TRANSCRIPT OF

PUBLIC MEETING REGARDING

THE DRAFT PROGRAMMATIC ENVIRONMENTAL

IMPACT STATEMENT ON THE

CLEANUP OF THREE MILE ISLAND

UNIT 2

ANNAPOLIS, MARYLAND

September 30, 1980

U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION

TMI PROGRAM OFFICE

NOTE

This is a transcript prepared from tape recordings. Every attempt has been made to provide a verbatim transcription. However, there are points at which the recording was inaudible, or at which the tape was being changed and the words were not recorded. Some very light editing has been performed when absolutely necessary to clarify the transcription. However, in this process every attempt has been made to preserve the exact wording and/or intent of the speaker.

MR. CAWOOD:

Good evening. If I could have your attention please.

My name is Jim Cawood. I am going to explain what I'm doing here in just a moment. But, first of all, I wanted to indicate the purpose of the meeting and very briefly to indicate how the meeting is going to be run and what's going to be presented. This, of course, is a meeting concerning the Draft Programmatic Environmental Impact Statement on Three Mile Island Unit 2. I think everyone has the two handouts that are here -- questions frequently asked about cleanup activities and also this white publication. If you don't have them, please feel free while I'm talking to get them from the box, as you came in. This program is presented by the Nuclear Regulatory Commission at their request. It has been set up by the Department of Natural Resources of the State of Maryland, but it is a program of the NRC. They will make the presentation and they will answer the questions, although, of course, many people are here from State, Federal, and other concerns.

Now the way the program will run, is it will be a relative minimum of talking from up here and a relative maximum of questions and comments from you in the audience. The formal program will take approximately half an hour. It will consist of an overview of what obviously is a rather bulky document. After that point we will be open to questions, comments, suggestions, what have you. The bulk of the speaking will be done by Dr. Bernard J. Snyder, who is the Director of the Three Mile Island Program Office, Nuclear Reactor Regulation. There will be three other persons who will comment here, two from NRC and one from EPA; and Dr. Snyder will introduce those as part of his comments.

Now with regard to the questions, it was decided to tape the presentation, and in order to assist in the tape it's going to be just a little bit more formal than we might like. What we would like you to do, I'll recognize people from around the audience if you will raise your hand.

Now in order to pick up well, the problem is you have to come up to the seat over to my left (your right); this machine here and its support will be out of the way by that time, and ask the questions from there; the microphones both amplify and record. We would ask you (and if you don't I am trying not to interrupt, but we'll never know who you are) to give your name when you do speak, and to give us a position if you have one on a particular expertise you feel you may have on the subject, such as whether you are a chemist, or biologist, or work for the State government, or what have you. The proceeding will be relatively informal and I'm going to try to make sure that you have a chance to get the questions in that you want and try to follow in some continuity.

Now a couple of things which the NRC has advised me that they're really not able or desirous in getting into tonight. This is a hearing concerning what to do with the obviously great problem that has accrued at Three Mile Island and how to dispose of the waste up there. It is not a hearing on the nuclear power in general and it is not a hearing on Calvert Cliffs; I don't think it would be. In any event, they are concerned with the draft statement and what comments you have and what you have to add to that, what you can inform them of, and what you can be informed of.

I am not a member of the Nuclear Regulatory Commission nor have I ever been. I am an attorney in private practice who had some fair connection with Calvert

Cliffs, opposing it, and I'm currently Chairman of the Power Plant Siting Advisory Committee which advises the power plant siting program of the State of Maryland. I am not going to be answering the questions; I'm not technically competent to do so, and I'm probably not competent to answer many of them that might even be in the legal field as concerning strict environmental law, although I reserve the right to comment. As I said, I am not part of the NRC, I'm simply trying to move the meeting along to make sure that you get a chance to ask your questions, if you get cogent answers; that everyone gets a chance to say something. We are going to try to end the meeting at 10:30, earlier if we have no questions or comments. We will try to take a break for about 10 to 15 minutes at mid point so sometime around 9:00 o'clock we will be stopping for a few moments.

At this point, I would like to introduce Dr. Bernard J. Synder, who, as I said, is the Director of the Three Mile Island Program Office for the Nuclear Reactor Regulation of the Nuclear Regulatory Commission.

DR SNYDER:

Thank you, Jim. I want to thank Jim here for agreeing to be the moderator as an independent third party. I think it's necessary. I hope everyone will be able to see all right up there, we will get to the presentation in a minute. I also wanted to express the NRC's thanks to the State of Maryland, in particular the Department of Natural Resources, headed by Mr. Colter who did agree at our suggestion to make the arrangements for this meeting and have it in this very nice meeting room. I plan to talk for ,hopefully, about 20 minutes or so, and give you a fairly brief overview of a rather thick and ponderous document.

One of the problems that we have is that we have requirements to be met under NEPA and unfortunately one ends up with a rather complicated document

Now, apart from that and somewhat at our own initiative, we did prepare the two documents that are by the door, that I think you may find to be a little easier to go through in a summary fashion at least. The blue covered documents actually are questions that have arisen from the public and from other parties, couched in terminology and language that may not be scientifically precise, but I think it represents our attempt at least to communicate with the lay public, which is a real problem for an agency such as ours which is basically a technical agency. That just came out, we just got it printed in time to bring over today. So, if you know of other people that might be interested in the copies, please feel free to take them. For those of you who haven't had an opportunity to see a copy of the thick green document here in front of us, we do have a signup list on the table over there, which, if you will put your name and address down, we'll be more than happy to send you a copy. And, we would look forward to getting your comments on it.

I know that this discussion is being taped; I think that's an excellent way to be sure that we are able to go back and understand what your comments are. However, there is, I think, a better way to communicate with the government on a document such as this; a better way to communicate is to provide your comments to us in writing. They don't need to be fancy and elaborate but your thoughts are most welcome both here at the meeting and to us prior to the end of the comment period, which is November 20. We recently extended it for another 45 days to accommodate more comments. I will, as I say, give you an overview and then we have two individuals on the NRC staff, Oliver Lynch and Clarence

Hickey, seated down here on my right, who will speak specifically to a concern that I know that exists in this area; and that is what are the anticipated impacts on the Bay, if any.

Parenthetically, I'd like to make a personal comment, I'm a long-time resident of this area, believe it or not, I'm not one those who's in and out of Washington quickly. I've spent 25 years sailing on the Bay and I like to eat the seafood. I have a personal interest in what goes on here. Let me now quickly try to walk through some of the more salient points. Excuse me, before I do that we do have with us Steve Long from the Power Plant Siting group of the State of Maryland. Steve has indicated to me in some conversations that they have reviewed, in part, the document and have some thoughts on it that may be different than ours. And, I think if you were interested you could direct questions along those lines to Steve. He indicated that he would be willing to respond to some questions. Basically though, we will try to handle your questions. We may not have all the answers but we'll do our best. Let me proceed then with what we've put together as a presentation to give you some background on the document.

Initially, I'd like to indicate first what the purpose of the document is. It's to assist the NRC in carrying out its responsibilities under the Atomic Energy Act. Most important feature of the document is to engage the public in our decision-making process, we take that very seriously. This is a requirement laid on us by the National Environmental Policy Act. We feel that it is our job to focus on the environmental issues and alternatives before specific cleanup choices are made. (Next slide please, Paul) I'd like to first indicate what the statement does provide, and then I will next indicate what it does

not provide; because it is limited in scope. We have considered in an overall evaluation mode what the environmental impacts are, of the cleanup at the Three Mile Island as a result of the accident in March of '79. We do describe in the document proposed cleanup activities and a schedule for their completion. We do concentrate on description of alternative methods for accomplishing those things that we feel are necessary to be accomplished. We have concentrated on those methods that we consider to be feasible. The statement does not cover the accident itself and the environmental impacts of the accident. That has been well reported, and as we view it that's an unfortunate accident. It was clearly the most serious accident that did occur in the nuclear industry, and we're now faced with the problem of what do we do about it? We do not cover what the ultimate disposition of that Unit 2 on Three Mile Island. That is, whether or not it would be decommissioned or restored to a condition acceptable for licensed operation. Basically, we consider that to be a future decision. We conclude in the document that it is necessary in either of those two cases, that is whether it is decommissioned or restored to an operating condition. In either case, the plant needs to be cleaned up. We do not cover, we do not give specific recommendations among the alternatives that are considered for a specific activity. There are, therefore, no decisions per se, with one exception, which I'll mention, in the document itself. The document we do view as being part of the decision-making process. However, it will form the basis for future decisions on each individual activity. We have attempted, to the best of our knowledge and the conditions of the plant, to scope the environmental impact of each of the activities. In some cases, we've had to make assumptions because there are a large number of unknowns; the condition of the core being the major one. We scoped those decisions, scoped the alternatives, rather, that one would consider worst case, best case

kind of conditions, you'll see that in the document. And we hope by doing this that we have adequately bounded the problem for each various activity, and therefore taken a look at what the environmental impacts are of each of those two extremes. If, however, we haven't been smart enough in what we've done, we are committed, we are required under the NEPA Act to do an adequate environmental assessment of individual activities, we may then have to supplement the document.

The schedule is given on the next slide. This whole process started back in November [I've got the right one here, Paul] OK, let me correct that as I go. The schedule for finalization of this document (this is a draft) is as laid up. It started in November when the Commission issued a policy statement, November '79. We completed the draft as you can see. It was available on the 14th of August, and it was formally noticed for comment; the comment period starts on August 22. We had requests to extend the comment period which was orginally 45 days -- we doubled that to 90 days, which is a fairly long period of time. But this is an exceptional situation, we feel; so the comment period does end November 20th. We are committed to submit the document to the NRC Commissioners for their review. We will be briefing them sometime toward the end of February, perhaps the early part of March of next year as opposed to, I guess that says 1980 up there, it's '81. And depending on what the Commmission's action is on our document, we would anticipate, if they do not have any major problems with it, to have it available the third week or so in March of next year. I'd like to turn to the conclusions in summary fashion. These are not all the conclusions, I've selected out what I feel are the most germane ones and just to limit my discussion here.

Basically we've analyzed the situation and feel that the cumulative whole-body dose to any individual as a result of the cleanup (these are people offsite now) is about 1.6 millirem. That can be converted to what's the cancer risk for that individual. And, the probability of contracting fatal cancer from that is about 2 in 10 million. Now all of us living in the United States have a chance of 1 in 5 of dying from cancer, from normally, what is considered normally, or naturally occurrence (ah-h) occurring events. The risk of genetic effects from the cleanup would be about 4 in 10 million compared to a naturally occurring incidence of genetic effects of 1 in 17. Now, the conversion from dose to genetic effects in cancer deaths is in accordance with recommendations made by a National Academy of Sciences study, that was conducted some time ago and recently updated. The organization, or the body, that does this sort of work and advises us and other organizations of the government is a so called BEIR Committee, it's the Biological Effects of Ionizing Radiation group -- an independent body. And they recently came out with a report that, if you use the latest thinking on this subject, would actually reduce these numbers, somewhat. We haven't bothered because the numbers are so small -- the probabilities of occurrence are so small. We haven't bothered to update them, they would just be smaller.

Another way of looking at it is what the total cumulative dose from expected releases is. There will be releases when the plant is cleaned up; this is not a zero release situation. We anticipate that within the population of about 2 million or so people within 50 miles of the plant, the total cummulative dose would be 6 person-rem. Now, that's a very small percentage as you can see on the slide of the 255,000 person-rem to the same population that they get annually from natural causes. Now, we are talking about a 6 person-rem dose

over a 5- to 7-year period and making a comparison to what that same population gets annually from a background radiation of about 100 to 115 millirem. If you take a look over the 5- to 7- year period the real comparison needs to be, it works out to be about 1.3 to 1.8 x 10^6 person-rem; in other words, over a million person-rem compared to 6.

The second major conclusion is that during the transportation of radioactive waste that will be necessary in order to remove them from the site, if on assumption, if an individual stands for 3 minutes, 3 feet away from a truck loaded with radioactive waste; the most that person would get is 1.5 millirem and, you can see the numbers in terms of what the cancer deaths and the genetic effects might be -- again, extremely small. At the moment there is only one waste disposal site available to the operators of Three Mile Island. That's in the State of Washington. That route extends 2300 miles across the United States. We estimate there are about 700 thousand people who live along that route in an area -- a band -- of a few miles wide along that route. We estimate for all the shipments of waste and fuel, that about 26 to 66 person-rem would result. That, by the way, is the major offsite dose effect.

As far as the plant workers go, it's a somewhat different story. We have taken a look at the overall cleanup program and estimate that between 2700 and 12,000 person-rem will be accumulated for the whole program. These estimates were made earlier this year when we were finalizing this document. Since that time there have been two entries that have been made into that containment building where most of that dose would accumulate. Based on the very limited data that's been obtained from those two entries into the containment building, it appears that our estimates are very high. We've been very pessimistic, in

other words, in our estimates. We will probably have more data before this document is finalized and I expect, based on that data, that there will be somewhat lower numbers occurring in the final document. The health effects corresponding to these higher numbers range from 0.3 to 1.6 additional deaths due to cancer, and from 0.7 to 3 additional genetic effects. This is spread over a population of workers that we estimate to run between 2000 to 4500 individuals. The limitations that our regulations place on the licensee limit the occupational dose to 3 rem per quarter. A rem being a thousand times more than a millirem, per calendar quarter. The exact dose would be dependent on the type of work the individual is doing, but the requirement is that no one individual receive more than 3 rem. The licensee, Metroplitan Edison Company, the operator of the plant, has an administrative limit that's one-third of our 3 rem per quarter; they limit it to 1 rem per quarter, with some exceptions for unusual circumstances; but generally they have taken and applied an administrative limit one-third of ours.

The next conclusion that we have reached has to do with the treatment and cleanup of the contaminated liquids -- the liquids contained in the auxiliary fuel handling building, reactor building sump, and the reactor coolant system. In general, the decontamination activities we feel can be processed by several feasible alternatives which we have considered. I know this is probably the most important point for the audience here today It's clearly, in our view, technologically feasible, after suitable dilution, that the process water could be released into the Susquehanna River and there would be no adverse environmental impact. Let me make clear, however, that we have made no decision. There are other disposal methods that we are actively considering. And, a decision will be made subsequent to the finalization of this document. Realize

this is an open question and we are -- we do have open minds on this subject. We would like to hear from you on it. Next slide.

In the case of an accident in the process of the cleanup, we always do analyses to determine what's the worst situation one might find, and we hypothesize events that the probability of which is extremely small, but we test the system so to speak to see what the results might be. The worst situation that we view is leakage of all the water that's in the reactor building sump right now that remains from the accident. There is about 700,000 gallons of water in there. If somehow it got out, then we've made the assumption that it leaks to the river. What happens then? Well, we find that if that were the case, that there would be a dose of 31 millirem if one drank 2 liters of water a day for a whole year directly out of the river. Or, if one ate about 20 kilograms of fish in a year, he would get 27 millirem. Now this is on the assumption now that all the water goes out of the building, it is not treated, it goes to the groundwater, and it goes directly to the river. There are a number of things that mitigate against the possibility of that occurring. And we do consider it to be very highly improbable. First of all, it would take about over a year and a half before it would percolate through the soil to the river. That gives you time to do something about it. Things can be done during that period of time. First of all, there are a series of wells in place that are sampled routinely and periodically to monitor the condition of the water in the building. So far, there is no evidence that there is any leakage, even of a minor amount. And, I anticipate that that would remain the case. However, we are vigilant; we are monitoring for that possibility. If this problem did arise during that year and a half or more that we feel we would have, there are number of well-proven methods of stopping water once it's

gotten into the ground from going any further. Techniques have been used to do that. However, even assuming the worse-case situation, that there is leakage that we don't detect, we don't know that it is happening, we don't miss 700,000 gallons over a year and half, somehow; even if that were to occur, the doses to an individual are only a small fraction of the background dose in the area which is about 116 millirem. I don't think you need to concern yourself about the water getting out of the containment building without our knowing about it. One of the concerns that has arisen as a result of the accident and subsequent events is psychological health, the psychological stress imposed on the residents of the area, the immediate area in particular, but downriver as well. We feel that based on some expert advice that we have gotten, by professionals in the mental health field, that since the krypton has been vented, and it was successfully released under controlled conditions, that there should be considerable relief of the psychological stress. However, we recognize that low levels of stress will probably continue throughout the cleanup operations. It is our anticipation that there would be no long-term effects on most of the people in the community. This program is going to take a long time. We estimated in the draft document that it would take 5 to 7 years. That's a long time to drag something out of this nature. We do feel that there is the potential therefore for chronic stress for some people. It's our intent to expeditiously clean up the plant -- to have the licensee clean it up as expeditiously as safety allows, in order to minimize that stress.

We have taken a look, as is our responsibility, in what other social impacts might be, such as reduced property values, competition between the work force and tourists for temporary housing in the immediate area, and some traffic congestion that may occur. The potential economic impacts include the effects

of increased electricity rates for the people who are supplied by this utility, potentially reduced tourism in the area (it's a major tourist center for the State of Pennsylvania), and possibly, and only possibly, there may be resistance to the consumption of agricultural and fishery products that the public may think are radioactively contaminated. That latter point obviously is of great interest to the people here, it's of interest to me, and for that reason I have brought with me two of our experts in this area that will speak to that point when I'm finished.

The shipments that will be required by truck to remove the solid radioactive wastes to suitable commercial disposal sites that are licensed will be a large number in our estimation. We've got quite a range, running from nearly 700 to about 1700. That is a representation of some of the uncertainty as to the conditions within the containment building and what it will involve in terms of volumes, at least, in cleanup. We expect that the shipments will be made over many years, and there won't be a convoy of 660 trucks at any given time coming out of the area. There are Federal standards which have proven themselves in accidents as being adequate. There are shipping regulations that we are convinced will result in a very small radiation dose to those along the shipping route, and I've already mentioned what those numbers are. And, even in the case of an accident with one of those trucks, and the chances of an accident are not insignificant with that number of shipments, the regulations on packaging and the inspection that's done by our people at the site insure that the packages are sound, as proven in the past. There have been accidents and there have been minimal environmental effects as a result of the accidents with regard to radioactivity. It's clear to us that the radioactive fuel and the other high activity wastes that are somewhat like spent fuel or radioactive

fuel, they must be packaged up. There may be a need to store them at the site until a suitable disposal site is established some place off the island. If that's done, then we have anticipated that there would be no significant environmental effects from that either, from this onsite storage. Our position is clear in the document, however, and we've stated it in a number of places that the Three Mile Island site shall not become a permanent waste disposal site for any of the radioactive waste. That is, it is not going to become a final repository. It is not a suitable place for the final resting place for any significant amount of radioactive material and, in particular, those higher level wastes. The review that we have done of existing methods and experience that's been accumulated over the years in decontamination work leads us to the conclusion that methods are existent and adequate to do the job. It's not all that exotic. There may be some modifications required. There will be some learning involved. It's a big cleanup operation, there is no question about that. However, we are convinced that it can be accomplished.

All the necessary cleanup operations can be accomplished with very minimal radioactive releases. In our view, the main factors which determine the complexity of the cleanup and the required number of trained technicians are the degree of difficulty in cleaning up the reactor building and the amount of damage to the core. Those are the two major uncertainties. In spite of the uncertainty, we are quite convinced, based on all our experience and NRC does represent considerable experience in this area, that the job can be accomplished. As I have mentioned a couple of times, we estimate it will take 5 to 7 years from the April '79, which is the date at which we have somewhat arbitrarily determined as being the start of the cleanup to accomplish all the tasks. I'd like to point out that this, among other places, we have some differences with

the licensee and operator of the plant. They're estimating that they could do it much quicker. I think 5 to 7 years is the minimum. It's clear to us that the cleanup needs to proceed; you can't leave the plant the way it is. The cleanup will alleviate several potentially hazardous conditions. For example, there is a possibility of accidental releases to the environment in case of human error, mechanical failures during the cleanup. It's our clear conclusion, and I did indicate earlier that we didn't reach any conclusions or reach any recommended decisions in the document save for one, and this is the one -- that on balance the benefits of the cleanup, removing the core, disposing the radioactive wastes from that accident in March at Three Mile Island, greatly outweigh the cost of the cleanup activities. The conclusion therefore on our part is that we need to go on and clean up.

There are a number of alternatives that we did consider, however, in the way of partial cleanup; full cleanup with salvage and decontamination of usable equipment. There is an alternative of cleaning up the plant entirely, removing the equipment with essentially minimum cleanup. There are a number of partial cleanup alternatives that you see listed or, finally, there's the alternative of doing nothing. We've considered all of these and, in particular, the last three don't solve the problem at all. They leave behind too many potential risks for the future.

We've actively considered and have still under review alternatives for processing the water in the reactor building. There are a number of technologically feasible ways of doing it -- demineralizer systems like the zeolite/resin system; one can use an evaporation/resin system combination; one can solidify all that water with portland cement. We can use some other techniques, some

of which have been used on a small scale in Europe, direct bitumenization, or one could filter out some of the debris and store the water. There, in our view, are a very large number of possibilities once the water has been processed, or that water which has already been processed, as to what do you do with it. You can keep it on the site in tanks for a long time. You can dilute it and release it to the river. You can evaporate it to the air by either natural evaporation or by forced evaporation. The natural evaporation one would allow for diffusion into the atmosphere of the tritium that remains after the processing. There is no feasible method that is known to remove the tritium. The usual method of disposing of tritium from a nuclear power plant is to dilute it and release it. One could possibly release it to the ground. It would be a deep well injection or subterranean grouting. It could be solidified with chemical agents, for example, with cement. It could be shipped offsite as a solid then. You could ship it as a liquid, presumably. Or, it could be solidified in cement, say, and retained onsite as a big concrete slab All of these are discussed in some length in the draft enviromental statement. Again, I want to emphasize, no decisions have been made in this area. There are those who just assume that the water is going to go down the river. I'd say to them that's a very bad assumption; I wouldn't want to bet on that.

I'd like to mention just very briefly, and I'll try to move along a little quicker so I won't cut into your question time too much, that we have as the major direct effect on the people is the occupational dose. The people that will work to clean up the plant, as I indicated earlier, could receive somewhere in the range of 2700 to 12,000 man-rem. As you can see, the largest component of that is cleaning up the containment building and decontaminating the equipment -- running from 1600 to 7000 person-rem. The next slide indicates

in a somewhat summary fashion, what the offsite health effects might be, and you can see the 1.6 millirem number and what the probabilities are of cancer death over the lifetime of an exposed individual that receives 1.6 millirem. Not nearly as good, not nearly as bad, rather, as the odds that we suffer as a result of living in the United States, which is 1 in 5. The total cumulative population exposure for the entire cleanup is, offsite, in the 50-mile radius is 6 person-rem, as I indicated earlier. Along the corridor, 2,300 miles long and a half mile wide, we estimate 26 to 66 person-rem. Let me just show you a map roughly of what that route is. Across the northern part of the United States to Hanford, Washington. Now that's...that's the route that is currently being used for shipment of low-level waste. And just to give you a perspective, you're not alone in your concerns that I know exist out there about the use of water that flows past the Three Mile Island Plant. There are a number of industrial and domestic water-users, as we have indicated, working its way on down to the Chesapeake Bay, the head of the Bay. Now I'd like to turn over now to Ollie Lynch...oh, to Clarence first, excuse me, Clarence Hickey, who is a fishery biologist on the NRC staff, who has made a special study of the whole issue of the effects on the bay itself. Clarence.

MR. HICKEY:

Thank you. I recognize that the concerns of those living around the Bay and depending on the Bay for food and recreation are on the radiological side of Three Mile Island. I'm not a radiation person, I'm a biologist, but I'm involved in this project to provide the type of aquatic and fishery resource information necessary to round out the consideration of effects from Three Mile Island in the impact statement. Therefore, the kind of information I've

supplied has been input to the radioecology analysis in the impact st tement and some input to those doing the psychological stress analysis. My nput has been to describe the aquatic and fishery resources along the path of he Three Mile Island effluent in the river and in the upper Chesapeake Bay. I the impact statement, a brief description of these types of resources are found in Appendix E in the back of the document -- way in the rear of the docu ent, Appendix E. The kind of information I have supplied are data on the ish communities, the shellfish communities, fish food habits, and the spo t and commercial fisheries, the presence or absence of endangered species, he presence or absence of fish stocks which are presently thought to be n some sort of trouble in the Chesapeake Bay, for example. These analyses l ad me to conclude that there are important and significant resources along the effluent path in both the river and the Bay. With respect to the Bay, which believe is what you are mostly concerned with, the upper Chesapeake Bay is a ery significant area with respect to spawning and nursery areas for fishe and some shellfishes, It's important for sport and commercial fisheries, in the Flats, the Susquehanna Flats area and farther down bay, and I've stat d these things in various places in the document to provide that kind of insi ht.

Since 1974, there has been a biological monitoring program ongoing in the Susquehanna River in the immediate vicinity of Three Mile Island, in he York Haven Pond, the reservoir formed by the York Haven Dam south of Three Mile Island. This program has encompassed a full spectrum of biological s udies as well as water quality studies of fishes and benthic microinvertebrate animals, of the sport fishery and river ecology. Now this is the area where t e effluent first enters the river from Three Mile Island, or would enter the riv r if it were permitted to do so, and it is that area of the river or the aqua ic

system from Three Mile Island to the Bay where the effluent would be the least dilute. Therefore, any effects that would come from the effluent, if any, would likely be seen there first; it would give us some idea just what is happening or not happening, as the case may be. Those studies are also summarized with respect to the fishes, the sport fisheries, and the fish food habits are summarized also in Appendix E.

Following the Three Mile Island accident, the sport fishery harvests from the York Haven Pond area around Three Mile Island showed reductions in the harvest from that area of the river due to the angler's concern with eating fish that they thought were unsafe to eat. These effects were small and they were temporary; they lasted for only a few months following the accident. When the latest information showed that the fishermen were indeed not harvesting at their usual rates. The sport fishery did not show any effects of a lower catch. The catch remained at the normal level and the fishing effort, that is the number of fishermen who fished the area and the time they spent fishing, was within the normal as established during 5 years of studies conducted prior to the accident as part of the normal monitoring around the power plant. The harvests were somewhat lower. I suspect you might see some similar effects following releases, if they were to occur, for both the river and the upper Chesapeake Bay. If effluents are detectable in the Bay and especially in the Bay fishery products, catches, harvests, or the marketability could decline temporarily for some species. And there could be some angler avoidance of those species or perhaps Bay areas where effluents were detectable. I suspect that should effluents be released, if that were to be permitted, treated effluents, any effects of this type I believe would be temporary and probably small. Thank you.

Ollie Lynch wanted to make a few comments on some of the radiological effects.

MR LYNCH:

I wanted to make some comments on the radiological effects. [Can you hear me from here? I tested it out earlier and the microphone seemed to pick up from anywhere. If you can hear me, I would rather talk from here.]

The radiological conclusions we have come to from this staff development of the document is (1) the Susquehanna River and upper Chesapeake Bay sediments would remain slightly contaminated with low but measurable levels of cesium-137 after either controlled or accidental discharges. This might be a source of continuing public concern since the radioactivity might be detectable in sediments for years after the releases are completed. However, it would pose very small hazards to man or other organisms. Low but detectable levels of cesium-137 from TMI-2 might persist in some fish of the upper Bay for 18 to 24 months after controlled or accidental releases of processed water from TMI-2. But the most important conclusion is that the postulated radionuclide concentrations, radiation effects on fish, shellfish, and other biota in the river and the Chesapeake Bay would be minimal and would have no impact on the aquatic populations or man. The area of interest, considering the entire Chesapeake Bay, is up at the top of the Bay, the upper Chesapeake, the Susquehanna River, and the Susquehanna Flats. Specifically, this area bounded by the upper portion of the Susquehanna River, the influence of the Susquehanna River and the Sassafras River. Looking at some of the radioactive effluent processed water, one of the systems we are concerned with, the zeolite/resin system, would have the following effluent of interest. We're talking about tritium

(that's H-3), cesium-137, cesium-134, strontium-90, and strontium-89. Effluent volume is indicated here 7.9×10^{-4} microcuries per milliliter, 4.6×10^{-8}, 8×10^{-9}, 1.5×10^{-8}, 3.5×10^{-9}. Now you put those in water [can you see that better?] in the discharge these numbers drop down considerably. The concentrations in the river become very small. We have considered processing the water flow in the process system of 30 gallons a minute, diluted by 36,000 gallons a minute, and added to a river that's flowing at 10,000 cubic feet per second, or 4.5 million gallons a minute.

What is this when we are looking at fish? Fish in the Susquehanna River would absorb these major radionuclides in relatively small quantities during controlled releases which are not much different from accidental releases. The accidental releases are just a slight fraction above the controlled. For example, with the tritium 6.3×10^{3} picocuries per kilogram; that is millionths of curies -- no -- that is millionths of millionths of curies per kilogram versus 9.5×10^{3} picocuries per kilogram. You are looking at just about 1.5 times more. But what do these numbers mean? If you look at fish flesh, let's take cesium-137, for example. In the area around Conowingo Dam, we're looking at about 316 picocuries per kilogram of fish. This is about three times that, 3.5 to be exact. If you look at the cesium-134, we're looking at about 230 picocuries per kilogram of fish, and that's about a little less than one times.

An area of significant interest, the upper Bay, let's look at these numbers now. This is in the Susquehanna Flats - cesium-137, 3.1 picocuries per kilogram for the controlled case and 1.7 picocuries per kilogram for the accidental release. Putting these in perspective, samples of fish flesh caught, say in

the August-September time, 1979, in this area, channel cat, 48 plus o minus 12 picocuries per kilogram. Forty-eight plus or minus twelve -- this level is not detectable nor is the accident quantity. If you want to look at esium-134, 0.2, that's what this means, the levels we have seen, 18 plus or minu 12. These are not detectable levels of these radionuclides in that portio of the Chesapeake Bay. The doses to the fish that are indicated here, for e ample in cesium-137, 6.2×10^{-3} millirad per yea. That is less than a micror d o, about a microrad per year. The background to fish is about on the or ler of 100 millirad per year or about 10 microrad per hour, and you are talk ng about a microrad per year. It is an insignificant dosage to the fish as we l. And that is what we have indicated in the statement.

DR. SYNDER:

Jim, do you want to open up. . .

Matt Bills is here from the U.S. Environmental Protection Agency, and he'll give you a brief summary of their monitoring program. Let me make on comment that we in the NRC do monitoring, the licensee does monitoring, but t e Environmental Protection Agency has been designated by the President of t e United States as having the lead responsibility for monitoring offsite. The are an independent agency, they have no ties to the NRC or the licensee. Ma t -

MR. BILLS:

On the Saturday noon after the accident, the EPA monitoring team arri ed at Three Mile Island and set up both air- and water-monitoring stations. This

team came from our Las Vegas laboratory which is responsible for monitoring around the test site in Nevada. We have had some 25 years of experience in radiological monitoring.

The monitoring data collected and analyzed during the first year after the accident was released through the NRC and the State of Pennsylvania Department of Environmental Resources. In March of this year, the President decided that EPA should take the lead role in the collection of data offsite and the reporting of this data to the public. At that time, we instituted a program at Three Mile Island of releasing data three times a week to the public that was collected in and around the Island, both, as I say, in water and in air. But mostly at that time, they were air samples because of the pending possibility of venting the krypton. This program has continued. We have some 23 air-monitoring stations around the island. We have the water-monitoring stations on the major discharges from the island. We also have a water-monitoring station above; we collect water samples above the Island and below the Island. During and right after the accident, the EPA Laboratory from Region III, which is situated here in Annapolis, did extensive monitoring of the upper Bay and the lower Susquehanna River. This capability still exists here and, in the event of an accidental release or in the event that a decision was made to vent the water or put the water in the river, EPA would institute that same monitoring program again. We stand ready to handle the monitoring program and we will assist the States and the NRC in any way we can. But we are there to assure the public health and safety of the people and, as Bernie said, we are an independent agency, we have no ties, we have no reason not to report the data to the public, and we will do so. Thank you.

MR. CAWOOD

Thank you, gentlemen. We are going to open this to questions. I don t want to introduce very many people because then it gets _____ who' here, but there are three people who have a great impact on this with the M ryland government, and I think that you ought to know who they are. Two are members of the Governor's Committee on Three Mile Island of the State of Mary and -- if they would stand for just a moment -- from the Chesapeake Bay Foun ation, Nancy Kelly; thank you Nancy, and Harry Krummelmeyer. I believe, Har y, there is no one else here from the Committee, is there, that my bad eyes ca 't see?

I don't think so.

OK, after I strained them looking at that one slide up there. It was indicated some question of the tourists, we may have tourists at Three Mile Isl nd because when the Committee went up there, I went along. All I can sa/ is that the Visitor's Center was closed that day, and that we were using it a. a base of operation and every time anyone opened the locked door and went ou side, three or four people came running up and tried to get in. So there i. a new tourist attraction there whether you want it or not. The other perso i that I'd like to introduce is a member of the General Assembly, a very har i working delegate from Harford County, who is most interested in this program, who has come a long way to watch, and that is Kathy Robb and who also assures me she has read this entire book twice and is well ready to comment on it. low, I am now going to open this to questions. What I am going to do -- there ire a lot of people here I know and a lot of people here I don't know and I war to specifically hear from a lot of people that I haven't seen before, be cause

this is their chance to go on record and also their chance to give something to the NRC. I can pick up the phone and do it, although I generally don't. You can't, and we want to hear specifically from you but I want to mix it up with some people from the State and they have expressed an opposition to it. Again, if you will just raise your hands, I am going to move around the room selectively, so you don't have to wave them. Again, if you will come up here to the microphone and introduce yourselves to everyone. The gentleman right in front, I believe, or you...Miss Nancy.

I can't hear you.

W. Garrett. Garrett? OK, fine, how are you? Nice to see you, Ma'am. Ok, who would like to ask a question or make a comment? OK.

MR. CAMPBELL:

Good evening, I am John Campbell and I am the President of TSE Research and Development and our area of expertise is plasmaphysics _____physics, backing depositions, so we have a little bit of knowledge in this area. I have to put a disclaimer in real quickly, we are not here representing the National Academy of Sciences tonight or the Congress. But as a matter of course, we will pass on our conclusions to them and of course to Frank Press' people with the _____Sytech, so we are interested in that hypothetical about dumping in the river and speaking of heavy water. I have one of my staff here with a technical question but he wanted to waive it until later. I just had a problem, I am a member in good standing of the American _____ Society, a publishing member, I am a member of the American Physics Society,

and that bloody thing is confusing to me and I read it twice, too. S , I was sort of hoping -- I was glad to see this effort come along -- so I th nk that Mr. Watt a little later has a question -- a what if? Like if he move to Havre de Grace or something of that sort and he'd like to pass it on. We ran into just one quick and that was I spoke to Mr. Jackson with the Susq ehanna River, something or other, Alliance or Committee, the hydrological da a coordination committee and checking out the figures that you all have quoted bout the rate of the river. You quoted a maximum flow or a minimum flow figur of 10,000 cfs and in the statistics on page 627, you stated there and, a I say the document was confusing to me, and so it may be an oversight on my part and if it is I would like to clear it up. When I spoke to the hydrologic l data people they said that the bottom end river flow in the Susquehanna is 2,000 and that top end is 10 and for like this time of year you are talking about 32, and he asked me other questions like I couldn't find it here, wha happens if all four of those dams or all of those plants are online and you a d if you guys choose that route of entering into the dumping water, right? So that is the question I have. I don't need a response here for myself, just i asmuch as I'm sure that a lot of people here haven't had the agony, I'm a bu eaucrat, so haven't had the agony of going through this as I have but, if they do, I'm sure they get confused too, so I am hoping that you can lighten it up a little.

DR. SNYDER:

Let me make one comment here. If that alternative were taken and the river flows were lower than the numbers that we have got there --

MR. CAMPBELL:

Right.

DR. SYNDER:

We have an infinite supply of dilution water, namely upstream. The 36,000 gpm number that's used for dilution in there, OK, is somewhat arbitrary. That happens to be a number that has been used for the licensing of that plant, as I recall, way back when.

MR. CAMPBELL:

Right.

DR. SNYDER:

And there is no reason that it couldn't be diluted down to the point where it could easily meet even the EPA drinking water tolerances as it comes out of the plant. OK?

MR. CAMPBELL:

I see.

DR. SYNDER:

So we've got a lot of variables to play with. If the river flow was ow, maybe you can dilute more. That is assuming now, and I don't think t at it's a good assumption necessarily, that it goes that route.

MR. CAMPBELL:

Granted, granted, I understand.

DR. SYNDER:

So if we're wrong on the river flows, I'd, we'd be glad to be correct d.

MR. CAMPBELL:

We will have some questions in writing about hot spots and some other things that we'll submit to you formally.

DR. SNYDER:

Fine, we will look forward to getting them.

MR. CAMPBELL:

Mr. Watt will wave his hand a little later....

DR. SNYDER:

Thank you.

MR. CAMPBELL:

Thank you, sir.

MR. CAWOOD:

John?

MR. KABLER:

Thank you, Mr. Cawood and members of the Panel. My name is John Kabler. I am the Coordinator of the Maryland Ad Hoc Committee on Three Mile Island, which is a coalition of citizen groups of environmental organizations, neighborhood organizations, and concerned citizens who are worried about the safety and the quality of the cleanup of Three Mile Island. I have actually got some things I'd like to say and a question or two thrown in there, if you give me a few moments. I've been to a lot of these meetings and sometime around June, around July, the Ad Hoc Committee began to work more closely with people in Pennsylvania, with people who belonged to those groups that are working on the citizen public participation in the cleanup up there, and I have heard a lot about how conservative the people are in Pennsylvania and how if there is going to be a nuclear accident, that is the best place to have one from the point of view of the nuclear industry because the people in Pennsylvania, in

that part of it, have such a faith in government, and having heard that, I was surprised when I went to the first meeting of the Public Interest Resource Center in Harrisburg, and began to hear things like this: 'Don't ever trust the NRC. Nobody here trusts the NRC, they'll say one thing to reassure you and then they'll turn around and do the other.' I was surprised to hear them say that, and I would like to comment this evening just on the Ad Hoc Committee's position in regard to their feelings about the public participation, and other people can speak more eloquently than I about scientific problems and disparities that they find in the PEIS.

The problem that I am trying to get at is it sounds good, everything that we heard sounded good -- it sounds like NRC is going to do a good job on the cleanup. I wish that I could believe it. I honestly wish I could, but I don't. My feeling on behalf of the Ad Hoc Committee and a larger coalition that supports us, a representative of whom is here tonight and will also speak, feels that the NRC has consistently and effectively blocked public participation -- blocked public participation in this cleanup -- in the environmental impact statement. It is true that we are here tonight, that I got an invitation to the meeting, I appreciate that; yet we feel that genuine dialogue has been impossible, that the public is angered and confused that the intelligence of concerned citizens has been insulted. Examples are the installation of the EPICOR system without proper public participation without an environmental impact statement, the release of the krypton gas so quickly that the people who were trying to get through to NRC didn't have access; they're taking it to court now, I think. The promises that we received in the March 20th meeting in Baltimore, promises from NRC to fund a panel of independent scientists appointed by a citizens advisory council; we never heard

from them again. The same thing happened to Pennsylvania. There is a similar promise to fund independent scientists to get a broader look at this problem and perhaps to assuage citizens' fears that the job wasn't being done correctly, and those negotiations broke down almost immediately. And that's one of the reasons that the people of Pennsylvania say, "Don't trust the NRC." This -- there is a deeper problem, what I perceive to be a mockery of the NEPA process. I heard you say, Mr. Snyder, that you are concerned about the NEPA process -- the NEPA process that under intense citizen pressure -- the Commission agreed to follow last November. My feeling is that you are making a mockery of the NEPA process by your intention not to hold a public hearing, a well-publicized public hearing, designed to maximize public participation in Baltimore and Harrisburg such as was requested by many groups, including public officials, Barbara McCulsky -- the answer that Barbara McCulsky got from your public affairs person, a Mr. Kammerer, didn't even mention her request. He said what a good job the NRC is doing, how happy the people in Pennsylvania are with the NRC's public participation process -- I never heard that from anybody but NRC. Barbara McCulsky is upset; we are upset. And we feel that unless you give us a public hearing designed to maximize public participation, with a month's notice in Baltimore and Harrisburg, that that process is being mocked. A few other things, we don't believe that NRC does have a real interest in conforming to those NEPA regs and considering the public concern in getting the best solutions to the cleanup, and hearing from independent scientists, requesting the calculations and assurances that you give us. We feel that the Nuclear Regulatory Commission has acted inappropriately and irresponsibly in several instances by letting things drift until a crisis occurs and then acting -- taking ill-considered actions and blaming that on the crisis which you have caused. EPICOR is an example of that. And we feel that before we can work

together to solve what is a mutual problem, it is our problem and it s your problem, this cleanup -- presumably we want the same thing, a safe cl anup -- that you have to rebuild the public trust that you have lost and that if you fail to do that, that citizen action will increase -- can only increa e, and it will get more and more difficult for you to get anything done. We don't want that, it's not a happy situation, but unless we can learn to wor together, there is no way to accomplish that -- there is no way to end that, ex use me. And we feel that you can reverse that problem by having the public he rings that so many people want, by funding independent scientists as you pr mised to do, chosen by a citizen advisory committee, or at least talking to us about it, by taking no more major cleanup actions until these questions hav been resolved, and by not dumping water into the Susquehanna River until t e scientific controversy about the possible effects of that have been resolved and until you can prove that the marketability of the seafood downstream on't be affected. You can't just say so, you have to prove it -- and a lot o people just don't buy that argument -- and until the citizens downstream agr e that dumping is a good idea. Those are some of my concerns and I sincerel hope that we can get together around these problems, and I think that ther is still time.

DR. SYNDER:

There were several points raised. Let me see if I can respond to the major ones as I heard them at least. As far as a citizens advisory panel, John, you may be aware that the Commission made a commitment some time ago, in May, in a Congressional Hearing before Congressman Udall's Committee to go ahea l and form a Three Mile Island Advisory Panel. There is -- it's in the fin l stages

of being established. It's in accordance with the legislative mandate, in other words, there is a pending bill, it's actually part of our '81 authorization that calls for a 12-member panel, and I don't know whether you are familiar with it or other people are, but let me just quickly run through the makeup of that panel. It was sponsored among others, by one of the representatives from the area not far from here, Representative Cosmire, and endorsed by a number of other Congressmen. It hasn't been passed yet, but we've taken on ourselves, on our own initiative, the commitment to organize that panel, but we've done it so that it tracks what we expect to be the direction from the Congress so that it doesn't have to be reconstituted if and when they ever pass our authorization bill, which I guess they better do by tommorrow. If I don't get paid, maybe that's OK.

[Laughter]

I don't think so. In any case, there is a 12-person panel in the process of being established. The Commission is just in the final stages of negotiating that out among the four Commissioners. In accordance with that pending legislation, there will be three members from the State Government of Pennsylvania, three members from the local governmental officials, there will be three members from the scientific community, and three individuals who reside in the area. That's the way the law states it. It's limited specifically to those 12 in those 4 categories -- 3 each in those 4 categories. That is the way I anticipate the Commission will go. We don't have any real flexibility on that one. We are hoping to work closely with that panel, I think that they will be open to hearing from organizations such as that which you represent. I think we've gone further than -- I know that we've gone a lot further than we have

ever gone before in attempting to bring the public into the process. We extended the comment period by 45 days; we didn't have to do that. I felt that it was absolutely necessary once we even got two or three requests for that, it was clear, and even though it will delay the cleanup. In a period of 5 to 7 years, another 45 days I felt was well worth it. The program that we have set up of which this meeting is one, generally under the auspices of the State of Pennsylvania officials but also as this meeting represents under the auspices of the State of Maryland people, we, the State people, and EPA, that Matt represents tonight, have a pretty heavy schedule of meetings with the public. There have been some public meetings held, one in Harrisburg right after Labor Day, there was another one recently held that the TMI Alert Group asked for and they got, there are a number of other meetings -- there is about, don't hold me to it if my recollection -- is something like 25 meetings that are planned in the area. I think that is pretty good in the way of meetings that are held at our discretion in order to involve the public. I hope to get lots of constructive comments on the document. We have a large staff of people available to us to carefully analyze those comments, and I can assure you that they'll get our personal attention. You mentioned a couple of things that occurred in the past - on EPICOR system, for example. It was assessed in an environmental assessment, there was a 30-day comment period provided for that. There was a number of public commission meetings that the public attended. The Commission specifically asked for an analysis of those public comments. I think they got a pretty fair analysis. I wasn't personally involved at that time, that was about a year ago. The system was put in place and was essentially ready to go prior to formal Commission approval. That was a difficult situation. There wasn't any time wasted in getting that ready. They were running out of space to put water and under those conditions I am

convinced, I am not an attorney, but I am convinced that NEPA processes are set aside in an emergency and that was a near emergency. We've had the luxury of doing a more careful and detailed environmental assessment on the krypton question. That was a difficult question, not from the technical point of view because everyone agreed that reviewed it, whether it was the Union of Concerned Scientists or us, that there weren't any health effects involved in releasing the krypton. I am convinced that was the case. I don't know anyone of any scientific background that would argue that. There was the physchological impact of adding more radioactivity into the environment in the immediate area of that plant. And that was what we addressed, that is what we felt was needed to be done right away, and it was done and it came off in a pretty professional manner, I think. It was certainly well monitored. There is a report that is due out -- Matt, when is the report going to be out--

MR. BILLS:

About 30 days.

DR. SNYDER:

There is a major report that will report on the expected versus the actual measurements. That is probably the most monitored event that's ever occurred in the civilian area the release of the krypton by a number of independent agencies all pulled together by EPA. As far as the funding or scientific expertise, I don't know whether you are aware, John, but the Congress has spoken clearly on that point. I suggest that that's a problem, since they've

told us that we can't fund for that purpose. We have no funds which pecifically disallowed for that purpose. There are members of our Commissio , Commissioners of the NRC, who have clearly indicated that they would e willing to fund, on a trial basis, scientific advisors to intervenor groups. The Congress said no. We work for the Congress. The Congress is supposed t work for the people. If the people have a problem on that point, I think hey should go to the Congress. Our hands are tied. I am sorry on about hat one. Did I miss any points? Tell me if I did. You had a lot of things th re.

MR. KABLER:

I went to a hearing once in a coastal zone management document that was prepared about 3 or 4 years ago, and one of the people who has been working on environmental matters for a long time at that hearing, her comment was to stand up and sing -- she sang a song "I Think I've Heard This Song Before." And, I was just amazed; and I wish I had the courage to do that now, but I won't, and I won't respond to anything that you have said. I think, instead, I'll get off the microphone here and you've heard my side. Everyone has heard your side and let's see what the rest of the people here have to say.

MR. CAWOOD:

John, I have one question to ask you before you leave and I am glad that you didn't start singing or I would have had to go after the gavel.

MR. KABLER:

Yeah, you probably would have.

MR. CAWOOD:

But believe me, I wouldn't have joined you. You have indicated something about public hearings and I wanted to follow it up just a moment.

I'm sorry I missed that. Are we talking about, what kind of hearings, everybody uses the word 'hearings', some people call this a hearing; I call it a meeting because it does not formally decide anything -- I and this panel or anybody here doesn't make a decision per se at the end. Are you talking about simply a more open meeting with more people speaking with more notice or are you talking about some kind of decision-making? And if so, what could make the decision?

MR KABLER:

The former. We are not talking about adjudicatory or decision-making hearings, we are talking about something similar maybe to a legislative hearing or maybe a public meeting. There is some discussion as to what the right term to use is. But -- in Barbara McCulsky's letter and in most of the requests for a public hearing, I think we are talking about something that meets the spirit and the letter of the NEPA regs that say when a clear controversy, a substantial controversy, exists on an issue on an environmental impact statement issue, that public hearings are called for. The kinds of hearings where people hear

about it a month in advance, where the word gets out all over the pla e, where it is publicized on radio and TV, and in other words, a hearing desig ed to maximize public participation, held, we think, in Baltimore and Harri burg. This is a public meeting and it is a good one, but there was not enou h notice it's not in the right place, and it does not meet the the spirit in t e letter of the NEPA regs according to our reading of them. And I am sure tha you will hear about that from other --

MR. CAWOOD:

But you are talking about the same general type of meeting.

MR. KABLER:

Yep.

MR. CAWOOD:

OK, fine, I agree with you.

MR. KABLER:

And it is also important that everything that is said be read into the record which I assume is happening tonight, is that true?

MR. CAWOOD:

It is being taped, yes.

MR. KABLER:

Well, it will be part of --

DR. SYNDER:

Well, as I indicated at the beginning of the meeting -- I am not sure if you were here at that point, John; the taping of the meeting will be useful to us. We have a large number of people here from my staff, from the NRC staff, who are diligently taking notes -- we are interested in what people have to say, but the real way to comment on this document is in formal comment in writing.

MR. KABLER:

Well, there is some controversy over that, because there are a lot of people who feel that you should see us and hear what we have to say, face to face. Rather than take anymore time, I really would like to move on. Bernie, I hope that I see you in a public meeting, the kind that I want. Thank you very much.

MR. CAWOOD:

OK, thank you so much. Let's see, let's try the lady far in the back.

MS. RYAN:

Hi, I am Coral Ryan. I'm with a group from Washington, DC called Nuc ear Information Resource Service. I was at the August 14th meeting when he NRC released this draft and.... [END OF TAPE]

Jeff, what input is this draft going to have in the actual decision-m king. You said tonight, Bernie, several times that no decisions have been m de -- I'd like a little indication of when these decisions are going to be ade and how.

DR. SNYDER:

OK. Let me clarify that, because I know that there has been some con usion on the purpose of the document -- I think that is really what your quest on may be. The document itself, as I indicated earlier, does not have any specific recommendations other than the fact that the cleanup should proceed. We feel that the "no action do nothing" alternative is not one that is worth pursuing. Other than that, specific choices for given activities -- the decisio s on those will be based on the environmental assessment. This is the env ronmental assessment of those alternatives, in final form, recognize, this is a draft now. So we feel that we meet our NEPA obligations by doing an envir mental impact statement of this nature and that is one element of the decisi n-making process. Now, each major activity will require a separate technical proposal from the licensee, which the NRC staff will review, and one of the review aspects will be not just the -- one of the aspects of the review is a safety review -- Is it safe to do this? Forget about the environmental impacts for

the moment. The second aspect of the review would be, is it within the scope of those alternatives that we considered? We may not have pinpointed the specific alternative that they have chosen, but is it within the scope, in other words is it bounded by this document in the area where we discuss it when it's in final. If that's the case and we are convinced that is the case, then further environmental review would be a repeat of the same thing that already exists. So the point here is to lay the whole program out and then when a piecemeal consideration is given, you know how it fits into the whole thing.

MS. RYAN:

How does the public get involved in those specific decisions on the cleanup process?

DR. SNYDER:

I think the public process is the commenting on this document here. What is its effect on the environment? That's the input point.

MS. RYAN:

That is our understanding that it has been designed to be limited to public input at this point. When this document was released August 14th, there was an official 45-day comment period which would be to October 6.

DR. SYNDER:

Yes.

MS. RYAN:

With many requests this has been extended to November 20. However, the point is that this document took 8 months to prepare by the NRC staff. The NRC was giving the public 45 days in which to comment on it. In the whole process that will take between 5 and 7 years to clean up, we think that this is very minimal input and very minimal impact on the whole cleanup process itself.

DR. SNYDER:

Well, let me comment for a moment on that. I indicated and first of all, the comment period has been extended for another 45 days on this particular document. I think that there probably will be opportunity for public comment on specific recommendations that the licensee will make. We are open to public comment on everything, OK? What I meant to indicate was that the November 20th, we have to have a cutoff date in order to finalize this thing; otherwise, it goes on forever; it doesn't serve anybody a good purpose. The specific proposals that the licensee will make -- you have our address, we are open to your comments. We would welcome them. They will be factored into our recommendations to our Commissioners. Ultimately, on the major cleanup elements that are discussed in here, our Commissioners will make the final decision. The staff will not. We will make recommendations to them, of course, that is our job.

MS. RYAN:

We as public interest groups and environmental and energy groups are very interested in having this process open to the public in a more formal manner rather than submit the comments for a short period of time and call us and let us know what you are thinking. It is not responsive to the public input on a formal basis. When you were in Harrisburg on September 3, I asked you directly about funding for independent scientists. Your response at that time too was that the Congress has not given the NRC permission to proceed with intervenor funding. Intervenor funding is separate from this. Intervenor funding is a separate issue. What we're talking about is we're asking for critical review and public assessment by appropriating funds to scientists that have been selected by citizen groups to review this document. It's a separate issue than intervenor funding. Intervenor funding requires lawyers intervening in a specific process, usually a licensing procedure. This is evaluation of a draft which is a process that is investigating technical assessment of very technical and new technical methods of cleaning up radioactive contamination. At this point, we think it is vital that an outside opinion be included in this whole assessment process. When you are trying to evaluate your own work, it is very difficult and we consider it strategic and very important and, in addition, a help to NRC to have this public input and to have independent analysis.

DR. SNYDER:

Well I think that it may be a turn on a legalism that I am not prepared to address as to whether it is or isn't intervenor funding. Let me indicate the

outside review that this document does get by well qualified scientif c bodies -- organizations -- the Environmental Protection Agency being one, th y will comment on it, the various, the two states that are most intimately i volved have technical staffs who are well qualified to comment and I am sure will comment on it. There are a number of other agencies throughout the g vernment that will comment on it. And in addition, as presently proposed at l ast, the TMI Advisory Panel has access to an independent body of advisors whic is in accordance with the legislation as it presently is written and probab y the way it will pass. It allows them to have access to the Commission's dvisory Committee on Reactor Safeguards to provide them with probably the fin st body of experts that exists in the United States. So, there are some mech nisms here to avoid that prohibition and I think it's a close call as to wh ther or not we have that ability to provide funding. I have been advised, at least, that it would be considered as intervenor funding.

MS. RYAN:

It would seem to me that NRC staff has hired such as Argonne Labs to valuate have hired consultants and that they would have the ability to hire a independent review of this document. But I guess that is what I was trying to cl rify at the last meeting and I understood you were saying, yes, that you coul l.

DR. SNYDER:

Yes, we have the ability to expend funds for advisors and independent consultants and we do that all the time. We had a large staff of the finest peop e available from Argonne National Laboratory that contributed heavily to this doc ment.

But for them to provide exclusive advice to another body, I think you get into the question of Intervenor funding. That is my own opinion, as I say, I think it may turn on a legal question and I am probably not the best one to answer that but that is the advice that I have been given.

MS. RYAN:

As you give examples of who will be reviewing this document. It seems clear that they are primarily government agencies and 90% of scientists are hired by the government and what we would indicate as an independent person is somebody who is a little bit more distant from that funding source.

DR. SYNDER:

Well, we do, we expect as we got 800 comments on the environmental assessment on krypton, I think. I would fully expect to see well-qualified, independent, technical people commenting on this document. I don't think that you are alone on this question. There are professors from universities and people from other areas of industry, etc., that are available and do comment and their comments will be considered.

MS. RYAN:

Our point for asking for funding for intervenors is (excuse me) [laughter] intervenor funders scientists is that when you ask the government such as EPA to evaluate the document, their scientists are being paid when an independent scientist has to evaluate this draft -- they are working full time at some other job and we as citizens have no funds to pay them to look at this issue.

DR. SNYDER:

It hasn't stopped an awful lot of them from commenting, however. They seem to work at nights, I guess.

MS. RYAN:

It seems like an uphill battle when you are doing it. I can tell you that.

DR. SNYDER:

I can appreciate that. I myself would like to see providing intervenor funding which I think it is. Unfortunately, I don't think that we've got that kind of flexibility.

Let me ask here, I don't know whether Mr. Chandler wants to comment on it or not but that is, of course, a legal question as to whether this is consultant or intervening funding. Do you have any thoughts on that?

At this point I don't think that we've taken a position on this subject whether it would be, strictly speaking, intervenor funding. But I think it should be noted that we have a rather direct guidance from Congress right now as to appropriate expenditures of our funds for outside help, if you will, or these types of situations. I don't think you have an option. Well, perhaps as a result of this meeting, that could be made clearer as a question. There are obviously two questions. Number 1, can you do it? And number 2, if you can do it, is it desirable to do, and you have to answer the first question before

you can answer the second and I certainly can't answer it. I am well aware that the intervenor, per se, is not funded but is certainly a subject that I think is fairly raised and I think it ought to be well answered.

MS. RYAN:

OK, I just wanted to mention that about 49 or 50 groups have asked to meet with President Carter on the issue of trying to include the public in this process -- trying to get response to the public. I know that you talk about public meetings as if it was responsive to the public, but in our experience it has been that the public has been addressed, has been talked to, has been invited to meetings mainly to be explained to how everything is going well and how everything is being done and how, you know, trust in us. And I guess our point is that we're asking for public hearings in which there would be, it would be processed, it would be recorded, there would be opportunity to prepare for it, there would be opportunity for citizens to involve and request scientists to provide testimony, and so that is in fact what we are asking for. And I just wanted to mention a few of the groups from the Maryland area are the Chesapeake Bay Foundation, the Maryland Conservation Council, the Maryland Waterman's Association, Baltimore Chapter of Sierra Club, and many other groups. Groups from Harrisburg and National Environmental Groups. I wanted to ask Matt Bills, if when you were describing the monitoring system you mentioned that the public were informed three times a week, I understand, on the monitoring.

MR. BILLS:

That's correct, during the weeks, I guess the month preceding the venting of the krypton, I instituted a 3-time-a-week news release (Monday, Wednesday and Friday) on the analysis on the data collected the previous week or maybe the previous 48 to 72 hours. During the venting, the 20 some odd days that we were there, we reported that information daily. The information was collected from our monitoring stations sometime around 12 o'clock noon each day went into our laboratory in our facility there in Middletown, and was analyzed, and about four o'clock in the morning the information from our scientists was given to our public information people and this information was available at about 9 o'clock each morning. After the venting of the krypton, it was decided, and I was the one that made the decision, that again we were only monitoring background data and that it made little sense to flood the public with information that only showed background data so, we... every day, let's put it that way, to flood the public every day with that information. So I instituted a once a week and it's on Friday now that we release the same data, at the same time that the air data is released, we also have the water data for that week. So we have a program going up there now and if for any reason it should be necessary to get the information out to the public sooner, I will do it. At the present time, since we are only finding background data, it made little sense to continue to pour that, those numbers out. But if the public wants it, we'll give it to them.

MS. RYAN:

That reminds me, when you had a period of public comment for the venting, 500 out of the 800 were responses that were negative to the venting

and I think that is one of the concerns of the people that are concerned about commenting on this public draft. When a majority of the people commenting are against something, what then is the process included in the decision making. In that instance it was that the venting just proceeded as planned. There was no public hearing held to try to work out the differences or get more input which the people were asking for. And I guess, you know, you can say very simply that there were no hazards from venting. However, that was the beginning of a very long process and very important process and if at that point, the public's opinion didn't seem to matter at all, how are we to trust this at this point? And that is one thing that was really frightening and disillusioning. I'd like to make one comment on the....

MR. CAWOOD:

OK, could you make one and then I think I want to let someone else have a chance also. You have given us a great number of things to think about.

MS. RYAN:

The Citizen Advisory Committee that is being proposed by the legislature that started out being talked about in March when this public document, this draft was released August 14th, the Citizen Advisory Committee was not yet formed. It seems to the citizens another instance in which the public is being talked about how much we are doing for you, how much we recognize you, in fact, being rendered ineffective. If this citizen panel was to be effective, it would seem that it would be vital that it would be established by the time this draft was released. The comment period was anticipated to be over by October 6,

and there is no citizen panel developed at this point yet. I realize the problems with the Congress, but the people who are living around the plant are in need of effective communication at this point and, if the Congress is not able to provide it, then what the people are saying is that we need a citizen advisory panel appointed by us, because we're ready, willing, and able and active now whether or not the Congress is ready to appoint it. The other point about the citizen advisory panel that is being proposed is that three State government officials, three local, three scientists, and three citizens panel of 12; it is now being termed the TMI Advisory Panel rather than the Citizens Panel and, in fact, it is not acceptable as the citizens panel in that over 50% of it are government.

DR. SNYDER:

Let me just comment briefly and allow other people to come up. We did make a recommendation immediately after getting the response from Governor Thornburg as to who he would appoint. I made my recommendation to the Commission within days of having received his. The Commission has struggled with this question; it is a very difficult question and is somewhat without precedent. They're breaking some new ground here. As far as the makeup of the panel, as I said before, I think that's a question for the Congress. We are constrained in that respect. I hope that it will be formed soon, however. We've been pushing hard for it.

MR. CAWOOD:

OK, thank you so much. The man way in the back there. The gentleman in pink, I think it's pink anyway.

MR. SORRELL:

My name is Steve Sorrell and I am a member of the Chesapeake Energy Alliance and the Patuxent Alliance and I would like to thank you all for coming out tonight and to compliment you on your efforts. I did want to comment a little bit on the situation with the proposed dumping of water which was one of the possibilities that you mentioned tonight. And I think that there shouldn't be any tritium dumping at all under any circumstances, for two reasons. The first being that the effects of tritium haven't been fully evaluated and, secondly, even if after evaluations, trititum is believed to be safe, which I find highly unlikely, it's going to be the EPICOR II system or ion exchange resin or whatever you decide to use is undoubtedly going to let some radio-isotopes get released into the environment which was addressed to earlier as far as cesium and strontium and I don't want to denounce the value of these machines and using them, but I think that we should respect their limitations and that no system is going to be 100% effective. And no matter how many times we cycle the water through these machines, there is still going to be some radioactive material that gets released, other than the tritium. And this is if the EPICOR II system or whatever we use is operated properly. The nuclear industry and its regulatory agencies have had a long history of turning valves the wrong way, of turning off systems that should have been left on, and claiming malfunctions when, in fact, radiation leaks were occurring. I think that we need some kind of assurances that only trained, highly skilled workers are going to handle this cleanup and not just any person that comes along that's willing to get irradiated to make a couple of bucks. And finally I think that we should use the best available technology throughout this cleanup and assure the best possible implementation of it. I think that we

should try to come about bringing economic cost of nuclear power that starts to approximate its social cost. And what I mean by the social cost is, to really understand the magnitude of it I think we have to be aware that as sophisticated and complex as this environmental impact statement is that it is only dealing with the tip of an iceberg and that the radioactive poisons that we have here are going to be deadly for a quarter of a million years and we have no feasible, foreseeable technology to contain this waste, and we don't really have any guarantee that it's going to be contained and it just appears to me that we have inadequate technology and inadequate guarantees that deal with the whole situation. And I think in light of this, the best possible thing to do is to shut down all nuclear power plants and employ the best available technology to get out of the mess we have now and realize that even employing the best available technology, whatever it costs, it's not going to be satisfactory but it's the only alternative that we have.

DR. SNYDER:

Well, I think the question on whether we have nuclear power plants or not isn't the issue here. The issue really is that there is a plant that had an accident -- do we want to clean it up or don't we? It is our judgment that it needs to be cleaned up.

MR. SORREL:

I agree with you. I just want to be sure that it is cleaned up properly.

DR. SNYDER:

OK, we all hope it does.

MR. SORRELL:

I think we are in agreement on that.

MR. CAWOOD:

OK, the question is, how?

(Guess we don't get our break.)

MS. GEORGE:

Let me get myself situated here. My name is Debbie George. I am representing the Maryland Watermen's Association. We are a nonprofit trade association which represents all the, well, the majority of commercial fishermen, seafood harvesters in Maryland on the Chesapeake Bay. I have studied the draft environmental impact statement a great deal and our association has a lot of concerns over the entire cleanup process. Some of the things that I would like to address in the document itself. First of all, I would just like to say that the document is very poorly done as far as assuring the public that there is no problem, as you tried to do so eloquently tonight. There are things that are said in the document about the seafood industry, that it is taken into account. One thing in particular, there is a statement that there

will be low, but measurable, amounts of cesium-137, I believe, that will be detectable for some amount of time, approximately 18 to 24 months in the upper Bay. That is a really critical consideration and I think you are aware of that. The upper Bay is in a very critical condition. The finfish in the upper Bay have been decreasing and decreasing and decreasing. Shellfish - there are no shellfish up there, so, OK, we don't have to be concerned about that, but the Department of Natural Resources reached the conclusion in a report that's used as reference in the EIS that there is "something wrong with the water" and they don't know what it is. So, that is one thing that we are concerned about, that the public, if the EIS says that if the public is properly informed, there should be no problem. But this is not an example of properly informing the public. And I don't think 25 meetings in the area of the Chesapeake Bay and Susquehanna River is properly informing the public. I don't think you are letting us do that. I think that as far, everyone is saying that the Susquehanna River alternative is just an alternative -- you are open to other alternatives. And yet, the Susquehanna River alternative is constantly, constantly brought up. There were graphs and charts and maps on it tonight and I have heard people say that it is just going to get dumped sometime. They talk about accidental releases in the EIS. There is going to be a big accidental release, so we are very suspicious and very unwary. We also feel that there needs to be independent scientific review. And again, to reassure the public, our efforts at seafood marketing which have really just begun to pay off will be just annihilated if the public is not properly informed and, again, this is not an example of that. So, I guess really I can sum up my whole statement in saying that in order for me to really represent Watermen just to say that we could not at all support in any way, shape, or form any kind of dumping or dilution of any kind of waste into the headwaters of the Chesapeake Bay or into the Susquehanna River.

DR. SYNDER:

I think, as I indicated before, I certainly, personally, share your concerns. Let me ask Clarence or Ollie if they would like to make any comments.

MR. KICKEY:

I can't respond specifically to some of your things. I think you brought up some general problems, some of which we recognize as well, and let me just say I am a water person as well. It may be of little comfort to the Watermen, but I personally am concerned about these things. When I prepared the type of input that I had for the PEIS, the first thing I did was to consult whomever I could find who was knowledgeable on the Bay with respect to aquatic biota and fisheries and one of the things that I did do was to go to the Maryland Department of Natural Resources and you mentioned at least the one document in there that was produced in combination by DNR and the Watermen which I found to be very useful and helpful and to give me an idea of what the people who actually do the production feel are some concerns. And other concerns that I got from DNR were some that you specifically just mentioned and that is, some of the fishery resources are in trouble from lots of different viewpoints, declining stocks of shad and stripped bass and a few other things which I mentioned in the document to provide some input for those who have to make a decision and need to know if certain things are going to be affected more than they already are from other causes. I share the concerns that you have, the 18 to 24 months of detectable nuclides, as it states in there, and a properly informed public. This is a tough document to go through; we recognize that. It's one of the reasons that we're here and it's one of the reasons that some of these

other documents were provided to help to give some more general insight. Emphasis on the Susquehanna River in the PEIS, I can appreciate your point of view there. I share that point of view, I might say. I think that is emphasized because it is a critical issue. It may well be the most critical issue of the entire cleanup process; at least in the minds of those people here, and that is the Chesapeake Bay and the releases into the river. It's not overemphasized, if you want to use that word, in order to promote it. It's emphasized to try to provide some understanding of what's going on and what the consequences could be if that decision were made by another body. We don't make that decision. If that decision is made, it will be by the Commission, as I understand it. We try to provide the insight into that. That has been an overriding concern among peoples all around concerned with this document and among us in the Agency, so we tried to treat it, tried to treat it heavily. In doing so, perhaps it looks as though something else is afoot, but it is not, to my understanding. But we will be treating some of these issues in more detail in the final document to try to bring the information together and make it more understandable and to treat some further issues in more detail with respect to the marketability of the Bay and releases to the river, and so forth -- to provide that kind of information to those who use this document to make decisions.

MR. BILLS:

Bernie, I wonder if I might add relative to her statement that the large dump. The EPA monitoring system on the major outfall of the island is a real-time, online, 24-hour-a-day manned system, so any release from the plant we would know immediately and our people would be flagged immediately and certainly we

would get the information to the local NRC official responsible, as well as to Metropolitan Edison. So we couldn't control, we don't control the valve, but we do control the monitoring system and would alert everyone involved.

MS. GEORGE:

I appreciate those comments because I have been very concerned about EPA's involvement. I don't think it has been -- they were talking about press releases that you evidently intensively put out for a while. I think people are not very reassured about EPA's involvement in this process.

MR. CAWOOD:

Thank you so much. The comments now. Let me just get a little count here of approximately how many people still want to speak so I can make sure we have enough time, so would you hold your hands up for just a moment? OK, we got -- I'll try therefore to limit everybody if we can -- I don't like to limit but we have to stop here approximately at 10:30 -- to about 4 or 5 minutes, so try to make you comments as succinct as you can make them and get it all in. Incidentally, about 2 hours ago I promised you a break but that number of questions, I lied. But if you want to sneak out, please feel free to do so for a moment. The lady here in front.

MS. BEAUREGARD:

I am Louise Beauregard and I am coming as a concerned citizen, while I am a volunteer member of three very worthy organizations. I am an Isaac Walton

conservationist member, I am a volunteer member of CRAFT, that is your Coastal Resources Advisory Committee, and I am a volunteer member for your Estuarine Sanctuary National Committee. I have two questions and one of them you gave me. I am dismayed that anything as acute as this would be kept on the level of printing and meetings and meetings and printings. And I am wondering if it's because you are not educating us as to how this really affects us in an acute way. The concern of the route that you showed on your map, that's not because of the Army-Navy game that we're a logical nuclear target, it is because the President takes that route to Camp David, that heavy trucking route from Washington to that point of Maryland where Camp David is, and it would jeopardize our first family of our country and the countries that are our enemies would certainly make that a natural target area with the heavy trucks, and I think that has not been brought out. The second thing is the cold war physchology and the repercussions from the nuclear blast in 1940 to the country of Japan. And I think it's time, while the first thing on Three Mile Island may have been an accident, and we praise the Lord that it was an accident, but only 4 weeks ago they showed clams one inch to an inch and a half growing inside of nuclear pipes. Now those clams had to be placed as seeds, so how long ago did that frame take place? And, therefore, I have a right to ask you, with the generation coming up, if we are being done to because someone did it to them? Will you alert us and why should we stop at Congress from keeping you from protecting us if infiltration of enemy sources are there now? I think that should be taken to the President of our country. Right here, we have 141 delegates in the State of Maryland, we have 47 senators, and I am very deeply concerned that you are sitting here and telling me that you have had meetings and meetings and meetings and our ducks on Route 2 now have thyroid goiters from the chemicals that are in the water and the tomatoes

that are grown cannot be eaten, you have to buy hot house tomatoes from another State, you are not eating the crabs that come from Maryland waters, they taste of kerosene gasoline and other chemicals. You are eating crabs that are sent in from another State. I think the children here tonight should be told if we're hitting on something then teach us how to get to the President and override anything that Congress is keeping you from. I thank you for your time.

MR. CAWOOD:

OK. Thank you so much, Ma'am. OK, we'll hear the young lady here if we can.

MS. MAY:

My name is Edith May and I am an economist and industry analyst for the energy industry with the Bureau of Labor Statistics in Washington, DC. And I've noticed this evening and also in the environmental impact statement that economics has been left out pretty much. There is very little cost-benefit analysis, you talk about the benefits of the cleanup being so great over the risks of environmental factors, what could happen to the environment, and I don't see any economic analysis going on. I know that the Department of Energy has economists; I assume that the NRC has economists on your staff also. I also would like to know why only the headwaters of the Chesapeake Bay are being considered. Has anyone considered the economic impact on the thousands of fishermen in the Chesapeake Bay, the fishing industry? Also, has anyone considered what the economic impact is on Metropolitan Edison? I have heard a lot of talk in these meetings before about the EPICOR system and how

Metropolitan Edison went ahead and spent millions of dollars and now he NRC, well, people are accusing the NRC of going to bail Metropolitan Ediso out, as it were. Has anyone analyzed what are the various net present values of Metropolitan Edison's investments in the various techniques of proces ing the water, of cleaning up the plant? What's the impact on Metropolitan E ison's current stock price? What will the stockholders want to do? What wi l the Board want to dc? Are you people bailing them out?

DR. SNYDER:

Let me answer the last question first. It's real easy, absolutely no . The NRC has no authorization to spend any money up there to assist the li ensee to clean up the plant. That's his responsibility. It is the responsibi ity of the owners of the plant and there are three owners, and it's also wit in the realm of the Public Utilities Commission and what profits and income hey are allowed.

MS. MAY:

My question really is not, is the NRC going to spend the money, but i the NRC going to make it the easiest and the cheapest way for Metropolitan Ed son to spend its money?

DR. SNYDER:

Not necessarily. I think the important consideration is what is the mpact on the environment. I think cost is a secondary consideration. I would like to

ask Ollie Lynch, who is the project manager, one of the project managers for this document, to comment on the reason why there are no costs in there. You are absolutely right, there are no costs in the document. Ollie, could you speak to that?

MR. LYNCH:

Yes, we fully intend to put costs in the final. It is very difficult to develop costs in the time we had available to put out a draft statement; in addition, we did not have any costs available to us. They intend to provide us with costs, we have been working all along developing costs of the various systems so we can give a comparison of what the economic costs will be for the various cleanup alternatives.

MS. MAY:

How long will it take you to put out the final?

MR. LYNCH:

The schedule is to have it out the end of March.

MS. MAY:

OK, you said it took you 8 months to put out the preliminary -- from the end of November to the end of March is what, 4 months? If you couldn't come up with costs in 8 months, how are you going to do it in 4 months?

MR. LYNCH:

Because we have been working on the costs for 8 months and we will continue to work on them until we do put out the statement. We didn't stop working on the costs, we have been working on them all along. It is a very complicated process to develop them, especially when you have to go through and figure out all the different alternatives that are available. We just were not ready with the costs when the draft came out. The costs are somewhat secondary, as Dr. Snyder pointed out. The cleanup is going to have to take place, environmental impacts are going to be weighed more heavily than the costs of the various alternatives to produce the minimum impacts.

MS. MAY:

Well, I am not only talking about the costs of the cleanup procedure, I am talking about the costs to the people, the cost to fishermen in the Chesapeake Bay.

MR. LYNCH:

On that particular point, your remark about we only considered the headwaters of the Chesapeake Bay -- that is not true. We considered the entire Chesapeake Bay. Impacts, if you want to call them that, that we can identify, only occur in the headwaters of the Chesapeake Bay and that is why there is a concentration of that particular material in the statement. We don't concentrate a lot on places that are not going to have impacts.

MS MAY:

Thank you very much.

MR. CAWOOD:

OK, thank you. A most interesting question. Miss Nancy, why don't we try you for a moment.

MS. KELLY:

Mr. Kaywood, Mr. Snyder, I am Nancy Kelly, Senior Staff Biologist for the Chesapeake Bay Foundation. We have several comments that we would like to make tonight and a written statement which I'll hand in. I would like to start by remarking that the Susquehanna River is a very important contributor to the fresh water in the Chesapeake Bay. It contributes about 80% of the fresh water that goes into the upper bay, 50 to 60% to the entire Bay, so that what happens during the decontamination of processes at Three Mile Island is very, very much of concern to the Chesapeake Bay Foundation and to the citizens of Maryland. I'd like you to notice, as you already have really, that the impact statement is a presentation of a series of alternatives and is not actually a plan as to exactly what you will do during the cleanup. And, therefore, we believe that it is important that certain criteria be developed by the NRC for making a decision when Metropolitan Edison proposes to do whatever it is that they do in each step of the process. For that reason, I'd like to give you our point of view of criteria that we think are appropriate in making those decisions. You mentioned alternatives as to cleaning up the

facility, that is partial cleanup, or complete cleanup with removal, and so forth. We feel that cleanup is appropriate, it should not just be entombed there, for instance, and that that cleanup should proceed as expeditiously as possible, assuming that you also want to proceed in a safe manner and with the proper planning. You noted that you may need to make further impact statements, that's one of the comments that we were making to you also, that there may be things that you have not foreseen that would require such statements, and we were urging you to make those if need be. We believe that the radioactive contaminated water which is on the site at the present time should be promptly processed by one of the systems and I am not going to tell you which one I think is the best, but one of the, either zeolite/resin processes or something similar to that, in order to remove the majority of the radioactivity from that water so that the potential accidental release of that water to the river is minimized or that highly contaminated water at least. We would like to see decontamination measures selected which would minimize the amount of liquid waste that's generated and for that water to be reused as much as possible during the cleanup activities. I am sure that is probably one of your objectives also. We believe that the processed water that remains after the accident cleanup has occurred should not be discharged to the Susquehanna River and I will go into that in more detail later. Basically, we believe that there are other alternatives available and the potential impact on the marketability of seafood products we think is fairly serious. Radioactive waste that is generated by this cleanup process, we believe should be moved from the Island as rapidly as possible and I'll go into that a little bit more in detail later, but we are concerned about the impact statements dealing with that particular problem. We would urge the NRC to select methods of decontamination which would reduce the volume of waste as much as possible because of transportation problems and

disposal problems, and also to insure that those wastes are in a form that can be transported. I say this, although I know that you are concerned about this, I understand that the EPICOR II liners are not in a form which can be transported right now because they are not completely immobilized or whatever the interior, the contents of them, and it is going to require further processing. We don't want that kind of hangup to occur in the future because we would like to see these wastes removed from the island as rapidly as possible. And of course, we hope, and I am sure that you do also, we want the radiation levels to be kept as low as possible both to the workers and to the public itself. Regarding the actual Programmatic Environmental Impact Statement, we have several concerns. I mentioned that these are a series of alternatives and Met Ed probably will propose certain plans and that you will be reviewing those. We'd like to take the opportunity right now to ask that there be public comment allowed and provided for and public notice provided for when those proposals come before the NRC so that the public is made aware of what the proposals are and can comment at that time on those.

One of the previous speakers mentioned a lack of cost estimates. I think that's been dealt with. I would just like to say that at least part way through the decontamination process it seems to me that it will be possible to determine whether the core and various other things are in a condition where restart of Unit 2 or decommissioning would be appropriate. I don't know when you are going to be able to make that decision. Part of that is a political decision, I am sure. But from a technical consideration, it seems that the cost of cleaning up a facility in order to restart would be somewhat higher than the cost if you were going to decommission and scrap a certain portion of that material and not worry about its surface being damaged and so forth. We

think that because of this, the decision about decommissioning versus restart of that Unit 2 is important in terms of deciding what that process should be, what the decontamination process should be. Understand, of course, that you are going to have to decontaminate the interior surface of the building before you can get to that point probably.

Now regarding various specific parts of this EIS, I have some problems with several areas. Our area of concern is primarily the potential release of water to the Susquehanna River so I'm going to confine my comments to that, although there is a tremendous amount of other material in the EIS that could be commented upon. When estimates were made of the concentration and distribution of constituents in the processed water, there were a lot of assumptions made, of course. There are a number of factors that are unknown at the present time, of course, including the condition of the core and the primary loop, and so forth, the total radioactivity that may be necessary to deal with and to remove. Yet in those estimates of concentrations and constituents in the processed water, there are no best-case and worst-case situations presented such as there are in the other areas of the EIS. I think that that would be appropriate. Another area of concern is that in basically, let's see. Chapter 6, I guess it would be called -- in Chapter 6, Table 6.3-5 deals with the concentration of various constituents in the waste water from the reactor building sump water process water and the total volume of water expected. And for a long time, I had difficulty finding anywhere in the EIS a summary telling me, not concentrations but total activity that might be found, and although you can calculate it, which I did, assuming no dilution which you went back and did, that's difficult. When I finally got to the table at the end which is in Chapter 10.1-2 where it summarizes the total number of microcuries that

would be present in the processed water from the auxiliary building water and the sump water, and whatever other water, primary loop water, I guess it was -- the numbers that are presented for reactor building sump water, the number of microcuries that are presented in that table do not jibe with the information that is presented in Table 6.3-5. In fact, if you calculate based on the concentration and the volume and the dilution factor of 1200 that 30 gallons per minute to 36,000; you find that the total number of curies of primarily tritium and other constituents is around 3700 curies. Whereas, the number of curies that are noted as being present in that water in the table in the back is something like two or three. I think somewhere there is an error or an oversight or I am missing something, but I think that that discrepancy should be checked. Now, I would like to say that if there are 3700 curies and it is primarily tritium in that water, and normally a power plant that is operating releases between 400 to 500 curies per year of tritium, if you released it at that rate, it would take 9 years to release the water, instead of the 1 year that would be proposed as one alternative in the EIS. I think that's substantially higher concentration than would normally be found in an operating plant situation. I am concerned about that.

I think that it might be appropriate to have Dr. Snyder comment on that now.

Perhaps, I have some other points. Maybe when I get through because there are several other points regarding concentrations. Whichever you want to do. Concentration factors are presented as a footnote, sort of, to Table 6.3-18 with tritium being no concentration basically. Cesium 3,000 to 1, strontium around 500 to 1. Now the rationales for those factors are not really mentioned in the EIS. I think that would be helpful and there are a number of factors

which a number of reasons why those concentration factors might vary, such as temperature of the water, salinity, presence of calcium or potassium or various other items in the Susquehanna River, and yet there is no information in the EIS as to what those levels are in the river and whether that would make a difference. And, in fact, there have been a number of studies done which discuss a substantial variation in concentration factors, and in reviewing those I found that concentrations up to 40,000 times for cesium in fresh water that has low potassium levels have been found and 30,000 times for strontium in one circumstance that I noted. So that there are reasons why it may be that those concentration factors would be considerably higher. In fact, there is even uncertainty regarding whether tritium bioaccumulates or not, there has been a lot of discussion about that. There is some disagreement among the scientific community, although most scientists do agree that it does not bioaccumulate. The potential impact of these radionuclides on fish and shellfish, primarily fish, are not really discussed. A recent report that I was reviewing said that "because a large percentage of the cesium accumulated by fish is in edible muscle tissue" sport and commercial fisheries suspected to be contaminated by radio-cesium should be carefully monitored. And the same report discussing strontium says strontium concentrating primarily in the bony areas, because of this bone-seeking tendency, radiostrontium is extremely dangerous. This is primarily humans they are talking about, but then it goes on to say fish, such as sardines, which are consumed in their entirety represent the greatest risk to humans, and soft waters contaminated by the radioisotope offer the optimum conditions for isotopic bioaccumulation. Since the Susquehanna River is an important drinking water source and since it is an important sport commercial fishery in that river and at the headwaters of the Bay, and since shad are sometimes eaten whole that these potential impacts should be more thoroughly stated in the EIS and perhaps they have been underestimated.

Moving to hydrology of the river, I noted that on page 6-19 it assumes that, the EIS assumes that there would be complete mixing in the river during average low flows and that's how they calculated what various concentrations there would be in exposure to life within the river and yet there is a notation that fish could be exposed to concentrations perhaps 20 times higher than that if there were not complete mixing. If you look at the map that was present, I think there was a map that was handed out tonight, that I just happened to notice the diagram of the location of Three Mile Island. It is on the eastern side of the river, and there is a rather large island to the west of it and a substantial portion of the river that is on the other side of that island. So at least where it would be released as far as I can tell, it certainly, the entire river is not available for mixing dilution at that point. So I don't believe that that assumption is valid.

Sediment deposition processes are very complex in river systems and in estuaries and I think this is rather sketchily mentioned in the EIS and I understand that there is a lot to cover, but I feel that some stress should be placed on the fact that you have dams below the island where sediment deposition is most likely to occur and then of course in the Susquehanna Flats. This could create "hot spots," particularly for cesium, which would be likely to be absorbed onto sediment particles. There is another assumption that cesium would remain in suspension in the water column, a large percentage of it, I think it was 50 to 75% for quite some period of time and eventually it would all drop out and get the loadings of sediment that I understand and have information about -- the sediments in the Susquehanna River are very heavy, particularly during storm events, and it's my understanding based on what I have read about the behaviors of cesium in some of the studies that have shown how long it remains

in suspension, that perhaps four days might be the maximum, not some greater period of time. Therefore, my feeling is that that sediment and its cesium would drop out rather quickly, perhaps at the head of the Bay, right in an area that is very important for commercial, for spawning and nursery area, for a number of important commercially harvested and sport fishery fish. I want to stress again that we believe that the release of processed water into the river is undersirable because the potential impact it has on the marketability of Bay seafood resources which are worth millions of dollars -- as is documented in your report to Maryland's economy and employ thousands of people and, of course, are a great recreational resource as well. Particularly, we believe that there are viable alternatives for the disposition of that water. I would like to make a couple of comments which are not in my written comments on your alternatives. Deep water well injection doesn't sound like my favorite idea of what to do with it. I think a lot of people would agree that putting it in the groundwater doesn't seem to solve anybody's problem, nor does evaporation because eventually it is going to rain down on us somewhere anyway. I think that there are a couple of alternatives which make sense -- long- term storage in a liquid form on the site has a potential for accidental release and is perhaps not totally desirable in that you would like to be able to get all that radioactive waste off the island eventually. Perhaps the most sensible thing to do with it is to immobilize it and leave it on the island as a low priority for removal -- eventually removing it when there is space available for that which could be some time. But at least in that form it would not represent a threat to the environment. And finally -- I know that this is taking a while -- but finally, we think that the inability, apparent inability of the Federal government to deal with this high-level waste disposal question must be resolved and that without that resolution, we are going to have Three

Mile Island being our nation's first long-term high-level waste disposal site and I don't think that is appropriate, based on its location at the headwaters of the Chesapeake Bay and certainly would not be the location that you would choose if you had any alternative available. Therefore, we think that in the EIS there should be a very, very clearly stated priority to finding that, locating that, high-level waste disposal site, working with the Department of Energy to get that question resolved, and we think it should be very clearly and very strongly stated that this is an important issue that must be addressed.

So, in summary, we feel that these processed accident water wastes should not be released because of potential impact on the seafood industry primarily, and other potential problems as well, and the ultimate waste disposal question needs to be decided, and criteria must be established for how you are going to decide what process to choose when the Met Ed makes its proposals to you. I would be glad to answer any questions.

DR. SNYDER:

I appreciate your obviously well thought-out questions. I think, considering the time, Jim, I'd like to receive your comments and we'd like to have an opportunity to study them. I think that you raised some good points.

MR. CAWOOD:

Yeah, I think that might be best because we are getting short and some other people want to say some things. Thank you, Miss Nancy.

This young lady here has been waiting patiently.

[Inaudible.]

OK, you have said words that are dear to my heart.

MS. CLAGGETT:

My name is Patricia Claggett. I am a local resident and I have not read the document. I have been paying attention this evening. I'd like to address my concerns to the alternative of disposing of the waters underground. Some of the people here tonight may be aware that the House Government Operations Committee today released a report that is concerned with toxic waste residues in our drinking water supplies in this country -- that they are very seriously in trouble and if we don't address that concern immediately, we are not going to have enough water by the end of the century, and people have been predicting for at least 20 years; Rachael Carson was one of the most well known early prophets about our water supply, and my concern is the residual problem over a period of decades. I don't have the technical background, of course, to know whether the figures you presented tonight represent a risk to me or to a future generation of mine. But, I think, taken into consideration with all the other things that are going to affect our water supply, I am very concerned about that possibility. And, of course, you cannot answer that concern probably in 25 words or less tonight. But, as was just mentioned, the whole debate of nuclear waste disposal has been going on for some time and some of the most capable minds in the country have been addressing the issue and it has not been resolved. And, I'd hate to think that we are going to attempt to resolve

it at Three Mile Island with the Chesapeake Bay and the surrounding communities as a recipient of that resolution, in whatever form, sometime in the next year or two, because I just don't think that we are capable of doing it. And I don't think that the underground water supply, maybe it is out of sight and out of taste a little more than dumping it in the river, but I don't think that is any safer at all, and I am particularly concerned about it. Thank you.

DR. SNYDER:

I guess that I would like to make one comment only and that is the deep well injection question is only addressed because if we didn't address it someone would comment, why didn't you think of that? I tend to agree with you -- that's probably an alternative of absolute last resort.

MR. CAWOOD:

OK, the gentleman right here.

MR. CAHROOM:

Good evening. I am Phillip Cahroom, another local attorney and a member of the Bay Alliance for Safe Energy, which is a citizens' group most of whose members come from the Ann Arundel County area. For myself and on behalf of the Bay Alliance, I would like to raise three basic questions that are on my mind. The first one and most specific is to agree with Miss Kelly and some other speakers that we really can hardly accept as any kind of environmental

evaluation the statements which appear a couple of places, such as, page 10-25 and page S-11 in the statement as it now stands to the effect that if the effects of radioactive releases in the Susquehanna are properly understood by consumers that the marketability of fishery products from the affected body of waters would not suffer. I have seen, in attempting to do a thorough reading of the EIS, no form of study whatsoever as to public acceptance of supposedly low levels of radioactivity, particularly in light of scientific controversy as to what those levels may be and what the effects of those levels, particularly if there were bioaccumulation or certain hot spots which might cause limited variances in contamination of seafood, what kind of public reaction there really would be. I don't know, if I had not seen any comparison to the actual reaction to agricultural problems in the TMI area at the time of the accident. I haven't seen any comparison with other seafood contamination scares in the actual history of the Bay. There is no foundation whatsoever which I have seen for that support. And I don't think it's a fair statement lacking any support, it's just someone's opinion. Second, I would like to agree with some other speakers and point out that the regulations as to the EIS 10 CFR Section 51.23 specifically require that there be a cost-benefit analysis which to the fullest extent practicable, should quantify the various factors considered. I think that it is also a disservice to the public that no effort was made or at least no effort was made to include even provisional dollar figures in the EIS. I think that the cost of the cleanup itself is an environmental impact because I don't think anyone could deny that the full cost of that is going to be passed down to the consumers in this area, whether exclusively limited to the Harrisburg area or whether passed along by the utilities consortium to consumers up and down the east coast, so that the dollar figure is something that should be included and I would hope that a

supplemental draft EIS would include dollar figures so that that might be considered. Related to that, the third and final point I have is that I suspect an assumption is being made here or that there are underlying assumptions which depending on how they go, would affect the cleanup decision of whether or not TMI-2 would ever be restarted or whether it is to be permanently shut down and the kind of costs that would result from those decisions are things that should be considered also. It's those decisions as to whether it should be permanently shut down or whether a full cleanup would result in starting up or salvaging any of the plant should be fully disclosed and the public should not be made to pay more either economically or environmentally to maximize the salvage value of that plant in any way. I believe that concludes my statement.

DR. SNYDER:

If you wouldn't mind, I would like to hear from the other people rather than take the time to respond to those comments, which I think are very good.

MR. CAHROOM:

Yes, that is what you had better do.

MR. CAHROOM:

Let me try the gentleman way back there.

MR. MAHAN:

My name is Kenneth Mahan, an attorney and a writer, and I live at Owings Mill, Maryland, and I have a prepared statement which I excerpt later, but there is one point that I would like to bring out and get clarified, perhaps which came up tonight. When Dr. Snyder was asked about the economic impact and why we don't have cost figures now, he said that the cost of the various cleanup methods is "of secondary importance." I attended a meeting similar to this in York, Pennsylvania on September 18, 1980 and John Collins filled the same role that Dr. Snyder does here and when he was asked the same question he said that it was of no import at all, that the only consideration would be to do it in a manner which is the lowest possible radiation exposure and I think that deserves a clarification somewhere along the line as to which is the real considerations, the secondary or no consideration at all. Let me just read a little bit from my statement in the interest of time, I will cut it off. I would like to comment also on the prospect of Metropolitan Edison running this cleanup. As I understand it, the NRC will not choose the method of cleanup but only has a veto over the method Met Ed chooses. We Marylanders who may drink the water possibly released from Three Mile Island, or eat the seafood that lives in it, need assurances that the NRC will require Met Ed to use the safest method for the cleanup. Metropolitan Edison is in bad shape financially. Two weeks ago, it laid off a large number of workers, including 500 working on the cleanup. The NRC should devise plans to continue the cleanup should Met Ed go backrupt and should devise plans to determine if Met Ed is scrimping on cleanup to save money in a manner which could jeopardize the health and safety of our citizens. The cleanup is a unique and difficult technical problem. Met Ed does not have a reputation for technical excellence. Saturday's Baltimore Sun notes that

NRC's study found 37 serious deficiencies at the TMI-1 control room and 50 less serious deficiencies. This leaves the observer with the fear that Met Ed will not do the excellent job required to make the cleanup safe. The NRC should develop plans to monitor the cleanup to see that it is being done correctly. Finally, the NRC must realize that the public does not have great faith in it and Met Ed. There must be some assurance for the public that this process is being done correctly. It should be a truly independent, knowledgeable, well-financed body to monitor the cleanup so that we Marylanders who drink Susquehanna River water are not having our health jeopardized and we Marylanders who make their living from the Chesapeake Bay are not having our livelihoods jeopardized.

DR. SNYDER:

Let me just make one comment on that. I'd prefer not to take the time to respond to each question, but as far as monitoring and oversight of the activities at the site -- I didn't mention but I think that it is important for those here to know that we do have a large, in fact, the largest NRC onsite office that exists in the United States. There are about 30 people onsite. John Collins, whose name you mentioned, is the Deputy Director of the TMI Program Office. He works for me and I guess that I would say that with the essentially around-the-clock coverage that we have on the site, we're doing everything within our ability to make sure that the cleanup does go smoothly and we have been known to tell Met Ed to stop. We don't have any compunctions about doing that in the future.

MR. CAWOOD:

Thank you, Mr. Mahan, we understand that you are working very hard on this and we are very happy to have you with us. Doctor, I am going to save you for my "piece de resistance" because I think I have a gentleman back there that I think may be short. Sort of the gourmet touch at the end which I am sure that you will appreciate.

MR. ECHENROAD:

My name is John Echenroad from the Chesapeake Energy Alliance. First of all, I would like to thank you gentlemen for coming down here tonight so that we could, you know, discuss and comment on the EIS. I would also like to, as a member of the Chesapeake Energy Alliance, endorse the view that has been taken by Marylanders here tonight -- that the radioactive discharges into the Susquehanna, into our waterways, would be considered unacceptable. Secondly, I would like to raise some questions and comments not on the EIS itself, but on this meeting here tonight. Basically, since the March 20th hearing there have been many people who attended that meeting and who had signed up for NRC publications had been regularly notified, had been getting NRC publications, had been informed of NRC activities and hearings. With this hearing, I was one of the few people in the Alliance who was notified. Also, because of the short notice that was given, it was very difficult; we have a membership of about 250 people. Our newsletter, which I am an editor of, has a circulation of about 1,000. These are people who are primarily concerned about this issue in Baltimore. Because of that short period of time, we weren't able to publish anything in the newsletter concerning that, so right there it was a main

problem as far as getting the word out. Many people who were very concerned and who had worked very hard in expressing their views on this in the past were caught off guard and weren't able to come tonight because of that.

Also, I have a question concerning what public notice was given -- I can't recall anyone who has seen anything in the local papers concerning this hearing tonight. And basically, to close the statement. Hopefully, this doesn't come off as just simply a complaint but more as a constructive criticism, hopefully to restate a view that was expressed earlier that we can have a hearing in Baltimore, at some future time, where there has been a great deal of concern generated over this issue and a large concentration of people who are concerned about it.

MR. CAWOOD:

OK, thank you very much. I think that someone here does have; you might check with us afterwards. I didn't do it or have anything to do with it but I understand that there was a fairly decent amount of notice and that is available as to where it was printed. So, for your own use you might want to check...but don't want to go into it now. Was that your hand peeking up over there? That was the most reticent hand that I've seen you raise for a long time.

MR. RILEY:

I have been waving it at you for the longest time.

MR. CAWOOD:

All right.

Contrary to Mr. Kaywood's comment earlier, I did not read this impact statement twice. I had trouble getting through it once. My name is Cathy Riley and I am a delegate representing Harford County and chair the Joint Energy Committee in Annapolis. I have written comments coming to you and I had not intended to say anything tonight but I would like to ask one thing. I am getting the impression from what you all have said and from some of the comments and questions that have been directed to you that this is our bite at the apple. That we're talking about a 5- to 7-year process of the cleanup and maybe I am incorrect and maybe I have been misled but it seems to me that I am hearing that this is our one chance as public officials and as citizens to have an input, and I find the statement deficient for a lot of reasons, some of which have already been pointed out. And I would like to clarify whether or not when it comes time to make the various decisions and to determine alternative after alternative, whether or not you are going to have public hearings, whether or not you are going to give the people and the elected officials the opportunity to comment at that time. I think it's terribly important You said earlier that in a decision that the NRC was trying to make that they were breaking new ground. And I think we've all broken new ground with the whole TMI issue. The track record of NRC in the last 18 months has not been one to be terribly proud of as far as I am concerned and I think we are all in the process right now of trying to expand credibility and to expand public knowledge and I would hope that you are going to give us the opportunity to comment piece by piece. Could you -- ?

DR. SNYDER:

I would like to pass the buck a little bit to Larry Chandler, if I might, on that question. I am not sure that we have completely thought it through. But let me ask Larry though.

MS. RILEY:

Sometime in the next five years I would like to have an opportunity to say something again.

DR. SNYDER:

Right, can I ask Larry -- would you be willing to comment on that? It's a...

MR. CHANDLER:

As the individual proposals are made by the licensee, many of them are going to involve the need for individual licensing actions. As any licensing action that the Commission considers, appropriate notices of opportunities for hearing, for example, are publicly made available and hearings are held, as appropriate. In addition, as was mentioned in a number of occasions, the programmatic statement itself may, in connection with this specific proposal, require further supplementation. And, I would expect that the extent the supplementation would take the form of additional statements, additional opportunities for comment would be provided, but I think we have to examine that as time goes on. I doubt seriously that this is going to be the last and only bite of the apple.

DR. SNYDER:

No, I agree 100% with what Larry says. I think he put it better than I did.

MS. RILEY:

Well somehow I keep waiting for the NRC's sensitivities to increase and the fact that 45 days was given to respond to this very large and very difficult impact statement, that the request has been made to extend it is an indication of some of our concern that we have other chances. Thank you.

DR. SNYDER:

Thank you.

MR. CAWOOD:

I think the statement is extremely important and I certainly think that the groups in Maryland, some of which I have some contact with, will be working to make sure that this decision process is shared, as I think the whole desire is to share it as we go along. The gentleman in the far corner --

MR. AMOS:

My name is Bill Amos and I have been sitting quiet so long, which I don't usually do. I am a delegate that represents the area that is most affected in Harford County. That is a single-member district so it just leaves it up to

me as that delegate to express how the citizens of that district feel about the possibility of dumping. I want to thank you for the "seem-like" decision to say it needs to be cleaned up. I believe that is necessary and I appreciate that very much. However, you can see how I would strongly object to the dumping and I think we that live there realize a few other things about the river, and I can't help but what you said about the flow in the area of Three Mile Island -- it just doesn't exist at the Conowingo Dam. You probably are privy to all the Susquehanna River Basin information. That information will lead you to the conclusion that they have been worried about the flow in the dam ever since the last dry spell. And, here we come into another dry area, and this summer we had a fish kill below the dam which meant, in the end, it proved that they had it shut off for almost 72 hours. Now, they can shut the dam down for 72 hours, can you imagine what that does to the flushing effect of the Connowinga reservior. I'd also.... [END OF TAPE]

...or a crow fly one mile to, or a little longer, just in a mile to the Peach Bottom facility which is very large and very extensive, in fact was bragging about its record of generation this past year. In taking dumping into consideration, you've stated what that would do to the environment if that amount of water there was dumped. However, you remember that, just remember that, something could happen to Peach Bottom, and if it did, you would have no alternatives if you don't, what I call, clean up completely and get it away from the river--this strong possibility of something else happening. Not only do you have that at the upper end of the Bay, you have Calvert Cliffs to the bottom. Of course, flushing effect is much more there because the ocean's a lot closer. But a combination of two accidents or even of a large spill at Peach Bottom could aggrevate the problem if you go towards dumping.

We also, in Harford County, the area Cathy represents, the City of Havre de Grace, depends of course upon the water supply. I'm not sure that anybody sits there and drinks two liters each day of water and I'm not sure that a lot of it wouldn't be filtered out. However, there is a bottling plant there for Coca Cola, and there's other industries there that would be affected because that whole corridor of Route 40 is hoped to be supplied from the Havre de Grace water works. And I just don't think for that reason dumping is a good idea. You go across the river and you have Perryville which can have the same problem, especially if any of these expand commercially.

I guess the final thing I'd like to say is that in this final proposal, I feel that there should be some more input. You're going to make a decision. I find input no problem. Evidently several regulatory agencies of the United States government do. One is the one in charge of licensing the Conowingo Dam. In that process, it's been very difficult to put input into it. I find the more input you get, the better off you are. We have to live with it in Annapolis all the time, and I find it very constructive. It's, if you're afraid of it, then you're really afraid of the democratic process. And if you're afraid of the democratic process, you certainly have no business serving on this board. And I mean that sincerely. So, I really thank you all very much. In other words, you know, I would just like to say what Miss Kelley said has brought out a lot. What Cathy said I think brings out a lot. I don't want to cut either one of their statements down. I thank you.

MR. CAWOOD:

Thank you so much Bill. The lady in the back.

MS. FIEDLER:

My name is Cristie Fiedler, and I am a resident of Anne Arundle County and a member of the Bay Alliance for Safe Energy. And I wrote a letter statement to Mr. or Honorable John F. Ahearne, the Nuclear Regulatory Commission, and I'd like to just read it briefly. It repeats a number of things that have been said already to night, and I'd just like to have it on the record.

Several months ago I received the NRC Draft Programmatic EIS related to the decontamination and disposal of radioactive waste generated from TMI accident. Accompanying the document were six pages of corrections, including Section 10.3, "Offsite Doses and Health Effects From Normal Operation." I would point out with strongest emphasis that the qualifying word in this phrase is "normal." Section 10.3 contains tables and descriptions correlating expected releases of radiation during transportation of wastes to the probability of cancer or genetic damage in the general population. As an example I cite the conjecture that a person exposed for 3 minutes at an average distance of 3 feet from a truck loaded with radwaste as at a highway facility might receive up to 1.3 millirems. The risk of cancer from that dose is 1.7×10^{-7}. The risk of genetic damage, about 3.4×7^{-7}. What this data and all similar conjectures that the NRC failed to account for is the likelihood of a major accident during radwaste shipments--a likelihood that must be considered as possible as a likelihood of similar TMI-type accidents at other nuclear plants. A worst-case accident would result in exposures during shipment that would exceed those of a person at 3 feet for 3 minutes. Furthermore, this Section 10.3 is merely an example of what is missing from the entire PEIS--an overall failure on the part of the NRC to consider the factor of human failure inherent in the nuclear program as a whole.

The NRC is to be credited for the clarity of their tables, research, data, statistics, and other raw information made available to the public. However, it is a discredit to the NRC and a disgrace to the public that the Commission does not regard the public health, welfare, and safety above all othe considerations. In order to restore public trust in the NRC's decision making, you must demand the highest safety standards possible from Metropolitan Edison and all other of these licensees regardless of economic impact.

There are two specific steps which logical means dictates for immediate implementation for the sake of both democracy and the public's present and future health. First, an increased number of public hearings with all testimony to be entered into record and weighed with adequate notification through all available channels on the radio. Such hearings would comply with the Council on Environmental Quality which calls for such hearings when there is substantial environmental controversy concerning the proposed action or substantial interest in holding the hearing." Second, to impanel an independent body of scientists to review the cleanup methocs proposed--a body whose selection would be largely selected by citizens' groups and empower such group with the authority necessary to fulfill the review.

Today the NRC has steadily been losing the trust and confidence of the public, its regulatory functions seem to be _____. It communicates with the public in fits and starts, and its independence is in severe doubt. The NRC must find that it is like a city upon a hill. The eyes of all the people are upon you. The people wish to believe your honor is more pitched to no group, but devoted to serving the public goods only. I think I would like to just corroborate in Miss Ryan's (from the Nuclear Energy Research Center, I believe

she was) and various other speakers tonight, it's very important that we have an independent body of scientists to review material that is presented to the lay public who do not have the kind of expertise and know-how to assess the data that is being given to us, so that we are able to come to have an understanding that the specific decisions that are made by Metropolitan Edison are actually the best decisions for the environment and not just simply the most expedient kinds of decisions that are being made under sloppy and unprofessional kinds of data.

MR. CAWOOD:

Thank you, thank you very much. O'k, I think we're ready for the good Doctor. As he comes forward, I want to comment on one thing. As we have a good deal of criticism now which is certainly something we're here to find out, times have changed a little, about 15 years, I remember an attorney I was opposing on the other side of the Calvert Cliffs case that were presented by the utilities indicated that by the mid-60's he was having a hearing scheduled on a plant somewhere in the South and the community was very much for it and the night before the hearing the local sheriff came up to him and he said, "Mr. Jones, I just heard that some people are coming in tonight to oppose that plant tomorrow." Jones said, "Yes." And he said, "Do you want me to stop them at the bridge?" So, we certainly don't have to worry about that problem anymore. Doctor will you -

DR. STILLMAN:

I don't know about "piece de resistance" or just plain resistance I think keeping me to the end may have been the latter. I will read some of this and

will perhaps comment further and fast. Both the NRC and Met Ed admit that they are unable to remove tritium from the hundreds of thousands of contaminated water resulting from the infamous accident that occurred on Three Mile Island, 1-1/2 years ago. According to their Draft EIS, this tritiated water may ultimately end up in the Susquehanna River and be carried downstream to the Chesapeake Bay. The plan is to release about three and a half thousand curies of tritium possibly over a period of a few months. Now the average annual release of tritium from a nuclear power plant is only 400 to 500 curies which means that on a similar annual basis, Three Mile Island will be releasing about 20 times more tritium than it would under normal operating conditions. We are told not to be concerned because the tritiated water will be sufficiently diluted with non tritiated river water so that the actual concentration of tritium will fall within the NRC safety standards. This sort of assurance does not assuage my concern for at least two very good reasons. Mainly, it is the cumulate amount of tritium rather that its concentration that is a significant statistic in this case. Never before have the people been subjected to 3500 curies of tritium in their fishing and drinking water. And secondly, the NRC standards for tritium are based on outdated population dosage calculations that grossly underestimate the radiotoxicity of tritium to human life. The remaining part of my testimony is meant to amplify the two reasons given above in a slightly more scientific venacular that should be comprehensible to the NRC Commissioners and to the public in general. A more detailed scientific presentation will be sent in the near future.

There are three major assertions of hypothesis that are presented throughout the NRC calculations and including the draft EIS that is presented today. I would like to argue with each of those three major hypothesis on the basis of

my scientific knowledge and on the basis of having reviewed several hundred articles about tritium. The first is the inhomogeneous dispersion versus uniform dilution. Conventional engineering wisdom asserts that disolved tritium or tritiated water rapidly diffuses throughout any body of water, reaches its equilibrium concentration and remains uniformly distributed in that body of water forever. This simplistic view does not take several factors into consideration such as convection currents, thermal differences, different rates and strengths of physical adsorption. For example, if a nuclear power plant such as Three Mile Island discharges its tritiated water into a flowing river such as the Susquehanna, then the tritium does not instantaneously diffuse throughout the total volume of river water to achieve maximum dilution but rather it may very well stay within certain currents or be absorbed by the sediment of the river bed or its aquatic contents or even remain within the cooler regions of the river where thermal diffusion is less vigorous. All of these additional factors would prevent a rapid mixing of the discharged tritium within the river by resulting in an unever distribution of the tritium. In other words, parts of the river would have a much higher concentration of the tritium than other parts and thus any ingestion of this more highly tritiated water by fish, animals, or even humans would result in greater radiation of their tissues by the beta particles than one would anticipate by the simple engineering hypothesis of totally uniform tritium distribution. That is the first hypothesis that is in error. The second one is one that has been alluded to before. I believe that we must consider the possibility of biological accumulation of concentration. The toxicity of any hazardous substance is typically a function of the quantity of that substance to which living organism is exposed. Radiation is no exception. The larger the concentration of the radioisotope, the greater the risk of genetic and sematic damage resulting in

birth defects, stillbirths, and cancer. When it came to evaluating the effect of tritium, the International Commission on Radiological Protection, the ICRP, calculated its population dose based on the tritium activity that would exchange with the body fluid, the inorganic compartment and totally neglected the transfer tritium, the tritium in the organic compartment. The implicit assumption of the ICRP dose estimate is that the tritiated body water exchanges its tritium for hydrogen only in a polar or an ionic transfer with other molecules. Understandably, real life is not that simple. There is now considerable scientific evidence demonstrating that the tritium to hydrogen ratio is much greater in the organic molecules for biopolymers such as polysacrides, lipids, proteins, and amino acids than in the inorganic tritium source. This results from at least three distinct biological or biochemical phenomena including (1) isotope effects in metobolic pathways, (2) concentration of tritium within the inorganic department along the food chain, and (3) radiation damage induction of unscheduled DNA synthesis. The metabolic route can, for example, produce covalent tritium carbon bonds which are much stronger than the much poorer hydrogen-oxygen bonds found in the inorganic compartment. Since many of these organic polymers are quite stable, that is they have long half lives, the tritium tends to hang around for relatively long intervals. Data also suggest that tritiated organic precursors are more easily incorporated than simple tritiated water into organisms. Further along the food chain, with several trophic levels, in other words biota, shellfish, fish, humans, and so on - thus the greater chemical stability of organic molecules and the concentration along the food chain results in a much greater biological accumulation of tritium than one would anticipate from the oversimplified ICRP hypothesis. The incorporation of tritium into any biopolymers is clearly a function of the tritiated percursors, the rate of synthesis, and the rate of half life of that

macromolecule in vivo. In the specific case of DNA, the beta decay of tritium causes radiation damage to this biopolymer which increases its rate of synthesis. That is, the tritium has a photocatalytic effect on the sysnthesis of DNA. All three phenomena therefore may come into play producing a greatly increased steady state concentration of tritiated DNA. In fact, several investigators have found that the incorporation of tritium into DNA was three or four times that found in the tritiated water, clearly demonstrating the importance of biological accumulation. And finally, the last hypothesis which I think that we must seriously question, is what I call the relative biological effect. In other words, the toxic effect of tritium on tissue and I call this the micro-distribution effects route, affects the relative biological effect of this. The radiotoxicity of tritium depends in part on its exact tissue, cellular, and molecular organization. The marked difference in radioactivity sensitivity of certain tissues has been well recognized. However, the effect of micro-distribution of the radioisotope within the cells has only recently been demonstrated. A measure of that cellular radiotoxicity called the relative biological effect of this, RBE or quality factor, QF, and it may be isolated various ways, such as the inhibition of antibodies which is the formation of blood elements, the killing of ova or spermatagonia, frequency of dominant mutations, tissue culture growth rate inhibition, the number of single strand breaks in the DNA, etc. It appears that the toxicity of tritium varies greatly with its molecular form. For example, the RBE of tritiated DNA is larger than tritiated water or even other organic molecules, such as tritiated protiens or lipids. Recent studies indicate that the radiobiologic relative effect of the tritiated DNA is closer to four rather than 1.7 or 1 designated by the ICRP. Now, in the discussion which we have here and which Ted Radford was included, admitted that many scientists now believe the biological effect of this tritium

is more of the order of 4 or 5 than the 1 or 1.7, and so we have a factor there of 3 or 4. The greater RBE for tritiated DNA is consistent with the increased importance of DNA strand breaks and chromosonal abberations as being primarily responsible for the mutagenic and cross eugenic effects of radiation. In addition to its well known capacity for ruptured DNA strand or macromolecules, there have been at least four other mechanisms identified that tend to augment its radiotoxic potential. Namely, one, the beta radiation from tritium retards the rate and efficiacy of DNA repair, two, - DNA may be altered so that poor mutations are introduced by errors in the rapid mechanisms, three - induction of repair mechanisms by radiation damage may also facilitate viral transformations of the cells into abnormal or malignant forms, four - synergistic effects due to the presence of toxic chemicals may enhance the radiotoxic effect of the decaying tritium nuclides with the DNA. Thus, any calculation or estimate of the population dose resulting from exposure to tritium or tritiated water must assume a greater concentration of tritiated DNA than was previously expected as well as its much larger relative biological effect in this. These two factors alone may represent a tenfold increase in the rate of toxicity of tritium and must be properly reflected by new government standards for the acceptable level of tritium to which the public may be subjected. Now, I know that it takes time to revise major standards and that has always been - I have always been told that would take us years before we could change our standards for certain radioisotopes. Well, I am not interested in the time it takes, the point is that there is a gross miscalculation as long as you do not take these factors into consideration. If it requires changing the standards, then, by gosh, change them. Thank you.

DR. SNYDER:

Can you submit that?

DR. STILLMAN:

Sure.

DR. SNYDER:

Thank you, Doctor.

I can make one comment to Dr. Stillman's presentation here. Keep in mind that the whole arguement is premised on that the water goes down the river. I said very clearly that is not necessarily the case,

DR. STILLMAN:

It would be great if it doesn't.

DR. SNYDER:

The decision has clearly not been made. We have heard the people here tonight. I am very sensitive to that point and it's you know, the arguments that we have heard from you and others on that point are going to be taken to heart, I assure you.

DR. STILLMAN:

Let me offer you in the same gracious way the support and the help of the group which I represent which are Physicians of Social Responsibility. There are thousands in the United States who would be willing to help in some of these deliberations if you would only call on us.

Thank you.

DR. SNYDER:

Thank you so much, Doctor. One comment I do have here - the list of the papers and places this was published if someone would like to look at it, it will be up here on the desk in front of me. Do you have any comment before we -

No, I wanted to thank those of you who hung in here for this long. I appreciate your coming and we will be seriously considering the comments we have received. For those of you again, perhaps on the way out, if you haven't picked up a copy you are more than welcome to pick up a copy of each of the documents that are over there in the box. There is a signup list if you would like to get a copy of the PEIS, we'll be glad to mail you a copy.

MR. CAWOOD:

Again we would like to thank you for being here. Please give your output to them and we would happy to get into the power plant siting program also.