that he talked about. So because of those functions, a lot of the TMDL limitation reports that the states prepare have wetland restoration as a way to reach their pollutant reduction strategies.

And a lot of times they are using 319 money to create those, to restore those wetlands. So all our programs are kind of integrated in various

fashions.

Q. And 319 money, 319 you mean a section of the Clean Water Act?

A. Right. I consider that the non-point source money. That's the 319 of the Clean Water Act.

Q. And you mentioned the term "TMDL implementation report"?

A. Right.

Q. What is that and how does that fit in with what we talked about earlier and the state TMDL?

A. Well, the important part of the TMDL is the part that is submitted to the EPA for approval. Although that is important because it sets their goal out and their target, but the State has to implement that report on the ground for it to have any water quality benefits. So our states have been very good at submitting implementation reports, even though they are not required to EPA, and then implementing those. So they identified a problem through the TMDL, and the limitation plan is how they are going to fix that problem.

Q. Okay. And implementation, the implementation on the ground as you said, does that apply to both non-point and point source pollution?

A. Yeah, I mean, most of the time the point source pollution, if there is a problem, it will be taken care of in the permit, being the national pollutant, you know, the NPDS permit. That's a different program from ours, but they have to reflect what was calculated in the TMDL. So that will be taken care of. That is a regulatory aspect.

If there is a point source discharge like a water treatment plant, they will have to have the TMDL reflected in their new permit when their permits are up again, because they expire and then they renew their permits. But the non-point source definitely.

Q. Okay. And how does the TMDL implementation report relate to a non-point source pollution generally?

A. The State will come up with a series of best management practices or different strategies to reduce the non-point source pollution. And oftentimes when this really works well is when they have water shed groups and other stakeholders really committed to restoring the water shed or the water bodies that the TMDL is for.

Q. And I believe you earlier testified that, except in certain circumstances, non-point source

pollution isn't regulated. There is no law you can't wash your car, etcetera. How do those implementation strategies then work?

A. Well, that's why you have to have the stakeholders involved. If they see a real benefit in having their part of the stream or river or whatever of the TMDL, the lake, restored, so they want to have these, you know, measures in place to do that.

We have had a couple like on the Cuyahoga River where the Cuyahoga River is famous because that was the one that caught on fire in the '60s. Well, we have had three TMDL reports and implementation by the state of Ohio, and they are finding fish and they have taken down parts of dams and they have basically restored part of that river. And the TMDL was the catalyst for that.

Q. Let's see. I believe now we are on, you mentioned you had management roles and that you had technical roles at Region 5 as deputy branch manager?

A. Right.

Q. What does your technical role entail?

A. It would be like I would provide hydrologic technical assistance. I am the criminal contact for wetlands criminal cases. I still perform

wetland delineations. I am assisting -- I have assisted on a couple of criminal 402 cases, hydrologic technical assistance. So some NEPA projects, some environmental impact statements that have come in, I will provide technical assistance to our group, our NEPA group, to that.

Q. And just to have the record clear, what does NEPA mean?

A. National Environmental Protection Act, is what it is, I think. I am not sure.

Q. And let's see, 402 I think you mentioned. What is 402?

A. 402 is a permit program. The MPP, yes.

Q. And what is your role -- you mentioned criminal contact. What is your role as a criminal contact entail?

A. Well, if there was a case, a wetlands case, that goes criminal, meaning that there was a knowing and willing violation of the Clean Water Act and they determine that it has the level to go criminal, I will provide assistance to our criminal RCID, criminal investigation division, or the attorneys that work with them.

Q. Ms. Melgin, have you ever been asked to

give an expert opinion, besides in this case, in any enforcement case?

A. Yes, I have.

Q. And have you provided an expert opinion in other enforcement cases?

A. Yes, I have.

Q. And were you added to the list of -- sorry. Were you added to the list as an expert witness in a case that was proceeding to trial and hearing in any cases?

A. Yes.

Q. And have you ever testified as an expert?

A. No, I never made it. It was settled.

Q. The case or cases were settled?

A. Uh-huh.

Q. Okay. At this time --

JUDGE MORAN: Aren't you going to ask her, you said was she qualified as an expert witness for what purpose. Ask her as a witness as what?

MS. PELLEGRIN: I am sorry. I am not sure if she can answer that, but if you can answer that --

JUDGE MORAN: She would have been listed as an expert witness and then would have said for what purposes.

BY MS. PELLEGRIN:

Q. For what purposes were you listed as an expert witness?

A. For hydrology or jurisdictional determination for the case.

Q. And by jurisdictional determination, what do you mean?

A. That hydrologic connection.

Q. Would that have been a wetlands case?

A. Well, no, this was a 402 case and it was jurisdiction is termination of a water in the U.S.

Q. And 402 cases is what?

A. The permit program, the Point Source Discharge Program.

JUDGE MORAN: So do I understand your testimony there was just one occasion when you were listed as an expert witness for trial?

THE WITNESS: Yeah. No, I have two more coming up.

JUDGE MORAN: But as of now one?

THE WITNESS: Yes.

MS. PELLEGRIN: Besides this case.

THE WITNESS: Right.

BY MS. PELLEGRIN:

Q. Let me ask you to turn your attention to Complainant's Exhibit 11, Bates number 176 through 179.

(Whereupon Complainant's Exhibit 11, pages 176 to 179, was presented for purposes of identification as of this date.)

Ms. Melgin, 11?

A. Oh, I am there.

Q. And looking at Complainant's Exhibit 11, 176 through 179, do you recognize this document?

A. I do.

Q. And what is this document?

A. It is my resume'.

Q. And is this an original or a copy of your resume', Ms. Melgin?

A. It is a copy.

Q. And does this copy truly, accurately and completely represent your resume'?

A. Yeah, I think it is 22 years of experience now, but you can leave that off.

Q. Okay. Where are you referring to?

A. At the very top.

Q. So the 20 years, so you would update that

to reflect 22 years. Okay.

And besides that does it truly, accurately and completely represent your educational and work experience?

A. Yes, it does.

MS. PELLEGRIN: Your Honor, I don't believe this has been admitted, so I would like to move to admit Complainant's Exhibit 11, Bates stamp 176 to 179.

MR. NORTHRUP: No objection.

JUDGE MORAN: Complainant's Exhibit 11, pages CX 176 through 179, is admitted.

(Whereupon Complainant's Exhibit 11, pages CX 176-179, was admitted into evidence.)

MS. PELLEGRIN: And, Your Honor, at this time I would like to move to qualify Ms. Melgin as an expert in hydrology, hydrogeology and wetlands ecology.

MR. NORTHRUP: No objection.

JUDGE MORAN: Okay. There being no objection but apart from that, I so designate Ms. Melgin as an expert for the purpose identified by counsel for EPA.

So now you are ready to -- you will now

resume with the substantive testimony?

MS. PELLEGRIN: Correct, Your Honor.

JUDGE MORAN: Let me ask two questions quickly just before we break.

EXAMINATION

BY JUDGE MORAN:

Q. Define "riparian" for me. I know we had it defined in the first week. What is your definition of riparian?

A. It would be a wooded corridor along streams.

Q. That's it? Okay.

A. It is a vegetative corridor.

Q. Riparian rights from law school seemed broader than that.

A. Stream side vegetation generally is the --

Q. And then I am just curious since you mentioned it, do you have a follow-up about Lake Tahoe? Has it continued to decline or is it getting better; do you know?

A. Well, yeah, I do follow up. I have some friends that work there. And I think the Clinton administration designated like $200 million for Lake

Tahoe, so I think it is stable. There is still a lot of research, and there is a lot of development.

Q. So the water quality has not declined; it has either stabilized or gotten better?

A. I don't think it has gotten better. I think it has stayed pretty much the same.

JUDGE MORAN: Okay. It is 12:38 so we will resume at 1:40.

(Whereupon the hearing was in a recess until 1:40 p.m.)

AFTERNOON SESSION

JUDGE MORAN: We are on the record.

DIRECT EXAMINATION (Continued)

BY MS. PELLEGRIN:

Q. Good afternoon, Ms. Melgin. Ms. Melgin, were you asked to give an expert opinion in this case?

A. I was.

Q. And what were you asked to give an expert opinion regarding generally?

A. Generally I was asked to look at how the impacts to the forested wetlands in Martin Branch would contribute to the downstream water quality to impaired Lake Centralia, especially with regard to the intent of the Clean Water Act which is maintaining and restoring the biological, physical and chemical integrity of the nation's waters.

Q. And, Ms. Melgin, what is your understanding of why your expert opinion is important to this case?

A. Well, we are trying to determine the impact of a potential project on the water quality of receiving waters and a downstream water that has been listed by the State of Illinois as impaired.

Q. And, Ms. Melgin, are you familiar if I use the term "Rapanos case," "Rapanos decision"? Are you familiar with that term generally?

A. Yes.

Q. And are you familiar with the concept of significant nexus generally?

A. Yes.

Q. And I am not going to ask you for any legal opinion, but is it your understanding of your expert testimony here today to help us come to some understanding of whether there is a significant nexus in this case?

A. Yes.

Q. Now, Ms. Melgin, generally what types of information did you use to formulate your opinion in this case?

A. I used quite a bit of different types of information. I mean, the first would be information that I received from Brad Carlson which would be his inspection report, maps and air photos. I read scientific articles and journals and did some research on my own just to look some things up. So books, textbooks and scientific articles. I had consulted with a few people. But going back to the

documents, I forgot, the TMDL and the integrated list and the implementation plan and associated documents concerning impaired waters, and the TMDL, and then I consulted with several people.

Q. And, Ms. Melgin, in formulating your opinion you are going to give in your testimony at this hearing did you also rely on prior testimony of other people that have testified throughout this proceeding?

A. Yes, I did that and I also personally observed the area from -- I wasn't ever on the exact area because we weren't allowed access. But I was on the adjacent property three times.

Q. Three. Okay, let me go through some of the documents you mentioned. Let's see. Why did you -- you mentioned the TMDL reports and the Integrated Report. Why did you review those documents in preparation for your testimony here today?

A. Well, there is a TMDL report. It is called a Stage I or a Phase I TMDL report developed by the Illinois Environmental Protection Agency called the Crooked Creek Water Shed TMDL. That includes Lake Centralia and its water shed.

Q. And you mentioned you consulted with

other people. Who did you consult with?

A. I basically talked to the two Hesers, William and Daniel. I talked with -- I called the woman at the city clerk's office in Centralia to find out about boat licenses for Lake Centralia. I was interested to see who was using the lake since I saw in a mobile guide that Lake Centralia was designated as a destination for boating and fishing. It also was a tertiary drinking water supply source, but it was being advertised as a swimming and boating and fishing sort of destination.

I called Linda, her name is Linda, she is at the city clerk's office in Centralia and she said that --

MR. SMALL: Objection to what she said. That's hearsay.

MS. PELLEGRIN: It isn't, Your Honor.

JUDGE MORAN: This is background information. Hearsay is admissible in these proceedings. And I often note that even if this were a federal district court, which it is not, you know, there are some 22 exceptions to the hearsay rule. So the exception in some respects are all overruled.

So I am going to -- I have been listening

closely to what she has to say, but she can relate what this person, the conversation -- this is a person she called?

MS. PELLEGRIN: Yes.

JUDGE MORAN: If there are other objections, I will listen to them. So proceed. Wait a minute. Before you -- TMDL stands for what?

THE WITNESS: Total maximum daily load.

A. I simply called her to find out if people from other states used Lake Centralia, and she said, yes, they do, especially from Missouri. Many people from Missouri have applied for boat licenses to put their boats on Lake Centralia, and Kentucky.

BY MS. PELLEGRIN:

Q. And you mentioned a mobile guide. What is a mobile guide?

JUDGE MORAN: It is like an Exxon guide. It's just a guide.

THE WITNESS: Yes, it's a guide.

JUDGE MORAN: You are thinking of like you were earlier, when you were thinking about mines. But go ahead, I am sorry.

A. It is like it lists destinations, like tourist attractions, sites of interest, historical

sites, hotels, it will rate them. So in this area Lake Centralia was listed, and the interesting part of that was that you could boat or fish or swim in Lake Centralia.

Q. You mentioned you conducted some site visits. You mentioned you visited the area adjacent to the site on a couple of occasions. Was that three occasions, you said?

A. Yes.

Q. And when was that?

A. Well, the first time was March 8 and 9. I was on the site both those days.

JUDGE MORAN: What year?

A. Of this year, 2007. Then I was at the site right before the previous hearing times. That was March 25, 2007. And then the time before this hearing which was March 29, 2007.

Q. And turning to your first time that you visited the areas adjacent to the site, March 8 and 9, where did you go, just generally speaking?

A. We went upstream of the site. We were adjacent to the site on the Bill Heser property and we were downstream of the site.

Q. And by we who do you mean?

A. Greg Carlson, Simon Manoyan -- I am even pronouncing his name wrong -- yourself, Tom Martin, Ward Lenz was out there the second day, Burke Davies was out there the second day. I think that's it.

Q. And were you present during the testimony of Greg Carlson when he described and denoted on Exhibit A where he went and put his initials next to different points of interest on Exhibit A?

A. Yes, I was.

Q. And were you present with Mr. Carlson the whole time that he walked that area?

A. I was.

Q. Let me ask you, where did you go generally during your second time, March 25, 2007?

A. We went to some of the same spots that we went on the first time, but we didn't walk sections of Martin Branch this time. We went to the Old Salem Road crossing to observe flow there. We went to the crossing at Mt. Moriah to see if there was flow there. We went upstream to Highway 37 and observed flow there. And then we drove down and around Lake Centralia.

Q. And when you say "we," who was present with you during that second visit?

A. Mr. Manoyan and yourself.

Q. And turning to your third visit, April 29, 2007, where did you go then?

A. That time we stopped at Old Salem Road and we talked up to the Bill Heser property up to the point where we could observe the L and a little upstream of that, walked down and we had a conversation with an adjacent property owner.

MS. PELLEGRIN: Your Honor, if we can go off the record for a second. I will set up the easel.

JUDGE MORAN: Sure. Go off the record.

(Whereupon there was then had an off-the-record discussion.)

JUDGE MORAN: On the record then.

MS. PELLEGRIN: Okay, permission for Ms. Melgin to approach Exhibit A?

JUDGE MORAN: Yes.

BY MS. PELLEGRIN:

Q. Ms. Melgin, can you take a look at all the markings, GC1 through I believe it may be 8? By markings I mean the blue areas where Greg Carlson denoted in his testimony on this map?

A. Right.

Q. And, Ms. Melgin, would you agree that

those are areas that you were with Mr. Carlson on your first visit, March 8 and 9, 2007?

A. I do agree with that.

Q. And, Ms. Melgin, what I would like for you to do is tell me where specifically, looking at this exhibit, you went on March 25, 2007. And let's designate those areas with a W1 through whatever it turns out to be.

A. Maybe in purple.

Q. Okay.

A. I will use a purple pen to designate where I visited on March 25, 2007.

JUDGE MORAN: Which was your second visit?

THE WITNESS: Which was my second site visit.

A. This is the Salem Road crossing. So WM1 I am marking with an arrow pointed to the Salem Road crossing. I am marking with the purple pen with an arrow and a line, marking the Mt. Moriah crossing with Martin Branch as WM2. I am marking with the purple pen and an arrow toward the crossing of Highway 37 with the upper reach of Martin Branch is WM3. And then on Lake Centralia we drove pretty much all around it, but I think we stopped about in here. I will mark this as WM4. It is on the western part

of Lake Centralia, right under the Section 5 marking on the topo map, and I marked that WM4. But we pretty much covered this entire -- just drove around so it is hard to locate an exact spot.

Q. And, Ms. Melgin, I don't know if you will have any new markings to place on this map, but now I would like for you to talk about where you went during your third visit which was March 29, 2007.

JUDGE MORAN: April.

THE WITNESS: April.

JUDGE MORAN: I think that's what she said.

MS. PELLEGRIN: Yes, thank you, Your Honor.

A. Which was just Sunday. We again stopped right here at Old Salem Road.

Q. If it is the same place, Ms. Melgin --

A. You don't want me to mark it?

Q. Just refer to -- yeah.

A. Okay. So we started here and we walked up this parallel to the stream on Bill Heser's property, probably about up to here. We observed flow in the channel and what we could see of the L-shaped channel and then walked back down.

Q. Now, Ms. Melgin, what I am going to ask you to do is, using the GC designations and/or using

your own designations, GC1 or WM 1 through 5, I would like for you to describe what you observed on your visits. And I think we can go ahead and start with GC1.

A. Okay. This was from the first site visit, Bill Heser's CPP project, conservation preservation project in the area. I observed one of your typical agricultural conservation practices that I have seen a lot across the country. My understanding from Burke Davies is that this project and the whole purpose of the Conservation 2000 project was to eliminate gullying and rill erosion. That was the problem at this area, and it looks like they laid back slopes and planted a fairly heavy cover of grass in the channel.

There was water in the channel. It was very heavily vegetated. It was difficult to tell if it was flowing, but it was flowing above the channel and below the channel. I assume the water was moving its way through the heavy vegetation in the channel.

Q. And is the next designation GC2?

A. GC2 would be this stretch of the stream that Mr. Carlson referred to as being previously channelized. And from my observation and from his

observation, the age of the trees and the condition of the channel, it probably was channelized decades ago. There is mature vegetation on it.

And what happens in these types of areas when you channelize and you leave it alone after that pretty much, it starts to reestablish it meander pattern which is the natural meandering pattern of the stream pathway, and it is starting to do that here.

I observed, you know, typical areas of deposition and erosion. So there was definitely erosion in the channel up here, and there was some tree roots and there was some sediment in the channel, but it is trying to -- the stream is trying to establish an he equilibrium and trying to come back from past degradation.

Q. And, Ms. Melgin, at this hearing I believe Mr. Carlson referred to it as not a pristine stream. First of all, let me ask you if you have an understanding of the definition of a pristine stream.

A. Well, to me that's a stream that's been pretty much untouched by man, which is very difficult to find any more, certainly in Illinois. Most of these streams have been impacted by agriculture in

some way. Some are hanging on with different, you know, riparian corridors that are too steep to farm. But it is difficult to find a pristine stream that hasn't been impacted in some way.

Q. And would you agree with Mr. Carlson's description of this area as not a pristine stream?

A. Well, it is a typical stream in an agricultural area.

Q. And you refer to it as channelized some decades ago. If you know, how common was channelizing agricultural area streams, if you know?

A. It was the normal practice. The government paid for that type of work to be done. It was a way to channelize streams because they wanted to get the water off the ag fields as quickly as possible. So basically they created a drain.

Q. And in this area can you describe -- you mentioned a riparian corridor. Can you describe what riparian corridor was present in this area?

A. Yes, that's a good point that I forgot to mention. In the Bill Heser part up here in the Conservation 2000, there were no trees. That was open field. That was the whole reason for the gully erosion; open fields, no shading on the channel. As

you walk down, you pop into this wooded area and all of a sudden you are in a fairly good, thick riparian canopy through the length of that channel. It is a nice shaded channel, a lot of trees.

Q. And making your way down to GC4 now?

A. GD3 is -- yes, GC3 is the site, the alleged violation site.

Q. And what did you observe at that location?

A. Well, I observed a constructed channel with no trees, but other types of vegetation. There was scrap and maybe some -- I am not a botanist but I think Mr. Carlson said they might be Russian Olives or something like that, some woody vegetation but not quite trees. So it was definitely an open field, constructed channel, very L-shaped, linear straight channel through the one side and concrete riprap at the scour marks on the corner.

Q. What is concrete riprap?

A. Well, where the -- the way they constructed the channel -- show it on a different exhibit. But they are funneling water straight in toward their field. And if they wouldn't have put riprap right there, which is just chunks of rock --

it could be any, I have seen car bodies used as riprap, but something to break up the velocity -- it would have continued to eat up their field since it was running directly in the field. So then it took a right angle turn.

Q. And you are describing the riprap location, is it correct, that that would be -- we would be talking about it as the top of the north-south leg of the L?

A. Right.

Q. Is that the location you are talking about?

A. Right.

Q. And let me ask you about your observations coming down the south leg of the L, and let me ask you about your observations along the east-west leg of the L. What did you observe there?

A. Again it was, you know, a constructed channel with some vegetation, grass, and some small shrubs, maybe like the Russian Olives, open field, very linear, no meanders.

Also at this time it looks like -- I mean, this part was very flat. And the stream is trying to re-grade itself. They lowered the gradient

to make it flat, so the channel is down cutting into itself. So we have a wider bottom, but within that bottom, as Mr. Carlson testified, is a smaller subchannel. So the stream is -- it is trying to establish a natural slope. So it is eating away at the bottom, eating away at the bottom, eating away at the bottom. And that's so you have a larger channel with a smaller channel at the bottom.

Q. And did you observe the flow in the subject?

A. Yes.

Q. And I don't know if you mentioned this, but you mentioned flow earlier?

A. Right.

Q. Throughout the GC1 through 3 you observed flow?

A. Right, yes. There was flow through here and we saw, as Mr. Carlson testified to, permanent pools with a series where pools were outletting and you would have a little ripple series and then it would go to the next pool, and that's where we observed the fish that Mr. Carlson talked about in those larger pools.

And flow through the channel -- now, are

we just talking about the first site visit or do you want me to talk about the other site visits also?

Q. Yes, just generally I want you to describe your observations inclusive of your site visits.

A. Well, what I observed here this time, from seeing it from Bill Heser's property, is cattail establishment in the channel. And you normally don't have cattails in stream channel bottoms. That really denotes a very slow moving system at low flow. That doesn't mean at high flow they won't be scoured out of there. But right now it looks more like an emergent wetland than an actual stream channel.

Q. Let me ask you, what do you mean by -- is there a distinction between low flow and how this channel functions with low flow versus how this channel functions at high flow?

A. Yes, there would be.

Q. And what is that distinction?

A. Well, in low flow, we have photos of these two things, that, you know, the water is moving very slowly, maybe not moving, maybe it is sitting there, the gradient is so flat, allowing cattails to establish. So at low flow the water might even be

backing the stream up north of there because the stream is coming out and it kind of hits a very low gradient. So it has a higher, not that much of a higher grade, this is pretty flat land, but at low flow there is not a lot of water moving through.

However, at high flow, because it is straight and it is a uniform channel, it will have the capacity to carry a lot more flow faster than the actual stream channel.

Q. And I am going to ask you some more questions about that a little later and we will look at the photos, but let's stick to Exhibit A and continue on your observations.

At the east-west leg of the L were you able to observe any features of the site of the alleged violations?

A. Yes, pretty much the same things that I just described.

Q. What is the next designation or do you have GC4?

A. Right.

Q. What were you able to observe on GC4?

A. On GC4 we are back into the natural stream channel so again we are back into more of a

meandering pattern of scouring out the sides and deposition. So the stream channel is looking -- it is a normal pattern that streams flow. Riparian corridor, trees overhanging.

What we didn't see here are -- and we might have seen it when we were near the site of the alleged violation -- we saw drainage features in the field across from where we were standing.

Q. And can you describe what you mean by drainage features?

A. Well, drainage features going out into the field and draining water off the field.

Q. And by the field you mean the site of the alleged violations?

A. Yes.

Q. And if you remember, would those drainage features, the ones that Mr. Carlson denoted on a separate exhibit -- we will get to that -- but just right now, is that the same drainage features Mr. Carlson referred to?

A. Yes, yes.

Q. What were your observations then continuing downstream at GC5?

A. Before I get to GC5, I want to go back

and just touch on Greg Carlson covered --

MR. SMALL: I am going to object.

JUDGE MORAN: Absolutely. You can't do that. You were doing so well. I thought you were Mr. Carlson there for a minute. You have to go by questions.

THE WITNESS: Okay, that's no problem. I will try not to be my own lawyer. Okay, GC5.

BY MS. PELLEGRIN:

Q. GC5.

A. GC5 is the Old Salem Road down to this section. But like Greg said, we didn't walk this section because we didn't have access. But we did observe flow at Old Salem Road. Again it looked -- we had the debris racks and evidence of high flow throughout, you know, like Mr. Carlson is testifying, is that the debris racks in the trees and above the channel buffer head, so we know that flow was fairly high. I observed fish in the channel at two different times right below Old Salem Road in a permanent pool.

Q. By fish do you mean -- generally what size fish?

A. They were from minnows to four to

five-inch fish. Especially there seemed to be a lot more of them in our second site visit on March 25 where I observed most of the fish, the most numerous fish.

I also talked with the property owner here who owns this property adjacent to the downstream part after Old Salem Road.

Q. What did you discuss with the property owner?

A. Well, she was talking about flooding on her property and what she has done to her property to improve its quality. And Mr. Carlson had testified as to the road, the culvert replacement and the road improvement that was done at that site. And her name was Jane Palissa (sp) and she said it was due to her badgering of the road commissioner that that road crossing was fixed, because for two days the road wasn't passable due to high water. She has worked with Tony Antonacci on her property to, she called it, a Force Management Program. I guess they did some selective cuttings to try to increase or improve the habitat for turkeys. So she has worked with the NRCS also on her property.

She said that water flows in the channel

most of the year except in extreme drought periods. She said there is always usually pools on her property.

Q. And continuing further downstream to GC6 we are on now?

A. GC7 -- or GC5, sorry. That's GC5. GC4 was right here and GC5 is -- unless I have messed that up, but it is from Mt. Moriah to the interstate.

Q. What did you observe during that stretch?

A. We walked the entire stretch and it was a wider channel, what you would expect as you move downstream. A lot of sediment in the channel. A lot of evidence of bank erosion. Trees, a lot of woody debris in the channel, and a lot of organic debris that Mr. Carlson was talking about, wood, leaves. We saw some agricultural material like it could be straw or maybe that was used for erosion control somewhere. But we saw a lot of debris in the channel that had moved its way down. High banks, fairly steep. We had to walk up. We were talking in the channel and there was times we couldn't get over the material so we had to walk up to the bank and back down. It was very, very meandering. It took us a long time. It was very sinuous around there. We made it to the

highway culvert. That's where we saw the mink; it was right there. And two 7 by 7 foot box concrete culverts, water flowing through. So we had seen water as we moved our way down in every part of the channel.

Q. Could you describe the riparian cover in that particular area?

A. Very wide riparian corridor. It is getting steeper so you can't farm right up to it. It starts steeping up.

Q. And continuing downstream can you describe what you found at the next observation point?

A. Well, from Mt. Moriah we tried to make our way through different parts to Martin Branch, but some of these roads aren't there. So we ran into a property owner up here and he provided us access. We drove up basically to the end of this field and he allowed us access to walk down to the flood plain area of where Martin Branch enters Lake Centralia.

Q. And can you describe what you observed at that location?

A. Graded channel, more than one channel. You had a main channel and then you had overflow

channels, probably during flood events. Very flat, your typical wooded flood plains area, very deep sediment. Mr. Carlson stuck his arm all the way down in there and it was very mucky, which you would expect from all the sediment coming out of Martin Branch and depositing before it goes into Lake Centralia. It is slowing down and it is a lot flatter down there.

We observed, he said, the Phragmites area, just a very nice area in there.

Q. And can you describe the riparian cover in that area?

A. It is totally forested. You can see just by looking at this map, the gradients -- or estimate the amount of forest. It is very steep in there. We walked, I would say, a 25 percent slope down into the area. So very steep. I walked down at the bottom where it is very flat. So a very nice area, very wooded, very shady.

Q. And what is the next observation point?

A. We drove back down these roads and there is a gap, an oil well right here. And we walked through the fields to the top of the slope and observed Martin Branch there. And we could see it

was flowing so we noted it flowed all the way down into Lake Centralia. There was water in the channel all the way.

So from what we could see, we didn't walk down into this. Again, we didn't have access to the property. We didn't know who owned the property. So from what we could see, the channel there was again wider, had erosion, trees. Pretty nice channel for this type of system, but definitely impacted.

Q. And what was your next observation point?

A. We drove up to the intersection up here to Highway 37 at the very top of the property, and I observed flow. We observed flow coming down the -- from both ways, down the road in ditches, entering the property here. Water was flowing from this side of 37 through a culvert down at the sidewalk. We also saw a crawfish, I think on the second one, swimming in the channel. He was in there; I don't know if they swim. And flowing, this one has a tree limb here now, I think, and then dropping down.

Q. And does that conclude that first -- the observations of the first visit?

A. Yeah, kind of all of them, I guess. I guess I didn't talk about the second ones very much.

But the second one just very quickly and we went to observe to see if there was flow in all those areas that I marked as WM1, 2 and 3, and there was flow there.

Q. So there was flow at all three times in all the locations that you just described so far?

A. That's correct.

Q. And now I think you marked some WM areas that were not -- that did not coincide with the GC, Greg Carlson, areas. Where does that start, the WM?

A. I think there is just one, isn't there, and that's up here by Lake Centralia.

Q. Okay. And then what did you observe -- is that WM4?

A. Yes.

Q. What did you observe at WM4?

A. At this time the purpose of this area visit was just to see the use of the lake, see if there were people fishing, see if there were boats on the lake, see how close we get to the condition of the lake.

And we saw boats. We saw people fishing from their boats. We saw people fishing from this road here that goes across. So it looked like people

were using it. There is quite a few houses. That was about the extent of that site visit.

Q. Ms. Melgin, you can have a seat.

Looking at -- and you can see from where you are sitting, I hope?

A. Uh-huh.

Q. The water shed, Exhibit A. First of all, as a hydrologist have you had occasion to use a water shed map such as this one?

A. Yes, I have.

Q. Now, what is your definition of a water shed?

A. A definition is simply an area that collects and conveys water to a single discharge point.

Q. And let me follow up on a single discharge point. Looking at the Martin Branch water shed, where is the single discharge point?

A. It's that little area on the right where it enters Lake Centralia.

Q. And we have been defining it as the sub-water shed of the Martin Branch the area that Joan Rogers delineated. Is there a single collection point, I think is the term, in that particular area

that you pointed to?

A. Right. They just picked a point above the violation site and denoted that as the point where all the water above that point would discharge to.

Q. And by above the -- I think you said above the violation site. What part of the L -- and if you want to get up and look at the map, Your Honor, can I have permission for Ms. Melgin to get up and approach?

JUDGE MORAN: Yes.

Q. You are referring to the L, the L channel?

A. Well, I think they considered it just right here below, the sub-water shed boundary. So everything would be -- wherever they picked the point, it is just that that, all this area, would drain to one point, whether it be that point, that point or that point.

Q. So what is the -- can you tell by looking at this delineation what the collection point would be on this?

A. I think it is right there.

Q. And where are you pointing on the map?

A. I am pointing right at the downward part of the L.

Q. You can have a seat. Looking at the water shed map as a whole, how many -- let's see, what are the components of this water shed just generally?

A. Well, the main part of the water shed is Lake Centralia. That's the water shed that we are concerned about here. The components are the five or six water sheds, I think six water sheds, that convey flow to Lake Centralia.

Q. And if I asked you what is the prominent feature of this water shed, what would you say?

A. It would be Lake Centralia.

Q. And what, if anything, do you know about Lake Centralia, besides what we talked about before, just looking at this water shed map? What does this tell you?

A. That it is an impoundment of Martin Branch.

Q. And do you know that from reviewing other documents as well, that it is an impoundment of Martin Branch?

A. That's correct.

Q. And how does the Martin Branch water shed fit within the larger Lake Centralia water shed?

A. Well, Martin Branch is the largest of the water sheds that contribute flow to Lake Centralia.

Q. And by largest water shed could you please explain what you mean by largest water shed?

A. In acres. In acres it is the largest land -- has the largest land mass of any of the other water sheds.

Q. And referring to this water shed map and also generally to your own knowledge of Martin Branch, how would you characterize Martin Branch within the Lake Centralia water shed or branch itself?

A. It is a tributary to Lake Centralia.

Q. And I believe you -- you have used a couple of terms earlier in your testimony, in your background. You mentioned headwater stream?

A. Right.

Q. And how, if at all, does the term headwater stream apply in this case?

A. Well, Martin Branch could be considered a headwater stream.

Q. And I believe that you also mentioned the

term "1st order stream"?

A. Right.

Q. And how does that term, if at all, fit within the -- how does that apply to this water shed?

A. Well, stream order is just a convenient way to classify and rank the size of the streams and rivers. A 1st order stream means that there are not tributaries to it -- no, you are very dependent on the scale that you use because some of the smaller tributaries or swells or farm drainages aren't considered when you do a stream order. What you would do is use the tributary systems or tributaries that are marked on a topo map like that.

Q. And, Ms. Melgin, at this time I think it would be useful for me to ask you if you could define tributaries and how your meaning of the word tributaries relate to -- I believe Mr. Carlson was testifying about using the term tributary as applied to the site of the alleged violations earlier. So if you could define what you mean by tributary in relation to that?

A. Tributary, by that I mean a mapped stream would be a tributary to a mapped drainage. You can see on the topo maps like Martin Branch is a mapped

drainage system. It is a mapped stream. The ones Mr. Carlson were talking about were field level features.

Q. So you are using the terminology as applied -- you are applying the terminology tributary as applied to this map?

A. Right.

Q. Using the scale of the map you are looking at?

A. Right. But tributary to is what he was trying to say. It is a tributary to. Water flows to. That's what tributary means. Water is provided by that water body. It is a tributary to another water body. So you can have drainage ditches that are tributary to another system. They might not be mapped on this map. They couldn't provide significant flow now.

Some of the ones he talked about are channel scars which are old meanders. Their streams flow back and forth and their meanders get cut off or they are impacted in some way, but the land form is left on the land.

But in stream ordering we are just talking about mapped streams.

Q. You talked about the flow of the Martin Branch. What, if anything, do you know about the source of that flow, that water flow?

A. Well, there has been a lot of talk, you know, testimony about this being an intermittent map, an intermittent stream. The difference between perennial, intermittent and ephemeral is basically based on the contribution of surface runoff and ground water. So those are the two components of stream flow.

So, and starting at the driest side, the driest type of drainages being ephemeral, the definition is there is no ground water contribution to sustain base load. There may be some input from ground water, but it is not enough to sustain any type of base load. So those drains only run as a result of storms. You know rains, get snow melt, those drainages will run. That's the source of their water.

An intermittent stream would be you have most of the water in the stream is from storm generation or something else, in this case storm generation. But you do have a component of ground water that may sustain the stream for a certain

amount of time. But the contribution of surface water is greater than ground water because the stream may not flow year around. It may sustain some permanent pools, like we have talked about.

And a perennial stream is when you don't see -- when it is not raining and there is water in the channel, then you are seeing ground water. That's ground water. This is no other way for that water to get in unless there is an artificial source.

Q. And how, if at all, is the water table impacted from the flow in any of those, either ephemeral and perennial streams?

A. Well, like I said, in ephemeral, the ephemeral channels would be above the water table so you wouldn't get much contribution of ground water. But where your stream channel intersects the water table, you would. In these soils that have high water tables, you would expect to have ground water inputs to the stream.

Q. And how, if at all, does that apply to Martin Branch in this case?

A. Well, we have seen flow every time we have gone out there and it hadn't rained before then.

Q. And by every time you have gone out

there --

A. The three times.

Q. And then how does -- I believe Mr. Carlson has testified and we have seen photos of a dry channel, some pooling, some dry in August and I believe in September. How, if at all, does that impact your view of the nature of the Martin Branch?

A. Well, August and September are the driest times of the year. There is in those pools -- you know, depending on the year, some years are going to be drier than others, sometimes those pools might dry up completely on a seasonal basis. And other times they might be there all year. But those pools are there because the water table is providing enough water to sustain those pools during drier times of the year.

MS. PELLEGRIN: And, Your Honor, let's go off the record to display --

JUDGE MORAN: Sure. Go off the record.

(Whereupon there was then had an off-the-record discussion.)

JUDGE MORAN: Let's go back on.

MS. PELLEGRIN: Permission to approach the easel?

JUDGE MORAN: Yes.

BY MS. PELLEGRIN:

Q. Ms. Melgin, you testified about 1st order streams, 2nd order streams. I would like for you to, using the easel, depict what you mean by 1st and 2nd order streams and however they are ordered.

A. Okay. Just a basic order system, okay. Well, I will just draw a --

Q. And, I'm sorry, let's go ahead and put a K, Exhibit K on it.

(Whereupon Complainant's Exhibit K was marked for purposes of identification as of this date.)

A. Okay. So I am just going to draw a little water shed here, also the outlet point. Here is the main stream. And then what you do is you order from the top. So you have a tributary coming in here. There are no tributaries to this. This would be a 1st order stream. This would be a 1st order stream; there is no tributaries coming into that. Where they make a confluence, this becomes a 2nd order stream.

JUDGE MORAN: A 2nd what?

THE WITNESS: A 2nd order stream.

A. So there is the 1st order stream and 2nd order stream, and then this might flow into a different stream system and this would be a 3rd order stream.

Just for context, the Amazon River is a 12th order stream as orders go. The Mississippi is a 10th order stream. Crooked Creek, where Martin Branch, Lake Centralia, with Crooked Creek, that is a 4th order stream. Where it enters the Kaskaskia it is a 5th order stream. So another 4th order stream has confluence with Crooked Creek at that point. The Kaskaskia River is probably a seven. It is higher than a six.

So that's just a convenient way of ordering streams relative to size, and with the assumption that, you know, as you get higher in order, the size of the water body increases, the flow increases, and all of that.

Q. And, Ms. Melgin, am I correct that the 1st order stream would feed into the 2nd order stream and the 2nd order stream would feed into the 3rd order stream?

A. That's right.

Q. And looking at -- you used the earlier

term "headwater stream"?

A. Right.

Q. How does that apply to Exhibit K?

A. Well, you see that these streams here, and I can put a couple here, they are at the top of the water shed. So they are in very intimate contact with the uplands around them. They are getting all this flow from up above and they are funneling it downstream. So those are -- the headwater streams are the farthest from the main stem, in this case it is the stream. They are just at the top of the water shed, the smallest orders.

Q. And using this Exhibit K can you explain just generally what the functions of the headwater streams are?

A. Well, like I said, they are at the very top and they are in intimate contact with the uplands. So anything that's -- the water coming from the uplands, that's what happens at headwater streams. That's where flow originates. That's where it starts. Water falls on the water shed, it starts concentrating in channels, and it starts forming a drainage system. Or there could be a spring or seep at the top that provides water. But regardless this

is where it all stops, at the very top. That's why these streams are so important.

Also what starts here is the contribution of organic material that feeds downstream systems. So all the organic materials, all the nutrients that are essential, also start here and start creating the food chain for all the organisms down below, all the material that falls in. These channels are narrow. The vegetation is very closely associated with the channels. There are overhanging. There is stuff from the trees, there is insects from the trees falling into the water and going downhill. You know, as you go down, the channel gets larger. And as you go down to the larger rivers like the Kaskaskia, the vegetation isn't as important to the channel function as they are in the headwater streams.

On the other hand, they also can carry pollutants. It carries nutrients that are essential to life downstream. But because it is in such intimate contact with the uplands, it also can be a source of pollutants, what's carried in the water, what's picked up and transported to the water downstream.

Q. And I like analogies. Using a lay

person's analogy, the headwater streams that feed into one another, that feed into a larger water body, can you give me sort of an analogy of how that works?

A. Well, I did a very poor job of drawing a water shed. But usually when you look at these stems for any type of water shed, people will say it looks like the veins of a leaf or it looks like a hand or, you know. The other analogy that's used is because it does transport the essential nutrients and organic materials, is that headwaters are sometimes referred to as the capillaries of the system. And it delivers all -- it is a delivery system just like the body, just like parts of the body and the blood. So it is delivering all those nutrients and whatever is in the water downstream like it would in a body.

Q. And if I can ask you to sort of flip them back, look back at Exhibit A, maybe I will help you with that?

A. I have got it.

Q. And I would like for you to -- you have just drawn the headwater streams and 1st and 2nd order streams on Exhibit K. And you analogized that to capillaries and veins. Apply that analogy to the Martin Branch water shed in this case.

A. You mean for ordering?

Q. I mean the analogy of the conveyance of the flow.

A. Well, it would be the same assumption. It was that these headwater areas, this is the very top. You are seeing these very small, little pieces of where drainage has started, water hits the ground, it starts flowing, it starts concentrating. It starts forming a channel, a channel is formed. And whatever is carried in that water -- that's what is meant by hydrologic conductivity -- is that water is the medium to transport energy, for mass, for nutrients. And that conductivity extends from the headwaters all the way downstream to the body. That's the delivery system of a water shed.

Q. So with this analogy we can say Lake Centralia is the heart?

A. You could. It is where everything is going.

Q. And it is the Lake Centralia water shed at least?

A. Right, right.

MS. PELLEGRIN: Your Honor, can I have five minutes?

JUDGE MORAN: Sure. You want to take a five-minute break?

MS. PELLEGRIN: Yeah, a five-minute break.

JUDGE MORAN: We will take that break. Five minutes.

(Whereupon the hearing was in a short recess.)

JUDGE MORAN: Go on the record.

BY MS. PELLEGRIN:

Q. Okay, Ms. Melgin. You were talking about the headwater stream a moment ago. I believe before lunch you talked about your expert opinion. I know we haven't gone into any depth on that; we will get to that. But I believe you mentioned that you based your expert opinion on the intent of the Clean Water Act, the goals of the Clean Water Act, which included restoring biological, chemical and physical integrity of downstream waters; is that correct? Am I remembering that correctly?

A. Yes.

Q. So first let me ask you, what do you mean by biological, physical and chemical integrity of downstream waters?

A. Well, integrity basically means the

condition or usually the unimpacted condition of the water. Integrity means you have full conditions. So the physical is the components of the physical earth, the stream flow, the channel, the structure. You know, basically it is the shape and morphology of the water body, whatever that would be. The biological is just the organisms and plants that inhabit those waters. And the chemical would be the nutrient or chemical component of the water.

So those are some. There are probably other lists. But those are simply what we mean by chemical, physical and biological. And physical, too, incorporates the structure of the habitat of the riparian corridor, that type of thing.

Q. So I am going to take these one at a time, and you mentioned -- since you just recently talked about headwater streams, I would just like to ask generally what effects, if any, do headwater streams generally have on the physical integrity of the downstream waters.

A. Well, there is positive and negative effects. But like I said, that's where -- I mean, simply the easiest way to put it is the best physical component is the path the water takes, which is the

channel. Those starts, the headwater streams, provide first initiation of a channel to transport water and anything in that water to downstream systems.

So the shape of the channel, the channel itself, the flood plain of that channel, the vegetation, the habitat or the substrate that allows that vegetation to grow, are the conditions as part of the physical component of headwater streams. So it is the quantity of the water and also to some extent the quality it provides, the basis for the quality of the water. And also for the biologics, the physical kind of incorporates or is the foundation for the biological and chemical because it is the media that's transporting and providing nutrients and things for downstream. So the physical kind of sets the stage. It is the transport mechanism and media to allow that.

Then the chemical would be --

Q. Ms. Melgin, one second. I want to follow up. You mentioned the term "habitat substrate." What do you mean by habitat substrate?

A. Well, it would be the soil that, you know, the flood plain inundates. And the soil that's

created there is impacted by the water that overflows there, and that creates an environment for the plants that live there. So it is the structure of the habitat.

Q. Okay. And continuing on, what effects do headwater streams have on the chemical integrity of downstream waters generally?

A. Like I said before, they are in very intimate contact with the uplands and that's where they are getting erosion from uplands and even natural erosion and you are getting material into the water, and chemicals and nutrients that are within that water are transferred downstream, providing those nutrients and organic materials to downstream waters. So, like I said, they are kind of the delivery system for those constituents to move downstream.

Q. And continuing on, what effects do headwater streams have on the biological integrity of downstream waters?

A. Well, biological is, like I said, the organisms and the plants that live there, and there is a big diversity in headwater streams because they sometimes dry up. So you have a large diversity of,

like Mr. Northrup was talking about, macroinvertebrates and the insects and other organisms, other aquatic and terrestrial organisms. Because you have a system that is wet part of the time, most of the time, to dry some of the time.

Uh-oh.

So you have a lot more biological diversity in those areas than you would in some other areas downstream that are more uniform.

JUDGE MORAN: And by the way, "uh-oh" on the record was just referring to the fact that an easel fell over. I don't want someone reading this and wondering what happened. "Uh-oh," what does that mean.

Q. Ms. Melgin, I believe you testified you relied on some journal articles...

A. Yes.

Q. ..to provide testimony here today. And I would like you to turn your attention to Complainant's Exhibit 30, Complainant's Exhibit 30.

A. Yes, I am there.

Q. And, Ms. Melgin, if you could flip through Bates number 667 through the end of Exhibit 30, I know it is a lot of pages, but it ends at Bates

number 74, if you could just generally flip through there.

A. Yes.

Q. Ms. Melgin, do you recognize this document?

A. Yes.

MS. PELLEGRIN: And I believe this document, Your Honor, has already been admitted to the record.

JUDGE MORAN: Complainant's Exhibit 30 has already been admitted. Is that right, counsel for the Respondents? It looks like it is. It is on my list. It may have been moved for admission.

MR. NORTHRUP: Yep, that's fine.

JUDGE MORAN: Stipulated for admission, okay.

BY MS. PELLEGRIN:

Q. Can I ask do you recognize this document?

A. Yes.

Q. And what is this document?

A. Well, this is a special edition, I think, of the Journal of Water of the American Water Resources Association talking about headwater streams.

Q. And is this one of the journals that you reviewed to add to your testimony here today?

A. Yes, one of them.

Q. And turning your attention to document Bates number 737.

A. Okay.

Q. And, Ms. Melgin, if you can just read the title of this, the title of 737, into the record?

A. Okay. The title is "The Contribution of Headwater Streams to Biodiversity in River Networks."

Q. And I am looking at what's under the Abstract portion of this document. Do you see where I am reading, that first paragraph?

A. Yes.

Q. And I believe -- I am asking you to turn here now because I believe this fits well with what you were just talking about. So I would like for you to, referring you to this paragraph here, and I would like for you to read into the record the first half of the paragraph and stop before we review.

A. Oh, okay, the first part of the Abstract. It says, "The diversity of life in headwater streams (intermittent, 1st and 2nd order) contributes to the biodiversity of a river system and its riparian network. Small streams differ widely in physical, chemical, and biotic attributes, thus providing

habitat for a range of unique species. Headwater species includes permanent residents as well as migrants that travel to headwaters at particular seasons or life stages. Movement by migrants link headwaters with downstream and surrounding ecosystems, as do exports such as emerging, drifting insects."

Q. And thank you for reading the punctuation. I don't think you have to do that.

A. I thought it would help her.

Q. I realize you were probably doing that to benefit the court reporter.

Ms. Melgin, looking at this section that you just read into the record, how, if at all, does that fit with what you have been talking about, in particular the Martin Branch headwater stream you discussed earlier?

A. Well, I mean, that's exactly what I was saying, is that these smaller streams are really important to, not only the biodiversity within themselves, but downstream, providing nutrients and food for downstream, and you know that they do differ.

And it is not just -- when we are talking

about species migration, and I think we touched on it a little bit in testimony yesterday, about did we see animals moving up and down or migration and everything. But, I mean, it is a pretty well-known fact, in my opinion, that what happens when streams with riparian corridors empty in lakes, not only do organisms move downstream, from the upper parts of the water shed down to a water body, they will move up, and even in larger rivers. Because there may be temperature differences or something in the lake, and they seek refuge in cooler stream waters, if possible, if they need to.

So species move down, they move up, they move laterally from the sides. So it is a very fluid corridor that these headwater streams provide, not just for the species that live in them, but for species that live around them and downstream of them.

Q. And continuing on past the "We reviewed" sentence, beginning at the "Even intermittent streams" sentence, can you read that into the record to the end of the paragraph? And you don't have to read the punctuation. If you could read that portion into the record, please.

A. "Even intermittent streams may support

rich and distinctive biological communities, in part because of the predictability of dry periods. The influence of headwaters in downstream systems emerges from their attributes that meet unique habitat requirements of residents and migrants by offering a refuge from temperature and float streams, competitors, predators and introduce species serving as a source of colonists, providing spawning sites in rearing areas, being a rich source of food, and creating migration corridors throughout the landscape. Degradation and loss of headwaters and their connectivity to ecosystems downstream threaten the biological integrity of entire river networks."

Q. And referring to the portion that you just read into the record, how, if at all, does that relate to this particular Martin Branch area?

A. Well, it was kind of what Mr. Carlson was talking about yesterday where riparian cover provided protection from predators in some cases, even for those type of animals, because it is cover. And it is basically what we have been talking about, that it serves the temperature and it could be either colonists or species from parts of upstream, maybe even downstream.

So it is trying to say that this is a dynamic system. It is not just a -- it just doesn't stay in one place. It is very dynamic and things moving back and forth. So organisms and nutrients and that type of thing, that's what a living landscape is.

Q. And referring to this whole document, Exhibit 30, it would be the Journal of the American Water Resources Association, do you know if this document contained -- or any articles contained herein are peer reviewed?

A. Oh, yes.

Q. Are they?

A. They are.

Q. Putting that aside now. Now, earlier, Ms. Melgin, I think we talked a little bit about wetlands and the functions of wetland. Let me ask you in terms of again physical, chemical and biological, what effect do wetlands have on the physical integrity of downstream waters generally speaking?

A. Okay. Well, Mr. Carlson talked about the big three that we always talk about, the nutrient absorption, the flood retention and the habitat. But

I would kind of like to break that down a little bit. And I look at it from a quantity and quality perspective again. So from a physical standpoint the wetlands help to abate flow or help to provide flow, depending on the circumstance.

So if you have a flood -- and today on the weather channel they were talking about all these small stream flood warnings for areas that had these large storms and a lot of that is because the wetlands have been destroyed or the streams have gone through some sort of hydrologic modification so they don't have any flood retention capabilities any longer. That's what wetlands do. You can say they act like a sponge, they soak up, that's what flood plains do. The water comes down, the water is able to spread out over the flood plain and it stays there for a certain period of time.

So then what happens to it, then it is released back into the channel at a slower rate. So you don't get high peak flows and these small flood stream warnings. You get this slower release of the water from the wetlands into the channel.

At the same time, you are getting that effect on flow which is the physical aspect of it.

That water that's in the soil is being able to be transformed. The nutrients that are in the water are able to be taken up by plants, if it is riparian vegetation or wetlands vegetation. The sediment can drop out into the wetlands. So the water that is being released back into the stream channel is cleaner. It is not carrying the nutrient and sediment load. So there is a reduction in sediment and nutrient load after the water has gone through a wetlands. It acts like a sponge; it acts like a filter. So that's kind of the chemical composition. Some of your downstream waters are receiving better quality water.

That's why I was talking about the non-point source project restoring wetlands to provide that function to reduce nutrient and sediment load. That's why a lot of these water organizations in the state are spending a lot of money and the federal government is spending a lot of money to restore wetlands on these smaller streams.

JUDGE MORAN: I just want to interject, try not to when you are doing your testimony -- you are doing a fine job and you know a lot -- but don't piggyback onto what Mr. Carlson's testimony was

unless it is integral to your being able to express your own opinion. If you can't express an opinion apart from what Mr. Carlson testified to, then you will have to include that. But other than that, I will make the connections if there is consistency. Just I would like to hear what you know.

THE WITNESS: Those are just the normal big three and I wanted to expand on them.

Q. I am sorry, have you covered all three of the big three, Ms. Melgin?

A. Well, the flood retention and the nutrient reduction but I didn't cover the habitat. That's an obvious feature. Again, the wetlands are a transitional area between open land and open water. That's why they are so important for habitat. Because, again, you get some aquatic species, some terrestrial species, and you get a higher diversity of species. Because you get species using both of those environments in wetlands. That's why they are big. You see birds there. There is a lot of different organisms because of the ecotone, the transition area, between upland and open water.

Q. And what do you mean by ecotone?

A. Ecotone is a transition area from one

eco-system like terrestrial, uplands, to open water, flowing water. So that part, you know, it is part terrestrial, it is part aquatic.

JUDGE MORAN: Do you want to spell that word, ecotone?

THE WITNESS: Ecotone, E-C-O-T-O-N-E.

Q. And, Ms. Melgin, let me ask you, you just covered the big three of wetland functions. Does that encompass the physical, chemical and biological? Is that what you just described, encompassing all those three?

A. Yes, uh-huh.

MS. PELLEGRIN: Your Honor, at this time -- first of all, let me ask.

Q. Ms. Melgin, you were at the site, you were adjacent to the site of the alleged violation a couple of times; is that correct?

A. Correct.

Q. And, Ms. Melgin, were you present in the courtroom when we played the video that Mr. Daniel Heser's brother had taken of the site of the alleged violations close in time to the occurrence of the alleged violation?

A. I was.

MS. PELLEGRIN: And, Your Honor, I would like to play the video for Ms. Melgin without the stops and starts that we had with Mr. Daniel Heser. I would just like to sort of get a bigger picture. I am saying that to show that it is not going to take 45 minutes like it did last time.

JUDGE MORAN: Well, that's fine. But, of course, with no counter, there will be -- no pun intended -- no frame of reference. It should just be speaking generally about watching the video as opposed to before when you were stopping and the witness would identify the counter number.

MS. PELLEGRIN: Right. I thought about that. I think we can probably speak generally about it, but I will reserve my right, I guess, to stop and start but with longer durations. I don't have any --

JUDGE MORAN: Okay. That's fine. So we are ready to do business?

MS. PELLEGRIN: Yes, if we can go off the record.

JUDGE MORAN: Okay. Go off the record for a moment.

(Whereupon there was then had an off-the-record discussion.)

JUDGE MORAN: Yes, we are on the record again.

BY MS. PELLEGRIN:

Q. Okay. Ms. Melgin, I am playing for you what I believe has been marked and admitted as Complainant's Exhibit 8C which is a videotape. I am going to begin that now.

(Video playing.)

Okay. Ms. Melgin, you just watched the video of the site of the alleged violation. I believe there was testimony that it was in September of 1999; is that your recollection? Sometime around September of 1999?

A. That's what I understand.

Q. And, Ms. Melgin, there were -- first of all, let me just ask you generally to describe what you saw in the video.

A. Well, I saw construction of a new channel, an artificial channel.

Q. Could you speak up or put the mic a little closer?

A. I saw the construction, basically the result of the construction, there was some heavy equipment out there, of a new channel, a lot of bare

ground. It looked like cleared vegetation, burning of woody debris, a berm created, and some riprap placed in the corners of the constructed channel, and the unstable slopes of adjoining property. Trees are hanging on there.

Q. Ms. Melgin, what, if any, water did you see depicted in any part of that video?

A. Just in the pool of the first area with the riprap. It looks like it is pooled there in the scoured area.

Q. And you testified earlier about pools in the Martin Branch. How would you describe in particular the pool that you saw in this video in September of 1999?

A. Well, there is definitely water there. What I would -- my opinion is, because I wasn't there in '99, would be that is probably ground water.

Q. And what, if anything, do you know about the time of year, September, in terms of seasonal rainfall?

A. Yeah, it is usually low.

Q. In September. I mean, August and September are usually the months that have the lowest amounts of precipitation.

JUDGE MORAN: In this area.

THE WITNESS: In this area and a lot of areas.

Q. Okay. Ms. Melgin, you described the channel in the video. Is that the L-shaped channel we have all been talking about, the L-shaped channel?

A. Yes.

Q. Ms. Melgin, referring to the video that we just looked at and also to your visit at the site, what is your opinion about the -- first of all, do you have an opinion about the function, how that L-shaped channel functions, as a water conveyance?

A. Yes.

JUDGE MORAN: Presently functions as a water conveyance?

Q. Yes, just -- yes. And can you tell me what the function of the L-shaped channel at the site of the violation is as a hydrologist?

A. Well, the purpose of an artificial channel like that is to move water from point A to point B as quickly as possible and to, depending on the depth, to drain adjacent -- it can act as a drain to drain adjacent soils.

Q. And I believe earlier you talked about

the function of the L-shaped channel differently in terms of low flow times and high flow times?

A. That's right.

Q. I would like for you to look at Complainant's Exhibit 27, a document Bates number 459.

A. I am there.

JUDGE MORAN: Give me a second. 27, right?

MS. PELLEGRIN: Yes, Your Honor.

Q. Ms. Melgin, in terms of low flow versus high flow, what does this photo depict to you?

A. You didn't send me to a picture.

Q. Oh, I am sorry, are you on 27?

A. Right.

Q. Bates number 459.

A. This would be at relatively low flow.

Q. And in terms of this picture, could you describe -- first of all, the caption of this photo, can you read the caption of this photo into the record? Just the -- let's see, up until the end of the second semicolon.

A. The end of the second, okay. "East or upstream on west to east lay of reconstructed Martin Branch, near the southeast corner of the Heser

brothers' property, water sits in an embedded trench beneath the original floor of the reconstructed Martin Branch channel bottom.

Q. Ms. Melgin, I believe you talked earlier about -- I can't remember. You termed it a subchannel, I believe.

A. Uh-huh.

Q. And does this depict the subchannel you were talking about?

A. Yes.

Q. And how is this -- from a hydrological standpoint how is a subchannel formed?

A. Well, the gradient of this artificial channel is fairly flat. Like I said, if the purpose is to convey water as quickly as possible from point A to point B, well, during high flow that would be the case. During low flow the water is kind of sitting there unless there is some water from gravity purposes from upstream, sort of pushing it through the gradient. It is pretty flat. Like I said, cattails are starting to establish in the channel.

So when water does flow, it is trying to establish a gradient. That's what streams do, is try to establish an equilibrium between the amount of

flow and the amount of sediment that they are carrying. So it is down cutting into this subchannel because the gradient is flat.

Q. And what do you mean by a little bit? Can you tell me a little bit more about what you mean by down cutting?

A. Down cutting is just the channel sizing itself. The water is sizing the channel. Any time you have an adjustment in flow, the stream tries to make some sort of its own adjustment, like I said, depending on the flow and the sediment it is carrying. So you are getting a sized, down cut channel in here.

Q. And when you get, I am looking at this, looking at this photo, to the right of the photo, I see vegetation; is that right?

A. Right.

Q. Vegetation. And when you get down cutting of a channel, a subchannel, generally would you expect there to be vegetation at the bottom of that down cut or down cut channel?

A. Well, it is going to cut through the vegetation and start forming a bottom of sediment that it is carrying. You saw cattails were

establishing in -- there was sediment in the bottom of the channel. So it was a vegetated channel, but now the water is cutting through that vegetation, that grass bottom.

Q. And so would I be accurate in saying that when this happens that you are having more like a bare bottom underneath the subchannel? Is that accurate?

A. Yeah, I would think so. I haven't seen the bottom of the channel except for what we -- I have never been on the actual site. From what I have seen from the adjacent site, that would be true.

Q. Okay. Let me turn your attention to Complainant's Exhibit Number 47.

JUDGE MORAN: That's in the brown volume.

THE WITNESS: Oh, Volume 3.

JUDGE MORAN: Yours is different than mine. What was that? 47?

MS. PELLEGRIN: Yes, 47.

JUDGE MORAN: Now, hold on. Okay. I have it. One second. Okay, thank you.

MR. SMALL: Would you, please, state that exhibit again?

MS. PELLEGRIN: Exhibit Number 47.

Q. Are you there, Ms. Melgin?
A. Yes.
Q. Ms. Melgin, were you present during the testimony of Mr. Daniel Heser when he described the photographs depicted in Exhibit Number 47?
A. Yes, I was.
Q. And looking at Exhibit 47, specifically number 7361, what is your understanding of what this depicts?
A. That depicts high flow in that artificial channel.
Q. And do you know if we are looking at the west lag or the north-south lag of this corridor?
A. I am not sure. To me it doesn't really matter.
Q. To you it doesn't matter. And why doesn't it matter?
A. Because you can see that it is a long length of stream. It is straight. There is a lot of volume in there. And that's what I was saying. During high flow you are going to get a lot more flow at a higher volume through this because it is straight. It has got the berm on one side or the up part, and it is going to flow quite a bit of water

downstream. There are no meanders to slow it down, which is what meanders in streams do. There is no flood plains, so it is trying to come out of its banks, and it did come out over into the field.

But this is what I mean by conveying water as quickly as possible from point A to point B. It doesn't do it during low flow because the gradient is not -- there is not enough water to move that flow. But when there is high flow, it really moves. Like we saw downstream and upstream, for that fact, there is a lot of water because of the debris racks that we saw over our head. The downstream appeared in a funnel because this is a straight shot channel. It is not bending and twisting like the rest of the natural stream channel.

Q. So, Ms. Melgin, comparing the function of the L-shaped channel in low flow which we saw in Exhibit 27, document number 459, and these photos depicted here, can you tell me about how the -- look at Exhibit 27, number 459. We saw grass, saw the down cutting of grass; is that correct?

A. Right.

Q. And looking at these photos in Complainant's Exhibit Number 47, how, if at all,

would you in your experience as a hydrologist, how, if at all, would you expect the grasses in the bottom of this channel to affect the flow in high flow of this channel?

A. It is not going to affect the flow very much in high flow, the grassy bottom.

Q. And in terms of how a meandering stream affects flow in high flow versus how this L-shaped channel affects high versus low flow, can you compare that?

A. Like I said, a meandering stream will slow the velocity down just because it has to turn around a corner. This is coming down a straight shot on the L, turning 90 degrees and shooting down a straight channel. So your velocity is going to be higher through that point at high flow.

You can have meandering streams and ag fields that aren't stable because the vegetation is gone. It might slow down a little bit. But in a riparian corridor, riparian wetlands, forested wetlands, that is taking some of that flow and retaining it, like I said, it will slow that flow down.

Q. And, Ms. Melgin, when you were adjacent

to the site of the alleged violations were you able to view the downstream portion of the L-shaped channel as it entered the natural part of the Martin Ranch?

A. Yes, I was.

Q. And can you tell me your observation of downstream, the bottom of the L as it entered the natural portion of Martin Branch, and how that would relate, how that would affect the water at a time of higher flow?

A. Well, you would have like almost a kind of a nozzle effect or a tunnel effect. You would increase the potential for flooding downstream because you are putting a large volume of flow through this straight, narrow channel. And then you are making it turn into a natural channel and it would start to spread out because it wouldn't be able to -- the natural channel doesn't have the capacity to handle the velocity of something that is coming at a straight shot.

Q. And can you compare the width of the L to the width at the mouth of the natural channel at the bottom of the L?

A. If I remember, I think the width of this

channel is 15 feet and I think the width of the bottom of the channel that Ward Lenz took is like three to four feet. I could be wrong. I am not recollecting that, but I would have to refresh my memory on that.

Q. Let's just talk in general terms. Was the width of the L larger or smaller than the width of the outlet of the L to the natural Martin Branch?

A. Right. You could see that from the video. You had a long, sort of like a trapezoidal channel that was fairly wide, and the construction on that video, and then there was some shots of the natural channel that were narrower.

Q. So in general terms the L would have been or is wider than the entrance, the beginning, of the natural channel, bottom of the L.

A. Yes, the way I understand it.

Q. Okay. Talking about the area of the grass area in the video and specifically the grass area along the bank in the video and also if you can refer to your observations of the grass area at the site, and I am talking about the -- if you are looking at the north-south leg of the L, I am talking about the site of the alleged violation, west of the

north-south leg which is north of the east-west leg, to include the site of the alleged violation. Is that accurate?

A. I think so.

Q. Now, can you tell me about your observations of that portion of the L, that bank portion specifically of the L?

A. Yeah, there looked to be -- based on topography it looked higher. Well, it got higher. So the berm became lower as you went south because the slope went up with the bank. So there was a fairly high bank and they vegetated it with grasses. And there looked to be from the video some scrub leaf down on top of that.

Q. And in terms of -- first of all, in your experience as a hydrologist and all the other things that you have done, have you had any experience in dealing with or viewing filter strips?

A. Yes.

Q. And can you tell me, based on your observations of this area of the Heser brothers' bank of the L-shaped channel, that side, how well does that compare to a filter strip?

A. Well, filter strips are usually, again,

are flat. You know, they are not on berms. Because water has to run into the filter strips. So they are usually parallel to the water body and so lateral runoff from fields can go into the filter strips and the filter strips can do its thing of nutrient and sediment retention, and then you have better water quality than you had before.

So they are not -- filter strips are not a berm and it is not a couple feet wide. If I remember correctly, Burke Davies said at least 66-feet wide is a filter strip that the soil and water conservation district would want to see.

Q. And, Ms. Melgin, when did you speak with Burke Davies?

A. On March 8, 2007.

Q. And where were you when you spoke to Mr. Davies?

A. We were on Bill Heser's property, up near the CPP project, the Conservation 2000 project, up at the top of the water shed.

Q. And if you can, can you compare that area that we talked about, Mr. Bill Heser's filter strip area that you were with Mr. Davies on, can you compare that to the banks, the Heser brothers' banks,

on the site?

A. Well, the comparison would be that the Bill Heser project was done under the supervision of a government agency. So as there are specific things that were required for him to fulfill the initiative of the program, which was to stop rill and gully erosions, he received technical assistance to construct that project. So that to me says a lot. The project was constructed under the U.S. EPA for the appropriate reasons and it was constructed to stop that erosion. That project is performing functions of nutrient and sediment reduction based on the grass strip.

Now, you could go downstream and you could see that there is a grassy strip also. But their property was performing those functions and more before this L-shaped channel was put in. They had a riparian corridor and forested wetland that was providing all of the water quality functions, plus habitat, plus more. They didn't need a water quality improvement project on the property. They had a much better system in place already.

They replaced it with an artificial channel that may provide some function during low

flow but not much during high flow.

Q. And actually that's a good segway into my next question which is do you have an understanding of what the -- we just looked at a video and that was post alleged violation. Do you have an understanding of what this site was like before the alleged violation?

A. From aerial photography I do.

Q. And do you have an understanding of what the site was like prior to the alleged violation from the testimony that you heard during this proceeding?

A. Yes, I have, from the wetlands delineation, from other testimony of Bill Heser or Daniel Heser. Yes, I have.

Q. And, Ms. Melgin, can you describe the function of the site of the alleged violation before the alleged violation took place?

A. Well --

MR. SMALL: I am going to object, Your Honor. You know, it seems like that's exactly where we are coming from; we are doing a bunch of piggybacking on somebody else's testimony. Unless she has personal knowledge of this --

JUDGE MORAN: She is just repeating what she

heard in the hearing. I agree. I sustain the objection.

MS. PELLEGRIN: Okay. I am going to rephrase my question. If we have the same objection, we will re-do it. What I am trying to get at -- it is late in the day, Your Honor, so I am inarticulate. I am sorry.

Q. Ms. Melgin, you talked about the functions of wetlands generally?

A. Yes.

Q. In this case there was a wetland delineation performed showing that there were wetlands at this specific location. Can you talk about the functions of the wetlands that were -- can you describe the functions of the wetlands at this site prior to the alleged violation?

MR. SMALL: I am going to object again. Same thing.

JUDGE MORAN: I agree. Sustained.

Q. Ms. Melgin, would you -- can you describe the functions -- okay, Ms. Melgin, let me ask you this. You were on Mr. Bill Heser's site, correct?

A. Correct.

Q. Which was -- can you describe Mr. Bill

Heser's site at the top of the L-shaped channel, you were present on that site; correct?

A. Correct.

Q. Can you describe the functions of that area?

A. Okay. The stream channel area?

Q. And the areas in and around the stream channel.

MR. SMALL: Your Honor, I would like -- I am not trying to slow things down, but I would like them to do one thing at a time, not -- what are we talking about.

JUDGE MORAN: I agree. I have the same question if my mind. So I will sustain the objection.

What we need to do is remember -- your question was fairly general. And it is late, I understand. You know, despite the wish to stay later, I think some of us are getting a little groggy. But I think that your question could have encompassed the area where -- what's the name of the Heser that did the approved? What's his first name?

MR. SMALL: Bill.

JUDGE MORAN: Bill. That area was

reconstructed. If you are asking her if she looked at -- if Mr. Heser had at this area just north of the alleged violation, if she used that area, and then you lay a foundation asking her if that was in a pristine state, unaltered, albeit with approval, that's fine. You can ask her if she saw that.

I don't know whether the area that was reconstructed under approval abuts -- I don't remember whether it abuts to the L or not. So if it abuts to the L, then you have a problem, unless you can have her walk further upstream where the work was not done. I forget, frankly, and I will know when I study the record how this all lays out. I think there was an intermission point where it was natural or whether it was reconstructed and then you hit the L. I forget.

THE WITNESS: I can go on.

JUDGE MORAN: Please don't volunteer.

MS. PELLEGRIN: Actually, I don't need her to volunteer. I was going to put up a map so we can be specific about where we are talking.

JUDGE MORAN: Sure. At 3:49 you have five minutes to do it because we are going to be out of here at four o'clock.

MS. PELLEGRIN: You know what, I am fine with either stopping now or --

JUDGE MORAN: No, you can use up to 4:00. But I want to be out of here so that I don't have the chief judge telling me that he is unhappy about having to pay overtime to the guards.

MS. PELLEGRIN: We can go off the record?

JUDGE MORAN: Sure. We can go off the record.

(Whereupon there was then had an off-the-record discussion.)

JUDGE MORAN: We will go back on the record.

BY MS. PELLEGRIN: Your Honor, permission for Ms. Melgin to approach Exhibit D?

JUDGE MORAN: Yes.

MR. SMALL: Your Honor, may I approach, too?

JUDGE MORAN: Absolutely, Mr. Small. Please come on up.

BY MS. PELLEGRIN:

Q. Now, Ms. Melgin, I would like for you to locate the site of the L-shaped channel on Exhibit D just for the record.

A. It is right here, this L-shape.

Q. And you are pointing to -- there is so

many markings on this map.

A. Yeah, it's hard. Well, this is circled. So whatever --

Q. DJH1. Now, what I would like for you to do is move to the right of the top of the northwest -- north-south leg of the L-shaped channel.

A. The top of it.

Q. Yeah, move to the right. And there is a -- can you describe the area as depicted on this map, just the coloration of the area on this map?

A. The green strip here?

Q. Correct?

JUDGE MORAN: Before she does, is she just describing this exhibit or has she been to this location?

THE WITNESS: Oh, I have been.

MS. PELLEGRIN: I am getting there, Your Honor. Yes, the answer is yes, and I am going to ask her that as well.

JUDGE MORAN: So she knows the answer. You have already told her the answer is yes.

MS. PELLEGRIN: She said yes.

Q. Ms. Melgin, the area that I am looking at is a silver line going through the green area and

there is an arrow GC Photo 8 relating to that area?

A. Right.

Q. Ms. Melgin, have you personally been to this area on this map?

A. Yes.

Q. And what is this area generally?

A. This is a natural stream area with the forested riparian corridor, just upstream of the site.

Q. And now I would like for you to describe the -- you have been to that area. I would like you to describe the functions of that area.

A. This is the area that we talked about it being channelized decades go. So it looks pretty straight. It looks straight on the map. But the channel within this is starting to establish its meandering path, the S-shaped curves. So it is starting to -- there is enough forest there. So it does that by its pattern of deposition and erosion.

So it is starting to establish its natural meanders. That's where we saw some permanent pools and the fish in there and Greg caught a frog.

Q. Okay, Ms. Melgin, you may be seated.

Ms. Melgin, is there something you wanted

to add to your description?

MR. SMALL: I am going to object. There is no question. I mean, she can't just say is there anything you want to add.

JUDGE MORAN: She said to add to her description.

A. I wanted to point out where the CPP project was in relation to the L.

MR. SMALL: I am going to object then because that's a whole different project.

JUDGE MORAN: That's right. But now counsel can play the game and say I would like you to identify the area where the project was completed, and I would have to allow her to do that. I am not sure why we need to do it, but that's the way it would play out, Mr. Small.

MS. PELLEGRIN: I am actually going to suggest that at five minutes til we leave. I think this is a natural breaking point in her testimony, if we would like to adjourn for today.

JUDGE MORAN: Yes, it is 3:55. So we will call the proceeding to a close today as of now. We will go off the record.

(Whereupon the hearing in this

matter was continued until May 3, 2007 at 9:00 a.m. in Carlyle, Illinois.)