

NEW YORK STATE : DEPARTMENT OF HEALTH

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IN THE MATTER

of

MEETING

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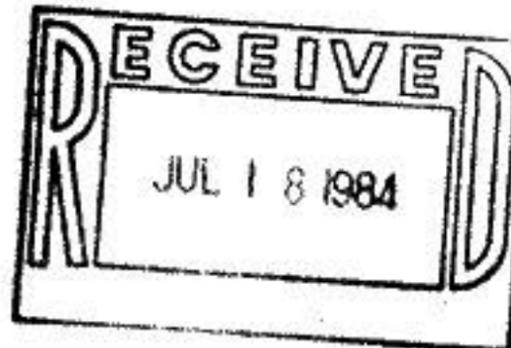
Determination of criteria and strategy having
to do with habitability of Love Canal, Niagara
Falls, New York.

MINUTES OF MEETING held at the Red Jacket
Inn, Niagara Falls, New York, on Friday, June 29, 1984,
commencing at 8:30 a.m.

CHAIRMAN: MICHAEL WELTY, MD.

PANEL MEMBERS: THOMAS CHALMERS, M.D.
MARTHA R. FOWLKES, Ph.D.
ROBERT HUFFAKER, Ph.D.
PATRICIA MILLER, Ph.D.
FREDERICK G. POHLAND, Ph.D.
I. GLENN SIPES, Ph.D.
MICHAEL STOLINE, Ph.D.
JAN A. STOLWIJK, M.D.
DANIEL VANDERMEER.
WARREN WINKELSTEIN, M.D.

MAY BE TAKEN FOR 2 DAY



DR. WELTY: I think we should begin now.

1 We have all of the consultants here except for
2 Drs. Miller and Fowlkes that we're expecting.

3 DR. STOLWIJK: Is Ellen coming?

4 DR. WELTY: Apparently she is unable to
5 attend.

6 I think we should get started. We've got
7 an awful lot of material to cover during this day.
8 I appreciate all of you making the effort to come
9 up and progress with this deliberation.

10 I wanted to start off with just a recapit-
11 ulation of what we're here to do. I outlined on
12 the board the five different options for the
13 criteria that we had discussed early on after our
14 first meeting.

15 The first was that---I don't know which
16 order they were in but at any rate, one of them was
17 the comparative habitability criteria, in other
18 words, comparing the environmental conditions at
19 Love Canal with some control area as a means of
20 setting up criteria. This was one option that some
21 of you said you felt would be feasible.

22 The second was a risk assessment and this
23 would involve the standard techniques of risk

1 assessment but would be more complicated than in
2 many situations because of the large number of
3 chemicals that are known to exist in the Love Canal
4 area and applying the risk assessment technology
5 to the numerous chemicals is one of the drawbacks
6 of this particular methodology.

7 Adequacy of remedial action, this is one
8 thing that we had discussed as an important part of
9 habitability criteria. Another is to look at the
10 canal in terms of toxic landfill and does it meet
11 the standard criteria for a toxic landfill and of
12 course the fifth we'll probably end up with is
13 a combination of permutations of these other four
14 options.

15 So I wanted to just start the meeting off
16 with a review of these options that we had previously
17 discussed because that's really the focus of the
18 day's activities is to try to put some real meat
19 into some of those and come up with, hopefully, a
20 beginning of a draft of the criteria as we progress
21 throughout the day.

22 The first item on the agenda is involving
23 the data and CH₂M Hill, Steve Hoffman will be the
one discussing the four items on this particular

aspect of this agenda.

1 Steve, are you ready to go through that?
2 If you want to just come up here so the folks can
3 see you.

4 MR. HOFFMAN: Very quickly the terms of
5 the inventory of data tied up in litigation, just
6 within the last week the DOL released approximately
7 nine more documents to us and they still have
8 another group that they are going through which we
9 expect to get word from them by next Thursday as to
10 the release on those particular documents. I
11 think in general we feel at this point in time that
12 none of the remaining documents that haven't been
13 released contain significant information in them.
14 We are continuing to review that. What we have
15 been told by DOJ is that in all cases the data
16 contained within those documents they considered
17 confidential are in other documents and are avail-
18 able from other sources. The assessment to date
19 indicates that nothing significant is not available
20 in the other sources of information released to us.
21 We look to be in pretty good shape in that particular
22 area.

23 Progress of the QA/QC task, at this point

1 in time a draft QA/QC alternatives memoranda,
2 rather longer than a normal memoranda, essentially
3 a report about this thick, is out for review with
4 the QA/QC committee that parallels this group right
5 now. We're expecting review comments back from them
6 by the 11th of July.

7 There will be a TRC meeting right now on
8 the 18th of July at which point there will be a
9 verbal presentation of those alternatives to both
10 the TRC and the public afterwards.

11 DR. STOLWIJK: These are QA/QC on what has
12 gone before or what is to be?

13 MR. HOFFMAN: What has gone before, the
14 existing data.

15 The 18th will be a presentation, verbal
16 presentation of these to get some initial reactions
17 from both the public and the TRC at which time we
18 will then produce, we will meet with the subcommittee
19 following that TRC meeting and come to a conclusion
20 on a final memoranda and recommendation. That
21 document will then be released to the TRC and the
22 public, to the entire group sitting here early in
23 August.

DR. CHALMERS: I forgot what TRC stands

for.

1 MR. HOFFMAN: Technical Review Committee.
2 It's essentially the guide, regulatory guide that
3 exists.

4 DR. STOLWIJK: It's the interagency group
5 that is looking at this whole problem.

6 MR. HOFFMAN: Right.

7 DR. STOLWIJK: Representatives of the
8 various agencies, is that correct?

9 MR. HOFFMAN: Yes, it has US EPA Region 2,
10 EPA Headquarters, CBC, DOH, Department of Environ-
11 mental Conservation of New York.

12 Anyway, so that task is still moving along
13 on schedule.

14 DR. STOLWIJK: Just for my information,
15 when did that TRC get established?

16 MR. HOFFMAN: November last year.

17 DR. STOLWIJK: What form?

18 MR. VANDERMEER: It was conceived in
19 August of last year.

20 DR. STOLWIJK: What form did the coordina-
21 tion between various agencies take before that?

22 MR. VANDERMEER: There was none. That
23 was why the TRC was established. If there was

before that, it was on an ad hoc basis.

1 DR. STOLWIJK: That's what I sort of
2 detected.

3 MR. HOFFMAN: I will let Martha
4 Monserrate speak about the progress of the data
5 comp, of the data organization compilation when I
6 get done here. She has a few things more to hand
7 out that describes in terms of the feasibility
8 of compiling information on Sentinel chemicals.
9 This was something that Tom asked me to look at.

10 As it was described to me, it was what
11 would it take to look at two or three chemicals
12 at the canal and compile all the information from
13 all the various media and all the various locations
14 based on what our review of the data indicates.
15 It will probably take us one to two and a half
16 months to do that effort. It would be a partial
17 effort at best. It would not contain anything at
18 all quantitative in terms of quality assurance or
19 quality control because that methodology has not
20 even been developed yet.

21 My basic reaction is that it's a task
22 that once the data base management system is up
23 and running, it would be a duplication of that

1 particular effort labor, intensive duplication of
2 that effort. We will do what it is that our
3 instructions are. I think our feelings are at this
4 point in time is that that process would probably
5 raise more questions than it would answer.

6 DR. WELTY: Let me give some background
7 on that particular issue.

8 Dr. Davis suggested that we might look at
9 the Sentinel chemicals since it was not possible to
10 have all the data compiled in a format that we had
11 hoped for. She asked me to find out if this would
12 be feasible or not so that's the origin of the
13 question. She is not here today nor is Dr.
14 Silbergeld, who is also interested in this approach.
15 I guess this comes back to the whole issue of the
16 chicken and the egg situation in terms of the data.
17 When we conceived of your expertise in this
18 committee, we had hoped that you would give us
19 guidance in terms of setting up the criteria of
20 habitability. Once we had those criteria in the
21 framework that we felt was most practical and
22 applicable to the canal---well, to the EDA, I
23 should say, then Hill would have a better idea of
how to compile this data.

1 I still feel that that's the way we should
2 go with this particular issue. We should try to
3 develop these criteria and at least get an idea of
4 which of these five options we're going to take,
5 outline it to the best of our ability and that will
6 give Hill a lot better feeling for how they might
7 best organize this data to apply to the criteria.

8 I don't know if any of you want to comment
9 at this point on that issue, if you have a
10 strenuous disagreement with that.

11 MR. HOFFMAN: Tom, let me make a couple
12 of comments. Primarily it's not an issue of
13 whether we can or cannot supply it. It's an issue
14 of time. If we had anticipated a process that went
15 along and parallel to this, as Martha---we dis-
16 tributed to you a list of all the environmental
17 data that exists and the process of organizing it
18 and putting that into a data base management
19 system is quite time consuming.

20 In addition, the quality assurance, quality
21 control efforts with that data is time consuming.
22 We're looking at some time this winter, early
23 winter probably before we have those tasks to a
point where they will be able to spit out all the

1 data in any way people might imagine wanting it
2 and make it available and have some assessment as
3 to the quality of that data.

4 DR. STOLINE: Is all the data that exists
5 in the manuscripts that you're finding and
6 periodicals and so on, is all that being computerized?

7 MR. HOFFMAN: Ultimately that will be, yes.

8 DR. STOLINE: So that aspect of it is
9 really under the purvey of the other group that's
10 working, the quality control group rather than this
11 group?

12 MR. HOFFMAN: To an extent. What the data
13 base management computerization system will do will
14 depend partly on what the habitability criteria are
15 and how the data needs to be represented through
16 that, how the QA/QC group wants to see the data
17 of quality assurance and quality control, that
18 provides an input on how this data base management
19 system will work. Also, the data base system
20 will be used by the Department of Justice in
21 litigation. They have some input. There is three
22 different groups that have input on how that data
23 base management system will work. We're just now
beginning the first steps to design that computer

1 system. There is just a horrendous amount of
2 computerized data out there---that's a poor choice
3 of words, an awful lot. It's on a variety of
4 different systems.

5 DR. POHLAND: I guess when the initial
6 request for the Sentinal chemicals came about,
7 as I understood it, it was an attempt to search for
8 some focus of what might be used as chemicals that
9 could fall into these options like comparisons and
10 so forth because it doesn't make much sense to
11 think about chemicals for which there obviously
12 is little data and maybe concentrations that are
13 not very meaningful. It would seem to me that in
14 your perusal of the data that perhaps you could get
15 a feeling for something that comes close to the
16 notion of Sentinal chemicals.

17 I'm waiting for somebody to tell me, for
18 instance, which ones we're going to focus on
19 because in terms of remedial option I have to know
20 that. I'm wondering whether your evaluation of the
21 data hasn't gone far enough now that you couldn't
22 kind of characterize a group of chemicals, maybe
23 by nature, for instance, dioxin, if that is in fact
a Sentinal chemical, is it from your perusal?

1 MR. HOFFMAN: We're not saying we can't
2 do that. We're saying to do that is probably a
3 one to two month effort, to go through that exercise
4 and also pointing out that after having gone
5 through that exercise, there would still be a series
6 of unanswered questions dealing with the quality of
7 one data set versus another data set.

8 DR. POHLAND: I understand that but I'm
9 wondering whether in the analysis of the data even
10 only to the extent of getting it into the computer
11 and so forth, whether you haven't gotten an
12 impression about certain types or groups of
13 chemicals that continuously pop up as indicators?

14 DR. STOLWIJK: What I think we are faced
15 with is there is a certain group of chemicals that
16 occur in higher concentrations and it's easier to
17 measure than others. As a result they tend to
18 get measured. So you see a routine of certain
19 sets of chemicals that form a part of a battery
20 that people have experienced that are relatively
21 convenient to measure. They are being measured
22 and this is what Steve is indicating. They are
23 being measured with a degree of accuracy and a
degree of appropriateness for instrumentation and

1 procedure that causes it to be classified in
2 different classes of reliability. You can adopt
3 some conventions of some sort as to which ones
4 you value more than others and which ones you will
5 basically disregard.

6 MR. HOFFMAN: That's what the QA/QC
7 procedures---

8 DR. STOLWIJK: That's what the QA/QC
9 procedures are going to do.

10 I've been doing some thinking, as I
11 should, over the past period of doing anything on
12 the basis of specific chemicals and specific
13 concentrations leads to a problem. It is necessary
14 to do that in order to do any kind of formal risk
15 assessment because otherwise---unless you have the
16 concentrations, you can't do that.

17 Once you have the formal risk assessment
18 and if some of the participants in the process
19 don't like the outcome of whatever you have pro-
20 duced, you leave yourself open to the introduction
21 into the discussion of other chemicals that are not
22 considered. There is no general agreement by all
23 the participants that once you accept a certain
set of chemicals that, in fact, that the discussion

1 in the future will be limited to that set of
2 chemicals. Anybody dissatisfied with the outcome
3 of whatever happens, either our recommendations or
4 the decisions made by the local agencies is faced
5 with a situation that, let's say, the Environmental
6 Defense Fund can effectively bring in another
7 chemical and say that is all fine but you haven't
8 done this one and what about that? This is a
9 process which tells me that if we make a decision
10 which is based on specific chemical determinations
11 of specific chemicals and specific concentrations
12 and specific locations, you are going to have that
13 accepted if in general the decision is accepted.
14 If the decision is not accepted, there is no
15 amount of formal recommendations or formal
16 determinations that we can set up, recommend or
17 that the state or anybody else can implement.

18 I had a fairly lengthy discussion with
19 Ellen Silbergeld the other day in another complex
20 and it is quite clear that organizations like hers
21 will always reserve the right to reopen anything
22 if, as a result of our determinations, the outcome
23 is not something that they are happy with. It is
clear that they have the ability to do so at any

1 time and that means to me more than ever that the
2 paper that Miller and Fowlkes gave us is something
3 to be taken very seriously. They, in fact, men-
4 tioned and I think we've all seen a copy of it,
5 they mentioned the reopening of things. I talked
6 to Ellen Silbergeld about how you reopened things
7 and I was given fifteen different scenarios about
8 how the whole thing can be destabilized and
9 reopened. That is a situation which makes me
10 feel very uncomfortable about anything that is based
11 on very specific numbers and any kind of methodology
12 that attempts to assure people.

13 When you use methodology that is based on
14 numbers, then you have the danger of it being
15 reopened, which is clearly, is clearly possible to
16 do. The other danger that you have is that we are
17 giving with those numbers something that can be
18 interpreted as a warranty. That warranty I don't
19 think any of us takes seriously, believes in or
20 even believes that we can give but there is an
21 implied warranty with that kind of approach which
22 makes me feel that by far the better approach is
23 to leave the Sentinal chemicals alone, to leave
the risk, the formal risk assessment out and to go

1 by an approach which relies much more heavily on
2 comparisons which is a form of reassurance that
3 can be given and to rely much more heavily on the
4 efficacy combined with the comparison, efficacy
5 of remedial treatment and rely on the assurance of
6 maintenance of these treatment methods.

7 This, I think, together provides something
8 that can be agreed or not agreed to, but at least
9 it cannot be assailed and it cannot be reopened
10 which is the thing that I fear will happen if we
11 go to specific numbers. It is an invitation to
12 reopen the situation. That's the thing, that's the
13 major conclusion that I have come to.

14 I have written some of these things down
15 in a memo that I think is being duplicated and I
16 believe that we need to see whether together we
17 can arrive at a formulation that uses that particu-
18 lar approach and see whether it gets agreement.
19 If we can get agreement on that to all parties that
20 are present, then I think it will not be likely to
21 be reopened because it is an agreement on a
22 principle rather than an agreement on a whole lot
23 of details. If we can get agreement on a
principle as to how to proceed without having it

1 tied down in lots of numbers---I don't envy Steve's
2 task he would have. I have now gotten the big
3 bunch of material you have gotten. For the purposes
4 of what we need to do, if it is to be assurance,
5 then that data will not do it. It will not produce
6 assurance. I think the data was not gotten in a
7 manner that makes it amenable to produce assurance.
8 It was, I think, for a whole lot of reasons a lack
9 of coordination in how the data was obtained, the
10 comparability of these data. I was able to find
11 very few data that I could find a counterpoint for
12 that was comparable. There are numbers but they
13 are not comparable. I found one set of observations
14 that I believe is comparable. That is in the
15 little report that is being duplicated. That
16 particular comparison was done by the same laboratory
17 using the same protocol and the same equipment and
18 the same procedures four years apart. One was
19 measurements made in the ring one of the atmosphere
20 as obtained in July of '78, I think, and it had, I
21 think, about seven or eight concentrations of the
22 normal chemical soup that you find at these sites.

23 This same group measured in a very wide
range of locations in New Jersey in the general

1 environment and they measured the exposure of
2 people living in New Jersey on a 24 hour basis and
3 measured what the exposure was in these same
4 chemicals. In that table I present the comparison
5 numbers. They are comparable. These are the data
6 for July '78 in ring one and data in Bayonne and
7 Elizabeth, New Jersey, as they now occur in the
8 general population of hundreds of thousands of
9 people living under those concentrations. That's
10 for air.

11 For water we have the contact problem of
12 surface water and the data for that I haven't been
13 able to evaluate in the same way. I haven't been
14 able to find data of the same. I suggest if we
15 can get Steve concentrated on similar things that
16 we can make comparisons with other locations about
17 that are really comparable and unassailable, not
18 meant to be comprehensive but indicative, I think
19 we may find that we can find a comparison base
20 which is that first strategy that will be usable
21 for not only the ambient air but also for the soil
22 contact and the water.

23 I think the drinking water situation is
reasonably well under control. I don't see the

1 drinking water being a problem. The concentrations
2 are sometimes troublesome and it is suffering the
3 same fate that a lot of water companies are having
4 at the moment trying to meet all the requirements
5 simultaneously and the chlorination is causing a
6 problem from time to time. They're all trying to
7 deal with it but there are a great many municipal
8 water companies having the same problems. I don't
9 believe that the water here can be made out to be
10 a problem. I think the water here is less than
11 perfect but it is no worse than it is in a very
12 large number of relatively small water companies
13 that are having the exact same difficulties.

14 The remaining problem that I see is the
15 problems that might occur in the residence. The
16 measurements in New Jersey indicate that people in
17 New Jersey have a concentration during the day,
18 during the whole day, their own personal exposure
19 is higher than the ambient concentration to these
20 chemicals so most of the exposure in New Jersey is
21 picked up inside the residence. That's where it
22 comes from. That means that the concentrations of
23 these particular pollutants in New Jersey is
higher in the residences than it is outside and

1 that again indicates that it is the normal everyday
2 chemicals that you use, the mix of chemicals that
3 we live with, that we have in our consumer products
4 and whatnot that concentrate in our houses, that
5 concentrate higher than outside. We do not have
6 at the moment comparable concentrations, at least
7 I couldn't find it measured inside the residences
8 in the EDA.

9 I would suggest that if we can get one
10 additional thing, it would be awfully good to get
11 some internal concentrations in the residences in
12 the EDA and I would suggest that we take residences
13 that are occupied, not residences that are un-
14 occupied because they'll be lower, but residences
15 that are occupied, and compare them with residences
16 in Buffalo or someplace in the not too distant, in
17 the not too great distance. Probably it doesn't
18 need to be done in very many of them. I think you
19 could probably do that in no more than ten of
20 these properly located according to some protocol
21 that EPA or somebody else is currently using.

22 I think that would give us an indication
23 of what concentrations are in the lived-in residences
in the EDA in terms of the indoor concentration.

1 I can see that that would give you the basis for
2 comparison. Nobody knows which way that's going
3 to come out but I think it gives you an indication
4 that is not biased by all the things that are going
5 to be questioned about the old data.

6 I think on that basis we can then come to
7 some kind of overall assessment based on the like-
8 lihood of gradual reduction of whatever is there
9 now. If we can document that, that's very good
10 also and I don't know whether we can or not.

11 We have to look at that treatment plant
12 to a great extent to see what the flow out is. We
13 also could perhaps find out whether the migration
14 from the soil in the EDA to the air is diminishing
15 and that could be diminished if we could find
16 time trends in the air concentration in the EDA
17 between 1978 and now. Unfortunately, I think
18 nothing was measured in the EDA at that time as I
19 can't find anything. I can't find any measurements
20 in the EDA of the outside atmosphere.

21 DR. HUFFAKER: Larry, did we do some
22 ambient in '78 in the area out of doors?

23 DR. STOLWIJK: You did but in ring one.

MR. KAMINSKY: I'm pretty sure I did but

I can't remember the details.

1 DR. HUFFAKER: There were some at the
2 schools. Let's look.

3 DR. STOLWIJK: But I think if there is an
4 effect of the remediation of the concentrations
5 in the atmosphere outside, in the EDA, then the
6 difference between '78 and '84 probably would show.
7 There would have to be some diminution of that
8 concentration and that would then establish the
9 fact that it is better and getting even better than
10 it is now. I think it is the direction that
11 makes basically, makes it possible for all groups
12 to recognize that the situation here is acceptable
13 and becoming more acceptable and that is the
14 atmosphere and the spirit we have to create. If
15 that doesn't work, nothing else will. I think it's
16 going to be simpler to achieve that than to go the
17 route we otherwise would have to take which I think,
18 as Steve said, it would become horrendous. I
19 think it would not be definitive.

20 DR. WELTY: Thank you for summarizing your
21 thoughts for this and I think it sets a good frame-
22 work. Rather than get into detailed discussion of
23 that now, we have some essentially informational

1 items we need to get through and then we can go
2 ahead and discuss your proposal in more detail after
3 that.

4 Did you have anything else on the data
5 organization that you wanted to say?

6 MR. HOFFMAN: Martha needs to spend a
7 few minutes and hand something out.

8 MS. MONSERRATE: I just handed out three
9 new documents to you. One is an addendum to the
10 sampling efforts summaries that you were given a
11 week ago. This includes basically the soils data
12 and a lot of these reports were just recently
13 released by the Department of Law as now being not
14 confidential documents. You will see that those
15 are marked as being formerly being confidential
16 in the reference documents column.

17 These tables, I might point out, were
18 prepared in order to give you an overview of
19 sampling efforts that were done. The results and
20 comments columns may not give you specific results
21 in every instance. I tried where that information
22 was obvious in the reports to pull it out and list
23 it there for you but it's not meant to be an
exhaustive summary of every single effort. I just

1 just hope to give you an overview of what had been
2 done.

3 I'm also giving you today a list of the
4 Love Canal sources. This should help you to
5 follow the document listing that was sent out
6 earlier this week. As you know, there are some
7 700 documents now in our system and in the listing
8 you're provided there, they're listed alphabetically
9 by source code so this index to the source code
10 should be helpful to you.

11 Finally, I'm giving you this list of
12 chemicals from Love Canal and other areas. I
13 prepared a table based on EPA monitoring reports
14 and a couple of other sources including the Inter-
15 agency Task Report and the SRI International Report
16 which is concerned with ambient air quality in
17 cities around the country. What I tried to do was
18 to list all the chemicals identified in each of
19 those documents and give you some idea of what
20 media were sampled, what states they were disposed
21 in for the Hooker Chemicals and for the SRI, the
22 relative toxicities of some of the chemicals. If
23 you decide to look into Sentinal Chemicals, this
may be a good start.

DR. WELTY: Thank you very much.

1 DR. POHLAND: While we're on that issue,
2 I'd like to determine whether or not from what was
3 said just here we are abandoning the Sentinal
4 chemical idea in preference to this comparative
5 search for data. Personally, I prefer the latter
6 because I think the strategy that was outlined is
7 the only one that we're really going to be able to
8 come to grips with and if indeed it's going to take
9 so much time to get a fix on so-called Sentinal
10 chemicals, I would rather see the current emphasis
11 placed on this search for comparisons and establish
12 that as an agreement in the panel because I think
13 today we were supposed to come up with first cut on
14 criteria and if we don't come to grips with this
15 kind of philosophical question, we're not going to
16 come to grips with the criteria...

17 DR. WELTY: How do the other consultants
18 feel about that?

19 DR. SIPES: Perhaps we should at least go
20 through some of the work that was done here on
21 these reports and if we can get through that in the
22 morning, spend part of the afternoon trying to get
23 down to the philosophical point, because I tell you

1 I had a hell of a time trying to go through those
2 documents and trying to find, as it was pointed out,
3 to find data that would be acceptable and not
4 challenged and trying to choose a representative
5 class of chemicals and I have a small report to go
6 through that gives a plea that something needs to
7 be done to either have a task force to look at the
8 data and make a decision if we would go the Sentinel
9 route or come up with some other alternative
10 approach. I think we perhaps, in the light of what
11 was said, should go through the report but keep in
12 mind that these are the problems.

13 DR. POHLAND: One other point that I'd
14 like to make, when you give comments, sometimes the
15 comments aren't very helpful.

16 For instance, in your new handout here,
17 the purpose of study was to detect any contamination
18 in swales and then detailed log provided.

19 Well, I guess that's an invitation for me
20 to get the document and look at it myself.

21 MS. MONSERRATE: Yes, it is.

22 DR. POHLAND: I just wanted to establish
23 that.

DR. WELTY: We're going to make a little

switch in the agenda at this point. We have with
1 us Bob Senior.

2 Bob, are you back there? You want to come
3 up here, Bob? Bob is the on site engineer for the
4 Love Canal remediation efforts and he has kindly
5 agreed to come over and update us on the progress
6 in the remediation of Love Canal.

7 Thank you for coming, Bob.

8 MR. SENIOR: First of all, my name is
9 Bob Senior. I'm Senior Sanitary Engineer and I
10 work in the western remedial section but I will be
11 on site for the duration of the construction taking
12 place at Love Canal.

13 I'm going to entertain any questions
14 related to the remedial work on site, the actual
15 physical construction. If there is any questions
16 dealing with the operation or maintenance, the
17 plasma arc furnace or things of this nature, we
18 have Nick Kolack with us today who will entertain
19 those concerns.

20 I have some handouts. What I'd like to
21 do is go over the handouts in a little bit of detail
22 and summarize as much as possible just from the
23 handouts and then entertain any questions you might

1 have at the end of the discussion. It's unfortunate
2 some of you were at the June meeting when we went
3 over this with the public, I think you're going
4 to have to listen to this for a second time around.

5 Turning to the first page of the handout,
6 there is a summary. What these are is the major
7 elements of work to be completed not in detail.
8 They're in sequence. That's what we're hoping to
9 do when we get our construction and our heavy
10 equipment on site. Looking at the first one, the
11 pump chamber extension, what there is is there is
12 four major pump stations that service the site.
13 What they do is they collect the leachate which is
14 the material that's in the ground and it drains
15 into these pump stations. These pump stations
16 send it to the treatment plant. What we have to do
17 now is to bring a couple of these pump chambers up
18 to grade. For example, the existing ground level
19 right now has to be raised to accommodate our new
20 liner. What we have to do is conduct this operation,
21 raise these pump chambers and do that before the
22 liner can be installed.

23 If you look on the second page, the only
thing I'm doing is repeating what's already listed

for you in detail. Again, the second thing,
1 grading and---

2 DR. POHLAND: Bob, can we interrupt you
3 as you go along? With regard to the pump chamber,
4 it's my understanding that in the southern section
5 that additional pumping capacities are being pro-
6 vided. Is that going to be accommodated at the
7 same time as your task?

8 MR. SENIOR: We have to coordinate that
9 work effort with the operation maintenance group.
10 For example, at pump stations 2 and 3 in the
11 southern zone, there is, if you remember, Fred,
12 there is fans and things of this nature so what we
13 have to do is raise that elevation to accommodate,
14 to keep those fans on line. I think it would be
15 something where we have to coordinate, for example,
16 with Nick's group where he would be doing the
17 modifications inside the pump chambers and we would
18 also, like our group would be running the electrical
19 systems to these pump chambers. We're going to have
20 to coordinate.

21 DR. POHLAND: Are the pump chambers large
22 enough to accommodate the new pumping capacity?

23 MR. SENIOR: Yes, no question about that.

The second thing is grading and recompact-
1 ing the existing clay cap. If you drive by 95th
2 Street and you look out across the site, you see
3 mounds of material that have been stockpiled.
4 What we've done in phase 2 of the operations last
5 year is strip the existing clay cap of the top soil
6 that was on there. Why we've done this is we're
7 going to reuse this material when we finally come
8 and install the liner. We're going to save this
9 material and reuse it. You see those mounds of
10 material, that's nothing more than topsoil that
11 was stripped from the existing clay cap.

12 When we make note of recompacting the
13 existing clay cap, what we have done is they have
14 large pieces of equipment that scoop this material
15 up. When they do this, the existing clay cap is
16 disturbed. We have to go back now and the work is--
17 well, we're just going to rough up that surface and
18 recompact the existing clay cap and then bring our
19 fill material on and install the liner.

20 What I have with me is a sample piece of
21 the liner that's going to be installed. What it is
22 is 40 millum thick and to give you an idea, 1 mill
23 is one one-thousandths of an inch. It's a high

density polyethylene material, a thick plastic.
1 I'll submit it for everybody to take a look at it.

2 DR. WELTY: The way I like to think of
3 this as a lay person is just like a big umbrella
4 over the top of the canal. When the rain comes or
5 the snow melts, instead of all this water filtering
6 down through the clay cap and eventually going
7 through this rather complicated treatment process,
8 it runs off the top of the canal and goes into the
9 storm sewers. I think that's the main purpose, is
10 to reduce the amount of water that has to be
11 cleaned up through this leachate treatment process.

12 DR. STOLWIJK: What is the volume that
13 goes through that plant a year?

14 MR. KOLACK: About 4 million gallons a
15 year.

16 DR. POHLAND: But it's very seasonal.

17 DR. WELTY: The projection is that this
18 umbrella would reduce the flow by about 90 percent.
19 I believe you mentioned last time.

20 DR. CHALMERS: How long does it last?
21 When do you have to replace it?

22 MR. SENIOR: The liner itself?

23 DR. STOLWIJK: We hope a long time.

1 DR. POHLAND: Most liner manufacturers
2 won't warranty beyond twenty years. That doesn't
3 say it won't last longer.

4 DR. HUFFAKER: I've heard mentioned with a
5 bit of irony that we're going to cover that canal
6 with a plastic cap probably generated by the same
7 process and manufactured there.

8 MR. SENIOR: The third issue is the
9 installation of the underdrain system. Again, as
10 Tom pointed out, the sole function of this liner is
11 just nothing more than to handle the rain water,
12 the snow melt, any kind of infiltration that could
13 get in the collection system. What we have to do
14 is when this material is starting to percolate in
15 the ground is divert it and what this liner would
16 do is divert it to the sides. As it runs to the
17 sides, if you're familiar with this site towards
18 97th and 99th Streets, Frontier Avenue and Colvin
19 Boulevard, we have to collect this water and how
20 we do this is the installation of this underdrain
21 system. What it is is it's a pipe that just would
22 tie into the existing catch basin on site, collect
23 the rain water and convert it to storm sewers that
are off site, for example, at 95th and 100th Streets.

1 The fourth item is the installation of
2 this synthetic membrane cover. I've passed around
3 a piece of that for everybody to observe. Currently
4 what the contractor is doing is taking rolls from
5 the site, and those are ten foot wide, taking three
6 of these roll sections together and seaming them
7 at his shop on Lockport Avenue. What that then
8 is going to save us time during the installation
9 when we finally mobilize on site to put the material
10 down.

11 Well, that's basically it.

12 DR. WELTY: These are in big rolls like a
13 roll of paper towels and you would roll it across
14 the canal and after you roll it across, as I under-
15 stand it, it's welded together and somehow put
16 together and I don't quite understand how that
17 happens.

18 MR. SENIOR: It's a heat seaming operation.
19 They have a machine that would actually overlap the
20 panels and it's a very slow process. As you run
21 this machine along, it just fuses the panels
22 together. What we're hoping to accomplish now is
23 to do as much as we can in the shop and save the
 time spent on the cap actually welding.

1 DR. WINKELSTEIN: Do the existing storm
2 sewers have enough access capacity to take this
3 huge amount of water that's going to come off that
4 camp?

5 MR. SENIOR: We're also constructing some
6 new drainage entrances, too, and hooking up with
7 some of the existing drainage inputs and storm
8 deicing all the way around the site.

9 The fifth item is site grading.

10 DR. STOLWIJK: I think what Dr.
11 Winkelstein is suggesting, are you taking care of
12 the one inch an hour rainfall?

13 MR. SENIOR: I can't, for instance, give
14 you a ten year storm or fifty year storm or some-
15 thing like that but---

16 DR. STOLWIJK: But it's something of that
17 order?

18 MR. SENIOR: Yes, definitely.

19 The fifth item is the site grading. In
20 this we have the earth fill placement, the imported
21 topsoil and the grass establishment. If you're
22 going to cut through the liner and look at a detail
23 section of it, there will be six inches, for
example, the earth fill is earth fill being brought

1 on the site right now. Six inches of material
2 goes over this. Like, for instance, if you're
3 going to install a liner, a swimming pool liner,
4 you don't put it on rocks because it might cut.
5 You put it on some type of soft bedding, sand.
6 This material we're going to put the liner on is a
7 silty sand so there will be six inches of material
8 placed over the earth fill. The liner would be
9 placed down, a material similar to what's under-
10 neath, about an additional twelve inches and then
11 your topsoil and then we would seed the site. That
12 would be it if you could envision that.

13 I could define the limits, for instance,
14 back on installation of synthetic membrane, if you
15 look at original set of plans, we would propose
16 to put a concrete cutoff wall in. That has since
17 been deleted. We've modified the liner to be tied
18 in on what we refer to as a termination trench.
19 What this is is now extended beyond 97th and 99th
20 Streets. In other words, if you were standing on
21 site, if you looked at 99th Street, it would be to
22 the east and on 97th Street it would be to the west.
23 These roads would be covered with material and as
we tie it in, there would be a drainage swale,

1 approximately, oh, thirteen feet outside the road-
2 ways. This drainage swale would have the pipe that
3 we refer to as collective runoff water from the cap
4 and divert into the storm and offsite.

5 The final thing is this termination trench
6 which would be about one foot deep and about six
7 inches wide. What you do is you would fold the
8 liner into it with the earth fill over it and
9 mound it over. So what you have is a swale that
10 dips down. It's collecting water from the site
11 itself and then a termination trench which you fold
12 this liner into. That has been a change in the
13 site grading plan.

14 Now, we also have some other modifications
15 along Colvin Boulevard and around the existing
16 treatment plant. I'm not giving too much detail on
17 it but we've modified the existing plant to more or
18 less accommodate. More material will be brought
19 in and we have now sloped it differently.

20 The sixth item is---

21 DR. POHLAND: Excuse me, did you say what
22 intensity, frequency, duration storm that's
23 designed for?

MR. SENIOR: I don't know that.

1 DR. POHLAND: Could you find that out for
me?

2 MR. SENIOR: Sure can.

3 DR. POHLAND: Also find out or provide me
4 a map of the sizing of the storm sewers receiving
5 this including the slopes?

6 MR. SENIOR: Okay.

7 The last item is one, it's the---well, to
8 get into it, if you are again familiar with the
9 site and you're on 95th Street and you enter off
10 of 95th Street on the old Reed Avenue, that portion
11 of roadway to the existing treatment plant is going
12 to be restored. It's going to be repaved so the
13 operators have access on site to the treatment
14 facility. The remainder of the roadways on 97th
15 and 99th Streets will be covered with earth fill
16 and the liner placed over this. This item discusses
17 how we're going to accomplish that. For example,
18 on 99th Street, what we've done is we've taken out
19 curbing along 99th Street. We've cleaned it and
20 stockpiled it on site and we're going to reuse it
21 along 97th Street now for the existing treatment
22 plant and that curbing is going to be reused and
23 we're going to repave in that area. So that's all

1 it is, you finally fixed up the site and we're
2 providing access for the operators. That's pretty
3 much it.

4 The second sheet just outlines this in a
5 little bit more detail. It's much the same as I
6 said. It's pretty much straightforward.

7 The last sheet is just some topics that
8 are outstanding that are more or less in conjunction
9 with remedial work taking place on site. There
10 has been a study done by Malcolm Pirnie on Black
11 and Bergholtz Creeks and in the study they found
12 some dioxin at the confluence of Black and Bergholtz
13 Creeks. What we're going to do is install a fence
14 there. The bids have come in. We've awarded a
15 contract and we'll be starting construction shortly.

16 The second item---

17 DR. POHLAND: Excuse me, how far is this
18 fence going to extend?

19 MR. SENIOR: Where the confluence which
20 is where Black and Bergholtz meet, that's the
21 confluence, it will be approximately 500 feet down-
22 stream and approximately 150 feet upstream.

23 DR. POHLAND: 150 feet upstream?

MR. SENIOR: Of Bergholtz.

1 DR. POHLAND: These are the fences men-
tioned in the back yards of the homes, is that it?

2 MR. SENIOR: Right, that's one topic of
3 discussion.

4 The second item is another topic of dis-
5 cussion.

6 DR. POHLAND: Okay, this fence though is
7 being placed in the back yards abutting the creek?

8 MR. SENIOR: That's correct.

9 DR. POHLAND: On both sides of the creek?

10 MR. SENIOR: That's correct. If you want
11 a little bit more detail of this, what we're
12 allowing for or providing for is an access road from
13 93rd Street along the street and there will be a
14 gate. For example, if you're familiar with the
15 93rd Street school site, this fence would be in the
16 northeast corner. There would be a 20 foot gate
17 in which we'd have an access road going from 93rd
18 Street along the creek through that area. On the
19 north side of the creek the fence is being
20 installed solely to restrict access.

21 DR. STOLWIJK: Without knowing the
22 detailed geography and hydrology of the area, I'm
23 making the assumption that the dioxin that is found

there was presumably placed there by surface runoff
sometime prior to '78?

MR. SENIOR: I don't know if I can answer
that.

DR. STOLWIJK: Is the geology and the
hydrology consistent with that idea?

DR. HUFFAKER: Probably storm sewers that
drain into the creek, the creek's termination of
the storm sewers and the canal, there is a direct
connection between the canal, around the school and
a number of other places that took it and the same
material has been found in the sediment in the
storm sewers.

DR. STOLWIJK: And the storm sewers also
traversed the canal at one time.

DR. HUFFAKER: That's right.

DR. MILLER: Excuse me, is the plan to put
fencing along the creek, it implies to me that the
earlier suggestion that the creek itself might be
cleaned has been abandoned and instead of cleaning,
the fence is going up, or is it both going to be
cleaned and fenced?

MR. SENIOR: The fence is being put up
right now to restrict access. In 1985, we're going

1 to then go in the field. In other words, we haven't
2 determined what measures we want to take to clean
3 the creek. The creek will be cleaned.

4 DR. CHALMERS: I don't understand once the
5 plastic cap is on what the four pump stations will
6 pump?

7 MR. SENIOR: It's a good question.

8 DR. STOLWIJK: Less and less.

9 DR. CHALMERS: But what?

10 MR. SENIOR: I'm going to do my best on
11 this one. There is four pump stations right now
12 servicing the site. There is an existing clay cap
13 that's over the site. The existing clay cap is
14 approximately 20 acres. The pump chambers in the
15 collection system are just outside this clay cap
16 so, for example, there is still runoff getting in
17 there. There are two types of things you have got
18 to worry about: infiltration like, for example,
19 from the top down and then there is groundwater
20 flow, normal groundwater flow patterns. For
21 example, if you look at the way the groundwater
22 flowed through, it might start in the north and
23 flow through the site to the river that way.

What we'll do is put the synthetic membrane

1 over which is actually doubling the area. Instead
2 of now a 20 acre site, you've got a 40 acre site.
3 Not only that, it's allowing the water to be
4 diverted and running back through the ground.
5 For example, as it hits and soaks in through the
6 ground, we're now doubling that area and taking
7 that runoff, collecting it and sending it out.
8 We're hoping to eliminate much of the infiltration
9 coming in through. However, that does not eliminate
10 the normal groundwater patterns, the groundwater
11 flow that may be---

12 DR. CHALMERS: It would be flowing into
13 the canal under the plastic cap and picking up
14 chemicals. It comes in clean and picks up chemicals
15 and you pump it out so eventually you get all the
16 chemicals out.

17 DR. WELTY: Theoretically, the chemical
18 concentrations outside this umbrella should diminish
19 because the chemicals are flowing back in.

20 DR. STOLWIJK: You cannot really create a
21 vacuum around the canal to take everything that
22 comes out of the canal without also creating a
23 vacuum that begins to suck in groundwater from
outside. The diminished flow that will take place

1 place presumably is mostly groundwater that comes
2 out from the periphery into the drains that you've
3 installed.

4 DR. CHALMERS: The concentrations of
5 chemicals now and after that cover is on for a long
6 time will be extremely informative about the degree
7 of contamination outside the canal.

8 DR. STOLWIJK: There should be an indica-
9 tion of two things. It's very good to monitor
10 the effectiveness of the cap, of course.

11 DR. CHALMERS: But I was thinking the
12 other way around. It's a monitor of how much con-
13 tamination has gone on in the past of the lands
14 going out from the canal.

15 DR. STOLWIJK: It will be difficult to
16 distinguish how much of these chemicals came from
17 outside the drain and how much came from inside the
18 drain. There is a difficulty in determining. You
19 have two variables and you don't know which one is
20 varying. As an absolute indicator it has a problem.
21 As an indicator of the situation in general getting
22 better, yes.

23 DR. CHALMERS: But it's the time, of
course.

1 DR. STOLWIJK: Any time that the concen-
2 tration in that drain water that is collected goes
3 up, you have a very serious concern. So it's a
4 very good absolute indicator of the general
5 efficacy of the system.

6 DR. WELTY: Thank you very much, Bob.

7 Does anyone else have further questions?
8 I think it's pretty clear the way you presented it.
9 I appreciate you coming over.

10 MR. SENIOR: Thank you, Tom.

11 DR. WELTY: Can you introduce your people?

12 MR. SENIOR: This is Larry Kaminsky, a
13 doctor in the Department of Health.

14 DR. WELTY: You want to come up here?

15 DR. KAMINSKY: I have some slides I'd like
16 to present.

17 DR. WELTY: Do you want to say anything
18 before that or should we just adjourn?

19 DR. KAMINSKY: Let's see the slides.

20 DR. WELTY: Okay, could we go to the other
21 room then.

22 (Whereupon, the participants moved into
23 a separate room for a slide presentation.)

DR. KAMINSKY: Perhaps I should just
1 introduce myself again. I'm Larry Kaminsky. I
2 work for the Department of Health, Sentinal Labs
3 and Research. I am a toxicologist. What I'd
4 like to do is very briefly review for you some of
5 the data that we've been gathering over the last
6 couple of years and propose a hypothesis and give
7 some evidence to support that.

8 I've handed out a reprint of a recent
9 paper that we had published on some of our original
10 Love Canal studies and also some data that was
11 gathered in Bergholtz Creek which is apropos to
12 recent discussion, the TCDD levels. I think the
13 sheet I handed out should be clear to everyone.

14 Most of our recent studies, toxicological
15 studies, have centered on leachate which is the
16 heavy organic layer that settles out in the water
17 treatment plants and which most of us believe would
18 be the potentially worst case exposure that one
19 would ever expect from Love Canal. So if we were
20 to show that this was relatively nontoxic, I think
21 that would be an important point.

22 We've been doing a number of things with
23 this leachate and I'm going to go through this very

1 quickly and hopefully give you some time for ques-
2 tions at the end. One of the things we've been
3 doing is to subfractionate this leachate in an
4 attempt to determine which chemicals are present
5 in it and also determine where the toxicity resides,
6 which are the most toxic chemicals. Very briefly,
7 the leachate is passed through various steps which
8 separate it into high and low molecular weight
9 compounds, basically through acidic factions,
10 florisil, subfractionation and ultimately the
11 various fractions are tested by the GCMS. This is
12 still in a relatively early stage of development.
13 Here are some of the chemicals we found to date.
14 They're the same type of chemicals found over and
15 over. This is no where near an exhaustive list.
16 I'm not the chemist involved in this. I simply
17 took their list and extracted some of the chemicals.

18 Because we do not have standards for all
19 of them, you'll see that some of these identifica-
20 tions are not exact. For example, you'll see that
21 chlorotoluene is rather a nuisance at this point.

22 As I say, this is an ongoing project in
23 the Department of Health and within time, presumably
a much greater list will be produced.

1 DR. SIPES: Larry, how concentrated is
2 that list, is that a concentrated or are those
3 just---

4 D R. KAMINSKY: Those are just the ones
5 ---this is purely quantitative. These are ones
6 that have been found.

7 One of the things we've been doing with
8 these subfractionations of leachate to get an idea
9 of toxicity is to put them into chick eggs. Let
10 me move this around so you can see all of it. We
11 take the leachate and the various subfractions and
12 put them into chick eggs and simply observe whether
13 the embryos survive or not. What I have plotted
14 here is the various doses that have been put into
15 the chick eggs against the mortality arising from
16 those doses. The figures I have here are the
17 LD 50s, that is an indication of how much of this
18 compound would kill half the emryos we exposed them
19 to. The leachate requires .36 milligrams of the
20 raw leachate per egg to kill half the emryos, which
21 is relatively nontoxic.

22 Just very briefly, the high molecular
23 weight, the fraction of that leachate is .94 so
it's much less toxic. The toxicity resides in the

1 low molecular weight as you can see here. It also
2 resides in the base neutral fraction.

3 DR. HUFFAKER: When you say .36 milli-
4 grams, is that .36 milligrams of the raw leachate?

5 DR. KAMINSKY: Raw leachate, which is a
6 pretty high dose.

7 DR. POHLAND: That's just a weight basis?

8 DR. KAMINSKY: Weight of leachate per egg.

9 DR. WELTY: The leachate you injected
10 was just the gunk as it comes out, you didn't put
11 it in water?

12 DR. KAMINSKY: It's in corn oil. It's a
13 very concentrated corn oil.

14 DR. STOLWIJK: Is it what you have
15 extracted from the leachate or is the raw leachate
16 itself?

17 DR. KAMINSKY: This is raw, no extractions.

18 DR. POHLAND: How much volume is that?

19 DR. KAMINSKY: I guess the density since
20 it's settled out of water is probably 1.1 or some-
21 thing like that.

22 What I'd like to do now is just briefly
23 review the toxicology studies done with Love Canal
and emphasize the most recent one. We distributed

1 a copy of a study we did several years ago in which
2 we put pregnant rats into a basement of a house
3 and left them for the duration of the pregnancy.
4 I won't go over that study except to say we made
5 no observations of any effects, which really wasn't
6 too surprising. Certainly the levels in that base-
7 ment which was chosen at that time to be the most
8 exposed basement that we could find produced no
9 effects at all in the pregnant animals.

10 I think rather than go through all the
11 studies we've done, I've distributed a reprint of
12 another study. What I'd like to do now is to
13 discuss in some detail a most recent study and
14 propose a hypothesis. This is a teratology study
15 in which again the raw leachate was used and the
16 leachate was administered orally to pregnant
17 Sprague rats from day six of pregnancy through
18 day---I'm sorry, day five of pregnancy through day
19 sixteen. It's a ten day exposure. At twenty days
20 the animals were killed and they were examined.

21 We used two different doses of leachate,
22 .1 grams of leachate per kilogram weight of the
23 rat per day for ten days. So the ten day period
those animals received a gram of leachate and at

1 the higher dose they received 2.5 grams of leachate.
2 These are enormous doses which I think in my
3 opinion reflects the nontoxicity of the leachate.

4 Let me briefly go through what we observed.
5 We lost a few of the animals. These are controls
6 which received the vehicle. We take the leachate
7 and dissolve it in corn oil and the control animals
8 received just corn oil. None of those animals
9 died. We lost one of the lower dose animals and
10 what was it, three of the upper dose.

11 The leachate had the effect of greatly
12 diminishing the rate of weight gain of the dams
13 during this period. The control animals during the
14 period of observation gained 112 grams. The low
15 dose only gained 91 grams and the high dose 37 grams.

16 DR. CHALMERS: How do you administer these
17 doses?

18 DR. KAMINSKY: Orally.

19 DR. CHALMERS: Is it mixed up in the daily
20 food?

21 DR. KAMINSKY: No, it is dissolved in corn
22 oil.

23 DR. CHALMERS: Once a day?

DR. KAMINSKY: Once a day for ten days.

1 The first effect we were observing here
2 on the dams is that they do not gain weight at
3 their regular weight. Recall these are very large
4 doses, however.

5 I also would like to have you reflect on
6 the fact that this lack of weight gain is a
7 commonly observed effect of dioxin.

8 DR. WINKELSTEIN: Why do you choose
9 different size groups?

10 DR. KAMINSKY: We do not choose different
11 size groups. Unfortunately, when we begin we can-
12 not be sure if the animals are pregnant or not so
13 we start with more animals and when we kill them,
14 we find some unpregnant. We discard them. That's
15 why our group changes. We purchase these pregnant
16 animals and they will not guarantee their pregnancy
17 until much further into this time course than we
18 start so we have to do that.

19 DR. STOLWIJK: These are about 200 grams?

20 DR. KAMINSKY: I think about 250.

21 The number of litters, the number of
22 fetuses were not significantly different. There
23 were early resorptions in the high dose group which
 was statistically significant. No difference in

1 late resorptions. In the high dose group the
2 number of living fetuses per dam was significantly
3 lower than in controls and the low dose group,
4 perhaps significantly---let me retract that---
5 significantly, but perhaps importantly, the mean
6 fetal birth weight was significantly lower for the
7 high and even for the low dose group. Why I say
8 that may be important is that you may recall in
9 the epidemiological studies done there was some
10 indication of lower birth weight. In fact, that
11 is one of the reasons why we do teratological
12 studies. If we feel there is going to be any
13 effect, it might well be in this type of parameters.

14 DR. STOLWIJK: What did the lost animals
15 die of?

16 DR. KAMINSKY: We have no idea.

17 DR. STOLWIJK: You didn't do any pathology?

18 DR. KAMINSKY: Not with the lost animals.

19 DR. STOLINE: May I ask specifically
20 where did this Love Canal leachate, where did you
21 select that?

22 DR. KAMINSKY: It's from the water treat-
23 ment plants. It's the heavy, organic layer that
settles out from the water. I might add, what we

look at is roughly concentrated one thousandfold.
1 One takes the original leachate that comes into
2 the treatment plant and what we get is settled out
3 and is about one thousandth of the total volume.

4 So there is those effects. We then take
5 the fetuses and do two types of studies with them.

6 DR. STOLWIJK: Now that you mentioned it,
7 I'm now less sure than I was about what the
8 leachate is. What you call leachate is in fact
9 the heavy, insoluble fraction that is carried with
10 the water?

11 DR. KAMINSKY: Right.

12 DR. STOLWIJK: It is not water soluble
13 at all. There has already been severe fractiona-
14 tion of the compounds.

15 DR. KAMINSKY: It's what settles out.

16 MR. STEELE: You have to be careful because
17 we don't use that definition as you are now using
18 it. Leachate is the groundwater coming out of
19 the field. What you are using is a second phase.

20 DR. WELTY: This would be more like a
21 sludge that settles out.

22 DR. STOLWIJK: I think to call it leachate
23 is probably a little misleading.

1 DR. WELTY: Might be best to call it a
sludge.

2 DR. KAMINSKY: Just for clarification,
3 I think you suggested it was heavily fractionated.
4 I'm not sure I would agree with that.

5 DR. STOLWIJK: Let's say the water soluble
6 parts, there would not be much water soluble parts.

7 DR. KAMINSKY: No. I don't think one has
8 too much to fear from water soluble parts or even
9 from non-water soluble parts.

10 Two types of studies were done with the
11 fetuses. In one case the skeletal abnormalities
12 were examined and in the other case the fetuses
13 were sliced and examinations of each slice were
14 made. The only observations---there were no
15 teratological effects that we observed at all.
16 The observations that we made were that there was
17 a slight renal effect, dilated renal pelvis and
18 there were very minor skeletal abnormalities which
19 we believe are probably primarily due to the weight
20 loss in the dams rather than the effect of the
21 chemicals. Of course, the weight loss in the dams
22 is due to the chemicals.

23 The bottom line of the study is essentially

1 at a very high dose of what we've been calling
2 leachate which I should perhaps call sludge, we
3 get virtually no teratological effects. The major
4 effect was the weight loss in the dams and some
5 fetal loss.

6 What I would propose is that these
7 observations that we've made are consistent with
8 the amount of TCDD present in that leachate and
9 that the remaining chemicals play virtually no
10 role in these effects we've observed. I'd like to
11 present some data to support that hypothesis.

12 Before we do that, let me just say that
13 this sample of sludge that we've been using has a
14 TCDD level of 3 parts per million. At the doses
15 we administered to the animals, the sludge, that
16 would translate to at the high dose .75 micrograms
17 of TCDD per kilogram per day. At the low dose it
18 would be .3 micrograms per kilogram per day.

19 DR. SIPES: Three parts per million?

20 DR. KAMINSKY: Three parts per million.

21 Now, the only study that I can find with
22 TCDD that was completely comparable to ours and
23 the same species and strain of animals were used
and the same dose regimen was used and the same

1 type of observations were used was this study that
2 was put out in '71 by this group and there is the
3 title of the paper. I'll show you some of the data
4 from this paper.

5 There have been numbers of studies of
6 TCDD teratology but none of them, apart from this,
7 compared sufficiently with our study that I could
8 make the extrapolation on it. In fact, we feel
9 that we should perhaps do a study with TCDD now
10 to compare it with our leachate or whatever you
11 want to call it study.

12 This is their data now, their doses.
13 Remember, this is TCDD itself. They dosed control
14 .03, .125, .528 micrograms per kilogram per day.
15 You will recall that, based on the TCDD contents
16 of the sludge, we gave not exactly the same doses
17 but we gave .75 which was slightly higher than this
18 dose and we gave .3 which is also in between there.

19 I might add for those who have done studies
20 like this, the reason for our very close dosage is
21 there is a very steep dosage and we were forced
22 into tight dosages. We went slightly higher and
23 the animals died and we went slightly lower which
we just completed now. We have very tight dosage

ranges.

1 You will recall that at .3 micrograms
2 per kilogram in our leachate we had decreased birth,
3 decreased body weights in the dams, and these stars
4 here represent where the effects are significant.
5 You see at .5 they also got a significant decrease
6 in body weight which corresponds very closely to
7 where we first saw it.

8 There is an unusual thing about this
9 study that they put in eight micrograms per kilo-
10 gram per day of TCDD and they had no deaths. We
11 got significant deaths with the leachate at a
12 much lower dose but I feel that this study is in
13 error because this eight micrograms per kilogram
14 per day gives a total dose of 80 micrograms and
15 the known LG 50 for TCDD in those rats is 45. I
16 think somehow they didn't get the TCDD in.

17 I think that our studies, apart from that
18 one thing where I feel they're in error, correspond
19 very closely which the conclusion being that it is
20 only the TCDD in the leachate that is causing any
21 effect at all. The rest of the chemicals are having
22 virtually no effect. To emphasize that slightly
23 further, the resorptions came in at roughly the

1 same dose as us, .5. We were at .75 which is very
2 close.

3 The same is true here of mean litters,
4 mean numbers of fetuses per litter. It only
5 significantly decreased at .5 which is again
6 roughly the same where we are.

7 DR. WELTY: Can I ask just a couple of
8 questions? Were the autopsies or analyses done
9 blindly in terms of which groups the rats were in?

10 DR. KAMINSKY: No.

11 DR. WELTY: Is there any indication of
12 what the power is as to picking up any reproduction
13 effects, the power of the study?

14 DR. KAMINSKY: I'm not sure how to answer
15 that. In terms of teratology, the rat is not a
16 good animal to use. When we started off this, we
17 didn't have a hypothesis. We have now. The rat is
18 very frequently used so we used the rat.

19 TCDD however does not cause teratological
20 effects in the rat to any major extent so that's
21 why even when we go through---we see they had very
22 few effects. The effects they've got, though,
23 very closely mirrored the effects we got.

We plan to do studies with mice, which is

1 far more sensitive. We definitely will then get
2 teratological effects.

3 MR. KOLACK: Is it possible for me to
4 get documentation as to where that sample was
5 collected, on what day and the results of the TCDD?

6 DR. KAMINSKY: That's three parts per
7 million. It was collected from the water treatment
8 plant. I don't have the date of it but I could
9 find that. All our studies were done with a
10 single sample of sludge collected at one time.

11 Just let me show you one more slide.
12 This is their results of their skeletal abnormali-
13 ties. Again, they're very minor and compare very
14 closely to the effects we found with the leachate.
15 Again, at the same doses they got slight effects
16 because they used roughly the same dose of TCDD as
17 we had in the sludge.

18 The last one here is the tissue effect.
19 Again, dilated renal pelvis is the only effect and
20 again it came in around about .5 which you might
21 recall is the same effect we observed with the
22 leachate or sludge.

23 I realize I've got through this very
quickly and you really didn't have time to see all

1 the figures but I think I've shown you enough to
2 support to some extent the hypothesis that I would
3 like to propose, that the sludge is firstly the,
4 probably the sample of greatest as one is likely
5 to obtain from the canal area, two, it is not very
6 toxic, and three, the toxicity that we observed
7 today is that of the TCDD mean component only and
8 that all the others, probably hundreds of other
9 compounds presently contribute virtually nothing
10 to that.

10 DR. WINKELSTEIN: Can't you fractionate
11 that sludge to test your hypothesis, in other words,
12 can't you---

13 DR. KAMINSKY: When I started that frac-
14 tionation scheme is the start of that. When we
15 started, we had no idea what we were looking for.
16 Now, what I have proposed to the chemists is that
17 they fractionate based on isolation of TCDD which
18 they know how to do and go through the whole scheme
19 of tests and toxicity of all the fractions.
20 Ultimately, I believe that the TCDD is the only
21 thing to be concerned about.

22 DR. WINKELSTEIN: The other thing
23 Dr. Stolwijk is questioning, I don't quite see your

1 logic in ruling out the supernates, the water
2 solubles. Why not test them? It seems to me
3 rather simple.

4 DR. KAMINSKY: We can test---

5 DR. WINKELSTEIN: You can't really make
6 that statement until you do because everybody will
7 say how do you know. You say that all the toxic
8 parts are in the soluble---

9 DR. KAMINSKY: What do you imagine would
10 be in the water that would be that toxic?

11 DR. WINKELSTEIN: If I shake a salt
12 shaker in a glass of water, you know that the salt
13 dissolves. There must be about 10,000 chemicals
14 that are water soluble.

15 DR. CHALMERS: But I thought the sludge
16 had been washed continuously before you get it
17 so it's not fresh sludge.

18 DR. KAMINSKY: I agree.

19 DR. WINKELSTEIN: The questions of
20 credibility seems to be a simple thing to do. If
21 you told me that the water fraction, if you give
22 me a quart of leach material from Love Canal and
23 I put it into a settling tube or whatever, column,
and I settled it out of the bottom and I tested that

1 and it's toxic, but unless I've tested the super-
2 nate or the chemist says there's nothing in it,
3 there's no credibility.

4 DR. CHALMERS: We heard this morning that
5 sludge comes from millions of gallons of liquid
6 and presumably it's a washed residue.

7 DR. KAMINSKY: In principle, you're
8 correct.

9 DR. CHALMERS: You have to test what
10 originally comes in rather than the sludge.

11 DR. KAMINSKY: In general, it's highly
12 unlikely that a water soluble compound would be
13 that toxic.

14 DR. WINKELSTEIN: I'm willing to accept
15 your statement if it's just a matter of discussion
16 but we're dealing with something where you have to
17 test it.

18 DR. KAMINSKY: We can test that.

19 The other thing is we've done a number of
20 other studies. We have done a teratological
21 study in which we took the top layer of the soil
22 from the canal, that was prior to the cap being
23 put on, which at the time was the most toxic
environment to test and we extracted that and put

1 the extract into pregnant rats but there was no
2 effect whatsoever. So that's almost everything that
3 we've tested toxicologically, has been relatively
4 nontoxic.

5 MR. KOLACK: Did I hear you correctly
6 earlier that the Department of Health considered
7 that the sludge is nontoxic with the exception of
8 the dioxin?

9 DR. KAMINSKY: No, no. I said I hypo-
10 thesized. Our current hypothesis is that the
11 toxicity that we are observing is apparently that
12 of the dioxin components and that the other
13 components apparently at the moment are not
14 contributing significantly to that toxicity.

15 DR. WINKELSTEIN: Is that an important
16 hypothesis?

17 DR. KAMINSKY: In my opinion it is a very
18 important hypothesis. We are discussing this
19 morning that we have all these chemicals to look
20 at and I would propose you only need to look at
21 the dioxin.

22 DR. CHALMERS: Therefore, we ought to
23 design some exquisitely reproducible, sensitive,
specific experiments rather than what you've done

so far to determine---in other words, using
1 specimens that are the wrong stuff, specimens that
2 have the dioxin removed---

3 DR. KAMINSKY: That's very difficult.

4 DR. CHALMERS: Two different animal
5 species, blinded autopsies. Can you agree to the
6 blinded autopsies?

7 DR. KAMINSKY: That's easily done.

8 DR. CHALMERS: The whole experiment
9 blinded so the people measuring the effects do not
10 know what they're dealing with?

11 DR. KAMINSKY: We can do that. That's no
12 problem.

13 DR. CHALMERS: I'd rather hear you say
14 you will do that.

15 DR. KAMINSKY: We will do that.

16 The next experiment we're going to do is
17 we will be looking at mice which are far more
18 susceptible. We will be able to be much more
19 firm in our hypothesis. We plan to work with both
20 A-positive and A-negative mice which should really
21 pin down whether the dioxin is the major problem.

22 DR. WELTY: Are you through with the
23 overheads? Maybe we can return to the other room.

1 (Whereupon, the participants returned to
2 the original hearing room.)

3 DR. WELTY: There may be a few more ques-
4 tions about your teratology studies and I guess
5 you wanted to go over this Bergholtz Creek?

6 DR. KAMINSKY: I handed it out. There is
7 not much more I can tell you.

8 DR. POHLAND: I'm trying to establish
9 whether or not whoever is doing it, we are comfort-
10 able or can analyze the sludge fraction. You gave
11 a qualitative assessment of it but I'm wondering
12 whether the problems with separating out constitu-
13 ents and quantifying it have been resolved?

14 DR. KAMINSKY: I would say they have not
15 been resolved. I think the scheme which I've
16 given you this morning which is very simple is as
17 far as they've got. This is my personal opinion
18 and it's an opinion I always have on environmental
19 disasters of this sort. I think the chemists can
20 beat this thing to death forever but we're not
21 interested in what chemicals are there. We're
22 interested in how toxic it is and as a general rule
23 we tend to look at environmental mixtures and try

1 to assess their toxicity. This is a very, very
2 major chemical task to subfractionate and quanti-
3 tatively identify each one of those and I'm not
4 sure it will help.

5 DR. POHLAND: Except in a remedial sense.
6 We are interested in changes in the character of
7 both the aqueous fraction and the sludge fraction
8 with time. Whether or not that can be done
9 qualitatively---

10 DR. KAMINSKY: I think it could be if
11 you select a couple of chemicals but right now I
12 think the last they told me was that they had
13 tentatively identified 96 compounds. I think it
14 would be a tremendously difficult task to try and
15 keep track of all of those. I think the thing to
16 do is look at what is most potentially harmful and
17 look at those rather than trying a complete scan
18 of it. I think that's technically impossible.

19 DR. WELTY: Any other questions?

20 DR. MILLER: I'd like to reply to what he
21 just said. You said earlier that the focus had
22 been pretty well restricted to toxicity. I guess
23 I'd like to ask what that literally means, what
does toxicity really mean as you're using it?

1 DR. KAMINSKY: Well, that's difficult to
2 answer. It seems to me that what one would like
3 to do in an ideal situation is determine whether
4 there are human effects and then use animals
5 monitoring those human effects. The only human
6 effects that I have seen documented are possible
7 diminished birth weights of children and so that's
8 why we've emphasized the teratological aspects.

9 DR. MILLER: What does toxicity mean when
10 you said it a few minutes ago?

11 DR. KAMINSKY: I think toxicity is---

12 DR. MILLER: As you're using it, when you
13 said what we're really interested in is toxicity,
14 what does that mean?

15 DR. KAMINSKY: I think Love Canal is the
16 potential of those chemicals to impinge upon humans
17 and cause detrimental effects. I'm not sure we've
18 ever seen such effects.

19 DR. FOWLKES: I'm sorry, I'm a Social
20 Scientist. I really must ask you what the meaning
21 of those tests are when, by your own admission, the
22 animals that you have used are poor candidates to
23 serve as indicators for the measure of teratology?

DR. KAMINSKY: I can answer that.

1 DR. FOWLKES: It seems to me and I'm a
2 Social Scientist rather than scientist, the
3 assimilation of that, it's as though you used a
4 shade growing plant to demonstrate the effects of
5 deprivation of the sun.

6 DR. KAMINSKY: When I say it's a poor
7 candidate, it's a poor candidate for TCDD. It's
8 a very good candidate for studying teratology.
9 At the start of the study the question we asked is
10 the sludge harmful in a teratological way? We
11 didn't have the idea then that maybe it was the
12 only TCDD we should be worried about. It is
13 classically used, rats for such studies.

14 As we got further into the studies, we
15 realized in comparisons in the literature the
16 effects we were observing were apparently only from
17 the TCDD. So we have not completed this study.
18 We are now going to look at mice which are very
19 susceptible to TCDD.

20 We did not start out the study by saying
21 it's TCDD that's the problem. Let's pick something
22 that's not effected by TCDD.

23 DR. WELTY: What kinds of chemicals do
produce teratological effects in rats?

1 DR. KAMINSKY: There is a whole host of
2 chemicals, one we use for positive control is
3 hydroxyaurea. Whenever one does a study of this
4 kind, you take a compound that is a known teratogen.
5 You do the study with that chemical alongside the
6 unknown compounds. You make sure the animals
7 you are working with are responsive.

8 DR. WELTY: Are any of the other chemicals
9 that are found in the sludge known to be teratogens
10 for the rat?

11 DR. KAMINSKY: I don't know if any of
12 them are known to be teratogens but we don't know
13 what that sludge is. This is why I believe that
14 one should take the environmental samples and study
15 them rather than spend enormous amounts of time
16 analyzing them because I don't think you'll ever
17 find everything that's in them.

18 DR. WELTY: What about the Bergholtz
19 Creek, did you want to comment on that at all?

20 DR. KAMINSKY: Well, excepting that it's
21 as you see, the sites of collection are noted in
22 the first column. The actual TCDD levels determined
23 there are in the second column and the final column
is an indication of the total tetrachlorinated

1 dibenzadioxin. So you can see that the figures
2 are virtually the same so that all the tetra that
3 is present is apparently 2278. The levels are
4 not very high. I don't want to interpret what
5 they mean. These are just---I just received them
6 yesterday from your labs.

7 DR. STOLWIJK: We are to understand that
8 these are samples of sediment?

9 DR. KAMINSKY: Sediment collected at the
10 sites indicated.

11 DR. WELTY: You have received a protocol
12 for this sampling in one of the mailings.

13 DR. STOLWIJK: So the only thing that is
14 slightly unexpected here is the thing that is
15 furthest away from the outfall has the highest
16 concentration which is sampling errors or whatever.
17 You can't tell.

18 DR. HUFFAKER: The difference in parts per
19 billion between 6 and 10 is not---

20 DR. KAMINSKY: I would not say that this
21 is different.

22 DR. CHALMERS: That's why it would be
23 awfully useful to us when we're given a figure
like that to be given a duplicate figure. We can't

remember. I complained about this last month.
1 We can't remember the duplicate variability of all
2 these measurements all the time and yet we're
3 constantly getting single figures.

4 DR. STOLWIJK: I assume these are not
5 single figures. These are probably more than one
6 sample or more than one determination per number,
7 is that right?

8 DR. KAMINSKY: I don't know that that's
9 true.

10 DR. CHALMERS: Then we need a number or
11 standard deviation or standard error, some measure
12 of the scatter in the method.

13 DR. STOLWIJK: When I see a recovery
14 percentage, that to me usually means that there was
15 at least one more determination made at the same
16 time.

17 DR. KAMINSKY: Yes.

18 DR. WELTY: It is an isotope method and
19 may be right in the specimen.

20 DR. WINKELSTEIN: Let me see if I under-
21 stand this. We have one sampling point and it is
22 the outfall, one sampling point is upstream and
23 two sampling points are downstream at different

1 distances. What this shows, if I read this
2 correctly, is that upstream from the outfall the
3 amount of this material of this chemical you're
4 testing for is very small and downstream it exists.

5 DR. HUFFAKER: Mr. Steele called to our
6 attention last spring that the 93rd Street sewer
7 had stuff in the sediment and wanted to know what
8 was happening at the creek, were we going to fence
9 the creek. At that time we asked CDC if they'd
10 go ahead with the sampling. The sampling was done
11 and those are the results. The TDC obviously has
12 the report now. Bob Senior commented a minute
13 ago about the fencing going on and I'm sure that
14 that fencing contract can be modified to include
15 this data and also the creek clean-up.

16 MR. STEELE: Just for the record, at the
17 same time that we asked for additional samplings,
18 we asked for comprehensive sampling, and we asked
19 at that point in time for immediate fencing to go
20 up so what we see here is a confirmation of some-
21 thing we should have realized we would likely find
22 a long, long time ago and there is really no need
23 to have waited this long to begin to take sensible
precautions to prevent public access to that

contaminated creek.

1 DR. CHALMERS: I hate to belabor this
2 point but why give us 200 feet, 60 feet, 60 feet
3 downstream and at outfall three different measure-
4 ments if you don't want us to know what the three
5 different measurements mean. We have no way of
6 telling that these figures mean anything in terms
7 of differences from each other if we're not going
8 to have any way of telling what the differences
9 mean. What's the point in measuring them much less
10 reporting them?

11 DR. KAMINSKY: I think that our lab, did
12 they say they're within 15 percent?

13 DR. CHALMERS: That's meaningless to me
14 because those are usually estimates of error made
15 under ideal circumstances and then you go on and
16 measure a routine thing and you may be miles in
17 error.

18 DR. KAMINSKY: I think that's an estimate
19 from samples.

20 DR. CHALMERS: Give us the data. In
21 other words, instead of giving us 10.2 and 6.4,
22 which could have 50 or 100 percent error, give us
23 10.2 plus or minus so many standard deviations

1 because you must do them in replicate or if you
2 did them just in duplicate, give us the two
3 duplicates so we can judge ourselves whether 10.2
4 or 4.8 from one place, we'd have a feeling for what
5 it means to get 6.4 and 8.2 from another place.

6 DR. HUFFAKER: We'll ask the lab.

7 DR. KAMINSKY: This is not my day. I was
8 just given this. I believe that you should not
9 be concerned with anything that comes out of the
10 decimal place. I don't believe either that a
11 100 percent error is very meaningful. What
12 difference does it make if it's 5 or 10?

13 DR. WELTY: We'll get the variability.

14 DR. CHALMERS: All I'm asking is when you
15 approach new numbers like this and having a great
16 experience in variability, that you have some
17 estimate of variability routinely given with the
18 numbers.

19 DR. KAMINSKY: This is purely my opinion.
20 In my opinion, what this data is telling you is
21 that downstream from the outfall there are low
22 parts per billion of TCDD.

23 DR. WELTY: Before we move on, I have a
question about these maps of concentrations. Are

you familiar with those?

1 DR. KAMINSKY: I've been run through on
2 those. I was told to comment on these maps.

3 DR. WELTY: Because there is a couple of
4 things that should be clarified. First of all,
5 there is different levels and I think that it is
6 not obvious what the levels mean or what do the
7 absolute numbers mean.

8 DR. KAMINSKY: Let me just say that all
9 of this data is represented in these maps. I have
10 been told to say that it's semi-quantitative.

11 DR. WELTY: That's clear.

12 DR. KAMINSKY: It is EC data. There is no
13 mass spectral confirmation so they are at best
14 guesstimates of the presence of these compounds.
15 They have not been confirmed. The levels do not
16 represent the levels beneath the surface in terms
17 of inches. They were selected based on observation
18 of changes in the composition of the soil. So
19 that there are some areas where the third horizon
20 in one area may well be higher than the second
21 horizon in another.

22 DR. WELTY: When you say the second and
23 third, you're referring to As and Bs and Cs?

1 DR. KAMINSKY: The A was the surface level.
2 They then started digging lower and the next level
3 was B. When they observed a change, that became
4 C. Because of the inhomogeneity of an area, it
5 could vary a lot so that one area could go much
6 lower before you hit a change and call it C.

7 DR. WELTY: Then in terms of the absolute
8 numbers, for instance, I see here 2.4AE plus 03,
9 how do I interpret that number?

10 DR. STOLWIJK: Tens of thousands.

11 DR. KAMINSKY: I'm not sure specifically
12 what you're asking.

13 DR. WELTY: Well, what does that number
14 mean in terms of plus and minus?

15 DR. KAMINSKY: Are you asking me what
16 terminology of representation of the data this is?
17 In other words, this is ten to the one. In other
18 words, if it was 1.79 E2 to the 1, it would be
19 17.9. If it's minus, it's ten to the minus one.

20 DR. STOLWIJK: It's the exponential that's
21 associated with it.

22 DR. KAMINSKY: This is the standard
23 scientific notation. Ignore the E. Whatever comes
after the E is ten to the power of that number. If

1 you had---let me make up a number. If it was a
2 2.00E01, that would be two times ten to the one
3 which is ten so it would be twenty.

4 DR. WELTY: Twenty parts per billion.

5 DR. KAMINSKY: Twenty.

6 DR. STOLWIJK: You're cautioning us that
7 the numbers are semi-quantitative which I interpret
8 to mean that we should only believe the order of
9 magnitude?

10 DR. KAMINSKY: I would say that's correct.
11 You must take into account that these are not
12 mass spectrally confirmed, they're ECDG data.
13 In other words, a peak comes out a certain reten-
14 tion time and that might correspond to a certain
15 compound. There is no guarantee that it is that.

16 DR. STOLWIJK: Except for these particular
17 chemicals mass spectralgraphic confirmation is not
18 terribly essential.

19 DR. KAMINSKY: They are but one wouldn't
20 put one's head on a block on that.

21 DR. STOLWIJK: That's why we're only going
22 to look at the E values you have there.

23 DR. KAMINSKY: Correct.

DR. STOLINE: What we have here, this is

essentially raw data and presumably---

1 DR. KAMINSKY: There are many problems
2 with this data. It's an enormous data base here.
3 It was analyzed over a prolonged period of time.
4 There are certain questions about the stability of
5 the soil sampled. The data could have changed
6 with time. The identifications are not unambiguous.
7 The initial objective of the study, as I understand
8 it, was to attempt to correlate chemical data on
9 various areas with reputed human effects. To my
10 knowledge, there has been no such correlation
11 observed and in fact, I'm not convinced that this
12 data could even have been used as a correlation.
13 It is just too tenuous.

14 DR. POHLAND: The soil horizons, do they
15 relate to the actual accepted geological distribu-
16 tion that has been always put forward?

17 DR. KAMINSKY: I believe that there was a
18 geologist on site who made the determinations as
19 to where the horizons---

20 DR. POHLAND: So there are the extraneous
21 layers included in here?

22 DR. HUFFAKER: Let me do something on
23 that. There is a computer print that generated this

1 data at the different horizons. It talks about
2 the layers. They are different in terms of feet
3 and inches and there is no way to present that
4 evidence so that's what they did. If you're really
5 interested in it, you need to go back to the
6 printout. We would have to get a hold of Don
7 Ellis who did the drilling and ask him exactly what
8 his criteria was. Most of it appears to be here
9 at even feet, two feet, two and a half inches,
10 three feet, three and a half, and so on. He notes
11 whether the soil was distributed---

12 DR. POHLAND: My question was whether or
13 not when they saw this change in texture or what-
14 ever they used as a guide, actually corresponds to
15 the accepted geology of the site as previously
16 described?

17 DR. HUFFAKER: I can't answer that.

18 DR. POHLAND: So we really don't---

19 DR. STOLWIJK: Was there a geologist
20 present at the time they took the cores?

21 DR. KAMINSKY: He was the one who
22 determined when a horizon was reached.

23 DR. POHLAND: My question still holds
because if they encountered some lenses or something

1 and so forth and just called that a new horizon,
2 then I don't know how to relate that fact to what
3 I consider to be the geology of the site.

4 DR. STOLWIJK: But if that happened,
5 then we're lost anyway. The liability of the data
6 to begin with---

7 DR. POHLAND: That's another problem
8 with the data.

9 DR. KAMINSKY: This data is not of great
10 value.

11 DR. HUFFAKER: It's the only thing we
12 have that shows areawide distribution of any of
13 these chemicals on a qualitative basis and we
14 didn't know that before and so if you're wondering
15 about the distribution, this gives you an idea of
16 where it was found and roughly the concentrations
17 that were found and then the identification is
18 probably good enough so you could say that is what
19 it is. There is a good correlation between the
20 presence of these chemicals and whether or not it
21 was fill or undisturbed soil when it was done. I
22 think that's important.

23 When Hill finishes, they have our tapes
that this came from. We would have produced it

1 for the group and others before but identifiers
2 are still on here that tell what house it is.
3 Some of these privately owned homes, we have
4 problems with putting out information on these
5 homes until we can some way separate the home
6 owners identification from the state owned stuff.

7 DR. STOLWIJK: After the state took this
8 data, it had the opportunity presumably of testing
9 with this data sampling various hypotheses as to
10 how things got where they are. In other words,
11 one hypothesis presumably would have been that
12 most of the distribution of these materials would
13 be close to the surface or at the surface and that's
14 how it got to places where it is and probably not
15 very much of it migrated at ten feet depths, stay-
16 ing at that particular layer. That would be I
17 think a hypothesis that is consistent with how most
18 people look at the problem. That would then mean
19 that you would find gradients in terms of concentra-
20 tions as you go to a particular site and depth
21 where you would find most of the highest concentra-
22 tion near the surface and then less as you go
23 further down. Has the state analyzed this data
with that particular concept in mind?

1 DR. KAMINSKY: Well, I think to some
2 extent I recall that there were many, many theories
3 as to how it got there.

4 DR. STOLWIJK: I spent a couple of hours
5 looking at this, making some notes here and there
6 trying to see whether such a thing actually could
7 be ascertained. From what I could see, and it is
8 not appropriate that I carry this out myself,
9 from what I could see, I could see that probably
10 a hypothesis that most of the distribution was via
11 the surface could be sustained but I think you
12 probably have the data there if you want to look at
13 it creatively that way to actually make this stick
14 in a pretty solid way. You do need to look, not
15 just gather the data, you actually need to evaluate
16 it on the basis of some concept of some hypothesis
17 that you want to test.

18 DR. KAMINSKY: I know that many hypotheses
19 were tested. One concept was the chemicals were
20 traveling along the swale. Then there was another
21 one that they were traveling along the roadbeds.
22 I know from time to time these were tested.

23 DR. STOLINE: With this data?

DR. KAMINSKY: I believe so.

1 DR. STOLWIJK: Where are the results of
those evaluations?

2 DR. KAMINSKY: I don't think any hypothesis
3 was ever supported.

4 DR. HUFFAKER: This is an eyeball evalua-
5 tion like what we're doing here. If Hill has the
6 data, when we first began this on how it might be
7 possible to do some mapping for us by horizons and
8 see if there is a distribution, what you're asking,
9 this hasn't been done on a formal basis.

10 DR. STOKWIJK: If this is available on
11 tape so it's readable and it's probably the biggest
12 data set that exists about the soil, which is one
13 of the troublesome situations, if that could be
14 stuck on a data base with the coordinates entered
15 in where the samples are, I don't know whether
16 that's possible, are there coordinates with it,
17 then it should be possible to go through a machine
18 analysis of profiles from locations. It should
19 be possible to carry out an evaluation that would
20 once and for all determine whether those swales,
21 in fact, were channels or not, which is a question
22 that comes up from time to time again.

23 DR. KAMINSKY: I think that's been

1 resolved. My memory is that that is no longer
2 a viable hypothesis.

3 DR. STOLWIJK: I think it would probably
4 be well worthwhile. If there are going to be
5 additional efforts in this area, it would be well
6 worthwhile to do that on the basis of the data set
7 that was not collected or analyzed for a particular
8 purpose because this would be an incontrovertible
9 analysis of a set of data that was not collected
10 for this particular purpose.

11 DR. KAMINSKY: There is one problem
12 however. I recall that there were transfers of
13 surface dirt and soil over a period and that would
14 complicate any analysis of this.

15 DR. STOLWIJK: But that soil would not
16 have been deposited at a depth of six feet.

17 DR. STOLINE: Regardless of how it got
18 there, we would have to know that, whether it was
19 by a natural process or whether it was transported
20 by dump truck. The reality is if it's there, we
21 ought to know about it regardless of how it got
22 there.

23 The other thing I want to say is that with
respect to the soil data, the only other data that

1 I'm aware of is the EPA data and there 150
2 substances were monitored and the sample sizes,
3 there were roughly 100. I don't know if this is
4 the total data that's available that was tested in
5 the soil in 1982, '83 winter, but I don't think
6 this was done on all 150 substances that were
7 monitored by the EPA in 1980 but at least with a
8 few of these, we got a more complete data set
9 because I'm looking at Beta BHC right here and
10 clearly there are more than 100 observations here.
11 It looks to be a fairly complete picture of the
12 total or at least a good portion of the EDA and
13 with this and by the way, Beta BHC is a good one
14 because the record shows that that was deposited
15 and maybe a few others. Even though you say that
16 this data, that there may be problems with it,
17 it still is the best thing we have. I would not
18 say to totally ignore this.

19 DR. POHLAND: Furthermore, even if in the
20 final analysis everything looks random, that's an
21 answer in itself.

22 DR. KAMINSKY: I wouldn't say that. I
23 didn't say that.

DR. POHLAND: You suggested though that the

question on the swales has been answered. I'm
1 not sure in my mind that I believe that yet.

2 DR. KAMINSKY: The swales, I'm again
3 speaking from memory over several years, I do
4 recall that the swales are transected and extensive
5 analysis was performed. There was no support---

6 DR. POHLAND: What concerns me is that
7 the reason why that conclusion was drawn as I can
8 ascertain it is because of the uncertainty of
9 everything around the swales, the conclusion was
10 made that the swales didn't have this impact. Now,
11 my problem with that conclusion is that when I
12 reviewed the notes of the trenching for the drainage
13 system, it seemed like all along the whole trench,
14 particularly in certain areas and in the swale areas,
15 these areas were filled with refuse and if I were
16 to pick out an area where I would get movement,
17 migration from the canal, I'd pick those areas.
18 I'm not sure all the refuse fill areas were neces-
19 sarily in the swale areas. So then if I compare
20 data from one of those other refuse fill areas to
21 the swale area and saw that they were the same, I
22 might reach the conclusion that the swale area
23 didn't have an impact. I think there is some

1 concern about concluding that the swale wasn't
2 important because I think what was deposited in the
3 swale and in other areas around the site is
4 important with regard to what you may find out
5 there in the soils or whatever layers are encountered.

6 DR. WELTY: I think we need to move on at
7 this point.

8 DR. POHLAND: I would just like to say
9 that I strongly recommend that this kind of
10 synthesis of the data be made for us.

11 MR. HOFFMAN: I guess that's clearly what
12 is intended, the data base still is intended to be
13 able to do that. That's clearly one of its tools.
14 It's a matter of timing at this point. The kind
15 of thing that we're talking about, taking this
16 and storing this, is it in the fill or in the soil,
17 how does it plot, how does it look, inserting the
18 EPA data into the system, there is more than just
19 EPA data in this to go into this. That's clearly
20 what the data base system will do.

21 DR. POHLAND: I guess what I'm interested
22 in establishing today are perhaps what some of
23 your priorities should be and I think this is one
of them.

1 DR. STOLWIJK: I think, Fred, I couldn't
2 agree more. The value of this is that although it
3 may not be, it may be only order of magnitude data
4 which I don't have any copies of, it would however
5 be a data set that was not collected with a
6 particular theory in mind and I think that makes
7 it a very valuable data set.

8 DR. KAMINSKY: It was collected with a
9 particular theory in mind. It's not the one---

10 DR. STOLWIJK: Not this particular one.

11 In addition to that, the evaluation that
12 is going to be carried out is going to be carried
13 out on a systematic basis by a machine which, if
14 you also take into account that it was a data set
15 that was not collected for this purpose, would
16 yield conclusions that come from this to be
17 especially valuable in the process that we are in
18 here. I think that the TRC should consider that
19 as a very high priority and something that doesn't
20 require any further input. It's going to test
21 the data base management system.

22 MR. HOFFMAN: It's clear, our direction
23 from the TRC internally that that data base manage-
ment system is critical to our project. There is

1 not a lot of things to be done to speed that
2 process up.

3 DR. STOLWIJK: I'm not in favor in
4 microscopically examining the data that has been
5 collected but this particular data set serves the
6 purpose of describing geographically and topographic-
7 ally what is in the EDA. It is likely to help
8 support or defeat the hypothesis as to how the
9 stuff got there which I think is very important
10 for reassurance that it won't occur.

11 DR. WELTY: When we come back I'd like to
12 go through the reports of the consultants. Do you
13 want to finish?

14 DR. STOLWIJK: I think it will allow us
15 to make one map out of this whole thing which will
16 then show us whether, in fact, concentrations are
17 unordered and due to random processes and so that
18 there isn't any particular area that we need to be
19 concerned about specifically and it tells us
20 whether and we hope that it will tell us something
21 about time trends that may be established by any
22 duplicate measurements between the state and the
23 EPA and whatever. There is a likelihood that by
luck we will have some comparable measurements.

DR. WELTY: Let's take a ten minute break.

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(Whereupon, a ten minute recess was taken.)

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DR. WELTY: Go ahead, Dr. Stolwijk.

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DR. STOLWIJK: After going through the materials that were collected and I must compliment the staff on the effectiveness in which they have inundated us with the things we asked for, it became more and more apparent to me that deriving supportable and definitive conclusions from that mass of material is probably an illusive objective. It led me to also discuss this with a number of people in the environmental advocacy field because I want to learn what their likely responses might be to different approaches in deriving habitability criteria.

As I mentioned earlier, I also despair about arriving at any criteria in that fashion that would stay put, that would be accepted and that would remain accepted. Quite apart from the fact that the implementation of such criteria or the determination of such criteria in detail are in fact being met or not being met might easily

1 result in a condition, for instance, where the
2 determination of the habitability of a certain
3 house and the assurance of that habitability might
4 cost more than the house is worth. Theoretically
5 it is possible to define a set of measurements
6 and a set of criteria for the habitability of a
7 house if you want to really assure the safety of
8 that house for all time. You might end up with
9 procedures which would cost more than the value of
10 that house. That, of course, is an excessive
11 extrapolation of what might happen but I think it
12 can be used to indicate that the highly specific
13 assurances and the risk assessment procedure
14 basically will lead to an endless morass that I
15 don't think any of us really want and that, in fact,
16 will not in this micro kind of environment, will
17 not produce the results that we or the people
18 directly interested are really looking for.

19 So that then leaves us to a set of condi-
20 tions that would be, or criteria that would be
21 much more general than I think we were thinking
22 about in the earlier sessions, that we were trying
23 to explore in the earlier sessions. That then led
me to first of all to try and see whether we could

1 try and agree on a notion of habitability or a
2 notion of safety or a comparable notion of safety
3 because I think what is inherent in the kind of
4 criteria that would be based on the concentration
5 of specific chemicals would be a notion that those
6 levels and those concentrations would, in fact, be
7 safe and that those levels and concentrations
8 could, in fact, be assured, all of which would
9 become very difficult. Also, we do not provide that
10 for other conditions and other situations. It would
11 be a totally unusual level of certainty that would
12 be implied. I'm trying to compare it with the
13 kind of risks that might exist in housing in
14 general and that's why you see these three kinds of
15 risks.

16 It would be my guess, based on everything
17 that I have seen, that living in Love Canal under
18 the current circumstances would end up on the high
19 end of the third category or the low end of the
20 second category. That would be my guess. So you
21 would be sitting in an environment that in most
22 places and under most circumstances, in fact, is
23 being found acceptable. It is the special condi-
tions that surround this particular issue that make

acceptability not automatic and not easy.

1 The only way that I think we can and I don't know
2 whether it's possible or not, but the only way in
3 which that acceptability, in fact, might be accepted
4 widely, and it would have to be accepted widely,
5 would be if we could through comparisons and just
6 by offering comparisons based on data that were not
7 gathered specifically for the purposes by parties
8 who were interested in any findings, on the basis
9 of such comparisons, we can come to the conclusions
10 and support of conclusions and have other people
11 accept the conclusions that, in fact, the risks are
12 in the usual range that we might get to habitability.
13 It would be the function of the authorities involved
14 in making pronouncements of habitability to actually
15 ascertain that the criteria that we would set, in
16 fact, are being met. That would have to be
17 demonstrated.

18 I think the criteria ought to be set if
19 they're going to be useful at all in such a way
20 that we will not be continuously having to monitor
21 an endless number of places for an endless number
22 of compounds because that would be the consequence
23 of criteria that are highly detailed. I would

1 suggest that the only criteria that are of any
2 usefulness if there is going to be habitability
3 would be criteria that would be generic for the
4 whole district, understandings about how things
5 operate in the whole district, understandings about
6 the degree of monitoring and the degree of security
7 that would be provided and the form in which it
8 would be provided. I think those are the kinds
9 of criteria that make some sense.

10 Now, precisely what form they should take
11 I think is not something that we probably ought
12 to completely presume upon ourselves to actually
13 develop. I think they ought to be agreed upon in
14 a sense with some kind of feedback from the
15 community that we are asking to accept these
16 criteria. In other words, unless these criteria
17 are accepted in advance as being reasonable, we
18 will end up with pressures to change the criteria
19 or pressures to in any specific cases seek excep-
20 tions from these criteria or to seek exaggerated
21 implementation of these criteria. I think the
22 criteria have to be accepted in an atmosphere of
23 trust by all concerned. If we can develop criteria
of that type, then I think our mission will be

1 be relatively simple and I think the implementation
2 of these criteria and the assurance of these
3 criteria then becomes a relatively simple matter.

4 The difficulty will be, in my view, the
5 establishment of criteria that are sufficiently
6 credible and that are sufficiently reasonable and
7 sufficiently understandable by all that they can
8 be knowingly and willingly accepted. I would hope
9 that such a set of criteria, if it can be developed,
10 would then lead to the re-establishment of a more
11 trusting relationship between the population and
12 the people who are in charge of maintaining all
13 this equipment and who are in charge of maintaining
14 public health or assuring the public health in the
15 area.

16 That's what I come down to and I think
17 that we are still looking at comparability as one
18 of the elements that will lead to acceptance. I
19 think that independent demonstration, that in
20 fact the situation has improved considerably, I
21 think it is an important element. If that can be
22 done on the basis of these soil determinations for
23 instance, that would be very helpful. If it can
be done on the basis of the total load of organic

1 chemicals in a currently occupied or a number of
2 EDA houses, and houses outside the area, it would
3 be helpful.

4 I think that the assured monitoring of
5 the operation of the containment system is clearly
6 a thing that should be specified and agreed upon as
7 being acceptable. I think that based on that kind
8 of consideration, we could probably arrive at a
9 set of relatively simple criteria which, if met,
10 would then constitute a recommendation for habit-
11 ability and it would also set up a set of criteria
12 that would assure the maintenance of these condi-
13 tions, that would assure that these conditions
14 would from then on improve and not get worse, and
15 there would be adequate warning or adequate notifica-
16 tion if, in fact, something should happen that in
17 any way affects the livability in the area. I
18 think it would be a very unlikely event but I
19 think there ought to be mechanisms in place so
20 there is a coordinated way of communicating any
21 unexpected developments to the people that might
22 live in the area affected.

23 I think there is also something to be
noted that I think represents an improvement. I

1 think the whole problem has indicated that there
2 was a severe lack of coordination between all the
3 parties and agencies that have responsibilities
4 in some way. It's an unfortunate fact that our
5 regulatory agencies and our public health agencies
6 were not designed with this kind of problem in
7 mind. They were designed for other reasons with
8 a rationale and a philosophy that was aimed at
9 different things. It's not surprising when a
10 totally new and different problem arises that the
11 system finds itself in difficulty responding to it.
12 I think the Love Canal problem is a clear indica-
13 tion that both the scientific establishment and the
14 regulatory establishment were not prepared to deal
15 effectively with this on a day to day basis. I
16 think we've all learned from it. I think the
17 establishment of a technical review committee
18 clearly has helped the situation in this particular
19 case. If there had been a coordinated response
20 team from the very beginning, then I think some of
21 the difficulties that have arisen here would not
22 have developed to the extent that they have. I
23 think one of the lessons that we can draw on and
we might make that recommendation is that there be

1 in the case of similar incidents or other Super
2 Fund sites or sites where there are serious ques-
3 tions like this, that there be a coordinated
4 response team that be established very early in
5 the game and that that coordinated response team
6 include under all conditions at least one individual
7 with an understanding of public reactions to this
8 kind of event. I think it is an essential element.
9 I think if there had been a coordinated team in
10 1977 and if that coordinated team had had the
11 benefit of the advice of Dr. Miller and Dr. Fowlkes
12 here, then I think the total history here would
13 have been totally different. I think we've
14 learned from that and we might as well. We're
15 all willing to learn and understand things better
16 as a result of what happened. It is quite clear
17 that there are lessons that have come out of this
18 particular problem and I think they should be
19 ---I think these lessons are probably difficult
20 to put down for any of the participants and I
21 think this group might be able to devise some
22 recommendations as to how responses to this kind
23 of situation might be organized in the future.

That's a long tale. The one thing that

1 you see here in terms of numbers, and I've tried
2 to avoid numbers as much as possible, is a set of
3 numbers that was measured, it's on page 5 of the
4 handout, it represents measurements of air
5 contaminants of similar kinds that were done by the
6 most sophisticated type of equipment that is
7 currently around, a high level of quality and a
8 high level of reproducibility both in the sampling
9 as well as in the measurement. They were carried
10 out by the same outfit using the same equipment at
11 two different times. In the Love Canal area it
12 was measured outside residences in ring one in
13 July of 1978 and you see there the concentrations
14 for six of the compounds that overlapped with the
15 measurements that were made in Bayonne, New Jersey
16 and Elizabeth, New Jersey.

17 The differences that you see here are the
18 outdoor concentrations in Love Canal. I have put
19 down there the lowest value that was measured and
20 the highest value that was measured in any of the
21 ten sites that were observed. These are the highs
22 and the lows, absolute highs and absolute lows.

23 DR. CHALMERS: What do the 50 percent and
90 percent mean?

DR. STOLWIJK: I was going to get to that.

1 In New Jersey, the measurements were made in such
2 a way that the outdoor measurements correspond,
3 were done exactly the same way as they were done
4 in Love Canal. They made a great many measurements.
5 What I'm showing there, the 50 percent ones were
6 8 micrograms per cubic meter of benzene, for
7 instance. 50 percent of the measurements were
8 higher and 50 percent of the measurements were
9 lower.

10 DR. CHALMERS: So it's the median?

11 DR. STOLWIJK: It's the median. The 90
12 percent one is the 90 percentile measurement and
13 only 10 percent of the measurements were above that.
14 It gives you a little bit more information than
15 just the average of the high and the low.

16 Then for comparison I'm also showing you
17 the levels that were measured when you put a
18 monitor on a person and that person carries that
19 monitor around for a 24 hour day and then you
20 actually find out what people are exposed to
21 rather than some machine sitting outside is being
22 exposed to. When you do that, you find that the
23 levels given under person, these are the actual

1 person exposures that were measured in Bayonne
2 and Elizabeth, New Jersey. Again, you have the
3 median and the 90th percentile measurement.

4 It's important to recognize that the
5 outdoor measurement is then somewhat indicative
6 but it's not a very good measurement of exposure.
7 People, in fact, are exposed to more than that
8 because people mix around with things a lot. They
9 do things. They are around automobiles that put
10 out benzene. They are in general in different
11 places where their likelihood of being exposed is
12 higher than it is outdoors. If you did the same
13 thing for a resident in ring one, then you'd
14 probably would have found concentrations inside
15 that residence that would have been higher than
16 the ones outside. We don't have those measurements.
17 I can't show them to you but if there were, they
18 would be higher.

19 DR. WINKELSTEIN: Let's take, for example,
20 benzene. 10 percent of the Bayonne measurements
21 were about 15, whatever that is. Now, is this
22 the highest measurement?

23 DR. STOLWIJK: No. That's the highest
that was seen but they only did about ten. It

doesn't make sense to make it 50 in a 90 percentile.

1 DR. WINKELSTEIN: I see. I get you. So
2 they're really not comparable.

3 DR. STOLWIJK: The New Jersey data is
4 much better than Love Canal data. They also
5 spend \$7 million.

6 These are now the data that EPA is using
7 in any event to determine whether or not and
8 which chemicals ought to be regulated in the indoor
9 environment or in the outdoor environment, or which
10 one should have guidelines. They will probably
11 stand. The New Jersey data is highly representa-
12 tive of what an industrial population is exposed to.

13 DR. HUFFAKER: Is this an industrial area
14 or is this a residential area?

15 DR. STOLWIJK: It is in an industrial area.
16 It is done as a sampling of the whole area, the
17 residential as well as industrial. These samplers
18 were located to be representative of the exposure
19 of the population.

20 DR. FOWLKES: So to be comparable, that
21 would also take into consideration the industrial
22 areas of Niagara Falls?

23 DR. STOLWIJK: It's a similar relationship

just as the measurements done in Love Canal
1 obviously would have the benefit or damage done by
2 things that were contributed to the air outside the
3 actual Love Canal area.

4 DR. CHALMERS: Do you have any explanation
5 for the very high chloroform? That's really the
6 only one that's out of line.

7 DR. STOLWIJK: No. That's just one
8 measurement that they had. I just gave you the
9 highest measurement.

10 DR. CHALMERS: It may be an aberrant
11 measurement. That's almost a drowsy dose.

12 DR. STOLWIJK: No, not really. 70 micro-
13 grams per cubic meter isn't going to put you to
14 sleep.

15 DR. WELTY: You felt we could synthesize
16 these criteria to a relatively simple format and I
17 just want you to comment on how we, as the managers,
18 of this project, should proceed from this point in
19 terms of developing these criteria. Do you feel
20 that we can take the written comments from each of
21 the consultants and develop a working document that
22 we can then review at our next meeting in terms of
23 the logical sequence of what you've said?

1 DR. STOLWIJK: That's the only way we're
2 going to get a coordinated kind of representation
3 out. I would think that the staff or the TRC
4 staff take the comments that you've gotten together
5 here and try to synthesize it into what you perceive
6 to be the drift that's been presented.

7 DR. WELTY: And then you'll shoot it
8 down the next time.

9 DR. WINKELSTEIN: I kind of would like
10 to hear all of these reports and discuss them
11 because they all interact.

12 DR. STOLWIJK: That's what we're doing
13 here now.

14 DR. WINKELSTEIN: I'm not sure that's
15 what you're proposing.

16 DR. WELTY: Could we then, rather than
17 have a prolonged discussion, perhaps we could go
18 on in sequence. Is that agreeable to everyone?

19 Dr. Pohland, would you be willing to go
20 next? Do we have copies of Dr. Pohland's report
21 distributed?

22 DR. POHLAND: I realize that you got it
23 just today or maybe within the last few days. You
probably haven't had an opportunity to discuss it

or to read it in detail.

1 I've taken a little different tact here
2 because I felt that my assignment, as I understood
3 it last time, was to address the technical and
4 engineering issues related to the remedial actions
5 and more specifically the treatment system. I've
6 intentionally avoided concerning myself with the
7 health and welfare issues. I'm trying to address
8 simply here as a preliminary evaluation the
9 technical and engineering rightness, wrongness,
10 sensitivities and so forth of what I see out there
11 and also what is intended to be implemented in the
12 future.

13 What I recognized also was that I was
14 faced with a tremendous fragmented array of
15 information and I've been trying to reconcile this
16 in my own mind in some kind of chronology of events
17 that occurred since the issue came up in 1978.

18 What you have before you is my perception
19 of how things developed with regard to control and
20 remedial action. I offer it not only for my own
21 edification but perhaps for your own and also for
22 an opportunity to get feedback should my perceptions
23 be in error. So I think what you will find in this

1 document is a kind of a procession of events that
2 occurred, some in sequence and some in parallel,
3 that have addressed a desire to contain the site
4 and to deal with the problems specifically related
5 to the leachate production on the site.

6 In this perusal of the information that is
7 supportive of this, what I attempted to do is also
8 usually in parentheses indicate the information
9 that I would like to see brought to our attention
10 in some understandable form so that it could be
11 an indication of the assurances that I think need
12 necessarily be built into any criteria that we
13 might come up with. There are assorted reports.
14 We've already talked about some of the details and
15 data that I think require additional synthesis so
16 that we can use them in our deliberations on
17 whether or not some of these assurances are possible
18 and how they may be formulated in our final
19 recommendations.

20 I believe that in a general way what has
21 been done technically and engineering-wise is
22 acceptable state of the art type of approach. I
23 think we need fortification on data that would be
suggestive of whether or not things are getting

1 better, whether indeed the system is doing what
2 it was conceived to do and whether the further
3 remedial actions will, in fact, dovetail into the
4 already existing systems in a beneficial manner.

5 In addition to that, I think we need some
6 additional assurances and written confirmation of
7 procedures that will be imposed on the systems to
8 indicate how they are going to be managed in the
9 future. I would like to receive, therefore, from
10 the state, since they presently have the responsi-
11 bility and the overall remedial action and also
12 treatment system some documentation of established
13 procedures relating to not only the operation of
14 the systems but also the monitoring of the systems
15 and how this monitoring data is then used in a
16 feedback way to provide assurances that the system
17 is under control and that it's actually doing the
18 job it's intended to do. I think I would leave it
19 at that at this time because I think the rest of the
20 commentary here and my narrative will support those
21 kinds of concepts.

22 I would repeat again that I'm not, I
23 intentionally stayed out of the health-welfare
implications of this thing because I looked

1 specifically at the technical issues that I felt
2 related to those systems that have been placed in
3 place and are intended to be implemented to
4 accommodate the control structure that I think we
5 need along with the criteria for habitability.

6 I would be glad to entertain any questions.
7 I would certainly like to get some feedback, both
8 from the state and maybe from our panel with
9 regard to what I've said and presented and whether
10 there are some issues that I could respond to in
11 a fortifying manner with regard to some of the
12 topics that have been assigned to the other panel.

13 DR. WELTY: One of the things that
14 Mr. Steele asked that we discuss or present to the
15 consultants here is the remedial action with regard
16 to the sludge. Do you feel comfortable explaining
17 that?

18 DR. POHLAND: The sludge from the treat-
19 ment plant?

20 DR. WELTY: Yes, in terms of the plasma
21 arc. Just a little bit about how the treatment
22 plant works in terms of removing the organics.

23 DR. POHLAND: Just as an overview of the
treatment plant, it's a technology that is used for

removal of what is normally referred to as refractory organics, meaning that they would not be well removed by biological processes. The treatment system is established to be a so-called physical chemical treatment system and the core of the system is the absorption system, the activated carbon beds that will remove at least those chemicals that are in the aqueous phase, that are susceptible to absorption on activated carbon. The pollutants that come into the plant from the drainage system are really separated between the bottom sludge from the clarifier, which is the first process in the sequence of processes, and then the absorbed materials that reside on the carbon in the second phase of the process. Now, that leads to then, of course, the sludge residuals and the spent carbon in time, both of which require proper disposal.

The sludge presently is being stored in large tanks on site. Presumably the problem with the sludge is that a technology is such that it hasn't been established as to what really is the best way to deal with the sludge other than burying it somewhere. The notion is to explore the

1 possibility of plasma or treatment of this and
2 I've asked for the cooperative agreement that
3 apparently has been established between the EPA
4 and a company who is promoting the use of this
5 particular technique for the destruction of
6 materials such as are found in the sludge. That
7 seems to be the solution of focus at the present
8 time. There is a hope at least that this will
9 prove to be a technique that will properly deal
10 with this type of material.

11 There have been some other recommendations
12 with regards to treatment of these materials. The
13 usual one that crops up is incineration. The
14 problem with incineration of unknown concentrations
15 of materials and mixtures such as would accumulate
16 at this plant is that during the process of incinera-
17 tion, unless it's highly controlled and monitored,
18 it's possible to release from the incineration
19 process certain volatiles that would end up in the
20 air environment.

21 At the present time, with regard to sludge,
22 it's being stored. It will probably continue to
23 be stored on site until some feasible technique
is established to deal with it off site.

DR. CHALMERS: What is a plasma arc?

1 DR. POHLAND: Well, I should ask the
2 chemist back there.

3 DR. WELTY: Dr. Nick Kolack, would you
4 stand up? Dr. Nick Kolack is the person in the
5 State Department of Environmental Conservation
6 responsible for the treatment process. I was just
7 wondering if you had any comments in reviewing
8 Dr. Pohland's report, if you had anything that you
9 wanted to emphasize or comment on in that regard?

10 DR. KOLACK: The only comment is I can
11 get into the details of plasma arc, if you wish,
12 but I know you have a pretty full agenda.

13 DR. WINKELSTEIN: Just one sentence.

14 DR. KOLACK: Basically, EPA and New York
15 State have engaged in a cooperative agreement to
16 explore the demonstration of plasma arc technology
17 in the destruction of hazardous wastes. A mobile
18 trailer has been built.

19 DR. WINKELSTEIN: What is a plasma arc?

20 DR. KOLACK: Essentially the technology
21 is based on a high temperature arc up front in what
22 we call a reactor. It's very similar to an arc
23 welder of sorts. The air is forced through that arc.

The air becomes super heated fairly quickly.

1 Temperatures in this plasma flame are expected to
2 be in the 10,000 to 15,000 degrees centigrade range.
3 We're talking about temperatures fortified on the
4 magnitude of what is present in rotary kilns.

5 The trailer, as I said, is just about
6 complete and ready to begin the first testing, the
7 first test phase. The contractor happens to
8 reside in Canada. The trailer is expected to be
9 moved in Kingston, Ontario shortly where the
10 shakedown testing will occur. The testing will be
11 conducted during the course of the summer and we
12 are hopeful that the results can be successful
13 enough to warrant bringing it down to New York
14 State for further testing.

15 Long range plans, we hope to be able to
16 apply it to the sludge or the oils which are derived
17 from the waste water treatment plant in Love Canal
18 and to successfully demonstrate the process on that
19 particular material.

20 The process is not aimed specifically at
21 the Love Canal sludge. It will handle any liquid
22 or organic waste. The waste will be injected
23 through that flame so the reducing atmosphere will

1 be generating quite a bit of carbon, quite a
2 bit of hydrogen. We're disrupting all the
3 chemical species being fed into the system. We
4 have a lot of hopes on it. At this time we have
5 a long way to go in terms of demonstrating test
6 burners and that kind of data to see if it would
7 meet the design criteria.

8 DR. STOLWIJK: You may not be the person
9 responsible for it but it sounds like an intriguing
10 development but it sounds like a developmental
11 process. The tanks that you have there now can
12 accommodate how long a period of operation?

13 DR. KOLACK: Okay, we have a tank fram, as
14 we refer to it, which has the capacity of 40,000
15 gallons. As of today we have approximately 17,000.

16 DR. STOLWIJK: How many years can you---

17 DR. KOLACK: I would say very easily
18 three to four years.

19 DR. STOLWIJK: What kind of back-up scheme
20 have you if the plasma arc doesn't work?

21 DR. KOLACK: If we have no other alterna-
22 tive of destruction and we cannot remove it from
23 the site, we would be forced to go into expanded
storage.

1 Our technology, by the way, is an effort
2 taken through the EPA and New York State. There
3 are other technologies throughout the country that
4 are still being explored. It's very possible that
5 one of them may come on line and be sufficient
6 where our type of material can be sent for disposal.
7 We're not limited to the plasma arc. This is
8 simply one pathway that we happen to have chosen
9 ourselves.

10 DR. STOLWIJK: Did you have a specific
11 reason to try it out rather than the more conven-
12 tional rotary kiln?

13 DR. KOLACK: The rotary kiln has high
14 temperatures but based on a lot of testing of the
15 projects to be performed today, there is still a
16 problem of a dioxin feed. Rather than perhaps
17 put all our eggs in one basket, there were many
18 advantages that are potentially offered by the
19 plasma arc technology. We simply feel that it does
20 have that potential to destroy not only dioxin but
21 the entire sludge material. I'm not sure how many
22 people are aware but dioxin requires less energy
23 thermally to destroy it than those PCBs and certainly
requires less energy than carbon tetrachloride.

1 We'll be testing this in Canada this summer. If
2 we can demonstrate early on that refractory
3 material that Dr. Pohland mentioned earlier, the
4 things that are difficult to destroy thermally,
5 if they can be demonstrated on the system up there,
6 we feel we have a good chance of destroying things
7 like dioxin. But it does warrant further testing
8 on the dioxin feed stock before you can go into a
9 full permit.

10 The system is rated at about one gallon
11 per minute. Hopefully, if we are successful in
12 demonstrating it, we could be permitted to hook it
13 up at the plant and go into a full scale operation,
14 40 hour week, it would take us less than three
15 months to destroy the full inventory.

16 DR. STOLWIJK: How much NO₂ will this
17 process produce?

18 DR. KOLACK: Right now we expect very
19 little or essentially nonexistent. On some of the
20 testing to date, the only data we have is on a
21 prototype unit that bears little resemblance to the
22 current system that has been redesigned. We're
23 going to be checking that and we'll have to verify
that.

1 DR. WELTY: I just wanted to, from a
2 non-engineering point of view, describe how I saw
3 this treatment plant working when Fred and I
4 toured it yesterday and you might look at the
5 board here. As this stuff comes in, this influence
6 comes from the perimeter of the canal and this
7 stuff is pumped into this clarifier. The clarifier
8 is just like a big vat and the heavy stuff goes
9 to the bottom, which is this oily sludge that was
10 described as being used in these studies. This is
11 extracted here and this is what has accumulated
12 to the 17,000 gallons. Is that the number?

12 DR. KOLACK: Approximate figure.

13 DR. WELTY: This is the amount of the
14 sludge that now exists on site and it's contained
15 in---well, there is actually four-ten thousand
16 gallon vats so, in other words, almost two of
17 those vats are filled with this stuff.

18 Then the aqueous phase goes through a
19 series of pipes and it's certainly not as simple
20 as I'm drawing here, into this carbon and the
21 carbon sort of picks up all these organics and all
22 of the organics---not all of them, but the great
23 majority of the organic compounds are attached to

1 this carbon. There is two of these big carbon
2 filters so that they're connected and the flow is
3 like this and of course it percolates through all
4 of this carbon to remove the organics. It goes
5 into the second one and then the effluence goes
6 into the city sewer system.

7 The city has certain regulations that
8 this effluent has to meet so that there are certain
9 guidelines in terms of what type of chemicals can
10 be in that effluent. The city does measurements
11 on the effluent to determine whether or not the
12 treatment plant is meeting those guidelines.
13 As I understand it from yesterday's discussion,
14 the effluent has met the city's guidelines. At
15 least the treatment plant has never been informed
16 by the city that it was exceeding the guidelines
17 established.

18 Over a period of time this carbon fills
19 up with organic compounds and there is a sampling
20 procedure done here by the Department of Environ-
21 mental Conservation and it's measured by the
22 contract lab so that the sampling is done here and
23 there is also some sampling of the influence and
the effluence that's measured by the DEC for the

1 various organic compounds that are in this aqueous
2 phase. Actually, I guess the measurement is done
3 at this point so there is three different measure-
4 ments that are done of this aqueous phase.

5 Once the organic compounds in this
6 particular point in the system are increasing,
7 approaching the levels of the guidelines, then it's
8 felt that this carbon is almost filled with organic
9 compounds and is in need of being replaced.

10 DR.STOLWIJK: So twice a year these, one of
11 these carbon elements, has to be replaced. Then
12 the spent carbon is taken to a toxic landfill.
13 As I understand it, it's a CECOS landfill?

14 DR. KOLACK: CECOS.

15 DR. WELTY: So all of this toxic or carbon
16 that contains, that's filled with the organic
17 compounds is then disposed of in this hazardous
18 waste landfill.

19 DR. KOLACK: The company is CECOS.

20 DR. WELTY: Fred, did I get it right?

21 DR. POHLAND: You missed one process right
22 at the end. There is a filtration system, a
23 pressure filter.

DR. KOLACK: It's after the clarifier.

1 DR. WELTY: That's to filter out any
2 leaves or any larger things that might be floating
3 on the top.

4 DR. STOLWIJK: What is the fraction that
5 you're now removing, like 10,000 gallons a year or
6 so?

7 DR. KOLACK: I was just talking to Brian.
8 We estimate that we can't put flow meters on this
9 material. It's about 300 gallons a month would be
10 a close approximation.

11 DR. WELTY: The sludge?

12 DR. KOLACK: Yes, out of the clarifier,
13 right.

14 DR. STOLWIJK: Has that been going down
15 over time?

16 DR. KOLACK: We can't answer that. It's
17 been fairly constant. The way the system is plumb,
18 we don't have flow meters in there. Oftentimes we
19 will transfer it with a considerable portion of
20 water to keep it loose and then that has to be,
21 that water would be taken off and sent back to the
22 plant.

23 DR. STOLWIJK: The purpose of the whole
operation is to not remove gradually all of the

1 toxic materials out of the Love Canal. The purpose
2 of the operation, as I understand it, is to see to
3 it that to put a barrier so that nothing gets out,
4 is that correct?

5 DR. KOLACK: The purpose of the plant?

6 DR. STOLWIJK: Yes.

7 DR. KOLACK: The purpose of the plant is
8 to treat the water that's contained in the drain
9 from migrating out.

10 DR. STOLWIJK: Right. What you are now
11 getting into is a very high tech solution of des-
12 troying or changing a very small fraction of what
13 is contained in Love Canal. I'm sure that thought
14 has been given to the more simple solution of
15 reinserting it back into the canal.

16 DR. KOLACK: We have not wanted to---

17 DR. STOLWIJK: Never thought of that?

18 DR. POHLAND: There is a problem, I guess,
19 associated with that because at the present time,
20 as I understand it, the plant, its operation is
21 permitted by the state and has this discharge
22 agreement with the city. If Love Canal receives
23 no hazardous waste, it has a new input. I would
suspect that Love Canal would necessarily then have

to be considered a hazardous waste disposal site.

1 That puts it under REGRA.

2 DR. STOLWIJK: If you actually take it out
3 of the drain and put it back into the top, then
4 you never remove it from the site and you never
5 reinsert it.

6 DR. POHLAND: That's the argument often
7 voiced but not accepted.

8 The other problem that I might see to that
9 approach is that remember that the canal is not
10 like a hazardous waste disposal site per se. It's
11 not a line site. Obviously it is contained only
12 by virtue of the natural geology in the region.

13 DR. STOLWIJK: And by virtue of this
14 pumping.

15 DR. POHLAND: Which says that reinjection
16 of material is probably not the best way of going
17 about it because you don't have the control at the
18 bottom that you would otherwise have in a hazardous
19 waste disposal site.

20 DR. STOLWIJK: What I can see happening
21 is you're taking one one-hundredth of 1 percent of
22 what's in the canal that is oozing out of the
23 bottom and you're reinserting it back into the top.

At least that is a known situation whereas the
1 installation of high tech solutions to deal with a
2 very small fraction that is getting out strikes me
3 as a very elaborate---

4 DR. POHLAND: It's a developmental solu-
5 tion. The real crux of the issue is that EPA hasn't
6 decided how it's going to deal with the transporta-
7 tion of dioxin. Now, within the next few years,
8 one would hope that a decision with regard to that
9 issue might be forthcoming. I think inevitably
10 EPA will have to come to grips with situations where
11 these kind of concerns exist. It's obvious that
12 there is a limit on the perpetual storage of these
13 materials wherever they occur. We have that
14 problem of uncertainty regardless of which way we
15 go. We have uncertainty with regard to the develop-
16 mental science or technology. We have uncertainties
17 about the transportation of ultimate disposal
18 off site issue and then, of course, we certainly
19 have the uncertainty as it relates to on site
20 injection and disposal.

21 DR. STOLWIJK: Now, somehow I feel uncom-
22 fortable with one kind of uncertainty and I don't
23 like to resolve an additional uncertainty by adding

a second or third uncertainty into the process.

1 I would rather pump it back into the canal if some-
2 body would let me.

3 DR. POHLAND: Yes, just to use that as an
4 example, we have a lot of landfill sites that are
5 biologically active. We, in fact, recover methane
6 from them to recover energy. In the process of
7 recovering gas, we get condensate and the issue of
8 disposal of that condensate comes up because now
9 the condensate, which is oftentimes a toxic type
10 of material, qualifies as a hazardous waste. The
11 EPA hasn't come to the decision on how we ought to
12 deal with that yet. Now, the logic is to dump it
13 back into the landfill because, after all, that's
14 where it came from.

15 DR. STOLWIJK: Well, I don't know how
16 everybody here would feel about it. It sounds to
17 me that this is another good example of trying to
18 persuade EPA to reconsider that particular problem
19 because I think if you do things in order to
20 maintain the security of a landfill, then to get
21 into yet another type of uncertainty and performance
22 problem in dealing with a tiny amount of effluent
23 that you are gathering instead of reinserting it,

1 to me doesn't make much sense but then it's not my
2 field. It doesn't have to make sense.

3 DR. POHLAND: The same issue, I think, has
4 already come up with regard to the disposition of
5 the sediments that has already come up that are
6 going to be cleaned up. The question was why take
7 them off site. Why don't you put them into Love
8 Canal?

9 DR. CHALMERS: Isn't it likely that to
10 reduce the water flow to 10 percent of what it was
11 is also going to reduce the amount of sludge by a
12 great deal?

13 DR. WELTY: That's what is projected but
14 we obviously wouldn't know.

15 DR. STOLWIJK: I was asking but they were
16 uncertain of which direction that's going.

17 DR. WELTY: Could we move on?

18 DR. KOLACK: I'd like to just make a
19 comment that, number one, in your discussion it
20 still sounds like you feel that the plasma arc is
21 specifically undertaken with the Love Canal intent.
22 We have many other sites in the state that that
23 process, once demonstrated, could apply to. It
doesn't make any sense to me through the funding we

1 have available where you have to spend and operate
2 a treatment plant pulling the material out of the
3 ground and treating it and then taking the residue
4 of toxic material and reinjecting it, we're not in
5 a crisis situation where we can't wait a few years
6 and hope that either the plasma arc or some other
7 development will be made available where we can
8 simply take this material and permanently destroy
9 it instead of reinjecting it.

10 DR. STOLWIJK: I want you to know it's
11 very far from my idea to attach your beautiful
12 plasma arc. I think it's a wonderful thing to
13 proceed with. I think, however, to tie it in with
14 this particular situation as one of the necessary
15 elements of a resolution here, it's perhaps not
16 the best way to go. I think it should be pursued.
17 It's a wonderful idea and it ought to be done but
18 I think to have it relied upon and brought into
19 the fray of the resolution of this particular
20 problem is probably not very wise.

21 DR. KOLACK: We had a question from Lou
22 of further remedial activities that our group will
23 be sponsoring this calendar year perhaps and I think
at least so far this morning that hasn't been men-

tioned. I think the intent is at least to make
1 it known.

2 DR. WELTY: Do you want to come up and do
3 that in a few minutes then? Why don't you just
4 come up here. I think it will be easier for people
5 to hear you.

6 I thought we had covered Lou's concern
7 but if there is more---

8 DR. KOLACK: I'm not sure and if we don't
9 please forgive me for interrupting.

10 We have under design now and I can't tell
11 you exactly when it will become available but we
12 wish to modify the pump stations in the south and
13 we have no need to increase pump capacity but to
14 ease the operation and maintenance down there.
15 That portion of the construction was performed by
16 the city back in '78 and in those pump stations
17 there is only one pump. Should it go out of
18 commission, not operating, potentially we have no
19 way to pump the leachate out of that side of the
20 field. On our team we wind up with a small crisis
21 and we have to get immediate repair.

22 DR. POHLAND: Permit me to interrupt you
23 but we did discuss the addition of pumps this

morning when we talked about the remedial action.

1 DR. KOLACK: Let me just summarize I
2 guess for just somebody else's benefit but it will
3 be short. We expect to add a second pump to those
4 stations and it will act as a back-up. I hope that
5 the work will be completed by December but I can't
6 guarantee that right now.

7 We have two concrete pads that are supposed
8 to be under way, should have been under way perhaps
9 a month ago. The contractor is gearing up for
10 that. They would be located, one would be very
11 adjacent to the treatment plant and the nature of
12 its construction is it would serve as a decontamina-
13 tion pad for vehicles in the future.

14 A second pad will be approximately across
15 the street. It would serve to provide temporary
16 storage of drums of waste material, excavated soils
17 from any of the projects that are undertaken from
18 here on. We have a problem with storage of drums
19 on site because of the lack of space. We wind up
20 storing them in the streets there and it's not an
21 acceptable effort.

22 There would be some minor excavation
23 below grade in the construction of those pads. We

1 do not view it as major. Those materials perhaps
2 as much as a foot deep would be scraped off to one
3 side and stored in drums pending resolution of
4 disposal. What that does for us in the meantime
5 is allow us to go ahead with construction of the
6 concrete pads. This is to maintain the operation
7 in and around the plant. We have some large
8 vehicles that deliver carbon and this would ease
9 some of the site operations.

10 We have just received bids on a contract
11 to undertake modifications to the treatment plant.
12 What will be happening there perhaps later this
13 summer will be changes in the plumbing, heating,
14 ventilation, things that will improve odor control
15 to the entire process that is on the blackboard,
16 provide a better safety factor for any staff that
17 works there.

18 Also under design is an administrative
19 building. It appears now that the construction of
20 that may be pushed to 1985. It would be a one
21 story type structure to serve as an office for
22 personnel, a place for meetings. We have inadequate
23 facilities for those purposes right now. We would
have a very extensive clean room or shower room

1 where people would come in or workers would come
2 in from one direction with street clothes, step
3 across into a work room or locker room where they
4 would don their work clothes for the day, and at
5 the end of the day the cycle would be reversed with
6 a shower facility in between and provide a little
7 better hygiene perhaps for our people.

8 That's it in a nut shell. I don't know
9 if anybody has any other questions. I don't know
10 how this impacts on the issues overall.

11 DR. WELTY: Well, I think it's just
12 important for people to know what's happening.

13 DR. KOLACK: I think this is a summary of
14 all the remedial construction which I think was not
15 addressed this morning through Bob Senior.

16 DR. WELTY: Thanks, Nick.

17 Glenn, you want to go ahead with your
18 presentation, please?

19 DR. SIPES: I had a brief report here and
20 as it starts out and I think some of the discussion
21 you heard this morning focuses on the problem on
22 what chemicals are you going to select and indeed,
23 are we going to select some Sentinal chemicals.
At the beginning of my report I just pointed out

1 that first and foremost we did have a large volume
2 of data, however oftentimes I found it uninterpret-
3 able. There is just so much. But most important
4 I think were the comments in many of the accompany-
5 ing articles that severely criticized the validity
6 of this data and I found that a major problem.
7 When I would attempt to select some chemicals, I
8 would go back and read Dr. Stolone's paper or the
9 OTA report and then have basic problems as to
10 whether or not these data were even valid. So I
11 found that to be a major problem.

12 I think a severe criticism also is that
13 EDA area, that too few samples were obtained in
14 order to obtain a reasonable profile of chemical
15 migration from the canal area. As you pointed
16 out, concentrations were often greater in the
17 control area or the declaration area than were in
18 the canal, et cetera.

19 This was only for a limited number of
20 compounds but that did shed some light on it or did
21 present some problems when attempting to pick
22 chemicals.

23 Also, and I think we discussed this at a
previous meeting, it's almost impossible to understand

1 what a trace amount may be or something that is
2 below detection or below a detectable concentration
3 when we do not know the standard deviation around
4 that sample measurement and the number of samples
5 that may have been taken. Oftentimes reviewing the
6 data, what you would find would be a mean value
7 of 700 parts per billion or whatever and then you
8 would look at the actual data and one was 2 and
9 one was a 1398 and you divide that by, add those
10 together and divide by two and then you get 700
11 so all these presented a variety of different
12 complex problems.

13 So then I sat back and asked myself if
14 we were setting criteria for monitoring and this
15 is essentially for monitoring as of a point in time
16 and continuous monitoring in the future, what would
17 our criteria be. If we're talking about migration
18 from the canal area, then I think first of all we
19 would start by choosing chemicals that were reported
20 to be dumped in the canal and also then were
21 confirmed by identification, select chemicals that
22 were found in the canal in a high enough concentra-
23 tion to insure a reasonable chance for quantifica-
tion of the chemicals in the EDA area and finally,

1 to select chemicals for monitoring based on the
2 above and also with respect to their known toxicity
3 or suspected human toxicity, likelihood to represent
4 reasonable indices of migration from the canal
5 area, the feasibility of obtaining accurate and
6 reproducible measurements.

7 So then, therefore, if we would follow
8 some sort of criteria along this line, then major
9 efforts would need to be expended along this line
10 to insure that the measurements are quantitative
11 and we have heard frequently that qualitative
12 measurements have been made but then frequently
13 that quantitative measurements are lacking.

14 Also, we need to know the definitive and
15 acceptable levels of detection stated in order to
16 be able to validate the results and again in the
17 future monitoring studies standard deviations
18 would need to be made available so that the analyses
19 could be accepted.

20 A question was also raised then what media
21 and I'll get on to the chemicals that I just chose
22 later on---what types of media should be measured
23 and looking through what Dr. Stolwijk reported, I
think we came down along the same lines. If we were

going to be monitoring them, the media which should
1 be measured would basically be those to which
2 individuals would be exposed such as shallow water,
3 soil and probably the indoor air. I can see no
4 reason for really measuring on a continuous basis
5 monitoring deep wells because I don't think those
6 waters are used in the drinking water supply. If
7 they are, then as was pointed out earlier, drinking
8 water is probably very well monitored on a level
9 with most other municipalities. So my suggestion
10 would be that the critical media would be the
11 shallow water, the soil and indoor air. I still do
12 find that the sump pump data may be worthwhile as
13 a means of monitoring for chemicals since it does
14 give us a chance for concentrations.

15 So then I went back again and went over a
16 number of the chemicals and decided to eliminate
17 from any consideration various heavy metals because
18 it seems that these do not give any pattern that
19 they were due to migration from the canal. There
20 has been a lot of work on the phthalates but again,
21 those do not seem to have come from the canal
22 migration. Although I think chloroform and the
23 other trihalomethanes would be good marker chemicals,

1 the fact that they were formed following chlorina-
2 tion of water, it may give misleading values on
3 those particular types of agents. So I eliminated
4 the trihalomethanes because they are produced
5 routinely through chlorination.

6 I came down then with a potential list of
7 marker chemicals and at the top of my list was
8 2378, tetrachloroparadioxin, otherwise known as
9 TCDD, not knowing that Dr. Kaminsky would be here
10 and presenting material that he presented this
11 morning. This compound is, as we know, is extreme-
12 ly toxic and it has been detected, as you heard,
13 in a variety of areas.

14 I should also like to point out that I
15 think the data that was presented this morning by
16 Dr. Kaminsky is a step in the right direction.
17 People here may have sounded to be a little bit
18 critical but the fact is that a model system was
19 established. Samples from an area such as the
20 sludge were tested, not just one particular chemical
21 but he was testing the real thing although it may
22 have been high concentrated. At least we have an
23 indication now of what type of effect the highly
concentrated sample might produce. If indeed he

1 could go on in the future to show that the change
2 in birth weight and the loss of maternal weight was
3 due to TCDD, I think that is a real step in helping
4 to define the potential toxicity of the chemical.

5 More importantly, his data may show that
6 there is not this synergistic effect. I think
7 that's one area where data is sorely lacking and
8 there is a lot of feeling now at the federal level
9 that we need to know more about the possible

10 effects of exposure to more than one
11 particular chemical. I don't know how many of
12 you realize it but most of the studies that have
13 been done on the toxicity of chemicals is due to
14 single exposures again to even usually very high
15 concentrations. So there are very few studies
16 where more than one or interactive effects are
17 known for chemicals. We're just to the stage now
18 where we may be able to mix one or mix two chemicals
19 together and ask if we have a synergistic effect,
20 not an additive effect but a synergistic effect.
21 The data is sorely lacking there. So I think the
22 fewer number of chemicals we may come up with,
23 the more important it would be.

Another chemical I had on my list was

Gamma BHC. Looking over the data from our past
1 meetings, I think, from what I've heard, high
2 concentrations of this were found in the canal. If
3 I'm correct, there were actually chunks of this
4 material. Is that correct, Tom, so that to me
5 seems to be a chemical that was there. Also in
6 evaluating the Pirnie Report, the persistent scores
7 for this chemical seemed to be appropriate for
8 monitoring. Looking at it, it was not highly
9 volatile but it had some volatility and it has
10 an intermediate tendency for absorption on various
11 matrices so I thought that there may be some chance
12 of picking up a chemical that would give, have some
13 ability for migration.

14 I was a little biased earlier on and I
15 thought perhaps the dichlorobenzenes maybe would
16 have the best chance for Sentinel chemicals.
17 High concentrations of these had been found and in
18 reviewing some of the data on blood samples, we
19 did find that and whether or not---I don't know how
20 valid those samples really are but I calculated
21 that in 2 of 36 blood samples, at least
22 1,4-dichlorobenzene was found in these blood samples.
23 The stability of that compound and probably it's

decreased metabolic potential in individuals and
1 in its stability, it may be a good marker chemical.
2 I think it's been found in all the media. It's
3 been found in the stores and found in the air.

4 Another compound would be the
5 1,2,4-trichlorobenzene and some of the other
6 trichlorobenzenes. Again, just reviewing the data,
7 the compounds seem to be reasonable.

8 I have some questions on benzene,
9 benzidine and benzene hexachloride. They are
10 known to have, because of their carcinogenic risk--
11 benzidine may be important because there were a
12 few other chemicals on here in the mean class
13 and I think perhaps something along the line it's
14 outside the line of the halogenated hydrocarbons,
15 perhaps in a mean line may be used usefully.

16 Also then we probably need to have a
17 representative aliphatic compound. Carbon tetra-
18 chloride was mentioned. I heard someone mention it
19 today. Also, I had a question on 1,1,2,2-
20 tetrachloroethylene which I thought would be a good
21 marker compound because it's been found in a number
22 of samples but then I was confused by the statement
23 that the monitoring system or the testing system

1 seemed to find 1,1,2,2-tetrachloroethylene but
2 I'm not sure if that's in the trapping systems or
3 the filter systems that have been used for
4 collecting this or not. Does anyone know what
5 the problem is with the 1,1,2,2-tetrachloroethylene?
6 The statement was made that there was a couple of
7 reports and it did seem to be more widespread.
8 That was one consideration.

9 DR. STOLWIJK: I think it was one that
10 was in New Jersey. It was in much higher concentra-
11 tions in New Jersey than it was here.

12 I think it was one of the chemicals
13 industrially related. Benzene is a marker that
14 can be used but the source of benzene nowadays is
15 almost always gasoline. All of the lead free
16 gasolines have what we got in return for having
17 lead free gasoline, is having benzene.

18 DR. WELTY: What about benzidine and
19 benzene hexachloride, are they also in gasoline?

20 DR. SIPES: No.

21 DR. WELTY: Would they be good markers?
22
23

1 DR. STOLWIJK: Benzidine would have
to come out of the dump.

2 DR. SIPES: That's what I think.

3 My bottom line here was that I just
4 presented this list as a means for open discussion.
5 I think my own feeling is that if monitoring is
6 going to be part of this remedial action and
7 habitability criteria, I think the fewer chemicals
8 that we're monitoring, the better off we would be.
9 If we could have monitoring over a larger number
10 of -- more samples taken at greater number of
11 areas instead of looking for fifteen or twenty
12 chemicals and coming up with the same story four
13 years from now, that there were not enough data
14 points, not enough areas were monitored. I think
15 if we could just select a limited number of
16 chemicals based on what was in the canal and these
17 maps that we're talking about, possible changes
18 over time, if we could find that particular data
19 on areas and then look for changes in concentrations
20 in particular areas, my own feeling is that would
21 be our best chance. I would hate again to have
22 fifteen or twenty chemicals being continuously
23 monitored in a limited number of areas and with

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criticisms coming up that we don't know the validity of that value.

DR. STOLWIJK: I think the comment was made by Steve this morning that monitoring the things that might be migrating is probably best accomplished in the monitoring wells outside the drain circle because that would catch both anything that came out of the dump and anything that was migrating towards the drain from the outside would be caught in these monitoring wells and of course they do provide sort of an averaging scheme for the groundwater and they're easily accessible. For surveillance they are an ideal mechanism and they would carry also those things that move with the water which is what you're really concerned with. Some of the insolubles are less --

DR. WELTY: Would that wells constitute shallow water?

DR. STOLWIJK: Yes.

DR. WELTY: Shallow water.

DR. STOLWIJK: Basically monitoring groundwater which is essentially the average of the water that is above the water line so that's

1 a convenient point that's already available for
2 a monitoring program, for a surveillance program.

3 DR. WELTY: Could we go on with your
4 report, Dr. Miller?

5 DR. MILLER: Sure.

6 DR. WELTY: It's been sent out to
7 everyone. Did everyone receive a copy?

8 DR. CHALMERS: Mine never arrived or
9 my mailing system -- I never got it.

10 DR. MILLER: Well, this is a little
11 anticlimatic. Because apparently the draft was
12 leaked to the media and all of Niagara Falls had
13 access to it before you did, Dr. Chalmers, and I
14 apologize to you for that. Everyone else knows.

15 We have attempted to put together a
16 statement that deals with the social concerns and
17 social parameters within which we think the work
18 of this group ideally would go forward or would
19 go forward with reference to and in doing this,
20 our principal concern is for two issues: Both
21 the absolute habitability of the area and the
22 perception that people have about the habitability
23 of the area which is to say the area could
conceivably be the safest place to live in America

1 but if people didn't understand or believe that
2 that was the case, there would be tremendous
3 resistance to living there. It is the case that
4 we all understand, I believe, the value to the
5 city and that would follow from reinhabiting
6 the Love Canal area.

7 The City of Niagara Falls is one of
8 those cities that sociologists think of as
9 trouble. The population is declining which for
10 us at least is a kind of marker, I guess, of a
11 whole lot of other problems that follow with
12 population decline. The population of the city
13 declined by something like 30,000 people in the
14 last decade which is about one-third of the
15 population. It certainly is the case that the
16 people who live in this community understand that
17 the tax base is eroding and that the relationship
18 of the city to the resident industry is perhaps
19 particularly problematic at this historical
20 moment for a variety of reasons. So that jobs
21 have been eroding, population has been leaving,
22 the tax base has been eroded. Love Canal is a
23 major problem but it's a problem within the
context of these larger problems that confront

1 this city and this community. In other words,
2 there is a tremendous bias, if you would, at
3 least at the political level in favor of
4 reinhabiting this area, getting those houses
5 back on the tax rolls, opening the school again,
6 the schools again, I guess there is only one
7 school there. And the feeling is that at least
8 in some quarters that the interest of the
9 community is to be served in this way. Added,
10 of course, to this but I assume is the sort of
11 universally known gaff of Rita Lavelle which
12 appeared in Time and Newsweek all over America
13 two or three years ago to the effect that the
14 task confronting EPA was to transform the image
15 of the Love Canal area to one that was essentially
16 benign hasn't escaped the attention of the people
17 who live in this community either.

18 It follows then that there is
19 tremendous sensitivity to the possibility that
20 our work might be organized around the principle
21 of expedience rather than one that stressed the
22 security of people who might come to live in that
23 neighborhood again. There is a large audience
for the work of this group as it moves forward

1 and I think anything that suggests that an
2 expediency is being emphasized is not going to
3 serve us well. In this respect, I would point
4 out for example a number of references that have
5 been made in the course of our meetings to the
6 possibility that we might hold Love Canal, the
7 Love Canal area to higher standards than those
8 that apply in the rest of the city or in the rest
9 of America as if somehow that might be the worst
10 thing we could do and it might be the case that
11 some people would be very troubled by it, that
12 kind of a situation. I think I might sleep much
13 better at night if I thought that the most
14 stringent criteria conceivable really had been
15 applied to the Love Canal area.

16 In any case, in view of this history,
17 we're suggesting that a single criterion should
18 organize the work of this committee and it's
19 unfortunate in a way that we weren't able to
20 come in with this document at the very beginning.
21 Of course, we didn't know what we need to know
22 in order to draft it. If that criterion is that
23 the determination of the present environmental
status of the Love Canal EDA is as safe as if the

1 toxic waste landfill had never been there, that
2 of course is a lot easier to say than it is to
3 operationalize. But at least it occurs to us
4 that it's an excellent starting place for us to
5 begin to think about working and how the work will
6 go forward and how we need to express it.

7 Moreover, we're concerned that, and it
8 has particular relevance I think for the presen-
9 tation that Mr. Sipes just made because I would
10 like to ask him whether the kinds of strategy
11 that he's proposing with all the advantages that
12 he has, that he sees to it, that it's going to
13 enable us to speak to what we refer to as common
14 sense questions about the wellbeing of the home,
15 family and neighborhood and particularly if, when
16 people are talking about toxicity, I don't know
17 and I continue to try to find out what toxicity
18 means because it seems that everybody or many
19 people use the term to mean rather different
20 things. I want to know that the Reverend's son
21 can mow the law and I don't know whether the kinds
22 of indicator compounds that we're talking about
23 are going to create a situation where we have a
very good picture of some kinds of chemical

1 activity in that area but not other kinds of
2 chemical activity and that's the kind of chemical
3 activity that affects his boy when he goes out
4 to mow that lawn. As we say in our report, the
5 work of epidemiology has sort of historically
6 developed and quite reasonably so with a
7 preoccupation marked by the polls of life and
8 death or birth and death and that the concern is
9 for tertogenic effects and carcinogenic effects
10 and there is a whole lot of other things that
11 we mean by health that fall outside of those
12 kinds of issues. Most particularly that's the
13 case where children are at issue.

14 Well, obviously we've asserted that the
15 criteria that are established here must not
16 direct scientific attention or inquiry away from
17 the possibility that the area is not habitable.
18 In a way I feel somewhat uneasy in even saying
19 this at these meetings because I don't believe
20 that any of us would wittingly do that but it's
21 conceivable that we could unwittingly do that.
22 There is certainly an apprehension in the
23 community that that's exactly what has happened
in some cases in the past, that good men and

1 women were misled about the true facts of the
2 case of Love Canal in consequence of which
3 research has been biased and on that account
4 is essentially unreliable.

5 We also think it would be ideal if
6 some effort was made to begin to document as
7 best as we conceivably can do the boundaries of
8 the chemical migration prior to remediation with
9 all of the flaws in the knowledge base that lie
10 there because it's a sort of necessary marker,
11 it seems to us at least, of the effect of
12 remediation. In the absence of it it's very
13 difficult, it seems to us for the lay person to
14 understand that things indeed have been improved.

15 Martha, do you want to go on from there?
16 Oh, no, that's a very good point. Do you want to
17 do it or shall I?

18 DR. FOWLKES: I have two or three
19 separate and distinct points which are really
20 supplementary or complementary to what Pat has
21 said. One is that we have been troubled in the
22 context of the issue of credibility as we have
23 come to understand that in the community by the
fact that certain studies, which are not yet

published that we have had access to which
1 again suggest hypotheses that may lean toward
2 risk and potential non-habitability, have not
3 been represented by the author of the study which
4 is to say that studies that favor habitability
5 or favor no health risk have been represented by
6 their authors. The studies of Beverly Paigan have
7 been represented by the same authors who favor
8 habitability rather than Beverly Paigan. It's
9 very important for us to make clear that we make
10 no stand ourselves on habitability or non-
11 habitability with respect to what we think the
12 reality is but rather the approach of science to
13 establishing the criteria and the information
14 around that.

15 We would like to request that Dr. Paigan
16 and/or any of her co-authors be invited to
17 represent their own work and to engage in the
18 same kind of dialogue that other people whose
19 work is not published have been able to present
20 their work to us as was true this morning, as was
21 true last time.

22 DR. MILLER: We think this is particularly
23 important because of the pivotal role Dr. Paigan

1 has played in this community and the perception
2 on the part of many people involved in the
3 situation at Love Canal that she alone seemed to
4 be addressing the issues that were of profound
5 concern to them, that she alone seemed to have
6 no vested interest in the outcome of her research
7 and it's certainly the case that there are many,
8 many methodological issues that cloud virtually
9 every piece of work that's been done at the canal.
10 But to create a situation where I think the state
11 speaks for the state's work and Dr. Paigan does
12 not speak for Dr. Paigan's work is once again
13 to cause questions to be raised about bias.

14 DR. FOWLKES: Which is not to say that
15 we lend support one way or the other to Dr. Paigan's
16 work, only that in the interest of not escalating
17 and exacerbating -- the division is already there
18 and controversy already there that it would go
19 a long way I think toward establishing both the
20 content and form of objectivity to invite
21 Dr. Paigan on that account.

22 I do have the feeling, though, sitting
23 around the table that there is nothing at odds
or mutually exclusive about the kinds of concerns

1 that any of us have raised and, in fact, I see
2 them as highly overlapping and highly overlapping
3 and highly intercepting and I don't want to give
4 the impression sitting here talking as a sociologist
5 that we're somehow offering a vantage point that
6 is incompatible with the various kinds of vantage
7 points that have been offered. I think that there
8 is a unifying framework that's beginning to
9 emerge. I'd like to address that after lunch,
10 if we could, because I think the underlying
11 concerns are the same. There are just different
12 approaches being offered as to how to establish
13 those concerns and come to terms with them. In
14 fact, I guess I think there is emerging a kind of
15 happy and unexpected congeniality between applied
16 and social sciences, applied natural sciences and
17 engineering and social sciences.

17 DR. WELTY: Bob, do you want to just
18 comment on --

19 DR. HUFFAKER: I have a comment. Joe
20 Highland is co-author on that. Would he be
21 satisfactory since he's coming anyway next time?

22 DR. MILLER: I don't know. I guess
23 my feeling would be to -- that one should perhaps

1 invite Dr. Paigan and let Dr. Paigan decide
2 whether she thought Highland could speak
3 adequately to the work. There have been a
4 variety of co-authors and a variety of research
5 efforts that she's been involved in and to bring
6 in someone other than Dr. Paigan is to risk the
7 possibility that that person doesn't speak --

8 DR. FOWLKES: I don't think we can
9 answer that satisfactorily. The basic point is
10 that Paigan's work ought to be represented by
11 the people who did that work and I think somebody
12 ought to be in touch with Paigan.

13 DR. STOLINE: He is actually co-author.

14 DR. FOWLKES: I understand that.

15 DR. CHALMERS: I'd like to present a
16 dissenting viewpoint that bringing the author of
17 the study that has some design flaws back to talk
18 about the study may not be productive. The
19 problem is that the data was gathered and reported
20 in the papers which we saw in a way that I don't
21 see how interviewing them is going to give us
22 any more information.

23 DR. FOWLKES: I guess I'm troubled by
the fact that the state, who has long been at odds

1 with the work of Dr. Paigan, and who is in a way
2 a pivotal figure in some of the controversies
3 experienced by the community, represented
4 Dr. Paigan's work as well as its own in a way
5 that cast Dr. Paigan's and I thought that frankly
6 it was handled -- it may be that the work is
7 flawed but the treatment of the flaw I thought was
8 very unprofessionally addressed last time.

9 DR. CHALMERS: I don't see that that's
10 relevant to what we're doing. We have the
11 manuscripts and whether or not the state handled
12 Dr. Paigan appropriately or not I think is
13 totally irrelevant to our problem.

14 DR. FOWLKES: I suppose it leaves me
15 with a very bad feeling about good faith.

16 DR. WELTY: Let me just interrupt. I
17 don't know how productive further discussion of
18 this issue would be. Would you be able to
19 contact her and see what her feeling is about this
20 issue?

21 DR. WINKELSTEIN: I'm sorry I missed
22 the last meeting. It was unavoidable. Neither
23 in the communications nor now do I know why so
many of the papers have not been published.

1 DR. WELTY: We discussed that at
length at the last meeting.

2 DR. WINKELSTEIN: Could you sort of
3 synopsis it just briefly?

4 DR. WELTY: I can't answer why they
5 haven't been published. The main thing that we
6 discussed is should we consider the unpublished
7 reports and the feeling of the consultants was
8 that there are a lot of reservations about
9 considering them but when the whole issue was
10 discussed in a rather lengthy discussion, the
11 group wanted to go ahead and at least look at
12 them. I think that there is different reasons
13 for each one of the papers as to why they're not
14 presently published and I don't know that we can
15 address those specific issues.

16 DR. STOLWIJK: I think Martha --

17 DR. WELTY: All three papers.

18 DR. STOLINE: Mine included?

19 DR. WELTY: Yes.

20 DR. STOLINE: We're trying to get ours
21 published so we're in the process of obtaining
22 referees and it's going through refereeing. It's
23 going through a process and resubmitting it at

this point.

1 DR. WINKELSTEIN: I would like to
2 support the idea about who should present the
3 paper, the author, the senior author. I think we
4 have to invite the senior author to make the
5 presentation. If the senior author doesn't accept
6 or delegates it to somebody else, that's fine but
7 I think we have to be impartial in this regard
8 and we have to invite the senior author.

9 DR. STOLWIJK: I think that I recognize
10 the feeling that somebody sounds as if they're
11 being excluded. In fact, Dr. Paigan's work has
12 been very present. Her manuscripts have been
13 here. I don't know whether there is anything
14 that she particularly wants to add to it in
15 addition to what is written down in the manuscript.
16 I accept the manuscript in the way they are
17 written. I think at the time they were a very
18 valuable source of information. I have reread
19 them in order to see whether they could somehow
20 be incorporated or added to criteria for habitability
21 and I don't see how, other than as a source of
22 information or the kind of exposure or the kind
23 of effect it may have been seen, whether they in

fact are directly useful for the development of habitability criteria.

DR. FOWLKES: Wouldn't it be useful to have some of that dialogue with the author or authors of the paper?

DR. STOLWIJK: No.

DR. CHALMERS: What would you learn from quizzing the author, what would you ask him?

DR. MILLER: The point is really a political one.

DR. WELTY: I think that that point is well taken and we can follow up on that. If there is something that Dr. Paigan wants to add, I don't see any reason why we couldn't have a closed session like we did before in the July meeting.

DR. STOLWIJK: I don't think there is any particular advantage in being able to present your work to this group.

DR. CHALMERS: We never did have any author present --

DR. FOWLKES: Dr. Stoline did, Dr. Vianna did and at the same time he made it very clear that he thought that Dr. Paigan's work was "terrible." Now I regard that, regardless of

1 whether it is or isn't as rather a very
2 unprofessional way of handling Dr. Paigan's work.
3 If you all think it is terrible, then perhaps
4 the dialogue ought to go on between the
5 independent experts rather than a commentary on
6 the part of the state.

7 DR. POHLAND: We're not really dealing
8 with the substance of the work. We're dealing
9 with the perception that we're trying to avoid.

10 DR. FOWLKES: That's correct.

11 DR. POHLAND: If the local perceivers
12 feel that we're being unfair, I feel that we ought
13 to resolve --

14 DR. CHALMERS: I still want to qualify
15 that. We don't have Vianna's manuscript and
16 therefore he presented his data. That's acceptable
17 to me. We do have her manuscript and therefore I
18 see no need for her to present her data.

19 DR. FOWLKES: Well, it's possible to
20 present his as a point-counterpoint.

21 DR. WINKELSTEIN: I have a copy of his
22 paper. In some cases you show --

23 DR. CHALMERS: This is a published
paper?

DR. WINKELSTEIN: No, unpublished.

1 DR. CHALMERS: That is a problem that

2 I --

3 DR. WINKELSTEIN: I think the social
4 scientists have laid out a problem that surrounds
5 their work and they're trying to get it out on
6 the table so it isn't a problem.

7 DR. CHALMERS: Bringing someone to
8 defend a manuscript which you already read --

9 DR. WINKELSTEIN: Once we take the
10 step, we in a sense are obligated to be impartial
11 about it. Either we have to erase from the
12 record what we've done or we need to make not
13 only the substance but the appearance correct
14 and we're bound to it.

15 DR. WELTY: I think your point is well
16 taken and you can follow up on that with
17 Dr. Paigan.

18 DR. FOWLKES: We didn't just read it.
19 It was, in fact, moderated in a certain way by
20 Health officials from DOH and that was unfortunate.
21 If we had read it and discussed it among ourselves,
22 without that kind of MC role, that would have been
23 very different.

DR. STOLWIJK: We all read it.

1 DR. CHALMERS: I don't understand this.

2 DR. STOLWIJK: We read those papers
3 very carefully. They were not available to us
4 before this and they were made available to us
5 through the agreement.

6 DR. CHALMERS: We didn't read Vianna's
7 paper. It wasn't made available to us. We
8 didn't read it beforehand.

9 DR. FOWLKES: But you see Vienna was
10 implicitly engaged in a dialogue with Paigan and
11 I think the parties to that dialogue ought to be
12 represented.

13 DR. POHLAND: As I read what you're
14 all saying is that you're concerned about the
15 perception that has been perceived with regard
16 to the notions of habitability, preconceived
17 notions on habitability and non-habitability.
18 What you're saying is that you feel that there is
19 an imbalance between the presentations permitted
20 by people that you feel may have some leanings
21 toward habitability and those that would have
22 leanings toward non-habitability.

23 DR. MILLER: And that it was unwitting.

1 DR. FOWLKES: And I don't want to do
2 anything to jeopardize the credibility of this
3 committee.

4 DR. POHLAND: If we can resolve that
5 by inviting the young lady to appear before us
6 and the rest of the audience, that's fine with
7 me.

8 DR. WELTY: Was there anything else
9 that you wanted to speak to?

10 DR. FOWLKES: We've written it and I
11 want to call attention, I guess, to our sense
12 of what's at issue and the social meaning of
13 neighborhood as we go about measuring and
14 assessing and to somehow mesh the measuring and
15 assessing. I think this has already been brought
16 up though.

17 DR. STOLWIJK: I think you've given us
18 an additional reason why the house by house
19 situation is very undesirable.

20 DR. FOWLKES: Our long running concern
21 is that even under the best of environmental
22 circumstances if you have a family with X amount
23 of money looking at two comparable houses and two
comparable prices and two comparable neighborhoods

1 and one of them is Love Canal, how likely are
2 they to buy in Love Canal? What are the
3 implications of that? Even if the neighborhood
4 could or would be cleared to the best of our
5 ability --

6 DR. WINKELSTEIN: The one thing I was
7 going to ask you about, though, are there
8 objective criteria that are of the social and
9 psychological nature that can be applied? Let
10 us say we drilled holes all over the place and
11 put up sensing devices in the area and we
12 determined that everything was perfect.

13 DR. FOWLKES: Right.

14 DR. WINKELSTEIN: Even better than any
15 other place so it's the cleanest of all neighbor-
16 hoods but some of us might say, well, even if
17 you said that and let us say that 1000 people
18 moved back into that area but certainly things
19 would happen among those thousand people. For
20 example, a certain amount of birth defects would
21 occur if they had 1000 babies.

22 DR. FOWLKES: By random chance.

23 DR. WINKELSTEIN: By random chance those
births could happen at the first birth as well as

1 the last birth if they're going to happen at
2 random. Would the people attribute them to Love
3 Canal? Are there objective criteria that one
4 could establish for the social-psychological
5 aspects of habitability?

6 DR. FOWLKES: Objective criteria, that's
7 the problem. It's a subjective problem. There is
8 no way of bounding the exposure, its meaning and
9 therefore the apprehensions. That's part of the
10 problem. It's motile among populations who have
11 been exposed to invisible contaminants since they
12 don't know where the problem begins and ends.
13 In the situation that you're describing the
14 landfill hasn't disappeared. The chemical
15 landfill still is there so the environmental
16 indicators may suggest that everything is go but
17 the basis for apprehension remains in the middle
18 of the neighborhood. I would certainly predict
19 that the likelihood is going to be that that
20 would be for a lay person an obvious and
21 parsimonious form of explanation, rightly or
22 wrongly, around various kinds of health problems
23 that had been associated in the past with
chemical leachate.

1 DR. WINKELSTEIN: Trying then to
2 establish criteria on the basis of chemical
3 measurements may be a futile task.

4 DR. FOWLKES: We refrained from making
5 exactly the futuristic prediction that you just
6 made because we thought it wasn't fair. You're
7 one step past our concern of suppose the
8 neighborhood appears to be in the best of all
9 environmental situations. Then who would move
10 in? Our concern is still who would move in, what
11 sort of a neighborhood would it be, would it be
12 still an essentially blighted neighborhood.
13 You're past that in saying, okay, people have
14 already moved in. Let's not talk about who they
15 are and what kind of a neighborhood it is.
16 Then they begin having the usual number of health
17 problems, birth defects, miscarriages and that
18 sort of thing. What would be the explanatory
19 then to the chemicals? I don't think that it
20 would ever go away. I can't imagine that it would
21 go away.

22 DR. MILLER: We were invited to a
23 conference sponsored by the Three Mile Island
Public Health Trust a couple of weeks ago. We

1 heard a paper on atomic soldiers, atomic veterans
2 men who the United States Army put in airplanes
3 and drove through mushroom clouds during atomic
4 tests. Apparently at least some of these people
5 have sort of organized their entire life around
6 the sense that death is imminent, that the
7 pathogen is ticking inside of them. They go
8 from doctor to doctor to doctor and you see this
9 as a whole syndrome that seems to attach itself
10 to exposure to invisible contaminants.

11 DR. FOWLKES: Because you never know
12 when to stop being afraid.

13 DR. STOLINE: On that same topic, isn't
14 it true though that suppose that it is somehow
15 decided that the area is habitable. All of the
16 things you're saying may be true but the things
17 that we're saying is that we must monitor over
18 time. I think somehow the community problems
19 that you're talking about are going to be most
20 severe in the first few years but if, in fact,
21 it turns out that it is safe, that, too, over
22 time will diminish. You're talking about a short
23 range problem here but the long range is that
this community would be able to get back, the

1 long range prognosis would be it would somehow
2 eventually get back to the quote unquote some
3 type of normal path.

4 DR. FOWLKES: I don't think it's ever
5 going to be the kind of neighborhood it was.

6 DR. WINKELSTEIN: There are some
7 analogies. They are all in the negative side
8 but one analogy is Southern Utah and exposure to
9 down wind from the atomic bomb testing. There's
10 a furor there every few years. The newspapers
11 reestablish the hysteria. Now, of course, there
12 is a lawsuit that's now in favor of the litigants.

13 DR. CHALMERS: I don't see how we can
14 continue to think and talk about the future
15 habitability of an area that's now being
16 inhabited without talking at the same time about
17 the lives of the people who are there.

18 DR. FOWLKES: I think that they choose --

19 DR. CHALMERS: And why that would be any
20 different from letting people move in.

21 DR. WELTY: Could we just use this
22 opportunity to have you summarize your feelings
23 about monitoring since that's the only topic we
haven't discussed in perspective health studies

1 that you might recommend. I have your handout
2 here and then we can break for lunch.

3 DR. CHALMERS: I apologize for not
4 having anything written and the fact that I'm
5 handing out a description of the National Death
6 Index will give you a clue as to what I'm going
7 to say which is that cohort studies of health
8 assessment are so extremely difficult to do
9 under the most ideal of circumstances that you
10 don't have all sorts of prior biases and the
11 existence of illnesses and commonness of symptom
12 complexes that bother people are so enormous and
13 are made so much worse by worry about environmental
14 factors that it becomes an absolute impossibility
15 I think to draw any valid conclusions from
16 examining people who have been exposed to
17 diseases of which we don't know any specific
18 disease to look for. In the case of Dioxin,
19 I think it's very impressive that the people who
20 work in factories and have their skin so covered
21 with Dioxin for twenty years that they have a
22 chronic skin disease called chloracne still have,
23 although the power of the observations I admit
are very low, no other disease than chloracne and

1 their exposure is certainly very much greater
2 than these people.

3 There is the possibility that some
4 good data will come out of the Wilburn, Mass,
5 situation because there the people did actually
6 ingest the toxin although the same problem of
7 health survey exists there and some people think
8 studies done are greatly flawed by the form of
9 questioning that went about and the people who
10 did it.

11 So, at any rate, what I'm trying to
12 summarize is that cohort studies in which patients
13 are examined or quizzed about complaints and
14 abnormalities are looked for, unless they're
15 exclusively controlled like none have been that
16 I know of, are more misleading than they are
17 helpful. Really the proof of the pudding is in
18 the eating and that is what are the long term
19 bad effects of this kind of exposure. I know of
20 no way to determine that except by comparing
21 people who have lived with a fairly heavy
22 exposure to see whether they live out a normal
23 lifespan or die of some diseases that might be
 related. Again, we keep coming back to the fact

1 that we don't have a hypothesis of a disease
2 that is supposed to be related to an increased
3 risk of cancer but in humans I don't know of
4 its having been demonstrated.

5 That doesn't mean that it isn't
6 important in a situation like this to gather
7 data on people so that they can be followed.
8 In 1978 I don't think anybody knew there would
9 be or maybe they didn't know the National Death
10 Index could get off the ground but now it is off
11 the ground and presumably Dr. Vianna has it on
12 his tapes although I was unable to talk to him
13 to gather the detail exactly of what is on his
14 tape that would enable the easy follow-up of these
15 people, about 8000 people, those that were there
16 when they did the survey plus the names and some
17 identifying information of people they bought
18 their houses from. There is a group of people
19 who could be followed to see what they died of.
20 I don't think that answer would ever come through
21 in time for anybody to determine habitability of
22 the Love Canal and therefore it would be an
23 academic exercise of importance for future
contamination in the century to come.

I don't know of any clinical,
1 epidemiological study that can be done now that
2 would answer the question of habitability. I
3 think we can be reassured that there hasn't been
4 a serious epidemic of easily diagnosed diseases
5 as there was in Japan and various few other
6 examples of environmental contamination. Since
7 there hasn't been and since the environmentalists
8 are going to make sure that the place is a lot
9 less contaminated than it was when the people
10 lived there, it seems logical to me to assume
11 that people moving back into an area that is a
12 lot less contaminated than it was when people
13 who lived there now have turned up with no
14 serious diseases, that's reassuring.

15 I don't see how you can deal with the
16 problem of the community worrying about being in
17 there when you have people living there already.

18 DR. FOWLKES: On the whole though most
19 of the people with growing children have moved
20 and so that we've removed a certain population
21 who might be vulnerable who we would use as
22 indicators.

23 DR. CHALMERS: But you know their

1 vulnerability is so, probably so little compared
2 to all the things that could happen to them and
3 are happening to them. I was struck by the
4 number of members of the community who smoked.
5 Now, for goodness sake, their smoking I would
6 guess is probably a hundred times as dangerous
7 for their health as anything in chemicals in
8 the soil. That's a disease we know about. That's
9 a disease we see people dying of all the time.
10 Why aren't we doing something about that? Here
11 we are spending all this time worrying about a
12 disease, a group of diseases for which we can't
13 find the diseases to worry about. There we know
14 the disease.

14 DR. FOWLKES: There is a difference
15 though between what you as a scientist might
16 decide is objectively true and the kinds of
17 perspective that organize and determine people's
18 decision-making and behavior.

19 DR. CHALMERS: Yes, I think that's true
20 but I think scientists have a responsibility to
21 be sure that when we do gather data we establish
22 this with exquisite care and with exquisite
23 caution.

1 DR. FOWLKES: But the fact that there
2 are people remaining there now doesn't necessarily
3 mean anything.

4 DR. CHALMERS: Oh, no, don't misunder-
5 stand me. We shouldn't be continuously only
6 talking about habitability in the future. We
7 should be talking and saying that one of the
8 decisions that we should be making is should those
9 people be forced to move out.

10 DR. FOWLKES: That's correct.

11 DR. CHALMERS: I see no evidence to that
12 but I think that's just as important a decision
13 as letting people move back in.

14 DR. FOWLKES: I thought you were
15 suggesting that the fact that they're living
16 there now is somehow an indicator that habitability -

17 DR. CHALMERS: No, I detected that we
18 were concentrating on the people who might move
19 back in and their welfare and forget about the
20 welfare of the people who want to live there,
21 they've chosen to live there.

22 DR. MILLER: The question becomes
23 whether they can be replaced in a certain way.
Many of those people who are living there are

1 older people, they're retired. They really don't
2 have the money, the social resources, and frankly
3 the energy to pick up and begin their lives
4 somewhere else. It would be far preferable to
5 them to have the neighborhood rebuilt around them.

6 DR. WINKELSTEIN: The basic criteria
7 that we're going to set up essentially is to
8 allow the state to sell the houses. Isn't that
9 really what the issue is? The state owns these
10 houses and there is pressure that they should now
11 be done something with, sold for commercial
12 uses, residential uses, what have you. I agree
13 with everything Dr. Chalmers has said but I
14 think there are additional criteria that I still
15 haven't heard articulated meaning it is essentially
16 the case that in other situations what happens
17 is unacceptable. By that I mean that even if a
18 person were to buy that house, that all these
19 criteria are meaningless because we're going to
20 be faced again with a recurring --

21 DR. FOWLKES: Love Canal.

22 DR. WINKELSTEIN: -- a Love Canal
23 problem.

There is one paper published in the

1 Journal of American Medical Associates which
2 says there was a serious effect of the fallout.
3 There has been another paper published by another
4 scientist in Science and he says there was no
5 effect and in a sense they're both looking at the
6 same data.

7 Now, I think one of the studies and
8 I won't say which one is flawed but you may think
9 the other study is flawed. Clearly, the people
10 who refereed the article, who said there was an
11 effect, thought it was an acceptable article and
12 it was not flawed because it was published in a
13 very reputable journal. I won't say. I think I
14 slipped but the point is that the reputable
15 scientists disagreed and they disagreed over the
16 interpretation of the same thing. I think it's
17 absolutely the case that we can predict that no
18 matter what we establish to be the purity and
19 the cleanliness and the cleanness, in a sense
20 clean up all the dirt and polish it all up, get
21 rid of all these chemicals, but if something
22 happens, it doesn't matter.

23 DR. FOWLKES: Something will happen.
You can virtually guarantee that. There will be

1 two or three people living adjacent to one
2 another who have what they perceive to be a
3 pattern, illnesses or health effects. There will
4 be an unusually rainy season and this system will
5 begin to take in more leachate than it has.
6 Something will break, not necessarily with any
7 deleterious effect but giving rise to the fears
8 that something has collapsed, a retaining wall
9 may give way a little bit. It's inevitable that
10 these things may happen. They may have objectively
11 no consequences or may be asserted that way but
12 scientists --

12 DR. STOLWIJK: I think you point out
13 something that of course nobody can make go away.
14 It's very clear what you're saying is right.

15 DR. FOWLKES: Dr. Winkelstein brought
16 this up. I really do want to make this point,
17 that we can build in a sense such futility to the
18 work of the community.

19 DR. STOLWIJK: There are some things
20 that one can say that do address those associated
21 problems to this extent. Let me give you an
22 example. I think it is Beverly Paigan who very
23 correctly in the paper points out that many of the

1 symptoms that she found in the population actually
2 are compatible with the idea that it was the
3 stress of living in a place that was in question
4 might have been a causative factor rather than
5 any of the chemicals involved. I think she is
6 quite right. I think that's an important observa-
7 tion to make. I think one of the major stresses
8 of living in the place was the reason that the
9 value of the real estate that people had gotten
10 was severely in question. That was a very
11 severe psychological and social distress on the
12 people who lived there. The state won't like
13 such a suggestion but one of the suggestions we
14 might make as a criteria for habitability is
15 that there be a guarantee on anybody buying one
16 of these houses that the state or authority that
17 has been set up for this purpose at the moment
18 stand ready in the next ten or twenty years to
19 take that house back for exactly that same price.
20 That would be one way.

20 DR. CHALMERS: Plus inflation.

21 DR. WINKELSTEIN: The lawyers aren't
22 going to let you do that.

23 DR. STOLWIJK: It is possible to relieve

1 that particular part of the anxiety by a structure
2 that you impose on the habitability decision.
3 We won't make that decision anyway but we could
4 suggest a criteria that says that one of the
5 ways in which the people that move back in are
6 being reassured is that economic risk of very
7 severe perceptions is being removed from the people
8 that moved back in. That would be one way of
9 dealing with one of the problems that I think you
10 very correctly identified.

11 DR. MILLER: Another possibility is to
12 set up a lottery and people submit their names.
13 If you're drawn in the lottery, you get to buy
14 a house for \$500.

15 DR. POHLAND: That doesn't help the
16 one that doesn't win.

17 DR. MILLER: The point then is it
18 doesn't -- I'm sorry, with the stipulation that
19 you have to live in the house for a specified
20 length of time yourself. It has to be an owner
21 occupied house for five years or eight years or
22 something. Then, of course, you can leave it
23 without penalty.

DR. STOLWIJK: I think that it probably

would be a sounder proposition to actually have
it paid for.

1
2 DR. WELTY: I think it's a good time
3 to break for lunch and during the lunch hour I'd
4 just like to ask the individual scientists to
5 think about the question I raised earlier after
6 Dr. Stolwijk's presentation and that is how do
7 we translate what has been said into tangible
8 criteria and how do you want us, as the managers,
9 to proceed with this process? Do we go ahead
10 and try to synthesize what has been presented
11 into a draft we would review or what other
12 alternatives would you suggest we take from here?

13 Let's break for lunch at this time.

14 (Whereupon, at 1 o'clock P.M. a short
15 luncheon recess was taken.)

16 DR. WELTY: We have approximately two
17 hours to discuss the issues that were voiced
18 this morning.

19 The first thing I'd like to start off
20 with is to mention that our next date of meeting
21 is July 25th and 26th. I'd like you to be
22 thinking whether we need to meet for both days
23 or one of those two days and what our agenda

should be for those two days.

1 DR. WINKELSTEIN: I can't be present.

2 DR. WELTY: For either one?

3 DR. WINKELSTEIN: Yes, I've already
4 told the staff that. Did I talk to you? I
5 talked to someone.

6 DR. CHALMERS: Maybe we ought to change
7 the date.

8 DR. WINKELSTEIN: That date is out.

9 DR. WELTY: How about the rest of you,
10 is that satisfactory? We've got problems.

11 DR. WINKELSTEIN: I don't think you can
12 change it for one person.

13 DR. WELTY: We've been assured that
14 Dr. Davis, Dr. Silbergeld and Dr. Highland can
15 make it on that day. Whether or not they will,
16 in fact, make it, we'll have to see.

17 Do you all have any feelings whether
18 we need a two-day meeting or one-day meeting?

19 DR. WINKELSTEIN: Could you discuss
20 this after? I think this is relevant to what we
21 discuss here the next couple of hours.

22 DR. WELTY: The meeting where we go
23 from here, as I said, hinges on the development

1 of the criteria that we've all been discussing
2 and we certainly appreciate the work that all of
3 you have put into producing a paper that will
4 help us give us direction in developing these
5 criteria. If you consider these as the criteria,
6 as I see it there is different factors that
7 input. There is the monitoring part, the stuff
8 that Dr. Pohland was talking about and the
9 additional monitoring in terms of what media
10 needs to be sampled and how we set up a protocol
11 for monitoring. That's one part of it that needs
12 to be a contingency for this criteria.

13 Then we have the medical monitoring
14 perspective studies using the National Death
15 Index is what the final thought was.

16 DR. CHALMERS: It's not relevant to
17 moving back in.

18 DR. WELTY: But it would be a likely
19 contingency in terms of a factor we need to follow
20 up.

21 Then the main part of the criteria here
22 is certainly the sociologic factors need to input
23 into the development of those criteria.

How do we translate the concept for

instance of the comparative criteria into applicable things that we can use in the EDA? I would appreciate any additional suggestions on how to do this and then if it looks like it's doable, we could get together and have some sort of a draft that would be available, a working draft for the next meeting and we could send that out ahead of time.

DR. STOLWIJK: When you think about that sort of criteria, I think it would be appropriate for instance to say that one requirement should be that the agency making the determination do this on the basis that it has verified that the ambient air exposure in the EDA at the moment is in line with or comparable with other well-documented cases that are not in controversy. That is a statement. I don't know whether others agree but that's a statement that I could live with that's relatively easy to make and I think it's a sensible kind of comparison that everybody could understand what it means.

DR. CHALMERS: Could you make it again?

DR. STOLWIJK: That the agency making the determination on habitability be required to

1 show either on the basis of new measurements or
2 the basis of existing measurements that at least
3 the ambient air quality in the EDA be of the
4 same order of magnitude as other areas in similar
5 surroundings, urban or urbanized situations,
6 where there has been a good documentation of this
7 kind of air fall. I think that's a very logical
8 thing to be required to be established. It's
9 easy for us to ask. It shouldn't be very difficult
10 for us to produce it. It will be most desirable
11 if this could be done on the basis of data which
12 was not gathered for this purpose. There probably
13 are other data that could be gathered that way
14 but I think the idea should be that the
15 concentrations and as a result the likely
16 exposures are not more than they would be in a
17 number of other well-documented areas.

17 DR. POHLAND: Now, are you talking
18 about current situations or past?

19 DR. STOLWIJK: Current. I think that's
20 the requirement for the current situation.

21 DR. POHLAND: Are you saying this
22 should apply to all environmental phases, this
23 kind of strategy?

1 DR. STOLWIJK: No, I think it's going
2 to be much more difficult for the ground work
3 and I think the soil part is something that I
4 also don't know yet how you'll best do that because
5 the soil exposures here are due to a particular
6 kind of situation that probably doesn't exist
7 quite in the same way in any other place. The
8 particular way in which it was transported is
9 probably not being replicated in other locations.

10 DR. POHLAND: I guess except that we
11 can't be so sterile about the separation of the
12 phases. The soil would most likely under certain
13 conditions contribute to what you found in the
14 ambient air.

15 DR. STOLWIJK: This is why the ambient
16 air is a mirror of everything that goes on but
17 it is not a very sensitive mirror. This is again
18 why the groundwater in monitoring wells around
19 the site is a much more sensitive mirror of what
20 goes on. That would be another thing but I don't
21 know that we have a good basis of comparison for
22 that.

23 DR. POHLAND: I guess I'm trying to
establish whether we would include in a

1 philosophical way that notion for the other
2 phases, too. I think you're including in the
3 air because you feel comfortable with some data
4 out there. I think on the other hand we shouldn't
5 preclude the possibility that similar data are
6 not out there for the other phases by the way
7 we state the condition that we're trying to
8 perform.

9 I personally would like to modify what
10 you say to the extent that we would try to at
11 least search for similar comparisons in the
12 other environmental areas.

13 DR. STOLWIJK: My problem, Fred, is
14 being realistic. I know that if we call for
15 something that we don't see how they're going to
16 do it, it isn't going to happen.

17 DR. POHLAND: I guess the reason why
18 I'd like to see them give it a shot is that I
19 think we might uncover some other things of value.

20 DR. STOLWIJK: That probably then would
21 have to await CS₂M Hill doing that sort of thing.

22 DR. POHLAND: We could go at it that
23 way then.

DR. STOLWIJK: I think a lot depends on

1 how fertile that really is as a source. Nobody
2 can tell at the moment. I hate to kind of build
3 in a criterion that I don't even know whether it
4 can be considered.

5 DR. POHLAND: Well, in a sense you are.
6 The only reason you feel more comfortable with it
7 is because you've done it and you know it's out
8 there.

9 DR. STOLWIJK: For me that's a good
10 reason.

11 DR. POHLAND: On the other hand, I have
12 a suspicion some useful information is out there
13 both on the shallow groundwater and also on the
14 soils.

15 DR. STOLWIJK: Maybe if you can devote
16 some thinking time between these two sessions
17 on where those sources might be---

18 DR. POHLAND: I think they're partially
19 on that map that we've had difficulty interpreting.

20 DR. STOLWIJK: I tried to do some and
21 that looked like it would be worth continuing
22 with. I gave up.

23 DR. STOLINE: I have a question with
 this air quality. Are you talking strictly outdoor

1 air or indoor air, living room air, basement
2 air or just what?

3 DR. STOLWIJK: The second criteria,
4 the outdoor air is the simplest and the easiest.

5 DR. STOLINE: That's what you're really
6 talking about.

7 DR. STOLWIJK: There needs to be I think
8 an additional requirement and that is that in a
9 lived in, let's say ten lived in residences in
10 the EDA they ought to have a 24-hour or one week
11 sample that then gets analyzed for volatile
12 organics. They ought to either compare it with
13 similar examples of measurements that were made
14 elsewhere by others and EPA has such within their
15 vast network or that similar measurements be
16 made in an area let's say within fifty miles of
17 here that is not in question.

18 DR. CHALMERS: I favor the latter.

19 DR. STOLWIJK: They can go to Lockport.

20 DR. CHALMERS: I hate the thought of
21 comparing new data gathered here with data
22 gathered by somebody else.

23 DR. STOLWIJK: They can go to Lockport
or someplace that is not in question. That has

1 the normal burden of everyday life attached to
2 it.

3 DR. FOWLKES: How would you select the
4 ten, you said ten residences? They would be
5 distributed, I guess, to represent the area
6 geographically? Could we just add that? You may
7 think that that goes without saying but I'd
8 just as soon add it.

9 DR. STOLWIJK: The ten is really not
10 enough to really do much statistics on but you'd
11 like it to be --

12 DR. FOWLKES: Geographically represented.

13 DR. STOLWIJK: A similar thing ought to
14 be comparable residences. They shouldn't
15 suddenly be house trailers or mansions. They
16 should be something in between. I think the people
17 who do that can do that. I think similar measure-
18 ments have been made on a basis that would have
19 to call haphazard but I think in this particular
20 case it would add a very useful dimension of the
21 actual indoor exposures that could be measured.

22 DR. SIPES: You want these in inhabited
23 places?

DR. STOLWIJK: Yes, inhabited places

because they'll be higher.

1 DR. SIPES: The last time someone said
2 it should be uninhabited places. I understand
3 why you're saying that.

4 DR. STOLWIJK: I think people in their
5 activities would contribute more than the
6 environment.

7 DR. WINKELSTEIN: There is no reason
8 if you're going to take the trouble and you're
9 going to take ten inhabited houses that you
10 couldn't take ten uninhabited ones.

11 DR. STOLWIJK: You'll run up a bill of
12 \$1000 apiece.

13 DR. WINKELSTEIN: We're talking about
14 millions of dollars and you're quibbling over
15 \$10,000. Come on.

16 DR. CHALMERS: Is the air pulled over
17 or through an organic solvent?

18 DR. STOLWIJK: It's pulled through a
19 column and driven off.

20 DR. WINKELSTEIN: Maybe this is a time
21 for each of us to express what he or she would
22 like to see in order to set the criteria.

23 DR. WELTY: Sure.

DR. WINKELSTEIN: It's my understanding
1 that a list of the people who lived in the area
2 exists or at least a partial list with what,
3 8000 people on it or something like that. If my
4 mathematics are correct, we have about a period
5 of between six to seven years now since these
6 people have been known. We have something close
7 to 50,000 person years of experience, post-
8 knowledge of the catastrophe. I would think it
9 would be worthwhile, at least I would like to
10 know whether those people could be followed up
11 and the way I would find out would be to take a
12 sample of about a hundred of them or maybe a
13 hundred and fifty, some number, doesn't have to
14 be large and I would see whether you could follow
15 those people up, whether you could find them and
16 ascertain their current life status and health
17 status, if you will.

18 From that information one could make a
19 decision whether or not it would be feasible to
20 follow up the whole cohort. I know the
21 epidemiologists of the state Health Department
22 have certainly said that it's not feasible to
23 follow up the 8000 but I'm not convinced. I mean

1 we have doctoral students who follow up 1000
2 people who they ascertained from some list
3 somewhere have lived in a place and want to know
4 what happened to them and make hypotheses and
5 so forth. With all the resources of the state
6 Health Department, it would be possible to do.

7 DR. MILLER: We didn't have any trouble
8 doing it and we had \$8410.

9 DR. WINKELSTEIN: Did you follow the
10 8000?

11 DR. MILLER: No, we didn't follow up
12 the 8000. We did a sample from people relocated
13 out of the area and it was astounding how many
14 of them, how successful we were in locating them.
15 They're all in the Niagara Falls phone book
16 except for a handful in Florida or --

17 DR. WINKELSTEIN: How big was your
18 sample?

19 DR. MILLER: Small, 10 percent of
20 families.

21 DR. CHALMERS: The Coronary Drug Study
22 has just finished a follow-up which was now
23 eight to nine years to determine the life and
death status of the 8000 patients in that study.

1 It's cost \$180,000. They have the advantage of
2 being able to go to the doctor first who cared
3 for a patient, clinically cared for a patient.
4 It's not an insignificant amount of money to do
5 such a follow-up.

6 DR. WINKELSTEIN: No, but on the other
7 hand we spend lots of money for lots of things.

8 DR. WELTY: What would you follow up
9 these people for?

10 DR. CHALMERS: Well, if I were doing
11 it dead or alive.

12 DR. WINKELSTEIN: I'd go further than
13 dead or alive but that's a beginning.

14 DR. WELTY: I think that probably could
15 be done through the National Death Index with a
16 minimal cost.

17 DR. CHALMERS: That only goes back to
18 '79.

19 DR. STOLWIJK: That's good enough for
20 this group.

21 DR. WINKELSTEIN: I'm not sure that's
22 quite enough. We were talking about other facts.
23 There may not be. Children may have a good
survivorship. It's conceivable. Let's take the

1 worst case. Let's say there is a lot of cases
2 of leukemia in there, chronic leukemia. Maybe
3 that wouldn't show up in six years in the death
4 registry.

5 DR. CHALMERS: How would you find that
6 out. Then you get into a terrible expense.

7 DR. WINKELSTEIN: It's expensive but
8 how much is going to be realized by the sale of
9 the property for instance? The state is talking
10 about many, many millions of dollars.

11 I don't think I'll add to my previous
12 comment. I'm not sure that you're going to be
13 able to get acceptable criteria based only on
14 environmental comparability. I think people are
15 always going to ask the question what happened
16 to the people, what about the risk of the disease.
17 Whether we're satisfied by comparable criteria
18 is one thing. The people who ask the questions
19 you're not going to satisfy. I don't think I
20 would be satisfied if any criteria didn't include
21 an evaluation of disease risk.

22 DR. FOWLKES: That also ties into the
23 whole concern about how bad was it when it was
 bad, unremediated and that leads I think to

questions with respect to --

1 DR. WINKELSTEIN: The fact that that
2 was never resolved, as we know.

3 DR. CHALMERS: Are you talking about
4 a health survey to get in touch with these
5 people and find out how sick they are because
6 that's what I had rejected in my thinking to be
7 terribly misleading in that you wouldn't be able,
8 you'd find some data on how they feel and what
9 different diseases they have and then who do
10 you compare them with.

11 DR. WINKELSTEIN: You have to develop
12 a study. I don't understand why they didn't
13 do it. That's what has always puzzled me about
14 this. I've talked to people over the years about
15 this. It was always judged too difficult.

16 DR. WELTY: Could we have Dan comment?
17 He was involved in this process.

18 MR. VANDERMEER: We in the summer of
19 1980 and the fall of 1980 put together a protocol
20 for doing several things. One was to do a health
21 status examination and questionnaire of every
22 resident of the Love Canal EDA including the rings
23 one and two residents and then certain subset

1 studies, epidemiologic studies including stress
2 measurements and neurotoxicity testing. Another
3 one slips my mind right now.

4 We were convinced at that time before
5 the present residents, that set of people that
6 lived in the area when it was declared a disaster
7 area, that we could find even though they had
8 been temporarily relocated, we could find almost
9 all of them. There was a great deal of difficulty
10 of getting agreement among the community that
11 they would participate in such a study but we
12 were able to design the study and develop a
13 protocol and put up clinics in place to do the
14 health status survey, the questionnaire to do
15 the epidemiological studies. The price tag on
16 that was in the order of \$6,000,000 to \$9,000,000
17 at the time and Congress refused to fund a
18 program of that magnitude. We were sure it could
19 be done. The point is that it was not funded
20 and the community was supportive and endorsed
21 it. Of course at that time there was a tremendous
22 concern in the community about the present health
23 status.

DR. CHALMERS: Did you really think you

could interpret the data when you got it?

1 MR. VANDERMEER: Our agreement with the
2 community, Dr. Chalmers, was if we could get
3 90 percent of the people living in the community
4 at the time that the declaration was made that
5 we would be able to get sufficient data so that
6 it could be analyzed in a way to give the
7 statistical power some meaningful statements.

8 DR. CHALMERS: Compared to what?

9 MR. VANDERMEER: Good question. There
10 was not going to be a comparison group. It was
11 going to be internally analyzed.

12 DR. CHALMERS: You got a list of
13 illnesses of people who had been worrying about
14 their health over the last few years and you
15 can't interpret it. It's even more dangerous
16 to do it because you can cause a lot more harm
17 by publicizing bad data than you could by not
18 gathering it at all.

19 MR. VANDERMEER: It was for that reason
20 that we wanted full participation to get a broad
21 brush look at the health status. I agree with
22 you. It couldn't be compared and it would not
23 be terribly useful.

1 DR. WINKELSTEIN: You could have
developed a control population.

2 DR. CHALMERS: Very difficult to find
3 one where you could rely on the data because of
4 the recall problems.

5 DR. STOLWIJK: The only comparison you
6 would have would be Hayne's data or something
7 like that.

8 MR. VANDERMEER: I was going to say
9 that. It may have been possible over time. It
10 was clearly described to the community as a
11 cross-sectional look and it would not be
12 terrifically helpful.

13 DR. CHALMERS: We went through this
14 with the Michigan PPAD stuff. That was totally
15 uninterpretable. We had some data on samples.

16 MR. VANDERMEER: Let me make one more
17 point. About two years ago we made an attempt to
18 find everybody who lived in twelve of the presumed
19 most contaminated houses in the first two rings
20 to do our cytogenetic study and the 36 people who
21 had been included in the earlier EPA study. We
22 were able to find every single person who lived
23 in those houses or participated in the earlier

study and offer them an opportunity to participate.

1 There was not of course a complete participation
2 in the study but we were able within a period
3 of just a couple of months to find everybody.
4 There was one person who had died. We were able
5 to determine that also.

6 I think it's possible with efforts to
7 do as you suggest and this is attempt to find
8 a random sample of people who have lived in the
9 Canal area. The data are good enough to do that
10 and our source for finding those people was New
11 York State's list and the ~~ALCRA~~ list of people.
12 It's possible to do it. Finding people for the
13 cytogenetic study was not a particularly expensive
14 endeavor.

15 DR. HUFFAKER: I talked to Nick a little
16 bit about follow-up and his feeling was that there
17 was a critical amount of selection going on when
18 the people left the state, either job potential
19 was better which may indicate education or high
20 skills and is marked or may carry over in the
21 health status of the family, eating habits and
22 so forth. He was not anxious to do a sample on
23 those who had not gone on because he felt it would

have been biased perhaps badly by those who left.

1 The other thing, the big study he did
2 he ended up with those things where he could get
3 pretty objective criteria like miscarriages,
4 birth weight and things of this sort. Whether
5 it was waiting for hospital records or something,
6 it verified what you said or what the option was
7 or and where also there was a wealth of data
8 already existing that you could use for comparative
9 purposes. Start talking to him now about the
10 health sort of thing. I don't know what we
11 measure against.

12 DR. MILLER: You all did collect
13 self-report survey data in 1978, did you not?

14 DR. HUFFAKER: Yes, ma'am.

15 DR. MILLER: What about using that as
16 a benchmark?

17 DR. HUFFAKER: See if they felt better
18 now than they did then?

19 DR. MILLER: Then you've got time one
20 and time two data for the same people. Moving
21 away is comparable to -- well, that's the assumption,
22 whether moving away is comparable to remediation.

23 DR. HUFFAKER: As a Social Scientist

1 do you think they would feel different now that
they're out than when they lived here?

2 DR. MILLER: Of course. I know they
3 do. There are two things, I know they think
4 they're feeling better but you know that too.

5 DR. HUFFAKER: That's why I asked.

6 DR. MILLER: The second thing is that
7 there is a tremendous amount of apprehension.

8 DR. WELTY: How would doing that help
9 you determine habitability?

10 DR. WINKELSTEIN: There is two sides to
11 habitability. Suppose we just judge it on living
12 or dead and we ascertained that in the 50,000
13 person years available to look at that the
14 expected death rate is no different than the
15 observed death rate. That certainly says
16 something. That's at least a positive criteria
17 and it seems to me that would be relatively simple
18 to ascertain. Anything beyond that gets more
19 complicated and more subject to a problem. But
20 let's say that we were to follow these people up
21 and well none of us to believe the case, but let's
22 say we found that the death rate to be three times
23 as high. Then you would have a very good criteria

for not rehabilitating the area until you found out why it was so high.

Lacking the information you leave yourself open always to the question here you have a list of 8000 people and we called up this screwy epidemiologist in California and he said why didn't you go out and find out whether they were living or dead. It seems to me we need to at least have some common sense and find out if they're living or dead.

DR. STOLWIJK: You would have gotten about 400 deaths in that population between '79 and now.

DR. CHALMERS: There is a lot of kids.

DR. WINKELSTEIN: That's quite a few deaths.

DR. STOLWIJK: Was this population particularly biased?

DR. MILLER: Yes.

DR. STOLWIJK: Was there a young population?

DR. MILLER: Yes.

MR. VANDERMEER: The National Death is at least two years behind.

1 DR. WINKELSTEIN: 8000 people are
2 not hard to find. So it costs you a few thousand
3 dollars.

4 DR. CHALMERS: If you start using
5 Social Security and credit people -- of course
6 the Coronary Drug Study was determined to get
7 every damn person so the big cost comes in the
8 last twenty people.

9 DR. STOLWIJK: Suppose there are 300
10 deaths and based on age distribution, you could
11 determine what the expected death rate was.
12 Suppose that you were 10 percent over or 10 percent
13 under?

14 DR. WINKELSTEIN: 10 percent is not
15 different.

16 DR. STOLWIJK: It would mean nothing.
17 If you were 50 percent over, well, the 50 percent
18 still could not statistically stand up.

19 DR. MILLER: But a finer sort than the
20 determined causes of mortality.

21 DR. STOLWIJK: Then you don't have any
22 numbers anymore. Then you've got three or four
23 people again. That's the trouble whenever you
start to stratify, you've got nothing left.

1 DR. MILLER: But if you've got 300
or 400 deaths --

2 DR. FOWLKES: But I think Dr. Winkelstein's
3 main point is well taken and I'm afraid we're
4 losing sight of it which is the perfectly reason-
5 able question on the part of a potential
6 population is going to be, well, what was the
7 health risk attached to that place anyway in
8 order to be able to form again a common sense
9 comparison what it may have been once and what
10 they think it could be now based on the kinds of
11 things Dr. Pohland would think about, remediation
12 and the effectiveness of that.

13 There is also, I think, a certain value
14 and I won't elaborate on that right now just in
15 terms of that population out there and their
16 perception of the credibility of government
17 health and government science to doing some kind
18 of follow-up. I wouldn't want to be in the
19 position of specifying that. It's an indirect
20 way of dealing with criteria for habitability
21 but it's not unrelated to the ways that people
22 are going to think about it.

23 DR. CHALMERS: But you see even if you

1 got 300 deaths and a minor difference and you
2 calculate that we really would be interested in
3 how big an increased risk of death are you going
4 to accept as being acceptable. If you get low
5 enough, let's say a 1 percent increase, then we
6 have to wait for 40 years.

7 DR. FOWLKES: Before you could talk --

8 DR. CHALMERS: We're looking for a
9 negative.

10 DR. FOWLKES: I understand that.
11 Clearly everybody worries about death but that
12 isn't all people worry about.

13 DR. WELTY: One of the other options
14 would be to use the New York State Cancer
15 Registry to follow up those residents who still
16 remain here. I guess Dr. Vianna doesn't feel
17 that that would be scientifically valid. I wonder
18 about your thoughts.

19 DR. WINKELSTEIN: I think that would
20 be biased badly. I don't think that would be
21 accepted. That's why I think that a pilot just
22 to see what the situation might be might be useful;
23 not too big.

DR. CHALMERS: Especially when you have

1 such a common cause like smoking which could
2 vary among the people who leave the state.

3 DR. STOLWIJK: There is one report that
4 appeared that actually compared the cancer
5 mortality in that particular census tract. The
6 difficulty with that is that's a study that said
7 that there was no significant increase compared
8 with the surrounding census tracts. The difficulty
9 with that study, if I remember correctly, is
10 that its sensitivity was low because the census
11 tract incorporated not only this but also several
12 other people, quite a lot of other people which
13 would lower the sensitivity of seeing something.
14 As a study that is meant to have relevance to the
15 Love Canal area, it's one of those studies that
16 doesn't prove one thing or the other.

17 I think that the cancer follow-up
18 through the state tumor registry for the 8000
19 people which should not be a very difficult task
20 is not something that is beyond what ought to be
21 contemplated provided we recognize that it is
22 not likely to show a very decisive thing one way
23 or the other. It is likely to be one of those
with no particular different kind of thing. That

1 would be better however than what we have in
2 the record in that science article which dealt
3 with a larger population and as a result it was
4 diluted.

5 Do you have any ideas?

6 DR. WINKELSTEIN: You could evaluate
7 the bias by taking a small sample and following
8 it up and see how many moved out of state. So
9 then you could at least evaluate the bias with
10 the New York State Tumor Registry. You could tell
11 what you potentially missed.

12 DR. WELTY: So I get the feeling that
13 in terms of the issue of medical evaluations,
14 we should at a minimum include a mortality,
15 ongoing mortality study and then possibly a
16 cancer study using the New York State Tumor
17 Registry and looking for those people who moved
18 out of state.

19 DR. CHALMERS: One amendment I'd like
20 to stick on that is if you're going to start doing
21 a mortality study or start looking into the
22 follow-up is before any data starts to come in,
23 you classify people with regard to their exposure
as best you can so that's not done post hoc after

the data is in.

1 DR. FOWLKES: But that gets into the
2 concern about documents and exposure distributions.

3 DR. WELTY: How do you do that?

4 DR. CHALMERS: Well, you start with
5 people who lived in ring one and you put a little --

6 DR. STOLWIJK: Take ring one and two
7 and the EDA as two areas.

8 DR. CHALMERS: With the possible
9 exception of people who lived close to the
10 swales, would they be a third group?

11 DR. FOWLKES: We're using criteria to
12 determine other criteria.

13 DR. CHALMERS: No, no, this is very
14 important. If you do it the other way around,
15 you're in real trouble because they you start
16 looking to try to interpret the death data, post
17 hoc distribution data. You've got to commit
18 yourself beforehand. You've got to commit yourself
19 beforehand on who you think is going to have a
20 high risk.

21 DR. STOLWIJK: The thing that we're
22 suggesting here has a very specific purpose. It
23 has a very specific purpose of being able to make

1 a statement for the whole population that was
2 here and being able to apply to anybody who might
3 wish to move in. It is not designed nor can it
4 be designed to decide swales and non-swales.
5 That is outside of the question. That cannot
6 possibly be determined. It must not even appear
7 in the rationale of the protocol because you'll
8 do yourself in if you do.

9 DR. HUFFAKER: That's a different
10 problem here. We can address the canal, ring
11 one, ring two. There are also a lot of chemicals
12 out there in the EDA. This is one of the
13 problems with Beverly's study. We never knew
14 exactly how she did her exposure data because
15 she talked about swales and things, what she
16 measured from. We should measure from, when we
17 do the exposure area, the people who have higher
18 ground regardless of sorts.

19 DR. CHALMERS: See, the reason I'm
20 emphasizing this so much is that's one of the
21 defects in her paper. I wasn't sure that all
22 of the determinations were made before they did
23 the health survey and were put aside and weren't
known by the people who were doing the health

1 survey. Now, I think before you start pursuing
2 people, just be sure that you have settled your
3 data base with regard to the exposure so that
4 any data you then get on health status can be
5 referred back to reliable data and reliable
6 data that couldn't be biased by outcome.

7 DR. FOWLKES: Do we have that?

8 DR. CHALMERS: Yes, I think they have
9 some.

10 DR. STOLWIJK: No, I think that the
11 same question really applies, Dr. Chalmers, is
12 that what you get is why is this particular
13 thing being pursued, why are we asking the
14 question this way. Are we asking the question
15 this way from the point of your being able to
16 inform the public and not from the point of view
17 of being able to prove one thing or another.
18 It is basically a political question that we're
19 trying to ask, that we're trying to ask and we're
20 trying to have an answer for. The question can
21 be asked. It cannot be asked in the sense that
22 we can explain anything but you can communicate.

23 DR. CHALMERS: I hate to see somebody
go to all that effort for just a political question

1 when you might get something of interest out of
2 that.

3 DR. STOLWIJK: I think it's already
4 predetermined that that cannot be done with the
5 information and the people and everything else
6 that is now available because we can't go back
7 to the way it was then. There is no longer any
8 way to determine what the exposures were then.

9 DR. CHALMERS: You mean to say we're
10 going to do something for a political purpose that
11 we have no faith in scientifically?

12 DR. STOLWIJK: No, we're saying there
13 is no scientific futility to doing the study of
14 the cancer mortality --

15 DR. CHALMERS: Then you can't do it for
16 political purposes. You can't sell people
17 political reasoning on the basis of scientific
18 invalidity.

19 DR. STOLWIJK: No, it is not invalid.
20 It is just not useful to build further conclusions
21 on. The invalidity doesn't come from being wrong.
22 The invalidity scientifically comes from not
23 learning something from it that you didn't already
know. However, it is possible for people to ask

1 a particular, very simple question and not being
2 able to answer it in the framework and in the
3 terms in which people have a right to ask it
4 makes the process very difficult.

5 DR. CHALMERS: But I would answer the
6 question by saying that we examined that question
7 very carefully and decided if we got an answer
8 that we wouldn't be able to interpret it and
9 therefore we didn't try to obtain the answer.

10 DR. WINKELSTEIN: Let me try this.

11 DR. CHALMERS: If you're going to try
12 to obtain the answer, try to make it as scientificall
13 valid as possible which means setting up hypotheses
14 beforehand and make sure that bias from one side
15 can't influence bias from another.

16 DR. WINKELSTEIN: I think this is the
17 same question that you're proposing that we answer
18 for the air pollution. Let's just take an
19 example. We're going to answer the question is
20 the air pollution in the EDA any worse than the
21 air pollution in other places around the country?
22 So the person then will ask what are you going
23 to compare it with, are you going to compare it
with New Jersey or are you going to compare it

1 with Lockport or something like that. That's
2 the same question you're asking here. The
3 question is is the mortality among the people
4 who lived in Love Canal any different than would
5 be expected if we compared them to the mortality
6 of other urban dwellers in Upstate New York or
7 something like that. I think the two questions
8 are quite analogous.

9 DR. WELTY: I think the big question is
10 whether we can in fact get any accurate
11 quantification of the exposure.

12 DR. POHLAND: I'm not sure that's
13 relevant particularly because it seems to me
14 what I'm hearing is we have a difference in motive
15 of why we're doing these two things. All the
16 scientific perception put aside for the moment,
17 it seems to me that there are certain things that
18 we feel inclined to address because they're
19 subjective issues and then there are others that
20 we would address because they can yield objective
21 judgments. Perhaps maybe we need to separate
22 out those issues that we are addressing simply
23 to provide a subjective perspective as we
presume the receiver audience would like to see

us do.

1 DR. CHALMERS: How reliable is this
2 subjective impression of the receiver audience?

3 DR. POHLAND: The reliability issue
4 really isn't the crux of it. The crux of it
5 as I am beginning to feel is that we feel a
6 responsibility to the receptor audience that's
7 listening to all of this to address those issues
8 that are of concern to them, that may not --

9 DR. CHALMERS: How unreliable they might
10 be.

11 DR. POHLAND: No, they may not have
12 any objective basis for them at all. That's
13 the trouble as I try to come to grips with
14 some of these issues, if you try to respond in
15 an objective way to a subjective issue, you
16 invariably get into trouble because --

17 DR. CHALMERS: And invariably wind up
18 making wrong conclusions because you've responded
19 in an objective way to a subjective issue or a
20 subjective way. What good are bum data? Who
21 wants to be in a position of reassuring the people
22 on the basis of data we don't believe that they
23 could move back in there?

DR. POHLAND: It's not a matter of
1 whether the data is bum, it's a matter of dealing
2 with the issue in the first place. Maybe in the
3 final analysis the data doesn't provide us any
4 real scientific advancement or anything but the
5 mere fact that it was addressed --

DR. CHALMERS: You can't separate
6 those and as soon as you say subjective search,
7 you're saying it's a search in whose answer I'm
8 going to be subjective in interpreting.
9

DR. POHLAND: No, I didn't mean that
10 you would organize a search in a subjective way.
11 There are certain issues as I see them that the
12 nature of the issue is such that there are no
13 real solid objective quantitative indices that
14 we use. They're at most a more or less perception
15 that we've developed. It's a lifestyle implication
16 in who's to say what should be the best lifestyle
17 for a certain population and so forth. Those
18 are asked of necessity.
19

DR. STOLWIJK: I don't think so. Can
20 I try a way of putting it? You and I would much
21 prefer to know how a particular exposure related
22 to outcome. That's what makes it stick. That's
23

1 what we want to understand. Somebody moving into
2 an area that has been marked in some way, it
3 isn't particularly meaningful to explain that
4 this exposure will result in that. What is
5 meaningful is what will happen or what is likely
6 to happen if I move into that area. The
7 questions that tend to be asked, tend to be
8 asked in terms of what is relevant to the person
9 having to make that decision or having to react
10 to a particular issue, their frame of reference
11 is if I move into that area, what is the
12 experience and the expectation of people moving
13 into that area. That is a frame of reference.
14 That is a frame of relevancy. The way the data
15 are going, the way we would create the data isn't
16 particularly organized that way and as a result
17 when that question gets asked, we cannot answer
18 it with absolute specificity.

19 DR. CHALMERS: You shouldn't get
20 involved, the proposed answer shouldn't get
21 involved. You should say, I'm sorry, I'm not --
22 because they look upon you as an expert. What
23 you're doing is telling me now as an expert I've
decided it can't be answered and therefore I'll

give you an answer that will be useful for you.

1 DR. STOLWIJK: No, there are two ways
2 that you can behave in this situation. One is
3 you can take the stance that I am the expert.
4 I will interpret the data and I will tell you
5 what it means.

6 DR. CHALMERS: I'm not talking about
7 interpreting the data. I'm talking about
8 designing it so somebody could interpret the
9 data, not me. That's the last I would do. I
10 think we do have a responsibility to make sure
11 that the data are in such a way that they can
12 be interpreted.

13 DR. STOLWIJK: I think the situation
14 we find ourselves in here and I think a good
15 deal of the harm and the damage done to the
16 people that have lived through Love Canal has
17 come from the fact that there has been a mismatch
18 between the perception of the people who handled
19 them, the insights and the data and the perception
20 of the people who were on the receiving end of
21 these data. There has been a severe mismatch
22 between the two. This led to all kinds of
23 perceptions and feelings which then gradually got

worse and worse. I don't believe that we can
1 get out of it by doing more of the same.

2 DR. CHALMERS: I would agree to the
3 extent that the gathering of data in the past
4 was not carefully enough controlled so it could
5 be interpreted.

6 DR. FOWLKES: Except it's more than
7 that. Dr. Stolwijk is saying, I think, that
8 there are ways that non-experts have of asking
9 questions and posing questions that may or may
10 not be the way experts ask questions. That
11 doesn't mean that the questions as they get
12 fashioned by the lay person should not be
13 addressed. If they really can't be addressed in
14 any adequate way, a very careful explanation of
15 why it can't be addressed or alternative ways
16 of getting to that kind of information rather
17 than telling people that because they're not
18 the experts, they really are asking the wrong
19 questions and isn't that ridiculous.

20 DR. CHALMERS: Are you putting those
21 words in my mouth?

22 DR. STOLWIJK: No, mine, I think.

23 DR. FOWLKES: I thought that's what he

1 was saying but I don't think that's what you
2 understood him to say. It's a bigger -- I'd
3 say it's an issue of paradigms almost, the expert
4 vantage point on the world that takes for granted
5 a whole lot of things about asking questions and
6 finding explanations.

7 DR. CHALMERS: I was with you right
8 along to where you got to the stage of asking
9 the expert for help in interpreting the data.

10 DR. FOWLKES: No, but it starts way
11 before that even what definition of the question
12 is.

13 DR. WINKELSTEIN: I don't understand
14 now which question we're talking about.

15 DR. WELTY: In terms of the criteria
16 that we're going to develop, I think we need to
17 focus back on that and we're talking about a
18 mortality study and possibly a cancer study and
19 looking into the feasibility of classifying
20 exposures. Are those the three main things that
21 we need to focus on or maybe I'm missing the boat
22 here.

23 DR. FOWLKES: But there seems to be
some disagreement on the wisdom of doing that

1 and if so, the wisdom of the approach to doing
2 that and these two gentlemen, I think, were
3 speaking to that, to the reasons why one might
4 or might not --

4 DR. WELTY: I'm looking for alternatives.

5 DR. CHALMERS: Let me put forward my
6 thesis once more and see if I can't get it across.
7 If I were going to be given the opportunity to
8 move in there and buy a house and live there,
9 I would want some reassurance that it wasn't
10 going to damage my health. I would say to whoever
11 was advising me to move in what is your data that
12 it's not going to harm me. I would expect his
13 data not a politically popular statement but I
14 would expect the person to say either we have
15 done this to the best we could to gather data
16 and we've been able to find no evidence with a
17 10 percent chance of being wrong or 20 or what
18 have you that it would harm you to move in there
19 or we have found this small risk but we think
20 it's so small compared to the fact that you're
21 smoking or what have you that it's not an increased
22 risk or that we've done our best and we can't
23 come up with data that will help you make a

1 decision so you have to make it on some other
2 basis than the probability that your health
3 will be harmed when you move in compared to
4 living somewhere else.

5 It's our responsibility, it seems to
6 me, to explore all possibilities in which data
7 could be obtained with reasonable costs which
8 would help these people make the decision.

9 DR. MILLER: But the real -- to move
10 back again, we all recognize that there is a
11 difference between a policy question and a
12 scientific question. The policy question is, is
13 the neighborhood safe? The scientific question
14 is what concentrations of what indicator chemicals
15 are found where --?

16 DR. CHALMERS: How can we have a policy
17 statement without having data to base it on?

18 DR. MILLER: I said the question.

19 DR. STOLWIJK: There was one policy
20 statement made which caused the removal of a
21 considerable number of people without any data.

22 DR. CHALMERS: That's true.

23 DR. FOWLKES: That's true.

DR. CHALMERS: Are we trying to repeat

that kind of mistake?

1 DR. POHLAND: We're trying to rectify
2 the reality that exists.

3 DR. WINKELSTEIN: Let's take them in
4 terms of criteria. Criterion number one, is
5 there a danger to life among the people who
6 might move into Love Canal area? That's criterion
7 number one, is there an extra death rate?[?]

8 DR. CHALMERS: That we can answer in
9 twenty years.

10 DR. WINKELSTEIN: I think we might be
11 able to answer it that within some --

12 DR. CHALMERS: But not in terms of
13 long term cancer death.

14 DR. WINKELSTEIN: Given the limitations
15 of the data, this is what we can say: In eight
16 years, 50,000 years of experience, the death
17 rate did not exceed what was expected or maybe
18 it did or maybe it was 25 percent more which was
19 questionable.

20 Question number two, is there excess
21 cancer in that area?[?] Well, we've a little more
22 difficulty in answering that question for the
23 reason you just gave but we can say given the

1 limitations of eight years follow-up or whatever
2 it is, this is what we found when we looked at
3 it.

4 Third, is there a risk for malformations,
5 low birth weight and so forth? I think the data
6 may be available to at least give an answer.
7 We can put those forward as disease criteria for
8 rehabilitation or we can propose that and we can
9 then discuss those specifically as criteria.
10 If those criteria can't be met, well, we may say
11 if the state Health Department can't come up with
12 the data to satisfy those criteria, then that
13 has to be stated. This criterion, if the
14 committee decides that that's a criterion, can't
15 be met.

16 Then you go to your other criterion,
17 your environmental, your chemical criteria, set
18 the criteria and see if they can meet them. If
19 they can't meet them then say criterion number
20 three, number five are unmet. Then you can make
21 the policy decision.

22 Let's say that the committee comes up
23 with ten criteria and the state Health Department
can only meet four of those criteria. Then the

1 policy maker has to decide whether they will
2 set the policy one way or another based on six
3 of the ten criteria. Maybe criterion number two
4 which they were able to meet is unsatisfactory.
5 Well, they still have at least that data. That's
6 what I think is meant by the criteria. I would
7 propose that we have to have some criteria.

8 DR. CHALMERS: Gathered as well as we
9 can make it.

10 DR. WINKELSTEIN: About the minimum.

11 DR. FOWLKES: That's right. There is
12 always -- I don't want to belabor this point --
13 always the risk that the kind of data that
14 epidemiologists feel most comfortable looking at
15 don't speak to the kind of concerns of the
16 people and I think that's really going on. You
17 may say as the experts we have looked at health
18 in terms of --

19 DR. CHALMERS: I guess you put the
20 finger on the difference between social science
21 and heart science.

22 DR. FOWLKES: No, not as a scientific
23 endeavor, as a set of perceptions. I'm saying
to you that as an expert you may say to the people

1 in terms of your health we have looked at the
2 following and have ascertained the following.
3 What if they say to you, yes, what about all those
4 CAT scans in the neighborhood. Do you turn around
5 and disqualify that kind of apprehension or that
6 kind of data by saying to them but we really
7 can't measure that, we don't want to be concerned
8 about that.

9 DR. CHALMERS: I didn't say we can't
10 be concerned about it because we can't measure
11 it. I'm saying it if we can't measure it, we
12 can't measure it.

13 DR. WINKELSTEIN: But presumably when
14 we set up our criteria, maybe the public will
15 look at that criteria and give us feedback. At
16 that point they'll say either this criteria
17 doesn't seem to us to be useful in which case
18 we'll have to re-examine the criteria --

19 DR. WELTY: How would you interpret
20 in these three areas an increase?

21 DR. STOLWIJK: I think you would have
22 to say that there shall be no deviation greater
23 than 25 percent from some norm.

DR. CHALMERS: Let me ask the

1 sociologists if that's all right, would you be
2 willing to move back in if you had assurances
3 that there was no greater than a 25 percent risk
4 of having increased death from cancer -- let me
5 see if I can put that in the right way. Well,
6 relative risk increase of no greater than
7 25 percent?

8 DR. FOWLKES: You can't answer that out
9 of context. I wouldn't move back into Love Canal
10 under any circumstances.

11 DR. CHALMERS: We've been aware of that
12 for a long time.

13 DR. FOWLKES: Would you?

14 DR. CHALMERS: Yes, I think I could
15 conceive of a lot of different circumstances.

16 DR. FOWLKES: In fact, I'm not sure
17 if I would live in Niagara Falls by choice but
18 not everybody has a choice.

19 DR. CHALMERS: That might be one of the
20 reasons why I'd move in.

21 DR. FOWLKES: That's right, but the
22 context is what are constraints on choices and
23 what is at stake.

DR. CHALMERS: Well, I was just trying

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to get an estimate of whether our 25 percent increase was a reasonable number.

DR. WELTY: The other question is even if there is a risk, you would have to then dissect what the increase was due to.

DR. STOLWIJK: That's the 25 percent part.

DR. MILLER: Well, the idea behind the 25 percent is not a bad one. It's much better than speaking in terms of levels of statistical significance.

DR. STOLWIJK: Well, the difficulty comes as policy. The determinations that will statistically come out of it will be something like this. There will be a ratio if the controls are one, then some other area might be either .5 or 1.5 as a ratio. That would be the kind of ratio that you would get. Now, the statisticians won't let you have that all by itself. They will also say the level of competence that that ratio is right will now lie in this case it might say between .1 and 1.2. In other words, there is only a one in twenty chance that the actual ratio will be .1 or 1.2.

DR. FOWLKES: Yes.

1 DR. STOLWIJK: This pronouncement
2 without that range to it, the range tells you
3 how sure you are of that ratio and you would
4 have to state the reason why the beautiful
5 chromosome study that CDC did isn't useful is
6 that it said that the ratio of the damage was
7 likely to go down to 1.1 or something like that
8 and then the ratio, the level of confidence in
9 that determination said that the range was
10 .1 to infinity which tells you that you haven't
11 decided anything because the statistical power
12 between this range is just not there. You're
13 not allowed to make a conclusion. That's what
14 this says. You would have the kind of mortality
15 or cancer statistics that you would have gotten
16 from the small population over the short period
17 of time would suffer from this kind of problem.
18 That's the kind of difficulty that you would
19 run into.

20 DR. CHALMERS: That's right.

21 DR. STOLWIJK: In terms of making
22 certain pronouncements, that's why I said earlier
23 on this kind of assurance is very hard to come by.

1 DR. CHALMERS: But you could increase
2 the precision or sensitivity of the measurement
3 if you had some data on exposure and if you could
4 show that there was some -- even though the
5 numbers might be small a trend in the direction
6 that made sense with regard to man years of
7 exposure.

8 DR. STOLWIJK: Yes, there is a tradeoff
9 that you get into and that is as you get data
10 about exposure, you stratify the population to
11 smaller and smaller numbers. What you gain in
12 strength in terms of numbers you lose in terms
13 of absolute numbers.

14 DR. CHALMERS: However, there is still
15 some gain.

16 DR. WINKELSTEIN: Let me come back to
17 deal with this. I think again your paper deals
18 with this because it says that there is a possibility
19 that the place is not habitable and it may be that
20 if we can't come up with reasonable criteria for
21 habitability, then the decision may have to be
22 put off as to whether a determination of
23 habitability can be made.

Now, as an epidemiologist, I would say

1 that -- of course I happen to think that the
2 more important issue is the criteria for
3 evacuating an area, not the criteria for
4 reinhabiting an area --

5 DR. FOWLKES: That's where we're having
6 trouble now.

7 DR. WINKELSTEIN: I think I would have
8 to say that it's hard for me to conceive that we
9 could set a policy to rehabilitate the area unless
10 we can set some health criteria since that's why
11 the place was evacuated in the first place. You
12 can't evacuate the place on the basis of the
13 danger to people's health and wellbeing and then
14 rehabilitate it on another set of criteria without
15 grappling with that.

16 Now, if you can't set health criteria
17 for the reasons that you've just shown us, then
18 I think the whole exercise has to be brought in
19 question. If that's the case, if there are no
20 health and disease criteria available to us,
21 then why worry about these other criteria? There
22 are other reasons to be concerned about the
23 environment but not in the sense of criteria --

DR. STOLWIJK: There is one very

1 important difference between the two conditions
2 in terms of why you go one way or another. In
3 '78 there was bad news and there was every time
4 that anybody looked anywhere, it got worse.
5 There was, amongst the authorities as well as
6 among the population, the perception that here
7 was something out of control and, boy, it probably
8 wasn't going to get better. It was going to get
9 worse. Under those conditions I can't understand
10 that you make a very hard decision to evacuate
11 even though you don't have data except that what
12 you have in data is rapidly deteriorating. It's
13 showing a situation that's out of control, it
14 might be a lot worse than you think even.

15 What we now have is a situation that
16 I think we need to show, we need to have the
17 agency and the state or whoever else demonstrate
18 that, in fact, there is a considerable improvement.
19 Not only did the worst not materialize but there
20 is considerable improvement and continuing improve-
21 ment.

22 Now, you have created an atmosphere
23 whereby all things, all the news is gradually
getting better. In that environment the trust

1 in what is going on can undoubtedly be much
2 greater. It has to be a credible situation.
3 It has to be believable by the people involved
4 that things, in fact, are not going to get worse
5 ever again. They're going to keep on getting
6 better in terms of potential exposures. That in
7 my experience makes a very crucial difference,
8 a situation that is out of control and out of
9 hand as compared to a situation that is in hand.

10 DR. WELTY: Could I just suggest that
11 we get back into the environmental part of this
12 discussion and we'll pursue the health aspects
13 from those three areas that were suggested,
14 mortality, cancer and malformations to determine
15 whether that's feasible and give you some feedback
16 on that.

17 The point where we left off on the
18 environmental was the soil and groundwater sampling.

19 DR. CHALMERS: And air.

20 DR. WELTY: No, we discussed air. I
21 thought we had pretty well settled on ambient
22 air being compared with another location and a
23 sample of EDA homes to be compared with other
homes in a community nearby. We have not yet

1 really grappled with the issue of the soil
2 samples or the groundwater and how to go from
3 there.

4 DR. STOLINE: With respect especially
5 to the soil, that's the one that bothers me most
6 for a couple of reasons. One is, again going
7 back to that volume one statement of the EPA
8 that there were -- two statements in there: One
9 that there were isolated instances of soil
10 contamination in ring one, ring two homes and
11 it may not be ring two and nestled away in there
12 well, there's another comment. Essentially there
13 was no pattern of migration into the EDA from
14 the canal but there was one sentence in there
15 that they did say essentially that there were
16 isolated instances of soil contamination found
17 in the EDA. That statement, coupled with things
18 that I learned last time that apparently we don't
19 have documentation of how materials were moved
20 by dump truck and so on when the area was being
21 built, when the homes were actually being built,
22 coupled with another thing that was said and I
23 think one of the most significant statements that
was said last time by Axelrod saying that

1 habitability may be determined on a home by home
2 basis, I have kind of come to my own conclusion
3 at this point. I am not firm on this but I just
4 want to put it on the table. I think that we
5 are going to have to somehow recommend testing
6 the soil in each one of the households in the
7 EDA. For one thing, I'm not sure that we can
8 guarantee the averages and say that the averages
9 represent for every home what is the true nature
10 of the soil.

11 The second thing is that there may be
12 isolated -- I'm saying this because of the fact
13 there may be hot spots and random sampling may not
14 pick up on this. Also the fact that if you are
15 really moving into this area, given the news
16 media and quite frankly what we are doing here
17 is not a pure exercise of science, we're tangled
18 with a political thing here. If you were really
19 moving into those areas, given what Axelrod is
20 on public record as having said, a person moving
21 in might want to know what is the actual data
22 that was collected on my place that would be
23 evidence that with my soil at least or at least
this one area here that I know that this is either

habitable or not.

1 We've been talking about health studies.
2 I think that's very important. I've been thinking
3 about that in context and that very important
4 statement that was made two months ago when we
5 were together that you really want to know is this
6 piece of terra firma that I'm considering
7 purchasing or moving back into, is that safe or
8 not. That's essentially the unit that was put
9 out for us to grapple with. It might be done on
10 a home by home basis.

11 DR. CHALMERS: I think that another
12 reason for starting on it right now in the
13 sociologic interpretation of that home by home
14 segment --

15 DR. FOWLKES: I think it has to start
16 that way. It's necessary but not sufficient.

17 DR. CHALMERS: I think we're going to
18 be in agreement for the first time today, strongly.

19 DR. WINKELSTEIN: If I understand
20 correctly, what's reconciling these two points
21 of view, Pat's and Martha's with yours, if a
22 neighborhood had one house that was unacceptable,
23 essentially that sets the whole neighborhood back.

1 DR. HUFFAKER: You wouldn't want to
send your little kids down --

2 DR. FOWLKES: You're talking about the
3 whole neighborhood and we suggested to think of
4 it as sub-areas that were already natural
5 sub-neighborhoods as part of this geographic
6 organization of homes and roads and that sort of
7 thing. But it should, I think, be all or
8 nothing.

9 DR. CHALMERS: Besides to me that
10 house by house connotation reminds me of World
11 War II defending the town house by house. It
12 may be just a bad interpretation but it's not a
13 good way to go about it.

14 DR. POHLAND: It appears to me that
15 if that kind of assurance is to be part and
16 parcel of the criteria, maybe we're being dragged
17 back into our discourse on the soil information.
18 At least that information, if condensed, synthesized
19 and put into a format where we could get an
20 overview of conditions, would lead us into what
21 we might otherwise like to see done to fortify
22 the criteria prior to the time of habitability
23 would come about. I'm a little bit concerned

1 about the realities of being able to provide
2 absolute assurance to everybody that might want
3 to move into one specific property because sampling
4 of the soil, particularly if there are
5 uncertainties about random distribution of the
6 materials that may have come from the canal
7 coupled with possible uncertainties with regard
8 to migration, I wonder if we would ever truly
9 satisfy anybody in the sampling protocol without
10 incurring tremendous costs for monitoring. I
11 think we're going back to the issue of we're
12 going to develop a monitoring program that's
13 going to be so expensive that probably the best
14 solution would be to sell all the homes or pay
15 the people for the homes out of this budget that
16 we would otherwise use to monitor the area.

16 DR. STOLWIJK: There is a difference in
17 philosophy. One is how do you gather enough
18 information to make a decision which is one sort
19 of information and the other is how much infor-
20 mation do you need to collect before you could
21 assure somebody which is sort of limitless. There
22 is almost no end to how much people accept as
23 further assurance. If you give them something,

1 then there will be very effectively, very
2 quickly a demand for something else to be added
3 to that before it is accepted. It's sort of an
4 endless process trying to provide personal and
5 absolute assurance to a given individual or given
6 residence. It is a limitless process. It's not
7 something that you get for anything else either.
8 It is not a common human experience and as a
9 result it is something that I think we ought to
stay away from if we can.

10 DR. FOWLKES: The assurance monitoring.

11 DR. STOLWIJK: The assurance part,
12 trying to assure something absolutely might be
13 interpreted forever. It is something that we
14 don't get offered much in our lifetime anyway.

15 DR. MILLER: But the notion that somehow
16 a decision that's made with respect to an area
17 is based on data collected from every lot within
18 that area, a sample designed that allows for
19 data collected from everyone.

20 DR. STOLWIJK: That is not very difficult
21 because you could allow for a soil sample to have
22 a given weight from all sorts like a proper
23 token and it could be assembled and it would not

1 require more than one-tenth or one-twentieth of
2 the total number of determinations.

3 DR. CHALMERS: Average it before you
4 determine rather than after.

5 DR. STOLWIJK: That's right. You make
6 your measurements that way.

7 DR. SIPES: It takes you perhaps to
8 the same end point.

9 DR. STOLWIJK: Yes, perhaps it would
10 take you to the same end point but it would be
11 considerably simplified and not nearly as costly.
12 It would not imply that each particular unit had
13 been specifically warranted.

14 DR. FOWLKES: Guaranteed. I think
15 you're right but implied in this, I assume, are
16 certain standards that if a house either falls
17 below or rises above --

18 DR. STOLWIJK: I think that we ought
19 not to in our recommendations somehow imply or
20 whoever makes the determination get into the
21 position of having to warrant or having to
22 guarantee something because an absolute guarantee
23 is just not available. I think we ought not to
give the appearance of doing that.

1 DR. HUFFAKER: We can classify them
2 as a pack a day house or two cigarette a day
3 house. You're talking about composite soil
4 samples, four lots together or something like
5 this?

6 DR. STOLWIJK: Something of that order.

7 DR. STOLINE: I think the soil media
8 would be a good example to select for this rather
9 than all the media because I think the air is
10 going to be affected by the remediation. I think
11 the water is going to be affected by the
12 remediation. The soil, that's the other problem
13 that I'm concerned about here, how do you
14 remediate the soil?

15 DR. STOLWIJK: With great difficulty.

16 DR. FOWLKES: Maybe it's useful to see
17 whether it needs remediation to start.

18 DR. POHLAND: I was going to say, the
19 concentrations may be there in concentrations that
20 are not that hazardous.

21 DR. SIPES: It comes back to where we
22 first started this whole discussion back in March
23 that the data that was required was one that we
could safely state that there was no significant

1 health risks. Now you're asking that we get
2 that data. Secondly, the concentrations of the
3 chemicals were decreasing and if there was not
4 health risk and the concentrations were going
5 down, then it would be somewhat safe to say that
6 we bring in the idea of the economic, sociological
7 point of view. You may then have something within
8 the confines of a criteria that can be worked
9 out.

10 I recall asking about the epidemiological
11 data and you said you won't be happy with it.
12 It's not there. Now, okay, can we get that.
13 That's what the argument was -- not the argument
14 but the discussion was. Now, it comes down to
15 the fact that if we can get from those maps what
16 concentrations were and they are decreasing, then
17 I think we can make some progress that we would
18 feel comfortable with.

19 I'm particularly interested in the soils,
20 too, just from the things that Doctors Miller and
21 Fowlkes made in their report, the fact that
22 is it safe for a child to go and dig in the
23 ground for three feet and have a good time or
play in a puddle. That drove the point home is

1 why we had to have a feeling for not just one
2 piece of soil from this particular lot but a
3 composite of the neighborhood. That's why I
4 pleaded if we were going to have Sentinel chemicals,
5 then that you have fewer chemicals to worry about
6 and more sampling. But this idea of doing it as
7 a pool, we do that oftentimes --

8 DR. STOLWIJK: A kid would sample all
9 over the lawn.

10 DR. WELTY: In terms of the --

11 DR. POHLAND: Furthermore, let me just
12 add that the soil media is a lot different than
13 the air and the water. The water is bounded
14 but it's a transport medium in itself and so is
15 the air.

16 DR. STOLWIJK: And it mixes.

17 DR. POHLAND: And it mixes and dilutes
18 and so forth.

19 The soil has a capacity. The things
20 we find in the soil are there because they were
21 picked up for some contact reason. That contact
22 reason could have been by transport with one of
23 the other phases or it could have been deposited
there as an isolated site. Those are really the

1 two scenarios that I see might well be the
2 reasons for why things may be found somewhere.

3 Once there, though, they're not going
4 to go very far, particularly if they're
5 refractory. They're just going to stay. Maybe
6 the soil populations will learn how to degrade
7 them in time but they'll pretty much stay there.

8 DR. SIPES: On a negative note, if you
9 would have a hot spot, though, how would you
10 handle that?

11 DR. WELTY: That is my question, too,
12 what is an acceptable level and are we going to
13 go ahead and measure the compounds that you
14 suggested?

15 DR. CHALMERS: What relative risk would
16 be the difference between this soil and other
17 soils?

18 DR. WELTY: How do we set up a criteria
19 for acceptable levels?

20 DR. CHALMERS: Incidentally, I could
21 make it safe for that boy to cut the grass by
22 using a highly carcinogenic agent like 24D to
23 help kill the poison ivy.

DR. POHLAND: That's part of the

1 difficulty. Interest in the soil has just been
2 a rather current thing. There haven't been
3 established very much data with regard to that
4 and everybody's got different opinions about what
5 contact really means. Some of these things you
6 can't get them off the soil to analyze. It's
7 kind of like trying to pull dioxin off the
8 activated carbon.

8 DR. WINKELSTEIN: If you have levels
9 of some of these chemicals that are 100 times
10 background, I think you have to worry about it.
11 We've seen some measurements this morning in that
12 range. Were they not a hundred times?

13 DR. STOLWIJK: Which ones?

14 DR. CHALMERS: In the river?

15 DR. WINKELSTEIN: These measurements
16 were 100 to 1000 times background.

17 DR. STOLWIJK: Two or three parts --
18 ten parts per billion.

19 DR. SIPES: That's dioxin.

20 DR. STOLINE: Three parts per million?
21 Something like that?

22 DR. WINKELSTEIN: There is one thousand-
23 fold difference between the levels in the creek --

wasn't it one thousand-fold?

1 DR. STOLWIJK: Ten versus .1 one hundred
2 times.

3 DR. WELTY: Probably the best handle
4 we have is on dioxin in terms of previous
5 experience in the area of Time's Beach and many
6 other areas throughout the country. I think we
7 could probably handle that one looking at the
8 values that we obtained but the other chemicals
9 that you've listed are more difficult and I'm
10 not aware of any, I don't have any good ideas as
11 to how we could handle a level of 100 parts per
12 billion of Lindane or others.

13 DR. STOLWIJK: There are now ways in
14 which relative toxicity ratings have been given
15 for chemicals and I think Lindane is one of those
16 that have been done that way. There is a rating
17 that is due to persistence and toxicity.

18 DR. SIPES: The Pirnie report has some
19 of that in it.

20 DR. STOLWIJK: There are some attempted
21 standards. I think that the Time's Beach
22 experience for example led to one part per billion
23 in soil as a concern level or action level. I've

forgotten.

1 DR. STOLINE: Is that per million or
2 billion?

3 DR. STOLWIJK: One part per billion.

4 DR. WELTY: That's in residential areas.

5 DR. STOLWIJK: That's I think somewhat
6 overenthusiastic as an action level but as a
7 level of concern it's not a bad indicator. I
8 would hate to have to naturally take action when
9 every time a part per billion of dioxin was
10 found. But I think that as a level of concern
11 something could be done to limit the contact
12 which I think is suitable. Dioxin, because of
13 its level of concern, is likely to be the critical
14 chemical. I think the Lindane is going to be
15 much less so.

16 DR. SIPES: And the other chemicals
17 on that list are probably even --

18 DR. STOLWIJK: Of less concern.

19 DR. SIPES: The fact that they were
20 chosen in a way is because they were, I thought,
21 deposited in high concentrations, some of the
22 chlorobenzenes and some of the chlorotoluenes.
23 The fact that they were found in some of the

1 soil samples, sump pumps and were volatile,
2 they seemed to have this capacity for migration
3 and volatilization, it sort of gave you a
4 representative. They were not highly volatile
5 but they did not have this persistence that they
6 would stick completely and not migrate at all.
7 I don't know what the action level would be on
8 those chemicals.

8 DR. WINKELSTEIN: I should think you
9 could set some sort of common sense criteria.
10 For example, suppose you have a chemical for which
11 there is a standard. Well, then you certainly
12 wouldn't want to -- the criteria then might be
13 then half that level or such.

14 DR. WELTY: See, there is no standards
15 for soil. That's the problem.

16 DR. WINKELSTEIN: Let's say there is a
17 standard for one of the chemicals you measure
18 in drinking water. You can make some kind of
19 translation of that to what it would mean in soil,
20 can't you?

21 DR. WELTY: You don't drink soil.

22 DR. STOLWIJK: You would accept something
23 higher in soil than you would in drinking water.

1 DR. WINKELSTEIN: The people who are
2 experts in that field can give you some feel for
3 it. You would simply arbitrarily set some level
4 like half.

5 DR. WELTY: Well, the process that went
6 into setting that one part per billion required
7 convening a group like this and then having them
8 deliberate and it took six months to come up with
9 that level.

10 DR. WINKELSTEIN: I understand that but
11 what I'm saying is that if there is a standard
12 for a substance of chemical, then you've got some
13 experts here who could tell you what that means
14 in terms of soil.

15 DR. WELTY: Well, you have to translate
16 that in terms of the child out there eating the
17 dirt.

18 DR. WINKELSTEIN: Well, if you can't
19 meet, match the criteria, if you feel that a
20 criteria -- let's take the simplest one, dioxin.
21 I gather that you people who are experts in this
22 field, that you could come up with a criteria
23 expressed in mammograms or whatever you express
it in.

DR. STOLWIJK: Painfully so.

1 DR. WINKELSTEIN: My goodness, if you
2 couldn't come up with one for dioxin, what are
3 we talking about?

4 DR. WELTY: That's what I'm trying to
5 point out to you.

6 DR. WINKELSTEIN: If you can't come up
7 with one for the simplest case --

8 DR. WELTY: The most toxic.

9 DR. WINKELSTEIN: The most toxic,
10 what's the use of talking about these other things?
11 To me, just from a logical point, it seems very
12 simple. If we could come up with a criteria
13 for dioxin, then we could grapple with a criteria
14 for PCB's.

15 DR. WELTY: In terms of what we said
16 before in the previous statement from the
17 habitability point of view, that low parts per
18 billion was acceptable except for dioxin in
19 chemicals in the EDA, so -- in the soil.

20 DR. STOLWIJK: In the soil.

21 DR. WELTY: In the soil.

22 DR. STOLINE: How low?

23 DR. WELTY: Parts per billion or parts

per million?

1 DR. WINKELSTEIN: Well, the low would
2 be less than ten.

3 DR. WELTY: Low parts per million.

4 DR. WINKELSTEIN: That's what stimulated
5 this discussion. You gave them a number.

6 DR. WELTY: Just to clarify, in the
7 previous statement it was felt to be acceptable
8 to have low parts per million of most of these
9 other volatile hydrocarbons. Again, I don't
10 know how firm a basis.

11 DR. STOLWIJK: Hydrocarbons have parts
12 per million in the atmosphere so they certainly
13 can have parts per million in the soil.

14 DR. WINKELSTEIN: Again, it seems to me
15 straightforward when you have a standard, as you
16 might have, or when you have a carcinogen which
17 is on the Union Against Cancer list, the UN list,
18 well, obviously for those carcinogens you want
19 to set levels that are below or are very low.
20 If they haven't --

21 DR. STOLWIJK: Warren, one of the
22 difficulties in making up your mind about this
23 and I think that's what our panel probably is

1 struggling with is that what is the translation
2 from having it in the soil, by what passways does
3 it get into a person and how much gets into a
4 person. It's that step that is difficult.

5 DR. WINKELSTEIN: I understand but all
6 I'm saying for our purposes which is to set
7 criteria it seems to me that we have to set
8 criteria that are acceptable, common sense and
9 that are, that err on the side of safety.

10 DR. STOLWIJK: I think that's what
11 they did for dioxin in six months or so.

12 DR. FOWLKES: But we set the criteria.
13 The difficulty and I'm not sure we should be
14 talked out of the criteria on the basis of the
15 difficulty of assessing it.

16 DR. WELTY: We're not talking, we're
17 talking about how to interpret what is an
18 acceptable level. We can explore this further
19 and try to incorporate something into a draft
20 for people to review. I would like to just
21 discuss the groundwater before we move on. We
22 had talked about monitoring the groundwater as
23 an indicator of how well the remediation is going.

Fred, do you have any specific ideas

on how that could be done?

1 DR. POHLAND: Yes, I think that one
2 is a little easier because we've got precedent
3 already set as to what standards you might want
4 to meet for an acceptable groundwater. Usually
5 what's imposed is what's done for RECRA sites,
6 for at least select chemicals that constitute
7 those chemicals of focus for drinking water
8 standards. That particular requirement is
9 100 times drinking water standard. So in terms
10 of the monitoring, the requirement means that
11 should you have circumstances where you violate
12 this concentration, then remedial action would
13 have to be implemented. At least for those
14 chemicals that are already established by drinking
15 water standards, I think we should address it.
16 Obviously, there are a lot of chemicals associated
17 with Love Canal for which there are no standards
18 established. At least there is a precedent with
19 regard to the hundred times drinking water meaning
20 that the idea is that given that it gets into
21 the groundwater, there is a dilution factor
22 involved. I'm not sure where the 100 times --

23 DR. STOLWIJK: Actually, that's very

helpful because there are also WHO drinking water standards which have many more chemicals in it than --

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3 DR. POHLAND: I think the state has
4 their own set of standards. I think the E. C.
5 Jordan report, the second group of reports --
6 or was it in the first -- I guess it was in the
7 first. Which one was it where they actually
8 looked at the degree of -- I don't know whether
9 I should call it hazardous, critical chemicals
10 versus non-chemicals based upon drinking water?

11 MR. HOFFMAN: That was in the first
12 report on the perimeter area.

13 DR. POHLAND: That was the bore hole?

14 MR. HOFFMAN: Yes.
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DR. POHLAND: Something similar to that should certainly be used so I think we have - - I'm not sure it's an easier task, but it's not as difficult as with the soil. That's what I would suggest. Certainly we would want to have a monitoring externally to the drainage system as was described that would give us indications of things getting better from outside. Also then, of course, we would want to monitor what's really happening inside.

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DR. STOLINE: I'd like to add one more minor thing to that. Maybe it's not so minor. It isn't just enough to collect the data. I think the data has to be analyzed and written up and explained to the people. Some of the data has been collected but it hasn't been analyzed and that's not what I mean by monitoring. It means collecting the data in a timely fashion and also interpreting that data and analyzing the data that has been taken under comparable conditions at previous times and explaining this to the people. This is part of this whole problem that we're talking about here. I think that has to be a part. I think that has to be part of the habitability

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2 criteria, that this communication process between
1 these numbers and people's welfare has to be linked
2 in in a very solid way with this whole habitability
3 sort of thing.

4 DR. POHLAND: You can't run a control
5 system without having a current hands-on informa-
6 tion with regard to how it's formed. I think if
7 you read my poem you'll see where I requested
8 this.

9 DR. STOLINE: I haven't read it yet.

10 DR. STOLWIJK: Actually one recommenda-
11 tion that might be made is that the officials that
12 are responsible for the operation of the treatment
13 plant at the site and I assume there will be on
14 site people, that there also be made a repository
15 and a library where all monitoring information
16 is available. That would be one way of assuring
17 that there is community contact.

18 DR. FOWKLES: Centralized information.

19 DR. WELTY: It has been made available
20 in Anita's office.

21 DR. STOLWIJK: It might be that we
22 hope that Anita will be there. That office might
23 get closed down. The thing that you can count on

3 being forever is that treatment plant.

1 DR. FOWLKES: So it becomes the public
2 record, the environmental public record.

3 DR. POHLAND: They're thinking about
4 building new administrative offices.

5 DR. WINKELSTEIN: If they should rehabi-
6 tate the area, maybe one criteria that they should
7 have is an adequate community center from a social
8 point of view.

9 DR. FOWLKES: An information center.

10 DR. WINKELSTEIN: We could set criteria
11 like that if we believe in that. I think the
12 point has been made very well that just selling
13 the property does not make for a community. It is
14 probably true in this case that you not only have
15 to remedy the situation in terms of building a
16 treatment plant and capping the Love Canal and
17 so forth, you may have to build some community
18 facilities before you can sell the rest of the
19 property. I think we should consider this.

20 DR. WELTY: What kind of facilities?

21 DR. WINKELSTEIN: I'm not prepared to
22 say at the moment. I'm just saying that habitability
23 criteria can include social facilities, for example,

4 we're talking about a library essentially is what
1 Jan was just talking about. Maybe a criterion
2 should be in that the State should build a library
3 for the area before making the rest of the property
4 - - I'm not saying that should be the criterion,
5 I'm just saying that that type of thing can be a
6 criterion.

7 DR. WELTY: From the information we've
8 discussed in the last hour or so, I think we can
9 proceed and write at least a draft.

10 DR. FOWLKES: I have one question I
11 wanted to ask because it came up this morning with
12 reference to the data base management information
13 center and data available that was not specifically
14 collected around the specific problems of Love
15 Canal. That seemed to relate to questions about
16 distribution and things got, the sources of that.
17 You have particular concerns for that, the
18 importance of using that data and I would just, I
19 think you did, too, Jan. I would like to hear you
20 speak to the utility of that data with reference
21 to criteria for habitability.

22 DR. WELTY: That was going to be my
23 next question is what additional data do we need

5 because I would like to kind of get the criteria
1 drafted and then - -

2 DR. FOWLKES: There was a lot of focus
3 this morning about the usefulness of meshing cer-
4 tain data in the data base management system that
5 would begin to document parameters and answer
6 questions about exposure distribution and effects
7 of remediation accordingly. Have we dealt with
8 that?

9 DR. POHLAND: My focus at the time that
10 I brought up the issue maybe you're referring to
11 the question, the notion of the importance or
12 lack of importance of the swale area and so forth.
13 There is information out there that I don't think
14 has been connected in a way that could give us
15 some additional ideas about where this point of
16 sensitivity and control for the remediation and
17 operation lie. Of course, my particular focus
18 was on those issues and the more comfortable I
19 am with my perspective of what was there and what
20 has now since happened and what is there now so
21 that I can get a feel for just how effective the
22 system is and what I can anticipate would be
23 the behavior of the system in the future and so

6 forth is quite important. The whole issue of
1 whether or not the drainage system was put out
2 far enough to capture the main part of the waste
3 is an important question.

4 Now, if because of the way the swale area was
5 developed or maybe even other lower areas around
6 the Canal provided an opportunity for escape of
7 these materials beyond what might be logically
8 considered the limits of the Canal with regard to
9 really large migration and so forth, then I think
10 that's important. All I was suggesting is that
11 knowing that that kind of information about where
12 refuse was encountered as they dug the trench and
13 so forth, if that were connected with the monitoring
14 information that we have, then maybe out of it we
15 could get a feel for the sensitivity of that.
16 Maybe it will show that that isn't an important
17 consideration, that, in fact, the drainage trenches
18 were placed far enough beyond those locations
19 to capture them.

20 DR. FOWLKES: Well, I'm wondering if that
21 recommends then a specific and separate criterion
22 to address the swales issue and offer documentation.
23 The reason I say that is because you seem to be

7 saying that as an engineer, it's useful in assess-
1 ing the remediation. The swales theory has also
2 had a very powerful hold on the community as a
3 public for obvious reasons. It has a kind of
4 compelling simplicity and logic to it as far as
5 their understanding of the distribution of chemi-
6 cals and health risks.

7 DR. POHLAND: Let's single out the swale
8 area. The swale area, as you know, kind of came
9 around and cut through the Canal at the north end
10 mainly and toward the center. Now, if we can
11 isolate that, say, that would be a point of
12 sensitivity of migration prior to the time remedial
13 action was imposed. Then one would presume that
14 as things, as the Canal filled and emptied during
15 high water and rainy periods and so forth, that
16 that would give us a more likely path of migration
17 so that the areas associated with those points an
18 external to the Canal should then, if that's true,
19 show up contamination more than other places.
20 You don't see that in the data right now, at least
21 as it's being interpreted. The conclusion could
22 possibly be there for that and it might be the
23 right conclusion that the swales apparently did not

8 provide that opportunity of migration as we might
1 anticipate.

2 On the other hand, as I was trying to say this
3 morning, the swale, the behavior of the swale
4 may have been masked by the fact that there were
5 other areas of release around the Canal that could
6 have cause for no real differential that was seen
7 out there. All I'm suggesting at this time that
8 maybe that kind of idea needs a re-look.

9 DR. FOWLKES: Does that suggest the
10 establishment of a criterion around that kind of
11 idea?

12 DR. POHLAND: It depends upon what those
13 concentration really say out there.

14 DR. FOWLKES: How do you find the con-
15 centrations unless you establish the criterion?

16 DR. POHLAND: The concentrations that
17 are available are those that were encountered in
18 the bore hold examinations and then of course the
19 monitoring information. That's why I believe we
20 ought to synthesize that data and take a look at
21 it in some kind of a map way and so forth and to
22 look at it not only in an aerial distribution but
23 also in a depth distribution.

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DR. STOLWIJK: Could I ask, is the intent that both the State Department and State Health Department and the EPA numbers be put into the same data base with coordinates to locate them?

MR. HOFFMAN: And the E. C. Jordan data on soils.

DR. STOLWIJK: Does that data base scheme have the ability to look for - - the coordinates will not be the same.

MR. HOFFMAN: Obviously.

DR. STOLWIJK: Has it the ability to look for adjacent coordinates or near coordinates?

MR. HOFFMAN: It is a matter of how you plot it up.

DR. STOLWIJK: You presumably would be able to dump out subsets that would describe the profiles and also the temporal history for a particular coordinate location?

MR. HOFFMAN: Right.

DR. STOLWIJK: And you can do that even if they're somewhat proximate but not identical?

MR. HOFFMAN: I don't understand why you couldn't build into the system a way to search

10 within a certain distance around, from another
1 location, either in time or - -

2 DR. STOLWIJK: Because that's the kind
3 of interpretation that was the only hope of getting
4 either the temporal or the distribution information
5 out of it.

6 MR. HOFFMAN: That is a lengthy task to
7 get to that point.

8 DR. POHLAND: Again, we need to include
9 it in our criterion. The other thing it would do,
10 I believe, is to direct the future monitoring
11 efforts. There is no need to monitor everything
12 we've got out there if, in fact, we had some
13 reasonable assurances that we can properly isolate
14 monitoring positions to give us an overview.

15 DR. STOLWIJK: Based on that, you could
16 formulate a monitoring scheme.

17 DR. POHLAND: I think that's what E. C.
18 Jordan is doing now.

19 DR. WELTY: We need to talk about the
20 dates again and also to be as specific as possible
21 with regard to what additional data we need for
22 developing and refining these criteria. Is there
23 any feeling about a one or two-day meeting and what

11 we should have on the agenda for the 25th and 26th
1 of July? I feel that we can develop a draft of this
2 in two to three weeks that we can mail out to you.

3 DR. CHALMERS: This is a draft report?

4 DR. WELTY: A draft criteria document.

5 DR. STOLWIJK: That will be an assembly
6 of what was said at this meeting.

7 DR. CHALMERS: This is our last meeting?

8 DR. WELTY: Well, that's the other
9 question. Should we set a date for another meeting?

10 DR. FOWLKES: I don't think until we
11 get together the next time we should do that.

12 DR. CHALMERS: I think one day should
13 be enough.

14 DR. FOWLKES: I'd like to ask the rest
15 of the group how they feel about bringing people
16 in for the next meeting which is the last meeting
17 who have never been part of the group? You said
18 that there were two people scheduled to talk who
19 have never been here before.

20 DR. WELTY: Good point. How do you feel
21 about that?

22 DR. POHLAND: I've been at too many
23 circumstances where you get a working group

12 together and they do the best job and the most
1 objective evaluation of things only at the end of
2 the road to be, to encounter somebody who has
3 really maintained a rather aloof posture and
4 because of one thing that they happen to be
5 interested in - -

6 DR. CHALMERS: If they've never been
7 here, I would dis-invite them.

8 DR. SIPES: We have to explain the same
9 thing over five times to people who haven't been
10 here.

11 DR. STOLWIJK: We're going to have some-
12 what that same problem with Ellen and Devra.

13 DR. FOWLKES: Well, I think Ellen was
14 one of the people.

15 DR. SIPES: We're talking about Ellen.
16 She has never been here.

17 DR. POHLAND: I think it's time to come
18 to grips with whether these people, by their
19 behavior, have disqualified themselves.

20 DR. FOWLKES: There are two people who
21 have never been here.

22 DR. WELTY: Three. Dr. Upton has
23 never been here, Dr. Silbergeld, and Dr. Highland.

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DR. FOWLKES: Is it the feeling of the group that they shouldn't?

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DR. WINKELSTEIN: I think they should be disqualified and anybody who misses more than two should be disqualified.

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DR. WELTY: We have just a couple of more minutes before the public discussion, and I want to ask you in terms of the additional data, you know now that Hill is planning to compile all of this data and the format that it will take. I feel that we could continue meeting after this has been done but in order to get data ready for the next meeting, I think it's been pretty well stated that it would perhaps be counterproductive to spend a lot of time now even looking at one or two chemicals. I want to get a feeling for any additional data that you've seen in these, in this compendium that you really feel that you need to make these criteria or should we just proceed with the document?

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DR. STOLWIJK: I think also the document, I believe, should contain as few numbers specified in it as possible. It might have illustrated numbers and it might specify relative

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14 numbers relative to something else that also is not
1 given as a number rather than to try to dictate
2 specific numbers because that's not going to be
3 helpful, I believe.

4 I would also hope that a document will be
5 framed in such a way that it will be addressing
6 as wide an audience as we can reach with it rather
7 than be addressed specifically to this group.

8 DR. SIPES: The only data that would
9 be helpful would be if there was any temporal
10 data on say chemicals in the same location over
11 time. That's the only thing and I don't know if
12 you've asked for that before but after, early
13 after remediation collected.

14 DR. WELTY: Can we take another look
15 at that specific question, Steve?

16 MR. HOFFMAN: Do we have concentrations?

17 DR. WELTY: Yes, the ones on his list.

18 DR. SIPES: The chlorobenzenes or
19 dichlorobenzenes or trichlorobenzenes, something
20 in that class.

21 DR. POHLAND: I'd like to ask that
22 question of the contractor.

23 MR. PITRUZZELLO: That could be

15 available, obviously but it may come in the reports
1 and the variability of the numbers may be differ-
2 ent.

3 DR. SIPES: What I'd like there is just
4 if the data is available, if some input from who-
5 ever is evaluating it on how close are these
6 numbers, do they differ by a factor of 1,000 or
7 by a factor of 2 or just each and every, small,
8 each and every value. We should make our own judg-
9 ments. I understand the problems with that data
10 so if you know what the detection limit is and the
11 reproducibility, that would be helpful.

12 MR. HOFFMAN: Most cases it probably
13 wouldn't.

14 DR. POHLAND: Let me ask a question.
15 As I reviewed the draft copies of the E. C. Jordan
16 segment, both modeling and the one that preceded
17 that, it seemed to me that there are elements
18 that were, that must address some of the things
19 we're asking you to do. They have to have a basis
20 for coming up with their prediction models. I'm
21 not clear on what they used to do what to come
22 up with a draft and I think if that model, that
23 predicted model and what they're predicting is of

16 value to us in regard to understanding what they're
1 saying, I think it would be helpful to have that
2 information available, because that's basically
3 what we're trying to come to grips with is what
4 is necessary basically to provide as much assur-
5 ance as possible that the system in place should
6 be implemented in the future will do what is
7 predicted.

8 DR. WELTY: Let me just say one thing
9 on the date. Dr. Sipes has requested the 26th.
10 Is that agreeable with all of you? I believe - -
11 is that a Friday or a Thursday?

12 DR. SIPES: I think it's a Thursday.

13 DR. WELTY: Thursday, July 26th, same
14 time, same place.

15 DR. SIPES: One day will be sufficient?

16 DR. STOLWIJK: I think so.

17 DR. WELTY: Now, I'd like to open this
18 discussion up for question and answer from the
19 community.

20 DR. MILLER: I'd like to say something
21 just very quickly before we start that. I'd like
22 to clear up a misunderstanding that may have occur-
23 red earlier with respect to a remark I may have

17 made in connection with Dr. Sipes' proposal
1 wherein I said I had some problems with the
2 general strategy and by that I meant to say that I
3 don't know what it means that there are certain
4 questions that we have or might reasonably have
5 about that area that effectively cannot be
6 answered. That most particularly would be
7 questions about chloroform which, as he explains
8 it to me, is virtually impossible to reliably
9 assess, as I understand it. That was what I
10 meant when I earlier said that I had some reser-
11 vations about his remarks. Just to get that on
12 the record.

13 DR. SIPES: Just the fact that chloro-
14 form forms with chlorination of drinking water and
15 people are exposed to that routinely, drinking
16 chlorinated water. That's a problem that the
17 EPA has been groping with, so why add a compound
18 issue with that chemical. That was my only point.

19 MS. GABALSKI: Can we open it up to the
20 public now?

21 DR. WELTY: Yes.

22 MS. GABALSKI: We have a number of
23 questions. There are eight people who have asked

18 for some time. Given a half hour, I think we
1 should limit each of the questions to about five
2 minutes. We will start with JoAnne Hale.

3 MS. HALE: First of all, when I read
4 this, there is like three questions all in this
5 whole thing. You'll know who you are, who the
6 question is for.

7 We have a problem with the agency saying that
8 some contamination is something other than the
9 Love Canal contamination. Could you please put
10 this in some sort of perspective or are you
11 consideration contamination whether it be Love
12 Canal or who cares where it's from, that it dropped
13 out of the sky. When you make your criteria for
14 habitability, are you going to include it even
15 though it might not be Love Canal contamination?

16 For a list of residents for cancer or deaths,
17 if you call the EPS or the Love Canal Homeowner's
18 Association, we've got a pretty darn well complete
19 list, more than probably what Mr. Huffaker has.

20 The questionnaire passed out to people in
21 1978 consists of approximately 27 pages and the
22 answers were yes, no and unknown. Some people
23 don't even know what some of the diseases - - so,

19 they just put down no. They never questioned when
1 they took medicine from their doctors. I just
2 wanted that to be known.

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3 The difficulty of a racial risk problem,
4 I might have misunderstood Dr. Chalmers. You said
5 25% as an illustration. 25%, when you say 25%,
6 I almost fell off my chair. I think you meant one-
7 fourth of us that move in there would die tomorrow.
8 You understand what I'm saying? We're lay people
9 out here.

10 DR. CHALMERS: It's a 25% increase in
11 the chances that you would have of dying from
12 cancer anyway if you lived anywhere else. That
13 doesn't mean that 25% of you are going to die.

14 MS. HALE: Right, but you have to under-
15 stand we're lay people.

16 DR. CHALMERS: I have a question for
17 you. This registry that you have of the residents,
18 does that include such things as we would need to
19 do a follow-up, such as father's surname, date
20 of birth, Social Security number?

21 MS. HALE: If not, we have access to
22 almost all the people. Mr. Huffaker said it took
23 him almost three months to get 200. I can get you

20 over 200 people right now.

1 DR. CHALMERS: We're talking 8,000.

2 MS. HALE: Well, we could come closer
3 than the Health Department, particularly people
4 who have never been included in any of these
5 studies.

6 DR. HUFFAKER: JoAnne, the problem is
7 not reaching people; it's reaching people that
8 are purely representative of the whole thing. A
9 lot of these people left, and this is what the
10 argument was about, can we use part of the 8,000
11 without screwing the results all up and that
12 was not resolved.

13 MS. HALE: All right, but I just wanted
14 that to be known that there are other sources
15 than say the Health Department.

16 MR. VANDERMEER: I just wanted to say
17 it didn't take us two months to locate everybody,
18 that is to know where they were; it took us two
19 months to reach everybody, two people in Texas and
20 one in Pennsylvania. Thank you for the data
21 source.

22 MS. HALE: That's all.

23 DR. SIPES: Does she want a response to

21 some of those earlier things?

1 MS. HALE: Yes, the contamination.

2 DR. SIPES: Right, my concern there was,
3 for example, I looked at the metals. For example,
4 we have general feelings that cadmium can be
5 toxic but cadmium was in the Canal. Cadmium was
6 in other areas. It probably did not, in my
7 opinion, it was not migrated and my whole emphasis
8 there was to try to see if remediation was going
9 to reduce levels of chemicals that have been shown
10 to come from the Canal. Relative to lead which
11 may have come from somewhere else or cadmium or
12 something, I don't think that's the thing we need
13 to focus on.

14 MS. HALE: Some of the levels were higher
15 in the non-Love Canal contamination than there was
16 in the Love Canal contamination. In the EPA
17 report it was higher.

18 DR. SIPES: It was higher outside that
19 area. It was the same thing as I pointed out with
20 the phthalates, that there was statements made
21 that there was no feeling that these were con-
22 taminations from the Canal, that they were from
23 other sources. I have no idea what those other
sources would be.

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MS. HALE: Neither do we.

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DR. SIPES: So that's why I wanted to

focus on - - if we're going to say, if you're going to put anything like a plastic bubble over the Canal, we would like to make sure that the chemicals that are in there that contaminated the EDA area, that that problem has been remediated. That's why I was focusing on that.

MS. HALE: But it's also a political problem when you exclude the contamination from one source to another. People would still be exposed to another source.

DR. SIPES: I agree with you there but I don't know how to handle it within the context of this committee. I agree with you 100% on that.

MS. GABALSKI: Reverend Dyer?

REVEREND DYER: The last time I was here at the other meeting, I expressed a concern because of the success of the leachate system bringing ground water into the drain and then to the leachate system and in doing so it was bringing it underneath our property and when it would become a very rainy season, it would flood sure enough. For a long, long period of time the yard of the church

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was not able to be used, the yard of the church from the fence to the church because of the heavy water that was there. Water came up in the basement and I called Albany and said you can come and test it if you like. They said we're not going to come out and test it. I was concerned because it was there and it was there for a long period of time.

We had a meeting a few days afterwards in the community and talked with Dr. Huffaker. We found out at that meeting that they've already moved people back into the Canal. We've already established some criteria. We established that the home was safe and they moved them back in. Maybe that same criteria you could use that because you've already established that it was safe for somebody or the determination was made and maybe that should be included in what's going on here. They tested that house but wouldn't test my house but would test that house. I just thought that would be very important.

DR. HUFFAKER: That's a valid observation. Dick Morris, who is the head of the Love Canal Revitalization Group, the gentleman who

24 talked to you on the bus tour, lives in a house
1 in the Canal. The question came up at the TRC
2 meeting how was that house chosen and who says it
3 was habitable. I asked a lot of people, including
4 Dick and, evidently what happened was he went
5 around and asked and it was a nice house and did
6 anybody have a problem with it and what do we
7 know about it. Several people said this is the
8 list of data on the house and it doesn't look bad
9 to me. That was about as far as it got and Dick
10 said, well, from what you say and I trust you and
11 so on, I'll take it. He made a risk choice, if
12 you like, that the house was all right and that
13 was his judgment and he moved back in.

14 DR. WINKELSTEIN: Did he buy the
15 house?

16 DR. HUFFAKER: No, he was given the
17 house. He gets the rent in lieu of salary. Now
18 he's moving to Albany. He got a promotion and
19 transfer. I think his family is up here but he's
20 down there two days a week. He will move down there
21 full time.

22 The Reverend's question was a good question,
23 how was it decided that that house was usable.

25 It was done on a very informal basis, conversation
1 with several people at the Health Department, I
2 believe, not with me.

3 DR. WINKELSTEIN: Why wasn't the water
4 tested in the basement of the church?

5 DR. HUFFAKER: I wasn't aware of the
6 request. I don't know.

7 UNIDENTIFIED WOMAN: How can you say
8 that? That was what was discussed at the last
9 meeting, to take tests on Reverend Dyer's house.

10 DR. HUFFAKER: No, the conversation at
11 the TRC meeting was that he wanted his basement
12 of the house tested and this is where we said,
13 well, we can't do it. Now, I understand this
14 was the house and nothing was said about the
15 church. There are no standards for houses and
16 until this group comes up with some standards for
17 habitability, we won't be testing any residences
18 or unless it's part of the study. Now, we can
19 do it for businesses because there are some
20 standards there. I don't know why churches fall
21 under this thing. If you were requesting some-
22 thing on the church, I misunderstood. I understood
23 it was your house. It was the rectory.

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REVEREND DYER: It was the basement in

1 both places and water stays in one almost all the
2 time, in one area of the church and it comes up
3 in the house. When it does, when we get all the
4 runoff from Love Canal or what this stuff is in my
5 yard, we can't use it. We can't use our yard when
6 it's very rainy in that area. It's right there
7 between the fence and the church and there is one
8 area of the church that keeps quite a bit of
9 moisture in it. This whole area is what we
10 were concerned about.

11 DR. HUFFAKER: My response is going to
12 be very unsatisfactory. We would do the church
13 as a public work place, something of that sort and
14 use OSHA standards. Those are all we have and
15 those are all we can fall back on. Those are
16 set on a completely different basis.

17 REVEREND DYER: Well, we have designated
18 since last September our house, we're not living
19 in it. It's now a church. It is part of the
20 church and this is true. This is true. This is
21 true. Look at my insurance papers. It is an
22 auxiliary building we use for storage and other
23 things that we do at the church. It's part of the

27 church.

1 DR. HUFFAKER: I want to see my lawyer.

2 DR. WINKELSTEIN: Let me ask a question.

3 Is the church, the church is in the EDA?

4 DR. HUFFAKER: Yes, sir.

5 DR. WINKELSTEIN: And outside the
6 ring also?

7 DR. HUFFAKER: Just on the edge.

8 DR. WINKELSTEIN: It seems to me when
9 you have an emergency declaration area, invoking
10 those arbitrary rules seems strange. I don't
11 quite understand that.

12 DR. STOLWIJK: Is this surface runoff
13 that's taking place?

14 DR. HUFFAKER: I don't know where the
15 water is coming from because it's coming in the
16 house.

17 REVEREND DYER: It might prove that
18 there is nothing wrong with it. I'm just concerned
19 that this water is being pulled underneath our
20 properties, that it's not real successful in pul-
21 ling chemicals. When it gets all the water, it
22 comes up in our facilities.

23 MS. GABALSKI: I hate to cut this short,

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but I think there are a number of concerns of
adequate value.

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Mrs. Marian Smith?

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MRS. SMITH: Mr. Huffaker has suggested
that I have health assessment done and our family
and on our home and I was wondering how I could
go about getting the information as to what that
health assessment showed and if that was the same
type of health assessment that was done on other
families that lived on the other side of the
creek or the other side of the declaration area?

DR. HUFFAKER: Did you talk to Pat
after?

MRS. SMITH: Nobody talked to me at
all.

DR. HUFFAKER: Let me talk to her.

MRS. SMITH: I was also wondering like
with us living so close to the creek where the
dioxin is found, are they going to give me some
kind of an assurance that my family is in no
danger by living there, that my kids won't be hurt
by the chemicals in that creek?

UNIDENTIFIED WOMAN: Well, somebody
answer her.

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DR. STOLINE: You live right outside

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the - -

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MRS. SMITH: I live outside the

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declaration area. They're going to fence out

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30 feet of my property in the back yard to clean

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up the creek. While they're back there in their

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uniforms cleaning the creek, my kids are going to

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be hanging on the other side of the fence watching.

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DR. HUFFAKER: The back of her property

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is the center line of the creek. She has a very

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legitimate concern here. I don't have a mechanism

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to answer. The creek rises up and you have ques-

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tions of that sort.

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DR. WINKELSTEIN: You're putting the

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fence on her property?

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DR. HUFFAKER: Yes, the State is putting

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the fence on her property.

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DR. WINKELSTEIN: I think it's outside

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the EDA but it seems to me some kind of compensation

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approach to this thing ought to be to do what one

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could to help the homeowners accommodate to this

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problem.

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DR. HUFFAKER: Such as?

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DR. WINKELSTEIN: If you're putting the

30 fence on her property, maybe you ought to buy the
1 property or offer to or at least pay her for the
2 fence or do something. I mean it's, as I under-
3 stand it, I am not on this Committee to advise you
4 on this, but this lady obviously has a problem and
5 I should think that a sensitive public agency
6 ought to be able to negotiate some solutions to the
7 problem instead of not answering it.

8 DR. HUFFAKER: Is there anybody here
9 with DEC that's involved in this particular
10 business? Well, let me wing it then. I'm not
11 DEC. This is the agency handling it. They're
12 using either Eminent Domain or permission to put
13 the fence on the north side of the creek. This
14 is not in the declaration area. This is outside.
15 This is what they were talking about.

16 DR. WINKELSTEIN: I don't want the
17 answer.

18 DR. HUFFAKER: There is no mechanism
19 set up unless there is new legislation which would
20 allow us to do anything with Mrs. Smith. It's
21 outside the declaration area. We have a legal
22 problem of where our authority ends.

23 DR. STOLWIJK: Somebody exercises

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police power.

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DR. HUFFAKER: To do what?

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DR. STOLWIJK: To put a fence on somebody's private property.

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DR. HUFFAKER: Yes.

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DR. STOLWIJK: That has to get into some kind of Eminent Domain question.

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DR. HUFFAKER: That's a different matter. I'm sure that's true. I can't comment on what they're doing.

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Was there an offer to buy?

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MRS. SMITH: They did offer me to give me a certain amount of money to rent the property for a period of two years but my concern also was that when we first moved into our home, our old drains from our house ran directly into the creek. After we lived there three months, after we moved in, the property was condemned. We had to hook into the City sewers. When we had our drains hooked up to the City sewers, they never removed the old drains from our yard which are still running into that creek and sometimes that creek comes up pretty high and it's almost level. I'm afraid that if the dioxin hasn't already come up

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near my home, there is a possibility it could and we've had a lot of illness in our family. I thought that somebody should do something to help us, but nobody really wants to do anything.

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DR. STOLWIJK: Could I ask, Madame, did you accept the compensation that was offered?

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MRS. SMITH: No. I asked them to help me. I stood there and bawled. I didn't know what to do.

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DR. STOLINE: One comment I'd like to make, in the original EPA study which was done in 1980, apparently two control groups, one was quote, unquote kind of randomly selected but there was another control group that apparently were people that said that they thought they had problems in the area and that they were included as a control group but I don't think that data was ever analyzed, at least what I read in the summaries in Volumes 1, 2 and 3, that that data was never used in making any kind of decision. If it's there, I would assume that your particular situation that you're talking about, falls in that same realm area which is probably something this group ought to take a look at is essentially

33 if we're saying that the area is habitable, maybe
1 we ought to take a look at the other areas in
2 cases like yours and other cases like that if
3 there isn't something connected with living close
4 to the creek that has been identified as having
5 dioxin.

6 DR. HUFFAKER: Mrs. Smith's back yard
7 was tested just by chance by the EPA sampling and
8 they drilled a well, three wells, I'm not sure
9 which, and took soil samples at six, twelve and
10 twenty-three feet. At six feet we found 14 parts
11 per billion benzene or something like that and
12 that was all. We didn't get anything at twelve and
13 we got a number of trihalomethanes and a couple
14 of chloronates at twenty-three feet. I don't know
15 what any of that means.

16 MR. STEELE: Benzene and hexachloride
17 are there.

18 DR. HUFFAKER: At the bottom of the
19 deep hole?

20 MR. STEELE: Some of the swale areas.

21 MS. GABALSKI: Again, I think we've got
22 to move on.

23 Mrs. Violet Iaducicco?

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MRS. IADUCICCO: You made some remarks

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about lifestyle and I was wondering if there would

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be anything in your criteria that would kind of

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forewarn the unsuspecting, like the mentally

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retarded or the handicapped or someone who doesn't

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understand, should you decide to rehabilitate the

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area because there is a lot of people who may not

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have a good standard lifestyle that may decide to

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move into that area and they may be unsuspecting

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and really not know or be aware of what the dangers

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are there. Should there be something established

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that says that they are to be forewarned? You

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can't leave it as to whether or not they know.

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It may be people who move from another area who

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don't know about the Love Canal. It's not some-

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thing they would know. I think there should be

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something established that they have to do to be

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sure they're warned. There are a lot of people

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who really don't know and that might go out there

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and live there and really want to live there because

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they - -

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DR. FOWLKES: We're trying to draw up

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a criteria of habitability which, if they are met,

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would render it safe enough for anybody - - you're

35 assuming that it would be opened up for habit-
1 ability and be at the same time latently and
2 knowledgeably dangerous and that doesn't - - that
3 is not the point of drawing up the criteria.

4 MRS. IADUCICCO: They're allowing people
5 to live in it already, in a declared unsafe area
6 now.

7 DR. FOWLKES: No, it's an evacuated
8 area. Unfortunately, the process of evacuation
9 didn't seem to follow on any real concrete reliable
10 information on exactly what the risk was. It was
11 the fear of what the risk might be that accounted
12 for the evacuation but not an absolute base of
13 knowledge.

14 MRS. IADUCICCO: Before I left home
15 this afternoon, I received a phone call that some-
16 body was recommended to call me because they knew
17 I had rentals in the Love Canal and to see would
18 I rent these houses to them because they wanted
19 to move in there. They have small children and
20 the Revitalization Agency referred them to me.
21 I don't understand why they referred them to me
22 when they could refer them to the LaSalle
23 Development. There are a lot of people that really

36 are not aware that the property is what it is.

1 They will move in there if you let them.

2 DR. FOWLKES: It's fairer to say not
3 aware of what the problem might be if it is because
4 I don't think that that really is known. What
5 we're trying to do is establish criteria for
6 habitability to assess information that allows
7 somebody to assess the information in hand in
8 terms of whether those criteria can be satisfied
9 and the declaration of habitability made on the
10 basis.

11 I wish somebody else would speak to this,
12 too. I'm not sure I'm getting my point across.

13 MRS. IADUCICCO: There may be an element
14 of risk that you may decide to have people live
15 there with that element of risk. There is a lot
16 of people that won't understand that.

17 DR. FOWLKES: I think it's probably
18 fair to say that the criteria will be put together
19 in the end to open up Love Canal and I'm just
20 guessing, but I think to open up Love Canal on the
21 basis that it doesn't, it can be documented that
22 it doesn't, to the best of anyone's knowledge, carry
23 any more risk with it than any other neighborhood

37 in the general area or general region. I think
1 that's - -

2 DR. MILLER: I think what she is trying
3 to say is that a potential resident has to make
4 an informed decision about whether they're going
5 to trust that assertion or not trust that
6 assertion. She is arguing that there are some
7 people who are not capable of making that informed
8 decision because they don't have the information
9 or they don't have the ability to process the
10 information.

11 MRS. IADUCICCO: To understand.

12 DR. WINKELSTEIN: I think we should
13 consider a criterion which would include informa-
14 tion concerning the history of the area.

15 DR. SIPES: The library.

16 DR. FOWLKES: The renter or buyer.

17 DR. WINKELSTEIN: I guess what the lady
18 is suggesting or asking is would we consider a
19 criterion to include information regarding the
20 history of the area and I think we should con-
21 sider such a criteria.

22 DR. FOWLKES: Is that the sort of thing
23 you meant?

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MRS. IADUCICCO: Something to be sure that anybody even with an element of risk knows what they are doing.

DR. FOWLKES: So that because this neighborhood has a special history, that this special history ought to be available to anybody considering moving in.

DR. CHALMERS: It's called informed consent.

DR. FOWLKES: I'm sorry. I guess I didn't quite understand you.

MRS. IADUCICCO: Is that a Hooker clause?

DR. FOWLKES: That's a disclaimer. You're not talking about a disclaimer, you're talking about some information, you're talking about the opposite.

MRS. IADUCICCO: I know a lot of retarded people who wouldn't understand the word disclaimer. I would hate to see a lot of unsuspecting people go in and they're not fit.

DR. FOWLKES: All I meant is if we did our job right, it shouldn't be possible for unsuspecting people to be victims of undue risk.

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MRS. IADUCICCO: They're already victims

1 in a sense because there is a lot of people that
2 take advantage of them now and this would be just
3 another case of they could be taken advantage of.

4 MS. GABALSKI: I call on Mr.
5 Stevenson, Bill Stevenson.

6 MR. STEVENSON: Yes, I don't know what
7 I have to say concerns you or not, but I'm sure
8 it concerns us. What I can't figure out is we
9 can send a man to the moon and bring him back and
10 all and here we've been living, I've been living
11 out in the Love Canal area for the last 40 years
12 and where I live now, I live at 1059 99th Street
13 and I live about one block north of Colvin
14 Boulevard.

15 What I can't understand is it's not our
16 health problem - - it's not the Love Canal I think
17 that will eventually get us. It would be the
18 tension and waiting for results. Every time we
19 get results and they send them in and somebody
20 says, well, it's clear enough, we do this again.
21 The tension on this from waiting, I've developed
22 hypertension and all of this here and not really
23 too bad but I don't really think the chemicals will

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get us. It will be the tension. We would like some good results, encouraging results whether we should move or whether we should stay there. This way, the longer we stay there, the sicker we get and if we should move, I think you should tell us this. So far, I can appreciate the results they have been getting. They talk about cleaning the sewers. There is dioxin in the sewers. I don't know if there has been anything done about it, but we haven't heard about it.

Also, there was a theory, I suppose, to put the plastic cap over the Love Canal and they haven't started that. I more or less looked forward to seeing people working up there, whether they're containing this or not, but here, a month or two has gone by and they may have brought the plastic top in but as far as I can see, there is no work being done on it.

This is about all I have to say right now. I can appreciate you having a long day but we would like to have some positive results out there some way.

Thank you.

MS. GABALSKI: Sam Giarrizzo?

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MR. GIARRIZZO: First of all, if this
guy is talking about health reports, questionnaires,
how much faith do you people put in it because I
got one of those health report questionnaires:
Yes, no, possible. At the time that those health
reports were sent out by the Health Department,
people were emotionally upset. They were dis-
cussing what was going on. They had lawsuits
pending so the answers to that health report coin-
cided with the way they felt. One of the question
is, do you get frequent headaches. Okay, yes, no
or possible. I was upset. I had a lot of head-
aches so I put down yes. You have miscarriages,
yes, no or possible.

DR. POHLAND: You better not have put
down yes.

MR. GIARRIZZO: Those questions like
that are the way people were feeling at the time,
they put down anything they wanted. If you had a
lawsuit, you put down all the answers to pertain
to your lawsuit to make it awfully good. If you
were undecided, you might answer truthfully. People
who figured they were safe, they went the other
way. You can't very well base your answers on that

42 health report. Some of those questions are even
1 called up on the phone. They called me on the
2 phone and asked me the questions on the health
3 report. I don't think that's very qualified
4 health reports to put any basis into it.

5 DR. CHALMERS: We agree with you.

6 MR. GIARRIZZO: Thank you.

t-15 7 Secondly, like Mr. Stevenson said, we've
8 been waiting a long time for an answer. The
9 people out there want a fair, honest, unbiased,
10 habitability report. We don't want no emotional
11 things or political implications put into it,
12 just if it affects our health or it doesn't
13 affect our health. If it doesn't affect our
14 health, we'd really like to remain there. I've
15 been there 29 years and going on 30. Maybe I
16 don't want to argue with Violet there but she
17 says some people might not know what to do. I
18 think the remaining residents know what their
19 answer is and any people wanting to move back
20 in are able of answering if they want to live
21 there or not.

22 Thirdly, all I can say is there is an article
23 here which more or less answers all our questions.

43 You can have it. You can pass it around.

1 That's about it. Just give us a fair,
2 unbiased health report or habitability report
3 and we'll be satisfied.

4 Thank you.

5 MS. GABALSKI: Mr. Steele graciously
6 asked to be placed last on the people who had
7 questions and comments and we are now up to
8 Mr. Steele.

9 MR. STEELE: Just a couple of things.
10 I know last time it was indicated that there would
11 be made available to the Committee the results
12 of the monitoring and sampling that had not yet
13 been made available to that date. I don't know
14 whether the Committee has seen them. I know I
15 continue to inquire about those results and to
16 date, I have not been able to see the results and
17 I hope you people are having better luck than I.

18 The second thing is with respect to your
19 boundaries in your criteria. It does not seem
20 at all to me inappropriate for your guidelines
21 to consider whether or not you believe that any
22 particular circumstances or particular geographical
23

44 areas the boundaries of the emergency declaration
1 area is or is not appropriate. If you feel that
2 under all the circumstances Mrs. Smith and perhaps
3 people like her should be treated the same as some
4 of the other people, I would encourage you to put
5 that in the document and perhaps that could
6 encourage the Legislature to give Mr. Huffaker
7 the kind of help he needs by legislation to treat
8 Mrs. Smith fairly. So I would urge you to use your
9 mandate as broadly as you feel you should and don't
10 artificially constrain yourselves.

11 Third, I think it might be appropriate and
12 useful to look at whether or not the remedial
13 program in effect currently at the Love Canal is
14 appropriate and adequate. I know subsequent to
15 the deletion of the wall, the DEC has prepared
16 proposed additional remedial measures which they
17 have never made public. That leads me to believe
18 that perhaps there are some people with some kinds
19 of experience that might be needed and to ask that
20 group to review the current remedial plant and
21 to make whatever appropriate suggestions you feel
22 would be helpful.

23 As far as the Committee members who don't

45 appear to be taking the responsibility as you
1 people are and who don't appear to be coming to the
2 meetings, I know at least one of those people
3 ended up on the Committee as a result of citizens'
4 suggestions. Before you take people off the
5 Committee, I suggest, as a matter of courtesy,
6 I ask that you run that idea by those people and
7 see whether or not they have no objection to that
8 person being removed.

9 Apparently there was an article in the paper
10 recently about a house for sale by the United
11 States Department of Housing and Urban Development.
12 That seemed to be inconsistent and that house,
13 apparently, is in the declaration area. That seems
14 to be inconsistent with the Governmental position
15 that we're not going to do anything until you
16 people make your recommendations and the Govern-
17 ment makes specific findings based on that.
18 Perhaps you can help every agency of the Govern-
19 ment act as a single body and not have HUD
20 trying to sell their insured homes. Perhaps you
21 can look into that.

22 DR. CHALMERS: We'd certainly like the
23 answer to that.

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MR. OGG: Mr. Steele stated that there were plans for further remediation. A decision that we need to study further whether or not additional remediation is necessary, that study has not been funded as yet and we were waiting for some guidance from you as to how to go about that study.

HUD, HUD on the issue of HUD, they have apparently recently - - I don't know all the details about the general policy to sell off all the excess property, this was thrown into that pool nationwide of excess property they wanted to get rid of, proceeded with an advertisement calling for a bidding process. We have called HUD and informed them this is in the emergency declaration area and suggested they may not want to take this action on this site.

DR. WELTY: Excuse me, some of our people do have to leave but some of us can stay for a while. So I'll have those of you who have an early flight, feel free to go and I will stay for a while.

DR. WINKELSTEIN: I think the point is a pretty important one. I certainly hope we would

47 not rely on letters but some affirmative action
1 taken at a pretty high level.

2 MR. OGG: We're trying to set up a
3 discussion. Apparently they handle things
4 out of their local offices. We'll be up here
5 talking with these people so we clearly understand
6 this. It's been indicated there may be some other
7 federations that might have some mechanisms.

8 DR. STOLWIJK: These are houses that
9 are currently occupied?

10 MR. OGG: No, I believe this is a
11 vacant house.

12 DR. STOLWIJK: It's a vacant house that
13 still has a mortgage on it?

14 MR. OGG: I believe there is a fore-
15 closure of the mortgage at some point.

16 DR. STOLWIJK: You mean it has not been
17 taken over?

18 MR. OGG: It has not been taken over,
19 no.

20 DR. STOLWIJK: It's just sitting in a
21 vacuum?

22 MR. OGG: I don't have all the specifics.

23 DR. STOLWIJK: Something doesn't make

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sense.

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MR. OGG: I think there is a VA

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mortgage that may be out there. They may wind

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up being able to - -

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DR. WELTY: It sounds like it was an

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oversight on HUD's part and we'll get back to

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you at the next meeting as to the state of the

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house.

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DR. STOLWIJK: The title for all these

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houses have actually been taken over by Alcara,

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they hold title?

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MR. OGG: Alcara will hold title for

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those houses they have taken over under their

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agreement.

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DR. STOLWIJK: So this HUD house pre-

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sumably has not been taken over.

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MR. OGG: Housing is apparently not

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included.

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MS. GABALSKI: If you're willing

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to stay, he has two more.

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MR. STEELE: People are ready to go.

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I wasn't finished. I will put my short remaining

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three questions in letter form. I won't finish

23

it. People are prepared to go but I will have

49 three other short items I will put in letter form.

1 DR. POHLAND: If they're short, let's
2 hear them.

3 DR. SIPES: Can you also comment too
4 on your statement to the fact that people who had
5 never been to a Committee meeting, how they're doing
6 the job for the people who put them on the
7 Committee in the first place. I find that sort
8 of perplexing.

9 DR. WELTY: No, he's suggesting that
10 we should get input from the community about
11 whether or not - - specifically with Dr.
12 Highland?

13 MR. STEELE: I believe so.

14 DR. WELTY: I'd certainly welcome
15 any feedback that you have at this point as to
16 should we continue to invite Dr. Highland to
17 serve on the Committee or I think that you've
18 heard the concerns that the consultants have that
19 coming in at this late date might in many ways
20 be disruptive to the activities that we're trying
21 to achieve.

22 MR. STEELE: I think the only thing that
23 I had there is this might be sensitive to Chuck

50 with the particular originals.

1 DR. WELTY: That's what I'm trying to
2 do right now.

3 MR. STEELE: They may not all be here
4 right now. I think the point that Ms. Gabalski
5 made is that I had three short additional questions.

6 DR. WELTY: I wanted to get a little
7 more feedback. Anita, how can we get feedback
8 on how the community feels about their consultant
9 who hasn't shown up for any meetings?

10 MS. GABALSKI: I believe the coalition
11 is planning on meeting again and maybe that is
12 something that could be included as a point on
13 their agenda.

14 DR. WELTY: Can you try to convey to
15 the community the concerns that are consultants
16 have about people who haven't attended?

17 DR. HUFFAKER: Not just Joe Highland.
18 There is Ellen and several other people involved.

19 DR. WELTY: I'm sorry, go ahead with
20 your final questions.

21 MR. STEELE: I was wondering whether
22 or not the discussion of standards with respect
23 to what's in the ground water and what's in the

51 ~~soil is something which is consistent with the~~
1 criteria that some people are talking about as
2 to whether the dump was ever there. It seems to
3 me that that, that we might find standards that
4 people are comfortable with that do in fact repre-
5 sent the fact that the dump is there and I see one
6 set of criteria as being, as being inconsistent
7 with the other.

8 A second to the last area was if at all
9 possible and I know certainly with my own legal
10 work, I get things done close to the deadline.
11 If it's at all possible, copies of your draft
12 report, if that could be made available prior to
13 the meeting so we can have an opportunity to have
14 informed comments at the meeting, that would be
15 helpful.

16 The final thing is I would implore people
17 to make sure that the renters, including those
18 who reside, who used to and still do reside in
19 the LaSalle Development would be part of your
20 medical follow-up study. I know in the past those
21 individuals haven't. It hasn't been policy to make
22 sure that those people were included and I ask that
23 they be so.

52

DR. WELTY: We'll check on that.

1

MR. STEELE: Thank you very much.

2

DR. STOLWIJK: Mr. Steele, the

3

reference to, as if the dump had never been there,

4

you have to recognize represents a very heavy

5

emphasis on the as if. It is impossible to have

6

any chemical ever, anywhere, without it leaving

7

traces that with sufficiently sensitive equipment,

8

you will be able to demonstrate that it had been

9

there. The reason why we are thinking about

10

criteria that have some indications that relate

11

to ground water standards or put an upper limit

12

on the presence of these things, is not to try

13

and tell anybody that it is as if, literally as if

14

it had never been there because that's just not

15

possible.

16

MR. STEELE: Well, one of the proposed

17

criteria was as if it should be as if the dump

18

wasn't there. That's different than saying we

19

have these levels and it reflects the dump

20

intermediating conditions and we think under all

21

the circumstances and safety factors that these

22

are appropriate. I just wanted to find out that.

23

I saw those two criteria to some extent conflicting.

53

DR. STOLWIJK: The criteria that we

1

are proposing to you are criteria that are used

2

in all other circumstances as levels above which

3

you're concerned, a level below which you did not

4

take any action. You don't have any concern.

5

The criteria that will be used are the ones that

6

are already in force in other places.

7

MR. STEELE: There was some discussion

8

along the table as to the abilities of certain

9

kinds of standards.

10

DR. STOLWIJK: When there is an

11

absence of criteria, then one way or another,

12

something will have to be done about that and

13

it will be clearly stated.

14

MS. GABALSKI: Walter Mikula had a

15

statement.

16

MR. MIKULA: Yes, you know for years

17

I tried to get the State Health Department and the

18

EPA to give me an answer in regards to whether it

19

was dioxin in the sewer at 93th Street or not.

20

I couldn't get any answers from any of them. I

21

asked Dr. Davis to test my basement and he said

22

it was too expensive. He couldn't do it. I lived

23

on 93th Street, Black Creek and Bergholtz Creek.

54 It seemed to me if I found dioxin in both of the
1 creeks, that it would conceivably get into the
2 sewer system and into the home. I brought this up
3 several times. There was an awful rainstorm when
4 some of the people had moved out of the area.
5 My daughter got a splotch of water on her arm like
6 this and then she developed a rash over her entire
7 body. She went to three skin specialists. It
8 took clear up to three months to clear up. All of
9 her joints cracked. She couldn't even type in
10 school. The doctor told her, you're never going
11 to get a doctor to attribute this to Love Canal
12 because he would spend more time in Court than
13 he would at his practice.

14 Now, this is what we run into. This is
15 among the doctors in the City. Nobody is going
16 to stick their neck out. A neurologist, he told
17 me, Walter, if I was you, if I had to live in a
18 tent in a field, I would move out. He also told
19 me, you won't win your fight.

20 I also want to say that those that speak,
21 have spoken here in regard to the severity or the
22 risk there are speaking themselves and don't
23 represent me. My feeling is that it is a dangerous

55 situation over there. I'm a grandparent. My
1 daughter is 60% of the size she should be. I know
2 another lady that her husband was six foot three
3 and weighed 270, she's five foot nine and they have
4 a daughter and she is about 60% of the size she
5 should be. I had a neighbor woman, I talked to her
6 the other night and because of her husband's
7 work, she didn't get involved in this. I won't
8 say where he works. Four of the children are not
9 born in Love Canal. The last two were. The one
10 that's 19, he has the shakes and the seven year
11 old one has all kinds of allergies. The rest of
12 them are all completely healthy. Another friend
13 of mine, his son died of leukemia at Love Canal. A
14 short time ago another one died of Hodgkin's
15 Disease. You don't want to talk about it. He's
16 not in his teens any more.

17 These are things that raise questions in
18 our minds. I can understand how some people feel.
19 My wife doesn't want to leave there either. One
20 of the causes that we broke up.

21 I guess that's about it. I just hope that
22 you think of these things when you make your
23 decisions of what's happening to us psychologically.

56

Many have died of cancer and a lot more will.

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And I will tell you people that it takes years for cancer to show up for a lot of people after the exposure. This is what we're faced with.

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In the past, I don't know how it is now, but the State and the EPA dragged their feet for a long time. They knew about the dioxin in Black Creek for well over a year before we knew about it. They wouldn't tell us. These are some of the things we've been faced with because a lot of us lose faith in our Government agencies. It's caused a lot of bitterness.

I just hope you think about that. We're not all nuts out there. I'm not there any more. That's about it.

DR. WELTY: Anita, is there anybody else?

MS. GABALSKI: Tom, there is somebody who would like to make a rebuttal statement but I think we would be getting into an argument.

DR. WELTY: I think it's appropriate that we end the discussion right here and hope that you will be able to attend our next meeting and try to follow up and take into consideration

56-A the comments that you've made today. Certainly
1 they've been very helpful. Thank you.

2 (Whereupon, public hearing adjourned
3 until July 26, 1984.)
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