ISSUES CONFERENCE VOLUME 17

In the Matter of the Applications of

CROSSROADS VENTURES, LLC

for the Belleayre Project at Catskill Park
for permits to construct and operate pursuant to
the Environmental Conservation Law

Margaretville Fire House
Margaretville, New York
August 25, 2004

B E F O R E:

HON. RICHARD WISSLER,
Administrative Law Judge

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(8/25/04)

(9:36 A.M.)

P R O C E E D I N G S

MR. GERSTMAN: I'll mark these exhibits.

(COLOR PHOTOGRAPH "180 DEGREE VIEW FROM ATOP ROSE MOUNTAIN" RECEIVED AND MARKED AS CPC EXHIBIT NO. 98, THIS DATE.)

(SAME PHOTO AS 98, WITH DESCRIPTIONS RECEIVED AND MARKED AS CPC EXHIBIT NO. 98A, THIS DATE.)

(WEB PAGE FROM "CATSKILL WATERSHED MUSEUM" RECEIVED AND MARKED AS CPC EXHIBIT NO. 99, THIS DATE.)

(PHOTOCOPY OF NEWSPAPER ARTICLE "M-ARK WINS HOUSING FUNDING; DIRECTOR ANNOUNCES RESIGNATION" RECEIVED AND MARKED AS CPC EXHIBIT NO. 100, THIS DATE.)

(LETTER FROM ULSTER COUNTY LEGISLATURE DATED 7/7/2000 RECEIVED AND MARKED AS CPC EXHIBIT NO. 101, THIS DATE.)

(PLANNING BOARD APPLICATION FOR

CHELSEA PARK SUBDIVISION RECEIVED AND MARKED AS CPC EXHIBIT NO. 102, THIS DATE.)

(LETTER TO ROBERT CROSS FROM RON

ODATO CONCERNING PINE HILL LODGE RECEIVED AND MARKED AS CPC EXHIBIT NO. 103, THIS DATE.)

(BELLEAYRE MOUNTAIN POWERPOINT RECEIVED AND MARKED AS CPC EXHIBIT NO. 104, THIS DATE.)

ALJ WISSLER: This is Office of Hearings 16.

("WINDHAM SITE VISIT - JULY 22, 2004 ITINERARY" RECEIVED AND MARKED AS OHMS EXHIBIT NO. 16, THIS DATE.)

(POWERPOINT PRESENTATION DOCUMENTATION RECEIVED AND MARKED AS CPC EXHIBIT NO. 105, THIS DATE.)

("A METHOD FOR ASSESSING HYDROLOGIC ALTERATION WITHIN ECOSYSTEMS" - BRIAN D. RICHTER, JEFFREY V. BAUMGARTNER, JENNIFER POWELL AND DAVID P. BRAUN CONSERVATION BIOLOGY, VOLUME 10, NO. 4, AUGUST 1996 RECEIVED AND MARKED AS CPC EXHIBIT NO. 106, THIS DATE.)

("LARGE RIVERS VOL. 12, NO. 2-4 -

PHYSICAL HABITAT MODELING FOR FISH - A DEVELOPING APPROACH" RECEIVED AND MARKED AS CPC EXHIBIT NO. 107, THIS DATE.)

("STRATEGY FOR SUSTAINABLE MANAGEMENT

OF THE UPPER DELAWARE RIVER BASIN" PREPARED BY PIOTR PARASIEWICZ FOR TROUT UNLIMITED RECEIVED AND MARKED AS CPC EXHIBIT NO. 108, THIS DATE.)

(WEB PAGE "INSTREAM HABITAT PROGRAM - UNIVERSITY OF MASSACHUSETTS, AMHERST - STONY CLOVE CREEK" RECEIVED AND MARKED AS CPC EXHIBIT NO. 109, THIS DATE.)

("INSTREAM FLOW REGIMENS FOR FISH, WILDLIFE RECREATION AND RELATED ENVIRONMENTAL RESOURCES" RECEIVED AND MARKED AS CPC EXHIBIT NO. 110, THIS DATE.)

ALJ WISSLER: If we can convene. We'll begin by taking the appearances of counsel for the record, please.

MR. RUZOW: Dan Ruzow and Terresa Bakner for the Applicant.

MR. ALTIERI: Vincent Altieri for Staff.

MR. GERSTMAN: Marc Gerstman and Cheryl Roberts for the Catskill Preservation Coalition.

ALJ WISSLER: Okay. A couple of

housekeeping items. First, we had a site visit to Windham on July 22nd, 2004, and the Applicant has supplied us with a copy of the itinerary for that day. I will take that in as Office of Hearings Exhibit No. 16.

In addition, yesterday we took in CPC Exhibit 93, which was that area along Route 28 opposite the Weyside Motel looking at Belleayre Mountain and the balloon. Now, the balloon is very faintly visible in the photograph, so I'm going to ask that counsel come up, take a look at the balloon because the photocopies that we have, I don't know that they show it. The balloon is right there. (Indicating)

MR. RUZOW: I would note for the record that I am not certain that is, in fact, a balloon, and when we get our photos and distribute it to you, Marc, and the other parties, we can confirm it because the clarity on that -- I'm not sure that's where the balloon was.

ALJ WISSLER: I don't disagree, but clearly that is something that's in the photograph and kind of red in color.

MR. RUZOW: At least on our copy.

MR. GERSTMAN: I believe it is the balloon, but we can confirm it when the other photographs are produced.

ALJ WISSLER: Mr. Gerstman, I take it that the exhibits that you're introducing today will be part of your presentation today?

MR. GERSTMAN: Yes. They're part of cumulative impact and aquatic habitat.

ALJ WISSLER: Then why don't we -- do you want to make a statement with respect that you had a witness --

MR. RUZOW: We had intended, as we said yesterday afternoon, to produce Abel Garrigan. [sic] Because of scheduling, it's not possible. We will submit a statement from him, for purposes of the record, when we submit our subsequent submissions.

MR. GERSTMAN: Who is Mr. Garrigan?

MR. RUZOW: Mr. Garrigan is both a businessman and he was involved in Ulster County economic development activities. We can submit a statement from him. So that's how we'll deal with that.

ALJ WISSLER: Okay. In terms of

schedule, then, with respect to cumulative impacts, secondary growth, community character, are we done now with that?

MR. GERSTMAN: I would be presenting today on cumulative impacts, along with Peter DiModica. I don't believe we'll take more than a half-hour, 45 minutes on that and then move into aquatic habitat. We do reserve, your Honor, of course the right to respond to whatever statements are submitted.

ALJ WISSLER: Okay, I understand. If there's nothing else, then you're on.

MR. RUZOW: Marc, are you going to introduce those exhibits first?

ALJ WISSLER: Tell us what they are.

MR. GERSTMAN: Your Honor, we have marked exhibits this morning for the record. I'd like to start with CPC 98 and 98A.

CPC 98 is a 180-degree view from the top of Rose Mountain. On the 17th of August we made the trip up Rose Mountain, and Mr. Bennett from the Catskill Center took photographs, and these are the photographs put together side by side to create the panorama.

98A is also the panorama from atop

Rose Mountain with the labels of various mountain features that was given out at the site visit.

MR. RUZOW: Your Honor, if I might, I just want to renew our objection to the Rose Mountain photographs as not being representative of views open and available to the public, and we will have another exhibit to bring that point home as soon as the proceeding will allow us to introduce that.

ALJ WISSLER: Okay. Thank you.

MR. GERSTMAN: CPC 99 is a printout from the Watershed Museum website. It was printed out this morning.

Exhibit 100 is an article from the Catskill Mountain News dated Wednesday, August 11th, 2004 concerning a housing project.

Exhibit 101 is a letter from Ward Todd, majority leader of the Ulster County Legislature, dated July 7th, 2000 to Assemblyman Kevin Cahill.

Exhibit 102 is an application to the Town of Shandaken planning board from the owner of property, Chelsea Park Company. The date of the application is June 8th, 2004.

CPC 103 is a letter from Ron Odato and John Odato to Robert Cross, supervisor of the

Town of Shandaken, concerning a project for a 96-room hotel within the hamlet of Pine Hill on the north side of Route 28.

ALJ WISSLER: When is that dated?

MR. GERSTMAN: There's a reference they would like to appear before the Town Board on May 3rd, 2004 in the letter.

CPC Exhibit 104 are a series of documents that I received in response to my Freedom of Information Request to the Department of Environmental Conservation, which is a PowerPoint presentation made by Tony Lanza in community meetings concerning the Belleayre Mountain Ski Center expansion.

CPC Exhibit 105 is a PowerPoint presentation and slides from Piotr Parasiewicz. We will provide the CD copy of this later on in the day, and we will introduce that as CPC 105A.

CPC 106 is an article entitled, "A Method for Assessing Hydrologic Alteration Within Ecosystems," dated August 1996.

CPC Exhibit 107 is an article entitled, "Physical Habitat Modeling For Fish, A Developing Approach," offered by Piotr

Parasiewicz and M.J. Dunbar, dated February 2001.

CPC 108 is an article entitled, "Strategy for Sustainable Management of the Upper Delaware River Basin," prepared by Piotr Parasiewicz.

CPC Exhibit 109 is an article entitled, "Stony Clove Creek," also authored by Piotr Parasiewicz.

Finally, CPC 110 is an article entitled, "Instream Flow Regimen for Fish, Wildlife Recreation and Related Environmental Resources." It is authored by Donald Leroy Tennant, T-E-N-N-A-N-T in the publication called Fisheries dated July/August 1976.

Your Honor, our first topic for this morning is the issue of the cumulative impacts associated with the proposed Belleayre Resort project at Catskill Park. We believe that the Draft Environmental Impact Statement does not begin to address the likely cumulative impacts that will occur as a result of this project and the other projects that are pending or planned for this region.

In our petition, we have provided

articles under Exhibit R concerning the proposed expansion of the Belleayre Mountain Ski Center. As your Honor knows, we have sought information concerning the Department of Environmental Conservation's plans for that expansion. Our FOIL request has essentially been denied concerning the actual Draft Unit Management Plan which was referred to by Mr. Lanza, director of operations at the mountain, in which he publicly stated that there was significant plans for expansion of the mountain.

Also, your Honor, as you know, the Commissioner has denied our appeal to your motion denying us discovery against the Department of Environmental Conservation Staff to produce that Unit Management Plan. Her ruling, I believe, was a denial of leave to submit an expedited appeal, and the right to appeal is preserved pending your rulings. Ultimately, she will have a chance to review that issue again.

What's been very clear is that there is a lot of activity, notwithstanding some of the witnesses that testified on behalf of

Crossroads, which tried to paint a gloom and doom picture of this region. As your Honor has seen through the site visits, it's certainly not black and white, there's a tremendous amount of vitality in this community, a tremendous amount of growth, and the type of growth that our experts would characterize as smart growth.

What we believe will happen as a result of this project is a significant amount of induced and secondary growth. We don't believe that that has been adequately addressed, as we identified yesterday.

Today, this morning, what we want to do is present to your Honor for consideration many of the other projects that are pending and for which agencies have received applications or which are formally before the boards or beginning to be before the various local and state entities and municipal entities for approval.

I would like to start with the

Catskill Watershed Museum. We presented to you CPC Exhibit 99, which indicates, your Honor, that there is an option that has been secured on 44 acres of land in the Town of Middletown, and that there are preliminary designs for the building that have been done, including some initial exhibit design plans. We believe this is far enough along in the process to be required to be considered by the Draft Environmental Impact Statement. The failure to do so is a significant deficiency which requires further adjudication.

We believe all these projects that we're going to talk about today will raise issues of additional traffic, additional visitors to the area, which may or may not -- withdrawn -- which will take place at various times of the year which will contribute to potentially the use of the Belleayre Mountain Ski Center, beyond that which it's capable of absorbing at this point.

We believe that there are significant issues in terms of water withdrawals, in terms of changing the community character and potentially aquatic habitat as well, as a consequence of water withdrawal.

What we're saying, your Honor, is that -- we're certainly not saying that CPC is opposed to any of these projects. What is important and what is absolutely essential as a function of SEQRA is that the impacts be disclosed and that they be evaluated in the decision-making process. And that is what is lacking in the Applicant's documents to date. That's our position in terms of the secondary induced growth. It's also our position here in connection with cumulative impacts.

To give you some background on the issue of the Catskill Watershed Museum, I've asked Peter DiModica, who you met previously as a witness on community character, and also has been a participant in some of our challenge events during our site visits.

Mr. DiModica is a former supervisor of the Town of Shandaken. He is also a member of the executive committee of the Friends of the Catskill Interpretive Center, and an active member of this community.

I wanted Mr. DiModica to give you some background on the history and the status of the Catskill Watershed Museum.

MR. DIMODICA: I'm speaking mostly about the time that it was proposed for the

Town of Shandaken. I know that they have since gotten some grant money from the O'Connor Fund. I know they have -- as was said before, some options on the property, I believe. On the off-site visit when we were going off to Hanna, we stopped and were shown that property by Gary Gailes on the left side of the crossroad, the cutoff road.

It was first proposed in Shandaken on property offered to the town by the project manager of this project, Gary Gales, on Highmount. At the presentation of the Town Board, there were some issues that were brought up, one of those issues was that there were likely to be 52,000 visitors per year to make their basic -- their breakeven point was 52,000 visitors a year. One thing that was a little strange was that they had 48 parking spaces.

There were other concerns brought up about the exhibits by the citizens in the audience. I publicly asked them to come back with some adjustments to that and to, you know, make some changes and come back to us.

As soon as the issue of segmentation

was raised, I believe in the letter by the Catskill Heritage Alliance, the project moved to Arkville. Now, since most of the visitors would be coming from the east, I think it still would have an impact on the traffic.

MR. GERSTMAN: Your Honor, Mr. DiModica also as Friends of the Catskill Interpretive Center has information concerning a proposal that has been pending for, I believe, the Mount Tremper day use area concerning the Catskill Interpretive Center.

My understanding, and Mr. DiModica will explain this further, is that it would follow along the nature of the Adirondack Interpretive Center, which attracts significant numbers of visitors. It's a very beneficial gateway feature for the Adirondacks, attracts visitors and, in fact, is very, very well used. And actually the agencies that have put it together have done a great job, if you have been up there.

Do you want to comment on the Catskill

Interpretive Center?

MR. DIMODICA: Yes. The Catskill Interpretive Center would have the dual role of education and tourism. So it wouldn't be primarily a tourist destination. It would also be something there for the local people to go, maybe hear seminars, see movies or presentations on all sorts of things about the Catskills, from the bluestone production to trails and fishing and all that sort of stuff.

The Interpretive Center has a web site, catskillinterpretivecenter.org. It had about a million dollars invested by the state to do the entry bridge, which is referred to as the bridge to nowhere, since it's a beautiful bridge and entryway to a field.

It was kind of dropped at one point and officials and interested citizens from four counties, Ulster, Delaware, Sullivan and Greene, got together and started to get this process moving again.

The idea was to do some fundraising from private funding to try to build up -- I believe the figure -- the total figure to build it was about $6 million, and the plan was to try to raise a million and a half in private funding and then have the state kick in and put together the other four and a half million. I could be a little wrong on those figures, but I believe that is what we were talking about. We're coordinating this on the local, regional and state levels. We've gotten resolutions in support by the Ulster County Legislature, by the Town Board -- town boards of various towns.

It also had pretty good support in the Town Comprehensive Plan Survey of 1999-2000, I think that's one of our exhibits. And it would be similar to the two Adirondack Interpretive Centers. And we would be, of course, seeking state funding once we get it off the ground with the local funding.

We have raised some money. The people are very, you know, into this idea. A lot of people have shown support for it, so I think it would be a good thing.

And again, we don't know what the numbers of visitors may be, but we're hoping it would attract visitors.

MR. GERSTMAN: Mr. DiModica, you said

there's a bridge that's been constructed at the site?

MR. DIMODICA: Yes.

MR. GERSTMAN: The intention when it was constructed was --

MR. DIMODICA: To build the Interpretive Center.

MR. GERSTMAN: So there's actually an infrastructure in place for the Interpretive Center?

MR. DIMODICA: Yes.

MR. GERSTMAN: Your Honor, we now refer to CPC Exhibit 100, which is a newspaper article dated August 11th, 2004. I identify and point out that there has been a significant grant that's been announced that will allow funding of a 14-family-style townhouse and 30 apartment development on County Route 38 called originally, "The Crossroads in Arkville." And we believe that that's adjacent to the site that the Catskill Watershed Museum has obtained an option on. Is that your understanding, Mr. DiModica?

MR. DIMODICA: I think so, yeah.

MR. GERSTMAN: I next refer you, your

Honor, to CPC Exhibit 101 referring to a July 7th, 2000 letter from Mr. Todd to Assemblyman Cahill requesting a grant for the

Catskill Mountain Railroad. And the money would be used to construct, essentially, the new railroad bridge tressels and two portions of the Catskill Mountain Railroad tourist line. It's my understanding that this grant was approved.

Your Honor, on page -- essentially one of the document that's attached, which is the "Catskill Mountain Railroad Economic Impact Study Completed for Ulster County by Fair Weather Consulting," dated March 1999, under the executive summary you'll see that the most likely scenario, in terms of visitors, is that they anticipate 50,000 visitors in order to provide the revenue necessary to keep this going.

The worst-case scenario that's listed there is a 15,000 visitor level, and the most optimistic is 200,000. But they anticipate, when this project is complete, to attract 50,000 visitors to the project, to the railroad.

CPC 102, your Honor, refers to a 17-lot subdivision that's currently pending before the Town of Shandaken planning board.

These are the only documents that we have been able to obtain at this time. The location is in Pine Hill, and it's essentially on old Route 28, approximately 800 feet from Academy Street Road. Pete, can you describe that location, where that is?

MR. DIMODICA: Yeah. Well, you're familiar from our site visits, off-site visits, the Main Street of Pine Hill where it comes to Academy Street, it's right around where that hotel that's being renovated is. If you look back toward 28 up the hill, it's about 800 feet above there. It's an area called Chelsea Park. I believe we actually pointed that out to you also coming down that hill in Pine Hill.

MR. GERSTMAN: Your Honor, we next refer you to CPC Exhibit 103. I'll ask Mr. DiModica again to help us in terms of the location. But this is a proposal that has been presented to the Town Board in the Town of Shandaken for a 96-room hotel on the Route

28 corridor just east of the Pine Hill property.

Mr. DiModica, do you know where this

is proposed?

MR. DIMODICA: Yeah, approximately it's on the north side of Route 28 between the entrance -- the easternmost entrance to Pine Hill and the sewer treatment plant, the wastewater treatment plant.

MR. GERSTMAN: You'll notice that the Applicants are trying to incorporate a restaurant and gift and conveyance shop -- convenience shop, and they're also looking to incorporate a shuttle service to and from Pine Hill, Phoenicia and the Belleayre Mountain Ski Center. The project is described in that exhibit.

Your Honor, it's also my understanding, although we don't have documents to present to you today, that the Margaretville Hotel project that you have heard referenced repeatedly in this proceeding, and also which we had the occasion to visit on one of our early site visits, has put an application to the Department of

Environmental Protection to allow them to connect to the POTW in Margaretville, as far as I understand. That application we heard was initially denied by DEP, but as far as I understand, the application was resubmitted and there's a likelihood that it will be approved, from what we have heard.

The next issue, your Honor, is raised by CPC Exhibit 104. This is a document that we obtained through the Freedom of Information law from the Department of Environmental Conservation. It appears to be a presentation that was made by the Director of Operations, Tony Lanza, to various public forums in and around the Route 28 corridor.

Although Mr. DiModica can't attest that this is the entire presentation that he saw, there may be some additional notes in this presentation that were not in the one he attended. If I can characterize what you said, Mr. DiModica, this is essentially a PowerPoint presentation that you witnessed in a public meeting in Pine Hill by Tony Lanza?

MR. DIMODICA: Yes.

MR. GERSTMAN: What was the nature of

that meeting?

MR. DIMODICA: A public hearing to talk about the Draft Unit Management Plan that they were working on, and the first few pages in there that talk about the skier visits were part of that presentation. The revenues, I believe, was also part of it, skier visits was part of it. He did speak somewhat about the summer operations. When it gets near the end, the end of this, I think it may have been more part of an in-house presentation. I don't remember the overusage, although that might have been part of the presentation that he gave, and I believe that there was more to the presentation that is not in this as well. But I know the skier visits and revenue was part of it.

MR. GERSTMAN: Let me just make sure I understand, Mr. DiModica. The purpose of the presentation was to present the plans for the Belleayre Mountain Ski Center expansion?

MR. DIMODICA: The Draft Unit Management Plan.

MR. GERSTMAN: That called for an expansion of the ski center?

MR. DIMODICA: Yes.

MR. GERSTMAN: Do you remember the specifics of the expansion at this point?

MR. DIMODICA: It was a while ago, but I remember they were going from, I believe, 17 miles of trails -- I remember Tony saying they would go to 22 miles, maybe 22 and a half miles, that they were leaving a little bit left in the size that they can expand to by virtue of the Constitution. And that there would be a huge increase in the skier visits. I don't remember the numbers that was actually part of that presentation in there. I think some 170,000 or something a year.

MR. GERSTMAN: For the record, your Honor, we can provide the accurate numbers. I believe the Constitution allows the ski center to be expanded up to 25 miles.

MR. DIMODICA: If I could also add one other thing that really did impress me and a lot of people there at that meeting was that there was talk about a gondola run down into the edge of Pine Hill up near the water company property. And in a previous engineering report by Sno Engineering, they were talking about a major, major expansion into Pine Hill. And people were very upset about it because at that point they were taking a bunch of houses for parking lots and all that sort of thing.

In the plan that Tony Lanza presented, he promised there would be no parking at the end of this trail. It would merely be a trail bottom. You would be able to ski down, get back on. It would just make a very long trail. You could get back on the gondola and go up. And he left it up to the people of the Town of Shandaken or Pine Hill how they wanted to access that area.

So if, for instance, the people felt good about the idea of having a shuttle bus go there at lunchtime and bring people into the town, that would be up to the people of Pine Hill. And everybody found that to be a very good plan in that it wasn't heavy-handed, and it would allow the people of Pine Hill to make use of it as they saw fit.

MR. GERSTMAN: Your Honor, I refer you back to the exhibits to our petition, Exhibit R, are the articles that identify and report on the public meetings and the UMP planning process that was undertaken by DEC in anticipation of this Belleayre Mountain Ski

Center expansion.

Let me make one thing perfectly clear on the record, because I have been the subject of some press information in the past, which has tried to mischaracterize CPC's position concerning the Belleayre Mountain Ski Center. Let me make it perfectly clear that the Catskill Park -- Catskill Preservation Coalition supports the Belleayre Mountain Ski Center expansion. We have issued a press release to that effect. There has been no question in this proceeding that that is, in fact, the case, and I will not tolerate being -- our position being mischaracterized in the public in order to drive a stake, a divisive stake between the community in this community, and that's the only purpose for which those press releases were issued by Crossroads Ventures.

The other issue that has not been addressed by the Draft Environmental Impact Statement, is sorely lacking, has to do with the impacts on the use of the ski slope itself. The Belleayre Mountain Ski Center, if you take a look at some of these documents produced by Mr. Lanza, it is characterized as being overused. The numbers that have been put forward by Mr. Ketcham in the traffic analysis indicates that there's a steady increase in the use of Belleayre Mountain Ski Center. There was a dropoff, I believe, in the winter of 2002-2003 because of the snow, but there has been a steady increase in the use of the ski center.

There is no analysis on the impacts -- an what the impacts of this resort will be on the use of Belleayre Mountain Ski Center. In fact, one would argue that being part of the forest preserve, while it's an intensive-use area, this is a situation that calls for a very intensive review of what the impacts will be. What will the use look like? What will the impacts be on parking?

We've already heard that the shuttle bus operation is deficient in terms of transporting people from the resort to the ski center. What kind of crowds are there going to be on the trails? Will it, in fact, be counterproductive because of the alleged overuse? As Yogi Berra once said, that restaurant -- "Nobody goes to that restaurant anymore, it's too crowded."

So the same type of thing might occur to the Belleayre Mountain Ski Center. We're very concerned that the lack of analysis here presents a gaping hole in the evaluation of the cumulative impacts of this projects.

We are also concerned, as we have identified previously, that the exploitation of resources by this project may leave little room for the future Belleayre Mountain Ski Center expansion, that this project may create conditions and may deplete water resources or may have impacts on traffic, which somehow will not allow the Belleayre Mountain Ski Center to expand due to the exploitation of those resources or the use of those resources.

And we believe that it's absolutely essential in the evaluation of this project to ensure that the Belleayre Mountain Ski Center expansion is considered so that does not happen. We're seeking, essentially, to protect the expansion and make sure it does not suffer at the expense of this project, which we believe is potentially likely given the enormous impacts that this project will have on the very resources which will be necessary for the Belleayre Mountain Ski Center to use in order to expand.

Your Honor, many of these issues require a legal briefing to identify the current status. I anticipate objections from Mr. Ruzow concerning the formality of the applications submitted, whether or not these are glimmers in the eyes of the developers or whether, in fact, they have formal status due to applications pending before various agencies.

We believe that all these applications, all the projects I have referenced today have sufficient formality in an agency process, either through funding or through applications pending, that they must be considered in the cumulative impact analysis that's undertaken to evaluate this project; and that those evaluations are lacking, are absent, in fact, from the Draft

Environmental Impact Statement.

The two percent growth factor that's used by DOT to evaluate traffic impacts over the course of a project's development and build year are not a substitute for evaluation of projects that will take place in a community. And I don't believe DOT would suggest that you can avoid evaluating those.

Certainly SEQRA doesn't allow you to avoid evaluating those pending projects using some generic growth factor that would be applied -- I believe that the EIS uses a three percent growth factor. Even that is insufficient in order to evaluate the impacts from these pending projects.

I think the briefing on this, your Honor, will shed some further light on the issues of which projects are required to be considered, and we believe that all of these fall into that category.

Thank you.

ALJ WISSLER: Would you like to respond first.

MR. ALTIERI: My comments are just

limited to the mentioned, you know, so-called expansion at the ski center. Just to reassert and restate our comments, Staff's comments before regarding the alleged expansion, it's speculative at this time. It would have to go through numerous hurdles before such an expansion would ever be effectuated. None of this has occurred.

Any proposed expansion of the ski center would be limited by the Constitution. The number of visits could be limited by parking, lift capacity, weather, and the decision of the ski center, whether it actually even wants to try to max out at the site under the Constitution. All these are elements that just -- evidence that this proposed or this mentioned new expansion is purely speculative.

As to CPC Exhibit 104, it doesn't evidence anything. The mission statement, I think it's pretty vague, "Why We Are Here."

ALJ WISSLER: Mr. Altieri, let me ask you this. There was a UMP in 1998; correct?

MR. ALTIERI: Correct.

ALJ WISSLER: That was finalized?

MR. ALTIERI: That's my understanding.

ALJ WISSLER: Have all the projects
that were proposed under that UMP been
completed?

MR. ALTIERI: I don't know that to be the case.

ALJ WISSLER: Is that UMP still valid, or is it in abeyance pending some new UMP?

MR. ALTIERI: I believe the '98 UMP is the one that's effective now.

ALJ WISSLER: That's still effective?

MR. ALTIERI: I believe so. That's my understanding. The third page of CPC 104, "Why We're Here," quote: "In order to not only ensure Belleayre's continued growth but to be certain that our vision is environmentally sound and consistent with that of our neighbors and guests, we are conducting an open forum to encourage the partnership we have enjoyed in achieving our shared goals. Our commitment to be in harmony with this community is steadfast. It is in this spirit that we are presenting our vision of the future of this mountain as it relates to our friends, neighbors and visitors."

We have historical revenue data in the

following pages, historical ski visit data. A page that represents summer operation but doesn't elaborate. Another page that speaks to handicap accessibility. Some were comments with no elaboration. Winter operation. I'm not sure what -- some date that looks to historical housing numbers perhaps. I'm not sure what this next page represents. (Indicating)

We have a couple of photos regarding usage that show a crowded eating area; each one, one indoors, one outdoors. I don't know what that establishes in the context of this proceeding. (Indicating)

Maintenance garage. This is, I think, the only page that looks prospectively. "A new maintenance garage was already approved in the 1998 UMP, but we are in the process of determining its new home."

Questions -- well, the only question is: "Suggestions of where it should go?" That's the only prospective looking item in 104. And we have a couple of maps at the end. (Indicating)

So essentially, we're just restating

Staff's prior comments regarding this alleged expansion. At this time it's speculative, and even if there was some sort of future expansion, that expansion would have to undergo SEQRA and would have to do the complete review of the surrounding area, which may or may not include this proposed project. So the public is not being -- full public review would occur regarding any future expansion or additional expansion of the ski center.

Thank you.

MR. RUZOW: Your Honor, a couple of things. With respect to CPC Exhibits 98 and 98A, we have two photographs that are taken -- and I would defer to Al Frisenda in terms of their precise location -- that were taken near the state property on the Rochester Hollow Trail leading -- adjacent to the Vinci property. And, your Honor, they show the nature of the public access that is allowed to the Vinci property. So that's Applicant's Exhibit 134.

ALJ WISSLER: 134.

(PHOTOGRAPH TAKEN NEAR STATE PROPERTY

ON THE ROCHESTER HOLLOW TRAIL RECEIVED AND MARKED AS APPLICANT'S EXHIBIT NO. 134, THIS DATE.)

MR. RUZOW: The second is another photograph taken approximately the same location, Mr. Frisenda?

MR. FRISENDA: Yes.

(PHOTOGRAPH TAKEN IN APPROXIMATELY THE SAME LOCATION AS APPLICANT'S EXHIBIT NO. 134 RECEIVED AND MARKED AS APPLICANT'S EXHIBIT NO. 135, THIS DATE.)

MR. RUZOW: In case there's any ambiguity with regard to the open access that was suggested during our site visit, the land is posted. It is not -- public access is not provided. So we still question whether the views, as beautiful as they were, whether the views are meaningful, in terms of the site visibility from places of public interest.

Mr. Gerstman is correct because he is familiar with what the law is under SEQRA regarding cumulative impact assessment. We do take issue with their suggestions that projects, many of which have been dormant, lack funding and are still the gleam in someone's eye, a wonderful gleam, but nevertheless, never reach the stage of public -- of a point at which one can do anything but speculate regarding what their impacts might be, do not belong in a cumulative impact assessment. And we'll look through these documents and respond and brief these issues as necessary. But the SEQRA law does not require that an applicant for a project take into account other projects, unless they are pending and they've reached their own level of maturity where their impacts, in fact, have been presented and can be assessed cumulatively.

For example, the Catskill Interpretive Center on Route 28 has been a gleam in the eye of the area since the Catskill Center for Conservation and Development acquired that site sometime in the late '80s or early '90s when DEC was convinced to take a 99-year lease on it, I believe, and they built the road to nowhere. In fact, there is a road, it's a lovely road. You can go back there. But there's never been any funding to bring it to fruition.

Indeed, one of the factors in the Memorandum of Agreement, which was hard fought at the negotiation table, was funding for a visitor interpretive center museum exhibits. And indeed $3 million was provided, I believe it was $3 million, with a million for exhibits, which expired because they couldn't agree on the site there. And ultimately the site was not found somewhere else until afterwards.

So the opportunities for that development of that site as an Adirondack Interpretive Center -- which Marc is correct, it's a beautiful place at Paul Smith's College in Newcomb -- has never come to fruition here.

So how we can assess the cumulative impacts of a project that has never been able to get off the ground -- as good as an idea as it is -- under SEQRA, either required to or can is just impossible.

With respect to the current Catskill Museum -- and we can present information, Gary Gales, I believe, is the president of that museum -- that too, they've required an option and are in the course of fundraising. They have an idea for an artist's rendering for the building, but no funding to do more than the artist rendering and an idea for the model of the building.

Programmatically, they need to raise money. So when and if that is all successful -- the O'Connor Foundation grant I think was a matching grant. I know a number of people attended an event this past spring on a fundraising, and thank you to the local folks for giving money, but there are no plans that one can assess. From a financial feasibility point of view, yes, just as the Catskill Interpretive Center Museum, you have to do some feasibility numbers. Indeed, the exhibit with respect to the Catskill Mountain Railroad, that's a 1992 document. This is 2004, August 25th today.

But those documents, you must do the financial feasibility. Where is your breakeven point? How many visitors do you need? But they have not progressed the museum to the point they know how many visitors they're going to have and provide for that. That's later on.

SEQRA will require -- with the Belleayre UMP, I concur with our colleagues from DEC, that that has not yet reached the point. That meeting was a charrette, an opportunity to provide public input into an ongoing planning process. There is a planning process, and they have not yet reached the stage for the planning for the Belleayre Ski Center for any further expansion.

Mr. Gerstman's suggestion that the resources available to Belleayre will be depleted by this project moving ahead, we have challenged their suggestions, we think their science is not good science. We have presented our own views and met the state's requirement for pump tests, et cetera.

And from a traffic point of view, we meet all the state requirements for DOT, in terms of projections on traffic. And three percent is a very high growth rate in an area that has largely seen very little growth whatsoever. You've heard all the offers of proof with regard to the population numbers in this area, and the only measure you can see is based on 10-year segments. And you see very little movement within those segments.

So the growth rate we have projected and used is a very large one which exaggerates the impacts but takes into account all the things that might come along, unless there's some new pending proposal.

With respect to the hotels that are being suggested and the other developments, they have an obligation in their SEQRA review to take into account our project from a cumulative impact point of view.

SEQRA doesn't require -- you won't find it in the regs and you won't find it in the case law, an obligation for an applicant who has had a determination of a scoping outline and a positive declaration years ago and submits an application and a Draft EIS that is finally accepted as complete to commence the public process, to assess cumulative impacts of projects that come up afterwards. You're not going to find a case that says that you have that obligation.

What you have is an obligation to do -- they will have an obligation to consider our project as a pending project, in terms of the implications of what they will add to it. But not the other way around.

As you understand, your Honor, this

has been a very long process, and it remains a very long process. We do not have an obligation to continue to amend, in effect, or supplement, as they're suggesting, our environmental analysis every time something happens, somebody else comes forward with a project. You would never be able to focus and make a decision under that theorem. And it is just simply not acceptable, and we will brief it further.

But with respect to the resources for Belleayre, we believe our experts have demonstrated that there is ample capacity for water and sewer, certainly for sewer without any question, as well as -- subject to New York City allowing people to tie into the available capacity now at 415,000 gallons a day. So there isn't a paucity of resources that this project will somehow impinge in terms of others.

With that, I will close and we will supplement both our submissions and our arguments in a brief on this issue.

Cumulative impacts is an important issue, and we have forecasted induced growth and secondary growth, and we have taken that into account in our submissions, in our Draft EIS. And while there have been interesting arguments that induced growth will be greater, the corollary benefit of that induced growth, in terms of taxes and wealth, as described by Mr. Arace yesterday, in the area, have not been cataloged to the same extent and offered, in effect, your Honor, as justification for a balance, the ultimate SEQRA balancing, because we took a very conservative view on most of those issues.

But the point is that when there has been an identification of the potential, realistic potential for growth, we have demonstrated what that is. And with regard to these other projects, many of them are great potential projects that may or may not arise in our -- in the next horizon in this decade. And when and if they do, they too will have to take into account the cumulative effects of our projects and other projects along the way.

But there's ample capacity in the roadways, there's ample capacity in the water regimes and the things that are important, in terms of the quality of life, and their synergy is still very much available to the region. They're all tourism-based ideas as a way of attracting people into this region. They are not mutually exclusive, they all work together.

And if they ever get off the ground, there is no question that this project will seek to harmonize its visitation with their visitation, whether it's through shuttle systems, whether it's through timing and operation. They all make sense in a tourism-based economy.

And indeed, they evidenced something that was, quite frankly, not suggested as -- sort of almost in a counter way -- by the comments by the RPA. This is all increased tourism. Those very same projects might lead, based on their theorem, to some form of induced growth. I have not heard, in references to these, that that might be possible.

We see that these projects are all trying to achieve the same thing, which is restoring this region's ability to act as a tourist mecca for this part of the state. And everybody has their dream. Everybody has a goal in terms of achieving a certain level of visitation. Not everybody gets to be as successful, but where the resources and the attractions are actually available, they increase everybody's chance of sharing in some success.

So we don't see any of these things as competing in any way, but they all become important if they can be successful to restoring the region's grandeur as a place of visitation.

But the roadway systems, the assumption that is built into the argument is that the peak hour -- everybody is going to come on the same Martin Luther King ski day in the same hour. That's the only way you can get to a point where -- I'm just adding in my head, all of these visitations were to occur at the same time -- where Route 28 might find some constriction. But that's impossible because you're -- the railroad has got to be operating at the same time that the museum that's got bus loads of people coming to it, at the same time the skiers are coming to the center, at the same time, God willing, this facility is full to the brim with every room filled. Not possible.

You analyze these things from a worst-case point of view to look at things, but you don't surrender logic and sanity in the course of doing that. And we believe that an appropriate measure of analysis in this process, relying on DOT's standard methodology for looking at how you look at worst case for them, applying New York State DOH and DEC's measures for water pumping and testing the capacity, and a realistic sense of when people will come and how they will come, at the end of the day has to be applied in terms of the cumulative effects of this project and anything else.

You don't take a myopic view and a narrow view because science or some methodology suggests that you can, or computers will give you the ability to look in a particular fashion that, again, you surrender your logic to say that: Oh, that is the measure by which we make our judgment.

That is not cumulative impact analysis. It doesn't require that. And here, where many of these projects have not yet reached the stage where there's data, other than a single data.

We use Marc's example, 50,000 visitors, most reasonable case, as opposed to 15,000 -- best, worst case, I don't know how to describe it. When are they coming? Where is the data to inform us, to inform our consultants when they are coming? What days would they come? Is it school kids? Is it during the school?

You don't have any of that. You can't analyze it. So the prematurity of it, and we'll brief this, but the prematurity of all these things affect the realistic ability to project, to assess these things. You don't do it in a speculative fashion. SEQRA does not require that, the courts are consistent in that view. And while someone can dream up a way of trying to consider all these things together, the law doesn't require that an

Applicant do that.

MR. GERSTMAN: May I?

ALJ WISSLER: Yes.

MR. GERSTMAN: Your Honor, I actually find it somewhat astonishing that the DEC Staff will not step up and protect its -- the potential for its future project. We know that the Belleayre Mountain Ski Center has the ability to expand based upon the constitutional limitations.

ForMr. Altieri to talk about the -- our Exhibit 104, the PowerPoint presentation, as if it was not a DEC record that was put out in conjunction with public meetings which envisioned the expansion of the Belleayre Mountain Ski Center, defies logic.

This is a project that was moving forward, that had the official imprimatur of the director of the Belleayre Mountain Ski Center. And the brakes were put on at some point as a result, we believe, of the Belleayre Resort project.

DEC Staff should be aggressively protecting its resource and the ability for that resource to expand. And they have not done so.

What we haven't said is this exhibit stands alone. We've said, take a look at the articles in Exhibit R. Listen to what Mr. DiModica said in terms of the presentation that Mr. Lanza made to the public, in terms of outlining his vision -- not Mr. DiModica, Mr. Lanza's vision -- for the expansion of the Belleayre Mountain Ski Center and you will find there's more than a speculative proposal sitting before DEC.

If we had the opportunity to have discovery, not that we needed it to make our case, but if we had opportunity for discovery, we would have clearly established that this project is more than just a glimmer in Tony Lanza's eyes. It's gotten much further than that. We unfortunately were prevented from having that information.

We do believe, however, we have established the viable -- that this expansion is, in fact, a real project. We are more concerned apparently than DEC Staff is concerned about the possible expansion and protecting the resource to enable that to occur in the future.

Mr. Ruzow talked about the -- I believe he misspoke when he was referring to

CPC Exhibit 101, which is the Catskill Mountain Railroad. The letter is dated July 7th, 2000. It's based on a study of March 1999. I thought he was referring to something around 1993 or earlier.

The DEIS itself brings together the ski center and this project. There's countless references, which we have already provided to your Honor, in connection with the marriage of these two projects. There's reference to the expansion. We have established, through the Belleayre Mountain Ski Center maps and trails that go through each, that not only is the project married to the forest preserve and the amenities that are here, in terms of wilderness and wild forest areas, but the project is definitely married to the ski center.

For Mr. Ruzow to then say that it's all speculative, and maybe we'll take a look at the harmonizing visitation at some later date is contrary to SEQRA. SEQRA requires an analysis before this project is built to determine what those impacts are, to determine whether they're significant -- which they are -- and to mitigate and avoid, to the maximum extent practicable, consistent with all those other important considerations.

Also, the Commissioner has a responsibility, not only under SEQRA to evaluate cumulative impacts, but under Environmental Conservation Law 3-30301(2), I believe it is. It's 30301. I'll confer with Mr. Ruzow later to get you the exact cite.

ALJ WISSLER: I know where to look.

MR. GERSTMAN: So this is not just a requirement under SEQRA, it's a requirement under the general powers of the Commissioner -- required evaluation of cumulative impacts.

Whether or not the scoping outline in the DEIS included these projects is obviously subject to legal interpretation and discussion at this point.

This is not just any project. This is an overwhelming project that will have significant ramifications not only for the communities in which it's situated, Middletown and Shandaken, but the entire region and, in fact, the Catskill Park and the Catskill

Forest Preserve. It is under that roof or that umbrella that the cumulative impact analysis must take place. To ignore the potential cumulative impacts of this project, Belleayre Mountain Ski Center expansion, and all the other projects we put on the table, violates and contravenes the spirit of SEQRA and the letter of SEQRA, as we will brief it later on.

But this is not every project. If it were every project, then maybe Mr. Ruzow would have some point. The long-term evaluation and consideration of this project by both DEC and the public evinces that there's a necessity for full and complete evaluation in order to avoid the likely impacts that will occur.

The fact that there has been a long time frame between the scoping document, the acceptance of the Draft EIS, and now the adjudicatory process, is not something that Mr. Ruzow can hide behind in order to avoid the evaluation of impacts. We are here in an adjudicatory process. This is not just a local planning board dealing with the SEQRA process, taking into account comments on the draft EIS and responding to it in a final EIS.

We are in an adjudicatory process where your Honor's responsibility, as you well know, and the Commissioner, is to determine whether there are substantive and significant issues. Not to say, well, the timing isn't right for evaluating impacts so we can't look at it. That's not what's required under uniform procedures and the Commissioner's hearing decisions, and frankly, under SEQRA as well.

We note that Mr. Arace was talking yesterday about the economic viability of this project and others. We believe that our experts, both on alternatives, Mr. Alschuler; on traffic, Mr. Ketcham; on water, Mr. Michalski and Mr. Rubin, have all demonstrated, based upon their evaluation of the DEIS and their application of their scientific expertise, showed, in fact, that there were significant issues on all these counts, all these substantive areas.

Mr. Arace mentioned yesterday that gambling was really the shoring-up of the Sullivan County hotels. It's the thing that was keeping those hotels afloat. Nobody is talking about that here, and so there may be apples and oranges, but the Sullivan County hotel example can't be used necessarily for this area, unless gambling is introduced as a possibility. I understand the project sponsor, to the extent that he's involved in this project, said he's not interested in that, but to the extent he has no control over the future of that issue.

We're not looking for anybody to surrender logic. We're looking for, in fact, the application of law and facts and science to a very significant project that's going to have far-reaching implications for this region, for the forest preserve and for the future of the Belleayre Mountain Ski Center.

We think we've established a substantive and significant issue, and we believe this issue, based upon the entirety of the record, ought to go forward for adjudication.

Thank you, Judge.

ALJ WISSLER: Brief comments before we take a break?

MR. ALTIERI: I'll make a short comment that I find it objectionable when CPC staff uses the word "brakes," that the DEC put the brakes on this, again, speculative expansion. And I would just say for the record that the DEC has been and continues to be an excellent steward of the ski center, notwithstanding CPC's self-serving comments otherwise.

MR. RUZOW: Your Honor, I just want to respond that with respect to the project interrelationship with the Belleayre Ski Center, our DEIS does in many places describe the way in which this project can integrate itself without harm and, indeed, meeting mutual objectives for the ski center. And if necessary, we will continue to brief that issue further.

With respect to Mr. Gerstman's position and the concern being expressed for community character, it is important to note he does not speak on behalf of the two towns, the municipalities which, as we heard yesterday, have the responsibility and want to exercise that responsibility for determining their destiny with regard to this project and other projects that will come up before them.

And SEQRA does not change jurisdiction between or among agencies. SEQRA is expressly -- it's a statutory provision in the SEQRA statute. And that, in part, is what they're asking you and this agency to do.

We are not at an adjudicatory hearing, with all due respect, yet. That is a determination that you and the Commissioner have to make to see whether or not there is a basis for that.

At this point in time, because the Department staff have not suggested that that is warranted, they are the supplicants coming to this agency to determine whether or not there are issues that can affect permit issuance in a material way. We will argue, and we will present in the brief, why we do not believe they have met that standard at this point. And -- but SEQRA does not -- UPA does not turn SEQRA on its head in terms of what is reasonable and rational in terms of what you adjudicate and how you determine impacts.

We are very much in a SEQRA mode at this point in time, and your job is performing it, albeit it under the UPA umbrella, which is integrated with SEQRA at this point in time, to consider the comments that people have made, what our appropriate response is, and then separately to determine for the Commissioner and the Department whether or not any of these issues rises to the level of affecting a statutory or regulatory criteria in a material way, and separately whether it's significant enough to actually affect permit issuance.

We're still in that process. You know, you've heard argument, and that's all it's been, and proffers of proof for, I don't know, 20 days now. And there's a lot that has been said. But at the end of the day, the standard that is going to be applied is not met simply. You are still performing a regulatory function and you don't abandon that regulatory experience and insight to anyone, whether it's us, quite frankly, or the CPC's purported experts.

You're still free -- there's nothing

in SEQRA that mandates that there be an adjudication. To my knowledge, this is the only agency that actually attempts to adjudicate questions that are presented in an environmental forum.

There may be other agencies that have similar types of authority, APA, PSE, but under SEQRA, this is the only forum in which the broad spectrum of issues that can be raised under SEQRA or have the potential for adjudication, if and only if you and the Commissioner determine that they have risen to this very high level of potentially affecting your jurisdiction in permit issues.

So it is a unique position, and it is a fascinating one, and it's one I've been a student of for 20 years. But it has no particular cast or model to it that must be followed. And all of this information is taken into account in performing it.

So we will, as Mr. Gerstman suggested, and Mr. Altieri, we will brief these issues,

but I just don't want to leave you with the
notion that simply because one can find an
expert to make an offer of proof with respect

to an issue, that that then rises to a level of adjudication because, in fact, there's a dispute. The Department always has that power to reserve to itself the ability to determine what will be adjudicated.

With respect to the cumulative impact authority under Article 3, as you may know, that authority was actually provided to the Department in the same year in which SEQRA was enacted. And I think the Legislature, not being sure which would get passed. But that's a different authority, and that talks about considering the cumulative effects of the grant of multiple permits by the Department, looking at various resources. It doesn't have, at least in my judgment, the breadth that SEQRA might provide to it, in terms of community character and things outside the Department's stewardship.

But it is a different authority, and it has been exercised very rarely in the history of the Department's review. But we believe that the record has been established and will provide the Department with the ability, and I believe Staff's position on the project so far have taken that into account, that we have -- this project does not raise issues that haven't been conditioned in terms of their permit that will affect the Department's stewardship of the various resources that it is required to either regulate or protect as the state's agent.

So it's there. It is obviously a tool that is available to the Department, but whether the Department chooses to exercise that in this case or any case is still not directed or mandated by any particular proof that is offered by any party in a proceeding. It is a separate piece of authority available to the Department for consideration.

MR. GERSTMAN: Two very brief comments. One is, again, we need to make sure that the record is clear concerning the CPC position and the Belleayre Mountain Ski Center, because it has been, we believe, intentionally misinterpreted.

No one suggested that Mr. Lanza's

oversight and management of the Belleayre Mountain Ski Center hasn't been anything but exemplary. And I understand that he's a very active member of the community, soliciting comunity and public support and public input into what he was doing. It is not our position that that is the case, just to make that clear. I hope Mr. Altieri wasn't suggesting otherwise.

The final comment is -- I'm sure Dan misspoke when he referred to us as supplicants -- but from now on if we need to approach your Honor as a supplicant, you have to give us special instructions as to how we might approach your Honor in that vein.

ALJ WISSLER: Does it make me an archbishop or something?

We will take a break.

(11:14 - 11:33 - A.M. - BRIEF RECESS TAKEN.)

MR. GERSTMAN: Your Honor, we are about to embark on a presentation by Dr. Piotr Parasiewicz. His curriculum vitae is submitted along with our Petition for Party Status, I believe as Exhibit H.

I'd like to ask Dr. Parasiewicz to describe your educational experience and your background.

DR. PARASIEWICZ: Thank you. Your Honor, first of all, I really appreciate Marc's really hard work on pronouncing my name. I'm not expecting it from everybody. I'm originally Polish. I was living in Austria for 15 years before coming to the United States where I was educated as an engineer, as a civil and water engineer, and where I had opportunity to work for a long time, for 15 years, with a group of biologists at the Department of Hydrobiology Fisheries and Agriculture.

At this time, I had opportunity to work with a multidisciplinary group that was focusing its work on river restoration, river management; and this gave me the second part of my education besides engineering, ecological education and biological dutch. That's where I had opportunity to learn a lot about biology and about fisheries in particular.

In 1999, I came to Cornell University

where I was working at natural resources as a research associate, and begun to establish instream habitat program that was oriented towards development of simulation models and methods for river restoration and river management.

At this time, I had opportunity also to work in Catskill Mountains. I was working on the project on the Beaver Kill River. I was also preparing the expertise for Upper Delaware River, for sustainable management of Upper Delaware River. And I was working recently on Stony Clove Creek, not that far away from the project area. And this study was completed last year. So I was able to gain specific experience in Catskill Mountain region.

Since spring this year, I work as a research associate professor at the University of Massachusetts, where I continue to work on instream habitat issues in the Northeast Instream Habitat Program.

Luckily, my engineering background and biological expertise allowed me to develop this multidisciplinary view of the streams.

And with your permission, that's what I would like to bring first.

My presentation is in three parts.

The first part will be to brief you on status, on conceptual status on running waters and physical habitats, what we scientists actually know about it, what are the most important underlying issues.

The second part will be what I have learned about the Catskill Mountain regions, specifically starting with the Delaware. And then at the very end, I would like to describe how I see this related to the project area and what kind of consequences I would expect based on this expertise, and what I have seen in the project area and the streams in the project area.

MR. GERSTMAN: Let me interrupt you one minute. Your Honor, without going through Mr. Parasiewicz's CV, I refer you to the CV for his publications and various research projects, honors and awards he has received in his professional career.

I also refer your Honor to the exhibits to the Petition for Party Status in which Mr. Parasiewicz has submitted his evaluation of the project and the potential impacts to aquatic habitats.

As you recall, when we presented our offers of proof on surface and groundwater impacts, Dr. Michalski, we believe, established very clearly that the Draft Environmental Impact Statement did not adequately consider what the impacts were going to be specifically with respect to the surface waters in and around the project area.

As a district consequence of the drawdown that will occur from the project, we believe the aquatic habitat will be severely impacted. There's no substantive evaluation of those impacts in the Draft Environmental Impact Statement. And that's why we have asked Dr. Parasiewicz to be here and present his evaluation today.

Dr. Parasiewicz.

DR. PARASIEWICZ: In recent years, there is a growing consensus among scientists that running waters belong probably to most complex systems of our planet, and that our state of the knowledge is increasingly growing. And it is way more difficult than we ever imagined before. Most of the scientists agree to this statement, I think. And I tried to put as -- a summary of what we understand under running waters from that ecological standpoint, and it is this very condensed definition, that probably hardly ever understand on the first glance, that brings the most important issues, and I will address every element of this definition.

But it basically says that: "Running waters are open systems of dynamic four-dimensional processes which can be a biological, chemical and physical nature which are very strongly interrelated within each other and along these dimensions, as well as across the scales."

So what does it all mean? It's probably interesting question. We understand under open ecosystems that running waters or these systems are strongly affected by whatever is happening in its surroundings in the entire watershed. This is at multiple levels.

The simplist example of this kind of

influence is how flow in the river is affected by whatever happens in the landscape or in the climate. The precipitation is one of the factors that affects the amount of water in the river, but it's also the permeability of soils, how much groundwater comes to the river. There is also the storage capacity of the entire landscape, the slope, how fast the water flows down, as well as even vegetative cover that is producing a lot of evapotranspiration and might reduce significantly the amount of water in the river. So this is only one example. This is only one hydrological example of this interaction. And that's what we understand under open systems, that they are open to the influences from outside. (Indicating)

The other thing that we also understand is that those systems and the underlying nature of the system is the dynamics. That's what we people who try to use and live next to rivers have the biggest problem with to understand that it is the basic nature of the stream and of the river that has dynamics that is changing over time.

And it might be -- alignment of the stream will change with every event, either of low flows or high flows. It might move in horizontal direction, it might move in vertical direction, and whatever we see usually as a river corridor is just a small portion of what is -- the area it usually takes.

Then within this system, within this dynamic systems, we identify several critical features, which will be flow, of course, which will be riparian wetland, will be connectivity to the groundwater, as well as streamside vegetation.

And one other definition we -- the term identify low flow channels. That's what we usually see when we would go to the streams. We would go, we would see most of the low flow channels filled with the water because we have a lot of rain. And then we have a bankful channel which is the area of the river corridor that is filled up with water until -- at every annual high flow event.

We also distinguish, as I mention in

this definition before, four dimension, and those dimensions are different than in standard geometry. We identify the linear, longitudinal dimension of the stream. So that's along the corridor. We identified lateral, across the river, and the vertical. And these dimensions are very important because a lot of processes are happening along these dimensions, and I would like to talk about each of them.

Longitudinal dimension and the importance of longitudinal dimension is something that has been realized relatively early, and it was published in the River Continuum Concept. Vannote identified that there are processes and there are some patterns and mosaic of vegetation or of fauna that is characteristic -- is typical to some parts of the river. And this mosaic is connected with each other.

So in the upland stream, the headwater stream that we usually distinguish as the most steeper part shortly after spring, we will have a lot of consumption, not so much production. There's a lot of litter coming into the stream and that's being consumed and transported further down the stream.

While we move further downstream, this

relationship is turning over. We are having much more production of organic matter than we would have consumption. So that's one excellent example how this longitudinal dimension is necessary, these processes are connected along the longitudinal dimension.

And not only this, the river also functions not only as a transportation corridor for water but also for the flora and fauna. Flora and fauna distributes along the river corridors, typically. So they play very important role in the landscape, as arterious for transportation along this longitude and latitude.

One thing that we recognize also, that there is usually a biological process associated with every one of these dimensions, multitude of biological processes. Flora and fauna adapted to this situation and basically relies on existence of longitudinal connectivity.

The simplist example, and most

well-know example, is migration cycle of many fish. Many species show the pattern as presented here on this diagram. They spend most of the time in a portion of the river on the feeding grounds, then very frequently they go upstream to spawn, actively swim upstream to spawn, and then the eggs are hatching. And the juvenile fish, larvae passively are transported down to the feeding grounds again. So this cycle is -- has been developed based on this underlying characteristic of running water, longitudinal dimension.

Another type of dimension that is not so well known and interactions that are not so well known are the vertical interactions. Not many people know that every river extends far beyond it's wetted corridor. It goes far deep into the ground. And it's different in different parts of the river.

Some rivers, that I call alluvial rivers, that physically dig through the substrate that they brought themselves -- that they transported themselves -- are having very rich fauna in this underground area, so-called interstitial area. And this can go very deep, sometimes up to 30 meters.

This is example from one study of my colleagues from Austria showing that in such alluvial stream there was very high traffic of animals, and we had densities of species that were going up to 30,000 species -- 30,000 individuals per square meter. Very densely populated. Again, there are some other species that are strongly depending on existence of this vertical interaction and this vertical exchange.

Here again, another example of this, salmonids, which are the fish which become salmon, trout, all kind of trout species, they use actively this vertical interaction. They spawn -- they go upstream, spawn into areas usually of groundwater intrusion. And then after hatch, the larvae actively go into the interstitial and spend some portion of their life before they move out of it.

Another part that is also very important, another dimension that is very important is a lateral dimension. Every river expands laterally at specific periods of time. Again, in some portions, like in upstream, headwater streams like here. (Indicating)

This is maybe not so evident further downstream. This is very substantial part of the entire system. Again, there are species and life stages that strongly depend on the existence of this lateral interaction.

For example, every pike, or cyprinid species, use the flooded areas for spawning. So pike is physically going to the meadows, spawning over there, the eggs are developing within the flooded areas and then return to the river together with the water. This is -- in this way, the river fulfills the basic life function for the species.

As mentioned before, it's different in different parts of the river in that the lateral dimension is not only caused by flooding and expanding of the river into the side, but also by the very interesting hydraulics of every stream that is allowed to flow normally, starts to flow in a sinusoidal pattern, like a sinusoid. It creates manners, [sic] and these manners are moving all the time. They create backwater and so on. This is identified as one of most diverse -- most diverse area of every river.

Less known is there are parts of streams that we call -- in the intermittent part of the river where river flow in its own substrate into multiple corridors, so-called braided rivers. These corridors are changing constantly in position. And every part of it is being used by different type of animal, by different creatures. This is also the area of very high biodiversity and here the lateral interactions are extremely important.

(Indicating)

This recognition was a base for the River Discontinuity Concept by Ward and Stanford where they identified the three major parts of almost every river, most of the rivers in the world, where we have the headwater reaches, where the interactive paths are going mostly along the linear dimensions. Then we have the braided reaches where we have a lot of lateral interactions, and many, many thalwegs and braids; as well as meandering reaches that are having interactions mostly in lateral and longitudinal, but also vertical dimension. (Indicating)

MR. GERSTMAN: Dr. Parasiewicz, can you describe the terms that are used under aquatic habitat?

DR. PARASIEWICZ: Sure. Oh, I'm sorry. The lotic -- aquatic habitat means that lotic means the species that are oriented along -- first of all, along the longitudinal dimension and living in fast-flowing water.

The lentic means the species is more kind of a spawn type of a species like carp that do not need fast-flowing water for their life. (Indicating)

So that's what is meant here by aquatic habitat. In the upper portion, we have majority of species are those that need fast-flowing cold water. In the lower portion, we have a mixture of both. Still we need some river run species. (Indicating)

The fourth dimension that I mentioned already before is time. As everyone knows, but not many people realize, that the flow in the river is changing constantly. It's every day something different. It is also -- it shows some specific pattern in a year, and this pattern has important biological significance. (Indicating)

So basically the species, fauna and flora is adaptive to this pattern. We have at times high flows, which are usually here connected to the snow melt. We have a short after, that's the peak area, and then we have a spawning time -- this graph is showing a typical hydrograph. So on the vertical axis, you see the median daily flow, and the X axis, you see the days of the year, calendar year and it's a typical hydrograph. (Indicating)

MR. GERSTMAN: Dr. Parasiewicz, does this hydrograph pertain to any of the particular rivers we're discussing today?

DR. PARASIEWICZ: Not discussing today. This is the hydrograph from the Quinebaug River in Massachusetts.

So we have specific events, I call it events, within the seasons, that are probably having the highest importance for aquatic life. We have times of flooding, times of high flows, this will be in spring shortly after the snow melt in this area. Then shortly after, while the flows are declining, we have spawning of most of resident fauna, most of resident species. (Indicating)

Then we have a summertime when the species gather energy for the winter, and there is growth as well as rearing for majority of the species. (Indicating)

And then in the fall, the flows are increasing, and we have some Atlantic salmon spawning, for example, in some areas and further growth in adults and juveniles. (Indicating)

And then we have a winter survival, that we know very little about. (Indicating)

But I just wanted to point out -- this is important that this pattern will be preserved, because the entire fauna is adopted to this pattern.

Now, to make matters a little more complicated, we also identify something that we call scales. We realize there are numerous processes of biological, physical and chemical nature that take place at different scales in the landscape. It might take place on the drainage basin scale, on the scale of watershed. This would be, for example, geological processes. And they will have direct influence on the processes of the scale of the flood plane, reach or even the scale of individual organism.

This is very important recognition, and some of my colleagues believe that scales are driving these systems. And it's important to know so whatever we do in the landscape, whatever -- every modification of a landscape will eventually have an influence on some organism at its scale, and a scale might be of centimeters or meters. We call it microhabited scale. (Indicating)

Then we have -- then we have also biological interactions across the scales. There is production, as you see in the upper-left corner. The energy from sun is creating production, whatever is being produced. Organic matter is being then shredded and then consumed. Animals that consume this organic matter are consumed by other guys that are bigger. And all this develops across the scales, and across the food chain. But there are also other parts that are important and are not known very well. There is competition between the species. That is a very important biological process. (Indicating)

There is something that even some

species might not like each other. This is very interesting observation in my aquarium in my office. There was two species. It was a longnose dace and blacknose dace. Both of them are cousins. But longnose dace did not like any presence of blacknose daces. And as long as blacknose daces were in the aquarium, this fish was under the stones and hiding all the time, trying to chase the blacknose dace away. Once I removed the blacknose dace from the aquarium, the longnose dace was sitting on the biggest boulder and watching to my eyes every day I came to the office.

So these are the events, these are the interactions that we do not know much about.

The purpose of this, what I was trying to bring up here was to make a point that what we've learned in the recent years is that running waters are extremely complex, and that we deal with very difficult systems. And one of the reason is that -- two major reasons, one is dynamics, and second is interconnectivity of all the processes. So for us scientists, it is very challenging to describe them in every detail and know every single element of the system. And specifically our appreciation of this fact began only recently.

Meanwhile, there was a lot of modification introduced into the systems. Many of the rivers has been completely modified and changed beyond the recognition, so that nowadays we have a real difficulty to go to such a pristine system and learn about its processes.

That's one of the examples, one of the -- several studies that have shown that, and this is the study that investigated on 39 rivers in the northern hemisphere, and the conclusion of the study was 33 percent of larger rivers can be classified as not heavily impacted. (Indicating)

Another study that my colleagues in Austria made were we mapped 5,000 kilometers of larger rivers in Austria. And the conclusion of the study was only 6 percent of the rivers can be classified as nature like, not completely pristine but relatively intact. (Indicating)

So the consequences of these

modifications are very dramatic. And what we recognize as a consequence of this is, for example, modification of community structure. We find that many rivers have different species that they supposed to have, that there is an increased number of so-called general species that can adapt much better than specialist species. (Indicating)

We have decline of diversity in aquatic ecosystems that is five times faster than terrestrial ecosystems. And extinctions that occur all the time; and we have lost about 30, 35 percent of diversity. (Indicating)

Apparently, these are very precious systems. What are the reasons for all these results? Well, probably the most brutal way of modification of running water system is channelization. There's two examples from Europe. Europe is way ahead of United States in this kind of engineering, probably because the density of population is much higher.

(Indicating)

To the left you see a picture from Poland where upland stream has been basically put in a concrete corset. (Indicating)

The other one from Austria where the river has been modified just to protect the agriculture of the land. (Indicating)

Again, Europe was leading in this part obviously because it started in 18th Century. Danube, the big regulation of one of the largest rivers in Europe, the Danube, began in the 18th Century. You see the plans for this, beginning of 18th century. As you see on this plan, all the backwaters and meanders are areas of highest diversity, has been basically removed and filled. This is causing a lot of ecological deficits. And that's what we see in Europe in some places. (Indicating)

On the left side, we see the comparison of River Trison, [sic] which was braided river, it was having three times more of a shoreline than it has now. To the right side, you see the way it looks today. And the picture shows you the present view of the river. It causes a lot of problems because it doesn't want to stay in the corridor, and it costs a lot of money to maintain this river into shape.

MR. GERSTMAN: We'll mark this 105A.

(CD OF DR. PARASIEWICZ'S POWERPOINT PRESENTATION RECEIVED AND MARKED AS CPC EXHIBIT NO. 105A, THIS DATE.)

DR. PARASIEWICZ: Another type of impact that is more common here is impounding, building dams. That obviously undercuts the longitudinal connectivity, but also creates -- turns rivers into series of ponds. And that's a classic example from Austria. The Danube in Austria, there's only two areas of free-flowing waters. Everything else has been turned into ponded areas for hydropower generation. (Indicating)

But effects of hydropower are much more dramatic than creating ponds. Very frequently we just take all the water away, and this is probably very severe impact on aquatic fauna. (Indicating)

Something that is less obvious is hydro-peaking. Very many power companies are producing -- generate electricity only at the time of highest demand. They release the water a few times a day, large amounts of water, just to produce the power and then turn it off. (Indicating)

So this is what I observed in one of the streams in Austria. Within 15 minutes, this stream, as you see below, has turned into that fast-flowing river. And this is very dramatic consequences for fauna. It's like being smashed with a hurricane three times a day, and with no warning. Usually -- some studies have shown there's some warning mechanisms where natural floods are coming. These unnatural events are having very drastic impact. (Indicating)

There is something else that is also even less obvious, and I saw it here in the United States on the Rio Grande River. Change of the hydrologic pattern and its consequences. (Indicating)

What you see here on this graph, this is a hydrograph from the Rio Grande River below the Cochiti Dam, right above Albuquerque. And the blue line shows the flood hydrograph during the high-flow events in 1949 before the dam was constructed. You see there was really steep peak and then quick decline. (Indicating)

After the dam was constructed, one of the purposes of the dam was not only energy production but also flood protection. So their task is to extend hydrograph, to make this curve much flatter and have flood last longer. But not so high magnitude so that houses won't be flooded. (Indicating)

Now, there was one unexpected consequence. There was this species that occurs only in the Rio Grande River, Rio Grande silvery minnow. It has very peculiar way of reproducing. This species is releasing hundreds of semibuoyant eggs. And this is happening right on the onset of the hydrograph during the flood. So as the water increases, they release the eggs. The eggs are floating with the water, and once the water goes down, they end up in some shallow areas. And that's where they can grow very nicely. (Indicating)

Well, you can imagine what happens if you make the flood event much longer. They are obviously transported much further down the stream. And this put the species almost on the verge of extinction because most of them end up in the next reservoir. So that's one of these unintended consequences. (Indicating)

Pollution is another type of impact introduced by humans. These type of pictures are not that common anymore, at least in our parts of the world. However, we deal now with different type of chemicals, might be much more aggressive. PCBs is something that everyone knows. There's issues of caffeine [sic] in the water. So this problem did not disappear. (Indicating)

Then something that I call biomanipulation, something we do since beginning of our existence is to modify the fauna composition; either by fishing, might be intensive like this picture, but also by introducing different species. You can also introduce exotic species today into the rivers. And this means creating very different fauna composition and different competitive interactions, of which we do not know much. (Indicating)

So until now, the point that I wanted to make was on one hand we have this highly complex system, highly complex ecosystems, that on the other hand have been strongly and dramatically modified over last century. What makes this system extremely precious, we have only very few of them that are absolutely intact.

So there is a dilemma for us scientists because actually realizing that we should put a stop on every development project and say: Let us study it first. That's almost impossible because we would have to leave the place.

So we are looking for some pragmatic solutions, and some countries found some ideas for pragmatic solutions and introduced it even to the legislature. This kind of philosophy is associated with the idea of ecological integrity. Again, very condensed and a very important definition. The philosophy behind maintenance of ecological integrity is we should be able to use the systems, we should be able to use the rivers and take our advantage of this, use the water until the moment that they are not severely destroyed, that ecological integrity is maintained, that they are self-sustained. That's the underlying principle. We allow some use, but we do not allow damage. We don't want to destroy it. (Indicating)

And since we don't know so precisely, we can achieve this only in more or less an indirect way by defining some baselines, some goals that we want to achieve, and maintain what we can maintain, the processes that we can maintain, in such a way that we will achieve this goal.

And that's what this ecological integrity definition says: "We want to maintain all internal and external processes and attributes" -- and I will explain in a minute -- "interacting with their environment in such a way, that the biotic community corresponds to the natural state of the relevant aquatic habitat, and where this community is preserved by regulation, resilience, and resistance to environmental stress." (Indicating)

So what this definition says up front

is a natural aquatic community. We want to maintain the community structure by providing this community appropriate habitat. And we provide this appropriate habitat by managing the processes outside of the river or inside of the river indirectly. That's the idea behind it. So external processes, everything what happens in the landscape. Everything, what could influence sedimentation, what could influence the flows, what could influence evapotranspiration. This process is something we can maintain and modify. (Indicating)

There are internal processes like competition, food availability, water quality, habitat diversity, it's something that is inside a river that we can also maintain. We cannot force the fish to take advantage of it, but we can provide the conditions. (Indicating)

The goal is, as I said in very simple words, is that if we have a river, that the majority of the fauna in this river will consist of river run fish. Not like there is in majority of impoundments that will consist mostly of pond fish. That's the very basic principle. (Indicating)

Of course, we are trying to be much more precise. And recently we have developed methods to identify this target, this reference communities. And there was a method that has been developed by my colleague, Mark Bain, at Cornell University to go target community approach, a method that is having rapidly increasing popularity, specifically in Northeast and New England where, based on historical records, based on biological information from the region, we try to define, first of all, what kind of species would we expect in particular river. And here is an example from the Quinebaug River. It would be dominated by fallfish, common shiner, white sucker, longnose dace, blacknose dace, and other species. (Indicating)

We also try to identify the dominant structure and the expected proportions of the species. So this model tells us in the Quinebaug River, the community should consist of about 33 percent of fallfish, 15 percent common shiner, white sucker, daces and so forth. (Indicating)

This is our reference, this is our baseline that allows us to say what's the status of the system. If this community is maintained, the habitat that supports this community is maintained, then we consider river being intact. (Indicating)

How do we maintain this community? Well, by providing, as I mentioned before, appropriate living conditions and appropriate habitat and habitat structure. Under habitat, most of the people understand three types of habitat. There is a physical habitat, there is a chemical and biological. Part of biological habitat is, for example, food availability. (Indicating)

It's very hard to maintain biological habitat. It's much easier to maintain physical habitat. And still the most underlying block of every river of every habitat is a habitat structure. That in a river it will consist of hydraulic portion of this. This will be depth and velocities, that have to be maintained and appropriate. There has to be a cover. There has to be a substrate. And of course, some channel geometry. (Indicating)

Now, every one of the species in the community will take advantage of some portion of this habitat structure, will use some of this habitat structure. Some of them will be in the middle, some of them will be in areas of high cover. For some of them, the depth will be more important. For some of them, velocity will be more important. (Indicating)

MR. GERSTMAN: Dr. Parasiewicz, what kind of fish is exhibited on your slide?

DR. PARASIEWICZ: That's probably one of the sunfish.

Okay. So we use these physical parameters, these physical attributes that we can determine by observation of fish, to determine how suitable is this physical habitat structure for our community.

There are numerous models developed for this purpose, and probably the most advanced of these models are physical habitat models; were developed for the first time in the early '70s, and were considered to be a planning tool that would allow us to determine amount of water necessary for fish in the river on the hydropower projects.

The way this model's function is that on one hand we describe the physical habitat conditions in the river. We describe distribution of depth, velocities, cover, substrate. We describe how many ripples or pools or rapids are there. (Indicating)

Then in the other survey, we observe the areas with the higher or lower abundance of the species, and use relatively sophisticated statistical and mathematical models to identify parameters that are very important for each species.

Here on this picture, we see such a model that identifies boulders that are very important for fallfish, for example. Or high abundance of overhanging vegetation -- that overhanging vegetation will not cause high abundance of this species. (Indicating)

This information can be then combined to translate their habitat structure into good or bad habitat, to suitable or not suitable habitat for fish. And we can create these maps of the river that tell us whatever is green on this picture is a good suitable habitat with high probability of fallfish. Whatever is red is more or less not used very commonly. (Indicating)

And then we also observed this pattern might change. As we add water or add structure to the river, obviously, the distribution of a suitable and not suitable area will also change. That's basic information that goes into the model. The amount of suitable area can be used as a metric of good or bad conditions, and can be plotted, for example, against this chart. (Indicating)

What you see here on this graph, that so-called braiding curve that describes how much of habitat area, how much of the river is suitable for entire community over the range of flows. This was a model developed for Quinebaug River too. (Indicating)

What this line tells us, that if the flows are very low and at the level of maybe .3 cfsm, cubic feet per second per square mile drainage, we have only 21 percent or 20 percent of the river that is suitable for the community. As the flow increases, it goes up to 30 percent, and then it drops and doesn't go much higher. (Indicating)

That's very important metric for us.

It tells us, for example, that Quinebaug River is severely impacted, that 30 percent of habitat is not really much for the fish that should be there. And I don't want to go here much into the detail, but that's the basic principle. This is getting much more complicated when we started to overlay this model with time, with dynamics over time. How much of this habitat would be available over time? We can combine it with the hydrological time set. (Indicating)

And it leads us to very detailed predictions of how much habitat would be necessary, what needs to be done in order to improve the river, to permit water withdrawals. There is possibility of tradeoffs where you can trade some water for permanent structure.

We can analyze ahead of time as a planning tool what would be if we would remove the dams, what kind of advantage we would have, and also predict how long of a period should we have -- for how long a period should we have habitat maintained in order to protect the community.

MR. GERSTMAN: Dr. Parasiewicz, have you developed such models yourself?

DR. PARASIEWICZ: Yes.

MR. GERSTMAN: And would this be an application of the model you developed?

DR. PARASIEWICZ: That's right.

MR. GERSTMAN: Would that be reflected in -- is this the model you were referring to?

DR. PARASIEWICZ: No. This article, "Physical Habitat Modeling for Fish, A Developing Approach," had been written before I had developed a recent model. And there's another article for fishery that we should probably submit later on. There are two other articles that deal with these issues. But I have developed these models in specifically recent five years at Cornell spent on development of this model.

MR. GERSTMAN: Dr. Parasiewicz, I refer you also to CPC Exhibit 106. Is that a description of a model that could be used to evaluate impacts to river ecosystems?

DR. PARASIEWICZ: This CPC 106 is more to point towards developments in the northeast. It describes one of the methods that could be used possibly for determination of flow needs in the river. It's a different type of method than this one. It is based mostly on analysis of hydrological regimes. (Indicating)

But also the second part of this, this abstract, the change of the paradigm, among the regulators and scientists of how should we use the flows in the rivers and how should we maintain rather the ecological integrity first before defining how much water can be used. So this is more to show the most recent developments. And this was prepared for the commission of state of Massachusetts that is presently considering development of statewide rules for instream flow regulation.

MR. GERSTMAN: Are the models you referred to, both the one outlined in CPC 107 and the one you referred to in the article in Fisheries magazine, models that are generally accepted in your profession and could be applied to determine the adaptability of a river ecosystem?

DR. PARASIEWICZ: That's correct. The physical habitat models, as I mentioned, has been developed in the early '70s and have been widely applied in most of the states at the regulatory process that have been developed specifically for mitigations, for all kind of litigations where we are dealing with water quantities.

So physical habitat models are widely recognized. The model I have developed is brand-new. It is being now widely recognized as being applied in the State of New Hampshire as a measurement for development of statewide standards. It is being applied in the State of Connecticut for the same purpose, and it is likely to be applied in the State of Massachusetts for the same purpose. And it was applied on Stony Clove Creek for analysis of the habitat. That was supported by New York City DEP. So it is also being applied here in the region.

As I mentioned, these are not only methods. The physical habitat models that I've described are the most precise, most detailed and should be applied where we deal with a very complex situation.

The other models like IHA, Index of

Hydrological Alteration, are either used in adaptive management, or there are methods that are so-called standard setting approaches that are being considered to be reconnaissance methods.

Probably the most popular of those is the Tennant method. It has been developed by Don Tennant, CPC 110. It's the article of Don published in 1976. What this gentleman has done, he was working for a fish and wildlife service and he took hundreds of photographs of the rivers in northern United States. And based on the analysis of these photographs, identified some common patterns. And based on these common patterns -- for example, change of wetted area, change of the width, change of the depth and velocities, he then determined three types of thresholds and recommended so-called baseflows. 10 percent of mean annual flow, that's what MAF is for, describes that -- provides the habitat that is very poor. So whenever flows are below 10 percent of mean annual flow, according to Tennant, we deal with very poor habitats.

And explanation for this is in this

curve that we see here on the graph. The depth, velocity and width is sharply increasing up to 10 percent of mean annual flow. So this is providing really critical conditions. (Indicating)

MR. GERSTMAN: Could you show on the graph what you're referring to?

DR. PARASIEWICZ: Yes. As you see here, we have here on the X axis, we have percentage of average flow in cubic feet per second. That is referring to this. And then change in depth in feet per seconds, and then percent of substrate cover width. That's how -- the width would change. Width would increase very rapidly within the first 10 percent. The same, the depth would increase very rapidly and velocity would increase very rapidly. It is like filling the bathtub. Once you open the water, the fill water gets wider, it gets deeper until it comes to this vertical area. And then the situation doesn't change so much.

(Indicating)

So 30 percent is what Tennant identifies as providing third type of habitat.

And above 60 percent should be excellent conditions provided for fish. That's important to remember, that what Tennant defines as a 10 percent threshold is the river width and depth and velocities are severely reduced; when the riverbed and substrate is half exposed; when gravel bars and sidearms are dewatered; stream bank cover is diminished; temperature increases; fish are crowding in pools; invertebrate fauna diminishes; riparian vegetation suffers, lack of water. So pretty grim vision.

(Indicating)

MR. GERSTMAN: Dr. Parasiewicz, how did you describe the Tennant threshold, the Tennant method before; is it a reconnaissance?

DR. PARASIEWICZ: It is a reconnaissance and conservative crude method. The way it should be understood, and it does not include any changes over time, it assumes a baseflow. Therefore, the way it should be understood is if the Tennant method shows there is a problem, there is a need for something much more sophisticated to determine the real impact. It points out there is a problem. It does not provide any solutions.

MR. GERSTMAN: Thank you. Let me ask one further question about the Tennant method. Is it a widely accepted method in your profession, in your experience?

DR. PARASIEWICZ: Yes. This has been published 1976, and it is probably the most recognized method worldwide. It's also known under the name Montana method. It was very popular. Fish & Wildlife Service is using it on all kind of licensing, all kind of projects, hydrologic project analysis. All the states are using it. So it is widely recognized. Probably the best known or best recognized worldwide.

Recently there were several publications analyzing all these methods that deal with flow regulations, and altogether worldwide, we can find about 250 methods that exist for these purposes. The papers that I have seen distinguish -- a big portion of it is standard setting methods like Tennant.

Everyone mentions Tennant. Then there are the physical habitat models, and then this group that's defined in every paper differently, it's either holistic models or adaptive management models or methods that I would classify in Index of Hydrological Alteration.

MR. GERSTMAN: Thank you, Doctor.

DR. PARASIEWICZ: Should we make a break now or should I continue? I have probably about half an hour more.

ALJ WISSLER: Why don't we finish.

DR. PARASIEWICZ: So that's setting the stage -- the state of the art, the state of the knowledge in analysis of aquatic habitats and impact assessment.

The next part I would like to talk about is what I have learned while working in Catskill Mountains, and the first opportunity that I have is when I was asked to develop, to provide expertise and ideas for some strategies for sustainable management of Upper Delaware River Basin.

This was excellent opportunity for me to -- I was new in the country, so it was possibility for me to look into information that exists, learn how the entire landscape is set up, how this river should function and how do I believe the river should function, and apply also my expertise I brought from Europe for this purpose.

MR. GERSTMAN: Refer your Honor to CPC 108.

DR. PARASIEWICZ: One thing I need to point out is that while working in Austria, developing such a multidisciplinary strategic plans was a speciality of my team, of my group. So I had a unique opportunity to apply the ideas and methodologies that have been developed in Austria for this purpose, and that is what I tried. It was not a very intensive study. It was based on analysis of existing information that I was able to obtain at this time.

The first conclusion that I had is the scarcity of the information on such a big river and to such a huge project. There's multiple uses of the Upper Delaware, including the New York City reservoirs. And it was surprising how little do we know about these systems.

During my research, I run over this book of Nick Karas, Brook Trout. Despite the fact that this book has been strongly criticized for having a lot of inconsistencies or lacking detail information, missing -- specifically referring to Catskills -- I think Nick Karas was more focused on the brook trout than anything in the Catskills, and maybe he did not perform his research too well. But the definition that I found there was reflecting whatever else I have learned about a system and about an area, and whatever -- from my experience, I could imagine for this region. At least it was very compelling to my imagination and whatever I could feel is right for the systems.

This begins with following the historical documentation and finding out what kind of species have been found here in the river in the pre-Colonial times, as well as the following of the history of the Catskill region.

As probably everyone knows, this region has been colonized by a white man relatively late, if you can say so at this time. It was beginning of 18th Century first where this area has been discovered or rediscovered, and it is easy to imagine, it was covered by forest. And this forest was thousands of years old, and it is easy to imagine that it was really deep, portion of it was covered with topsoil. And we can find remnants of this in the old growth in the area, and old growth in other portions of the northeast. This would be maybe not so unique because it happened probably most of the northeastern portion of the United States that we had this situation.

What is unique here is that it was everything on the top of very unstable glacier tuff. The consequences of following removal of the trees were probably more -- manifested more dramatically than in other areas. I will come to this a little later.

The one thing is to remember that I'm bringing this because -- despite all the criticism that Nick Karas have received -- because it is formulated very nicely and tell us what we could imagine under the streams down here. We know there were a lot of cold water species. And I used this definition as well as all other information that I found to establish conceptual vision of how these rivers in the area would look like or how did they look like, and try to pull up some obvious facts on the paper.

We obviously deal here with the upland river that has -- river that has relatively moderate gradient. It has very unstable glacial geology. It has snow melt and sometimes also the rainfall-driven flow regime.

Apparently, being in this ancient forest, it probably had a very high retention capacity, very high storage capacity. This obviously stabilizes the flow in the river. It stores the water that is being brought in the spring and releases slowly in the summer.

Consequently, we probably had high water table. Because of stable flows, as well as this heavy forest in the area, we could expect the streams were narrower and more heavily shaded. And this would provide low summer temperatures, and this would provide the cold water fish assemblage, which would be very likely here. Those would be dominated by native brook trout. And there are many records of large amount, enormous amounts of brook trout in the Delaware River as well as the tributaries. And also some seasonal occurrences of American Shad and other migrating species. This was my visionary conclusion that I could establish based on the information that I received at this time.

(Indicating)

Now, to understand where we are now, I also try to follow the historical path that the consequences of human activities after white man moved into the area. And one of the first thing that happened was deforestation. And not only because of wonderful white pines and need for agricultural fields, but also a very high amounts of tanning in the bark that led to removal of almost every tree here in the lower portions. Now, there are sources that document this very nicely.

(Indicating)

If this happened -- obviously in this very unstable area of unstable glacial tuff -- the obvious consequences must have been removal of the topsoil and removal of this organic layer. This I could imagine would increase flow amplitudes. So we would have higher highs and lower lows. Consequently, we should have also lower groundwater table.

If we have higher flows in this unstable environment, it is easy to imagine that we would have bank erosion, so the river would get wider. And not only this, we had very, very intensive logging activities, and there were a lot of rafts sent downstream, especially after the Civil War. The obstacles in the way have been actively removed, and there are historical records that show that there were engineers going downstream and blowing up every big boulder. So this caused the river to get wider and less structure.

The next consequence that can be imagined, if the river gets wider and shallower and has less forest cover, it obviously gets more sun and more solar radiation. And on top of this, if the groundwater table dropped, then we should have less input from groundwater infiltration of cold water that is so important in the summer.

So what you would expect is increase of water temperature. And indeed, and DEC definitely will support this, apparently the area has a high temperature problem in summer.

(Indicating)

Another influence that wasn't maybe that dramatic, but there were substantial fish introductions, exotic species have been introduced, either small-mouth bass, trout. And this caused alteration of fauna.

(Indicating)

And of course, since we had a lot of these acid factories, there was at this time, beginning of last century, we had obviously enormous pollution problems. This was probably the final nail to the coffin. That's what I could speculate based on the data on the information that I had received.

(Indicating)

So obviously, and probably at the beginning of the last century, the rivers were in much worse shape than they are now. And from this moment on, the reforestation of the region has begun.

However, the one thing that has to be considered is that if the trees grow again and they do not have the topsoil cover that stores the water, the trees are using the water and produce a lot of evapotranspiration. So actually what we should expect is to have -- with the re-growing forest and not provide retention -- we should expect the streams to have even less water over some period of time during this transition time.

So this was my conceptual model, partly based on the information I found. It was not perfect. It was based on the experience that I gained before. It was maybe a little speculative, and some people thought it was speculative. However, the facts of the last two years supported very nicely this theory.

One other thing that I also have learned from one of my colleagues at Cornell, Todd Walter, is that Catskill region nowadays is covered, and you hear it probably before, with very shallow soils that have very high infiltration capacities, so water flows relatively freely through and we do not have the phenomena that we usually would have with a lot of impervious areas that would cause excess infiltration flow. So we're basically -- the rain that falls goes immediately to the rivers. It does not stay in the landscape.

However, there is another phenomenon here that is called access -- saturation access flow. And we have areas that are usually in the sinks of the landscape that are getting saturated with the water; and basically function at these times almost as impervious areas. All water that falls on this part flows away, goes away. These areas are changing over time. This is what the variable source area hydrology stands for. Very complex hydrological pattern.

But this pattern could be responsible, or this geology or hydrology could be responsible for this extremely -- pretty dramatic hydrographs that we see in most of the areas of the Catskill Mountains. As you see on this graph, that's the hydrograph, again, from Stony Clove Creek. Here you have the flows in cubic feet per seconds per square mile drainage, and you have the dates. And this was 2001 or 2002 where -- see how dramatically the flows increase and then decline. (Indicating)

Actually, we have it -- at the times

of the high saturation of this saturated -- high expansion of the saturated areas, the water just like goes immediately to the stream. And in summer, it is being held up more in these reservoirs that are getting smaller in the sinks of the landscape. So this is causing the amplitude of flows to grow even faster.

ALJ WISSLER: It's cubic feet per square meter?

DR. PARASIEWICZ: Per square mile drainage.

ALJ WISSLER: Per square mile?

DR. PARASIEWICZ: It is a unit that is not popularly used. It basically allows -- allows us to determine amount of water in the river regardless of the place you are at on the river corridor, along the river corridor. Because if you are in the headwaters, maybe 20 cubic feet per second will fill the entire riverbed. Further downstream, this 20 cubic feet per second will maybe fill a third of the riverbed. Using this unit allows us to express the flow for the entire length of the river.

ALJ WISSLER: I understand.

DR. PARASIEWICZ: It's basically standardized.

MR. RUZOW: Cubic feet per square mile?

DR. PARASIEWICZ: Cubic feet per second per square mile.

MR. RUZOW: Thank you.

DR. PARASIEWICZ: So apparently, we still can observe these very dramatic hydrographs that probably cause further widening of the streams, but also cause very low flows in the summer, and therefore, higher temperatures. And all kind of problems to fauna, to trout, specifically trout that is very sensitive to higher temperatures.

We also performed one experiment to support this theory. This was, again, in collaboration with Todd Walter. The Department of Biological Environmental Engineering created the hydrological model using SM, Soil and Moisture Routing Model, for

Town Brook, that's a stream in the Catskills. This model, based on the landscape structure and the permeability of soils, predicts the hydrograph -- and based on the climate and precipitation. So if we have this precipitation, this soils, this slope, that's how much water will be in the stream. That's what this model predicted. It continues to decline. You have a flow in cubic meters per second and the dates. (Indicating)

Now, the experiment we performed, we added 15 percent -- 15 centimeters of topsoil on top of the entire watershed. We just put a layer of -- an analyzed what would happen to the hydrograph. Interestingly, whatever we predicted before has happened. The peaks, the high flows dropped dramatically, and we have much lower peaks and high low-flows.

This went even further when we take this simulated hydrograph that shows the effect of soil depth changes on the annual hydrograph, is that the average flow in the stream in summer increased -- the peak as I mentioned declined. This was the other graph. But also what was very interesting for me is that the timing of high flow events in the stream was pushed to the later period. This is a month. Even if this would be two weeks, it has a very dramatic consequence for faunas that adapted to spawn in the right season. (Indicating)

As you see here in this part, summer baseflow that was described by this model would be higher with the 15 centimeters deepersoils. So what we expect today is to have lower flows, but also observation of other rivers brought us to one more conclusion, that there is also a duration of this low flow that is extended. It just does not last for three days or five days and then being interrupted by some flow increase. It lasts for a month. (Indicating)

And the consequence of such an event is very obvious, and that's the documentation from the Quinebaug River where in August 2001, we had this relatively long period of very low flows. That's this pink line, shows the amount of water in the stream. And at the same time, we measured temperature. As you see, as the time goes by, the temperature continuously grows until the next high-flow event. (Indicating)

So this might be the consequence of

extended duration of low flows, that we automatically have higher temperature. And obviously also we'll have pollution that reacts in the very same way.

So that's how much I have learned with regard to this region and that specific phenomenon that we could expect here.

Some other interesting story that I had opportunity to participate at; it was the study of Fish Habitat Assessment on Stony Clove Creek. A brief summary of this is in CPC 109, and the CDs that you received have a full report from the study. This study was performed as a part of stream management plan by New York City DEP, and we were asked, first of all, to test our method, but also provide information on habitat conditions in the Stony Clove Creek. (Indicating)

And the Stony Clove Creek has been selected as one of the best in the area, least impacted in the area. It is very close to here. It confluences with Esopus Creek in

Phoenicia. We have almost the same circumstances. So a lot of what we learned here could be applicable in our project area.

Here is the project area, here is Phoenicia. (Indicating)

The first thing we developed for Stony Clove Creek was our biological reference. So target fish community -- and we received a lot of help from New York State DEC, specifically from Mike -- and based on the data that we collected, that we were able to find historical data, this was the community structure that we had developed for this creek. And it turned out to be that the fauna of this creek should be dominated by slimy sculpins, which are the small very neat fish, very nice. Then blacknose dace, brook trout, white sucker and longnose dace. And I'm dealing here only with native fish. (Indicating)

There's also brown trout and rainbow trout in the stream, but they are introduced and they are not part of our model.

This is just a short picture of the

watershed of the Stony Clove Creek. We have developed physical habitat model for 21 management units of the Stony Clove Creek, units that have been defined by the DEP as well as for the entire river. (Indicating)

We fished Stony Clove and three other streams. We collected intensive biological data. We used for this purpose -- this is just an example from another stream -- the technique that was developed by Mark Bain where we observed the fish in specific locations, and we have electric grids that are exposed to different habitats. And we capture the fish within the grids and then describe what were the conditions that we found them at. This is being used to develop the biological model. (Indicating)

The stream is about 10 miles long, and we mapped the entire stream three times, using three teams of people at three different flow conditions. For each of the slow conditions -- for each portion of the river, we created such maps of something that call hydromorphologic units. (Indicating)

Then used our fish observation to determine the suitability of this area in these units for fish of our community. And here I'm showing an example of only one of the management areas and the habitat that has been determined for brook trout. (Indicating)

Surprisingly, even though it should be a good stream, we did not predict a lot of good habitat for brook trout. As you see, the red color means poor, that's probability of fish below 30 percent, suitable below 50 percent, and over 50 percent is excellent. (Indicating)

This is pretty astonishing. Specifically, that our rating curves for the whole river for entire community -- and you see here again on this graph, the relative habitat area, how much of the riverbed was, first of all, wetted at different flows, the different flows at the X axis, how much habitat -- so 50 to 70 percent of the entire river corridor has been wetted. (Indicating)

Out of this, majority has been suitable for entire community, but most of habitat was good for the slimy sculpin -- and we found a lot of slimy sculpin -- and blacknose dace. And we had very little habitat predicted for brook trout.

(Indicating)

We did not really understand the

reason originally. So we went back to the model and tried to analyze, what is the specific characteristics of areas that are predicted to have good brook trout habitat; and these are riffles, runs, pools, glides, and lot of them had a lot of woody debris, a lot of boulders, shading, some specific depth. (Indicating)

Then we went to the same site where we predicted no habitat for brook trout and looked for the same units, like riffles, runs, pools, and we're watching what is actually missing. And there was woody debris, boulders and shading missing, and they were usually too fast flowing. (Indicating)

So in this experiment in this model, I followed the advice of a fish, and artificially or eventually added as much wooded debris as I could, and boulders. And all of a sudden, we received a lot of habitat for brook trout. (Indicating)

Very interesting conclusion -- and

surprising conclusion for many of us, that wooded debris probably play a very important role in the system. It corresponds with whatever I was imagining as my original system, our reference system. And it also corresponds with the fact that wood is being most of the time removed from the streams because of danger of flooding. That's the final rating curve that we received.

The other part that was interesting was here is the distribution of habitat -- I'm beating a dead horse here -- here is the habitat distribution that we would expect to support a community in the stream, and it should have most of the habitat for slimy sculpin and a lot for brook trout, and so forth. (Indicating)

And the habitat that we found at all these flows was missing the habitat for brook trout, and we also caught very little brook trout. So the amount of fish that we caught corresponded very well with the amount of habitat that was there. So another suggestion that our model was probably right.

So much for introduction. Now I would

like to -- having all this information and after introducing all this information, I would like to talk a little about my conclusions and my observations when analyzing the project area for this meeting.

As you very well know, the project location is in this portion of the Esopus Creek Watershed. And there are several streams in the project area. You probably know this map very well. It is taken from DEIS. (Indicating)

Here, these squares are showing the project area, and here are the streams that flow. We have Esopus Creek coming here, Birch Creek coming from the top, and it's being joined by Crystal Spring Brook, Cathedral Glen, of which some, Giggle Hollow Brook. Some of the streams are intermittent streams, do not flow the entire year. Then we have Emory Brook that flows in different direction. (Indicating)

For the purpose of my analysis, and I was able here to perform only the reconnaissance type of analysis, there was not sufficient references and time to perform detailed models.

I focused on the area that has most of the data available, and this was Birch Creek.

We have one flow gauge on the Esopus stream. We have also -- and those have relatively long hydrological records. (Indicating)

One thing I need to mention here. Whenever you analyze hydrological records, it is important that you will have it over relatively long period of time.

Then we have a -- four years of data recorded on the Birch Creek, somewhere around here. (Indicating)

The information that I found, the information that I found in the EIS, the information that was provided by New York City DEC, led me to some interesting conclusions. First of all, based on biological observations, fish observation, fauna composition of Birch Creek is relatively intact, relatively unimpaired.

Specifically in the upper portion of the stream before the confluence with Crystal Spring Brook, we have relatively good population of brook trout that is dominating this area. Not so many slimy sculpins. Here is one question that I had to myself. Our model from before is showing the slimy sculpin as the dominating species. Apparently, the DEC data collections did not show so many slimy sculpins. I don't know why. One of the reasons could be temperature. This species is very sensitive to the high temperatures, but on the other hand, brook trout is sensitive too. So I don't know what's the reason for that.

Interestingly, further downstream, and here is this snow-- here is that snow -- Belleayre Mountain Ski Center Pond, snow production. (Indicating)

In this area, the stream shows, first of all, pretty dramatic morphological modification. It has been regulated in the direct vicinity of this pond. Secondly, the fauna composition has changed, and from DEC data, obviously we have much more brown trout and rainbow trout, and only a few brook trout. That's also very interesting because apparently, it's more like common knowledge, brook -- brown trout is believed to be much less sensitive to the higher temperature than the brook trout is. So it could be that there are some higher temperatures in this area.

Nevertheless, it was classified as a good stream, as a good trout stream, and it apparently has relatively good infiltration of groundwater. Maybe the groundwater plays the vital role in the system. It is very likely that it provides the cool temperatures of the summer. Specifically with the channel modifications here, there is nothing else that I could imagine that would provide good thermal conditions for trout.

Nevertheless, this graph shows the hydrograph from the Birch Creek from the four years the data has been collected. This hydrograph is, as you see here, is also very spiky. The flows are increasing very dramatically, even in summer. (Indicating)

What I tried to do here, I tried to apply Tennant method to this hydrograph. And using Esopus Creek data, hydrological data, I calculated the 30 and 10 percent thresholds of the Tennant. The 30 is presented here, about

-- I think about 8 cfs in this area, or 7 cfs; and 10 is the red line. (Indicating)

For purpose of comparison, I also transferred the data to the confluence of

Crystal Spring Brook and Birch Creek, and that's how the hydrograph should look at this confluence. Here is a very interesting observation --

ALJ WISSLER: That's cubic per second flow at that point in the stream?

DR. PARASIEWICZ: That's correct.

ALJ WISSLER: Not the mile?

DR. PARASIEWICZ: That's correct, not per mile. That's a good point.

As you remember, Tennant said that once we go below 30 percent of mean annual flow, we are in very critical area. That he recommends to have more than 30 percent of mean annual flow to provide for conditions, which are not perfect. The 10 percent, according to Tennant, is like drop dead minimum -- it's already very bad habitat.

The conclusion of this observation is that actually for most of the time and for specific years for entire summer, like in 2001, the flows were on the Tennant threshold of 30 percent. They are also going under the 10 percent threshold for some relatively long periods of time, I think two weeks.

Considering this, the fauna of Birch Creek seems to be in relatively good shape.

So the conclusion, based on all the data that is available here, there is not much more available, would be that it is in good shape, but we are close maybe to critical situation. This creek could potentially be on the verge of collapse, even if less water is flowing. That's what could be concluded based on this graph.

MR. GERSTMAN: Dr. Parasiewicz, let me interrupt you for one second. Before I believe you said that the mean average flow is -- gets to below 30 percent, it was projected to get below 30 percent as a result of project impacts, it would be wise -- in fact, you would recommend in your professional opinion that the sophisticated modeling ought to be used at that point?

DR. PARASIEWICZ: Absolutely.

MR. GERSTMAN: Was that done in this case?

DR. PARASIEWICZ: No.

So this allowed me to kind of define the status quo for Birch Creek for today.

There are some water uses that exist, this includes all the water uses.

Another interesting observation that I had here was that the duration of low flows is apparently extended due to the snow production. Apparently, the snow -- the resort starts to use the water for snow production already in September, and according to this hydrograph, the low flows go way into September. So it is very likely that use of this water is causing that we have even longer period of low flows, maybe even higher temperatures. Might be not so critical in the fall if this is not too high. So much to summer.

In winter, of course, we have use of water for -- presently for snow production. Here I think -- we don't know much about winter habitat, an over-wintering habitat. There are not many people that go to the rivers to watch the fish. The only thing we know is we need relatively deep water for good survival. Nevertheless, what we do know is that the groundwater intrusions are very important for winter habitat because they increase the temperature -- contrary to summer, the groundwater intrusions in winter increase the temperature at the river bottom and prevent ice formation. And formation of so-called anchor ice can have very dramatic consequences for river and the fauna.

First of all, some trout species are just having their eggs in the substrate that can be basically damaged. But also during the melt, this ice has a tendency of dragging and scouring the river bottoms. So might change the river morphology. Therefore, the groundwater intrusions could be very critical for this system in winter too.

Now, this is present. Then let's look into the future and what kind of sources of potential impacts we could imagine. The one thing Dr. Michalski has, I think, elaborated long on this; there is a high probability of reduced groundwater contribution due to pumping. It is likely. This, as I said, could have a strong influence on the winter habitat as well as summer habitat. This is very essential that baseflows would be protected.

The other thing that could happen is obviously increase of impervious areas. Of course, there are some measures planned here, but it's only that much that can be done. And once that flow will go beyond detention ponds, it still has a tendency of scouring the finds and bringing the finds to the stream too. And also, I cannot imagine that we would be able to retain it so far, even to bring the system closer to the original conditions. Please remember that nowadays already we have very flashy and very high flow amplitudes, and very flashy systems. Adding even more to this could be critical.

Of course, in some part, the forest cover will be removed. This, again, might have consequences for the runoff and increase the high flow runoff.

The other part that obviously needs to happen, and I cannot imagine that it wouldn't, would be the fragmentation of very small, tiny wetlands and filling of them. And these tiny wetlands might play very crucial role in the hydrology of the system. They might save a lot of water and just delay the runoff so far that there would be enough runoff provided for summer.

Another part that should be also mentioned, and I know from Austria that is a big problem, the snow production specifically causes compaction of ski slopes. The snow produced from water is heavier than the normal snow, and it usually compacts the soil and causes even higher runoff. That's phenomenon that is very widely discussed and very well known in countries like Austria.

So the conclusion here would be, okay, we could expect increased surface runoff, not only reduction of the groundwater flow but also increased surface runoff. And what would this cause? It could increase the peak flows in the river, obviously, and also extend the low flow periods. So we could have more frequent and longer low-flow periods, therefore, higher temperature. That increased peak flow could cause increased sedimentation of finds, and would fill the interstitial space and limit the vertical interactions that I mentioned before. And of course, the increased peak flows would cause stronger bank erosion, so we could have very similar phenomenon like we had on the Delaware. The river would get wider, and therefore, more susceptible to warming up.

So of course, I also tried to apply the Tennant method to this projected situation, future situation. I applied here a number that Michalski has calculated in his analysis and reduced the flows in the river by .3 cfs and recalculated the hydrograph. The same hydrograph we have seen before. And again applied Tennant methods, and this reduction of flow by that little, .3 cfs is not much, caused dramatic changes.

(Indicating)

First of all, I think this is the most astonishing, we doubled the duration of low-flow period, doubled the duration of flows under 10 percent of Tennant threshold. This could bring the system to the verge of destruction. Of course we extended the amount of time that the flows were under 30 percent of threshold.

So it is very questionable what the future of Birch Creek in this area would be with that reduction of flow.

The conclusions that I build up on my present knowledge, my present expertise and whatever I was able to learn about a system, is that aquatic fauna of streams adjacent to the project is of high value.

As I mentioned before, we have apparently problems in the Catskill region, as shown on the Stony Clove Creek that has been appreciated as a high quality stream. Even this stream does not have much of brook trout habitat or brook trout. So Birch Creek seems to be in better shape than Stony Clove too. So it is important that it be protected.

This fauna could be potentially impacted by a project. There is a very real potential of severe impact from the project on the aquatic fauna on the streams. This is caused by the increased duration of low flows, and what this is causing, it is reducing the mobility of species. In one of the studies that -- it's increasing temperatures, as I mentioned before, the mobility is reduced, obviously, because stream is smaller, but also causes overlap of habitat for different species and increases the competition.

One of the studies that I had before in Austria have shown that very low flows cause the habitat for juvenile fish to overlap with the habitat of adult fish. And the problem with this is that adult fish usually eat the juvenile fish, so it is reducing the survival opportunity.

The velocities and depth would be reduced. This would obviously reduce the suitability of habitat for bluegill specialties and river-end fish, and specifically cold-water species and trout.

So we could expect a shift in community composition to more general species. We could potentially expect even an upper portion shift from brook trout even to brown trout or other species that like more warm water. So we will have warmer water.

There is also a possibility that at this time, at this moment if we will have that little of water, the wastewater treatment plant could create almost a seizure thermal barrier that could limit the ability of trout species to move upstream and spawn. And these streams are playing very vital role for the spawning of trout.

Reduced groundwater flow could cause less opportunity for trout spawning. As I said, they spawn in areas of groundwater infiltration. Increased possibility of anchor ice, and therefore, modification of morphology, and the peaks could obviously modify morphology and this could -- as a secondary result, we would have increase in temperature and also increased sediment transport.

Another part is that we could also expect impact on intermittent streams and on the headwater streams, and also lower amount of wetlands, and therefore, less of these saturated areas that provide water in different kinds of areas.

ALJ WISSLER: Let me stop you right there. Help me understand that. So far this analysis that you have given us has used as an example perennial streams?

DR. PARASIEWICZ: Right.

ALJ WISSLER: Specifically, you used Birch Creek, which obviously impacts the Big

Indian side of this project. The Wildacres site, however, I think all the streams on the Wildacres site are intermittent streams. How does your analysis change when looking at intermittent streams?

DR. PARASIEWICZ: Looking at intermittent streams, the impact could be even more severe --

ALJ WISSLER: In what way?

DR. PARASIEWICZ: -- than perennial streams. The reason is, reducing the amount of water in intermittent streams would extend the periods of time that they are dry. Some of those streams are being used for spawning, and this could potentially reduce the time necessary for trout to hatch. And they could potentially dry out before they have a chance to get out of there. The intermittent stream --

ALJ WISSLER: If you know, are the intermittent streams in this project, are they trout spawning streams, the intermittent streams?

DR. PARASIEWICZ: Yes, some of those are trout spawning streams. Is it right, Mike?

MR. FLAHERTY: I can't tell you that for sure. Portions of these streams that are trout spawning are definitely intermittent in their headwaters. So trout may spawn up there, but it's hard for us to make that determination when we sample the --

ALJ WISSLER: If somebody can break that out for me, unless it's already broken out somewhere.

DR. PARASIEWICZ: So that's how the analysis -- basically, it could be even more dramatic on the intermittent streams, and specifically they are so small. They are so easily bulldozer, and so easily vanished under any kind of construction.

There was this letter that I provided here. There was a draft letter signed by many scientists to the Army Corps of Engineers about the status of intermittent streams in the country, and it pointed out it is very dramatic.

MR. GERSTMAN: We will provide that.

DR. PARASIEWICZ: So it underlines importance of intermittent streams as a network that, first of all, transports the water to the perennial stream, but also slows it down and fulfills a vital role in the landscape. Specifically in the upland areas.

Therefore, my conclusion here would be that it is a little dicey to say, or premature maybe, to say there will be no impact on the habitat. There is a very high potential for that. The systems are so valuable that it would be advisable to perform very thorough analysis of the systems and determine what really would happen; and not only this, if the project would more forward, to develop measures that would prevent its destruction, and that's why such analysis would be absolutely necessary. And by the project of that size, I consider it absolutely necessary.

ALJ WISSLER: What kind of measures would mitigate such a thing, impact?

DR. PARASIEWICZ: Well, off the bat, it's really hard to say, but if you develop a relatively good model of a system, you could potentially, first of all, provide some tradeoffs.

For example, the area -- as I

mentioned before -- the area next to the downstream of the Crystal Spring Brook is heavily modified, morphologically modified. Improvement of this area would provide more habitat for entire river. This could compensate for something. You could introduce all kind of measures specifically with regard to --

ALJ WISSLER: Specifically, that could mean things like adding boulders, you were talking about?

DR. PARASIEWICZ: Right. Adding wooded debris, for example. You could provide habitat improvement measures, on one hand. You could also make sure that as much water as possible will stay in the landscape during high-flow events. So there are engineering measures, but there are also long-term measures. I think what would be necessary is also a long-term plan. What would be if? What will be up to 10, 20 years? Some of the measures cannot be applied right away. You can create some wetlands, something that could be done.

So there are possibilities, but

without exact analysis, there is no way to say what would bring us benefit.

I give you just one example. On the first project I was doing here, this was on the Quinebaug River, my major task was to say how much water this river needs. And we created a model believing that the amount of water was an issue. As it turned out, it wouldn't matter how much water we put into the river without improvement of habitat structure. There are so many dams, there are so much morphological modification that it doesn't matter how much water. That's something that you learn only when you investigated the system very exactly. When you know it in and out.

MR. GERSTMAN: Dr. Parasiewicz, you reviewed the Draft Environmental Impact Statement and the discussion of impacts to aquatic habitat?

DR. PARASIEWICZ: Yes.

MR. GERSTMAN: What conclusions did it

draw?

DR. PARASIEWICZ: It drew the conclusion there will be no impact.

MR. GERSTMAN: On what basis did it draw that conclusion?

DR. PARASIEWICZ: There was not -- based on my observation, there was no thorough analysis. There was just a very brief analysis of what could happen. And the conclusion was there will be no reduction of the groundwater flow.

MR. GERSTMAN: Would you characterize it as conclusory statements?

DR. PARASIEWICZ: No, it's inaccurate. It's inadequate to the size of the project.

Thank you.

MR. GERSTMAN: Judge, we recommend we take a lunch break and come back with a couple minutes of follow-up questions and then turn it over to --

ALJ WISSLER: Are we finished with this?

MR. RUZOW: Your Honor, if it's only a couple more minutes --

ALJ WISSLER: Yeah. How much?

MR. GERSTMAN: I actually would look forward to a short break so I could go over some of the questions and come back and make some concluding remarks basically.

ALJ WISSLER: Do you want to take a quick break now and do that so we can come back and start with -- I'll give everybody five minutes right now.

MR. GERSTMAN: It may be less.

(1:34 - 1:39 P.M - BRIEF RECESS TAKEN.)

MR. GERSTMAN: Dr. Parasiewicz, how would you characterize Birch Creek and Esopus Creek in terms of pristine or nature-like river? Can you give us some description?

DR. PARASIEWICZ: Neither of the two is pristine. There is not much in the North America that would be a pristine stream -- maybe Canada. It is however, I would -- the definition of nature-like for some portions of this would be probably accurate, specifically upstream of the confluence with the Crystal Spring Brook. My observations is from this portion that there is apparently a deficit of a woody debris in the upper portion of the river. So -- but my fauna observation say that it works relatively good as a system, apparently better than Stony Clove. So it would be very interesting stream to study, actually.

Specifically by fact of having this very clear seizure between the brook trout and brown trout. We're wondering why, actually. There's a lot of debate in the science, why the areas that are full of brook trout are not having so much brown trout, or actually the other way around most often. I think the composition temperature. It would be very interesting to figure this out.

MR. GERSTMAN: Would you say that these areas that you described as nature-like are worthy, I think you said this, worthy of study and worthy of being very protective because of their status?

DR. PARASIEWICZ: Yes, I would say so.

MR. GERSTMAN: You have spent time studying the Beaver Kill and Stony Clove Creek and Town Brook. Are the conclusions you're drawing with respect to the impacts on Birch Creek and the Esopus based upon the body of knowledge that you've developed over the course of your study of these other rivers and streams?

DR. PARASIEWICZ: That's correct.

MR. GERSTMAN: In terms of the quality of Birch Creek above the confluence with Crystal Spring Brook, would you say it's fairly unique in the northeastern United States?

DR. PARASIEWICZ: It's in common. I wouldn't say it's totally unique -- I'm sorry, uncommon. There are parts of New Hampshire or Vermont that have streams that are as good as this one.

I think for -- there are also streams in the Catskill Mountains that probably are similarly good, but it's not extremely common. It would be actually one of the areas that we are trying to find for our first science to establish our reference on how to manage the streams that have been modified.

MR. GERSTMAN: So this area that we're talking about above the confluence with Crystal Spring Brook actually has value for further scientific study and reference?

DR. PARASIEWICZ: That's correct.

MR. GERSTMAN: Judge, do you have any
questions?

ALJ WISSLER: No.

MR. GERSTMAN: Thank you very much.

ALJ WISSLER: Okay. We will break for lunch until 2:15.

(1:43 - 2:33 P.M - LUNCHEON RECESS TAKEN.)

(LETTER FROM LA GROUP DATED 8/25/04 RECEIVED AND MARKED AS APPLICANT'S EXHIBIT NO. 136, THIS DATE.)

(LETTER TO KEVIN FRANKE FROM JOHN MACPHERSON, CHEMIST WITH NATURAL SITE SOLUTIONS, LLC. RECEIVED AND MARKED AS APPLICANT'S EXHIBIT NO. 137, THIS DATE.)

(AUGUST 23, 2004 LETTER TO BILL MIRABILE FROM KEVIN FRANKE ON SHALLOW GROUNDWATER MONITORING RECEIVED AND MARKED AS APPLICANT'S EXHIBIT NO. 138, THIS DATE.)

(LETTER FROM NYS DEC DATED 10/13/00 RECEIVED AND MARKED AS APPLICANT'S EXHIBIT NO. 139, THIS DATE.)

(USGS "WATER RESOURCES OF THE BATAVIA

KILL BASIN AT WINDHAM , GREENE COUNTY, NEW YORK RECEIVED AND MARKED AS APPLICANT'S EXHIBIT NO. 140, THIS DATE.)

(RESUME OF RONALD A. ALEVRAS RECEIVED

AND MARKED AS APPLICANT'S EXHIBIT NO. 141, THIS DATE.)

("CHITOSAN (LIQUI-FLOC) SYNOPSIS" RECEIVED AND MARKED AS APPLICANT'S EXHIBIT NO. 142, THIS DATE.)

("CHITOSAN ENHANCED SAND FILTRATION FAILURE TEST" RECEIVED AND MARKED AS APPLICANT'S EXHIBIT NO. 143, THIS DATE.)

("RAINBOW TROUT (ONCORHYNCHUS MYKISS) CHRONIC TOXICITY SCREENING OF STORMWATER TREATED BY CHITOSAN ENHANCED SAND FILTRATION FLOW-THROUGH SYSTEM - REDMOND, WASHINGTON - JUNE 2, 2004" RECEIVED AND MARKED AS APPLICANT'S EXHIBIT NO. 144, THIS DATE.)

("LITERATURE REVIEW-CHITOSAN: ITS FORMATION, PROPERTIES AND APPLICATIONS - STATE PLANNING AND RESEARCH PROJECT NUMBER 615" RECEIVED AND MARKED AS APPLICANT'S EXHIBIT NO. 145, THIS DATE.)

("APPLICATION FOR PILOT-LEVEL DESIGNATION GEL-FLOC ENHANCED BIOFILTRATION STORMWATER TREATMENT TECHNOLOGY" RECEIVED AND

MARKED AS APPLICANT'S EXHIBIT NO. 146, THIS DATE.)

MS. BAKNER: I'd like to introduce the

following exhibits. We have Applicant's Exhibit 136, which is a letter dated August 25th, 2004 from Kevin Franke to Alex Ciesluk addressing some comments raised by Trout Unlimited relative to stream temperatures and heavy metals.

The next is Applicant's 137, which is a letter and other technical information from Mr. MacPherson to Kevin Franke. Mr. MacPherson is with Natural Site Solutions, and he is a chemist.

The next exhibit is Applicant's 138, and it is a letter from Kevin Franke to Bill Mirabile at DEC, dated August 23rd, 2004. Attached it has a lysimeter, L-Y-S-I-M-E-T-E-R construction detail, and drawings showing where we're proposing to put the shallow groundwater monitoring well.

Next is Applicant's Exhibit 139, which is a report entitled "Pesticide and Fertilizer Technical Working Group Final Report," dated -- with a cover letter dated October 13th, 2000.

Next is an article, a technical document entitled, "Water Resources of the

Batavia Kill Basin at Windham, Greene County, New York." It's by Paul Heisig, H-E-I-S-I-G, and it's Applicant's Exhibit 140.

Next is Applicant's Exhibit 141, and that's a curriculum vitae or resume of Ronald A. Alevras, and he'll be one of our experts here today.

Next is Applicant's Exhibit 142, which is a position paper entitled, "Chitosan Liqui-Floc Synopsis," August 23rd, 2004, Revised August 24th.

Next is Applicant's Exhibit 143 is a Chitosan Enhanced Sand Filter Failure Test by Natural Site Solutions.

Applicant's 144 is an article entitled, "Rainbow Trout, Chronic Toxicity Screening of Stormwater Treated by Chitosan Enhanced Sand Filtration Flow-Through System," dated June 2nd, 2004, prepared for Natural Site Solutions by ECO-Endeavors, Inc.

Applicant's 145 is a literature review entitled, "Chitosan, Its Formation, Properties and Applications." The authors are Li, L-I, and Kegley, K-E-G-L-E-Y, dated June 2004.

Applicant's Exhibit 146 is

"Application for Pilot-Level Designation, Gel-Floc Enhanced Biofiltration Stormwater Treatment Technology" dated July 9th, 2004.

What we'd like to do first, since we have an expert with us today who hasn't been with us previously, is I would like Ron Alevras to go over his educational background and experience so that we're familiar with his expertise level.

MR. GERSTMAN: Could I get a clarification before you start on which of these exhibits relates directly to the aquatic habitat discussion that we had this morning?

MS. BAKNER: The Chitosan relates to the issue that's raised in your petition, which is part of aquatic habitat, which was impact on aquatic organisms from the use of Chitosan. So all of those articles are, obviously, on that point.

The rest is the comments on stream temperatures and heavy metals, and that's predominantly the response relative to the aquatic habitat issue.

The groundwater monitoring, we wanted to get to everybody as soon as possible.

You'll recall that in our discussions on pesticides, DEP had requested that we shift from deep groundwater monitoring wells to shallow groundwater monitoring wells. So we wanted to get that in the record.

The other thing here is the working group, that's related to the fertilizer and pesticides.

And the Heisig report, when we went back and reviewed our notes and your exhibits, we realized that Dr. Michalski had not introduced the report, just a few drawings from it. And we thought the entire report was instructive.

The rest of it really has to do with Chitosan predominantly.

MR. GERSTMAN: For our purposes, anything not directly related to aquatic habitat, we'd like to obviously reserve the right to respond in terms of the Chitosan and whatever comments you're making in terms of the Heisig report vis-a-vis Dr. Michalski's testimony.

MS. BAKNER: We just introducing it.
We're just putting it in the record because

you didn't.

MR. GERSTMAN: We only had a couple charts that were relevant. We didn't want to kill more trees than we had to.

MS. BAKNER: Just to get started, then, Ron.

MR. ALEVRAS: I have a Bachelor's Degree in biology from Montclair State College, and a Master's in fisheries science from Oregon State University. My professional career has been divided between a period of five-and-a-half years with Consolidated Edison Company in New York, and over which time I dealt with the fish problems at the Indian Point Nuclear Plant.

After that I spent 25-plus years with Lawler, Matusky & Skelly engineers; that's involved a wide variety of endeavors associated with impact assessments.

The one most relevant to this proceeding is -- I spent a long period of time working on the licensing of small hydropower plants in New York State dealing with all of the typical issues associated with hydropower effects on stream flows, water level fluctuations, entrainment of aquatic life. And as part of that, we looked into and participated with our clients on various types and approaches to mitigation to reduce the effects of hydropower operations on River Rhine and lake habitats. The work was mostly undertaken in New York State, significant amount in the State of Michigan and some in the State of Massachusetts.

Currently, I work on a wide variety of projects in New York Harbor involving dredging and waterfront development.

MS. BAKNER: Thank you very much. Kevin, could you just remind us of your qualifications relative to aquatic habitat?

MR. FRANKE: I have a Bachelor's Degree in environmental and forest biology, the College of Environmental Science and Forestry. I have a Master's Degree in aquatic ecology from Fredonia State University. Working for 15 years with the LA Group, and a good portion of that work was associated with assessing impacts and mitigation to aquatic resources.

MS. BAKNER: Thank you very much. I

think what we want to do immediately is focus in on the presentation that we heard this morning, and the very few points that it made with respect to our project in specific.

And what I would like to do, Kevin, is ask you a series of questions about our project, just so we can make this clear for the record.

Are we proposing to channelize any streams or intermittent streams as part of our project?

MR. FRANKE: No, no channelization, including no culverting.

MS. BAKNER: Are we proposing to eliminate any flood plane habitat or have any effect on any flood plane habitat?

MR. FRANKE: We don't have any development in the flood plane.

MS. BAKNER: We have two bridges that cross, and those are covered by draft DEC permits at this point.

How close are we in our development

with respect to Big Indian to the streams, Birch Creek and the other intermittent streams?

MR. FRANKE: The actual development footprints, exclusive of the access road, obviously, which crosses Birch Creek, the closest point, I believe, is around 800 feet away from Birch Creek.

MS. BAKNER: 800 feet away. With respect to Wildacres, I understand we're a tiny bit closer. Can you describe that?

MR. FRANKE: There are two Class B intermittent tributaries to Emory Brook which pass through the Wildacres site, and the golf course crosses both tributaries, and Tributary 2, I believe, more than once, two or three times.

MR. RUZOW: When you say the golf course crosses it, what do you mean by that?

MR. FRANKE: Basically, the fairway will be constructed so that it is built up to a point adjacent to the stream. There's no filling of the stream, and the fairway picks up on the other side of the stream.

MS. BAKNER: So you're essentially shooting over the stream?

MR. FRANKE: That's correct.

MS. BAKNER: Would it be correct to

say we're bulldozing any streams or any intermittent streams as a part of this project?

MR. FRANKE: No.

MS. BAKNER: Do we have any impoundment or dams as a part of this project?

MR. FRANKE: No, the DEIS clearly states under the section of "Diversion and Impoundment" that: "No existing surface waters bodies will be impounded as a part of this project."

MS. BAKNER: All right. In terms of the irrigation ponds then, those are dug ponds and they're not impounded?

MR. FRANKE: Correct. They will be created dug ponds; they're not associated with any existing surface water resources.

MS. BAKNER: In terms of direct discharges to Birch Creek and other creeks, can you describe where we have our effluent discharge points?

MR. FRANKE: Right. Each side of the

project has its own wastewater treatment plant. On the Big Indian side of the project, we discharge to Birch Creek approximately

200 feet downstream of where the bridge from Friendship Road is proposed.

At Wildacres, we discharge to Tributary 3 of Emory Brook, approximately two-thirds of the way towards the southern boundary between the town road and the railroad tracks.

MS. BAKNER: And I believe on the various site visits, we looked at all of those locations?

MR. FRANKE: Yes, we did.

MS. BAKNER: In terms of discharges into Birch Creek, what other notable discharges are there into Birch Creek above and below our effluent point?

MR. FRANKE: Right now the City's Pine Hill Wastewater Treatment Plant discharges to Birch Creek.

MS. BAKNER: In terms of the capacity of what we're proposing and the capacity of the City's plant, what's the relative magnitude of the difference?

MR. FRANKE: I believe we're less than half of what is currently permitted for the Pine Hill Wastewater Treatment Plant.

MS. BAKNER: Are we proposing to change any habitat structure in any creek?

MR. FRANKE: No, we don't have any -- we have no proposed instream work disturbance.

MS. BAKNER: Have we proposed to take any flora or fauna, that's instream flora or fauna?

MR. FRANKE: No.

MS. BAKNER: Are we withdrawing any water from surface waters, existing surface waters from this project?

MR. FRANKE: Nope. Potable and irrigation water supplies are from groundwater.

MS. BAKNER: Are we proposing to deforest the site and leave it in a deforested condition?

MR. FRANKE: No. Any area that's disturbed and not developed will be revegetated for golf course and landscaping.

MS. BAKNER: So would you characterize what we're doing as more or less an immediate change in cover type?

MR. FRANKE: It would not be immediate, it would be short-term, but it would be certainly not -- historical sense it will be short-term.

MS. BAKNER: In terms of what materials we're bringing onto the site, what kind of an impact will they have in terms of discharges from the site; and in particular, how will they differ from thin soils that may run off after deforestation?

MR. FRANKE: As we talked about in the previous session, the entire golf course will be topsoiled with six inches of sandy loam material, which will actually provide storage, if you will, and decrease the severity during low flow, according to the testimony that we have heard this morning.

MS. BAKNER: So nothing that we're doing from a design standpoint with our stormwater system or the replacement of vegetation on the site would, in your opinion, extend the duration of low flows in any of the creeks surrounding?

MR. FRANKE: That's correct.

MS. BAKNER: For our stormwater plan, we've extensively evaluated pre- and post-quantity of runoff?

MR. FRANKE: That's correct. The stormwater management system has been designed to discharge at rates that are at or just slightly below the rate at which water comes off the site now. And it's actually held back in time so it's not discharged until the peak in the stream has passed. We're not contributing stormwater during peak flows.

MS. BAKNER: Switching to Mr. Trader. Did we collect any actual empirical data with respect to flows in the creek surrounding the site?

MR. TRADER: Yes, we collected flow measurements for a two-year period from Birch Creek and Crystal Spring Brook, and many of the other streams in the area.

MS. BAKNER: Where are the results of that monitoring found?

MR. TRADER: That's found in Table 1A, the infamous Table 1A.

MS. BAKNER: In Table 1A. The two years that you took the data in, did that include a drought year?

MR. TRADER: Yes, it was.

MS. BAKNER: What was the year of the

drought, roughly speaking?

MR. TRADER: 2001.

MS. BAKNER: Do you have any new or unexpected data with respect to stream flow or stream temperatures in the area that you would like to introduce into the record?

MR. TRADER: We had a temperature logger that was installed in Birch Creek just downstream from the wastewater treatment plant outfall.

MS. BAKNER: The Pine Hill New York City DEC Wastewater Treatment Plant?

MR. TRADER: That's correct. It was located in the creek. At some point in probably January, we couldn't find it. So we wrote it off. Al Frisenda -- this is where it was located, back in the creek behind his house -- he found it not too long ago, several weeks ago when he was out there with his grandson. It was still in the creek. It had just moved and it was covered by another boulder.

So he mailed that to me, and we downloaded it, and so now I have a nice record of about three years' of temperature measurements of Birch Creek at that point.

MS. BAKNER: Hence, the unexpected?

MR. TRADER: Yes.

MS. BAKNER: Can you describe --

ALJ WISSLER: Are you offering this?

MS. BAKNER: We are going to. We just don't have more than one copy. We can mark it whatever the next exhibit is, if you'd like.

("BELLEAYRE RESORT AT CATSKILL PARK - TEMPERATURE LOGGER AT AL FRISENDA'S RESIDENCE" RECEIVED AND MARKED AS APPLICANT'S EXHIBIT NO. 147, THIS DATE.)

MS. BAKNER: Steve, can you describe where Al's residence is, for the record?

MR. TRADER: Yes. He is on the eastern side of Rose Mountain Creek, which is just east of the New York City DEP Pine Hill Wastewater Treatment Plant.

MS. BAKNER: I don't know if you need to retrieve the chart, but what does the chart show about temperature in Birch Creek over that three-year period?

MR. TRADER: It shows -- these temperature measurements were programmed to collect four times a day, so every six hours.

So for each day there's four measurements. So you'll see a low and a high for each day. It shows a seasonal fluctuation of water temperatures in Birch Creek.

In the year 2002, summer of 2002 was the warmest, it was about 70 degrees for one or two of the six-hour periods over this three-year period.

The lows, over three different winters that are shown on the chart are 32 degrees. It didn't go below that.

In 2003, the warmest the temperature got was about 65 degrees. So 2002 was slightly warmer water temperature.

MS. BAKNER: During Dr. Parasiewicz's testimony, he commented on Tennant method data with respect to the Birch Creek confluence, and specifically he appeared to use, although we have never seen this before, four years of data, four or five years of data in order to draw some conclusions about the flows in the creek.

How does that data, the sort of predicted data, compare with your results? And if you could, please take some time and explain the degree to which the data that he used is predicted or how he came up with it.

MR. TRADER: He's using the stream-flow measurements that were recorded at the USGS gauging stage at Big Indian. There's approximately four years of data available for that site.

The drainage basin associated with Birch Creek at that point is 12.5 square miles. The drainage basin to the confluence of Crystal Spring Brook and Birch Creek where they meet, that drainage basin is 7.2 miles. So what he has done is to present this data for Birch Creek at that confluence, is to take the ratio of the drainage basin areas, which is 7.2 square miles to 12.5 square miles, that's 57 percent. So he's multiplying all of the USGS discharge -- stream-flow measurements by 57 percent and making a hypothetical hydrograph at the confluence, which is further upstream from that point. So he has a hypothetical hydrograph at the confluence of

Crystal Spring Brook and Birch Creek.

MS. BAKNER: We're not objecting to the method he used, but we're going to compare it now, if you will, to actual data.

MR. TRADER: The two-year flow study that we did, we took measurements at the confluence. We measured at Crystal Stream Brook, upstream of the confluence, Birch Creek, upstream from the confluence, and Birch Creek just below the confluence.

When you actually compare the numbers that we got, they don't agree with the 57 percent prediction. They're higher. The average of the two-year flow study was 78 percent. So that the flows that are predicted for that point further upstream are actually higher. We measured flows that were actually higher than what he's predicting should have been during those same times.

ALJ WISSLER: Looking at CPC 105, which is the PowerPoint presentation --

MR. TRADER: I think it was the last page.

ALJ WISSLER: Essentially, what you're doing is -- this chart compared to Table 1A;

right? Is that what we're talking about?

MR. TRADER: Right, this chart.
(Indicating)

ALJ WISSLER: Page 13 of CPC Exhibit 105, it's the chart on the upper left-hand corner of that page.

MR. RUZOW: Your Honor, it's also -- Steve, could you describe where in the doctor's report it was?

MR. TRADER: Page 3.

ALJ WISSLER: Of?

MR. RUZOW: That was Exhibit R, was it, to the petition?

MR. GERSTMAN: To our petition, yeah, I believe that's correct.

MR. RUZOW: The same graph is, I believe, shown in Exhibit R to the petition.

ALJ WISSLER: Exhibit R or Exhibit J?

MR. GERSTMAN: It's not R, Dan.

ALJ WISSLER: It's J.

MS. BAKNER: Go ahead.

MR. TRADER: We have the right exhibit?

MS. BAKNER: You have the right exhibit.

MR. TRADER: Page 3.

MS. BAKNER: Page 3 is the first hydrograph.

ALJ WISSLER: Of Exhibit J?

MS. BAKNER: Which shows all the data.

MR. TRADER: Figure 1, "Summer and Fall Flows in Birch Creek Measured at Big Indian Gauge." So those -- so that figure shows the flows at the Big Indian gauge.

ALJ WISSLER: We're talking about Page 3 of Exhibit J of the exhibits to the petition; is that what we're looking at?

MS. BAKNER: Yes, that's correct.

ALJ WISSLER: Of CPC's petition, okay.

MR. TRADER: In order to generate the data for the hydrograph at the confluence, he's multiplied each of those values by 57 percent.

ALJ WISSLER: And you're comparing the table on page 3 of Exhibit J of CPC's petition to Table 1A, the values that you're comparing?

MR. TRADER: Actually, it would be on this, it would be page 6.

MR. RUZOW: The values on page 6 with Table 1A is what you're comparing?

MR. TRADER: With Table 1A. What Figure 3, I believe is showing, is the hypothetical hydrograph at the confluence.

Then those numbers reduced by another .3 cfs.

ALJ WISSLER: So it's those values that when you just made the statement about comparing that with 1A, that's what --

MR. TRADER: There's like an intervening graph that wouldn't be shown here. There would be a hydrograph that shows flows that are 57 percent of the Big Indian gauge. Then this Figure 3 takes another .3 cfs off of those values.

MS. BAKNER: Let's talk about the origin of that .3 cfs. Based on Dr. Parasiewicz's presentation and also this petition, he's indicating that he feels the project will cause a loss in baseflows of the creek of .3 percent. And he appears to be relying upon Dr. Michalski's testimony to make that statement.

Can you explain why you feel that that's an incorrect downward adjustment?

MR. TRADER: Sure. Let me start by explaining, the .3 cfs reduction is equivalent to 132 gallons per minute. That's the maximum day demand for the Big Indian Plateau Resort. That's where they get .3 cfs.

So what he's saying is there's going to be a one-to-one loss in Birch Creek flow due to groundwater pumping from the three Rosenthal wells at 132 gpm.

MS. BAKNER: First, before you go ahead, if it's helpful, where are the Rosenthal wells in relation to the confluence here?

MR. TRADER: They're downstream, 4000 feet.

MS. BAKNER: Do you want to point that out?

MR. TRADER: Yes.

ALJ WISSLER: Can you identify, is this from the DEIS or --

MS. BAKNER: This is something we haven't produced yet, but we'll be introducing it into the record. Steve, read off the title, if you will.

MR. TRADER: Title is, "Recharge Areas for Water Supplies in the Vicinity of the Proposed Belleayre Resort."

ALJ WISSLER: We'll call it 148. It's 148, and it's a map of recharge areas.

(MAP OF RECHARGE AREAS FOR WATER

SUPPLY RECEIVED AND MARKED AS APPLICANT'S EXHIBIT NO. 148, THIS DATE.)

MR. GERSTMAN: Is this different than the prior map of recharge areas that was introduced by Dr. Gowan?

MR. TRADER: It is different.

MS. BAKNER: Yes, it is different.

ALJ WISSLER: So we'll be copying this and making it available?

MS. BAKNER: It's much broader, Marc. Just for reference points, it shows the recharge areas as they go off our site. That's the difference between the two.

Where are the Rosenthal wells in relation to the location of where they have the confluence of Birch Creek and Crystal Spring?

MR. TRADER: Crystal Spring Brook is here, flowing north, taking a turn, but down towards the southeast, it joins up with Birch Creek, which is a southward flowing stream at that point. It joins up right near the village of Pine Hill. (Indicating)

MS. BAKNER: Where is the confluence in relation to that, if you could just point it out?

MR. TRADER: This is the confluence, and the Rosenthal wells are here, which looks to be about 4000 feet downstream. (Indicating)

MS. BAKNER: Thank you.

Just to make sure I understand this, Dr. Michalski is assuming that when we pump water out of the Rosenthal wells, that that water is going to be lost to the stream system upstream, or downstream, which is it?

MR. TRADER: It's going to be lost to Birch Creek.

MS. BAKNER: Okay. So that's the assumption that's being made. Do you agree with that assumption?

MR. TRADER: No, I do not.

MS. BAKNER: Can you tell us why you disagree with that assumption?

MR. TRADER: Sure. First off, the geology of Birch Creek Valley is very important here. What you see when you go down to the valley along Birch Creek, there's typically a surficial layer of sand, gravel and cobbles, and this is a variable thickness anywhere from zero feet thick to maybe 20 feet thick. This is up and down the Birch Creek Valley from Pine Hill to the southeast.

This thin, gravelly cobbley layer is what Birch Creek is flowing within. It's also what the water table in the area, in the valley is located in; it's situated in that sand and gravel cobble layer.

This surficial deposit is underlain by, directly, a very thick glaciolacustrine clay deposit. We saw this on one of the field trips. We saw it down by the Winding Mountain Road Bridge. You could actually see the layers in the clay exposed under the gravel in the creek bed.

MR. RUZOW: That reddish color?

MR. TRADER: The reddish-brown color. This is actually being eroded away at the Pine Hill Wastewater Treatment Plant also. There is a clay bank exposed there, and many times during a storm event you can see the cloudy, reddish-color water. And as you go upstream, it stops at that point.

So the reason that is very important is because that very thick clay deposit is --

effectively acts as a barrier to Birch Creek flowing through that clay, and also from any kind of bedrock water coming up through the clay from the bottom.

So there is water in the clay, but it's moving at such a slow rate, it's not going to be effectively attained as a water supply. You wouldn't want to put a well in clay and try to get water out of it.

This sets up a condition in the valley that had -- that displays confined hydrologic conditions in the bedrock aquifer locally in the valley. So that when we put our bedrock wells in and we seal off the overburden, they have the clay and the surficial gravels, that's all sealed off. Our water is being obtained from below, anywhere from 35 to 100 feet or so, approximately.

The bedrock water is not in direct connection with Birch Creek because of this thick layer of glaciolacustrine clay. There's also a glacial till, which is very low permeability also up and down the valley.

MR. GERSTMAN: Judge, I would object to this line of offer of proof that's being provided for the record at this point. The subject of the day is aquatic habitat. We had significant discussion on the issue of surface and hydrogeology of the site. Communication between -- the recharge, in fact, conceded by the Applicant -- this entire discussion has taken place when Dr. Michalski was here. We had an opportunity to respond. They're now resurfacing, if you will, those issues for discussion in connection with the aquatic habitat discussion.

We understand that Dr. Michalski's offer provides the premise, much of the support for what Dr. Parasiewicz said today, but that doesn't mean that this opportunity now is provided to the Applicant to reopen these discussions.

ALJ WISSLER: Do you want to respond?

MS. BAKNER: Yes. Thank you, your Honor. First of all, very little of what Dr. Parasiewicz said today related in any respect to our particular site or the conditions on our site. His entire argument regarding the change in baseflows and the impact it will allegedly have, this brink of disaster, is based upon Dr. Michalski's erroneous conclusion that our pumping of water from the bedrock wells are going to have an affect on the surface waters and the baseflows in the creek. So we need to explain why, in fact, that we don't feel that's going to happen. I mean, it's a house of cards he has built. If there's no impact, if there's no impact on our withdrawal of water from bedrock upon the stream flows, then there's no reason to discuss aquatic habitat because that's the whole thing he's pinning his argument on.

That's why it's so important that we point out to you that his hydrograph is mistaken in two respects. It's mistaken in that it artificially and without sufficient basis takes off .3 cfs based on Dr. Michalski's incorrect testimony. And it's also not reflective of actual empirical conditions, based on what Mr. Trader has shared about their actual surface flow monitoring.

We can leave it at this point. We feel that we've put everything in the record with respect to that, but we need to have the ability to defend the product that we've done and to show really that the academic exercise in channelization and dams and all these things that have nothing to do with our project, you know, really don't provide any probative value in this particular issue.

So we would like to go on just for a second or two more on this issue and we can move forward.

MR. GERSTMAN: It seems like Ms. Bakner has supported my assertion that, in fact, all they're doing is rehashing the discussion that took place when Dr. Michalski was here and was able to respond to some of the contentions that were made. Notwithstanding her characterizations, Dr. Michalski's projection and evaluation was based upon his scientific judgment --

ALJ WISSLER: Well, Dr. Michalski's conjectures are -- do form part of the basis of -- I'm not even going to try -- the good doctor's argument today, though, wouldn't you agree with that?

MR. GERSTMAN: I would say they were more than conjecture, and yes, they would form the basis --

ALJ WISSLER: Again, let's remember we are at an Issues Conference. These are offers of proof. I do think that what Applicant's have offered is relevant and germane to our discussion here today, so I'm going to allow it. To the extent that you have made an objection, that objection is overruled, but your concern is noted for the record. Why don't you go ahead.

MS. BAKNER: Thank you, your Honor.

MR. GERSTMAN: I would ask for the right to have Dr. Michalski review the testimony today to provide a response.

ALJ WISSLER: Whatever response, sure.

MR. GERSTMAN: Thank you, Judge.

MS. BAKNER: You were talking about the confined nature of the aquifer. Of course, this doesn't mean there's no recharge into the system or anything?

MR. TRADER: It's locally confined and mainly within the valley. And Birch Creek itself is confined within the valley itself. It's in Birch Creek valley. Let me back off that.

The reasons that we see that this is confined isn't just simply because I say there's clay there. It's been encountered in drilling logs in the valley. We did several pumping tests, and we interpreted the data to show that there's no water level changes that were attributable to our pumping either -- no water-level changes in Birch Creek, the nearby wetland, nor did we see it in the water table.

Also, the fact that the water levels that we saw in the bedrock wells, that we see still today, versus the water table itself, there's about a 15 foot difference. The water table is 15 feet higher than the water levels in the Rosenthal wells, which are not pumping.

If there was a direct connection between these two, the water table and bedrock wells and Birch Creek, we would expect to see a much more similar water level in all these measurings.

MS. BAKNER: When you pumped the well, you also monitored the levels in the creek?

MR. TRADER: Yes. We didn't see any water-level changes in Birch Creek or the water table or in the well.

Also, there are two known flowing artesian wells that are in the valley. One is one of the residential wells we monitored, which is further downstream from the Rosenthal well field, it's a flowing artesian well. There's about 100 feet of clay that was drilled through, and it's a bedrock well. So this indicates that the hydrostatic pressure in the bedrock at that point is higher than it is under the atmospheric conditions of the water table.

There's another flowing artesian well further down the Birch Creek valley down -- more closer to the Esopus Creek valley, to the junction. It also had 100 feet of clay that it penetrated before it made any water, and it's a bedrock well and it's a flowing artesian well.

One of the other signs of evidence that shows that this aquifer acts as a locally confined aquifer is something that was discussed in the pumping test report for the most recent pumping test, which was Wells R1, R2 and R3. There was a combined pumping test.

We saw in our pretest monitoring for

that -- this is before we were doing any pumping. We monitored it for a period of days, the water levels, and we saw the effects of what are known as earth tides. This is similar to what you see in the ocean tides, which are based on the moon. You see high tide and a low tide.

Earth tide is simply -- it's the reaction to the combination of the gravity pull of the sun, earth, moon system. The earth actually has a tide, if you will, that goes around -- we don't see it every day, but what it manifests itself is in a confined situation where you have fractured bedrock.

So it's basically squeezing these fractures and then slightly letting them up; squeezing the water up and then the water comes back down as the earth tide goes by.

These have been reported before in other places, and they occur in confined conditions. They have been reported to occur in an unconfined situation, but that's something like they were occurring in granite. And it was a very low permeability, and we certainly don't have low permeability, as evidenced by our results of our pumping tests, which we're pumping 149 gallons per minute.

So those are the lines of evidence that we have actually seen in the field, and tested and measured that shows that this is a confined situation at this aquifer, and that there is no connection with Birch Creek.

MS. BAKNER: Most particularly, you have the empirical evidence from two years of surface flow monitoring, as shown in Table 1A, which shows what, relative to the hydrograph? It shows more water?

MR. TRADER: The nut of this is that the relationship between Birch Creek at the confluence and Birch Creek at the Big Indian gauge is not what Dr. Parasiewicz's model had predicted. He's predicting -- based on the comparison, it would be 57 percent of the flow. In fact, over our two-year study period, it averaged 78 percent.

MR. RUZOW: Including a time of drought?

MR. TRADER: Including a time of drought, yes. During the time of drought, it was probably -- I think it was between 71 and

75 percent of the flow further down the stream.

MS. BAKNER: Thank you very much, Steve.

MR. TRADER: One other little thing on that. The effect of this on the chart where he has reduced the flows by .3 cfs, well, that was all predicated on the flows at the confluence being 57 percent of what they are downstream, and then taking .3 cfs off.

Well, our flow study shows that it's not that ratio. It's actually about 78 percent on average. So the flows would be higher. Then we're also saying that you shouldn't be taking the .3 cfs off --

ALJ WISSLER: How did you derive the 78 percent?

MR. TRADER: That's looking at the flows we measured at the confluence of Crystal Spring Brook and Birch Creek. We measured flows in Birch Creek just down from the confluence. Taking that flow and comparing it

to the flow that was measured by the USGS at
their gauging station.
ALJ WISSLER: That's taking Table 1A

data and comparing it to the USGS?

MR. TRADER: Yes.

ALJ WISSLER: And where is that USGA data?

MR. TRADER: Has it been submitted?

MS. BAKNER: We'll find out where that is, and if it's not in the DEIS, we'll submit it.

MR. TRADER: That's where the 78 percent comes from. So the effect of that is you're not going to be down to that 30 percent Tennant threshold as often as that one figure would indicate.

MS. BAKNER: Kevin, there was a lot of discussion about a number of things that we're doing that would cause changes in baseflow, and I just want to run through those briefly.

It is true that we are increasing impervious area on the site?

MR. FRANKE: Correct.

MS. BAKNER: The ratio of impervious area that we're increasing to the overall site, what is that, roughly?

MR. FRANKE: For the project site, I think approximately four percent impervious area.

MS. BAKNER: So for the entire project site, only four percent of it is going to be impervious area?

MR. FRANKE: Correct.

MS. BAKNER: As I recall, one of the ways we limited impervious area was by putting parking lots under buildings?

MR. FRANKE: We have parking under the Big Indian Hotel, we also have a multi-level parking garage at Wildacres, as well as parking at the Wildacres Hotel. Parking otherwise would have been surface parking lots, now it's underneath the building.

MS. BAKNER: So if one were to look for a sea of asphalt here, one wouldn't find it?

MR. FRANKE: No, one wouldn't.

ALJ WISSLER: The four percent for Big Indian is --

MR. FRANKE: It's for the entire project site, your Honor. If you total up all the impervious areas between Wildacres and Big Indian compared to the total project site.

ALJ WISSLER: Includes access roads?

MR. FRANKE: All the access roads, yes.

MS. BAKNER: Buildings, roof tops?

MR. TRADER: Correct.

MR. RUZOW: Including the Big Indian country club and spa building, which we have not taken credit for it being a vegetated roof as opposed to --

ALJ WISSLER: That's four percent of --?

MR. FRANKE: 1260, I believe is the total acreage.

MR. RUZOW: That's Big Indian.

ALJ WISSLER: Four percent of 1900 -- almost 2000 acres is what you're saying? That is not four percent of what is proposed to be actually developed?

MR. FRANKE: Correct. What is being proposed to be developed -- it's on a table if you would like, I believe we're up somewhere around 12 percent.

MS. BAKNER: One of the comments that

we heard here today was that we were fragmenting and filling wetlands on the site, and I would like you to point out where in the

EIS we cover what impacts we're actually going to have. I believe we have that tagged.

MR. FRANKE: In the EIS, Tables 3-25, Wetlands Table Eastern Property; 3-26, Wetlands Table Western Property; and 3-26A, Projected Impacts to Wetlands of the Belleayre Resort Site. In here we document the amount of impacts to isolated and nonisolated wetlands.

MS. BAKNER: We don't need to go over the numbers, I'm sure his Honor can read them himself from the DEIS, but in terms of the overall size of the site -- looking at the quantity to be filled here, as I understand it, the impacts to regulated wetlands are less than -- they're less than a tenth of an acre. And otherwise, impacts relative to clearing and filling are roughly two, two and a half acres, more or less?

MR. FRANKE: Right. The clearing, which is just simply removal of the woody vegetation, the trees from the wetland -- we talked about the golf holes playing over some of these drainages -- is approximately two and a half acres. And the numerous and scattered isolated wetland fills is about an acre and a half.

MS. BAKNER: As an aquatic biologist, would you have the opinion that these minor impacts to wetlands would have any impact on the baseflows of the streams?

MR. FRANKE: No, because none of the fills that are proposed are going to really totally interrupt the hydrology or the discharge from these discharge wetlands. Most notably, there's the area by the Wildacres Hotel where those wetlands would be affected, the water is currently flowing and would continue to be piped underneath the golf course fairway, so it continues to be flowing in the direction and the quantities that it's flowing today.

MS. BAKNER: And I believe we're also lining our stormwater ponds in that location so we can be sure we don't have an effect on the springs or the wetlands that are adjacent to those?

MR. FRANKE: That's correct, and we'll see more of that tomorrow when we talk about stormwater.

MS. BAKNER: So for this limited and very tiny amount of filling in relation to 1,970 acres, you wouldn't anticipate any kind of appreciable impact on the surface waters surrounding the site?

MR. FRANKE: No.

MS. BAKNER: Ron, could you share with us your opinion with respect to that?

MR. ALEVRAS: Yes. Just let me let the Judge know where we are -- LMS's role in this. We were asked by the attorneys for Crossroads to take a look at the Draft EIS and specifically, areas of technical concern. And my area specifically was to look at the effects on streams and aquatic life populations.

I reviewed the Draft EIS, various relevant sections, description of the project, the ways in which the project was designed to minimize impact. I've reviewed the aquatic resource information provided in there, as well as doing a reconnaissance walkover of most of the streams or major portions of the streams in the project area.

What I found was that I see no areas,

except in the minor locations identified by Kevin, where there's any direct effects on surface water. The project has avoided those almost completely, so that there's no direct effects on changes in the streams and the headwaters of the streams that are feeding the streams lower down on the slopes.

The stormwater provisions that are provided here are going to go a long way to preventing changes in flows in the intermittent streams that occur off of the site, and that will minimize any effects that could occur to the permanent flowing streams down below.

As part of the review that I did, I looked at the fishery data that's available and the aquatic life data that's available for this area of the streams. The streams provide, as has been identified, good habitat, good spawning habitat for trout, particularly Birch Creek. Substantial reproduction occurs there. And that occurs despite significant permitting changes that have occurred to the watershed all through the Route 28 corridor that goes through Pine Hill and the project area.

It indicates to me that the stream has adjusted to and has recovered from the various changes that have occurred over time as physical structures, roads, buildings and so forth were put into the watershed.

The relationship between the resort project, the existing resources and the existing impacts that occur to those resources, makes the resort a very minor influence and potential influence on the stream resources, the physical nature and the flows in the streams, therefore, likely to have very little impact on the aquatic resources that are using those streams.

MS. BAKNER: In terms of the suggestion this morning that we really need to do an extensive academic study, what is your opinion of the electro-shocking and the other data in the DEIS relative to the fish and the habitat quality? Do you think it does a good job of describing the habitat?

MR. ALEVRAS: Yes. The habitat quality is clear from the fishery data. The numbers and the distribution of the trout in the stream are impressive. There's a substantial trout resource present. I suspect that that resource is important for the Esopus Creek downstream of Birch Creek. It's probably an important spawning area for the trout resources that occur farther down and are an important fishery resource for the public.

The quality of the habitat is good, the walkover that I did indicated to me, even in those areas where there's been significant physical modification to the stream, particularly the stream is relocated around Pine Hill Lake, and basically, the whole stream course was rebuilt.

In the village of Pine Hill, there's numerous areas where there's direct runoff of the roads. There's sections where the stream is confined between stone walls that were built some time ago. Despite those changes, the physical resource is still there and the fish are responding appropriately and continuing to reproduce in that area.

The characterization of the creek as somehow on the brink of disaster is way overstated. There's no indication that that has occurred. In fact, the stream has shown extraordinary resilience in the face of a lot of direct impacts. The fact that this project is going to have only very minor indirect impacts, to suggest that that increment would push it over the brink, I think is way overstated.

MS. BAKNER: The value of the stream habitat was described by Dr. Parasiewicz as uncommon, not pristine, but uncommon. Could you give us your opinion on that?

MR. ALEVRAS: Yes. I take issue with that characterization. He was speaking specifically about the upper portion of Birch Creek upstream of Pine Hill Village, that's essentially upstream of Route 28.

I walked over that area, I took a look at it. I would characterize it as a stream that to the layman looks very good and would be characterized as natural in appearance.

However, that stream had serious impacts to it. There's a road that parallels it very closely, in fact, so closely that there are places where you can step off the blacktop into the creek. There's no intervening vegetation whatsoever, and there's eroding banks along the edge of the creek. This road extends all the way to near the headwaters, and there's a pond at the headwaters that's being used as a handicapped fishing area. But that pond is slowing the water down and probably warming it up to some extent.

There's former agriculture at the headwaters and cleared land up there. Along the stream channel, there's a number of areas where the land is cleared; in one case, a large acreage of grass where the creek has been channelized and goes to the middle of the creek. And near Route 28 on Academy Street, there's a bridge being replaced right now. That bridge -- that work area is not being adequately protected, and there's erosion occurring at that location.

I would not characterize this as a place that is uncommon in terms of its quality of habitat. I think it's a very common condition to see a stream treated this way. It is perhaps uncommon to see it that far up in the headwaters of the stream, but the kind changes that have occurred there, and are continuing to occur, are not at all uncommon.

If you simply survey a map of the Catskills and look at all of the hollows and the small tributaries that do not have roads up their valleys, I would suggest that virtually every one of those have higher quality and better habitat than the upper reaches of Birch Creek.

MS. BAKNER: In terms of the proposed project, Ron, and the steps we have taken to limit direct and indirect impacts to the stream, is there anything else, is there any other mitigating measure that you would have recommended?

MR. ALEVRAS: I would say no. I would think this has been a very thorough look at the potential effects, and clearly the project has been designed around the existing resources, not just the aquatic resources. But because you're at the headwaters and you're at the place in the stream channel where you might say there's such a close relationship between the watershed and the stream itself, that -- it's the place in the watershed where it takes a lot of care to make sure you don't damage the resource. And this has clearly been the case, leaving 800 feet between the nearest land clearing and disturbance to the nearest stream course, for example, I would characterize it as an extraordinary amount of space to protect a headwater stream.

Rarely is that done, and because it hasn't been done is why so many streams are in bad shape. And I think this is an example of somebody who's going to take care of a resource.

ALJ WISSLER: Kevin, I think you said it was 800-foot; right?

MR. FRANKE: Yes.

ALJ WISSLER: What is the elevation of that -- when you're measuring that 800 feet, is that coming down the hill?

MR. FRANKE: It was measured on a flat piece of paper, so a linear distance.

ALJ WISSLER: Linear distance, you

said was 800 feet; right?

MR. FRANKE: Yes.

ALJ WISSLER: But where that groomed

area, whatever it is, down to the stream, there's an elevation change; is there not?

MR. FRANKE: Sure.

ALJ WISSLER: About how much is that would you guess?

MS. BAKNER: It would be different at different locations.

MR. FRANKE: Mr. Frisenda estimated 6- to 800 feet in elevation.

MS. BAKNER: Your Honor, that's at Big Indian and not Wildacres.

ALJ WISSLER: Yes, because we're talking about Birch Creek.

MR. FRANKE: About 1900 is where the employee parking lot is, that's the lowest point.

MR. RUZOW: That's elevation?

MR. FRANKE: Correct. And the elevation of Birch Creek directly below is approximately 1320. The linear distance -- I misspoke -- the linear distance to the creek itself is approximately 1300 feet from the employee parking lot down the hill to Birch Creek.

ALJ WISSLER: That's going down the

slope of the hill; right?

MR. FRANKE: Correct.

MR. RUZOW: Can you give us a sense of the scale of the employee parking lot in terms of its size?

MR. FRANKE: The employee parking lot is actually two lots --

ALJ WISSLER: Who's good at trig?

MR. TRADER: 1400 feet up the slope.

ALJ WISSLER: 1400 feet in slope and 800 feet on one leg of the triangle.

MR. FRANKE: In terms of the nearest golf hole is approximately 2200 feet.

MR. RUZOW: For the record, we're looking at the drawing sheet MP-4, Master Plan 4.

ALJ WISSLER: Which is already in evidence as Office of Hearings --

MR. RUZOW: Right, it's part of the application, the LA Group plans' set.

MS. BAKNER: Your Honor, does that

answer your question?

ALJ WISSLER: It does.

MS. BAKNER: The other suggestion, and I'm frankly not sure who would be better to answer this, there was a suggestion that our effluent point into Birch Creek could somehow serve as a thermal barrier to -- I think it was fish migration -- as a thermal barrier, yes, that was the issue. So is there any evidence that would suggest that?

MR. FRANKE: No, I think we have got empirical evidence to the contrary. We have got the Big Indian Pine Hill DEP Wastewater Treatment Plant discharging into the vicinity. And the temperature data that Al Frisenda collected indicates there's no significant changes. The temperature of the stream is very localized.

MS. BAKNER: You're referring to Applicant's Exhibit 147?

MR. FRANKE: It's not just that data, there is other data in the EIS that point to that.

MR. TRADER: The effluent from the treatment plant is typically about four to six degrees warmer than Rose Mountain Creek, which is the direct tributary to Birch Creek.

MS. BAKNER: And Kevin, also, I'm sorry, I want to refer to --

MR. FRANKE: Let me just back up a second.

MS. BAKNER: Sure.

MR. FRANKE: Related to that, in terms of any thermal loading during the warmer months, the warmer months will be the dryer months where we will need that effluent for irrigation. So there will be certainly less frequent discharges to Birch Creek during the warmer months. But a lot of that water is going to be pumped to the irrigation ponds and filtered through the ground before it reaches Birch Creek as baseflow.

MR. ALEVRAS: One more point is that the likely time that fish would be migrating in the creek -- and this would be almost probably exclusively trout, they would be migrating upstream to spawn -- that is going to occur in the fall of the year when the base temperature is substantially less than the peak temperature that's shown on the graph of the temperature monitoring that was done just below the treatment plant. All those factors taken together, I suggest there's very little, virtually no chance that it's going to block the migration of fish in the creek.

MS. BAKNER: I'm referring to Applicant's Exhibit 136; this also addresses the temperature issue, I believe, Kevin?

MR. FRANKE: Right. This reiterates what I just stated but gives specific data as to actual temperatures at various locations along Birch Creek in relation to the Pine Hill Wastewater Treatment Plant.

MS. BAKNER: So that's the table on page 2 entitled, "Post-Spawning Stream Temperatures"?

MR. FRANKE: Correct.

MR. GERSTMAN: Could you repeat that?

MS. BAKNER: Exhibit 136, page 2, look at the table in the middle of the page. It goes through the temperatures, November, December, January, February and March.

MR. FRANKE: The concern here wasn't so much for a thermal barrier, but any potential impacts on egg development within Birch Creek.

MS. BAKNER: And your conclusion regarding that is?

MR. FRANKE: It's not going to have

any significant impact on the viability of eggs or egg hatching time.

MS. BAKNER: There was another allegation early on that we would have some indirect impact relative to increasing heavy metals in the stream. And that's addressed on page 3 of Exhibit 136. If you could just go over that quickly.

MR. FRANKE: The simple answer to that is that we've designed a stormwater management system that serves all our impervious surfaces and has been designed in accordance with the New York State Stormwater Design Manual, which has, as part of its criteria, removal of metals from stormwater, among other things, such as nutrients and solids, metals are also taken into account.

MS. BAKNER: They use the removal of sediments as sort of a surrogate for metals and other things; is that correct?

MR. FRANKE: Yes.

MS. BAKNER: Is there anything else

you want to point out in Exhibit 136 to the
Judge?
MR. FRANKE: No, the only thing I'm

just piggybacking on the stormwater. The method that we're proposing to use, these micropool extended detention ponds actually have the highest ranking for metal removal among all the practices listed in the Stormwater Design Manual.

MS. BAKNER: What does that practice do for us in terms of temperature?

MR. FRANKE: Temperature, it's also one of the practices that is recommended in a cold-water fisheries area, as opposed to other practices which could have greater thermal impacts. This is one of the practices to choose from in the selection matrix in the manual when you're in the area of cold-water fisheries.

MS. BAKNER: So are you satisfied as a biologist that we've done everything we can to protect the aquatic habitat?

MR. FRANKE: I feel comfortable, yes.

MS. BAKNER: And that was relative to stormwater.

There was a suggestion that somehow compaction, either compaction on the ski slopes or compaction of the golf course, would have some impact on infiltration and baseflows. Do you find that allegation credible?

MR. FRANKE: Particularly not for ski slopes, since there's no ski slopes associated with our project. As far as the golf course goes, their golf course maintenance is going to involve steps that we're able to take to relieve compaction in order to enhance the ability to grow the grass, various physical methods of working the soils such as pulling soil cores out, slicing, things like that are routinely performed to relieve compaction on golf courses.

MS. BAKNER: I think that's everything that we needed to cover. I would just invite you, Ron and Kevin, if you have anything more you would like to say relative to Dr. Parasiewicz's testimony.

MR. ALEVRAS: Well, I found that the testimony lacked the detail that was needed to evaluate a specific project. I've seen this time and again on development projects where there's concerns over various levels of impact and those concerns are based on general information about what occurs to streams and aquatic resource populations in those streams.

But I would have to look at the details of what the project is going to do, its relationship, how it's affecting the watershed. And those specifics are where the issues need to be addressed, not in the general concerns regarding someone's desire to have more trout or more fish in the stream. I hope that this project -- as the review of this project goes forward, the specifics are what are dealt with and not the generalities.

MS. BAKNER: What I would like to move forward to now, just briefly, is the use that we're proposing to make of Chitosan, which has been -- an issue has been raised related to the toxicity of Chitosan to aquatic species, most notably trout.

So the first thing I would like Kevin to do briefly is just refresh your Honor's recollection as to how we're using the Chitosan, and the somewhat limited use that we're making of it during construction. So if you could do that, Kevin.

MR. FRANKE: Right. We discussed

during the construction phasing presentation earlier, we need to do something to treat the collected stormwater in order to settle out all the fine clay materials.

What we propose to do is treat this with a chemical liquid flocculent, the active ingredient, Chitosan, also known by the trade name of Liqui-Floc. The material will be sprayed into the basin, the basin will be allowed to settle out, and then the water, once it's cleared, will be pumped out of the basins through these long dispersion pipes that will be in wooded areas, pumped out, and the water is dispersed over the hillside.

The product itself is a natural product derived from seafood shells. It has many different formulations, but the one we're proposing to use is the chemical, Chitosan acetate.

ALJ WISSLER: Kevin, the plans that have been submitted, they show the placement of those outfalls?

MR. FRANKE: Yes, your Honor, Applicant's Exhibit 44. If you recall, the earlier version we had out there did not show those, but we supplemented the record the following day with Applicant's 44 which does show the locations of those dispersion pipes.

ALJ WISSLER: It's already in the record; right?

MS. BAKNER: Yes.

MR. FRANKE: This is for Phase II of Big Indian, if you recall, which was 10 of the golf holes. We have got 22 basins that will be capturing stormwater, designed to capture and hold six inches worth of runoff.

Of those 22, 17 we're able to pump to the irrigation ponds. So they'll be no overland dispersion. We'll take that water, empty our ponds, put it in there for a later date for when we need to irrigate the sod.

MS. BAKNER: So you said there were 17 out of the 22 will get pumped to the irrigation ponds?

MR. FRANKE: Correct.

MS. BAKNER: That leaves how many that

get into the dispersion pipes -- since I can't add and we've demonstrated that before?

MR. FRANKE: That would be five.

ALJ WISSLER: Is any of it located in

the 100 acres of sod?

MR. FRANKE: Actually, it will be below the 100 acres of sod.

The EIS, specifically Appendix 9 goes into great detail to explain how the discharge rates will be --

ALJ WISSLER: Where is Birch Creek?

MR. FRANKE: Down here. And here is the employee parking lot we talked about is roughly over here. (Indicating)

ALJ WISSLER: So you have a level spreader along here?

MS. BAKNER: Dispersion pipe.

MR. FRANKE: Dispersion pipe is the term we prefer to use.

ALJ WISSLER: Basically, a perforated pipe?

MR. FRANKE: Correct, yes.

MS. BAKNER: Is that the closest perforated pipe to Birch Creek?

MR. FRANKE: Yes, it is. They're equally distant.

ALJ WISSLER: Kevin, is this the scale? In other words, there will a pipe that will run -- if you were to scale this hill --

it will run that distance and stop right there, or is this just generally the area where you intend to run them?

MR. FRANKE: No, we ran specific lengths so we could control the rate of our discharge so it doesn't exceed normal stormwater runoff rates. We want it to spread out enough over that slope so we don't have concentrated flow.

One of the concerns of the Department was getting concentrated flow once you start pumping this water out, so we spread it out purposely over these long areas of slope.

ALJ WISSLER: So what that shows is where it is?

MR. FRANKE: Like everything else, it's to scale and at its location.

MS. BAKNER: Kevin, did you produce something that showed you made the pipe long enough?

MR. FRANKE: The back of Appendix 9,

there's an addendum which has the hydrographs for the discharge rates for all the dispersion pipes that are being shown there.

MS. BAKNER: That was in Appendix 9?

MR. FRANKE: Right, the addendum to Appendix 9.

MS. BAKNER: Okay. So the ponds that we're focused here on are the five ponds that we're going to dose with Chitosan in order to enhance sedimentation. Do you typically use flocculents in your stormwater management plans?

MR. FRANKE: Typically, no.

MS. BAKNER: Would you describe this as an enhanced stormwater control measure?

MR. FRANKE: Yes, it certainly is. The other thing is you just let the course of sediment settle out and pump out the water with your fine silt suspension.

MS. BAKNER: So you actually searched quite a while until you found something that you felt presented the least amount of risk. What are the other things that are available?

MR. FRANKE: Aluminum sulfate or alum is commonly used as a flocculent to precipitate things out. Early discussions with the Department, the Division of Water folks, they didn't want us to even think about using that. There's another --

MR. RUZOW: The reason for that would be --

MR. FRANKE: It wasn't very clear at the time. I believe it had something to do with the metals loading from the aluminum portion of it.

The other group of chemicals are commonly known as PAMs or polyacrylamides. State of California lists some polyacrylamides on their list of potential cancer-causing agents. So we thought it wise to stay away from that group altogether being in the watershed.

MS. BAKNER: What is one of the -- kind of odd things you found out about Chitosan when you were going through this research? I mean, odd in the sense of unusual? Is it also used in human medicine?

MR. FRANKE: It has many uses, one of the uses being in human medicine, actually used as a coagulant on bandages.

MS. BAKNER: So there's no question

that it's not toxic to humans?

MR. FRANKE: Everything is toxic to humans in certain doses.

MS. BAKNER: Bad question.

MR. FRANKE: So at the correct doses, no, it's not toxic.

MS. BAKNER: Thank you. So our goal was an enhanced treatment, we've described the method of using it. How do we know it's going to work? What testing did you do?

MR. FRANKE: The EIS contains a figure -- we sent dirt from the site to the lab out in Washington and they ran jar tests on our soil, dosing it with various amounts of the product -- with our soils in suspension in water, and basically got 95 to 90 percent removal within an hour after dosing it with the same dose that we would use in the field. It's Appendix --

MR. GREENE: Section 3.

MS. BAKNER: Page 3-32, Figure 3-150 -- 15Q. 3-15Q.

MR. FRANKE: That's the results of the jar tests.

MS. BAKNER: The purpose of that test had nothing to do with toxicity, it had only to do to see whether it would actually assist in getting the suspended colloidal clay out of the water?

MR. FRANKE: The crew that worked on our soil, and unfortunately in followup conversations with the Department, it probably would have been very helpful to have tested the water after it was done to actually test our toxicity to prove that the chemical was safe. Unfortunately, we didn't have the forethought to do that, so we're relying on other data to prove that.

MS. BAKNER: What is the toxicity issue as you understand it?

MR. FRANKE: There was a study done by -- I'll just use the author's first name -- referred to as the Bullock Study. The way they tested it, it was pretty toxic. We're talking in the range of .075 milligrams per liter.

MS. BAKNER: Can you describe the test or describe what they did?

MR. FRANKE: It was basically a constant dosing test of different concentrations. It didn't really follow any standard EPA method. They were using it in their laboratory, their Freshwater Institute, if you will. They were using it in their laboratory actually for beneficial purposes, and one day they killed a bunch of fish and they didn't know why, so they subjected a number of trout to different concentrations of Chitosan and found that it did have some negative effects.

MS. BAKNER: So the way they were using it is not how we're proposing to use it?

MR. FRANKE: No, not at all. There was a second study that looked at possibly using Chitosan to kill zebra mussels, which is what I refer to as a Waller study, W-A-L-L-E-R. They used commercial products of Chitosan, different from what we're proposing to use, and a check of their website shows that the products aren't available anymore, so I wasn't able to find out what the actual formulation was.

These were -- toxicity was also somewhat higher in this second study. Then again, we didn't know what the formulation was. We have three sets of toxicity tests done on the product we are proposing to use, done in accordance with EPA methods, and the

LC-50 value, which is the concentration that's lethal to 50 percent of the trout, is just a little over one milligram per liter.

MS. BAKNER: And Kevin's referring now to Applicant's Exhibit 137; and what Applicant's Exhibit 137 is, is correspondence between Mr. Franke and Mr. MacPherson who is the chemist with the -- why don't you describe it then. What is the exhibit number?

MR. FRANKE: I don't have it on my copy.

MS. BAKNER: The one entitled, "Chitosan Liqui-Floc Synopsis."

MR. FRANKE: Applicant's 142. This is really just a distillation of a lot of the other Applicant's exhibits related to Chitosan that were submitted.

I already talked about the toxicology under Item 1. We talked about the rate at which you spray this into the ponds as listed in the second, which is approximately one-half to two milligrams per liter. We talked about how effective this was in settling out our soils. That reduces your concentrations in the ponds about 95 percent, because once it binds to the soil particles and settles them out, it's out of solution.

So we get down to a discharge concentration of anywhere from 0.02 to 0.1 milligrams per liter. It's about 11 to 55 times lower than the LC-50 value that was determined by EPA methods.

MS. BAKNER: So it's the point at which it leaves our ponds, and comparing it to the values at which it becomes toxic to trout, were an order of magnitude less?

MR. FRANKE: Yes.

MS. BAKNER: And was there some confusion over the formulation of the product?

MR. FRANKE: Yes, this was a good point brought up by the folks in the Department who were having discussions with me on this issue. There was some -- it was not clear at one point whether the toxicology was reported based on the product or the active ingredient, but we have since resolved that with clarification from the manufacturer and distributor.

MS. BAKNER: For the uninitiated, what's the distinction between the product and the active ingredient?

MR. FRANKE: Well, it depends on how you report it. Liqui-Floc is a one percent solution. So they tested it, reported it at a value of 111 milligrams per liter. So that's your product toxicity.

The active ingredient, the one percent active ingredient solution is one percent of your LC-50 for the product. So in this case it was 1.1 milligrams per liter for the active ingredient.

MS. BAKNER: Is that issue covered in the letter from John MacPherson?

MR. FRANKE: Yes, that is in Applicant's 137. There is a table on the second page of 137 clarifying that issue.

MS. BAKNER: Your Honor, do you have any questions about that, the product versus the --

ALJ WISSLER: No.

MS. BAKNER: So that gave us information regarding the toxicity. Now, if

we want to confirm that the material is
nontoxic as we're using it, how would one go
about doing that?

MR. FRANKE: The distributor has developed a field testing methodology. It isn't the most precise, it's basically a presence or absence test. It can be done in the field fairly simply with uncomplicated equipment. It basically tells you, do you have at least .1 milligram per liter of Chitosan in your water that you're going to be spraying out. So it's either a yes or no. Are you .1 or higher, or are you less than that.

MS. BAKNER: That would be unbound Chitosan floating in the water?

MR. FRANKE: Still in solution.

MS. BAKNER: It wouldn't have bound with the sediment, it would still be in the water in the pond. And you mean before you discharge it to the dispersion pipes?

MR. FRANKE: Right, before we actually pump to the pipe, you can kick on the pipes, you can grab a sample and do this field test to determine kind of a presence or absence at that point.

And the level of detection, if you will, that .1 milligram per liter presence or absence, that happens to be the same value that was determined in toxicity tests using EPA methods.

ALJ WISSLER: So what happens if that grab sample that you take shows you're over the limit; what, do you wait until it settles some more?

MR. FRANKE: Yes.

ALJ WISSLER: It will settle some more?

MR. FRANKE: Yep. As you recall, your Honor, the pumping system that we had is also going to be monitoring the turbidity of the water. So we'll have the opportunity, through swishing and hosing -- if we're not meeting our turbidity requirements at discharge, it just recirculates it back into the pond. Our setup will allow us to pump that, sample it, and if it's not pumping out, it doesn't clean the water, it just goes right back to the pond. It doesn't get discharged.

MS. BAKNER: I know they tell you in

law school to not ask the question if you don't know the answer. But suppose your Chitosan -- the testing method shows greater than .1 percent is present or whatever it is --

MR. FRANKE: Yes.

MS. BAKNER: -- what are you physically going to do to get that lower?

MR. FRANKE: I think by recirculating -- there's still going to be some suspended solids in the water, it's not going to be 100 percent crystal clear water like this -- there's still going to be some in there. And I think by recirculating that, you're going to have that Chitosan re-exposed to the material that's still suspended in the water, allowing it to do --

ALJ WISSLER: To do it's flocculent thing?

MR. FRANKE: Basically, yes, you're re-spraying your basin. You're taking the water out and spraying it back on top. But it binds by -- Chitosan settles through the water. And you're reintroducing it on top of the water.

MS. BAKNER: So worst-case scenario, you would introduce dirty water to the pond if you had to?

MR. FRANKE: If you have to, but then you'd have to, in your balancing act between adding the dirt --

ALJ WISSLER: Then you might have to add more Chitosan.

MR. FRANKE: -- that mechanism exists.

MS. BAKNER: Okay. Is there anything else -- are you satisfied, based on all the information that you have read regarding this product and your communications with the chemist whose resume is included in here and -- for the record, John MacPherson -- are you comfortable with the use of this material?

MR. FRANKE: I'm comfortable with it. I wish we had a little bit better testing methodology, and I think we'll hear this from the Department as well, but I think the level of safety that we have got is documented in 147.

Our ability to test it, the presence or absence at that .1 milligram per liter, that's the same concentration that was determined in the laboratory to have no effect -- not the lethal concentration of 50 percent, but what they call the no-effect concentration, meaning that 100 percent of the fish that were exposed survived that concentration.

MR. RUZOW: Your discharge, however, is not to the creek itself?

MR. FRANKE: There will be no direct surface water discharges. We saw for Phase II of Big Indian, we're going to have a thousand feet or so between our discharge pipe and the stream. And there's another factor that comes into play once you're discharging, if this stuff binds to dirt, you're discharging into the forest floor which is --

MR. RUZOW: But the Department asked us not to rely on whatever benefit that might provide?

MR. FRANKE: No.

MR. RUZOW: So when we discharge it, they have asked us to meet a certain level, in terms of the nontoxicity of the point of discharge, not to rely on it. And we're not relying on that, correct?

MR. FRANKE: Correct. The measurement is prior to discharge and not taking any credit for any uptake that would occur as the water flows over land after discharging it.

MS. BAKNER: Anything else you want to say about Chitosan or anything else in response to Dr. Parasiewicz?

MR. FRANKE: No.

MS. BAKNER: For the record, I just want to say, we saw a lot of things today from Dr. Parasiewicz that was never before in the record -- some which were, and a lot which wasn't. So we need to reserve so that if we see anything, we can supplement the record.

And as far as Chitosan, I don't know if CPC doesn't have an expert in that area. Marc, are you planning on presenting any proffer on that beyond what's in the petition?

MR. GERSTMAN: I'll reserve the right to take a look at what you submitted today and respond appropriately based upon our review. Thank you.

MS. BAKNER: It's all yours then.

MR. ALTIERI: Could we take ten, your

Honor, and I think we'll still be done by five-ish.

MR. GERSTMAN: Actually, we will want to respond, so we may end up having to go later.

ALJ WISSLER: Let's take five minutes.

(4:23 - 4:39 P.M. - BRIEF RECESS TAKEN.)

MR. ALTIERI: First, regarding Chitosan, I would like to introduce Ed Kuzia, Bill Mirabile and Shayne Mitchell.

Could you please state and spell your names for the record and give your position with the DEC.

MR. KUZIA: Ed Kuzia, K-U-Z-I-A, I head up the toxicity testing unit for the Division of Water, and I am responsible for doing both toxicity tests on a statewide basis and evaluating ambient waters and some discharges. And I also review, and a person directly under my supervision, review all the toxicity testing that's done under all the SPEDES permits. I also was responsible, again with somebody who is working directly below me, for developing the guidance document for how toxicity testing is put into permits in New York State waters.

ALJ WISSLER: Ed, you're out of Albany?

MR. KUZIA: I'm out of Albany. I also work out of the Hale Creek lab in Gloversville where we do all our toxicity tests.

MR. ALTIERI: I believe Bill and Shayne have already given their backgrounds on the record.

Ed, do you have a certain concern with regard to the use of Chitosan for the project?

MR. KUZIA: Well, the first concern is, I think, has to be determined by the Applicant, and that is whether or not this Chitosan-treated water is going to reach the surface water. Overground discharge is a concern with respect to, we don't really know whether or not this stuff is even going to get to surface waters.

MR. ALTIERI: This is as to the Big Indian and Wildacres, wherever it's used?

MR. KUZIA: Whichever. Wildacres was mentioned as an overland discharge, and I guess Big Indian, we're not quite sure yet. I assume that's going to be overland too at this point -- did I reverse them? I'm sorry.

If the Chitosan is going to reach the surface waters, we have some concerns. I went through the data, and I agree that the Bullock method was not standard EPA techniques. The Waller method that was already mentioned where they were using Chitosan as a potential for zebra mussel control, was done by EPA techniques, although they were old techniques according to the reference procedure. And the Waller technique did, in fact, develop an LC-50 value of .38 milligrams per liter, 380 parts per billion.

Using an EPA Part 132 Great Lakes Guidance, which we also used in the previous development of pesticide limits, because of the variability in the data that I saw, I used the safest application factor. And I came up with a Chitosan limit -- 17 parts per billion, we'll round it off to 20 parts per billion. And the problem with this is that there's no acceptable chemical technique for quantifying Chitosan at that concentration.

What I would recommend to the Applicant, again, prefacing it if the material is going to reach surface waters, if it cannot be measured in terms of a chemical limitation in terms of what the -- whether or not it's going to exceed this 20 part per billion concentration, would be to set up some tests either -- I would recommend that they test the Chitosan-treated water themselves using rainbow trout, using a 48-hour acute toxicity test, because rainbow trout were the most sensitive organism that was reported in the literature that I reviewed. That data could be submitted to the Department, and if it's not toxic to the rainbow trout, then we could approve a discharge.

The Bullock paper, which I want to address, does show some potential for significant toxicity. And there was some -- at continuous dosages, there's a difference in the testing procedures. So I want to explain that a little bit.

When we do a test, you can do a static test, static renewal test or flow-through test. A static test, for 48 hours, you would take one sample, put the Chitosan in, and it would then -- then you would put the fish in or whatever test organism you need, and you would do nothing to that sample for 48 hours except count the dead fish and remove them.

In a static renewal test --

MR. ALTIERI: Is this first test what's called the EPA test?

MR. KUZIA: These are all EPA tests. These are just theme and variation of the test.

The static renewal test, usually it's a daily renewal. So at the end of 20 -- you'd set up your solutions, say zero, put the organisms in, and at 24 hours you would transfer the organisms to a fresh solution of toxicants.

In the flow-through test, there's a constant renewal of the chemical by pumping fresh chemical in and the old solution out, and that ensures that you don't lose -- you don't lower the concentration of the Chitosan.

That was the problem that was brought up with the Bullock test, that the Chitosan apparently is lost. They didn't do a real chemical analysis of their system, but when they were looking at their recharge solutions, they took the material and they dried the water and then weighed what was left, and they found out they lost 25 percent of the Chitosan somewhere in the test procedure. This is my concern with any of these aquatic toxicity tests that use what are known as nominal concentrations, which are concentrations where the material is just added to the solution by weight. You weigh it out, put it in, and you don't do any chemistry. All these tests don't have any hard analytical chemistry to identify the concentration of Chitosan they're actually exposed to. This is why I'm concerned about any test data that's submitted with the nominal concentration. And this is why I put in this safety factor or direct testing of the discharge, I think as a recommendation for a requirement.

If the Applicant chooses to come up with or can come up with an analytical method that gets down to the levels I recommend, that's fine, or the alternative toxicity testing procedure is fine also prior to the discharge of the material.

MR. ALTIERI: We can put these requirements in the special condition?

MR. KUZIA: In a special condition, similar to what we do for regular SPEDES permittees that have a discharge requirement for toxicity testing.

MR. ALTIERI: Mr. Mitchell, do you have something to add?

MR. MITCHELL: The only thing I would add is that, you know, certainly the Applicant's could also choose to propose an alternative water treatment chemical that would achieve what they need to do at this site, and, you know, would be less toxic, if they don't want to go through these various testings of the organisms.

ALJ WISSLER: But the concern of both of you is founded on the premise that this stuff reaches surface water?

MR. KUZIA: Absolutely.

MR. MITCHELL: Yes.

MR. KUZIA: These are based on surface water organisms.

ALJ WISSLER: Do you have some model permit language that you would propose?

MR. ALTIERI: Mr. Mirabile could speak

to that.

ALJ WISSLER: That's Bill's department?

MR. MIRABILE: I would like to just clarify one thing, and then we'll get into the possible permit.

What Mr. Kuzia's referring to, magnitudes of like 20 parts per billion, 30 parts per billion, and the Applicant's referring to about 750 parts per billion -- I'm sorry, 75 parts per billion, what Mr. Kuzia did -- the Applicant was referring, I believe, correct me if I'm wrong, directly to LC-50 data, toxicity data. And what Mr. Kuzia did, as he mentioned, we did the same thing with pesticides numbers, he applied a safety factor. So the Applicant's numbers are straight toxicity test numbers, whereas Mr. Kuzia's levels are -- basically those numbers after applying a safety factor, which is what we do.

ALJ WISSLER: There's a toxicity level and the safety factor is lower yet?

MR. KUZIA: Yes.

MR. MIRABILE: It lowers it because of

the uncertainty --

ALJ WISSLER: By a percentage or what?

MR. KUZIA: In this case, it was a

factor of 21.9.

MR. MIRABILE: Because there's only one species.

MR. KUZIA: There's a real problem here with the variability in the data. They used rainbow trout. In the material that was submitted by the Applicant, the LC-50s for the rainbows were 1.1 milligram per liter after we figured out what the active ingredient concentration was.

In the Waller paper, which was the zebra mussel control material, the LC-50 was .38 milligrams per liter, so we're talking about a three- or fourfold difference.

ALJ WISSLER: The LC-50 is what?

MR. KUZIA: In this case, the LC-50 was the concentration of material it takes to kill 50 percent of the organisms in a 48-hour period. That's a standard end point that's used for acute toxicity and comparable.

The Bullock paper was used to -- they were after -- using Chitosan as a culture

enhancement, I guess, to pull out metals that
were suspended solids or whatever from tanks
that they were actually culturing rainbow

trout in, and they found they killed some trout, as I believe was already testified to, and they decided to do a study on it. And they were trying to find a no-effect end point. And even though there was no LC-50 calculated from their data, the LC-50 from that data that I calculated using a standard EPA analytical program was .13 milligrams per liter with very wide confidence intervals, and that's why I didn't use it.

But we have a broad range of toxicity for the same species in this situation, and I don't know what it's due to, and there's a limited amount of data out there. So I chose to use the most conservative safety factor that is in the guidance that we used before.

ALJ WISSLER: Which is 380 parts per billion?

MR. KUZIA: 121.9th of 380 parts per billion or 20 -- comes out to 17 and change, or 20 parts per billion would be the number. The problem is the detection limit on the colorimetric technique that they used is .1 or 100 parts per billion. And consequently, that method isn't a good analytical technique, and that's why we are recommending the toxicity testing be used if the material is going to get to surface waters. And that has to be determined.

MR. MIRABILE: So if we haven't already totally gotten lost in the numbers here, parts per billion, parts per million, so forth, the point I was making is the Applicant's numbers were straight toxicity test results, where our numbers were applying a safety factor. And we do that with all water treatment chemicals to ensure a greater level of confidence.

I just, again, wanted to clarify that point. As far as the permit goes, any questions up to now?

ALJ WISSLER: If you're going to get to this, I assume it's part of your permit condition; what is the analysis you go through to determine whether or not it's reaching surface water?

MR. MIRABILE: What's the analysis to

determine --?

ALJ WISSLER: To determine whether or not it's reaching surface water. How are you going to decide, or are you going to decide that's as part of this grab sample they take at the top of the hill before the stuff ever goes into the dispersion system, or whatever you call it; are you telling them that they have to use this 20 parts per billion number before they even put it through the distribution system? Is that what we're saying?

MR. KUZIA: No, it shouldn't exceed that 20 part per billion in any receiving water it hits.

ALJ WISSLER: Are you going to monitor the receiving water to see if it ever gets there, and then they'll be some permit conditions at that point?

MR. MIRABILE: I don't know if that step is necessary. Again, the number that Mr. Kuzia's reflecting here is basically if it's a surface water discharge. If it's not a surface water discharge, if it's to overland flow, who knows what the concentration is going to be by the time it eventually reaches the stream, if it reaches it at all. We don't know.

So if it reaches the surface water, then Mr. Kuzia's number would be applicable. As far as the actual mechanism where the test or the procedure for determining whether or not the Chitosan-treated stormwater reaches the surface water, I think that's something we have to sit down and take a harder look at how we want to consider that. Whatever the result of that consideration is, we can write a limit in the permit which reflects what we want. If it doesn't reach the surface water, the stormwater that is, then it's not a surface water discharge, essentially, and the number wouldn't apply. If it does reach the surface water, then the number would apply. We would also --

ALJ WISSLER: I understand what you're saying, but I need to get -- you're putting water into a system, you're sending it through some kind of -- what's the name?

MS. BAKNER: Dispersion pipe.

ALJ WISSLER: Thank you. You're

sending it through a dispersion pipe. Is it just going to be physical observation? You set up some kind of protocol where we observe every time we put water through the pipe, we see where it goes, and if it starts coming down the mountain and carving rivulets and getting into the stream, then we become worried or what?

MR. MIRABILE: I think that has to be worked out. I don't think we have enough information. The Applicant said they will pump the ponds through the dispersion pipes to overland flow. I think it's a matter of --

ALJ WISSLER: Seeing where that overland flow is going?

MR. MIRABILE: -- sitting down and looking at the slope and the contour lines and the flow direction of the overland flow and kind of making a professional judgment.

MR. ALTIERI: We're looking for testing to occur in the ponds before it is discharged; correct?

MR. KUZIA: Yeah. Well, the other thing is --

MR. ALTIERI: That's where we want to

establish the control?

MR. KUZIA: If the material is tested in the ponds and it's not toxic, then it doesn't matter.

MS. BAKNER: Then it doesn't matter.

ALJ WISSLER: But that doesn't -- I'm confused. Let's say that the only protocol that exists is what Kevin said, there will be a grab sample taken before the stuff gets put into the dispersion system.

What number should that be in the Department's view? Should that be, whatever, the 1.3, or should it be 20 parts per billion? Do you know what I'm saying?

Should it not go into the dispersion system until it is at a level where if you dumped it straight in the stream it wouldn't hurt the fish? You know what I'm saying?

MR. KUZIA: Given the uncertainty -- I'm not a modeler as far as runoff goes and that stuff.

ALJ WISSLER: Let's say it goes straight.

MR. KUZIA: Given the uncertainty, I would say we'll stick with the 20 parts per billion. But the problem is --

ALJ WISSLER: At the pond before we put it in the dispersion --

MR. KUZIA: At the pond before we put it in the dispersion system. But the problem is that's not measurable.

MR. ALTIERI: That's why we want the testing.

ALJ WISSLER: Not measurable by the technique that Kevin has suggested but by some little field test tube or shaking it up, or not detectable because a lab doesn't have the technical --

MR. KUZIA: We haven't seen any analytical techniques for Chitosan that go down to that concentration.

ALJ WISSLER: How far down do they go, to your knowledge?

MR. KUZIA: As far as I know, the only thing I've seen is the .1 part per million concentration. And I'm not a chemist, by the way, I'm a toxicologist. And these numbers that are arrived at by the toxicology, as I stated, are arrived at by weighing material out, making delusions of it and calculating the concentrations of material in the exposure of vessels.

ALJ WISSLER: So if the best we can do

is one part per million, we're talking about something that is one thousand times bigger than -- one part per million is one thousand times bigger than one part per billion?

MR. KUZIA: Yeah. Or the alternative is to toxicity test the discharge, or the potential discharge, with rainbow trout, and if it's not toxic, it can be discharged. That's my recommendation. There isn't a chemical technique, so I would recommend testing the discharge prior to release using rainbow trout. If it's not toxic, they can release it.

ALJ WISSLER: How would you do that?

MR. KUZIA: Using standard EPA methods. Static renewal.

MS. BAKNER: If I can just ask this question: Would that be a one-time test, or would that be each time you want to discharge water from the pond?

MR. KUZIA: You're only going to put Chitosan in it once; correct?

MR. RUZOW: No, these are active stormwater construction ponds.

MS. BAKNER: This is why we went over

-- Kevin, go get that plan and let's do this --

MR. KUZIA: I think what we could do --

ALJ WISSLER: You know what, this is the discussion you indicated you needed to have about crafting some kind of language. I don't know that we need to do this today right now. Why don't we just move on.

MR. ALTIERI: Your Honor, I would like to introduce Mr. Isaacs and Mr. Flaherty to speak about aquatic habitat.

Could you state your names for the record and describe your current position with the DEC, and then Mr. Flaherty, follow with the same.

MR. ISAACS: My name is Jack Isaacs, I-S-A-A-C-S. I'm the Habitat Manager for the DEC Region 3. I have been in that position for, in one form or another, for the last 25 years.

Among my duties are the review of

projects that impact the aquatic environment under Article 15 of the Environmental Conservation Law, the Stream Protection Act, as well as other projects that perhaps could impact the aquatic environment. My area includes Ulster County and the Catskills. I also supervise the Freshwater Wetlands Program in relation to it.

MR. FLAHERTY: My name is Mike Flaherty, F-L-A-H-E-R-T-Y. I got my Bachelor's Degree in 1987 from Ripon College, Wisconsin.

From 1987 to 1990, I was at Michigan State University where I got a Master's Degree, Master of Science in Fish and Wildlife Biology Management. And since 1990, I've been with the Department of Environmental Conservation with the Bureau of Fisheries, and as a senior aquatic biologist. And my area has been Ulster County, primarily as fish management oriented type of position.

MR. ALTIERI: Both of you reviewed the CPC's position and reviewed the aquatic habitat issues related to this project. And you have heard Dr. Parasiewicz's statements today regarding aquatic habitat?

MR. FLAHERTY: Yes.

MR. ALTIERI: Dr. Parasiewicz's

presentation, I guess, included sort of a good background, or a lengthy background, but then at the end it came to a certain concern.

Mr. Isaacs, do you have a certain concern as a general matter as it relates to what was presented by Dr. Parasiewicz?

MR. ISAACS: The final conclusion regarding the potential impacts should withdrawal of water occur from the Birch Creek system is of concern, and it is a valid concern. Should that system suffer the loss of groundwater, the impacts could be quite devastating, if the loss was of the magnitude that was brought about as a potential by Dr. Parasiewicz.

MR. ALTIERI: Mr. Flaherty, do you have a concern in this regard?

MR. FLAHERTY: No, I think that is exactly the point. If water is lost in that system at all, whether it's surface water or groundwater, it could be potentially harmful to the fishery. But I think further, the groundwater is even more important.

MR. ALTIERI: How does that relate to the discussion --

ALJ WISSLER: It would be harmful to the fishery because it would reduce the flow in Birch Creek?

MR. FLAHERTY: Right, and any of the tributaries potentially. And I think that as the good doctor explained, the levels are really low at times, and that it's at those times, I think, when it has the greatest impact on the fishery, either through floods or drought conditions. And if this in any way is going to make those problems worse, then it can have a greater impact. That's my main concern.

I guess it's being argued now by others outside my area of expertise whether that groundwater is really going to be impacted or surface water is going to be impacted. But if there are --

ALJ WISSLER: Hydrogeologic connections?

MR. FLAHERTY: Yes, then I think it could be an issue, and maybe modeling will be in order to try to assess how much of an impact the stream would have on it, given the certain amount being removed.

But I really think that the groundwater is of particular concern, primarily because it's during those drought conditions, that that may be the only thing that's coming into the stream because surface waters may be all dried up.

MR. ALTIERI: There was some discussion about 51 percent, 78 percent?

MR. FLAHERTY: Right. The interesting thing about that is, I believe the way I understood it, a back calculation was made from the gauge, Birch Creek down in Big Indian, to what it would be up at the confluence of Crystal Spring Brook. And I think your measured results, the Applicant's measured results, showed a higher flow in the stream than what would have been predicted based on watershed area, which would indicate to me that groundwater may be the additional volume that they are measuring. It doesn't seem to be explained by the surface area of surface flow of water, that it would be actually groundwater.

And I believe that most of these Catskill streams that have really good trout populations, it's that groundwater that really has helped to moderate the temperatures in the summertime and in the winter -- and flows to a great extent.

So I think it just points, and maybe drives home, that this system is really dependent on groundwater, and that withdrawals from the groundwater that may get to the stream, in some way or another, may have a greater impact than what they might in some other systems.

MR. ALTIERI: Having said that, neither of these experts are hydrologists and our hydrologists were in the water supply issue within the context of this hearing, so Staff will just reserve the right to have the water supply people provide a written comment or analysis as hydrology may affect this particular issue in the streams.

We heard some reference to September withdrawals of water by the ski center.

Mr. Flaherty, would you like to address that.

MR. FLAHERTY: It just so happens I spoke to Mr. Lanza from the ski center on sort of a separate issue with regard to additives that may be put into water for snowmaking purposes, because someone from the public had called and had a concern about that. So I asked him that question. And he said that the only reason that they would put additives in would be if they were going to try to make snow earlier in the year. And that they don't do that, that they wait until it's cold enough so that they can start making snow, and that their diversions don't start until later in the fall when they really need that water.

So I'm not sure where this idea of water being diverted for snowmaking purposes to their ponds up on the mountain in September came from, but I think before that statement becomes a part of the record and as fact, that that should maybe be clarified if it becomes an important issue.

MR. ALTIERI: Mr. Isaacs, there was some discussion regarding intermittent streams, perennial streams, did you want to elaborate on that?

MR. ISAACS: There was some discussion as to the impacts of water withdrawal on intermittent streams or the headwaters of the perennial streams where they become intermittent.

I will agree with whomever made the point, I'm not sure who that was, that intermittent streams do support wild trout. They are habitat for trout spawning. Many streams in the Catskills do go dry and become intermittent in their headwaters. That's not an unusual condition. And the withdrawal of significant amounts of groundwater can exacerbate the intermittent condition, and also make the intermittent section of the stream larger, thereby impacting a number of factors: Trout spawning, aquatic biota, benthic organism production, all of which form the basis of the aquatic biomass of the system.

MR. ALTIERI: I guess we heard differing characterizations of Birch Creek. What is your characterization?

MR. ISAACS: It's in the middle of

what he said and what he said. Birch Creek is a very healthy system. It's not uncommon in the Catskills, it's not on the brink of disaster, nor is it unimpacted. It has a very healthy, vibrant wild trout population. It has wild brook trout in its headwaters, which is very typical of Catskill systems.

The wild brown trout and rainbow trout become more prevalent as we go downstream in the watershed. That is not untypical. It's very, very typical. They enjoy a competitive advantage over brook trout, as well as they are more temperature tolerant. So in that regard, Birch Creek is not unusual, but it -- although it suffers some impacts at the hands of man, the situation is certainly not dire.

MR. ALTIERI: Any further questions, your Honor?

ALJ WISSLER: Real quick. If at the end of the day, groundwater withdrawals do effect the flow in Birch Creek, take it below the Tennant threshold and so forth, what kind of steps can be taken to mitigate that?

MR. ISAACS: Very little, quite honestly. There was some mention of habitat manipulation as mitigation for the lack of water. I have not ever seen that to be an adequate mitigation. Adding water to a debilitated system doesn't always help it. So just adding water to a system that has marginal habitat or habitat that has been degraded does not overcome the lack of habitat.

By the same token, removal of water from a stream that has good habitat is disastrous, and there's not much you can do to manipulate the habitat to make up for the lack of good, cold water.

MR. FLAHERTY: That's well said. I don't have anything to add to that.

ALJ WISSLER: Mike, what is your position with the Department?

MR. FLAHERTY: I'm a senior aquatic biologist.

MR. ALTIERI: With that, your Honor, that would conclude aquatic habitat, although Mr. Mirabile would like to make a closing comment regarding Chitosan.

ALJ WISSLER: He's got a permit condition worked out already?

MR. MIRABILE: First, my apologies for the confusion before. It's actually quite simple. Mr. Kuzia's analysis, quite in-depth, thorough analysis was under the premise that the Chitosan-treated stormwaters would reach surface water.

If that's not going to be the case, it's not an issue. I believe the Applicant stated that all of the Chitosan-treated stormwater will be discharged to overland flow and basically not reach any surface water. If that's the case -- if they can demonstrate that to us, it's not an issue. If it cannot be demonstrated to our satisfaction, then we can write a condition in the permit which puts controls on potential stormwater, Chitosan-treated stormwaters that would be surface waters. And there we would plug in some numbers that we can all be happy with.

And Mr. Kuzia was talking about the problem with the analytical detectabilities not being able to go low enough. That can be addressed through testing empirically arrived at, numbers can be determined.

But I don't think we have to really

get into that right now. We can write a permit condition which addresses the Chitosan issue, if they reach surface water, but that may not even be necessary if the Applicant can demonstrate that --

ALJ WISSLER: Wouldn't the overland flow provide enough of a buffer that some Chitosan might --

MR. MIRABILE: Does it provide a buffer?

ALJ WISSLER: Does it provide a buffer or enough of a buffer that it would filter some of that remaining Chitosan out?

MR. MIRABILE: That is something we have to use our professional judgment on. I know overland flow is what we call alternative technology with municipal wastewater treatment. They have fairly well-established numbers, the distance and the type of vegetation and so forth, required to achieve certain percentage of removals. That's not the case here with Chitosan.

So we would have to use our judgment on that. One thing we can say for certain. If Chitosan, in the level of 30, 50, 70 parts billion is discharged to a forested area and it's a substantial distance from a stream, we certainly can't apply stream standards because it's not a surface water discharge. So that's where our judgment has to kick in and we would have to take a harder look at it, and I can't give you a better answer that than.

ALJ WISSLER: I'm not asking you to.

MR. ALTIERI: That's it for Staff.

MR. GERSTMAN: Your Honor, let me pick up on the Chitosan issue. And from what I have heard, from a lay perspective, it seems at this point there are no answers to the questions that have been raised about Chitosan toxicity. There will be discharges over land. It hasn't been established whether they will or will not reach surface water. We do not know what kind of attenuation will occur as a result of the overland discharge. We don't know -- I don't know, and I'll ask our toxicologist whether or not this would persist in the environment. We don't know under what conditions or worst-case possible scenarios where this can be applied.

We don't know whether there would be

intermittent streams which would intercept these overland discharges or wetlands in those areas. We don't know enough about this except that it's toxic, and that the parties seem to agree that that is the case.

That being the case, there being no permit condition which adequately mitigates against that, we believe that we have adequately established a substantive and significant issue for adjudication.

I would like to proceed now with a response from Dr. Parasiewicz.

Dr. Parasiewicz, you heard the evaluation by Crossroads' consultants concerning the stream flow measurements at the USGS station at Big Indian versus the stream flow measurements that were done at the -- I guess, the confluence?

DR. PARASIEWICZ: Of Birch Creek with Crystal Spring Brook.

MR. GERSTMAN: Could you comment on the issue of the 57 versus 78 percent?

DR. PARASIEWICZ: I would like to comment just by checking the Table 2.1. I made a quick calculation of the numbers.

MR. GERSTMAN: I think it's --

MS. BAKNER: Table 1A.

MR. GERSTMAN: Table 1A.

DR. PARASIEWICZ: And quickly run the numbers that were -- the measurements that have been done at the USGS gauge versus location at the confluence, the Birch Creek at the confluence. And in June 2001, the measured ratio was 89 percent. In June 2002, the measured ratio was 48 percent. August 2001, 89 percent again. And 2002, 71 percent. October 2001, 118 percent. So we had more water upstream than downstream measured. And 65 percent in 2002.

I am not trying -- what I am trying to point here out is that the flow measurements in natural streams are sometimes very imprecise. And I did develop instruments myself, and I was working many years with different types of flow meters.

The way it is stated here in the methods, the measurements have been done using propeller type of flow meter, which is used as the standard technique. And is used by USGS. However, still very inaccurate. Or in some streams, in some situations, might be very inaccurate. The reason for that is it measures only one point in the entire vertical. The way the measurement is being done, you have a cross section, you lay out the cross section and measure velocities every specific distance.

ALJ WISSLER: At a specific depth?

DR. PARASIEWICZ: At the specific depth. What is usually happening -- there's a standard formula to this, and I couldn't find here how it has been done here. But a standard formula is used by USGS, is that there's one point at 60 percent of depth that is being measured and being entered into the formula or assumed mean velocity.

The problem with this, and I've seen it many times, this formula assumes specific distribution of velocities in the stream that it's faster at the top, slower at the bottom. And that's true in rectangular or trapezoidal channel. It is frequently not true in natural stream where you can have a boulder right behind or before the cross section that might create a velocity distribution that might be very fast at the bottom and very slow at the top.

And I have seen it from many

measurements. So the argument now, if we talk about 57 or 78 percent, is irrelevant. We still have shown that at a USGS location, even today, we are frequently going on the 30 percent threshold of Tennant. And this means the habitat is impacted, fisheries is impacted. Even today to some extent.

The matter of the fact is if there will be any loss of water in the system, we can have this much more frequently and much more often, and this will happen. So it basically does not really matter.

But it does matter with regard to that, the precision of measurements. And that's one of the points and the things that disturbed me is just one measurement every month. And it's great that they are concurrent measurements, one day upstream and downstream. But it's not sufficient.

ALJ WISSLER: What should it be -- for each of those days, how many measurements should have been taken?

DR. PARASIEWICZ: I would make -- take much more measurements than once a month. If we really have the surface water-groundwater interactions, the amount of water upstream and the amount of water downstream strongly depends on the meteorological history.

If you are in a very wet season, you might have very strong contribution of groundwater or subsurface water to the stream. So as you go downstream, you might have really more water. At other times in the times of drought, you might be losing water.

ALJ WISSLER: Or if measurements were taken immediately following a precipitation event or something like that?

DR. PARASIEWICZ: That's right. So it's important to know what kind of event, hydrological event this measurement has been taken.

ALJ WISSLER: Is there a USGS or some other protocol that's out there that tells you what you ought to do when taking measurements like this?

DR. PARASIEWICZ: It varies from study

to study. The USGS protocol is very precise with regard to gauging.

ALJ WISSLER: I mean, is there kind of a standard protocol that everybody follows or should follow?

DR. PARASIEWICZ: Not really, because it's a difficult measurement. It's really very difficult measurement. And specifically at the low end of flows, the inaccuracy might be very high. Whenever you calculate the discharge, you have to take into account the roughness of the river.

If you have so much water in the river and there is a boulder of this size, it matters a lot. If you have so much water, this boulder does not matter. (Indicating)

So when you do the discharge measurements at this level, it will obviously be much less accurate. And there are many, many different issues. (Indicating)

ALJ WISSLER: And there are also meteorological concerns?

DR. PARASIEWICZ: Right. So we would need to -- in this kind of situation, we definitely need a measurement during the low flow periods. And I would even suggest better techniques -- there are better techniques for -- dilution techniques that are much better for this type of stream.

MR. GERSTMAN: Can you describe that?

DR. PARASIEWICZ: Yes. You basically release salt into the water and you measure the concentration of the salt down the stream. And the timing of dilution is giving you that very precise measurement of how much flow is in the river at this time.

MR. GERSTMAN: In a project such as this where the potential impacts, as we heard from Dr. Michalski and from your offer of proof today, would be devastating on a very important fishery, would you recommend that kind of analysis be done?

DR. PARASIEWICZ: I think we definitely need more detailed analysis of flows, flow patterns, interaction -- surface water, groundwater interaction. We can argue forever; will the stream lose water, will it not lose water. As long as we didn't go and see, we don't know.

ALJ WISSLER: Of what duration should such testing program be? Do you have to

collect data for two months, six months, a
year; how long?

DR. PARASIEWICZ: It's asking me a

little too much to come up right away for an answer for this type of specific project. It varies from project to project, and we would have to provide some specific design.

The objective here would be to capture the critical conditions, so you would want to have the measurements. And the best would be to have continuous measurements, if we can have, during the summer months, for example. You have to have good measurements, I would say, over a period of summer at least, if not a year.

ALJ WISSLER: Because that's the period of lowest flow?

DR. PARASIEWICZ: Right. The best data is to collect the data continuously every part of the river all the time, but nobody would want to pay.

MR. GERSTMAN: Let me ask a question about the USGS gauging station. What kind of measurements do they do there?

DR. PARASIEWICZ: What USGS is usually

doing, they usually look for really relatively uniform cross section without any obstacles; sometimes they even create a cross section out of concrete or marble. Then they perform very many measurements, usually two, three -- first calibrate, create relationship between -- they take three to four measurements and they can establish the relationship between the depth and the flow in the river.

Then at least once a year, I think, they calibrate the cross sections again. So it is -- this is very intensive work and very labor intensive type of work. I have seen frequently that rating curves were dramatically corrected because streams move also.

MR. GERSTMAN: Those are continuous measurements that are taken by USGS?

DR. PARASIEWICZ: They continuously measure depth in the stream, and they use -- they have at least four calibration discharges that they measure with the velocities with the propeller, and that's how they establish -- they use the four measurements to calculate the discharge and relate it to the depth that they measured. This allows them to create a rating curve between the flow and the depth.

ALJ WISSLER: Is there a document that lays out this USGS protocol someplace?

DR. PARASIEWICZ: Sure.

ALJ WISSLER: What's that document called?

DR. PARASIEWICZ: USGS Manual. It would be USGS Manual describing discharge measurements. I don't know them off the top of my head.

MR. GERSTMAN: We'll provide it for the record.

DR. PARASIEWICZ: It varies worldwide. Some countries accept some instruments, some countries accept some other instruments. Therefore, I don't know off the top of my head USGS procedures.

MR. GERSTMAN: Without casting dispersions on the flow metering done in the stream by the Applicant, you would generally tend to rely on USGS measurements to get an accurate gauge of flow in Birch Creek, for instance?

DR. PARASIEWICZ: This is the reason why I used this technique that I used for calculation, the proportion of flow at the confluence of Birch Creek and Crystal Spring Brook, because after reviewing this data, I did not find it reliable enough.

ALJ WISSLER: The data in Table 1A?

DR. PARASIEWICZ: Pardon me?

ALJ WISSLER: The data in Table 1A?

DR. PARASIEWICZ: That's correct. A few things. Just a comment, and it's more a question than anything else. We have seen on the temperature data that we just luckily found, that already now that temperature goes up to 70 degrees Fahrenheit, which is relatively high for this type of stream for summer. And we -- then there was a statement that treatment plant -- I don't know if this was with the treatment plant or not -- would increase the temperature by four to six degrees Fahrenheit. If we would add this on top of 70 and would reduce the amount of water, then it could become critical.

ALJ WISSLER: Mr. Isaacs, what's too high for trout temperature?

MR. ISAACS: Generally, a sustained temperature of over 72 degrees is lethal. It's not an instantaneous mortality. They have to be exposed for a sustained period of time, but we consider 72 lethal for trout.

MR. ALTIERI: Is it a matter of days?

MR. ISAACS: That depends on a number of factors.

ALJ WISSLER: They can find a deep part of a pool to hide in too?

MR. ISAACS: Right. So if they are -- if they are confined to an area of the stream that is over 70 or 72 degrees for any length of time, it has an impact on the trout. As I said, it's not instantaneous mortality. It weakens them, makes them susceptible to disease, and eventually has a detrimental impact.

DR. PARASIEWICZ: The point I'm trying to make here, it's really very difficult to meet the conclusion today, because as I mentioned before, the temperature in the stream is a function of the duration of low flows. If it lasts longer, the temperature could rise very, very high. And then we're talking something very different.

Now, with regard to -- at one point there was a mention there would be no influence on the flood plane habitat. Well, assuming that we would have modification of high flows and low flows, there would be indirect influence on the flood plane habitat. This needs to be mentioned.

With regard to the comment of my colleague, Alevras, this was the issue if this is unique or not unique stream. We have three experts saying three different things, and I know that Joe knows the stream way better than I do -- Jack, I'm sorry -- they know the stream very well, and still each of us made assessment based on -- at least the two of us made assessment visual. This was just a brief walk. I didn't mention the street next to the stream or that there is a bridge, and the colleague did not mention that there is a bridge dam that I observed. So each one of us have seen some parts of it. And I absolutely agree that lack of detail in this analysis is mostly disturbing, and that's what I also pledge for, that there will be more data collected to provide much more detailed analysis and much more detailed assessment so we will be able to make a sound decision if this project will have an impact or not. Otherwise, we're ending up in arguments of experts.

ALJ WISSLER: Mr. Isaacs, does the Department have a protocol it follows for taking these flow measurements?

MR. ISAACS: No.

ALJ WISSLER: What do we use?

MR. ISAACS: We generally use the USGS data, which is based, as Piotr described, on a stable cross section that is generally a trapezoid, a very measurable trapezoid. And it is a continuous measurement of height of the water through that trapezoid, which then gives us the flow measurements. However, we also use the propeller method, and even the crude method of dropping tennis balls in the stream and measuring the time it takes for them to go a certain distance. So a variety of measurements are used. And the USGS gauges are the best we have available. But in many cases, they're -- on some small streams, they're not available. We don't have a standard.

DR. PARASIEWICZ: There is very good

publication that describes most of the methods, it's Gordon and McMahon, Stream Hydrology for Ecologists, and that's summary of most of the methods that are applied worldwide.

MR. GERSTMAN: Is the USGS protocol available to provide to the Judge?

DR. PARASIEWICZ: Sure, they're public documents.

MR. ISAACS: I would stress, though, that if we are getting to the point that the technique of flow measurement is the basis of our decisions, we better take a step back and review that decision because we'll never find a technique that is absolutely accurate. And our decision shouldn't be based on the differences in techniques. If there is an impact of flow, that impact is more important than how it was arrived at.

DR. PARASIEWICZ: Maybe just one last statement that I would like to make, that in the many years that I was working on the streams at various projects, big and small projects, I have never seen a project that would not have unexpected circumstances, that would not all of a sudden either turn the water off or release some excess water and cause some disturbance. This happens at every big facility. And it's really very hard to prevent because things happen, accidents happen. So that's something we also have to keep in mind.

MR. GERSTMAN: Several other comments to add. At first, we would agree with Mr. Isaacs, that where there is a demonstrated impact, especially in the nature of the one that we're putting forth here, it needs to be analyzed further. We would further say the USGS methodology seems to be at least understood, well-accepted and applied on a regular basis where the data is available. And it does seem to be available here.

Using that data, Dr. Parasiewicz has demonstrated that the water withdrawal will result in the stream flow falling below 10 percent of mean average flow for a very extended period of time, which would have, and

DEC staff agree, a significant impact on this aquatic habitat.

Ms. Bakner, again, talks about what we

put forward here is academic because there is no scientific response to what we've put forward. In fact, the science demonstrates there is a real possibility, a very significant potential for impact. And we believe, as Dr. Parasiewicz has said, that there is an absolute obligation on the part of the agency to look at this further to make sure that this type of impact does not occur. Whether or not there are other streams similar to the upper Birch Creek or not in the Catskills, it is an important resource. There are development pressures throughout the Catskills. It is a dwindling resource. It's not an academic exercise, and certainly one can't diminish the importance of an evaluation by somehow calling it academic.

The other aspect of this is I believe there was some effort to compare the discharges from the project to the wastewater treatment plant. I wasn't quite sure what the numbers were that were put out by Crossroads, but that's an existing discharge. We're looking to add to the discharge, and that has to be considered.

If the agency felt it was important to ratchet back on certain parameters in the discharge from the wastewater treatment plant, it would do so to protect the environment. Here we're facing a new discharge, and we have to take a look at the cumulative impact of this discharge to any existing ones in the stream.

Dr. Parasiewicz in his presentation was talking about the, essentially, holistic view of stream ecology. In order to do that, he was presenting various -- as much information as he could to demonstrate what the various influences were on aquatic habitat. We weren't suggesting that Crossroads was proposing to channelize the stream or construct an impoundment here. But in terms of the influences and the impact on the aquatic habitat here, it was important to see the entire picture, we thought.

As far as the temperature gauge

showing up after mysteriously being lost in the stream for -- we're not sure how long -- obviously, if this were a trial, chain of custody would have to go through Al Frisenda and maybe his grandson. We're not in that situation, but we do question that data, where it's been, where the flow meter has been, where the temperature gauge has been for three years.

The other aspect of this is that there is always the suggestion here, and unfortunately New York City is not here to identify some of these issues, there's been the suggestion that there's minimal impact on wetlands and minimal impact on intermittent streams. As we hiked both the Wildacres and the Big Indian sites, it was very apparent that there were what was affectionately called surface drainage features that course the sites. Intermittent streams, headwaters of these important streams that were flowing through the site towards Birch Creek and Emory Brook.

There were also these isolated or seemingly isolated wetlands that were identified both by Dr. Kiviat, some by Dr. Michalski when we were out, and very many of them by New York City's expert, Joe Damrath. If we go back and look at his testimony concerning those flows and concerning the wetlands, we will see that the impacts of construction of the golf course, the channelization to some extent, through the fairways, removal of vegetative cover, all have an impact on the aquatic habitat as Dr. Parasiewicz has mentioned today. So I think it's very important to take a look at that offer of proof from Joe Damrath in conjunction with what we are suggesting here today.

Judge, as I said earlier, we would request the opportunity to have Dr. Michalski review Mr. Trader's offer of proof here and response concerning the ground and surface water hydrology. We will provide the USGS protocol that's used for determination of stream flow, and we'll also review the information concerning Chitosan to determine whether or not a response is appropriate.

We would ask the Department staff to provide us with a copy of any draft documents that are exchanged between the Department and the Applicant so we can evaluate whether or not we need to pursue that issue any further.

We believe that based upon the offer of proof that's been made today by Dr. Parasiewicz, including the exhibit to the petition, we have established a substantive and significant issue for adjudication. We believe that due to the importance of the aquatic habitat in Birch Creek and the potential devastating impact that this project will have, that this issue demands adjudication and that we should explore these issues further. Thank you, Judge.

ALJ WISSLER: Thank you, Mr. Gerstman, and thank you, Dr. Parasiewicz. Anything else?

MS. BAKNER: We would like to take a short break before we respond.

(5:45 - 5:55 P.M - BRIEF RECESS TAKEN.)

ALJ WISSLER: Ms. Bakner.

MS. BAKNER: First of all, we want to say that we very much continue our view that Dr. Parasiewicz's analysis related to our project was not specific to our project, did not have information in it that would lead to any significant issue or substantive issue with respect to the aquatic habitat. As we have shown, we have no direct impacts. We've also proved we have no indirect impacts, and we have designed a system of stormwater control that meets or exceeds the Department's standards.

We have undertaken a substantial and lengthy study of surface waters surrounding the site, and we've collected a lot of empirical evidence in addition to evaluating other stream flow information and fish habitat information that was made available to us by the Department.

Basically, we don't see that the evidence that's been presented really directly relates to our project. It certainly relates to projects such as dams, hydroelectric facilities, other things where there are direct impacts on the streams such that you're going to withdraw water from the streams. Our point is simply we're not withdrawing water from the streams, nor are we adversely affecting the composition of the streams.

So Steve, there has been a lot suggested here regarding casting dispersions upon your methodology for testing the surface flows. We have gone over this at length previously, but of course, Dr. Parasiewicz wasn't here to hear that. So if you could describe how the USGS gauging works at Birch Creek and how you did your flow measurements for the record, again, that would be very helpful.

MR. TRADER: Sure. The method that we use with the propeller flow meter is essentially the same method the USGS is using to calibrate their gauging station. The USGS gauging station at Birch Creek does not have any sort of concrete structure or trapezoid form. In fact, it's the same bouldery strewn stream that we measure further upstream. They're measuring it with another device, a pipe that is connected. They measure the water level, and they calibrate that once a year to make sure that their stream cross section -- and see if the cross section is changed.

They can look at different flow rates during the year. A certain flow rate will correspond with a height of water in the measuring pipe that's tied to the creek. So they can calibrate it this way and they can construct a curve. So if you have a certain height in that water, in that measuring pipe, that will correspond to a certain flow. And it's not just a one-for-one basis necessarily because the channel is not a square -- certainly not in this case, it's just the regular Birch Creek channel.

MS. BAKNER: So to be clear, there's no trapezoidal thing in the creek?

MR. TRADER: No, it's the same type of creek bottom that we measured up below the confluence.

They calibrate this once a year. With our measurements, we're effectively calibrating it every month. Every time we visit the section, the measuring spot, we do it at the same spot, and we measure the cross section each time that we go there.

On a particular monthly -- on the day that we go to make these measurements, we do two or three different transects across with the flow meter to make sure that we're getting a good representative average of what the flow is there. We're not just doing a one shot and then leaving the site. We take our cross sectional measurement of the morphology of the general bottom and have it where the top of the water is. And then we do transects with the flow meter two or three times.

So I see it as our method is no less reliable than what the USGS is doing. I don't think people would say the USGS gauges are recording more accurate measurements of flow than our method, because Dr. Parasiewicz admitted, they only calibrate once a year.

Birch Creek can change its morphology in a day, just like that, two or three times a year. Anytime a big storm event comes along, boulders are rolling down the stream. It's changing. Our method accounts for that because we're measuring a transect every time we go out there.

ALJ WISSLER: Let me just understand. Without getting into the calibration thing, but the values that are in Table 1A, are you saying that the value that is expressed there is not just from one flow measurement, that multiple measurements were taken and then that number was the average of those multiple readings?

MR. TRADER: Exactly, right. Because in the instruction manual for the flow meter, it says that's what they recommend you should do.

ALJ WISSLER: So on a particular day when you went and you took a measurement, was there a log that you kept and you said, here are these three that I took across the stream, and that's how I derived this number that I put in the table?

MR. TRADER: Right. Al Frisenda and I would write them down. I would be out there and I'd call the number out and he would write it down.

ALJ WISSLER: Does that log exist?

MR. TRADER: Yes, it does. It's field notes.

ALJ WISSLER: Do you have them?

MR. TRADER: Not with me.

ALJ WISSLER: Can you produce them?

MS. BAKNER: We would be happy to provide that, your Honor.

The other thing I wanted to ask you

about was the temperature issue. We're at the Pine Hill Wastewater Treatment Plant. Describe what it discharges into.

MR. TRADER: The treatment plant has an outfall location which goes into a small ditch. This ditch parallels Birch Creek. Al, how far away from Birch Creek would you say that ditch is?

MR. FRISENDA: 50 feet.

MR. TRADER: 50 feet. It comes out and it parallels Birch Creek, runs into Rose Mountain Creek, which is coming from across Route 28 flowing towards the south. It hits Rose Mountain Creek and then another 30 or 40 feet downstream, Rose Mountain Creek enters Birch Creek.

So this graph of the temperature measurements that we just submitted, that was made from Birch Creek downstream, maybe 50 feet, 100 feet --

MR. FRISENDA: Which one?

MR. TRADER: The one that you found.

MR. FRISENDA: The temperature logger, yeah, I would say about 100 feet downstream from Rose Mountain.

MR. TRADER: So that those measurements were 100 feet downstream from where Rose Mountain Creek or Brook enters Birch Creek.

So what we did for 13 months, we had monthly visits to a lot of the streams and springs in the area, and we measured field water quality parameters, one of which was temperature. And we could tell from our 13 times doing this what the temperature was of that ditch -- that's the outfall from the sewer plant -- we could tell what the temperature is of the receiving stream, which is Rose Mountain Creek, and then get what the Birch Creek measurement was.

We also had this temperature logger that was there. It was lost in December of 2001, I think. So by comparing those field measurements, that's how I can make the statement that, in general, the sewer plant outfall had a greater temperature than Birch Creek does. Although, just downstream

100 feet, Birch Creek showed no effect from that introduction of warmer water, which I attribute to a volume issue.

MS. BAKNER: In terms of, again, to get to the specifics of our project; in the summer, what is your understanding is going to happen with our effluent? Is it going to be discharged to Birch Creek?

MR. TRADER: Most likely not, I imagine it would be used for irrigation.

MS. BAKNER: Kevin, just for the record, how many million gallons does the irrigation pond hold on Big Indian; 7 million?

MR. FRANKE: 7 and a half million approximately.

MS. BAKNER: 7 and a half million gallons. So unlike the Pine Hill Wastewater Treatment Plant, we have an alternative discharge site, which allows us to avoid entirely discharge of water into Birch Creek.

Now, when it comes to irrigation, again, Kevin, are we adding water to the system by using the -- by pumping bedrock groundwater and then irrigating with it?

MR. FRANKE: Sure, you're adding it to

the surficial system. It's likely that you're going to see shallow groundwater flow as a result of irrigation, and more likely precipitation that occurs because you're raining now on a moist soil where otherwise it would have been dry and you'll get more percolating into the soil.

MS. BAKNER: Steve, you had a point?

MR. TRADER: The water budgets that we've done, and typical water budgets for this part of New York State are going to show that during the summer months, typically July, August and even into September, you don't have percolation, which means you're not actually recharging the groundwater system during those months on a typical year.

The effect of adding this irrigation water will alleviate that fact. You will have percolation because the plants, the grass that is using this irrigation water, that's what it's using. The precipitation is not going to suddenly disappear. It's going to be actually having a chance to recharge to some extent the groundwater, where it wouldn't have done so before.

MS. BAKNER: But you, in fact, didn't take any credit for that in your water budget?

MR. TRADER: No.

MS. BAKNER: And your water budget showed that, in fact, there wasn't going to be any decrease in water available to the system as a result of the project?

MR. TRADER: That's right.

MS. BAKNER: So we've looked at it from sort of a global sense in terms of the water budget, we've done the measurements in the stream surrounding it, we've done the pump tests, we've done -- it sounds like days and days and days of tests over a period of four years. So, your Honor, we would submit that we really have done a good job here, and we really have looked at it.

I really think that the position that Department staff articulated, which is that given a dynamic system such as Birch Creek, the thought that it's not possible to approve any water withdrawal from Birch Creek or any consumptive use of water, which we're not proposing to do in any event, any consumptive use of water out of that system without having a significant adverse impact on the system is quite at odds with the record of the Department so far in issuing permits for snowmaking water withdrawals, in issuing permits just recently for the Pine Hills Water Company to have bedrock wells, and for the -- and given the historic use, frankly, of the Pine Hills water system of a lot of the springs that contribute water into the system and cold, fresh water into the system. So --

MR. RUZOW: Let me add, there are a number of other wells that are ground -- that are bedrock wells, like we proposed, that have been either approved or been undertaken. My understanding is that the New York City's Pine Hill Treatment Plant has two bedrock wells which are pumped on a regular basis because there isn't enough flow given the size of the plant with just sewage.

And so all of those elements are using the groundwater system. Our data shows, and our hydrologists' evaluation -- and I don't believe the Department's evaluation, at least at this point in time from the hydrology point of view, has taken issue with it -- is that we're not affecting the surface water flows in Birch Creek. And you have all these other sources that, at least to this point, have never raised a specter that would be impacting Birch Creek. So the newness of -- I guess some surprise by this assertion is, in fact, reflected by the fact that you have all of these takings, thousands of gallons a day from all sorts of sources and the flows to Birch Creek have not -- there's not been an indication of a reflection of impacting that.

So we're reasonably confident that looking at this science -- and the only thing we have from professor -- Dr. Michalski, is a theorem -- a theory that he has come up with based on looking at some other studies -- and the reason we submitted the rest of the Heisig study is that there are countervailing arguments in that study that were ignored by him and not brought to your attention, which we will address in additional submission and argument -- but it's this theorem that he is creating and which, in entirety, Dr. Parasiewicz is relying on here. So we think there is already good science and better science that says that we will not have an impact on Birch Creek. We understand the importance of it, and we respect the importance of protecting Birch Creek.

We think the conditions of the water supply folks, who have indicated that we not exceed the Tennant -- the standard 30 percent of the low flow -- for low flow purposes is a perfectly rational condition that they have imposed and that we find acceptable.

MS. BAKNER: On the usage of Silo A.

MR. RUZOW: On Silo A.

MS. BAKNER: Lastly, we would just like to say with respect to the Chitosan, we're confident that we can live with the condition proposed by the Department, and that we can examine the drawings, perhaps tomorrow, in the context of stormwater on the overland flow, and address that issue.

We do not plan to have surface water discharges of the treated water into surface waters. That's not what our plans are showing. And we feel we can most likely address that tomorrow. So thank you very much.

ALJ WISSLER: Just because I may have been flip before, and I would ask this of counsel, if there are logs that were kept during the year or whatever it was that Table 1A values were ultimately derived from, I want to see the originals of those.

MR. GERSTMAN: Judge, I ask copies to be provided to us.

One final comment, Judge. I know it's late and, Theresa, you've worked hard today, and I don't mean to take up more time than we need to.

Dr. Michalski based his offer of proof not on conjecture and not on theories. He looked at the data, he evaluated the data provided by the Applicant and was able to support it using the science that he, I think was able to express here during the offer of proof. And we rely, obviously, on his offer of proof and on his science based upon the data that was provided by the Applicant. That will be it.

MR. ALTIERI: Your Honor, I believe I reserved the right to supplement our record regarding hydrology as it may affect this issue, but since apparently we may get some more data, we reserve the right in general to supplement the record in writing regarding aquatic habitat.

ALJ WISSLER: Is there anything we haven't reserved?

We are done for today. We will reconvene tomorrow morning at 9 o'clock. Thank you very much.

(6:13 P.M. - WHEREUPON, THE ISSUES CONFERENCE ADJOURNED FOR THE DAY.)

C E R T I F I C A T I O N

I, THERESA C. VINING, hereby certify and say that I am a Shorthand Reporter and a Notary Public within and for the State of New York; that I acted as the reporter at the Issues Conference proceedings herein, and that the transcript to which this certification is annexed is a true, accurate and complete record of the minutes of the proceedings to the best of my knowledge and belief.

THERESA C. VINING

DATED: September 15, 2004