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Transcript of Hearing

Date: April 13, 2022
Case: Reflections Park, LLC

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1 A P P E A R A N C E S	1 P R O C E E D I N G S
2 ON BEHALF OF APPLICANT, REFLECTIONS PARK, LLC:	2 HEARING EXAMINER ROBESON-HANNAN: This is a
3 JODY KLINE, ESQUIRE	3 continuation of the case of CU 21-06, Reflections Park Inc.
4 MILLER, MILLER & CANBY	4 for a cemetery at 16621 New Hampshire Avenue, Silver Spring,
5 200 B Monroe Street	5 Maryland. Are there any preliminary matters?
6 Rockville, Maryland 20859	6 MR. BROWN: I would like to note that last night I
7 Phone: (301) 762-5212	7 forwarded to all, including Nana Johnson, a copy of a
8	8 corporate resolution ratifying the acts of the Patuxent
9 TIMOTHY M. SULLIVAN, ESQ.	9 Watershed Protection Association Inc. during the period of
10 BEVERIDGE & DIAMOND PC	10 forfeiture.
11 201 N. Charles Street, Suite 2210	11 HEARING EXAMINER ROBESON-HANNAN: I got that. And I
12 Baltimore, Maryland 2101	12 think all parties were copied on that.
13 Phone: (410) 230-4150	13 MR. KLEIN: Mr. Sullivan and I received it. Thank you,
14	14 Mr. Brown. And similarly we sent to all of you a copy of
15 ON BEHALF OF CITIZENS IN OPPOSITION:	15 the Serenity Ridge decision and a copy of the approved
16 DAVID BROWN, ESQ.	16 preliminary forest conservation plan resolution of the
17 KNOPF & BROWN	17 Montgomery County Planning Board of July 21, I think it was,
18 401 E. Jefferson Street	18 2021.
19 Rockville, MD 20850	19 HEARING EXAMINER ROBESON-HANNAN: Okay, thank you. I
20 Phone: (301) 545-6100	20 did get that. Thank you all for your cooperation. So
21	21 what -- are there any other preliminary matters? Okay.
22 ALSO PRESENT:	22 Hearing none, the agreed-upon schedule is that we would hear
23 GUS B. BAUMAN, ESQ.	23 from members of the community today that are not represented
24 BEVERIDGE & DIAMOND	24 by either Mr. Brown or Mr. Klein. So what we will do -- a
25	25 couple of words. If you were not here yesterday, a couple

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2 (241 to 244)

<p>241</p> <p>1 of words about these proceedings. 2 They are remote at the moment. We ask that you not 3 interrupt people. If you have -- you can -- if you go up to 4 the top, you can raise your hand under the "react" button. 5 And I can monitor that and I could stop the proceedings. 6 But please don't crosstalk and interrupt because it's very 7 difficult for the court reporter to make out what you're 8 saying. This is being recorded by Microsoft Teams. That is 9 simply to allow a backup for the court reporter. The 10 official record is going to be the transcription. We do 11 have a court reporter that takes the testimony verbatim. We 12 use the Microsoft Teams recording only as a backup for his 13 report. 14 We -- the testimony here is informal, but it's subject 15 to formalities. You will be under oath and subject to 16 cross-examination. The Board of Appeals remand is limited 17 to environmental factors. And so we will limit the 18 testimony and request that you address your testimony to 19 that remand issue and not other items. So we are focusing 20 solely on the environmental impact of this use on the 21 environmental impact issues. 22 Now if people who wish to testify want to raise their 23 hand, then I will begin to take them in order that I -- they 24 appear on my screen. All right? But we will get everybody 25 that wants to testify in. And I see that Mr. -- I don't</p>	<p>243</p> <p>1 very much. Please take a look at item number 95 that's in 2 the attachment. That's what I will be reading, the 3 background of who I am. I'm George Thomas Willingmyre as I 4 previously said. I'm a professional engineer for over 40 5 years. I have a bachelors of science and engineering from 6 the Johns Hopkins, and a master of science from the George 7 Washington University. And I looked at Forest Ridge Drive, 8 Spencerville, Maryland. 9 And I've been a homeowner and taxpayer this property 10 for over 20 years. This lot is also known as Lot number 10. 11 The email by the Department of Environmental Protection was 12 one of the statements considered by the office of zoning for 13 this zoning hearing. I emailed reference -- references 14 (inaudible) report that was published in 2006. But they do 15 not mention a 1998 WHO report the impact of cemeteries for 16 the environment and public health. And I've provided an 17 email address for that, that reference. 18 This took me less than 10 minutes of internet browsing 19 time. And I don't understand why this report was not 20 mentioned by the Department of Environmental Protection nor 21 the Washington Suburban Sanitary Commission. The report 22 contains as its first recommendation, human or animal 23 remains must not be buried within 25 meters of any well, 24 borehole, or stream on which a potable water supply is 25 drawn.</p>
<p>242</p> <p>1 have your name. So let's do this. I did see you here 2 yesterday. Sir, can you state your name, please? 3 MR. WILLINGMYRE: My name is George Willingmyre and I'm 4 a professional engineer for 40 years. I live on (inaudible) 5 Drive. 6 HEARING EXAMINER ROBESON-HANNAN: You're not -- Mr. 7 Willingmyre, stop. You got to listen to me because you're 8 not under oath, okay? So just let slow this down, all 9 right? So please raise your right hand. 10 MR. WILLINGMYRE: It's done. 11 HEARING EXAMINER ROBESON-HANNAN: Do you solemnly 12 affirm under penalty of perjury that the statements you're 13 about to make are the truth, the whole truth, and nothing 14 but the truth? 15 MR. WILLINGMYRE: Yes, I do. 16 HEARING EXAMINER ROBESON-HANNAN: Now, please state 17 your name, street address, and email for the record. 18 MR. WILLINGMYRE: My name is George Thomas Willingmyre. 19 I live at 1012 Forest Ridge Drive. And I live in 20 Spencerville, Maryland. 21 HEARING EXAMINER ROBESON-HANNAN: Your email? 22 MR. WILLINGMYRE: Oh, my email, GTW@GTWAssociates.com. 23 HEARING EXAMINER ROBESON-HANNAN: Okay. Go ahead, 24 please. Now you can talk. I apologize for cutting you off. 25 MR. WILLINGMYRE: No, no. I appreciate it. Thank you</p>	<p>244</p> <p>1 This is 820 feet calculated at 200 meters times 3.28, 2 foot to meters equals 820 feet. I believe my well maybe 3 within this distance from the nearest property line of the 4 proposed cemetery. And the potability of my well could be 5 adversely affected if burials were to be made of the 6 property line of the cemetery. Choice number one, 7 alternatives for consideration. If Montgomery would have a 8 requirement that any burials at the cemetery have to be 250 9 meters from the property line of the cemetery, the cemetery 10 could bury not anyone. But the cemetery property lines are 11 not such that they can show that this (inaudible) wells like 12 mine. 13 Choice number two, if Montgomery County were to have a 14 requirement that any burials in the cemetery could not be 15 closer than 250 meters from any (inaudible) then some survey 16 work would have to be done. It's not clear who would do 17 this, but the survey would conclude there were no wells 18 within this distance of the chosen burial sites. My opinion 19 is that there are many wells in this category, mine 20 included, if the location of burials was chosen to be the 21 property line. 22 The cemetery burial sites would have to be limited to 23 certain locations and I believe that the -- there is 24 reference in the materials that Reflection has provided that 25 indicate where they plan to have burials. And no wells will</p>

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3 (245 to 248)

<p style="text-align: right;">245</p> <p>1 be allowed in this zone thereafter. This would be an 2 absolute requirement that would apply to any wells planned. 3 This could be portrayed on a map, for example. My opinion 4 is that there are many wells in this category. 5 A third alternative might be where the cemetery plans 6 burials has to be more than 850 feet away. Let's say 1000 7 feet to ensure some (inaudible) from any well now and in the 8 future at surrounding properties. Again, an additional 9 survey would have to be completed to determine the nearest 10 wells where proposed burials could be located at a 1000 feet 11 distance and the location of burials would have to be 12 limited to certain areas. Again, a map can be used. That 13 concludes my testimony and I would be glad to answer any 14 questions that you might have. 15 HEARING EXAMINER ROBESON-HANNAN: All right. I'm going 16 to give both parties a chance to ask questions since he's 17 not represented. But we will start with you, Mr. Sullivan 18 or Mr. Klein. 19 MR. KLEIN: We're going to start with Mr. Klein this 20 morning, if that's okay. 21 HEARING EXAMINER ROBESON-HANNAN: Okay. 22 MR. KLEIN: Mr. Willingmyre, I'm glad to see you're 23 still here. I know you were involved in the case before. 24 Let me just ask you this as a simple question. You have 25 been prudent and you looked at the record. Have you seen</p>	<p style="text-align: right;">247</p> <p>1 I believe that I may be the only lot owner that has provided 2 testimony. You know, I live very, very close to the planned 3 cemetery. Thank you, very much. 4 HEARING EXAMINER ROBESON-HANNAN: Any questions based 5 on the testimony? Okay. 6 Hearing none, Mr. Willingmyre, would you -- could you 7 kindly lower your hand in the Teams meeting so I can keep 8 track? Okay. Thank you. 9 Now the next person I have is Quentin -- you said this 10 yesterday, and I apologize. 11 MR. REMEIN: Remein. 12 HEARING EXAMINER ROBESON-HANNAN: Remein, okay. Mr. 13 Remein, would you raise your right hand? 14 Do you solemnly affirm under penalty of perjury that 15 the statements you're about to make are the truth, the whole 16 truth, and nothing but the truth? 17 Please state your name, address, and email address for 18 the record, please. 19 MR. REMEIN: My name is Quentin Remein. I am at 201 20 Branch Nursery Road, Silver Spring, Maryland. I am 21 president of the Cloverly Civic Association. My email 22 address is Quent@Cloverly.net. Okay. 23 HEARING EXAMINER ROBESON-HANNAN: Thank you. Go ahead. 24 MR. REMEIN: Okay. We became aware of this Reflection 25 Park project when we were invited by Jody Klein to listen to</p>
<p style="text-align: right;">246</p> <p>1 the Applicant's submissions on March 14th, which are Exhibit 2 97 and March 28th, which were Exhibit 118? Reports by our 3 experts? 4 MR. WILLINGMYRE: I have seen them, but I haven't read 5 them. So yes, I have seen the reports. But no, I haven't 6 read them. And I'm not familiar with them. 7 MR. KLEIN: Okay. Well, I'm not going to ask you any 8 questions then. I would encourage you to stay on and listen 9 to what you're going to hear for the next three or four 10 hours. And I think it will address your concerns. Thank 11 you. 12 MR. WILLINGMYRE: Thank you, very much. 13 HEARING EXAMINER ROBESON-HANNAN: Okay. Any other 14 questions from the Applicant side? 15 HEARING EXAMINER ROBESON-HANNAN: Okay. Mr. Brown? 16 MALE VOICE: No questions, thank you. 17 HEARING EXAMINER ROBESON-HANNAN: Mr. Brown, do you 18 have questions? 19 MR. BROWN: No. Thank you, Mr. Willingmyre for your 20 testimony. We appreciate your interest. I have no 21 questions. 22 HEARING EXAMINER ROBESON-HANNAN: All right. 23 MR. WILLINGMYRE: Thank you. 24 HEARING EXAMINER ROBESON-HANNAN: Mr. Wi -- 25 MR. WILLINGMYRE: The only thing I want to say is that</p>	<p style="text-align: right;">248</p> <p>1 a presentation in approximately October 2020, I believe. As 2 a member of the officers of the Cloverly Civic Association 3 attended the presentation and we -- basically we had mixed 4 reactions to it. Later on it was -- they came and made -- 5 the Reflections Park Applicant made a presentation to the 6 Cloverly Civic Association. Again, there were mixed 7 reactions, but there were people who were enthusiastic about 8 it and welcomed it in the community. 9 However, we never made -- there was never a resolution 10 passed to support their project. Later on as more 11 information became available about the project, we reviewed 12 the project again. And on January 31st, the project was 13 discussed at the Cloverly Civic Association meeting and we 14 decided to be opposed to it based on the potential harm that 15 the project could bring to the community because of the -- 16 basically to summarize, not go into more detail, it's the 17 same issue that is before you today. 18 There is two factors. Basically the Cloverly Civic 19 Association has been involved with a contamination of our 20 wells by a gasoline leak at Cloverly Shell station. This 21 happened in 2002. It took a long time to -- basically we 22 had informants tell us that this had even happened. And it 23 took a while to get the State to be involved in it. And 24 when they finally determined the severity of it, they 25 finally did get involved. Just for the record, it's case</p>

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<p>249</p> <p>1 number 2003-0695-MO with MDE, State of Maryland. 2 Basically a number of wells were contaminated and were 3 closed down. And with aggressive -- went after Shell. 4 Shell finally agreed to reimburse the neighbors who were 5 damaged by it. Also, there were a large number of neighbors 6 who also had that's basically it was MTE contamination that 7 was the primary thing. MTBEs were used as a gasoline 8 additive and the gasoline additive was banned in I believe 9 2006 as being carcinogenic and causing cancer, and was 10 removed from gasoline. 11 And the MTBE -- the MTBEs were basically to not -- 12 percolate into the soil. And then they eventually surfaced 13 in various points depending on the -- what was going on 14 underneath. My point to bring this up is it's very 15 difficult -- it's been very difficult for the remediation of 16 this gasoline spill. And it's been -- it's taking a lot 17 longer. Basically when it first happened the State of 18 Maryland met with Shell Oil and they said that this would 19 be -- this process would be cleaned up in seven years. 20 And so we waited for longer than seven years. Then we 21 asked for Shell to come to the Cloverly Civic Association to 22 give a full report of what was going on. They said that 23 there was still problems. They were still removing -- it 24 was a large plume that covered about three quarters of a 25 square mile on Branch Nursery Road. And basically it was</p>	<p>251</p> <p>1 could never happen. Basically the assurances have been 2 couched in all sorts of ifs, buts, ands, possibles, but not 3 one hundred percent guaranteed. Nobody is putting up a bond 4 that would dig up the entire plot of land to make sure that 5 if something did happen there would be a way of removing it. 6 And even if the was a way of possibly removing it, we are 7 talking about parts per billion that cause problems here. 8 And we just -- as a civic association, we don't feel safe. 9 The second piece of evidence is I participated in 10 development of the Cloverly Master Plan. And my name is 11 included in the book as a participant, citizens -- a member 12 of the citizens advisory committee. And we considered all 13 these things when we developed Cloverly Master Plan and we 14 created a special -- the first special protection area in 15 Montgomery County in the Paint Branch area to protect the 16 watershed there from damage. We identified the Duckets 17 Reservoir as a protection area and this is well documented 18 and many people brought this up. And I'm not going to 19 belabor the point. 20 But with one sentence, the primary reason for the 21 statements in the Cloverly Master Plan, that the Duckets 22 Reservoir protection area is an environmental preservation 23 area that protects the water quality of the Howard Ducket 24 Reservoir and it's a major drinking water supply source for 25 the Washington metropolitan area including about half of the</p>
<p>250</p> <p>1 determined that it would take another -- the report 2 concluded by saying it would take another 2 to 4 years to 3 complete the removal of MTBEs to a safe level, which was 20 4 ppb. And any well that was contaminated above that level 5 was basically considered to be not usable. 6 It's now 2022. They just issued a report on May -- I 7 just received the report on May 8th. And the basic that's 8 the bottom line of the report is there is 200 ppb MTBEs in 9 the plume. And we have to get to 20. So we are long way 10 from clearing this problem from the soil. And so we've 11 observed many reports. It's a difficult process to try to 12 remove something that's in the soil and get it out of the 13 soil. 14 And it keeps on -- it keeps on recurring and it's 15 causing -- it's still polluting wells even though you have 16 20 MTBEs or less coming out of your showerhead, it's not 17 very comforting to take a shower in water that causes 18 cancer. And so a large number of our neighbors are still on 19 the brink. And of course as new research comes up we find 20 out new things. But basically we -- it stands in our mind 21 as the Cloverly Community as something we don't want to have 22 recur and we don't want to introduce this into the 23 community. 24 And so we are -- we were looking for the Applicant to 25 give us a 100 percent assurance that something like this</p>	<p>252</p> <p>1 Cloverly master planning area which we represent. 2 The second thing is, at the time that we considered all 3 this, the water was considered to be pristine in the Duckets 4 Reservoir and did not have any contamination. Here it is, 5 2022 and this is what WSSC says about the -- recommends 6 regarding being involved with the water in the Duckets 7 Reservoir. WSSC recommends, quote, if you come in contact 8 with the water in the reservoir, rinse it off right away. 9 Do not allow dogs to swim or drink the water. Do not eat 10 fish livers or digestive organs from fish caught in the 11 reservoir. This is not a safe reservoir. 12 And although they can purify the water to bring it to 13 drinking standard, if we continue to allow more pollutants 14 in the Duckets Reservoir, we're going to be in deep trouble. 15 And once they are in the ground, they're going to be leased 16 out for years and we're still -- we're still working a very 17 aggressive campaign to remove the MTBEs from the Cloverly 18 Branch Nursery Road area. And that's been going on for 20 19 years and it's been long -- taken far longer than the 20 science could ever have demonstrated that it would have 21 taken. So that our concern. 22 And basically the Association, on January 31st 23 unanimously recommended to oppose the plan. And we're 24 not -- I would say we are not -- basically people are 25 supportive of the mission. It's just that this is not the</p>

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<p>253</p> <p>1 place for this green cemetery. Thank you.</p> <p>2 HEARING EXAMINER ROBESON-HANNAN: Thank you, Mr.</p> <p>3 Remein. Are there questions? Okay. I -- does anyone have</p> <p>4 a second device? Because I'm hearing an echo. Okay. I</p> <p>5 don't hear it now. All right. Mr. Klein or Mr. Sullivan,</p> <p>6 any questions?</p> <p>7 MR. SULLIVAN: I think it's two different names for the</p> <p>8 same thing.</p> <p>9 MR. KLEIN: It will be Mr. Klein. Mr. Remein, good</p> <p>10 morning. Nice to see you again. Hope everything is okay at</p> <p>11 home. Thank you for your candor in describing the efforts</p> <p>12 on the part of the Applicant to meet with you and your</p> <p>13 organization in advance. You mentioned that you had, I</p> <p>14 guess, a community association meeting and adopted a</p> <p>15 resolution. You opposed the project in January. And I</p> <p>16 assume that in 2022.</p> <p>17 MR. REMEIN: That's correct.</p> <p>18 MR. KLEIN: Okay, fine. So am I correct in assuming</p> <p>19 you haven't, yourself or your Association, had a chance to</p> <p>20 see the Applicant submissions since that time dealing with</p> <p>21 the issues of the transmissivity of the necro-leachate?</p> <p>22 MR. REMEIN: I have reviewed them. The Association as</p> <p>23 a whole, some people have reviewed them. A number of people</p> <p>24 have written their own letters that are part of the record</p> <p>25 here. So let those speak for themselves.</p>	<p>255</p> <p>1 the reservoir that -- I'm using the term that used in the</p> <p>2 Cloverly Master Plan. But we are talking about the</p> <p>3 reservoir that this property drains into.</p> <p>4 MR. KLEIN: Okay, thank you. Mr. Remein, I will say</p> <p>5 the same thing I said to your predecessor or the preceding</p> <p>6 speaker. Please hang around and listen because I think what</p> <p>7 you're going to hear in the next three or four hours is</p> <p>8 going to give you much higher level of comfort as to what's</p> <p>9 going to happen as a result of the Reflection Park. But</p> <p>10 thank you for your testimony. No further questions.</p> <p>11 HEARING EXAMINER ROBESON-HANNAN: I just wanted to</p> <p>12 clarify something because I missed it. Did you say the</p> <p>13 Duckett and the Rocky Gorge and the WSSC reservoir are all</p> <p>14 the same -- are the same reservoir by different names?</p> <p>15 MR. REMEIN: That's what I'm saying, yeah. They are</p> <p>16 all -- the ones that you are considering are basically the</p> <p>17 same reservoir. The part that is the reservoir that's in</p> <p>18 the Cloverly master planning area is -- I would say more</p> <p>19 correctly known as the Duckets Reservoir. But that's the</p> <p>20 body of water that's in the Cloverly planning area. There</p> <p>21 are several dams that are associated with -- there is the</p> <p>22 Brighton Dam for their upstream. I think all these are</p> <p>23 considered to be part of the same reservoir system that</p> <p>24 provides water. And there is the Ashton planning area and</p> <p>25 Olney planning areas address part of the Patuxent watershed</p>
<p>254</p> <p>1 MR. KLEIN: With those people who reviewed the</p> <p>2 materials, the exhibits I mentioned follow March 14th and</p> <p>3 20th, have any of them come back and said, hey, it's okay?</p> <p>4 MR. REMEIN: No one has spoken further of it. And we</p> <p>5 have our own community expert on this issue and he says</p> <p>6 that -- his basic response is that, okay, that's one item,</p> <p>7 but it doesn't really address the poor quality of water in</p> <p>8 the reservoir right now and what could happen if there is a</p> <p>9 complication, a mixing of this pollutant with other</p> <p>10 pollutants that are already in the reservoir. So I think</p> <p>11 it's -- no, I -- you know, you can say -- try to be heroic</p> <p>12 about it, but I think we've learned the hard way that even</p> <p>13 the State and the Shell Oil company can't fix the problem</p> <p>14 they created even though they thought they could do it in a</p> <p>15 short period of time.</p> <p>16 MR. KLEIN: Well, was your -- based on your familiarity</p> <p>17 with the neighborhood, maybe you can correct me. Because</p> <p>18 I've been working on the assumption that we are talking</p> <p>19 about potential pollution and water quality issues</p> <p>20 associated with the Rocky Gorge Reservoir. You've been</p> <p>21 using the term Duckett. Are those the same things?</p> <p>22 MR. REMEIN: I'm using the term that we used in the</p> <p>23 master plan. The Rocky Gorge Reservoir, my understanding is</p> <p>24 it considers the whole reservoir system. The dam for the</p> <p>25 reservoir is actually the Duckett Reservoir for this -- for</p>	<p>256</p> <p>1 area that contributes to the (inaudible) to the WSSC water</p> <p>2 system there.</p> <p>3 HEARING EXAMINER ROBESON-HANNAN: Any questions</p> <p>4 based -- well, I will let Mr. Brown -- Mr. Brown, do you</p> <p>5 have any questions?</p> <p>6 MR. BROWN: No questions. Good morning to you Mr.</p> <p>7 Remein. It's always good to see you and the Cloverly</p> <p>8 Citizens Association.</p> <p>9 MR. REMEIN: Thank you, very much.</p> <p>10 HEARING EXAMINER ROBESON-HANNAN: Does the Applicant</p> <p>11 have any questions based on my question about Duckett versus</p> <p>12 WSSC versus Rocky Gorge? Do you have any questions based on</p> <p>13 that?</p> <p>14 MR. KLEIN: No questions, thank you.</p> <p>15 HEARING EXAMINER ROBESON-HANNAN: Thank you. Mr.</p> <p>16 Remein, thank you, very much. You may be excused as a</p> <p>17 witness, but you're welcome to stay in the meeting.</p> <p>18 MR. REMEIN: Okay. Thank you for the opportunity and I</p> <p>19 encourage you to -- I listened on and off to part of the</p> <p>20 proceedings yesterday and it seemed like there was an effort</p> <p>21 on everyone's part to try to discover the truth of this</p> <p>22 issue. And I wish that it -- I hope that it continues along</p> <p>23 that path. But thank you. Thank you for considering this.</p> <p>24 HEARING EXAMINER ROBESON-HANNAN: Okay. I'm not seen</p> <p>25 any hands raised. Does anyone else wish to testify? Okay.</p>

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<p>257</p> <p>1 I'm not --</p> <p>2 MR. KLEIN: I believe I saw Dr. Linda Moore's hand up a</p> <p>3 little while ago.</p> <p>4 HEARING EXAMINER ROBESON-HANNAN: Well, that's -- okay.</p> <p>5 Dr. Moore, I see you in the meeting. Do you wish to</p> <p>6 testify?</p> <p>7 DR. MOORE: Can you hear me now?</p> <p>8 HEARING EXAMINER ROBESON-HANNAN: I can hear you, yes.</p> <p>9 DR. MOORE: Okay. I'm having a little trouble with my</p> <p>10 connectivity. And the Teams, it seems to be conflicting</p> <p>11 with something. Can I speak later?</p> <p>12 HEARING EXAMINER ROBESON-HANNAN: Do the parties have</p> <p>13 any objection to that?</p> <p>14 MR. BROWN: No objection.</p> <p>15 MR. KLEIN: I'm sorry. I know Ms. -- Dr. Moore has</p> <p>16 been waiting. I mean, once we get going, we're going to be</p> <p>17 going for several hours.</p> <p>18 DR. MOORE: Yeah, that's the problem for me. I was</p> <p>19 here all day yesterday. And I cleared my schedule to be</p> <p>20 listening. I'm just having trouble. I don't know. I have</p> <p>21 like two Teams open. It seems to be some kind of problem</p> <p>22 with the connection.</p> <p>23 HEARING EXAMINER ROBESON-HANNAN: Let's do this. I</p> <p>24 don't anticipate that we will finish today. We may finish</p> <p>25 tomorrow depending on how long the Applicant's testimony</p>	<p>259</p> <p>1 here? Mr. Pleyas, I see you.</p> <p>2 DR. PLEYAS: I am here.</p> <p>3 HEARING EXAMINER ROBESON-HANNAN: Okay.</p> <p>4 DR. PLEYAS: I'm just going to --</p> <p>5 (Crosstalk)</p> <p>6 DR. PLEYAS: Can you hear me?</p> <p>7 HEARING EXAMINER ROBESON-HANNAN: I can. Thank you.</p> <p>8 Would you please raise your right hand?</p> <p>9 Do you solemnly affirm under penalty of perjury that</p> <p>10 the statements you're about to make are the truth, the whole</p> <p>11 truth, and nothing but the truth?</p> <p>12 DR. PLEYAS: I will.</p> <p>13 HEARING EXAMINER ROBESON-HANNAN: Please -- well, I</p> <p>14 will turn it over to Mr. Sullivan.</p> <p>15 MR. SULLIVAN: Okay. I think we are un-muted now.</p> <p>16 Good morning, Dr. Pleyas.</p> <p>17 DR. PLEYAS: Good morning.</p> <p>18 MR. SULLIVAN: Can you just introduce yourself to the</p> <p>19 Hearing Examiner and those listening today?</p> <p>20 DR. PLEYAS: Yes. Good morning to everyone. I'm</p> <p>21 what's called a pharmacologist and a toxicologist with 30</p> <p>22 years of experience evaluating human exposures to chemicals</p> <p>23 in the air, in water, in food, in drugs, in consumer</p> <p>24 products and occupational environments. As it pertains to</p> <p>25 this particular issue, I've conducted studies on the</p>
<p>258</p> <p>1 may -- takes. So we can -- Dr. Moore, if you want to plan</p> <p>2 on being here tomorrow morning at 9:30, we can take you then</p> <p>3 and you can work on your Teams connectivity.</p> <p>4 DR. MOORE: That would be perfect.</p> <p>5 HEARING EXAMINER ROBESON-HANNAN: Okay. I also see</p> <p>6 Leigh, a Ms. -- I think it's a Ms. Leigh Zimmerman. And I</p> <p>7 know you were actively involved in the appeal. Is there --</p> <p>8 do you wish to testify?</p> <p>9 MS. ZIMMERMAN: No, thank you.</p> <p>10 HEARING EXAMINER ROBESON-HANNAN: Okay. So seeing no</p> <p>11 other hands up, we will proceed to the Applicant's case.</p> <p>12 MR. KLEIN: Give us three minutes to reorganize because</p> <p>13 we would like to move Dr. Dawson up.</p> <p>14 MR. SULLIVAN: We are okay for now. Dr. Dawson is</p> <p>15 going second. We're going to start with --</p> <p>16 MR. KLEIN: I'm sorry. That's right. You're right.</p> <p>17 Sorry. In which case I will let Mr. Sullivan lead the</p> <p>18 presentation because I don't even know the order of the</p> <p>19 witnesses. Thank you.</p> <p>20 HEARING EXAMINER ROBESON-HANNAN: All right. Mr.</p> <p>21 Sullivan?</p> <p>22 DR. MOORE: Good morning Ms. Robeson-Hannan. The</p> <p>23 Applicant would like to call Dr. Richard Pleyas as its first</p> <p>24 witness.</p> <p>25 HEARING EXAMINER ROBESON-HANNAN: All right. Is he</p>	<p>260</p> <p>1 potential health impacts of pharmaceuticals, personal care</p> <p>2 products. That's -- what that means is ingredients in</p> <p>3 things like shampoo or things that you might put on your</p> <p>4 body, for example, as well as classic compounds called</p> <p>5 endocrine disruptors from human -- on a human health</p> <p>6 perspective from drinking water.</p> <p>7 MR. SULLIVAN: Great, thank you. And Dr. Pleyas, can</p> <p>8 you -- I would like to walk you through your educational</p> <p>9 background. Do you have a bachelors degree?</p> <p>10 DR. PLEYAS: I do.</p> <p>11 MR. SULLIVAN: And where is that from and what area?</p> <p>12 DR. PLEYAS: It's from Michigan State University with</p> <p>13 honors. And the degree is in physiology.</p> <p>14 MR. SULLIVAN: Okay. And you have a Masters degree?</p> <p>15 DR. PLEYAS: Yes, I do.</p> <p>16 MR. SULLIVAN: And where is that from and in what area</p> <p>17 of focus?</p> <p>18 DR. PLEYAS: It's from the University of Minnesota in</p> <p>19 the School of Public Health. And it is focused on</p> <p>20 environmental public health.</p> <p>21 MR. SULLIVAN: Okay. And I'm calling you doctor. So</p> <p>22 do you have a PhD as well?</p> <p>23 DR. PLEYAS: Yes, I do.</p> <p>24 MR. SULLIVAN: And where is that from and in what area?</p> <p>25 DR. PLEYAS: It's also from the University of Minnesota</p>

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<p>261</p> <p>1 in the same department, except that I did my PhD 2 dissertation work in the department of pharmacology. 3 MR. SULLIVAN: Okay. And do you have any postdoctoral 4 studies or training? 5 DR. PLEYAS: Yes, I do. 6 MR. SULLIVAN: And then where -- from where and what 7 area of focus? 8 DR. PLEYAS: Yes. It's at the University of Nebraska 9 Medical Center. And the focus is with the area called 10 neuropharmacology. 11 MR. SULLIVAN: Okay. And so you mentioned toxicology 12 earlier. What is toxicology? 13 DR. PLEYAS: So toxicology is the study of how 14 chemicals adversely affect the human body. 15 MR. SULLIVAN: Okay. And what about pharmacology? You 16 mentioned pharmacology as well. 17 DR. PLEYAS: Yes, this is a study of how pharmaceutical 18 agents, which are chemicals, affect the body as well. The 19 difference between the two studies is that pharmacology is 20 looking at chemicals that have a therapeutic intention, a 21 therapeutic value. In other words it's there to treat a 22 disease or relieve symptoms, for example, like an opiate to 23 relieve pain. So that's the study of pharmacology. 24 And when I was doing my research in those areas, I was 25 looking to design drugs, legitimate drugs that is, for</p>	<p>263</p> <p>1 environments. 2 At another point, I then left that firm and started my 3 own firm, which is nearly 27 years old now. We have 4 about -- we have roughly 10 scientists within the 5 organization currently. We continue to do that work that I 6 started off with, but we've included now medical products or 7 medicine. We've looked at food. We've looked at consumer 8 products as well. And we have done this work for a while 9 for a firm in Pacific Northwest. We've worked in Europe, in 10 the Middle East, in Africa, in Asia, in North and South 11 America solving these kinds of issues. 12 And the clients that we serve really run a number of 13 areas. And that includes obviously large corporations, 14 small corporations. It includes nonprofit organizations. 15 Includes government entities, both here and abroad. It 16 includes from government agencies from like in the United 17 States, federal government, all the way down to county and 18 local governments. And the focus that we do is to make 19 these assessments of chemicals and the potential impact on 20 human health. 21 MR. SULLIVAN: Okay. So I appreciate you've done work 22 all over the world. How about here in the mid-Atlantic 23 region? Have you done any work in the mid-Atlantic region? 24 DR. PLEYAS: Yes, we've done work in Virginia, in the 25 DC area, in Maryland as well.</p>
<p>262</p> <p>1 therapeutic effects. Toxicology in contrast, is if you 2 increase the dose of a therapeutic agent or if you look at 3 other agents in the environment such as lead or mercury, 4 things like that, at certain concentrations they will cause 5 health effects. And so toxicology is looking at the adverse 6 health effects whereas pharmacology tends to look at the 7 therapeutic effects. 8 MR. SULLIVAN: And so are there -- it sounds like there 9 are similar -- there is a relationship there. Are there any 10 foundational -- do they have similar foundational 11 principles? 12 DR. PLEYAS: Yes, they do. 13 MR. SULLIVAN: Okay. And we will get to those in a 14 moment. But I want to keep going through your experience a 15 bit. So tell us about your work experience following your 16 postdoctoral studies. You know, I think you said that was 17 1992. So start us off in the '90s with your experience. 18 DR. PLEYAS: So at the conclusion of my postdoctoral 19 experience I was offered a position at a toxicology 20 consulting group in Seattle, Washington where I currently 21 reside. And the work that was being done by that particular 22 organization was to take a look at how chemicals were 23 affecting or have the potential for affecting human health. 24 The areas that that firm was looking at was focused mostly 25 on water and air predominantly, and also occupational</p>	<p>264</p> <p>1 MR. SULLIVAN: Thank you. And have you spoken and 2 written on some of these issues? I assume -- I have looked 3 at your CV that you submitted and that is in the record; is 4 that correct? 5 DR. PLEYAS: That is correct. 6 MR. SULLIVAN: Okay. And the curriculum vitae you 7 submitted, that is an accurate reflection of the relevant 8 experience that you have; is that correct? 9 DR. PLEYAS: That is correct, yes. 10 MR. SULLIVAN: Okay. And so I think you just said -- I 11 just want to make clear though. You have experience with 12 assessing risks to human health from exposure to 13 pharmaceuticals in an occupational setting, correct? 14 DR. PLEYAS: That is correct, yes. 15 MR. SULLIVAN: And you also have experience with 16 assessing risks to human health from exposure to 17 pharmaceuticals, correct? 18 DR. PLEYAS: That is correct, yes. 19 MR. SULLIVAN: And to carry that further, you have 20 experience with assessing risks to human health from 21 pharmaceuticals in drinking water; is that correct? 22 DR. PLEYAS: Yes, that is correct. 23 MR. SULLIVAN: I couldn't hear that. Could you just 24 say that again? 25 DR. PLEYAS: Yes, that is correct.</p>

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<p>265</p> <p>1 MR. SULLIVAN: Looks like we have a little bit of an 2 audio issue.</p> <p>3 Approximately how many, if you can, if you know, can 4 estimate, toxicological assessments have you performed with 5 respect to exposure, potential exposure to pharmaceuticals 6 in drinking water? Just a ballpark.</p> <p>7 DR. PLEYAS: I would -- I don't have a count for you, a 8 ballpark. The projects that we have been involved with -- 9 I'm just going to check, can you hear me?</p> <p>10 MR. SULLIVAN: Yes.</p> <p>11 DR. PLEYAS: The projects that we have been involved in 12 are quite large. They take several years to do the work 13 that we do because it was foundational and fundamental to 14 this area. And we started this work roughly 15 years ago.</p> <p>15 MR. SULLIVAN: Okay. Thank you. The Applicant would 16 like to qualify Dr. Pleyas as an expert in the areas of 17 toxicology and pharmacology and in the assessment of risks 18 to human health from exposure to pharmaceuticals in drinking 19 water.</p> <p>20 HEARING EXAMINER ROBESON-HANNAN: Any objections?</p> <p>21 MR. BROWN: No objection.</p> <p>22 HEARING EXAMINER ROBESON-HANNAN: Okay. Can you read 23 back the -- I got toxicology and pharmaceuticals.</p> <p>24 MR. SULLIVAN: So -- go ahead.</p> <p>25 HEARING EXAMINER ROBESON-HANNAN: What was the last</p>	<p>267</p> <p>1 DR. PLEYAS: Yes, I do. I've taught at the University 2 of Minnesota. I've taught at -- given lectures at the 3 University of Washington. I've given lectures at -- and was 4 associate -- adjunct associate professor at the University 5 of Nebraska Medical Center in their toxicology and 6 pharmacology group.</p> <p>7 MR. SULLIVAN: Okay. You've listened to all the 8 testimonies up on this hearing, have you not?</p> <p>9 DR. PLEYAS: I have.</p> <p>10 MR. SULLIVAN: And you've reviewed the materials that 11 were submitted by PWPA's experts, correct?</p> <p>12 DR. PLEYAS: Well, I reviewed the materials relative to 13 Dr. O'Keefe and Mr. Muldowney.</p> <p>14 MR. SULLIVAN: Correct, yes. Thank you for that 15 clarification. You did not review Dr. Abia's?</p> <p>16 DR. PLEYAS: I did not.</p> <p>17 MR. SULLIVAN: Okay. And what did you think about what 18 you heard yesterday? Just a general impression.</p> <p>19 DR. PLEYAS: Well, scientifically I felt that the 20 science was absolutely incorrect and poor. And I can go 21 into more details about it, but I was --</p> <p>22 MR. SULLIVAN: Sure.</p> <p>23 DR. PLEYAS: I was astounded by the information that 24 was provided.</p> <p>25 MR. SULLIVAN: Would it be helpful to -- you mentioned</p>
<p>266</p> <p>1 one?</p> <p>2 MR. SULLIVAN: It is a -- it's a --</p> <p>3 HEARING EXAMINER ROBESON-HANNAN: Exposure -- go ahead.</p> <p>4 MR. SULLIVAN: It was toxicology and pharmacology and 5 in the assessment of risks to human health from exposure to 6 pharmaceuticals in drinking water.</p> <p>7 HEARING EXAMINER ROBESON-HANNAN: Thank you.</p> <p>8 MR. SULLIVAN: You are very welcome. I had to write it 9 down myself.</p> <p>10 HEARING EXAMINER ROBESON-HANNAN: Okay. I just wanted 11 to make sure what we are doing here. Thank you.</p> <p>12 (Crosstalk)</p> <p>13 HEARING EXAMINER ROBESON-HANNAN: Back to you.</p> <p>14 DR. PLEYAS: I want to offer clarification just for -- 15 this may be somewhat new to folks. A pharmacologist is not 16 the same as a pharmacist. I just want to be clear about 17 that. We are the ones that teach physicians about drugs in 18 medical schools, for example. We are the folks that design 19 drugs, not dispense medication.</p> <p>20 HEARING EXAMINER ROBESON-HANNAN: I figured that out. 21 But thank you for the clarification. All right. Go ahead, 22 Mr. Sullivan.</p> <p>23 MR. SULLIVAN: Thank you. And that actually brings up 24 a good point that I skipped over. You do have academic 25 experience as well, correct?</p>	<p>268</p> <p>1 those foundational principles and some of these things such 2 as -- there were some phrases that were thrown around 3 yesterday, things like dose-response, ADME, exposure 4 threshold, exposure (inaudible). Would that help frame a 5 discussion for you to talk about some of those concepts and 6 what they mean, their importance for toxicological 7 assessment, and then your reaction to what you heard 8 yesterday on those topics? Would that be good for you?</p> <p>9 DR. PLEYAS: I'm happy to provide that information.</p> <p>10 MR. SULLIVAN: Okay. And so let's start with dose- 11 response because I read your report. You said that dose- 12 response is a fundamental principle conducting a toxicological 13 assessment. We heard yesterday I believe from Mr. Muldowney 14 that he thinks the dose-response is out the window with some 15 of these, I think he called them cytotoxic drugs. So if you 16 could tell us, what is a dose-response, just to start?</p> <p>17 DR. PLEYAS: Yes. There is a fundamental principle in 18 pharmacology or toxicology and it's called the dose-response 19 concept. And it's a -- it's a -- it is a concept that has 20 been demonstrated for over 500 years. Mr. Muldowney I think 21 gave attribution to an old Swiss physician by the name of 22 Paracelsus back in the 1500s, which was correct and that he 23 is the one that coined the term. And he basically said this 24 500 years ago, that everything has a potential to be a 25 poison.</p>

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<p style="text-align: right;">269</p> <p>1 What differentiates -- and he was a physician. So what 2 differentiates a pharmaceutical or a therapeutic agent one 3 that's poisonous, is the dose. And so let me kind of unpack 4 that just a little bit more. What toxicologists understand 5 worldwide is that everything has a potential to cause 6 toxicity. So from that perspective, the chemical agent, 7 while that's important, and we need to know what the 8 chemical agent is, what's more important is, what's the dose 9 and what's the amount that a person would receive. 10 So to give a pretty simple example of dose-response, I 11 will use alcohol, ethanol. And I would say if I -- if 12 someone consumes a quarter of a teaspoon of ethanol, 13 probably it will go in the body. It will be absorbed. It 14 will be distributed. It will be metabolized in a little bit 15 of it will be excreted. However, the effect of alcohol 16 would be nil. 17 If I give a cup of alcohol to an individual, now we've 18 increased the dose and the response will start to affect the 19 person. And so the typical responses that one would have 20 with increasing the amount of alcohol would be things like 21 your social behavior starts to change, you feel more 22 comfortable in social situations. You might feel 23 psychologically a little bit better. 24 We increase the dose. Now you may not be able to think 25 as clearly. You may not be able to manipulate your</p>	<p style="text-align: right;">271</p> <p>1 individual. And you have to define that threshold whether 2 it's a toxic endpoint or the most sensitive toxic endpoint. 3 So again, going back to alcohol, if you want to consider 4 being socially comfortable, that would be a threshold. If 5 you wanted to talk about the ability to walk a straight 6 line, that's a different threshold. 7 So we define thresholds based on what we want to be 8 looking for. And in toxicology, what we want to look for is 9 was the most sensitive health effect that is known. Not the 10 worst health effects, but the most sensitive health effects. 11 And that way we start to determine how to determine whether 12 or not there is a potential for health effect. So these are 13 really critical pieces for all the chemicals that are at 14 issue in this particular issue. 15 MR. SULLIVAN: So let me follow up on that. So the 16 chemicals issue, the word I heard yesterday was cytotoxic. 17 And can you (inaudible) cytotoxic what that means and what 18 you heard yesterday about what was represented about what 19 that means? 20 DR. PLEYAS: Yes. Cytotoxic was a word that was used 21 yesterday. And frankly, it's a very general word. It 22 means -- cyto is cell and it's affecting a cell. That's it, 23 nothing more, nothing less. And every chemical has the 24 potential to cause cytotoxic affect. I get concerned 25 personally and professionally when people use the word toxic</p>
<p style="text-align: right;">270</p> <p>1 appendages as cleverly as well, or as good as you can. You 2 increase the dose more and you may not even be able to 3 stand. You may not be able to walk well. And we increase 4 the dose more and you can actually end up in the emergency 5 room. And if you increase the dose more, you will die. 6 So there is an example of dose-response. And that is 7 absolutely consistent with every other chemical that we have 8 seen. So dose is really critical. Another component of 9 dose-response is exposure. What do I mean by exposure? 10 What I mean by exposure is -- and we will go back to the 11 alcohol, for example. If it's in a bottle and no one 12 consumes it, the chemical is -- basically there is no 13 exposure to the individual. It's only when the individual 14 consumes what's in the bottle, so that's exposure. And the 15 exposure route is oral, meaning you drink it, for example. 16 Only once that chemical gets into the body does it have 17 an effect. So exposure becomes really important as a 18 specimen of a potential toxicity. So we need to know the 19 chemical. We need to know what the dose is and we need to 20 know what the exposure route is. One last thing that as 21 well understood and toxicology is what is called a 22 threshold. 23 And the threshold is a dose which -- below which there 24 are no adverse effects to the human. The threshold is a 25 level at which there is the beginning of the facts on an</p>	<p style="text-align: right;">272</p> <p>1 indiscriminately as if a chemical can be determined to be 2 toxic or non-toxic just by the word. That's incorrect 3 scientifically. 4 A chemical is toxic when it reaches a dose at which 5 there is toxicity. So cytotoxicity that I don't recall 6 exactly the words, but it was something about it affects the 7 genomic component and use the word genotoxic as well. Those 8 were not defined correctly. 9 MR. SULLIVAN: So -- and there was another word I heard 10 yesterday that -- maybe I'm going to -- I will ask you to 11 come in on this. And maybe I will mispronounce it, 12 teratogen. That came up and I'm not really sure. Can you 13 speak to what you heard about the word teratogen yesterday? 14 DR. PLEYAS: Yeah. I used -- I call it a teratogen. 15 MR. SULLIVAN: Teratogen, okay. Thank you. 16 DR. PLEYAS: And a teratogen is a chemical agent that 17 affects the embryo in its development of the embryo. My -- 18 what I heard yesterday in the definition of it is that it 19 affects future generations of offspring. And that's not 20 correct. 21 MR. SULLIVAN: Okay, thank you. I thought I heard Mr. 22 Mulowney yesterday say that the concept of dose-response 23 does not apply to cytotoxic drugs. If I heard that 24 correctly, is Mr. Mulowney wrong? 25 DR. PLEYAS: Yes, dose-response does apply and the word</p>

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<p>273</p> <p>1 cytotoxic needs to be clearly understood as to what that 2 means. 3 MR. SULLIVAN: And I believe I heard him say something 4 about no exposure threshold drugs or the concept of exposure 5 threshold does not apply to cytotoxic drugs. If I heard 6 that correctly, is he wrong about that? 7 DR. PLEYAS: While again, I didn't write it down, but 8 if I just use your words as a source of that, that is 9 incorrect. There is a concept for which government 10 agencies, in order to protect the public health, conduct 11 what's called a toxicological risk assessment. It's a very 12 formal process. The U.S. EPA does it. I'm sure the state 13 of Maryland does it. Many states do it in the United 14 States. European countries do it. Asian countries do it. 15 Most countries around the world are using this process. 16 It's a well-known process. It's adopted by not only 17 government agencies, but our profession. And it's the way 18 that we actually determine the potential for health risks. 19 And so that is a component that is completely missing in Dr. 20 O'Keefe's and -- Dr. O'Keefe and Mr. Mulowney's testimony. 21 MR. SULLIVAN: And so could you -- can you assess risk 22 just using common sense? Or is there some kind of -- are 23 there standards that apply? Is this a quantitative analysis 24 based on data? Or is it just common sense? 25 DR. PLEYAS: Well, it is a quantitative process. We --</p>	<p>275</p> <p>1 the small intestine in particular, and then absorbed into 2 the body. And that's a fairly complex physiologic process. 3 Why? Because in some cases the gastric juices and the 4 materials in the gut will metabolize the compound that you 5 took orally. So I know everybody is familiar with this, but 6 your gut has a micro biome. And that's a very active source 7 of bacteria that are there primarily as hosts that help the 8 body metabolize materials. 9 Once a chemical crosses into the bloodstream it will go 10 to the, particularly oral, it will go to the liver and then 11 the liver metabolizes that material. Then it can be 12 distributed throughout the body, hence distribution. And 13 the body says, we need to get rid of it. The liver is 14 primary -- when I say metabolism, the whole goal of the 15 liver is to help chemicals be excreted from the body so they 16 try to make them more available to be excreted into urine. 17 There's also a bypass that puts it back into the feces. 18 The liver can do that as well. So then let me unpack that 19 little bit more. So you might have a concentration of a 20 chemical in drinking water. That's a surrogate for what 21 might get into the body. Because the first kind of barrier 22 that it has is to get absorbed into the body. Then the 23 second thing that the body does quite well is to metabolize 24 it. And metabolism can do mostly to major things. 25 Well, one major thing, and that is to use that molecule</p>
<p>274</p> <p>1 you know, I've written papers that are published 2 specifically in this area on pharmaceuticals and drinking 3 water. The reason is because pharmaceuticals are in 4 drinking water around the world including in the area that 5 you all are located. It's all over the country and it's all 6 over the world. And it is a concern to all agencies to be 7 looking at this because of some of the issues that people 8 have raised. 9 And so there has been an effort for the last 15 years 10 in order to look specifically at chemical agents in drinking 11 water and whether or not it reproduces a potential for 12 health effect based on dose and exposure. 13 MR. SULLIVAN: Thank you. And let's talk about ADME. 14 That came up yesterday. And there was some discussion of 15 it. Can you talk to us about the concept of ADME and why it 16 is important to understanding potential risk? 17 DR. PLEYAS: Yes. ADME is the acronym for absorption, 18 distribution, metabolism, and excretion. So that's the -- 19 that's what the acronym stands for. And to kind of given 20 you an example -- I will just stick with the ethanol just to 21 give you an example because I think most people have some 22 familiarity with that compound. And that is, you need to be 23 exposed to it. So it needs to be introduced into the body. 24 And the absorption of a material means that it goes 25 from the gut, like if it's oral, it goes from the gut, like</p>	<p>276</p> <p>1 or to get rid of the molecule. Once it gets metabolized it 2 gets -- and this is particular with just ingesting, which is 3 the topic here. Then it gets distributed to the tissues of 4 the body. Depending on the chemical it might reside in some 5 tissues at more concentration than others. And then it gets 6 excreted. And excretion is via the urine, and then it 7 goes -- passes through the kidneys. There might be some 8 metabolism in the kidneys, and then released into urine and 9 it exits the body. 10 So the two major sources of excretion would be the 11 feces or urine. There's also a possibility of exhalation of 12 metabolites through the lungs, but that's a small portion. 13 Smaller even, but still possible, is through sweat. But 14 those are two pretty minor excretory routes for the 15 compounds that we are looking at. 16 MR. SULLIVAN: Does metabolism only occur when someone 17 is alive? 18 DR. PLEYAS: No. This gets interesting from my 19 perspective. And that is, as death occurs, you know, 20 there's always this question, when it is a person really 21 dead. 22 And what happens is that the body systems briefly start 23 the shutdown. And it's not automatic. It's -- and I'm 24 talking about a situation where the body, from all practical 25 purposes, is no longer going to survive. There is a</p>

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<p style="text-align: right;">277</p> <p>1 redistribution of blood shortly after. There is a 2 redistribution of fluids and tissues. The enzymes -- and 3 this word was raised yesterday. It was called mammalian 4 enzymes, but that just means enzymes in mammals. And we are 5 mammals. 6 Those continues to work until a couple of things 7 happen. One, the physiologic pH changes in the body. Or 8 two, the temperature decreases in the body. Or three, the 9 energy source stops. But that does take time for different 10 tissues. It doesn't happen -- it's not like a light switch 11 that just goes off immediately. 12 MR. SULLIVAN: So it does continue? 13 DR. PLEYAS: It does continue for a period of time. 14 MR. SULLIVAN: Right. 15 DR. PLEYAS: It is a short period of time, but it does 16 continue. 17 MR. SULLIVAN: And I think that estradiol was mentioned 18 yesterday, one of the specific drugs. Is that one where it 19 would -- would metabolism continue with respect to estradiol 20 to some extent after someone dies? 21 DR. PLEYAS: Yes. Again, we -- the one thing to think 22 about is -- I mentioned the micro biome of the gut. And 23 that is a place where metabolism of chemicals occurs. 24 That's even before something gets absorbed. So just because 25 you swallowed it doesn't mean it gets into the body. It</p>	<p style="text-align: right;">279</p> <p>1 risks in our lives. You know, walking across the street, 2 you've heard that is a risk. Leaving your house is a risk. 3 Eating food can be a risk. Breathing air can be at risk. 4 Drinking alcohol is a risk. I mean, everything has risks. 5 And I would love to be able to say that the world is 100 6 percent risk free. It just isn't. 7 That is not -- that is not scientifically accurate. It 8 is not accurate at all. So when we are talking about 9 toxicology and potential health risk, we go back to a 10 process by which we quantitatively determine whether or not 11 there is going to be a potential for health risk. And our 12 goal is toxicologists is to protect public health. And when 13 we protect public health, what that means is we take 14 scientific information, scientific data, we look for the 15 most sensitive health end point that we can for a particular 16 compound. 17 Not the therapeutic effect, for example with a 18 pharmaceutical, but we are looking for an adverse effect. 19 Even if it's the most sensitive adverse health effect. We 20 look at published health studies. Or if that's not done, 21 there will be studies that are conducted on that. And with 22 pharmaceuticals, as you well know, they are -- they have to 23 pass FDA and they have to pass their (inaudible) safe and 24 effectiveness for the compound or FDA will not allow it, to 25 put it bluntly.</p>
<p style="text-align: right;">278</p> <p>1 still has to pass in the gut. 2 MR. SULLIVAN: Okay. 3 DR. PLEYAS: With estradiol, estrogen compounds, and 4 there are quite a few different varieties of estrogen 5 compounds, the micro biome, there are studies that show that 6 estradiol, like 17 beta estradiol is metabolized by the 7 micro biome in the gut. So upon death, while the other 8 system start shutdown, what doesn't shut down is the micro 9 biome of the gut. It's basically saying, hey, we've got 10 a -- nothing is, nothing is holding us back. Let's -- we've 11 got plenty of material to use to eat and be happy. And so 12 they flourish. 13 And the decomposition of the body starts at that point. 14 Another portion of the body that starts to kind of feel the 15 same way are the micro biome of the skin as well and they 16 start to flourish as well. 17 MR. SULLIVAN: Thank you. We talked about -- I asked 18 you about the definition of a risk assessment and how that 19 happens, whether it's quantitative. I wanted to just focus 20 on the concept of risk itself. Can you speak to that little 21 bit more in depth about what risk means to you as a 22 toxicologist to -- a pharmacologist who undertakes risk 23 assessments? 24 DR. PLEYAS: Yeah. So I think this is well known by I 25 think everybody, but I may be wrong about that. We all have</p>	<p style="text-align: right;">280</p> <p>1 And so there is a lot of information about the 2 potential toxicity of pharmaceutical compounds. We use that 3 information. And then we say, what's the most sensitive. 4 And then what we do is apply what's called safety factors. 5 That's a common term. They go by other names like 6 uncertainty factors. But the concept is, that's a dose 7 maybe in a rat, maybe in a mouse, maybe in a human. 8 And then we add to it, safety factors that can range 9 anywhere from 10 fold difference to thousands of fold 10 difference. And that becomes a level at which we then 11 compare what the water concentrations are in order to come 12 up to determine whether there is a health effect or not. 13 There is a -- what we call this is a conservative approach. 14 The word conservative means health protective in this case. 15 It uses science. It uses scientific information. It is a 16 process that's transparent so that individuals can review it 17 and read it and look at it in order to determine whether or 18 not there is adequate safety. And that's what government 19 organizations will do as well. 20 MR. SULLIVAN: I think I understood you to suggest that 21 any drinking water source presents a potential for health 22 risk; is that correct? 23 DR. PLEYAS: Yes. And in fact, to make another point. 24 Even water is toxic depending on the dose. You have heard 25 these ludicrous situations where sometimes people will drink</p>

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<p>281</p> <p>1 a lot of water, gallons of water in a short period of time, 2 and they die. Oxygen at higher concentrations is toxic, so 3 to speak. So again, everything in our world has a potential 4 for toxicity. The question is, how much, what's the 5 exposure, and to determine from that perspective. 6 MR. SULLIVAN: And speaking of exposure, the word -- 7 and I used it a few times yesterday, the term exposure 8 pathway was used yesterday. Can you talk a bit about what 9 an exposure pathway is and why it is important in assessing 10 risk? 11 DR. PLEYAS: Yes. So the exposure pathway in this 12 issue would be what is released from the body. And then 13 from that perspective, was the pathway from there to the 14 tap. I use the word tap as -- in terms of you turn on your 15 faucet. And then as I just mentioned, whatever's in the 16 water has to get into the body. But from an exposure 17 assessment we assume that people drinking water. 18 What's the pathway between what's released from the 19 body and then at the tap? And that would be the exposure 20 pathway. And in this case it would include what's released 21 from the body, which one would have to consider what happens 22 in the body. We've talked that I've talked a little bit 23 about that. 24 And then once it's released into the, let's say the 25 soil underneath the grave, what happens to a compound there?</p>	<p>283</p> <p>1 demonstrate, for example, that fungi and bacteria -- 2 bacteria in soil will continue to decompose different -- I 3 mean, all these molecules. They look at these molecules as 4 a source of food. They get energy by metabolizing, by 5 breaking those bonds, chemical bonds apart. And they use 6 that as a food source. So that's what happens. Another 7 aspect to this is that chemicals will -- the word is called 8 adsorb. Not absorbed, but A-D-sord. 9 Will adsorb to soil particles. In other words, they 10 just -- they bind together producing a new entity. And if 11 that's the case, then the molecule has to go with the soil, 12 so to speak. If the soil is too big, it doesn't move. 13 MR. SULLIVAN: And when you talk about molecules, 14 you're talking about pharmaceutical molecules, correct? 15 DR. PLEYAS: Correct. 16 MR. SULLIVAN: Yes, okay. And if it binds to the soil, 17 that means that it wouldn't then go down farther along the 18 path to groundwater or to surface water or do some other 19 pathway down to the tap, correct? 20 DR. PLEYAS: Well, that's the exposure pathway. And 21 I'm the pharmacologist/toxicologist. I am aware and read 22 studies related to the movement of chemicals through soils. 23 But there are hydrogeologist and geologists that study this 24 much more in that area. But I read this stuff every day, 25 but I don't see myself as an expert in geology, for example,</p>
<p>282</p> <p>1 And then what happens from there to the -- through the 2 ground to the water body, underground water or surface 3 water? And then once it's in the water body, what happens 4 to it? And then what happens to it as it gets entrained 5 into the water system before comes to the tap? This is the 6 exposure pathway that is relevant in this issue. 7 MR. SULLIVAN: And is it -- it's your professional 8 opinion that it's essential to evaluate the exposure pathway 9 if you are going to excess risk here, correct? 10 DR. PLEYAS: Absolutely. Again, you cannot make a 11 determination of toxicities without knowing the dose. And 12 you need to know what the literature says about the 13 potential for toxic effects and you need to know what the 14 exposure is, yes. 15 MR. SULLIVAN: And to understand the interplay between 16 the ADME and the exposure pathway, if you take a 17 pharmaceutical less than 100 percent of that pharmaceutical 18 is going to leave your body; is that correct? 19 DR. PLEYAS: That's correct. 20 MR. SULLIVAN: Through the ADME process? Some less 21 than 100 percent. And then through the further metabolism 22 outside of the body and through the -- other factors through 23 the exposure pathway, you can expect further degradation; is 24 that correct? 25 DR. PLEYAS: That's correct. There are studies that</p>	<p>284</p> <p>1 or hydrogeology. 2 MR. SULLIVAN: And so you would rely on the -- rely on 3 a hydrogeologist, someone with expertise in fate and 4 transport of contaminants to understand what would happen to 5 those molecules along that path? 6 DR. PLEYAS: That's correct. 7 MR. SULLIVAN: Yeah, okay. Thank you. There was some 8 discussion yesterday that -- and again, I don't have it 9 written down. It seemed to suggest that there is a presence 10 of a whole lot of drugs in a lot of people. Can you talk 11 about the importance of determining the prevalence of 12 pharmaceuticals that are being taken by people in the time 13 before death that those are being taken, how that factors 14 into your analysis? 15 DR. PLEYAS: Yes. So when individuals have the 16 unfortunate situation of having cancer, and that the -- one 17 of the therapeutic interventions is to use a 18 chemotherapeutic agent, you know, certainly we all know that 19 that's a very serious, important disease. We also know that 20 there are side effects of some of these compounds. But the 21 purpose here is to treat the disease. And that's the 22 practice that has been used. 23 So what we that's what we do -- what I do as a 24 pharmacologist's last toxicologist, would be to say, was the 25 drug that is being used in the therapy and look at that</p>

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<p>285</p> <p>1 particular compound in the studies that I've already said 2 before. But then also, understand what's the medical 3 treatment paradigm. Typically when an individual has 4 cancer, but then makes the tough decision that they no 5 longer are going to receive chemotherapy, they stop. 6 And what happens, for example, is then there is 7 palliative care. And that tends more often than not, tends 8 to be pain relief. And the types of compounds -- there are 9 some other aspects of it, but some of the -- the most 10 frequent compounds are the opiates like methadone or 11 morphine as compounds. And that, for example, in hospice is 12 the major source. There might be anti-anxiety agents that 13 are also provided to individuals at that time. They may be 14 suffering from some other central nervous system issues 15 other than pain and anxiety, hallucinations and things like 16 that. The other compounds could be used as well. 17 So from a chemotherapeutic perspective, many of the 18 compounds, many, not all, but many of the compounds have 19 what we call short half-lives. Let me explain what a half- 20 life is. What we do as pharmacologists and toxicologists is 21 we look at how long a drug, so to speak, stays in a body. 22 That includes the absorption, distribution, metabolism, and 23 excretion. So it taps into that. And it's usually measured 24 in terms of time. And that time can be hours, in some cases 25 days, in some cases weeks, and in some rare cases, longer</p>	<p>287</p> <p>1 we look at everything from developmental, that's another 2 word for a developing fetus. We look at teratogenic 3 effects, we look at cancer effects, we look at immunologic 4 effects, we look at all the effects that would be -- that 5 could affect that sensitive population. And we take that 6 into consideration when we define what is a -- or the 7 government defines what is a safe level. 8 MR. SULLIVAN: There was some discussion yesterday also 9 about that and I was trying to get an answer for this. I 10 don't think I ever did. Whether the difference between the 11 amount of a pharmaceutical that will end up in the 12 environment by a -- comparing two things. Comparing a 13 living person who is taking, let's say a hormonal drug over 14 time on a daily basis. I assume it's a daily basis. You 15 will tell me if there are -- if that's wrong. The first is 16 someone versus a body that's been buried and the relative 17 contributions to the environment from pharmaceuticals in 18 those situations. Can you speak to that a bit? 19 DR. PLEYAS: Yes. There is no question that a person 20 taking a drug and is alive is producing more waste, if you 21 will, metabolically, than a person that's dead. The dead 22 body has everything in it that it will ever have. It will 23 not increase more. Recall too, that I mentioned that 24 metabolism of that compound continues until death and 25 shortly after death as well. And then you have a micro</p>
<p>286</p> <p>1 than weeks, months. 2 Most of the compounds that are used in a 3 chemotherapeutic range in the hours to day level. So if an 4 individual makes a decision, the tough decision to stop 5 chemotherapy, their body continues to metabolize until -- 6 and then switches to a different form of medical treatment. 7 And so the metabolism of those agents decreases dramatically 8 over those -- that time. 9 MR. SULLIVAN: Thank you. There was some discussion 10 yesterday regarding -- regarding damage to fetuses and 11 pregnant women. It was kind of disturbing. And I would 12 like to get your take on what you heard yesterday about that 13 and what your response is. 14 DR. PLEYAS: Well again, anything related to toxicity 15 to a toxicologist is important to us. And we want to make 16 sure we protect the public health. And that is part of our 17 work. And the pregnant woman is one of what we call the 18 more sensitive individuals. Let me define that for a 19 second. Sensitive individual would be someone that has a 20 particular situation that might make them may be more 21 susceptible to a chemical agent than another person, than 22 the average person, let's say. So they tend to be more 23 sensitive from that perspective. And pregnant woman would 24 be within that category. 25 And when we look at chemical agents in drinking water,</p>	<p>288</p> <p>1 biome that also interacts with the medication that's left in 2 the decomposing body. 3 So there is -- so it's not synonymous to say that the 4 dead body will continue to be leeching anything but what's 5 in the body at that point, and less after the time because 6 of decomposition. Whereas in comparison, if I'm taking a 7 daily dose of estrogen or whatever it is, I'm taking a daily 8 dose. I'm using the washroom daily, frequently. Everything 9 that goes down the toilet is then contributed to wastewater 10 or a septic system. 11 And that wastewater goes to a water treatment plant and 12 it does the best they can to remove those compounds. But it 13 still gets into the environment. Or the septic system, 14 which then would release those compounds in the soil as 15 well. So there is no question that a live body is producing 16 more waste, so to speak, of pharmaceuticals than a dead 17 body. 18 MR. SULLIVAN: And you mentioned a septic system. And 19 I want to talk about septic systems in the context of 20 another portion of your -- or a portion of your expert 21 report that you submitted, which is in the record at Exhibit 22 119. 23 And that -- I want to talk about septic systems in 24 connection with the statement that you made within your 25 report that is, other local sources are likely to be larger</p>

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<p>289</p> <p>1 contributors of pharmaceutical pollution than green burial 2 sites. And first, can you tell me -- well first, did you 3 assess how cemeteries compare to any other local sources 4 with respect to how each might contribute to pharmaceutical 5 pollution? 6 DR. PLEYAS: It -- it's within the same bailiwick that 7 I'm testifying at this point. And that is -- and I'm going 8 to repeat what I just said, because I think it answers the 9 question that you are asking. Is that a septic system is a 10 result of a home, let's talk about at a residence, where 11 they are not connected to a municipal wastewater treatment 12 system. 13 And as I just mentioned, the person that is alive and 14 taking drugs, therapeutic agents, is continually releasing 15 waste into the toilet which goes into the septic system. 16 Again, that becomes an exposure pathway that is relevant to 17 the issues at hand in this issue. So there would be a 18 continuous source over time of metabolic waste from septic 19 systems. 20 MR. SULLIVAN: Thank you. And in this case, I believe 21 you did in your report at least, reach a conclusion that 22 other local sources are likely to be larger contributors of 23 pharmaceutical pollution than green burial site. You said 24 that -- or I believe you said that. Correct me if I'm 25 wrong. But in here, yes, within your bailiwick, in doing --</p>	<p>291</p> <p>1 from Dr. O'Keefe and Mr. Mullowney yesterday, is that still 2 your conclusion? 3 DR. PLEYAS: Yes, it is. 4 MR. SULLIVAN: Okay, thank you. 5 HEARING EXAMINER ROBESON-HANNAN: Are you -- okay. 6 MR. SULLIVAN: Can you pardon us for one second Madam 7 Hearing -- 8 HEARING EXAMINER ROBESON-HANNAN: Yes. 9 MR. SULLIVAN: Thank you for your patience. I 10 appreciate that. I did want to follow up on -- going back 11 to the issues about -- that were said yesterday by Dr. 12 O'Keefe about a fetus and I think she mentioned a small 13 liver. I don't think you had talked about that today. Can 14 you comment on that? 15 DR. PLEYAS: Yeah. The pregnant woman is obviously a 16 fully functioning individual from a physiologic perspective. 17 Of course they have -- they are supporting and developing a 18 fetus. So that's really critical. And that does take 19 energy and activity and things on that line. That's great. 20 But it is the mother that is actually effectively protecting 21 the developing fetus. And so it's not the fetus per se that 22 is the endpoint, it is the mother, and the mother's health 23 and the mothers ADME that's actually working to protect the 24 fetus. 25 MR. SULLIVAN: So would you -- would it be your</p>
<p>290</p> <p>1 in reaching that conclusion, you did rely on some of the 2 analysis of -- in Dr. Dawson's report, correct? As far as 3 the septic systems in the area? 4 DR. PLEYAS: That is correct. I am -- again, the 5 exposure pathways I mentioned earlier, groundwater 6 transport, things like that, that is -- I'm speaking to the 7 that's pretty much the exit of the septic system into the 8 ground. But then at that point that needs to be the same 9 type of evaluation from that point to the reservoir or to 10 the ground water source. 11 MR. SULLIVAN: And you -- and just to be clear, you 12 have reviewed Dr. Dawson's report that she submitted for 13 this hearing? 14 DR. PLEYAS: That -- yes, I have. 15 MR. SULLIVAN: Okay, thank you. You had -- I just want 16 to be clear here. You had issued in your expert report, you 17 had provided a conclusion, and correct me if I'm wrong 18 again, that the reports of Mr. Mullowney, the written 19 materials that Mr. Mullowney and Dr. O'Keefe submitted 20 cannot be relied upon to assert that there will be a future 21 human health risk from pharmaceutical leachate to 22 groundwater sources of drinking water. Is that a correct 23 statement of the conclusion you reached? 24 DR. PLEYAS: That is correct, yes. 25 MR. SULLIVAN: And now after having heard the testimony</p>	<p>292</p> <p>1 professional opinion that the statements made by Dr. O'Keefe 2 yesterday with respect to the fetus exposure were incorrect 3 statements? 4 DR. PLEYAS: I think they were not scientifically 5 accurate. 6 MR. SULLIVAN: Thank you. Let's go back to your 7 literature review that I had started to talk about before I 8 sidetracked us. I believe you have conducted a literature 9 review within your report that indicated that, in your 10 opinion, measured levels of pharmaceutical pollution in 11 proximity to cemeteries are below typical background levels. 12 Is that a fair statement of the conclusion you reached? 13 DR. PLEYAS: It is, yes. I looked at -- what call a 14 literature review. We looked at the literature that 15 published and read those carefully, read those studies 16 carefully, and (inaudible). 17 MR. SULLIVAN: Okay. Can you elaborate at all on what 18 you found? 19 DR. PLEYAS: Well, first of all, it's an area of 20 increasing interest. First and second of all, it 21 demonstrated that the amount that was released in those 22 situations was below what is called background. Let me 23 explain that a little bit. Background means what's already 24 there in the environment. And what that means is, as I've 25 said before, the environment has these chemicals in it.</p>

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<p>293</p> <p>1 Whether we like it or not, it has that. And what the good 2 news is, is that we are looking into compounds very 3 carefully, determining whether or not they're going to have 4 an effect or not. And so the idea here is to take a look at 5 what is being determined and compared to what's called 6 background, levels that are already there. 7 And these studies definitely show that there was 8 detection of compounds, things like ibuprofen, fluoxetine, 9 cerataline, for example. These are different types of 10 agents, not chemotherapeutic agents. And that they were 11 detected but that they were at levels that were not causing 12 adverse health effects. Let me point out that -- this 13 really important piece here that sometimes gets confused in 14 the world. 15 And that is, my brothers and sisters in chemistry, in 16 the field of chemistry, worked really hard to detect things 17 in the environment or in the body. And they've gotten so 18 good, the technology has gotten so good, that it picks up 19 levels that are so small that it's, you know, from a science 20 perspective it's fantastic. But one of the key parts of 21 toxicology is just because you can detect it does not mean 22 that it's toxic or if at a level that can produce toxicity. 23 So detection is useful, but not sufficient to determine 24 whether a chemical has the potential to cause a health 25 effects. And so can we detect these things? Yeah. Boy,</p>	<p>295</p> <p>1 correct? 2 DR. PLEYAS: It is not the way to assess risk. 3 MR. SULLIVAN: And it is not an indicator that it is 4 unsafe to drink that water, correct? 5 DR. PLEYAS: That's correct, because as I just 6 mentioned, because you can detect something, it is not 7 synonymous with a chemical that could produce a health 8 effect. 9 MR. SULLIVAN: Thank you. Dr. Pleyas, we've been 10 talking mostly about toxicology, pharmacology responses to 11 things we've heard yesterday. Have you made any affirmative 12 conclusions yourself in your professional opinion based on 13 your experience and based on your review, for example, of 14 Dr. Dawson's report about whether there would be a risk to 15 human health from a person drinking water from the Rocky 16 Gorge Reservoir or a private well due to the presence of 17 pharmaceuticals in bodies to be buried at the proposed 18 cemetery? 19 DR. PLEYAS: I have. 20 MR. SULLIVAN: And what is that conclusion? 21 DR. PLEYAS: I conclude that it's -- that this facility 22 or the cemetery will not produce levels that would cause 23 adverse health effects. 24 MR. SULLIVAN: Thank you. One more moment, if you 25 would indulge me. Thank you. Can you just summarize</p>
<p>294</p> <p>1 these chemists are really good. And the levels or parts per 2 billion. You've heard that; parts per quadrillion. These 3 are infinitesimally small concentrations in the environment. 4 MR. SULLIVAN: Can you comment on comments made or talk 5 about comments made yesterday that would suggest that a 6 single molecule of some of the chemotherapy pharmaceuticals 7 that have been discussed, a single molecule in a water 8 supply would be harmful or unsafe? 9 DR. PLEYAS: Yeah. The -- the single molecule is an 10 idea -- what is -- is the way that the federal agency in 11 particular, but other states have adopted this, is to make 12 the assumption that a single molecule could do that. Why is 13 that? That assumption is used because it's conservative and 14 health protective. And it's used as the basis of 15 determining a cancer risk. Is it -- do cancer compounds, 16 carcinogenic compounds in other words, have -- follow the 17 dose response? Yes. 18 So the single molecule idea is an approach that we use 19 to determine, and it's a conservative approach to determine 20 that, to determine and to conduct a toxicological risk 21 assessment. That's the only reason that it's there. 22 MR. SULLIVAN: It doesn't mean, in your professional 23 opinion, the presence of a single molecule of any of these 24 chemotherapy pharmaceuticals in a drinking water source 25 is -- that is not an appropriate way to assess risk; is that</p>	<p>296</p> <p>1 briefly -- we've heard a lot. You've been talking for a 2 while and we've gotten a conclusion. Can you just summarize 3 briefly the kind of factors that play into you reaching that 4 conclusion? 5 DR. PLEYAS: Sure. First of all, I have considered the 6 chemotherapeutic agents that were raised in the reports by 7 Dr. O'Keefe and Mr. Mallowney. I've considered also the 8 approach that they used in determining their lists, which I 9 find incorrect. They use the NIOSH list of chemical agents 10 that are used for occupational health, that is workers that 11 are using the compounds. It's not the exposure pathway 12 route information source that's useful in conducting a risk 13 assessment. 14 It's like using orange juice to make pancakes when you 15 need milk. It's a -- they are both liquids, but they make 16 completely different things. And you can't do that. The -- 17 I have looked at the metabolism, the ADME carefully about 18 these compounds. I have looked at the metabolism by the gut 19 microbiota. I have looked at the micro biome or the fungi 20 and the microbes that are found in soil. I have considered 21 the exposure pathway and he used the information from Dr. 22 Dawson on the components between the earth beneath the grave 23 to the tap. And I've used all of those things in the 24 support of my conclusion. 25 MR. SULLIVAN: Thank you, very much. I have no further</p>

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<p>297</p> <p>1 questions right now.</p> <p>2 HEARING EXAMINER ROBESON-HANNAN: Mr. Brown?</p> <p>3 MR. BROWN: I think I would like to request about a ten</p> <p>4 minute break at this point to prepare for cross-examination.</p> <p>5 HEARING EXAMINER ROBESON-HANNAN: I don't have an</p> <p>6 objection. Does anyone have an objection?</p> <p>7 MR. KLEIN: No objection from the Applicant.</p> <p>8 HEARING EXAMINER ROBESON-HANNAN: Okay. So we will</p> <p>9 come back at 11:20. Thank you.</p> <p>10 MR. BROWN: Thank you.</p> <p>11 (A recess was taken.)</p> <p>12 MR. BROWN: Good morning, Dr. Pleyas, how are you?</p> <p>13 DR. PLEYAS: Good morning. I am well. Thank you.</p> <p>14 MR. BROWN: It looks like you are at home in Seattle;</p> <p>15 is that right?</p> <p>16 DR. PLEYAS: I would say sunny Seattle.</p> <p>17 MR. BROWN: Oh.</p> <p>18 DR. PLEYAS: Which is maybe a surprise.</p> <p>19 MR. BROWN: Well, I'm waiting for the word that the</p> <p>20 West Seattle Bridge has been reopened. Someday.</p> <p>21 DR. PLEYAS: Someday.</p> <p>22 MR. BROWN: I wonder if you could give me a little</p> <p>23 information on your company. It's a consulting company?</p> <p>24 MR. PLEYAS: Yes.</p> <p>25 MR. BROWN: And you've been retained in this case to</p>	<p>299</p> <p>1 paragraph for that section says, a few studies have examined</p> <p>2 the potential impact of leachate from cemeteries on ground</p> <p>3 water or soil in the vicinity of cemeteries. And then it</p> <p>4 goes on to say, however, those studies have been limited to</p> <p>5 essentially inorganics. My question for you is, these</p> <p>6 studies that you examined that talk about the potential</p> <p>7 impact of leachate from cemeteries, did any of these studies</p> <p>8 involve green burial cemeteries?</p> <p>9 DR. PLEYAS: No, not that I'm aware of.</p> <p>10 MR. BROWN: You also talked about the exposure pathway</p> <p>11 at some length as it relates to the burial of the bodies and</p> <p>12 then the passage of chemicals from the body then into the</p> <p>13 ground and then potentially into the groundwater. Are you</p> <p>14 familiar with the fact that in what I would call regular</p> <p>15 cemeteries, non-green burial cemeteries, the body is placed</p> <p>16 in a coffin, and the coffin itself is often placed in a</p> <p>17 concrete vault?</p> <p>18 DR. PLEYAS: I'm sorry. What was your question? If--</p> <p>19 MR. BROWN: Are you familiar with that fact?</p> <p>20 DR. PLEYAS: I'm familiar with the fact of-- that</p> <p>21 burials are -- occur in many different ways. That is one</p> <p>22 fact I'm aware of, yes.</p> <p>23 MR. BROWN: Okay. Would you agree then that as per</p> <p>24 burials that take place that way as compared to burials done</p> <p>25 in a green burial fashion, that the exposure pathway is</p>
<p>298</p> <p>1 provide consulting advice to a company that -- to defend</p> <p>2 against claims of potential water pollution. Would you say</p> <p>3 that that kind of activity is the bulk of your business as a</p> <p>4 consulting company?</p> <p>5 DR. PLEYAS: Yes, as a consulting group, much like a</p> <p>6 consulting physicians group, we are asked to take a look at</p> <p>7 health -- potential chemical exposures and health effects.</p> <p>8 That's the majority of the work. We also conduct our -- we</p> <p>9 also conduct research as well.</p> <p>10 MR. BROWN: When you're providing consulting advice of</p> <p>11 that sort, is it primarily or exclusively to defend a</p> <p>12 company against claims of potential adverse effects?</p> <p>13 DR. PLEYAS: I would say that it's a mix of our work.</p> <p>14 We have certainly defended companies, or counties, or</p> <p>15 governments, or other organizations. So on the defense</p> <p>16 side. But we've also worked, if you will, on the side of</p> <p>17 the consumer, or the plaintiff, or the individuals that are</p> <p>18 raising concerns. So it's a mixture.</p> <p>19 MR. BROWN: Let's turn to page 17 of your report,</p> <p>20 section 6.0, which reads -- the title to it is as follows;</p> <p>21 available literature indicates that measured levels of</p> <p>22 pharmaceutical pollution in proximity to cemeteries are</p> <p>23 below typical background levels. Are you with me?</p> <p>24 DR. PLEYAS: I am.</p> <p>25 MR. BROWN: All right. The first sentence of that</p>	<p>300</p> <p>1 considerably different?</p> <p>2 DR. PLEYAS: The exposure pathway as it relates to</p> <p>3 pharmaceuticals, is that what you're asking?</p> <p>4 MR. BROWN: Yes.</p> <p>5 DR. PLEYAS: Yes, potentially. Certainly with the</p> <p>6 pharmaceuticals, that's likely. That said, the caskets</p> <p>7 themselves or the concrete also provide different compounds</p> <p>8 that would be leeching over time as well. So there's other</p> <p>9 chemicals that would be released.</p> <p>10 MR. BROWN: You talked about, if I understood your</p> <p>11 testimony correctly, that when a cancer patient makes the</p> <p>12 tough decision to go from active fighting of the cancer</p> <p>13 through chemotherapy to palliative care, that the whole</p> <p>14 situation changes with respect to the use of chemotherapy</p> <p>15 agents; is that right?</p> <p>16 DR. PLEYAS: From a majority of the perspective, yes.</p> <p>17 MR. BROWN: So did you hear Dr. O'Keefe's testimony</p> <p>18 yesterday where she talked about how sometimes even in</p> <p>19 palliative care, that chemotherapies are used not so much to</p> <p>20 fight the cancer, but to relieve pain?</p> <p>21 DR. PLEYAS: Yes, I did hear that.</p> <p>22 MR. BROWN: Is she wrong about that?</p> <p>23 DR. PLEYAS: No, there are times that that will be the</p> <p>24 case. They are infrequent compared to the more normal</p> <p>25 palliative approach to it.</p>

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17 (301 to 304)

<p>301</p> <p>1 MR. BROWN: You also mentioned that -- you described in 2 some detail the fact that metabolism continues after death 3 in certain ways. And you are asked about how long that 4 would go on. And the term you used was it would go on for a 5 short time. Do you recall that testimony?</p> <p>6 DR. PLEYAS: Yes, I do.</p> <p>7 MR. BROWN: So can you give me a better -- any better 8 precision on what you mean by, a short time?</p> <p>9 DR. PLEYAS: I will attempt to. I think it depends on 10 the situation of the death, for example. And it also 11 includes the treatment of the body after death as well. My 12 assessment would be anything from minutes to hours, 13 probably, short hours.</p> <p>14 MR. BROWN: Would you say that the excretion of 15 chemotherapy agents in such a situation would cease fairly 16 quickly after death?</p> <p>17 DR. PLEYAS: Well, I think one needs to consider the 18 fact that while it could be minutes to hours of continued 19 metabolism, the rest of the assessment, assuming that the 20 individual is actually receiving the chemotherapeutic agent, 21 because that needs to be assumed, then recall that the dose 22 would -- only a percentage of the dose gets into the body. 23 It goes to the liver -- oh, sorry. It doesn't with other 24 treatment forms like IV treatments it would go to the liver 25 first. But it would then continue to metabolize in the body</p>	<p>303</p> <p>1 specifics would be important.</p> <p>2 MR. BROWN: Did you rely on any particular studies in 3 your evaluation of the exposure pathway from a green burial 4 cemeteries to the ground waters and the resulting -- and the 5 potential for there being wells and streams downstream?</p> <p>6 DR. PLEYAS: Yes, I reviewed Dr. Dawson's report.</p> <p>7 MR. BROWN: I want to also ask you about the notion 8 that you said that all, basically all chemicals have 9 potential toxicity depending upon the dosage. Would you 10 agree that there are -- that, at least in the vernacular, we 11 think of some chemicals as highly toxic because even in low 12 doses they are dangerous to life and health?</p> <p>13 DR. PLEYAS: I'm going to ask you just to repeat the 14 question because I wasn't -- I was trying to follow your 15 thinking here. And if you could just repeat the question --</p> <p>16 MR. BROWN: I'm trying to -- you made the point earlier 17 in your testimony, that basically depending on the dosage 18 all chemicals have the potential to be toxic.</p> <p>19 DR. PLEYAS: Yes.</p> <p>20 MR. BROWN: And when we use in the vernacular that 21 certain things are highly toxic and we see warning labels on 22 things saying, do not consume orally, you know, such things 23 as cleaning fluids, would you agree that, at least in the 24 vernacular, many things are considered highly toxic compared 25 to other things?</p>
<p>302</p> <p>1 until --</p> <p>2 MR. BROWN: (Inaudible).</p> <p>3 DR. PLEYAS: Until all structure have ceased operation, 4 so to speak.</p> <p>5 MR. BROWN: So are you aware if there have been any 6 studies that have evaluated the percentage of chemotherapy 7 agents that remain in the body after death?</p> <p>8 DR. PLEYAS: Well, I've been involved in some cases, 9 forensic cases, where there has been death of a patient not 10 because of the chemotherapy, but because of other related 11 issues. And the detection of those compounds can be 12 assessed. That's the more familiar form that I'm -- that 13 the source of information that I'm familiar with.</p> <p>14 MR. BROWN: And what numbers have you seen in terms of 15 percentage?</p> <p>16 DR. PLEYAS: I think it ranges. It depends on the 17 compound.</p> <p>18 MR. BROWN: Can you give me a range of -- among 19 chemotherapy compounds?</p> <p>20 DR. PLEYAS: That's where we need to go into the 21 particular compound for its absorption, distribution, 22 metabolism, and excretion. Otherwise it could be anything 23 from 10 percent to 90 percent.</p> <p>24 MR. BROWN: Okay.</p> <p>25 DR. PLEYAS: It would be a broad range and the</p>	<p>304</p> <p>1 DR. PLEYAS: So the -- so a good question and an 2 interesting question. And it's interesting from this 3 perspective. In the vernacular, I believe I've already said 4 this, but I will repeat it, is that people think of chemical 5 X as a toxic agent and they use the word toxic agent. I 6 want to reiterate that's not scientifically correct. So I 7 will just leave it at that. So by the vernacular, it 8 unfortunately mischaracterizes what toxicity is.</p> <p>9 Second, we expose ourselves as human beings to a number 10 of agents that we call potent, meaning that they have -- a 11 little dose would cause potential adverse effects. But we 12 need to determine that scientifically. A very common 13 example of this is botulinum toxin. You may be aware of it 14 as Botox. Botulinum toxin is one of the most potent 15 toxicants on the planet and it's a natural compound.</p> <p>16 And people inject with needles into their heads or into 17 their facial muscles and things like that. So that 18 illustrates the point that, yes, we want to know how potent 19 a chemical is in terms of its toxicity. But as you can see, 20 some people are using extremely potent compounds for, in 21 this case, maybe for, I guess vanity, I suppose. I'm not 22 sure quite to say, the word. And they do so freely to one 23 of the most potent compounds on the planet. So that's the 24 second point is that yes, it's important to know potency, 25 but it's also important to the dose and dose would be</p>

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18 (305 to 308)

<p>305</p> <p>1 important.</p> <p>2 Third, warning labels. The purpose of a warning label</p> <p>3 is to alert a person that there is the potential for</p> <p>4 toxicity. It depends on the dose. So good news is that</p> <p>5 cleaning agents underneath the sink, for example, have</p> <p>6 warning labels primarily so the parents can alert themselves</p> <p>7 to prevent the potential exposure to their children, for</p> <p>8 example. And so the purpose of a warning label is to alert</p> <p>9 the individual of the potential for toxicity. It is -- and</p> <p>10 that's its purpose is to protect the health.</p> <p>11 MR. BROWN: Just one more thing. You heard the</p> <p>12 testimony yesterday concerning the limitations that</p> <p>13 Baltimore County has placed on a location of green burial or</p> <p>14 natural burial cemeteries. Did you hear all of that?</p> <p>15 DR. PLEYAS: I do recall it, yes.</p> <p>16 MR. BROWN: I guess my question is this. In light of</p> <p>17 your testimony today that this particular green burial</p> <p>18 cemetery, even though it's going to be located upstream from</p> <p>19 some drinking water wells and upstream by just a mile or two</p> <p>20 from a major drinking water supply, will not be a risk. Do</p> <p>21 you think that the people in Baltimore County who have</p> <p>22 imposed these regulations are making something of a fuss</p> <p>23 where they really have no reason to worry?</p> <p>24 DR. PLEYAS: Well, I'm not familiar with the operation</p> <p>25 of the local government or what all of the components that</p>	<p>307</p> <p>1 DR. PLEYAS: Thank you.</p> <p>2 HEARING EXAMINER ROBESON-HANNAN: Dr. Pleyas, I did</p> <p>3 review your report. And I guess -- I know you were brought</p> <p>4 in to rebut the other expert witnesses. But I looked at</p> <p>5 your report and it says, I think it's on page 15, that there</p> <p>6 is very little documentation. Let me see if I can find it.</p> <p>7 Very little research has been done to analyze the fate and</p> <p>8 transport of pharmaceutical compounds in soils containing</p> <p>9 decaying bodies such as grave soils. And when I read</p> <p>10 through, you go through the -- forgive me. I will try to</p> <p>11 get the term right. ADME.</p> <p>12 Various chemicals raised by the expert reports</p> <p>13 submitted in opposition to this case. But my question is,</p> <p>14 can you tell me -- when I read through the analysis of</p> <p>15 what's going to happen to these drugs in the soil, I see a</p> <p>16 lot of possibilities for either metabolism of -- you</p> <p>17 know, fungi can -- fungi, I saw a couple of other things.</p> <p>18 But I -- do you have an opinion on exactly what is going to</p> <p>19 happen to these drugs when they are released?</p> <p>20 DR. PLEYAS: Yes. I'm comfortable as a scientist in</p> <p>21 the work that I have reviewed and the studies that I've</p> <p>22 reviewed that pharmaceutical compounds will undergo further</p> <p>23 degradation into areas after death. One is the</p> <p>24 decomposition process by the body. And I mentioned that</p> <p>25 earlier. Just the gut microbiota and then the biome on the</p>
<p>306</p> <p>1 they are making in terms of their assessment or the process.</p> <p>2 I can't speak to that.</p> <p>3 MR. BROWN: I know, but you are saying that this</p> <p>4 particular green cemetery, even though fairly close to a</p> <p>5 water supply, will be safe and not a problem for the</p> <p>6 community. But at the same time, Baltimore County is</p> <p>7 prohibiting this kind of cemetery burial in areas of similar</p> <p>8 proximity to water. So why should they be concerned based</p> <p>9 upon your testimony?</p> <p>10 DR. PLEYAS: I have no idea why they might be concerned</p> <p>11 about other properties or other locations. I just mentioned</p> <p>12 that it's an area that I don't -- I'm not familiar with.</p> <p>13 I'm a toxicologist, a scientist. And this is not an area</p> <p>14 that is -- that I was asked to look at, nor do I have the</p> <p>15 expertise to understand what the issues are relative to</p> <p>16 other sites in Montgomery County. But I can say, based on</p> <p>17 the science at this particular facility and facilities like</p> <p>18 this, assuming that they are considered -- the work that has</p> <p>19 been done that I'm familiar with, particularly with Dr.</p> <p>20 Dawson. And when we look at the complete exposure pathway,</p> <p>21 and when we look at it, is that it will not pose an</p> <p>22 unacceptable human health risk to any population in this</p> <p>23 vicinity.</p> <p>24 MR. BROWN: Thank you, Dr. Pleyas. Appreciate your</p> <p>25 testimony.</p>	<p>308</p> <p>1 skin will start to do their work. And then any of the</p> <p>2 liquid material that gets released from the bottom of the</p> <p>3 corpse will undergo further degradation depending -- again,</p> <p>4 site-specific, depending on what the conditions of the soil</p> <p>5 are. But they will have organisms that will further decay.</p> <p>6 I will add one more thing.</p> <p>7 HEARING EXAMINER ROBESON-HANNAN: Did you say -- I need</p> <p>8 your help on this, really. I'm looking for an answer. I'm</p> <p>9 not trying to attack.</p> <p>10 DR. PLEYAS: Okay.</p> <p>11 HEARING EXAMINER ROBESON-HANNAN: What do you mean by</p> <p>12 degradation? That the toxicity, and I say toxicity in the</p> <p>13 sense that the potential for harm is reduced by the</p> <p>14 interactions. Is that what you mean by degradation?</p> <p>15 DR. PLEYAS: Yes. So when you take a chemical and you</p> <p>16 start to tear it apart, and that's what the bacteria and the</p> <p>17 fungi will do, they will take a molecule that it's some size</p> <p>18 and they will start to attack it by snipping little bonds</p> <p>19 off of it and it breaks the molecule apart, that molecule</p> <p>20 become simpler and simpler in terms of its structure and</p> <p>21 actually makes it more available for continued degradation.</p> <p>22 That is what I'm speaking of from that perspective.</p> <p>23 I've also -- I just want to add, looking at drinking</p> <p>24 water sources to the public, for example in Fairfax County,</p> <p>25 or DC water, or LA, whatever, pharmaceuticals have already</p>

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19 (309 to 312)

<p>309</p> <p>1 been detected because of the source of those drinking 2 waters. And so we have done -- I've done an analysis. 3 Regardless of decomposition, just the parent compound that 4 the concentration is found in drinking water and found them 5 to be, doing a toxicological risk assessment, below levels 6 of the cause harm. And that's including safety factors as 7 well. 8 HEARING EXAMINER ROBESON-HANNAN: So our -- do you 9 have -- are these NIOSH or EPA levels that you are using? 10 Or are these your own levels that you are -- drinking water 11 levels that you are applying? 12 DR. PLEYAS: That's a good question. And the approach 13 that we use is an EPA approach, number one. Or the state -- 14 sometimes states have their own approach. So we will use a 15 state approach. We have our work peer-reviewed by 16 individuals that are toxicologists and pharmacologists in 17 academia and in government. And they review our work, for 18 example. 19 Or when we publish it, it's reviewed in the literature 20 by pure reviewers. They've gone through the work that we've 21 done and have approved it on hundreds -- certainly over 22 hundreds of compounds that we've looked at. And we make 23 this transparent so that everybody can see how we did that, 24 making sure that we didn't miss anything. 25 HEARING EXAMINER ROBESON-HANNAN: You're basing your --</p>	<p>311</p> <p>1 they the same chemicals that were tested? 2 DR. PLEYAS: Well, the -- so the answer is, yes and no. 3 Yes, because some of the chemicals that were listed were 4 tested. No, because not everything has been tested. There 5 is over 3000 different therapeutic agents out there. But 6 what's consistent is the data shows that the levels, for 7 example -- and I go back to drinking water because that's 8 going to be even a greater source of human exposure than 9 necessarily from a groundwater of the -- receiving water 10 from -- groundwater from this cemetery. They are going to 11 have higher concentrations than the concentrations that 12 would be expected out of the cemetery. 13 HEARING EXAMINER ROBESON-HANNAN: Maybe this is not for 14 you. Maybe this is for the -- Ms. Dawson. But I've heard 15 this comparison with septic systems. But even though -- 16 which I'm not even sure why we are -- that's relevant, but I 17 will go with it. But this is a lot of graves. It's not one 18 or two graves. This is -- I can't remember the number, but 19 it's in the hundreds. So if there is 30 wells, wouldn't the 20 concentration of these graves have an impact -- wouldn't it 21 be a -- sorry. Wouldn't the concentration of these graves 22 be a factor to consider as opposed to excretion per grave 23 versus excretion per septic system? Because there is 24 only -- I forget. There is -- the number of graves -- or 25 the number of wells in the area, if I recall, is under 50.</p>
<p>310</p> <p>1 if you say there is very little research on grave soil, what 2 are you basing your opinion on? Is it wastewater? Is it 3 through the discharge of wastewater? Or what? If there is 4 little of the grave soil analysis, what are you basing your 5 opinion on? 6 DR. PLEYAS: There are studies that have been conducted 7 where they place materials like pharmaceuticals and they 8 have tested it outside of a grave situation, but they've 9 tested it in soils to see what the degradation is. So 10 that's the type of study that's really important for the 11 analysis of degradation. But all -- 12 HEARING EXAMINER ROBESON-HANNAN: Are those cited in 13 your -- are those cited in your report? 14 DR. PLEYAS: Yes, they are. I can add more to it, but 15 I -- 16 HEARING EXAMINER ROBESON-HANNAN: Okay. And then are 17 the pharmaceuticals, which is any therapeutic treatment as I 18 understand your testimony. Do you know what pharmaceutical 19 specifically were studied? 20 DR. PLEYAS: Yes, they are put in the papers. 21 HEARING EXAMINER ROBESON-HANNAN: And were they -- 22 we've had a number of different chemicals mentioned in this 23 hearing. Were they the chemicals that have been -- I think 24 I heard estrogen. I heard many chemicals. I can't 25 remember. I can't repeat them all to you right now. Were</p>	<p>312</p> <p>1 So wouldn't a factor to consider be the concentration of 2 these graves? 3 DR. PLEYAS: May I offer just a refinement in your -- 4 to make sure I understand your question? Because I'm not 5 quite -- other than that, I would ask you to -- if you could 6 repeat it, because I did not understand it. 7 HEARING EXAMINER ROBESON-HANNAN: Okay. My question 8 is, that I keep seeing this comparison to septic systems and 9 how much worse a septic system would be for the environment 10 than these graves. But if you look at the concentration of 11 these graves, which may, per grave, have a smaller 12 concentration of chemicals, is the comparison really 13 accurate? 14 DR. PLEYAS: So that's a -- so the answer is, I believe 15 it is. Here is why. The body has whatever it has when it's 16 placed into the ground. And the assumptions that need to be 17 very thoughtfully understood is that a person isn't 18 receiving, or it's extremely rare that they would receive 19 the full therapeutic dose and then die. That would be the 20 worst case scenario, if you would, because when you 21 introduce a chemical in the body it metabolizes it. And 22 that's the ADME. 23 A person with a septic system, if you've got a family 24 and a house, and let's say the father has cancer and is 25 being treated by a chemotherapeutic agent, that treatment</p>

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<p>313</p> <p>1 goes on for a length of time depending on what the cancer 2 is, depending on what the treatment is. But it could be 3 weeks. It could be months, potentially years. And every 4 time that person goes to the bathroom and defecates or 5 urinates into the toilet it will go into the septic system. 6 So what you have from an exposure perspective, is you have 7 one dead body with whatever it has or you have a live body 8 that's continually metabolizing and excreting the same 9 compounds that are going into a septic system, that then 10 have the opportunity to be released into the soil. And the 11 magnitude of order there is -- you know, I mean, it could be 12 extremely large. It's definitely significantly different. 13 HEARING EXAMINER ROBESON-HANNAN: Do you know how many 14 graves are planned for the cemetery? 15 DR. PLEYAS: I don't recall offhand. 16 HEARING EXAMINER ROBESON-HANNAN: So it's your position 17 that all chemicals, all -- I know that every chemical has a 18 chance to be -- I understood that. But your position is 19 that all of the chemicals are either going to -- are going 20 to be degraded in the soil. Do you have a -- is that your 21 position? And for -- and then the second question is, how 22 long will that take? 23 DR. PLEYAS: So my position is that the amount of 24 chemical that reaches the soil will be less than was in the 25 body. That's -- that I'm certain of. I'm also certain that</p>	<p>315</p> <p>1 and some on your own peer reviewed safe water drinking 2 standards? 3 DR. PLEYAS: Yes, and other -- some other states have 4 also been more aggressive in their determination for their 5 work in this area. For example, State of California has, as 6 a part of their Prop 65 regulatory arena, has developed 7 levels, no significant risk levels. So the government 8 around the world recognizes things that are safe for human 9 exposure. They understand the toxicology of this. They 10 make a determination of some sort. So I think for example, 11 Prop 65 cyclophosphamide, the state passed it from a 12 potential cancer perspective. And they say at this level 13 there is no significant risk. 14 HEARING EXAMINER ROBESON-HANNAN: Okay. I think that 15 gets to my question. I'm going to let both parties -- I'm 16 going to let Mr. Sullivan redirect or ask any questions he 17 wants based on my -- and then Mr. Brown. Thank you. Mr. 18 Sullivan? 19 MR. SULLIVAN: I'm sorry, I thought I was talking. I 20 have no questions now. I would like to reserve my right to 21 respond in case Mr. Brown raises something that requires a 22 response. 23 HEARING EXAMINER ROBESON-HANNAN: All right. Mr. 24 Brown, do you have any questions based on my questions? 25 MR. BROWN: No questions.</p>
<p>314</p> <p>1 the decomposition and what we call adsorption, the molecule 2 attaching itself to some other organic matter or inorganic 3 matter underneath, in the soil, in the grave, which 4 effectively pulls that chemical out of potential exposure, 5 that will occur. I'm confident of that. The assessment 6 between there and the well, are in the water source is Dr. 7 Dawson's expertise. 8 HEARING EXAMINER ROBESON-HANNAN: Okay. I understand 9 that. And what about absorption? Is that going to occur 10 too? 11 DR. PLEYAS: Yes. 12 HEARING EXAMINER ROBESON-HANNAN: So your testimony 13 really is that all chemicals, all of them, will be absorbed 14 and degraded or adsorbed and taken away? 15 DR. PLEYAS: When you say adsorbed and taken away, I 16 mean, it's not available for exposure or toxicity. I'm not 17 saying that there wouldn't be other molecules that could 18 potentially reach that water source. That's always a 19 possibility and a potential. And I don't know the answer to 20 that. But I'm assuming that if it did, from a toxicological 21 perspective, it requires dose, it requires exposure, that 22 there will not be an adverse health effect expected in the 23 population if that even did occur. 24 HEARING EXAMINER ROBESON-HANNAN: So based on, some on 25 EPA -- I'm sorry. Some on EPA safe water drinking standards</p>	<p>316</p> <p>1 HEARING EXAMINER ROBESON-HANNAN: All right. Thank 2 you, Dr. Pleyas. 3 DR. PLEYAS: Yes, thank you. 4 HEARING EXAMINER ROBESON-HANNAN: You may be excused, 5 and you can stay in the meeting, but you are excused as a 6 witness. 7 DR. PLEYAS: Thank you, very much. Thanks for your 8 attention. 9 HEARING EXAMINER ROBESON-HANNAN: Okay. Now we are 10 going to Mr. Sullivan. Your next witness? 11 MR. SULLIVAN: We are going to call Dr. Dawson next. 12 We're going to need to do some shuffling around the room 13 here. And I wonder if -- 14 MR. KLINE: Might be a time to break before we start 15 with Dr. Dawson. I am -- just to inform the hearing 16 examiner, I expect that we will need just about a couple of 17 hours with Dr. Dawson for my testimony -- or my examination, 18 just to give you a sense of what we are expecting. 19 HEARING EXAMINER ROBESON-HANNAN: Fine. And how many 20 more witnesses do you have after Dr. Dawson? 21 MR. SULLIVAN: We have potentially one more after Dr. 22 Dawson. 23 MR. KLINE: Quick. 24 MR. SULLIVAN: And it would be very quick. A couple of 25 questions.</p>

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<p>317</p> <p>1 HEARING EXAMINER ROBESON-HANNAN: Okay. 2 (Crosstalk) 3 HEARING EXAMINER ROBESON-HANNAN: Wait, who is -- who 4 is speaking? I -- somebody said quick, and I can't tell 5 because you are all under one name. Oh, Mr. Bauman. Okay. 6 MR. BAUMAN: Thank you. 7 HEARING EXAMINER ROBESON-HANNAN: Okay. So Mr. Brown, 8 are you hungry? 9 MR. BROWN: I'm perfectly happy to break for lunch. 10 Although, I would like to know the name of the witness that 11 is coming after Dr. Dawson. 12 MR. SULLIVAN: Right. Well, we would propose to call 13 Haroon Matrusada just for a couple of questions of the 14 follow-up after the testimony we've heard over the last 15 couple of days. 16 MR. BROWN: That's helpful, thank you. 17 MR. SULLIVAN: You're welcome. 18 MR. BROWN: I support the lunch break. 19 HEARING EXAMINER ROBESON-HANNAN: Well, we will break 20 for lunch. Thank you. 21 MR. BROWN: All right. 22 (A lunch break was taken) 23 HEARING EXAMINER ROBESON-HANNAN: Adjusting the screen 24 so I could see the face of the next witness. So we are back 25 on the record. And we have -- just a second for me,</p>	<p>319</p> <p>1 DR. DAWSON: About eight years now. 2 MR. SULLIVAN: Okay. And what does your work with 3 Geosyntec involve? 4 DR. DAWSON: I provide technical support on projects 5 related to contaminant fate and transport of many different 6 kinds of contaminants. I also provide some pre-regulatory 7 advice to clients based on my former background as a 8 regulator. And then I provide litigation support as well. 9 MR. SULLIVAN: Okay, thank you. And I will go back to 10 your work experience. But I want to start with 11 understanding little bit of your educational background. 12 You have a bachelors degree; is that correct? 13 DR. DAWSON: Yes, I have a bachelor of science and 14 geology from Stanford University. 15 MR. SULLIVAN: Okay. And you have a Masters degree? 16 DR. DAWSON: I do. I have a Masters of science and 17 geochemistry from the Colorado School of Mines. 18 MR. SULLIVAN: Okay. And within geochemistry were 19 there any focus with your academic efforts there as far 20 as -- 21 DR. DAWSON: Yes. Geochemistry relates to the 22 interaction of natural materials like geologic materials 23 with water that weathers those rocks and then releases 24 chemistry with the chemicals into that. And geochemistry 25 then can be used -- and the way I used it then was for</p>
<p>318</p> <p>1 arranging something. We have Dr. Dawson. Is it Dr. Dawson? 2 DR. DAWSON: Yes. 3 HEARING EXAMINER ROBESON-HANNAN: Okay. Please raise 4 your right hand. 5 Do you solemnly affirm under penalty of perjury that 6 the statements you're about to make are the truth, the whole 7 truth, and nothing but the truth? 8 DR. DAWSON: Yes, I affirm. 9 HEARING EXAMINER ROBESON-HANNAN: Okay. Go ahead Mr. 10 Klein or Mr. Sullivan. 11 MR. SULLIVAN: Mr. Sullivan will be handling this. 12 Good morning. Or good afternoon, Dr. Dawson. Can you 13 introduce yourself? 14 DR. DAWSON: Yes. My name is Helen Dawson. Do you 15 want me to do the address and email? 16 HEARING EXAMINER ROBESON-HANNAN: Yes, please. 17 DR. DAWSON: Helen Dawson. I live at 3110 Faber Drive 18 in Falls Church, Virginia, 32044. And my email address is 19 HDawson@geosyntech.com. 20 MR. SULLIVAN: Thank you. Dr. Dawson, where are you 21 employed? 22 DR. DAWSON: I currently work for Geosyntec Consultants 23 Inc. 24 MR. SULLIVAN: Okay. And how long have you been with 25 Geosyntec?</p>	<p>320</p> <p>1 mineral expiration purposes. 2 MR. SULLIVAN: Okay, thank you. And you have a 3 doctorate? We'll call you Doctor, correct? 4 DR. DAWSON: I do. I have a PhD in environmental 5 science and engineering from Stanford University. And that 6 focus was in the transport of organic chemicals in porous 7 media, soil, and sediments. 8 MR. SULLIVAN: Okay, thank you. And then we started 9 with your Geosyntec express per but now let's start with 10 your post PhD work experience or your post Masters 11 experience. 12 DR. DAWSON: Well, post-masters was five years in 13 minerals exploration designing sampling programs using 14 geochemistry. And then I went back for a PhD, which takes 15 some time to do. And then after I finished my PhD I was a 16 professor for about 10 years with the Colorado School of 17 Mines teaching contaminant fate and transport in the 18 environmental science and engineering program there. 19 MR. SULLIVAN: Okay. And you also have experience as a 20 regulator; is that not correct? 21 DR. DAWSON: I do. I left academics after about 10 22 years and went to work for U.S. Environmental Protection 23 Agency in the Rocky Mountain region. And for 10 years I was 24 the regional hydrogeologist for the Superfund program. And 25 what that entails is, it was my job to ensure that</p>

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321	<p>1 appropriate and adequate hydrogeologic investigations were</p> <p>2 conducted by either EPA's contractors or principal parties,</p> <p>3 responsible parties at contaminant sites were providing</p> <p>4 adequate and appropriate hydrogeologic investigation.</p> <p>5 MR. SULLIVAN: Okay, go ahead.</p> <p>6 DR. DAWSON: And then still with a -- as a regulator, I</p> <p>7 was asked to come to headquarters to manage was called the</p> <p>8 Superfund science policy branch. And that's the branch that</p> <p>9 writes the guidance that says how do you do hydrogeologic</p> <p>10 investigations at Superfund sites, also how do you do risk</p> <p>11 assessments, how do you assess whether or not there is</p> <p>12 degradation or absorption or what are the factors that</p> <p>13 influence contaminant transport.</p> <p>14 MR. SULLIVAN: Okay. Is there any other work</p> <p>15 experience that would be relevant to your assessment that</p> <p>16 you've undertaken in this case that you would like to talk</p> <p>17 about?</p> <p>18 DR. DAWSON: The most analogous work experience is I</p> <p>19 had a recent case at Stafford, basically Stafford County</p> <p>20 that was to evaluate the contaminant fate and transport from</p> <p>21 a proposed cemetery in Stafford County.</p> <p>22 MR. SULLIVAN: And who -- on whose behalf did you</p> <p>23 conduct that work?</p> <p>24 DR. DAWSON: The -- my client was the Department of</p> <p>25 Justice, U.S. Department of Justice.</p>	323	<p>1 conclusion favorable towards the creation of the cemetery or</p> <p>2 unfavorable?</p> <p>3 DR. DAWSON: Well, my expert report focused on a</p> <p>4 technical opinion about the potential for contaminant fate</p> <p>5 and transport from the cemetery to result in concentrations</p> <p>6 above the drinking water standard in a nearby stream, the</p> <p>7 aqueous stream. And my technical conclusion was that it</p> <p>8 would not.</p> <p>9 MR. BROWN: Thank you. I've no objection.</p> <p>10 HEARING EXAMINER ROBESON-HANNAN: All right. You are</p> <p>11 so qualified. Go ahead, Mr. Sullivan.</p> <p>12 MR. SULLIVAN: Thank you. Dr. Dawson, you submitted</p> <p>13 two reports in this -- for this hearing, correct?</p> <p>14 DR. DAWSON: Yes.</p> <p>15 MR. SULLIVAN: Okay. And you've rendered opinions in</p> <p>16 those reports, correct?</p> <p>17 DR. DAWSON: I have.</p> <p>18 MR. SULLIVAN: Okay. And let's start with your first</p> <p>19 report, which is in the record as Exhibit 97. And I believe</p> <p>20 it looks like you have a copy of that report in front of</p> <p>21 you.</p> <p>22 DR. DAWSON: I do.</p> <p>23 MR. SULLIVAN: Okay. What opinion or opinions did you</p> <p>24 provide in your report that is at Exhibit 97?</p> <p>25 DR. DAWSON: Well, I provided two opinions in there,</p>
322	<p>1 MR. SULLIVAN: Okay, thank you.</p> <p>2 The Applicant would like to qualify Dr. Dawson as an</p> <p>3 expert in hydrogeology and in the transport and fate of</p> <p>4 contaminants in soil and groundwater and exposure assessment</p> <p>5 related to contaminated soil and groundwater. And I can say</p> <p>6 that again if you like.</p> <p>7 HEARING EXAMINER ROBESON-HANNAN: Please.</p> <p>8 MR. SULLIVAN: Okay.</p> <p>9 HEARING EXAMINER ROBESON-HANNAN: Slowly. Slowly.</p> <p>10 MR. SULLIVAN: Yes. So the Applicant is offering Dr.</p> <p>11 Dawson as an expert in hydrogeology and the transport and</p> <p>12 fate of contaminants in the soil --</p> <p>13 HEARING EXAMINER ROBESON-HANNAN: Okay.</p> <p>14 MR. SULLIVAN: I'm sorry. It in soil, actually and</p> <p>15 water, which includes both surface water and groundwater.</p> <p>16 HEARING EXAMINER ROBESON-HANNAN: Keep going.</p> <p>17 MR. SULLIVAN: And exposure assessment related to</p> <p>18 contaminated soil and water including both surface and</p> <p>19 groundwater.</p> <p>20 HEARING EXAMINER ROBESON-HANNAN: Okay. Mr. Brown, any</p> <p>21 objection?</p> <p>22 MR. BROWN: I do have a question for Dr. Dawson.</p> <p>23 HEARING EXAMINER ROBESON-HANNAN: All right.</p> <p>24 MR. BROWN: Dr. Dawson, in your work for the Justice</p> <p>25 Department on the Stafford County Cemetery, was your</p>	324	<p>1 two technical opinions. The first is based on a thorough</p> <p>2 examination of the ecogeologic data that were available for</p> <p>3 the site and coupled with modeling of contaminant fate and</p> <p>4 transport that there was no -- that the proposed cemetery</p> <p>5 would not pose a health and safety risk to adjacent</p> <p>6 properties, to nearby wells, to the streams, the Ednor</p> <p>7 tributaries or to the Rocky Gorge Reservoir.</p> <p>8 MR. SULLIVAN: Okay. Thank you. And there was another</p> <p>9 opinion as well?</p> <p>10 DR. DAWSON: And the second opinion has to do with a</p> <p>11 comparison of the potential impacts of the cemetery to the</p> <p>12 existing septic systems in the watershed, the same watershed</p> <p>13 in which the tributary was proposed. And that opinion was</p> <p>14 that the potential impacts from the cemetery would be</p> <p>15 essentially less than the potential impacts from all of the</p> <p>16 septic tanks, the nearby septic tanks in the watershed.</p> <p>17 MR. SULLIVAN: Okay, thank you. And I would like to</p> <p>18 just start generally and talk about just the general process</p> <p>19 that you undertook to reach these conclusions. And first,</p> <p>20 did you undertake a site-specific assessment of these</p> <p>21 issues?</p> <p>22 DR. DAWSON: Yes, absolutely.</p> <p>23 MR. SULLIVAN: Okay. And so just -- and we will get</p> <p>24 into specifics. But what are some of the factors you</p> <p>25 consider it?</p>

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<p>325</p> <p>1 DR. DAWSON: Well, they are standard. And actually</p> <p>2 while I was at the EPA I wrote an outline to facilitate</p> <p>3 getting appropriate hydrogeologic investigations from</p> <p>4 contractors. Starting from the surface where sources are,</p> <p>5 you need to characterize the source, understand what the</p> <p>6 potential contaminates they could be leached from the source</p> <p>7 are.</p> <p>8 You need to understand the physical setting of the</p> <p>9 source, which are, for example, the topography, whether it's</p> <p>10 forest in. You need to understand the types of soil that</p> <p>11 are present. You need to know the depth to groundwater and</p> <p>12 the material that is between the groundwater and that the</p> <p>13 base of the source. You need to understand what direction</p> <p>14 groundwater is flowing and then the distance between the</p> <p>15 source materials and any areas or discharge points that are</p> <p>16 available. And then consider surface water interactions</p> <p>17 with groundwater. So I did all of those for the site based</p> <p>18 on site-specific data.</p> <p>19 MR. SULLIVAN: Okay. And in assessing whether any</p> <p>20 contaminant release from the other proposed cemetery would</p> <p>21 or would not cause a health and safety risk, did you</p> <p>22 consider whether surface runoff from the area of the</p> <p>23 proposed cemetery to the nearby streams with the reservoir</p> <p>24 would cause a health and safety risk?</p> <p>25 DR. DAWSON: I did. Those -- so the first question was</p>	<p>327</p> <p>1 not.</p> <p>2 MR. SULLIVAN: Okay. So let's first talk about -- I</p> <p>3 want to talk about your conclusions and your analysis of --</p> <p>4 your conclusion that surface runoff from the area of the</p> <p>5 proposed cemetery will not impact the water quality of the</p> <p>6 nearby streams.</p> <p>7 And before we start that discussion, Ms. Robeson-</p> <p>8 Hannan, would like to put some exhibits from Exhibit 97</p> <p>9 which is in the Applicant's pre-hearing statement to which</p> <p>10 Dr. Dawson's report is attached. And I can -- if we get to</p> <p>11 that Exhibit 97, I can tell you it's a 141 page PDF, and I</p> <p>12 can tell you which page of that PDF the exhibit is on.</p> <p>13 HEARING EXAMINER ROBESON-HANNAN: I have the exhibit on</p> <p>14 my screen. It's Exhibit 97, correct?</p> <p>15 MR. SULLIVAN: Correct. And so I am looking for</p> <p>16 Exhibit D to Dr. Dawson's report which is at the PDF page</p> <p>17 41 -- or sorry of 141. The top of the page there, it should</p> <p>18 show you that.</p> <p>19 HEARING EXAMINER ROBESON-HANNAN: Let's see. For the</p> <p>20 record, I am getting to the correct page. Okay. The fifth</p> <p>21 part of the line there's --</p> <p>22 MR. KLINE: It will come up here.</p> <p>23 HEARING EXAMINER ROBESON-HANNAN: I'm sorry?</p> <p>24 MR. KLINE: Can we rotate it, please?</p> <p>25 HEARING EXAMINER ROBESON-HANNAN: Yes. Ahh. For the</p>
<p>326</p> <p>1 about, you know, what sort of pathway, what sort of</p> <p>2 components of an investigation are. And then, the other</p> <p>3 part of it is to evaluate what are the potential ways a</p> <p>4 contaminant might migrate from a site. So one of those is</p> <p>5 surface water. And so I did the evaluate surface water</p> <p>6 runoff and concluded that there would be no potential impact</p> <p>7 to adjacent properties based on -- or the streams and based</p> <p>8 on that surface water.</p> <p>9 MR. SULLIVAN: And then how about for the reservoir?</p> <p>10 Would surface water runoff cause any health or safety impact</p> <p>11 to the reservoir?</p> <p>12 DR. DAWSON: No.</p> <p>13 MR. SULLIVAN: Okay. And did you also consider whether</p> <p>14 groundwater from the area of the proposed cemetery, and</p> <p>15 first to the private wells of the adjacent properties would</p> <p>16 cause a health or safety impact to those wells?</p> <p>17 DR. DAWSON: I did consider that, and my conclusion was</p> <p>18 that it did not. And I can describe the details when we get</p> <p>19 to that.</p> <p>20 MR. SULLIVAN: Great. Thank you. And then, did you</p> <p>21 also consider whether groundwater from the area of the</p> <p>22 proposed cemeteries to the nearby streams, or the Rocky</p> <p>23 Gorge Reservoir would cause a health or safety impact to</p> <p>24 either the streams are the reservoir?</p> <p>25 DR. DAWSON: I did, and also concluded that it would</p>	<p>328</p> <p>1 record, I did that because I over rotated it. There you go.</p> <p>2 MR. SULLIVAN: Okay. Thank you. Dr. Dawson, up on the</p> <p>3 screen is what looks like Exhibit D to your expert report;</p> <p>4 is that correct?</p> <p>5 DR. DAWSON: Yes.</p> <p>6 MR. SULLIVAN: Okay. And can you describe the physical</p> <p>7 setting of the proposed cemetery?</p> <p>8 DR. DAWSON: Yes. So the physical setting is shown on</p> <p>9 this map. The site itself looks like sort of a different</p> <p>10 shape, a red bounded property. It flashes on and off on our</p> <p>11 screen here. Anyway, the red boundary there and you can see</p> <p>12 that with in that it's all forested land. It's all green.</p> <p>13 Where there are trees it looks a little grayer. Of course,</p> <p>14 where there is construction, or other man-made objects it</p> <p>15 looks a different color.</p> <p>16 The yellow line there is the boundary of the watershed</p> <p>17 that represents in the drainage area of the Ednor</p> <p>18 tributaries. And in the Ednor tributaries themselves</p> <p>19 comprise that blue line in there that discharges to the</p> <p>20 Rocky Gorge Reservoir. And you can see that there is a</p> <p>21 single line from about the western corner of the site that</p> <p>22 goes towards the reservoir. And it branches at that point</p> <p>23 into two branches. One to the north right at the western</p> <p>24 boundary of the property. And then there's another branch</p> <p>25 that goes to the South.</p>

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<p>329</p> <p>1 So I visited the site and walked the site, verified 2 whether or not water was flowing in those strings. And have 3 an exhibit that shows photographs. 4 MR. SULLIVAN: If we could. 5 HEARING EXAMINER ROBESON-HANNAN: Right there. Okay. 6 I need to do something. Okay, go ahead. 7 MR. SULLIVAN: If we could move back one page to 47 of 8 141, we can see Exhibit C. There we go. 9 DR. DAWSON: This test is a record of my visit. In the 10 tree photographs, the first one is up near the New Hampshire 11 end of the site, the western end of the site, the path that 12 leads into the property. And you can see that before us 13 that there is a deciduous forest. The whole site is covered 14 with deciduous forest. 15 And then, the two at the bottom are of the streams. 16 The first one is the stream that branches to the north, and 17 the second one shows the confluence of the two. You can see 18 the stream, it's a little hard to see in this diagram, 19 but -- or in this photograph, but anyway. On the left-hand 20 side is the South branch, and on the right hand side is the 21 North branch. And my purpose for walking down to the 22 streams was to verify whether or not these streams were 23 actually running. And the reason that's important is where 24 you have shallow groundwater, which we'll get into in more 25 detail, in this region of -- and it's close, which is called</p>	<p>331</p> <p>1 all the land helps minimize surface runoff, and allow 2 infiltration, which is a good thing. Surface runoff, if 3 there's too much of it, can lead to erosion. When I walked 4 the site, I thought no signs of erosion other than in the 5 streams where you expected. The other benefit is that where 6 groundwater discharges too streams, anything that is in that 7 groundwater is fodder, if you will, as nutrients for the 8 trees. And near the streams the tree roots are deep enough 9 to actually intersect the groundwater. That's not always 10 true further up where the groundwater is deeper. 11 MR. SULLIVAN: Okay. Thank you. Did you also consider 12 the topography of the site? 13 DR. DAWSON: Yes. So I walked the site and -- 14 MR. SULLIVAN: And if I might. If we can move to -- 15 I'm sorry. It's 49 of 141, so going in the other direction. 16 You see Exhibit E, I believe it is. There we go. 17 There we go. Okay thank you. So continue your 18 discussion, please? 19 DR. DAWSON: Thank you. So let me describe the 20 topography. That is simply a map that shows a line where 21 the elevation is the same. And geologists and hikers use 22 topographic maps to plan how they will traverse across the 23 land. This particular topographic map comes from online 24 sources from Montgomery County. And it shows contours every 25 2 feet. So if you think about that that's two steps. We</p>
<p>330</p> <p>1 the Piedmont, the shallow groundwater is generally 2 discharges to the streams. And you know that that's 3 occurring where the streams are running. And so both of 4 these streams were running with water through the site. 5 The one on the north is shown in the USGS map as a 6 perennial stream, which means water runs in a year-round. 7 The one on the left is shown as an ephemeral stream above 8 the zone where it -- above the place where it intersects the 9 site. And that simply, it plays into my analysis of the 10 groundwater -- of the flow direction as we talk about later. 11 MR. SULLIVAN: And I noticed there looks like, would 12 you characterize the banks of those streams as -- they look 13 for us. How would you characterize them? 14 DR. DAWSON: Yes, they are forced it. The entire site 15 was forested. And my understanding, based on the phasing 16 plan, the cemetery plans is that 100 feet within the -- 100 17 feet either side of the streams will remain forested. 18 MR. SULLIVAN: And the area next to the stream is 19 referred to as riparian, correct? 20 DR. DAWSON: Yes. 21 MR. SULLIVAN: And so is there anything significant 22 about having riparian growth -- healthy or thick riparian 23 growth or the opposite, sparse riparian growth? 24 DR. DAWSON: Yes. So growth in general, and riparian 25 growth in particular, has two functions. Vegetation over</p>	<p>332</p> <p>1 have an idea of what the elevation looks like that's a much 2 denser than, for example, what we see on typical U.S. 3 geological topographic maps which have contour intervals of 4 20 to 40 feet. So this is a very detailed understanding of 5 the surface. 6 And sometimes they're so busy they're difficult to, you 7 know, unless you're used to looking at topo map to decipher 8 what they're really telling you. But bottom line, this 9 site, if you're looking in the dipper part, as opposed to 10 the handle, you might not call it that, but the skinny part 11 to the southwest, I'm calling the handle and the thicker 12 part to the northeast I'm calling the dipper. 13 You can see and we can show you on another map in a 14 bit, that there's a ridge in the middle that goes pretty 15 much from east to west and slants down towards the stream. 16 So generally the topo -- the surface of the land will slant 17 towards the streams. You can see that. It slants to the 18 north of that ridge towards the north branch and on the 19 southside it's a little steeper, it slants towards the south 20 or the south branch. 21 There are some, you know, there's not a single ridge. 22 You can see those there, so the upper parts of the cemetery 23 and one other thing to point out on here is that the pinkish 24 shaded areas, those are the planned burial areas. And they 25 tend to be up on the, you know, the gentler slopes and away</p>

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<p>333</p> <p>1 from the streams. You can see it's at least 100 feet away 2 from the streams, where the streams are nearby. 3 So in walking this the slopes range from gentle slopes 4 to, as you get closer to the streams and beyond the burial 5 areas, more moderate slopes. The only reason for noting 6 that is gentle to moderate slopes help ensure that 7 infiltration of surface water occurs rather than runoff that 8 leads to erosion. In my walking the site, I didn't see any 9 evidence of erosion anywhere else on the site is than in the 10 streams. 11 MR. SULLIVAN: Thank you. And let's take a look at 12 Exhibit F if we could. It's on the next page. And my 13 question to you is, did you consider whether any of the 14 proposed burial sites would be within a flood zone or a 15 floodplain? 16 DR. DAWSON: Yes, I did. That is one key factor to 17 consider in siting citing cemeteries, and really in siting 18 anything. We don't like build or construct anything in 19 flood zones. So this map shows both the 100 year flood zone 20 and 500 year flood zones. The data comes from Montgomery 21 County, and their source of the data is FEMA, or the federal 22 emergency management agency. 23 And so they have mapped across the entire United State, 24 potential 100 year and five year -- 500 year flood zone. 25 Here, you can see the planned burial areas are outside of</p>	<p>335</p> <p>1 DR. DAWSON: Well, you can see that on Exhibit F. It 2 all looks green and just for contrast, if you look towards 3 the southern end of that handle, there's the two fields sort 4 of rectangular shaped fields that are lighter colored that 5 are south of that. That's not forested, that's grassy, you 6 can see that when you walk the site. So within the side the 7 100 year -- the 100 feet back from the streams is currently 8 forested. And my understanding is that that is the intent 9 for that to stay forested. 10 MR. SULLIVAN: Okay. And did you reach a conclusion 11 whether any surface runoff from the cemetery itself would 12 even reach the nearby streams? 13 DR. DAWSON: Well, it's possible that surface runoff in 14 a large rain could reach the surface streams. But the other 15 part of my opinion it relates to other factors. So for 16 example, because there's no erosion and because the bodies 17 will be buried at a depth of 4 feet which means there's at 18 least 3-1/2 feet between the top of the surface of the land 19 and the body, that there won't be animals excavating them. 20 There won't be erosion of that. So there won't be any 21 decomposition products that rise to the surface. 22 So any surface runoff that occurs, largely, will just 23 infiltrate in the land and if there were some minor runoffs 24 toward the streams, then, for example, in one of the big 25 torrential rains that we get in Virginia I've been caught in</p>
<p>334</p> <p>1 those boundaries. And that's important because number one, 2 there won't be any bodies that are subject to inundation. 3 Where you have significant flood, also you can have 4 significant erosion, and so here the planning has ensured 5 that that -- if there is that erosion it's not where there 6 are gravesites. 7 MR. SULLIVAN: Can you just elaborate on -- just in 8 case anyone doesn't know what a 100 year, or a 500 year 9 flood is? 10 DR. DAWSON: So we've had a few. Sometimes you have a 11 100 year flood, you know, two times in a decade. It's the 12 statistically high end of a flood event. And that is based 13 on statistical data that the U.S. government collects, what 14 have been the stream water levels and the number of events 15 of flooding that have occurred in particular streams based 16 on topography to evaluate lower lying areas around every 17 stream. 18 MR. SULLIVAN: Thank you. And you may have mentioned 19 this already, but in the area between -- said that the 20 proposed burial site, I believe, are 100 feet back from the 21 streams at least. 22 DR. DAWSON: Yes. 23 MR. SULLIVAN: And in between the stream and the 24 proposed burial, is it forested and in, is it something 25 else?</p>	<p>336</p> <p>1 those and I know that even on narrow or gentle slopes they 2 can get runoff. As long as they're gentle, though and as 3 evidenced here there's not erosion, there won't be any 4 decomposition products reaching the streams. 5 MR. SULLIVAN: And so it's your professional opinion 6 that surface runoff from the proposed cemetery would not 7 impact the water quality of the streams; is that correct? 8 DR. DAWSON: That's correct. 9 MR. SULLIVAN: And you also, I believe, stated that you 10 reached the conclusion that surface runoff would not impact 11 any of the adjacent properties; is that correct? 12 DR. DAWSON: It would not impact the water quality of 13 the adjacent properties. The adjacent properties near the 14 handle are served -- they don't have wells immediately 15 adjacent to the property. And the properties that are a 16 little further away from those that are immediately adjacent 17 are actually uphill of the property. 18 MR. SULLIVAN: And so just to be clear, fair to say 19 then that because the surface runoff isn't going to -- isn't 20 expected to discharge to those properties that there 21 wouldn't be any impact on the water quality of those wells 22 of those properties from surface runoff? 23 DR. DAWSON: Correct. 24 MR. SULLIVAN: Okay. And then the same thing with 25 the -- there would be no impact to the water quality of the</p>

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<p>337</p> <p>1 other tributaries as well, correct?</p> <p>2 DR. DAWSON: That's correct and since no impact to</p> <p>3 that, nor tributaries, no impact to the surface -- tor Rocky</p> <p>4 Gorge Reservoir.</p> <p>5 MR. SULLIVAN: And Rocky Gorge Reservoir is somewhat</p> <p>6 downstream from -- down stream of those -- or down -- at the</p> <p>7 other Ednor tributaries at the end of them?</p> <p>8 DR. DAWSON: Based on RTIS it's 1.75 miles that -- from</p> <p>9 the closest point of the property to Rocky Gorge along the</p> <p>10 stream fork.</p> <p>11 MR. SULLIVAN: Okay. Great. Thank you. And so now I</p> <p>12 want to turn our attention to groundwater as opposed to</p> <p>13 surface water. And I believe it was your professional</p> <p>14 opinion that groundwater in the area of the proposed</p> <p>15 cemetery will not impact the water quality of private wells</p> <p>16 at adjacent properties; is that correct?</p> <p>17 DR. DAWSON: That's correct.</p> <p>18 MR. SULLIVAN: Okay. And my first question is so how</p> <p>19 did you determine where groundwater is and how it flows</p> <p>20 beneath the proposed cemetery? And for this discussion</p> <p>21 let's pull up Exhibit G if we can which is page 51 of 141,</p> <p>22 of Exhibit 97.</p> <p>23 HEARING EXAMINER ROBESON-HANNAN: Wait a minute. I</p> <p>24 apologize. It should be on your screen now.</p> <p>25 MR. SULLIVAN: Yes, thank you.</p>	<p>339</p> <p>1 equipped to drill a hole in the ground with a core barrel</p> <p>2 that actually can extract a core, or a sampling of the soil</p> <p>3 to whatever depth you drill. And so that is brought to the</p> <p>4 surface, it's opened up, a geologist log it, and identifies</p> <p>5 the soil type that's present. Any indication of moisture or</p> <p>6 the presence of wet soil would be -- if you had intercepted</p> <p>7 the groundwater.</p> <p>8 And then, in addition at this site, and this is quite a</p> <p>9 large number of borings, it was specifically -- each core</p> <p>10 barrel, as well as a test, and I'll describe that in a</p> <p>11 minute, was evaluated for any historic evidence of a water</p> <p>12 table. And that, typically, is determined by looking at</p> <p>13 changes in oxidation levels. So red to black transitions in</p> <p>14 soil, for example can give you an indication of a high water</p> <p>15 table.</p> <p>16 The test pits are actually dug with a backhoe and or a</p> <p>17 shovel. And in this case they go to 10 feet deep, so a</p> <p>18 machine was used. So that you can see a greater proportion</p> <p>19 of the soil. You can actually see inside the test pit,</p> <p>20 you're not looking just at what's extracted. And the same</p> <p>21 evaluation the soil type, what kinds of soil are present at</p> <p>22 the site and if there's any sign of a high water table.</p> <p>23 At this site the -- I want to describe what the soil</p> <p>24 type is because that --</p> <p>25 MR. SULLIVAN: Go ahead, but before we get to that, I</p>
<p>338</p> <p>1 Okay. So please, go ahead and tell us -- explain what</p> <p>2 exhibit we're looking at here with Exhibit G and please tell</p> <p>3 us how Exhibit G was created essentially.</p> <p>4 DR. DAWSON: Okay. So Exhibit G provides the</p> <p>5 information we've seen before, the site boundary and the two</p> <p>6 streams and then the blue lines represent what we as</p> <p>7 hydrogeologist call a potentiometric map of the groundwater</p> <p>8 table surface. And what that is, is the topographic map</p> <p>9 essentially, of the water table. The place at the top of</p> <p>10 the groundwater; in this case the shallow groundwater.</p> <p>11 And those contours -- this is a typical exercise that</p> <p>12 every hydrogeologist attempts to do with the site data that</p> <p>13 are available. It's a requirement, you can't tell what</p> <p>14 direction groundwater is flowing if you don't have a</p> <p>15 potentiometric map and ground water contours to make that</p> <p>16 evaluation. The data that I used to develop this map is, I</p> <p>17 think it's tough to see on the screen, but there are sort of</p> <p>18 brown dots and yellow dots on the map. The brown dots are</p> <p>19 soil boring locations and the yellow dots are test pit</p> <p>20 locations. There are 39 total of them, 8 are borings and</p> <p>21 then the remainder are the testing.</p> <p>22 MR. SULLIVAN: And you can just explain what's a soil</p> <p>23 boring versus what's a test pit?</p> <p>24 DR. DAWSON: Sure. So a soil boring is collected by</p> <p>25 bringing a drill rig out to the site and the drill rig is</p>	<p>340</p> <p>1 just -- I have a question for you about the number of -- the</p> <p>2 density of these soil -- test pits and soil borings. In</p> <p>3 your professional opinion on a scale of sparse too robust,</p> <p>4 how would you characterize the number of wells we have -- or</p> <p>5 I'm sorry, the number of test pit and soil bores?</p> <p>6 DR. DAWSON: So it's pretty robust. I have worked on</p> <p>7 probably hundreds of sites and, you know, some have been</p> <p>8 denser than this. Many have been less dense than this in</p> <p>9 terms of the characterization conducted in order to evaluate</p> <p>10 soil types.</p> <p>11 MR. SULLIVAN: Does the density you have. Give you</p> <p>12 confidence that your understanding of the water table and --</p> <p>13 of the water table location, I'll just say?</p> <p>14 DR. DAWSON: Yes because in particular here we not only</p> <p>15 looked at whether potential groundwater levels, we have the</p> <p>16 actual soil descriptions at each of these places. We have,</p> <p>17 in addition to that, the -- Reflection Park had infiltration</p> <p>18 tests conducted to understand what is the rate at which</p> <p>19 these soils can allow water to infiltrate. And that varied</p> <p>20 from about 2 inches per hour to 17 inches per hour, which is</p> <p>21 something that we look for.</p> <p>22 We want to have at a cemetery or -- well, in particular</p> <p>23 for a cemetery and let's just talk about the cemetery here.</p> <p>24 You want to have soil that has enough infiltration to avoid</p> <p>25 surface runoff, but not so fast that it doesn't give time</p>

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<p>341</p> <p>1 for the soil to address contaminants that might be released 2 from the burial site. And so there's a lot of data to that 3 effect here.</p> <p>4 And then, a hydrogeologist and I took that data, 5 coupled with some other information that is standard 6 hydrogeologic information. Shallow groundwater has been 7 shown that many, many, many sites unless there's, you know, 8 a large nearby pumping well like a municipal well nearby, 9 will mirror the groundwater surface. So you can use the 10 groundwater topography to inform how you draw your 11 potentiometric surface. I used the data of either where 12 there were actual measured groundwater levels, and we will 13 show that exhibit next, but I want to finish describing this 14 diagram.</p> <p>15 We take the actual measured levels to which groundwater 16 was found, took into account where the high groundwater 17 table evidence occurred, and each of these borings and goes 18 from 10 to 20 feet. And then, on top of that, if you 19 recall, I mentioned it's important to know whether the 20 streams are perennial, whether the streams are running. And 21 that's because if they are that means groundwater is 22 discharging to the streams.</p> <p>23 And where that occurs, you know the elevation of the 24 groundwater. You know that because the groundwater table, 25 in order for those streams to be running the groundwater</p>	<p>343</p> <p>1 testified that he hadn't done any site specific analysis but 2 that groundwater was either 2 feet or 4 feet below the 3 surface; do you recall that?</p> <p>4 DR. DAWSON: I do recall that.</p> <p>5 MR. SULLIVAN: And so do you -- was he wrong?</p> <p>6 DR. DAWSON: It doesn't match the actual data.</p> <p>7 MR. SULLIVAN: Okay. So let's talk about the actual 8 data and is that what we're seeing here on Exhibit H?</p> <p>9 DR. DAWSON: Yes. So these are the lists of the 39 10 borings and test pits. It includes the surface elevation, 11 the depth of the boring which you can see varied from about, 12 I think the shallowest was 8.5 feet to 20 feet. And then, 13 the next two columns provide the seasonal highwater table 14 elevation and you can see that there were only seven 15 location out of the 39 where there was any evidence of a 16 water table at some point in the history.</p> <p>17 And then, on the next column is the depth to the water 18 table. You can see there's only two points that are bolded, 19 that's TP6 and TP8 where the water table was 8 feet below 20 ground surface at TP6 and 7 feet below ground surface at 21 TP8. And the rest all have a depth but with a greater than 22 sign in front. And that's because groundwater was not 23 encountered in the remainder of the -- that would 37 24 borings. The highwater mark where those occur, the 25 shallowest depth at which that occurred was 4.7. that's in</p>
<p>342</p> <p>1 table intersects the stream. And so the elevation of the 2 stream is a very firm point on the potentiometric so I used 3 all of that to create this potentiometric map, and 4 essentially it shows that the groundwater is flowing 5 eastward across the property. Northeastwards a little bit 6 on the north side, and little more directly due east on the 7 south side of the ridges.</p> <p>8 But in general, the groundwater is flowing to the 9 streams most directions in the site. And even in the 10 handle, because of how -- the fact that there is a branch in 11 the handle is also flowing to the east, and is intersected 12 by the stream. So basically, the streams serve as what we 13 call a sink for the groundwater, the shallow groundwater in 14 this area.</p> <p>15 MR. SULLIVAN: Thank you. And let's talk about the 16 depth to groundwater. So let's take a look at Exhibit H, 17 which is on the next page, 52 of 141. Unfortunately, it 18 requires rotation.</p> <p>19 So yesterday you've been at this hearing since the 20 beginning, correct?</p> <p>21 DR. DAWSON: Yes.</p> <p>22 MR. SULLIVAN: And so you've heard the testimony from 23 Mr. Mulowney, Dr. O'Keefe, Dr. Abia and others, correct?</p> <p>24 DR. DAWSON: Yes.</p> <p>25 MR. SULLIVAN: And so I believe Mr. Mulowney yesterday</p>	<p>344</p> <p>1 TP14.</p> <p>2 MR. SULLIVAN: And what's significant about TP14 if 3 anything?</p> <p>4 DR. DAWSON: So I was just -- I was waiting for the 5 mouse to get to that point.</p> <p>6 MR. SULLIVAN: Oh, sorry.</p> <p>7 DR. DAWSON: So TP14 is -- let's see if we go back to 8 Exhibit G. Well actually, yeah, you can -- you don't need 9 to rotate it again. I'll just tell you that it's in a 10 swale, a low spot and when I was describing the soil types, 11 I don't know if I got a chance to actually describe the soil 12 type (inaudible). Let me do that now. What all the borings 13 have shown is that the upper, about 5 feet, of the site is 14 silty clay, sandy clay. It's finer-grained in the upper 5 15 feet, which means it's less permeable, than the material 16 deeper until you get to the bedrock which is 18 to 25 feet 17 below the ground surface in some areas. And in some -- in 18 the ridge areas it's a little deeper.</p> <p>19 So TP14 sits in just a low place and Mr. Reese, I 20 believe opined, which is one of the hydrogeologic reports 21 that were conducted for the site, that it could represent 22 perched water. In other words, not be a real reflection of 23 the height of the groundwater, it could have been just that 24 some water sat there for a while because that soil tends to 25 be a little less permeable. Not on the surface, it sat at a</p>

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<p>345</p> <p>1 depth of about 4.7 feet.</p> <p>2 However, to be conservative, health protective, I used</p> <p>3 the 4.7 as the actual groundwater level in creating the</p> <p>4 contours. And that was true for all of the borings we use</p> <p>5 the highest water level is the .2 used to create the</p> <p>6 potentiometric map.</p> <p>7 MR. SULLIVAN: So these borings -- Exhibit H, with the</p> <p>8 39 borings, are the 39 borings all in areas that are</p> <p>9 proposed burial sites?</p> <p>10 DR. DAWSON: No. That's a good point, thank you. A</p> <p>11 number of these -- in fact, all of the ones that show</p> <p>12 shallower than 10 feet are in areas that are outside of the</p> <p>13 planned burial areas.</p> <p>14 MR. SULLIVAN: So it's -- so where burials are</p> <p>15 proposed, it's your testimony that the water table is at</p> <p>16 least 10 feet below the ground surface; is that correct?</p> <p>17 DR. DAWSON: Yes.</p> <p>18 MR. SULLIVAN: Okay. Thank you. And why is that</p> <p>19 important?</p> <p>20 DR. DAWSON: That's important because we want to</p> <p>21 have -- ensure for cemetery citing there is sufficient soil</p> <p>22 between the base of the planned burial site and the</p> <p>23 groundwater to serve as infiltration adsorption medium</p> <p>24 before reaching the groundwater. And so when burial depths</p> <p>25 planned at 4 feet that's at least 6 feet of (indiscernible)</p>	<p>347</p> <p>1 DR. DAWSON: Well, so before we go to that exhibit,</p> <p>2 which is the next one, if we could go to the one with the</p> <p>3 groundwater contours which is G.</p> <p>4 So what I want to point out here again is just to</p> <p>5 remind us that groundwater is flowing generally eastward.</p> <p>6 And so the key factor in determining whether wells -- or a</p> <p>7 key factor in determining whether adjacent wells would be</p> <p>8 impacted is where they are relative to the direction of</p> <p>9 groundwater flow from the cemetery. So now, if we go to</p> <p>10 the --</p> <p>11 MR. SULLIVAN: Exhibit I which is two pages away on 53.</p> <p>12 Okay. And that looks -- actually it's a lot easier to see</p> <p>13 than I thought it would be. That's good. Okay. So what</p> <p>14 are we looking at here in Exhibit I, Dr. Dawson?</p> <p>15 DR. DAWSON: So this is the similar exhibit to what I</p> <p>16 showed earlier in Exhibit D. So it's the same yellow lines,</p> <p>17 same blue -- which is the watershed boundary, the same blue</p> <p>18 for tributaries and the red boundary of the site. And then,</p> <p>19 superimposed on that I have some additional information we</p> <p>20 obtained from online resources from Montgomery County. And</p> <p>21 the dots then, the blue dots represent the wells. There are</p> <p>22 about 30 of them within the watershed.</p> <p>23 MR. SULLIVAN: I'm sorry, can we scroll up just one</p> <p>24 notch here? I just want to see the scale -- what the scale</p> <p>25 showed. It's just -- there it is okay. Thank you.</p>
<p>346</p> <p>1 03:04:12) simply means the material that is above the water</p> <p>2 table. So there's 6 feet of silty sands, (inaudible) sands,</p> <p>3 sandy silt that are in between the base of the burial and</p> <p>4 the water table.</p> <p>5 MR. SULLIVAN: And down at the bottom of it, thank you.</p> <p>6 At the bottom of Exhibit H, there's a -- it says sources ECS</p> <p>7 2020, ECS 2021, you see that?</p> <p>8 DR. DAWSON: Yes, I do.</p> <p>9 MR. SULLIVAN: Do you recall the names of those, or</p> <p>10 just generally what each of those is?</p> <p>11 DR. DAWSON: So one of them is a report from the soil</p> <p>12 borings, and the other is a report on the test pits. In the</p> <p>13 one that summarizes the test pits includes the information</p> <p>14 that was provided by Mr. Reese, or Reese Consulting. And so</p> <p>15 these represent the data, the hydrogeologic data that were</p> <p>16 collected for Reflections Park in planning their site. And</p> <p>17 it's no accident that the planned burial areas are outside</p> <p>18 of the shallow -- potentially shallow groundwater areas that</p> <p>19 was the purpose for conducting these studies.</p> <p>20 MR. SULLIVAN: Thank you. We're talking about your</p> <p>21 conclusion that groundwater from the area of the proposed</p> <p>22 cemetery will not impact the water quality of private wells</p> <p>23 at adjacent properties, unquote. Where are the private</p> <p>24 wells at adjacent properties you describe in your</p> <p>25 conclusion?</p>	<p>348</p> <p>1 DR. DAWSON: So the scale there is 0 to 1500 feet. So</p> <p>2 it's kind of -- half of that would be about 750 feet. So</p> <p>3 the blue dots are wells, and the red dots are septic</p> <p>4 systems. And I'll come back and talk to that. And then,</p> <p>5 you can also see there's some sort of red shading that is</p> <p>6 superimposed on this map. And what that is, is a reflection</p> <p>7 of two different data sources from Montgomery County. The</p> <p>8 dots were available, actual geographic spatial, you know,</p> <p>9 digital information from Montgomery County of the actual</p> <p>10 location of the septic systems and the wells. But they only</p> <p>11 go through 1997.</p> <p>12 And then, the red area represents -- the red shading</p> <p>13 represents a more recent map from Montgomery County that</p> <p>14 simply plots an area in which wells and septic systems</p> <p>15 occur. And so I don't have the specific locations for those</p> <p>16 other wells, but I do have, for example, near the handle --</p> <p>17 it's hard to see, at least on the map for me but near the</p> <p>18 handle in the furthest Eastern -- sorry, western side there</p> <p>19 are three blue dots in a row. Yes. I believe one of them</p> <p>20 is the gentleman who -- I couldn't see his name on the --</p> <p>21 MR. SULLIVAN: Mr. Willingmyre?</p> <p>22 DR. DAWSON: Yeah. Mr. Willingmyre whose property was</p> <p>23 one of those three. I can't tell from this distance,</p> <p>24 looking at the map which it is. And you can see that that</p> <p>25 is about half of the scale, at least 750 feet away. And</p>

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<p>349</p> <p>1 also, this is why I went back to looking at the 2 potentiometric surface. Recall the groundwater is flowing 3 through the site from east -- sorry, from west to east and 4 so none of the groundwater underneath the site could ever 5 reach those private wells that are to the south. 6 And then, furthermore, I showed that the groundwater 7 discharges to the streams and so the shallow groundwater, 8 which is -- if there are any contaminants migrating from the 9 cemetery would be in the shallow groundwater that discharges 10 to the streams. And it would not intersect any of the wells 11 that are further downstream. 12 MR. SULLIVAN: So let's assume that -- I've been 13 alerted by someone that maybe Mr. Willingmyre's well might 14 be further to the east, kind of -- keep going east from 15 there. I think that's west. 16 HEARING EXAMINER ROBESON-HANNAN: Oh. Well, I thought 17 it was Lot 10. 18 MR. SULLIVAN: I'm sorry, Par's Ridge? Okay. So that 19 area there. Would you have any thoughts about that area 20 where the cursor is now? 21 HEARING EXAMINER ROBESON-HANNAN: Wait. I'm confused. 22 MR. SULLIVAN: I'm sorry. 23 HEARING EXAMINER ROBESON-HANNAN: What area specific 24 area -- 25 MR. SULLIVAN: Well, we're trying to figure out --</p>	<p>351</p> <p>1 draw their water from the fractured rock in the Piedmont, so 2 deeper. And Montgomery County generally requires that for 3 any new well that's drilled, it would be drilled to depth 4 and they require that a casing, a protective boundary around 5 the well be placed all the way through the shallow 6 groundwater zone so the weathered material that's above the 7 crystalline rock that serves as the bedrock. 8 And that is to preclude any potential infiltration from 9 either the nearby septic tanks because you can see the 10 septic tanks are very close to the wells, other private 11 septic tanks are very close to the wells. Closer than 12 anything else. That's the greatest danger to a private well 13 is nearby, adjacent septic systems. And that's part of the 14 reason why Montgomery County and every other County that I 15 investigated requires a casing through the shallow zone. So 16 most of them draw water from deeper. 17 However, there are some old wells, older wells prior to 18 the '70s, prior to the '80s, a number of those were drilled 19 and completed and draw water from the shallow groundwater. 20 And those are grandfathered in. So for those wells is 21 important to understand where they're drawing water from. 22 And the way that a hydrogeologist evaluate so that is by 23 evaluating what we call the capture zone. 24 And you can kind of get a sense of this when you 25 draw -- take a straw and put it in like a smoothie, it draws</p>
<p>350</p> <p>1 yeah, we thought that Mr. Par's -- I'm sorry, Mr. 2 Willingmyre's well was one of those three, but I've just 3 been handed a note that suggests that maybe it was on Par 4 Ridge. And so I was just trying to -- 5 HEARING EXAMINER ROBESON-HANNAN: His road is Par's 6 Ridge. 7 MR. SULLIVAN: Oh. 8 HEARING EXAMINER ROBESON-HANNAN: And I don't know 9 where Par's Ridge is. 10 MR. SULLIVAN: Well then, I think we'll leave that for 11 now and we'll move onto the analysis that will -- it still 12 reaches the same conclusion. We were trying, for the 13 benefit of Mr. Willingmyre point out his specific property 14 and we may or we may not have. So we'll just move on. 15 DR. DAWSON: Well, I'll just say then, those three 16 wells we were talking about are the closest. All the other 17 wells are further away. 18 MR. SULLIVAN: And so how deep is the groundwater that 19 these wells draw? 20 DR. DAWSON: Well, the other part, aside from looking 21 at the direction of groundwater flow to determine whether 22 there could be impacts to adjacent wells has to do with 23 where those adjacent wells draw water from. And so in 24 Montgomery County, and actually any part of the Piedmont, 25 most drinking water wells, private drinking water wells,</p>	<p>352</p> <p>1 down the surface right around your straw. It draws the 2 water around that, that would be the capture zone for your 3 straw. Same kind of idea for a well. The only thing is, is 4 at the same time groundwater is flowing. So the capture 5 zone for a well has a certain width and extends upgradient 6 towards the direction from which groundwater is flowing some 7 distance. And that distance depends on how quickly the well 8 is pumping. 9 These wells, most private wells, service a single home. 10 A single home uses about 177, in Montgomery County, the 11 average water use is 177 gallons per day. On average 12 there's two to three people at each residence. We can use 13 that information to calculate, and I have done that, in this 14 geologic setting to determine that the width of the capture 15 zone, the total width is 30 feet, or maximum. In some zones 16 it's less. And that means less than 15 feet on either side. 17 And the distance upstream it's drawing from 50 to 100 feet 18 or so. 19 MR. SULLIVAN: And you said that you used Montgomery 20 County data evaluate the average water use, correct, the 21 average pumping? 22 DR. DAWSON: Correct. 23 MR. SULLIVAN: And did you consider other materials in 24 your well capture calculations with respect to, for example, 25 we looked at those ECS reports that were attached, or you</p>

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<p>353</p> <p>1 mentioned those ECS reports that were attached to your 2 Exhibit H. 3 DR. DAWSON: That's correct. 4 MR. SULLIVAN: For water -- 5 DR. DAWSON: So the capture zone analysis is a standard 6 process. It's an EP a guidance document, how to evaluate -- 7 how to calculate capture zone for individual wells. And the 8 kind of information that goes into that, in addition to what 9 I've just described, is the same hydrogeologic information 10 that I described earlier, which is what's the depth to 11 groundwater, which tells you what's the depth, or the 12 thickness of the water zone. That's a parameter that goes 13 into it. 14 The soil type tells you what's the hydraulic 15 conductivity of the soil, which is a measure of how quickly 16 water can flow through soil. And those data are data that I 17 derived from the ECS reports. And it's a simple -- or maybe 18 not so simple, it's not just calculating velocity, but it's 19 an equation that is typically used to calculate capture 20 zones. 21 MR. SULLIVAN: And did you also consider that United 22 States department of agriculture soil information? 23 DR. DAWSON: Yes. So it -- as a double check. For 24 example, we have the site specific soil data that tells us 25 what kind of soils were there. We have the infiltration</p>	<p>355</p> <p>1 certain distance on either side. So you know, it's a 2 totally different setting, and I recognize but it's the 3 point that water is moving and you capture some of that. 4 And that -- the capture zone here is 15 feet on either 5 side. So for example, those three wells that we were 6 talking about adjacent. 7 MR. SULLIVAN: Maybe we couple pull up Exhibit Gagain, 8 it might help. That when G is at -- 9 DR. DAWSON: Sorry, I get excited talking about 10 hydrogeologies. 11 MR. SULLIVAN: 51 of (inaudible). And so I think maybe 12 you said -- yes, so maybe those are maybe the closest well, 13 drinking water wells, yeah. 14 DR. DAWSON: Yes. 15 HEARING EXAMINER ROBESON-HANNAN: These are wells south 16 of the property close to New Hampshire Avenue. 17 DR. DAWSON: Yes. 18 HEARING EXAMINER ROBESON-HANNAN: Three in close 19 proximity. 20 DR. DAWSON: Yes. 21 HEARING EXAMINER ROBESON-HANNAN: Okay. 22 MR. SULLIVAN: And so in looking at the scale, those, I 23 think you said are maybe it looks like 700 or so feet 24 potentially from the cemetery, is that correct? Or maybe? 25 DR. DAWSON: To my eye, it looks like about half of</p>
<p>354</p> <p>1 rates that tell us how quickly water can infiltrate through 2 the soil. The U.S. Department of Agriculture has mapped the 3 entire continent of the United States soil type for 4 agriculture purposes. 5 And they classify the soils -- they each -- they have 6 funny names that relate to the site but they further say 7 what kind of soil is it. Is it sandy loam? Is it a clay, 8 silt? And then they have published for those types of soils 9 infiltration rates and hydraulic conductivity. But we use 10 the site specific information and cross tie it, compared it 11 to the USDA information. And that's actually an exhibit we 12 have of the soil types present at the site. There's a 13 couple of types. And that was just to gain more confidence 14 in the hydrogeologic evaluation. 15 If you have two sources of data that give you the same 16 information you know, that adds to the overall -- to the 17 evaluation. 18 MR. SULLIVAN: And so I think I heard you say that the 19 well capture zones that you calculated based on these site 20 specific soil conditions and the water use would extend 21 about 15 feet out in any direction; is that correct? 22 DR. DAWSON: Not in any direction. Perpendicular to 23 groundwater flow. So it -- think about if you're standing 24 in a stream and it's kind of like the wake of a boat, right. 25 The water is coming towards you and you see a wake for a</p>	<p>356</p> <p>1 that scale which would be about 750 feet. 2 MR. SULLIVAN: Okay. 3 DR. DAWSON: From the southern edge of the boundary. 4 And so that distance is far, far greater than the width of 5 the capture zone. And the capture zone here would be 6 pointed to the west. So the capture zone is not, it's not 7 intersecting any water from the site. It's intersecting 8 groundwater that is coming across New Hampshire, or -- yes, 9 in that direction. Basically the Piedmont has a general 10 slope that rises towards the west. And the general regional 11 groundwater flow, especially in the basement, in the 12 crystalline basement is from west to east. 13 So those three wells are simply not intersecting in any 14 way, whether they are pumping water or not, groundwater that 15 flows underneath the property. 16 MR. SULLIVAN: And so if the shallow groundwater won't 17 intersect the capture zone of any drinking well, is it fair 18 to say that it cannot affect the water quality of those 19 private drinking wells; is that correct? 20 DR. DAWSON: That's correct. 21 MR. SULLIVAN: And if the deep groundwater for where we 22 have deep groundwater is going to have a casing that goes 20 23 feet or so to the bedrock, the deep groundwater is being 24 pulled from underneath bedrock; that bedrock would serve as 25 a barrier, would it not, of any contaminates above?</p>

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<p>357</p> <p>1 DR. DAWSON: Well, not necessarily. The bedrock is 2 recharged by surface water filtration. But it's hydraulic 3 conductivity is a different and the -- so groundwater 4 generally flows in the direction of least resistance. So 5 the least resistive material is the shallow soils that are 6 eroded from the bed rock and so the shallow groundwater is 7 flowing laterally towards the streams. 8 But the bedrock is fractured and those fractures also 9 have a general flow direction which USGS has verified. USGS 10 reports show the general direction is from west to east in 11 the Piedmont region. But they would not be drawing down 12 directly from there. It would be what ever is infiltrating 13 some greater distance upstream, or up gradient. 14 MR. SULLIVAN: And then it's your professional opinion 15 that drawing groundwater from deep groundwater wells will 16 not be affected by -- the water quality of the deep 17 groundwater wells will also not be affected by the proposed 18 cemetery, correct? 19 DR. DAWSON: That's correct because here in this 20 particular site I believe -- and I think the data 21 demonstrate, that the shallow groundwater discharges to the 22 tributaries. 23 MR. SULLIVAN: Thank you. Okay. Now, let's move to 24 the -- what I think, kind of the main event here is, you 25 know, what's going to happen -- what's the potential impact</p>	<p>359</p> <p>1 the source. 2 And those factors are some of the things we've talked 3 about. We have talked about just the rate at which 4 groundwater is infiltrating. That's infiltration, and 5 that's an important factor. That is the measure of the 6 fastest rate that a contaminant can travel. And the reason 7 for that is that groundwater is carrying the contaminant. 8 The contaminant can't move any faster than groundwater is 9 moving because it's carrying it. 10 There are things that slow it down, or decrease the 11 concentration. Those are factors that influence the 12 transport and the fate. So let's talk -- adsorption is one 13 we've already talked about. Adsorption is kind of like 14 driving down the street where there are parking garages. 15 You have a set number of cars driving down the street, and 16 some pull off into garages and they stay there for a while. 17 Maybe some of them stay there permanently if it happens to 18 be a junkyard. That's like adsorption. The actual solid 19 particles of the soilglom on, if you will, to the 20 contaminant as its migrating. And the chemical properties 21 of the contaminant are what dictate whether or not it it 22 adsorbs. 23 There are two factors in soil that lead to adsorption. 24 One is for organic chemicals is how much organic matter 25 there is in the soil. We call that fraction of organic</p>
<p>358</p> <p>1 to the reservoir. And you've reached the conclusion, I 2 believe, and just tell me if I'm wrong, again, that 3 groundwater from the area of the proposed cemetery will not 4 impact the water quality of the nearby streams or the Rocky 5 Gorge Reservoir; is that correct? 6 DR. DAWSON: That's correct. 7 MR. SULLIVAN: Okay. And can you please describe what 8 kind of investigation, or I believe there's modeling 9 mentioned in your report. Tell us have you -- just walk us 10 through how you arrived at these conclusions, if you can. 11 DR. DAWSON: Sure. So there are two components to it. 12 One is what we've discussed so far, which is what the data 13 shows. So the data show there will be infiltration at the 14 site, and that's a desired thing. It shows that 15 groundwater, shallow groundwater likely discharges to the 16 streams and whatever is in the streams flow zone down to the 17 Rocky Mount -- I keep calling it Rocky Mountains because I 18 come from the Rocky Mountains, the Rocky Gorge Reservoir. 19 The other part has to do with potential contaminant 20 fate and transport. So just to clarify, or maybe add a 21 little more meat to the definition of contaminant fate and 22 transport, we've talked about it some. It is the 23 understanding of the factors that influence the 24 concentration of the contaminant leaving a source and then, 25 the factors that influence transport as it moves away from</p>	<p>360</p> <p>1 (indiscernible 03:26:37), and all of this is described in 2 different parts of my report. And that acts more like a 3 sponge. It's still called adsorption because it's still a 4 chemical process but it really is the organic matter will 5 grab on, kind of like activated carbon when you put it in 6 your cat litter boxes. You put activated carbon at the top 7 in order to capture the odors, which are organic chemicals 8 that might move out of the box. Same idea, organic carbon, 9 activated carbon, is an organic matter and it adsorbs 10 organic material. 11 The other part are clays. Clays in the soil will 12 absorb metals. It will absorb some organic chemicals if 13 they have a molecular charge. So both of those are 14 important to consider, both of those slow the motion of the 15 contaminant through the soil. And then the other factor we 16 talked about his degradation. Some compounds are subject 17 to, as Mr. Pleyas explained, actual breakdown, actual 18 tearing apart of molecules, changing them into something 19 that is different, and/or, in some cases, precipitating that 20 chemical. So precipitation happens to metals, degradation 21 happens to organic matter. 22 So here at this site, to understand potential 23 contaminant transport I used a model, a typical model used 24 by EPA to actually develop the soil cleanup levels at site. 25 It's a model called CSoil that looks for a great many</p>

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<p>361</p> <p>1 factors that control contaminant transport and it's the 2 basis for EPA soil cleanup levels. If the basis for New 3 Jersey's -- many states have used this model. 4 And then, that particular model in the version I used 5 is attached to a ground model -- groundwater model that says 6 all right, let's use all the information we know about the 7 sites specific soil types, how fast water is infiltrating, 8 how fast water could flow those materials -- through those 9 materials both vertically and laterally and estimate what 10 would be the concentration that reaches the groundwater 11 immediately below the graves, and then estimate the 12 concentrations on down. Sorry for the technical -- 13 MR. SULLIVAN: No, you're fine. That's great. And I 14 just wanted to touch on, you had mentioned immediately -- 15 HEARING EXAMINER ROBESON-HANNAN: I didn't hear the 16 last phrase. You said it estimates the amount that reaches 17 the groundwater and reaches somewhere else? 18 DR. DAWSON: Oh. So in order to model what's going to 19 migrate in the groundwater, you first estimate what might 20 reach the groundwater table. 21 HEARING EXAMINER ROBESON-HANNAN: Right. 22 DR. DAWSON: Mixed with the groundwater, and then a 23 different model that is attached to this one so that it can 24 take what you predict through the soil, models what's the 25 change in concentration as it moves through groundwater, or</p>	<p>363</p> <p>1 That is by design. When you're fertilizing it is by design 2 when you spread manure for example, which is the colonic 3 effluent of animals. And there are numerous studies that 4 show directly beneath bodies for a distance in the soil you 5 will see elevated concentrations of the constituents of the 6 body. 7 And there are also documentation of much lower 8 concentrations, but you still see elevated increases in the 9 concentration of some of the constituents of the body in the 10 groundwater immediately below. What you don't see in most 11 of the studies, including the World Health Organization 12 summary, Dr. Dent's summary, you don't see much transport 13 laterally from -- in groundwater beyond the boundaries of 14 the cemetery. 15 MR. SULLIVAN: And I think we said that the range -- I 16 mean -- maybe I missed it. The range of the depth between 17 the grave and the water table here at the proposed burial 18 sites, do you recall that range? 19 DR. DAWSON: Here. So we looked at -- so based on the 20 standard configuration, what we expect with a burial depth 21 of 4 feet would be about 6 feet. You know, there might be 22 some slop in how deep they dig, but nevertheless, it's at 23 least 5 feet, 5-1/2 feet. We did do a sensitivity analysis 24 which is an important thing to do when you do modeling is, 25 well, let's test different parameters, and see how it</p>
<p>362</p> <p>1 with groundwater through the soil that is saturated. 2 HEARING EXAMINER ROBESON-HANNAN: Okay. Thank you. 3 MR. SULLIVAN: And so my question had to do with, you 4 had used the phrase immediately below the grave, and so my 5 question is I'd like to understand how the depths to the 6 grave, or maybe that doesn't matter, or matters, and then, 7 the distance between the grave and the water table plays 8 into this. 9 DR. DAWSON: Okay. So the depths to the top of the 10 body it matters more for it. You want to be deep enough 11 that it won't be dug up and material will be -- rise to the 12 surface. And also that you don't have any water that brings 13 it up. 14 MR. SULLIVAN: And I think we have talked about that 3, 15 to 5, to 4 feet is the minimum we would see, potentially? 16 DR. DAWSON: Yes. And that's typical at green 17 cemeteries. 18 MR. SULLIVAN: Okay. 19 DR. DAWSON: And then, between the body and the water 20 table that serves as a filtration medium. There is no 21 question that directly beneath bodies that are decomposing, 22 or for that matter anything, your compost, any organic 23 matter that you put into the subsurface or on the top of the 24 soil, directly beneath that you are going to see an increase 25 in concentration of the constituents of that organic matter.</p>	<p>364</p> <p>1 influences our predictions. 2 And then, the other part of this that I don't think I 3 mentioned when I started the modeling is when you are doing 4 modeling, at EPA for example, I required people to give me a 5 conservative, if you will, sort of reasonable worst-case 6 scenario. And that is what I did in this modeling. So it's 7 at a minimum of, let's say, the 6 feet to more than 16 feet 8 because there are areas of the site for the depth of the 9 groundwater is greater than 20 feet. 10 MR. SULLIVAN: And I think you mentioned Dent in the 11 world health organization report. And so how do those 12 parameters fit in at all with the analysis of suitability 13 for cemetery? 14 DR. DAWSON: So the World Health Organization indicates 15 that that soils with intermediate properties, which is what 16 we have at the site, are ideal settings for a cemetery if 17 you're going to place a cemetery. And then, Dent actually 18 lists more factors. He says that the minimum of 3 feet 19 between the depth of the burial and the water table, and he 20 also list the same soil types, also gentle slopes to 21 maximize infiltration and so on. And all of those factors 22 are present at this site. 23 MR. SULLIVAN: So it's fair to say that the site soil 24 conditions are considered favorable for a cemetery in your 25 professional opinion?</p>

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<p>365</p> <p>1 DR. DAWSON: They considered suitable.</p> <p>2 MR. SULLIVAN: Suitable. Okay. Thank you. Suitable.</p> <p>3 DR. DAWSON: Suitable for a cemetery.</p> <p>4 MR. SULLIVAN: Great. Thank you. Okay so now I would</p> <p>5 like to talk a little bit about your contaminant transport</p> <p>6 modeling that you undertook. And so let's just start at the</p> <p>7 beginning.</p> <p>8 DR. DAWSON: Okay.</p> <p>9 MR. SULLIVAN: What's a model?</p> <p>10 DR. DAWSON: What's a model?</p> <p>11 MR. SULLIVAN: What's a model?</p> <p>12 DR. DAWSON: All right. Models sound like being, you</p> <p>13 know, people don't like, but I have an example of a model we</p> <p>14 all, most of us anyway who drive rely on almost every day.</p> <p>15 When we ask the map, or we ask for directions to a site, a</p> <p>16 location, we get Google maps or Apple maps gives us a</p> <p>17 distance and an estimated time of arrival. That's a model.</p> <p>18 That's based on a model. It's based on a model that</p> <p>19 says I expect -- it's a simple algebraic equation. It's</p> <p>20 basically taking the distance divided by the speed you might</p> <p>21 be going, just you're not going a constant speed, you're</p> <p>22 going a speed varies depending on the route. It depends on</p> <p>23 some statistical about how long on average you have to wait</p> <p>24 at the number of stop lights you have to go through. It</p> <p>25 depends on a number of other factors.</p>	<p>367</p> <p>1 because EPA can't actually spend anybody's money, or their</p> <p>2 own money until they demonstrate a risk, which means</p> <p>3 comparing concentrations to risk-based concentrations.</p> <p>4 Will the concentrations that you predict exceed a level</p> <p>5 that has been deemed a safe level?</p> <p>6 MR. SULLIVAN: And so in risk assessment that you have</p> <p>7 done, that you did in your roles at EPA, did you use -- I</p> <p>8 mean, how often would you use models to -- as part of that</p> <p>9 risk assessment?</p> <p>10 DR. DAWSON: Well, it's very common to use a model,</p> <p>11 especially in groundwater where groundwater flows a few feet</p> <p>12 if it's fast, every day. Sometimes it's a lot less. So in</p> <p>13 order to understand what might happen 10, 15 years from</p> <p>14 now -- and you need to do -- run a model. And then, often</p> <p>15 when you clean up a site, you want to know well, if I reduce</p> <p>16 the concentration, or the source by this amount, how long is</p> <p>17 it going to take for me to see an effect down gradient?</p> <p>18 It's a very common process. There's whole guidance books</p> <p>19 that EPA has published on how to conduct modeling for</p> <p>20 contaminant fate and transport purposes.</p> <p>21 MR. SULLIVAN: Thank you. And so I believe you had</p> <p>22 said that the -- we were discussing soil conditions and the</p> <p>23 site-specific information, the sub surface information other</p> <p>24 information, that you would put that kind of information</p> <p>25 into the model as inputs, correct?</p>
<p>366</p> <p>1 I don't know how many of you started using it years</p> <p>2 ago, but years ago the estimated time of arrival weren't all</p> <p>3 that great. Now, I find they come within a minute. I also</p> <p>4 find they come in within a minute longer then you get there.</p> <p>5 And that's because they are doing the same kind of thing I</p> <p>6 talked about, is sort of in the worst case given -- suppose</p> <p>7 you had to stop at every red light and wait the entire time,</p> <p>8 that's the factored into that model.</p> <p>9 So we use models of that sort every time we get -- you</p> <p>10 know, as for an ETA for an airplane or for a car, we use it.</p> <p>11 We are relying on models when we asked for the weather</p> <p>12 forecast. That's a measure of how fast our fronts, storm</p> <p>13 front is moving through air. Groundwater modeling is no</p> <p>14 different. We are -- we base -- we have an algebraic --</p> <p>15 well, a little more complicated than algebraic, it's a</p> <p>16 partial differential equation that measures -- that reflects</p> <p>17 what we have seen by many measurements over decades.</p> <p>18 And that those models are used because we don't want to</p> <p>19 just wait, as people have said, until contamination has</p> <p>20 occurred. We require modeling at EPA because we know where</p> <p>21 if we were working on a Superfund site. This is not a</p> <p>22 Superfund site, there is nothing present. But even where we</p> <p>23 know where there is a contamination we model to understand</p> <p>24 what's the potential risk over time as the contaminants</p> <p>25 continue migrating? What's the concentration those might be</p>	<p>368</p> <p>1 DR. DAWSON: Yes.</p> <p>2 MR. SULLIVAN: And then, there were some chemicals that</p> <p>3 you modeled and we'll get to those in a moment. So tell me</p> <p>4 your general approach to how you addressed the chemical</p> <p>5 properties of potential contaminants, and then will get into</p> <p>6 the specific contaminants themselves, with respect to -- I</p> <p>7 think you had mentioned, or Dr. Pleyas mentioned the word</p> <p>8 conservative before. So I'm just curious if you could</p> <p>9 comment on that?</p> <p>10 DR. DAWSON: Sure. To model any chemical you have to</p> <p>11 provide the model. What's the source concentration? That's</p> <p>12 number one. And so you can put in what you think is an</p> <p>13 average source concentration, or an upper end the</p> <p>14 concentration. And in this case conservative would mean you</p> <p>15 would put in the higher number. Then, there's the timeframe</p> <p>16 over which the source -- a source is a source.</p> <p>17 If you have a fixed mass within the timeframe -- if you</p> <p>18 have a long time frame, that's called loading, the</p> <p>19 concentration if you spread the mass over a longer time is</p> <p>20 lower, which is not as conservative as the saying I'm going</p> <p>21 to release the mass that I know is represented, say by a</p> <p>22 body, in a short timeframe. And then, all of the other</p> <p>23 factors, like the rate of groundwater flow, it's most</p> <p>24 conservative to use the higher rate, which is what we did.</p> <p>25 The properties that control it fate, like we talked</p>

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<p>369</p> <p>1 about adsorption, degradation, precipitation which doesn't 2 apply for any of the chemicals here, there are parameters 3 that we used to represent the amount of adsorption. We 4 would use the lower end of that because the less adsorption 5 the faster it goes. That would be conservative. And with 6 degradation we would use the lower end of the degradation 7 range that is published for a chemical or none. And so none 8 is what we used here for two of the contaminants -- three of 9 the contaminants that I considered. For one of them we did 10 use adsorption.</p> <p>11 MR. SULLIVAN: Right. And we've heard -- we heard this 12 morning from Dr. Pleyas that there will be some about of 13 degradation.</p> <p>14 DR. DAWSON: Yes.</p> <p>15 MR. SULLIVAN: For any of these chemicals.</p> <p>16 DR. DAWSON: Yes.</p> <p>17 MR. SULLIVAN: But you, for a couple of these and we'll 18 talk about those, you've assumed zero degradation?</p> <p>19 DR. DAWSON: Yes.</p> <p>20 MR. SULLIVAN: Thank you. Okay. So now, I want to run 21 through with you, or I'd like to ask you to run through 22 which contaminants you modeled and why you choose each, and 23 let's start -- what's the first one you choose?</p> <p>24 DR. DAWSON: So the first one was nitrate. And the 25 reason for that, nitrate is nitrogen and oxygen in a</p>	<p>371</p> <p>1 But first, I would like to talk to you -- would like you to 2 talk about how you characterized the source when you're 3 making -- undertaking your modeling exercise.</p> <p>4 DR. DAWSON: Okay. So as I said a little earlier, we 5 need to consider the conservative approach to all parts and 6 dealing with the conservative evaluation of the sources is 7 part of that. So for the model, not only did we take the 8 higher, you know, have the contaminants release happen over 9 the shortest time that made sense, that was reasonable, we 10 took into account all of the burials.</p> <p>11 So we -- you can model just what happens with one body, 12 and then we took into account all of the bodies that would 13 be buried over time, sequentially, phase 1, phase 2, phase 3 14 and so the model results that I present take into account 15 that every one of those planned burial sites is filled with 16 a body over the time frames that were planned. I just 17 wanted to make sure that that was clear.</p> <p>18 HEARING EXAMINER ROBESON-HANNAN: That's helpful.</p> <p>19 MR. SULLIVAN: Thank you. Thank you. And so now, I'll 20 ask you about -- so which contaminants did you model and why 21 did you choose each?</p> <p>22 DR. DAWSON: Okay. So --</p> <p>23 MR. SULLIVAN: And I believe we talked a little bit 24 about nitrate already.</p> <p>25 DR. DAWSON: Right. Oh, nitrate is the one that -- one</p>
<p>370</p> <p>1 molecule, NO3. The reason for choosing nitrate is that 2 bodies are composed of a considerable amount of nitrogen. 3 It occurs in our muscles, in our bones, particularly 4 muscles, bones and connective tissue, less so in fat. 5 And it is a compound -- it's an element that when 6 released converts rapidly to nitrate and ammonia. Actually 7 initially is (inaudible - technical problems).</p> <p>8 HEARING EXAMINER ROBESON-HANNAN: I'm glad to help.</p> <p>9 MR. SULLIVAN: Let me know when we're ready to get 10 going.</p> <p>11 HEARING EXAMINER ROBESON-HANNAN: Go ahead.</p> <p>12 MR. SULLIVAN: Okay. Thank you.</p> <p>13 HEARING EXAMINER ROBESON-HANNAN: And thank you, Mr. 14 Chamberlin for your help.</p> <p>15 Okay. Go ahead.</p> <p>16 MR. SULLIVAN: Okay. Thank you for just getting the 17 camera readjusted. So I had asked you before we broke and 18 I'll get back to this, which contaminants you modeled and 19 why. But before we do that --</p> <p>20 HEARING EXAMINER ROBESON-HANNAN: Wait. I think Mr. 21 Putman is not muted. Thank you. I can see him facially 22 apologizing. Okay. Go ahead, Mr. Sullivan.</p> <p>23 MR. SULLIVAN: So we've talked -- thank you. We've 24 talked about the characterization of the soil and some other 25 things. And we will get to the contaminants you modeled.</p>	<p>372</p> <p>1 of the ones that we modeled. And the reason for choosing 2 nitrate is, as I mentioned, it's -- nitrogen is a component 3 of the body. It's a significant component. Nitrate is one 4 of the products of ammonia, so when the nitrogen in our 5 body, which is present in different parts. So like 43 6 percent is in skeletal muscle, 17 percent is in the -- other 7 parts. Bone, a little bit less is present in cartilage, and 8 so on down, and the amount that's in fat is like 7 percent 9 of the mass of a model person.</p> <p>10 And so as the body decomposes you first get ammonia. 11 Some ammonia can off gas. We can smell it, that's why we 12 smell cat urine and so on, it's ammonia that we're smelling. 13 And some of that can off gas. We estimated very little of 14 that was off gassed. The majority becomes a nitrate. And 15 nitrate is the source that is most typically -- or the 16 compound that's most typically used to understand 17 contaminate transport from organic matter. And the reason 18 for that is that it acts much as a tracer.</p> <p>19 If you are in an oxygenated environment which soil 20 that's not in groundwater is oxygenated because there's 21 porous bases that oxygen can get into, you get nitrate. And 22 it moves -- it's a small molecule, it moves pretty much at 23 the same rate as groundwater. It is subject to what's 24 called denitrification if you get into an anaerobic 25 environment.</p>

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<p>373</p> <p>1 So if it passes through a lot of organic matter, are 2 often at the discharge area, like where there's lots of tree 3 roots where groundwater has been moving for some time, the 4 subsurface has a lower oxygen. But it is a significant 5 component, and a contaminant from septic systems which are 6 basically the waste products of our bodies. If a component 7 of our bodies when we're buried. So that is a key tracer, 8 if you will, of contamination from organic matter, including 9 bodies, as well as other -- fertilizer for example, any 10 fertilizer that's organic based will have nitrogen in it. 11 And that is one of them -- I can talk about -- so we 12 assume no degradation occurring other than where it 13 discharges to the stream, and the reason for including it in 14 the discharge area of the stream is based on a reference of 15 the USGS, which I included in my report, that shows that in 16 the Piedmont area which included -- the study included 17 Montgomery County as water discharges, the nitrate 18 concentration was decreased by denitrification, largely 19 because it passes through tree roots and so on. That's part 20 of the importance for the vegetation being maintained in 21 riparian areas. 22 MR. SULLIVAN: And so other contaminants modeled, one 23 had to do with fillings, I believe? 24 DR. DAWSON: Yes. So the idea is to look at a body -- 25 so and lots of -- for conventional cemeteries there are the</p>	<p>375</p> <p>1 that's what we used in our modeling. For mercury, it can 2 take a really long time, but to be conservative, we just 3 said the body dies, all of the mercury is released. That is 4 absolutely the most conservative, and that's what we used as 5 an input in our model. 6 And one of the techniques with modeling is to use 7 absolutely the most conservative, even if it's kind of 8 unreasonable. It's like over the top conservative, for 9 example for mercury. And if you see no concerns with that 10 you don't need to refine the model. If you do, then you 11 would look at well, that really wasn't a reasonable input so 12 let's look at how long it actually takes. 13 So for everything else we've model the as like the body 14 arrived, put in the grave, and it was released. 15 MR. SULLIVAN: And that includes all the heavy metal 16 that you -- 17 DR. DAWSON: All the heavy metals and the tracer also, 18 which we can talk about. 19 MR. SULLIVAN: Yeah. Thank you. And let's talk about 20 the tracer because this is -- the hearing examiner yesterday 21 had said that she wanted to understand how the -- how 22 pharmaceuticals would be traveling through and she didn't 23 see that in the report. So maybe you can talk to us about 24 your tracer. 25 DR. DAWSON: Yeah. I can. I guess to make it clear</p>
<p>374</p> <p>1 caskets. You have to consider formaldehyde, you have to 2 consider the caskets are made of metal, the metals that 3 leach from caskets are chromium and nickel, metals that are 4 more toxic than the metals that actually accumulate in our 5 bodies. 6 But our bodies do have some zinc, some cadmium, lead, 7 and some chromium. Many people take chromium supplements. 8 It's part of a daily vitamin. Lead, we can ingest in our 9 water. I think we also take as a supplement, and we get in 10 our food and cadmium is a metal that moves very similarly to 11 zinc. So we considered those metals. 12 But a metal that is typical and characteristic of a 13 body is mercury because it's the one metal really that is 14 unique to corpses that is not present in septic systems, for 15 example. At least private septic systems. And that's a 16 mercury that leaches from the fillings in our teeth. Almost 17 everybody that I know has mercury fillings. When the body 18 decomposes mercury is released. And so we chose mercury. 19 MR. SULLIVAN: And is a mercury released all at once? 20 DR. DAWSON: One no. Anybody that the decomposing 21 anything that leach from it will have it over a period of 22 time. So for nitrate what we did was assume -- I mean it 23 can reach for 20 years as Dr. Abia said. But most of that 24 happens when the soft tissue decomposes and that happens 25 within the first couple of years of decomposition. And so</p>	<p>376</p> <p>1 why the tracer is different let me just say, so we use 2 conservative inputs for the nitrates, the metals, and the 3 mercury, but each of those that did have, for example, some 4 degradation in the discharge for nitrate it was released 5 over a period -- most of it was released in the first two 6 years, and the rest over six years, rather than 20 years. 7 The metals were subject to adsorption because it -- metals 8 adsorb to clays and we know that there are clays in the 9 soil, so it would be unreasonable to not include that. 10 For the cytotoxic chemicals, there aren't much 11 published research about what are the kinds of parameters we 12 put into a model that says exactly how much, or how likely 13 it is to adsorb. There are a variety of chemicals. Some of 14 them which degrade and they degrade at different rates. 15 Some of them might adsorb to organic matter, different 16 rates. And so to address all of -- the whole set of 17 chemicals, what I choose to do was say let's just say 18 whatever's in the body from whatever source and whatever 19 chemical is released. Whatever concentration is present at 20 the time of death. 21 And then, assume no degradation, no adsorption, so 22 basically I am using -- I'm modeling it as a tracer. It's 23 like I put food coloring in the water and I'm going to 24 measure what's the concentration or you know, how strong is 25 that color some distance down? And that's the most</p>

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<p>377</p> <p>1 conservative.</p> <p>2 MR. SULLIVAN: Right. So -- and because I guess it's</p> <p>3 probably an obvious point, but people die from reasons other</p> <p>4 than cancer, correct?</p> <p>5 DR. DAWSON: Sure.</p> <p>6 MR. SULLIVAN: And people die without -- some amount of</p> <p>7 people die without chemotherapy drugs in their system?</p> <p>8 DR. DAWSON: I assume so, but I'm not an expert in, you</p> <p>9 know --</p> <p>10 MR. SULLIVAN: Right.</p> <p>11 DR. DAWSON: -- what people die of.</p> <p>12 MR. SULLIVAN: Sure. And -- but the assumption here is</p> <p>13 that everybody that's been buried --</p> <p>14 DR. DAWSON: Oh.</p> <p>15 MR. SULLIVAN: -- has this -- has what's being modeled</p> <p>16 in it?</p> <p>17 DR. DAWSON: Correct. So that -- thank you. So not</p> <p>18 only did we model it as though it's groundwater, we assumed</p> <p>19 every single body buried over the entire timeframe in every</p> <p>20 phase had the same concentration, you know, a concentration</p> <p>21 that -- of the chemical, every single body. Which is really</p> <p>22 very conservative.</p> <p>23 MR. SULLIVAN: And we also know from -- we heard this</p> <p>24 morning from Dr. Pleyas that there would be some kind of</p> <p>25 degradation or filtration happening. But this model assumes</p>	<p>379</p> <p>1 MR. SULLIVAN: Okay. And are these the results of that</p> <p>2 helped to lead you to that conclusion?</p> <p>3 DR. DAWSON: Yes.</p> <p>4 MR. SULLIVAN: Okay. So can you explain what were seen</p> <p>5 on the screen here, on that chart as soon as it comes back.</p> <p>6 DR. DAWSON: Yes. If you could enlarge it just a</p> <p>7 little bit so that the table -- great. Thank you.</p> <p>8 So what I'm showing here are three of the four, the</p> <p>9 nitrate, mercury, and tracer. As I said earlier, we modeled</p> <p>10 the zinc, and cadmium, and lead, and chromium. Those all</p> <p>11 had results that were -- essentially, nothing got to</p> <p>12 groundwater through 4 feet of soil. And so I didn't include</p> <p>13 it here because it would be just blanks beyond the maximum</p> <p>14 concentration. All of these, there was just a concentration</p> <p>15 in the groundwater directly under the body whereas this</p> <p>16 table is presenting the maximum concentration the model</p> <p>17 predicts in groundwater that discharges to those two streams</p> <p>18 adjacent to the property.</p> <p>19 And then, the maximum concentration and surface water</p> <p>20 discharge to Rocky Gorge. And this table also includes the</p> <p>21 drinking water standards for nitrate and mercury. So the</p> <p>22 maximum concentration using the very conservative, you know,</p> <p>23 a high source concentration short timeframe which increases</p> <p>24 the loading, no degradation other than at the very end,</p> <p>25 minimal volatilization, the maximum concentration in</p>
<p>378</p> <p>1 that there's none, correct?</p> <p>2 DR. DAWSON: The model inputs that I used were -- did</p> <p>3 not apply any of those.</p> <p>4 MR. SULLIVAN: Yes, correct. Thank you. You stated it</p> <p>5 better than I did. And so what did the results of the model</p> <p>6 show? Or maybe we should actually -- let's pull up --</p> <p>7 there's a chart in your report that shows those results,</p> <p>8 correct?</p> <p>9 DR. DAWSON: Yes. The table on page 12.</p> <p>10 MR. SULLIVAN: It's on page 12 which would be at page</p> <p>11 21 of 141 of Dr. Dawson's report.</p> <p>12 And I will ask you a question before you start.</p> <p>13 DR. DAWSON: Okay.</p> <p>14 HEARING EXAMINER ROBESON-HANNAN: It should be coming</p> <p>15 up. Oh yeah.</p> <p>16 MR. SULLIVAN: Perfect.</p> <p>17 HEARING EXAMINER ROBESON-HANNAN: Is this what you're</p> <p>18 looking for? Okay.</p> <p>19 MR. SULLIVAN: This is exactly it. Thank you very</p> <p>20 much. So you have testified that you have concluded that</p> <p>21 there will be no impact to public health from -- no risk</p> <p>22 to -- or impact to the water quality or any risk to public</p> <p>23 health from migration of contaminants through groundwater to</p> <p>24 the reservoir, correct?</p> <p>25 DR. DAWSON: Correct.</p>	<p>380</p> <p>1 groundwater that we would predict in the groundwater</p> <p>2 immediately adjacent to the tributaries.</p> <p>3 So right before it discharges is 38 micrograms per</p> <p>4 liter as sort of a worst-case. And that is the value that</p> <p>5 is lower than the drinking water standard even before it</p> <p>6 discharges to the stream. The stream itself has water in it</p> <p>7 already. So the flow of groundwater that we calculate that</p> <p>8 is discharged to the stream is about .08 cubic feet per</p> <p>9 second. The stream is flowing at 2 cubic feet per second,</p> <p>10 so that is an immediate dilution into -- if it does</p> <p>11 discharge into the stream, which I believe it does, it's</p> <p>12 immediate dilution to a level of 1.5 kg per liter. And that</p> <p>13 is well below the nitrate standard. That is actually within</p> <p>14 the background levels for nitrate.</p> <p>15 So there are natural sources for nitrate, when fungi</p> <p>16 decompose organic matter it releases nitrate from --</p> <p>17 (indiscernible 04:00:35). It releases nitrate when any</p> <p>18 organic matter -- natural organic matter is decomposing it</p> <p>19 releases nitrate. Typical background concentrations of</p> <p>20 nitrate in stream waters are somewhere between 1 and 3 mg</p> <p>21 per liter. Generally, if it's above 3 then we think there's</p> <p>22 a nancophogenic (ph) source.</p> <p>23 So by the time any -- in this worst-case scenario of</p> <p>24 nitrate released from dead bodies results in nothing above</p> <p>25 background by the time it reaches the Rocky Gorge. And</p>

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<p>381</p> <p>1 then, it would be further diluted by the amount of water in 2 Rocky Gorge and the influx of water from other, you know, 3 from the Patuxent River upstream. 4 MR. SULLIVAN: And do you recall the volume of Rocky 5 Gorge Reservoir? 6 DR. DAWSON: 5.5 billion. 7 MR. SULLIVAN: Billion with a B? 8 DR. DAWSON: Yes. 9 MR. SULLIVAN: Okay. Okay. Thank you. Gallons? 10 DR. DAWSON: Gallons of water. And the rate of flow 11 into Rocky Gorge is about 100 times greater than the -- 50 12 to 100 times greater than the rate of flow of the Ednor 13 tributaries into Rocky Gorge. So all of those leading to 14 dilution at levels below background. 15 And then, for mercury same thing, the drinking water 16 standard is lower. It's .002 mg per liter with a very 17 conservative estimate inputs to the model we estimated 18 absolute maximum is actually, it looks like a typo, .0013. 19 It must be when I wrote the result down from my model. My 20 threes looked like 5s, or 5s look like 3s, so .0015 should 21 be .0013. 22 MR. SULLIVAN: And is that -- oh go ahead. 23 DR. DAWSON: Anyway, that's less than the drinking 24 water standard by the time it reaches Rocky Mountain [sic] 25 Gorge it is well below background levels of mercury in soil.</p>	<p>383</p> <p>1 actually have that molecule in it. it's just maybe has been 2 next to it at some point. 3 MR. SULLIVAN: And these calculations are about -- 4 well, in the third column there it has to do with those 5 calculations are when something gets to the reservoir but or 6 into the reservoir, does not take into account any treatment 7 from WSSC before anybody would drink it -- drink the water 8 out of the reservoir; is that correct? 9 DR. DAWSON: That's correct. That's just what it might 10 be in the worst case upon release to the Rocky Gorge and the 11 length of time it would take to travel from the cemetery to 12 the tributary. 13 MR. SULLIVAN: Okay. Thank you. So as you sit here 14 today is it still your professional opinion that the 15 contaminate released from burial sites at the proposed 16 cemetery will not pose a health and safety risk to any 17 adjacent properties, nearby streams or the Rocky Gorge 18 Reservoir, correct? 19 DR. DAWSON: Yes, that's my opinion. 20 MR. SULLIVAN: Thank you. I'd like to talk now, a bit 21 about your -- the -- actually before I -- no, that's fine. 22 I'd like to talk a bit about the second opinion that 23 you rendered in your initial report. And I believe that 24 opinion, and you'll correct me if I'm wrong, states that any 25 health and safety risks potentially associated with the</p>
<p>382</p> <p>1 Mercury is a compound that's present in rocks and background 2 levels are greater than that level. 3 So then, for the tracer, I don't have a drinking water 4 standard to compare against. And we don't really know the 5 concentrations that would be present in the necro-leachate. 6 We can estimate, you know, if we -- but it wouldn't be me 7 doing this. I would need somebody else to advise what might 8 be the concentrations in blood or in serum and then, how 9 that would be diluted by all the 40 to 60 liters of water 10 that is present in a body that forms some of the necro- 11 leachate. 12 But what I can say, is that whatever is present in the 13 blood would be reduced by a factor of at least 500 at the 14 discharge point into the Rocky Gorge Reservoir. And then, 15 by thousands more in Rocky Gorge, if any tracers made it 16 through. Now that, recall, I'm not accounting for 17 adsorption. I'm not accounting for filtration. I'm not 18 accounting for any degradation. So these -- the dilution 19 that we would see or -- not the dilution the overall 20 concentration decrease would be almost homeopathic in the 21 reservoir, and in the discharge to the reservoir. 22 MR. SULLIVAN: And what do you mean by homeopathic? 23 DR. DAWSON: So homeopathic means that somewhere in 24 there there might be a molecule or two, but the changes that 25 the actual little bit that you sample or take doesn't</p>	<p>384</p> <p>1 proposed Reflection Park Cemetery are no greater and are 2 likely to be less than the health and safety risks 3 associated with contamination from nearby private septic 4 systems; is that correct? 5 DR. DAWSON: Yes, that's correct. 6 MR. SULLIVAN: Okay. Thank you. So can you tell us 7 how you reached that conclusion? 8 DR. DAWSON: Yes, I can, though I'd like, if I may, 9 address Madam Hearing Examiner's question about -- that I 10 thought I heard which was shy are we even thinking about or 11 considering septic systems. 12 And the reason for that is that the contaminants that 13 are associated with dead bodies as well as with septic 14 systems, are very similar, and the source of the 15 contaminants of concern have the same source. Essentially, 16 organic matter, bacteria, viruses, any constituents that we 17 have absorbed and are eliminated are present in the largest 18 concentration -- the contaminants of concern anyway, in our 19 colons. And colons are what are voided into septic systems. 20 So that's the reason for considering it. It gives us a 21 whole other body of literature that has investigated and 22 there's a lot of literature on it; the contamination from 23 septic systems for the same contaminants that we are 24 concerned about with the dead bodies. So that's the reason 25 why it's important to look at both.</p>

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<p>385</p> <p>1 And then, the other reason is that many of the studies 2 of cemetery contamination -- or contamination associated 3 with cemeteries that did show what they thought was some 4 migration some distance from a cemetery, which typically in 5 the studies that the World Health Organization summarized, 6 Dr. Dent, as well as there are some studies in South Africa 7 and in Portugal where the genealogy was very different than 8 at this site. It was more karst, which means kind of open 9 tunnels in the limestone, or very coarse gravel.</p> <p>10 Even at those they would have, at the end in their 11 conclusion, we think it happened, but we really couldn't 12 tell whether it was due to the nearby septic systems or the 13 cemetery. And so it's important then to compare considering 14 that here at this -- in this watershed there are 157 septic 15 systems.</p> <p>16 MR. SULLIVAN: And let's maybe pull up Exhibit G again 17 if we can. That would help, if that's -- again 51 of 141 of 18 Exhibit 97.</p> <p>19 HEARING EXAMINER ROBESON-HANNAN: That should be -- 20 okay.</p> <p>21 MR. SULLIVAN: Was it G? Oh maybe it's -- oh, I'm 22 sorry, it's I, I believe. Yes, it's Exhibit I, my 23 apologies. There it is.</p> <p>24 DR. DAWSON: So exhibit I, as I talked about before, 25 shows the location of both wells and septic systems, and the</p>	<p>387</p> <p>1 So it's important to look at what the relevant 2 contribution of the existing permitted, allowed septic 3 systems compared to the cemetery which has the same 4 contaminants as could be released from a septic system.</p> <p>5 MR. SULLIVAN: And I'm not sure, maybe you already said 6 this I missed it, but did you calculate how many septic 7 systems there are in the watershed?</p> <p>8 DR. DAWSON: 157.</p> <p>9 MR. SULLIVAN: 157. Okay. I got it. Thank you. 10 Okay. And that was based on Montgomery County's data, 11 correct?</p> <p>12 DR. DAWSON: Yes.</p> <p>13 MR. SULLIVAN: Okay. Thank you.</p> <p>14 DR. DAWSON: Yes. On their data prior to 1998.</p> <p>15 MR. SULLIVAN: Right.</p> <p>16 DR. DAWSON: And some of those are quite old. So you 17 can look at it in a lot of different ways. We can look at 18 the nitrate concentrations say just of properly operating 19 septic systems. And the USGS has published studies of 20 nitrate contamination from operating septic systems, and an 21 estimate that they have provided, and it's a citation in my 22 report, is that the concentration reaching groundwater would 23 be 25 mg per liter in some examples. And the USGS has 24 studied a lot.</p> <p>25 So you can just simply take 25 mg per liter, and I have</p>
<p>386</p> <p>1 septic systems are the red dots. So there's 157 that occur 2 of the red dots. As I said, we couldn't count the ones that 3 were in the shaded red areas because we didn't know their 4 exact location and how many there were. But there's 157 5 septic systems.</p> <p>6 The other thing I'll note is that every County, every 7 state that I have ever looked at has a water resources 8 evaluation study done at some point. And in every single 9 one of those they have listed septic systems, private septic 10 systems as significant sources of groundwater contamination.</p> <p>11 And that is both -- especially in terms of nitrates, even 12 properly functioning septic systems release nitrates into 13 the environment. And they are designed to release the 14 liquid. The nitrate is in the liquid, and the idea is that 15 you should ensure that you have at least some vadose zone, 16 just like for graves that can help address and degrade or 17 filter, or dilute the nitrates so that it doesn't pose a 18 problem for downgradient wells.</p> <p>19 However, especially for older systems in Montgomery 20 County and the document I reference, a 2018 document and on 21 PDF pages 65 to 68, I recall, provide many reasons why this 22 could be failures, or greater releases than standard. And 23 he estimates that I have seen range from 15 to 30 percent 24 failure rate for septic -- private septic systems in most 25 counties where there are private septic systems.</p>	<p>388</p> <p>1 this calculation in my report, times -- that's the 2 concentration in the leachate coming out and the whole 3 septic feeds into it. Times the amount of water that is 4 released through a septic system, and that the based on how 5 much the residents consume. On average in Montgomery 6 County, it's 177 gallons per day. Most of that is flushed 7 down the toilet, showers, all of that goes into the septic 8 system. Some doesn't though so if you water your plants 9 maybe. So the estimate I used was 90 percent, something 10 less than 100 percent. And then, you just do some 11 conversion factors. And I've come up with a mass, I believe 12 it was 860 kg of nitrate that would be contributed to the 13 watershed by just nitrate released from properly operating 14 septic systems.</p> <p>15 And then, if I compare that, if I just take the nitrate 16 loading from the number of bodies that would be buried say 17 per year, it 10 times less from the cemetery.</p> <p>18 And then we can --</p> <p>19 HEARING EXAMINER ROBESON-HANNAN: (Inaudible) the legal 20 standard governing this case, which is not -- there's a case 21 law, Oak Hill v. Preston, and then we have a separate 22 standard where you don't compare a conditional use with a 23 permitted use. And that's, you know, I'll let the lawyers 24 argue about that. But we have Montgomery County v. Butler 25 and our County zoning ordinance. So that is where I was</p>

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<p>389</p> <p>1 coming from and it sounds to me like your recommendation 2 would be to what? Ban septic systems or regulate them more 3 heavily or make people upgrade? 4 DR. DAWSON: No. The point is to look at comparing the 5 sources from both. The same processes that I have described 6 that reduce the concentrations of contaminants coming from 7 the cemetery also operate on the septic system contaminants. 8 So my point simply is just to compare the source loadings, 9 and not to make a recommendation about banning septic 10 systems or anything like that. 11 HEARING EXAMINER ROBESON-HANNAN: I understand. Thank 12 you. 13 Mr. Sullivan -- and thank you for your detailed 14 explanation. It was very helpful and clear and I appreciate 15 that. Mr. Sullivan, do you have additional questions? 16 MR. SULLIVAN: I have a little more, not too much more. 17 One question I have is -- well, before we leave the septic 18 system issue let's just assume for the sake of argument and 19 this is a hypothetical, and I make no representations about 20 whether this could or could not happen. But assume, for the 21 sake of argument that a property owner here decided not to 22 pursue a cemetery and instead wanted to build houses on this 23 property. And soon, I would just, you know -- can you make 24 a comparison of the potential nitrogen loading from those 25 houses that might be there if they're on septic versus the</p>	<p>391</p> <p>1 where for a -- an average 70 kg man, or person, he provided 2 a list of what is the mass of nitrogen present in muscle, in 3 bone, connective tissue, blood, urine, everything that 4 comprises a body to come up with a total mass. 5 It is true, and the EPA acknowledges, for example, by 6 increasing the body mass and that you need to consider for 7 exposure. Like how much a person is actually ingesting and 8 what does the risk pose to them based on the concentration? 9 The heavier -- so let me back up. The amount of nitrogen 10 that is present in a body is largely in the muscle and bone, 11 and the connective tissue; 7 percent only in a 70 kg person 12 is present in his fat. 13 I would -- I would venture to say that the greater 14 weight is largely due to increased fat in people. It's not 15 that their bones are bigger, maybe their skin is a little 16 bit -- has more surface area. But their connective tissue, 17 blood volume, perhaps would be a little bit higher. But the 18 majority is still in the bones and muscles. The muscles 19 might actually be, and maybe, a little bit less of a 20 fraction if we're sedentary enough that we have enlarged to 21 that size. 22 So the change in weight is approximately 14 percent. 23 That would not represent the change in the math because of 24 most of the change in weight is fat, that doesn't mean that 25 you're getting 14 percent more nitrogen overall, you would</p>
<p>390</p> <p>1 proposed cemetery? 2 MR. BROWN: I'm sorry. I was muted. I object to this 3 line of questioning. It has no relevance to the issues in 4 this case. 5 MR. SULLIVAN: We're looking for an illustrative 6 comparison. 7 HEARING EXAMINER ROBESON-HANNAN: It is a legal 8 standard and I'm going to sustain that. 9 MR. SULLIVAN: Okay. Then let's move on to -- I want 10 to follow up on something that was said yesterday and then 11 touch briefly on some -- because Dr. Dawson did submit a 12 rebuttal report as well, and I want to touch a little bit on 13 that. She has hit some of it already, but -- yesterday, one 14 of the fact witnesses, I believe it was Mr. Chamberlin, 15 raise concerns about using 70 kg as the standard for an 16 average adult. And then, but later, we heard one of the 17 expert witnesses, Dr. O'Keefe, refer to 70 kg in her 18 discussion of the effects of drugs. And there was a 19 reference to CDC analysis pretty current that suggested that 20 maybe I think it is Mr. Chamberlin said we've gotten bigger. 21 Can you tell me, have you taken a look at that and speak to 22 that a bit? 23 DR. DAWSON: Yes. So the 70 kg was based on the source 24 that we used for the mass of nitrogen in a corpse. And that 25 came from the event -- Dr. Dent's PhD dissertation of 2002</p>	<p>392</p> <p>1 just get whatever amount more is in fat, and the result is 2 something between 5 percent or so if you consider so little 3 amount of fat is -- I mean, so little and amount of nitrogen 4 is in fat. It has no substantive impact on our predictions. 5 MR. SULLIVAN: And is it fair to say that even using an 6 adult, an adult as the standard, of course that can vary, 7 that's a conservative input in itself, is it not? Because 8 the unfortunate reality is that it will not just the adults 9 who are buried in the cemetery, correct? 10 DR. DAWSON: Correct. Yes. 11 MR. SULLIVAN: Thank you. Okay. I would now like to 12 move quickly -- not to move you quickly, but to move next to 13 your rebuttal report that you submitted on March 28th. Or 14 least it (inaudible) of March 28th. And in that report you 15 addressed expert submissions by Dr. Abia, Mr. Mullowney, and 16 Dr. O'Keefe, correct? 17 DR. DAWSON: Yes. 18 MR. SULLIVAN: And let's just start with Dr. Abia. Do 19 you believe that Dr. Abia's submission is helpful to assess 20 potential water quality risks, or potential health risks of 21 drinking water related to the proposed cemetery? 22 DR. DAWSON: I do not. And the primary reason is he, 23 as he himself said, did not consider or evaluate any site- 24 specific information, or even regional information that 25 relates to the cemetery, or any of the factors that you</p>

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<p>393</p> <p>1 should consider in evaluating the impacts of a proposed 2 cemetery.</p> <p>3 MR. SULLIVAN: Thank you. And anything else about Dr. 4 Abia's report you would like to discuss?</p> <p>5 DR. DAWSON: Well he -- all three, but he also made a 6 statement that there will be impacts to a drinking water 7 source if a cemetery is placed in the watershed, with the 8 caveat, if poorly located. But he did nothing to evaluate 9 whether it was poorly or adequately located. Those are the 10 site-specific data that are needed for that, and kind of the 11 hydrogeologic assessment that I did.</p> <p>12 He also made some other statements about, you know, 13 nitrogen would be released from bodies for 20 years, and I 14 agree completely it could be released over the length of 15 time. It could take up to 30 years for a body to decompose. 16 But it's more conservative to say it's all release in a 17 shorter timeframe, which is what I did when -- in the 18 modeling.</p> <p>19 MR. SULLIVAN: Thank you. And I asked you about his 20 reports, but I think you -- were you commenting on his 21 reports and his testimony?</p> <p>22 DR. DAWSON: Yes.</p> <p>23 MR. SULLIVAN: Okay. Thank you. And let's move to Mr. 24 Mullooney's submission in his testimony. Do you find Mr. 25 Mullooney's submission and testimony to be helpful in</p>	<p>395</p> <p>1 completed for a cemetery. It's -- a type of cemetery. Do 2 you recall that discussion?</p> <p>3 DR. DAWSON: Yes.</p> <p>4 MR. SULLIVAN: And there was one Dr. Dawson's read off, 5 I believe, the requirements in those regulations for what 6 needs to be included in a hydrogeologic assessment; do you 7 recall that?</p> <p>8 DR. DAWSON: Yes, I do. That was Mr. Chamberlin.</p> <p>9 MR. SULLIVAN: I believe you're right. And I will 10 represent to you that I have -- I'm going to read to you 11 what I will represent to you are the -- what I believe to be 12 the requirements from the COBAR, the code of Baltimore 13 County's administrative regulations. The regulations of 14 course, will control if I'm wrong, but I'm just going to ask 15 you by what I've got here.</p> <p>16 And so I'm going to ask you. Does your report include 17 a scaled site plan showing the proposed location of the 18 areas to be used for burial, the property boundaries, 19 topography, water bodies, USDA soil type, existing and 20 proposed wells and septic systems on and within 200 feet of 21 the property line, and existing and proposed structures on 22 and within 200 feet of the property line?</p> <p>23 DR. DAWSON: Yes, it does.</p> <p>24 MR. SULLIVAN: Okay. Does your report include a 25 determination of the depth to bedrock and depth an flow</p>
<p>394</p> <p>1 assessing potential health risks from drinking water -- I'm 2 sorry, drinking water health risks associated with the 3 proposed cemetery?</p> <p>4 DR. DAWSON: No, I do not.</p> <p>5 MR. SULLIVAN: And why not?</p> <p>6 DR. DAWSON: Mr. Mullooney provided no data, and no 7 citations, no site specific information, no references even 8 of site specific information to come to the conclusion that 9 there would be an impact.</p> <p>10 MR. SULLIVAN: Thank you. And Dr. O'Keefe's -- let's 11 now go to Dr. O'Keefe's submission and testimony. Do you 12 find Dr. O'Keefe's submission and testimony to be helpful in 13 assessing potential health risks associated with drinking -- 14 potential drinking water health risks associated with the 15 proposed cemetery?</p> <p>16 DR. DAWSON: No, I do not for much the same reason. 17 There was no site specific information considered. Nothing 18 at all. And in fact, she didn't even conclude in her report 19 that the cemetery would pose a risk. She provided some 20 general summary that had nothing to do with the proposed 21 cemetery.</p> <p>22 MR. SULLIVAN: Okay. Thank you. All right. One final 23 line of questioning here. There was discussion yesterday 24 about the Baltimore County's -- certain regulations of 25 Baltimore County that require a hydrologic study to be</p>	<p>396</p> <p>1 direction of groundwater beneath the area proposed as a 2 burial ground?</p> <p>3 DR. DAWSON: Yes.</p> <p>4 MR. SULLIVAN: Does your report include an assessment 5 of proposed burial practices and the potential impacts of 6 buried remains on the groundwater quality, surface water 7 quality, and domestic water supplies in relation to human 8 health and the environment?</p> <p>9 DR. DAWSON: Yes, it does.</p> <p>10 MR. SULLIVAN: And the last one is a little bit 11 different and I'll ask you. I'm -- whether your report 12 includes recommendations as to the appropriate number and the 13 location and placement of burial sites on the land gassed on 14 the finding in paragraphs G, 1, 2, and 3, which are the ones 15 that I'll represent to you I just read.</p> <p>16 DR. DAWSON: So not directly. My report (inaudible) 17 what was planned and determined that it wouldn't pose a 18 health and safety risk. Any lower density would also not 19 pose a health and safety risk.</p> <p>20 MR. SULLIVAN: Okay. And before yesterday had you and 21 I ever discussed the requirements for a hydrogeological 22 study in Baltimore County required by its regulations?</p> <p>23 DR. DAWSON: No.</p> <p>24 MR. SULLIVAN: No, so your report just happened to have 25 all the requirements that Baltimore County would required,</p>

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<p>397</p> <p>1 correct?</p> <p>2 DR. DAWSON: Yes, but I don't think that's happenstance</p> <p>3 because those are the basic requirements of a hydrogeologic</p> <p>4 assessment, which I've done for 30 years of my life.</p> <p>5 MR. SULLIVAN: Okay. Thank you. I have no further</p> <p>6 questions.</p> <p>7 HEARING EXAMINER ROBESON-HANNAN: Mr. Brown?</p> <p>8 Mr. Brown?</p> <p>9 MR. BROWN: Yes, I'm ready to get started.</p> <p>10 HEARING EXAMINER ROBESON-HANNAN: You are? Okay. Go</p> <p>11 ahead.</p> <p>12 MR. BROWN: Why don't we start with going back to</p> <p>13 Exhibit I that was up on the screen a little while ago.</p> <p>14 HEARING EXAMINER ROBESON-HANNAN: Okay. Just a second.</p> <p>15 Can you remind me what page that was on? Or what's on</p> <p>16 it?</p> <p>17 MR. SULLIVAN: Yes. It's page 53 of 141.</p> <p>18 HEARING EXAMINER ROBESON-HANNAN: Thank you. Just a</p> <p>19 second. (Inaudible).</p> <p>20 All right. It should be up.</p> <p>21 MR. BROWN: Dr. Dawson, you have testified that you</p> <p>22 found that the groundwater flow is generally eastward along</p> <p>23 the area bounded in yellow by this diagram, right?</p> <p>24 DR. DAWSON: No, that's not correct. I have testified</p> <p>25 that the groundwater flow within the property boundary is</p>	<p>399</p> <p>1 this -- here's the north arrow. And you're talking about</p> <p>2 east of the cemetery ground, but I see dots to the south.</p> <p>3 MR. BROWN: I'm not talking about those. I'm only</p> <p>4 talking about those that are generally east of the cemetery</p> <p>5 boundary and within the groundwater flow from the cemetery.</p> <p>6 HEARING EXAMINER ROBESON-HANNAN: So east of New</p> <p>7 Hampshire Avenue?</p> <p>8 MR. KLINE: That's west.</p> <p>9 MR. BROWN: There's an earlier map that shows the</p> <p>10 groundwater flow. Oh, I'm sorry. I get it. I get it. I'm</p> <p>11 sorry.</p> <p>12 MR. BROWN: Okay.</p> <p>13 HEARING EXAMINER ROBESON-HANNAN: That's my mistake.</p> <p>14 Go ahead.</p> <p>15 MR. BROWN: So I'm not sure how many of these little</p> <p>16 blue dots you would characterize as within that groundwater</p> <p>17 flow direction, but my question is can you identify which</p> <p>18 ones are deep wells?</p> <p>19 DR. DAWSON: No.</p> <p>20 MR. BROWN: Okay.</p> <p>21 DR. DAWSON: I would like to clarify, if I may, that</p> <p>22 having said the groundwater flows eastward at the property,</p> <p>23 which I'm not changing that, the general regional</p> <p>24 groundwater flow in the crystalline rock is towards the</p> <p>25 southeast. And that is locally varied by the influence of</p>
<p>398</p> <p>1 eastwards towards the two streams, and that is largely</p> <p>2 controlled by those streams and the topography.</p> <p>3 MR. BROWN: All right. Pardon my imprecision, but the</p> <p>4 point I'm asking you is about the little blue dots which are</p> <p>5 the wells drilled prior to 1997 that are east of the</p> <p>6 cemetery boundary. And my question is -- well as a</p> <p>7 predicate to that question I would say that you testified</p> <p>8 that there were basically two kinds of wells. Deep wells</p> <p>9 and shallow wells. And that the deep wells go down well</p> <p>10 below the point at which any type of contaminate from the</p> <p>11 cemetery might affect the water catchment from those wells,</p> <p>12 right?</p> <p>13 DR. DAWSON: I think that's close enough. It's not</p> <p>14 exactly what I testified. I testified that the contaminates</p> <p>15 from the cemetery would migrate in the shallow groundwater</p> <p>16 and the shallow groundwater from the cemetery discharges to</p> <p>17 those two perennial streams and that that would be unlikely</p> <p>18 to impact the deeper crystalline well. The wells that</p> <p>19 screen the deeper crystalline material.</p> <p>20 MR. BROWN: Well, among the blue dots generally east of</p> <p>21 the cemetery boundary, can you identify which ones would be</p> <p>22 these deeper wells and which ones would not be?</p> <p>23 DR. DAWSON: No, I cannot --</p> <p>24 HEARING EXAMINER ROBESON-HANNAN: Can you stop talking,</p> <p>25 just a minute. Thank you. I don't understand what -- I see</p>	<p>400</p> <p>1 stream bodies and by surface topography.</p> <p>2 And so in the general, shallow well water, for example,</p> <p>3 the residences with septic systems and wells that that are</p> <p>4 north of the Ednor tributary, there will be local components</p> <p>5 to the groundwater that are southward there. And similarly,</p> <p>6 on the south side of the Ednor tributaries there will be</p> <p>7 components of groundwater flow to the north. So I just</p> <p>8 wanted to clarify that it doesn't mean that if the</p> <p>9 groundwater is flowing -- that because the groundwater is</p> <p>10 flowing eastward and the shallow groundwater at the property</p> <p>11 that is true throughout the watershed.</p> <p>12 MR. BROWN: All right. Thank you for that. I'd like</p> <p>13 to turn back again to an exhibit that was up a little while</p> <p>14 ago, which was page 12 of your report that includes a table</p> <p>15 called summary of model results for contaminant transport.</p> <p>16 MR. SULLIVAN: That one is at page 21 of 141, if that</p> <p>17 helps.</p> <p>18 MR. BROWN: Okay. I want to read to you from the</p> <p>19 bottom of that page, where you're talking about nitrate.</p> <p>20 And you say, actual concentrations are likely to be even</p> <p>21 more as conservative model, going on to page 13, as</p> <p>22 conservative modeling inputs were used for every parameter.</p> <p>23 And one of the parameters and model inputs was the 70 g --</p> <p>24 70 kg body weight measurement that Dr. Dent used in 2002,</p> <p>25 right?</p>

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42 (401 to 404)

<p>401</p> <p>1 DR. DAWSON: So the 70 kg was not put in. It was a 70 2 kg distribution of nitrogen at mass. So it's a nitrogen 3 mass that was used as an input from a 70 kg man. 4 MR. BROWN: Yes, but it was predicated on the weight of 5 a 7 [sic] kg man, right? 6 DR. DAWSON: Correct. 7 MR. BROWN: And you have explained today that you did 8 not -- well let me ask you first of all. Would you regard 9 using a 90 kg man as a more conservative parameter than a 70 10 kg man? 11 DR. DAWSON: So as I said just a moment ago, it's not 12 the mass of the person, it's in the amount of nitrate that 13 is the parameter of the input. And the amount of nitrate, 14 the concentration that I have put in is conservative. Even 15 though based on a 70 kg man, there were other components 16 that went into the actual concentrations that we use, and 17 those were very conservative. Those are, for example, as 18 I've said before, using the total nitrate mass in the body 19 divided over the necro-leachate generation over six years 20 rather than 20 years. 21 That's a factor far greater than even the change in 22 mass of the weight. So just to state again, the body weight 23 is not what's entered. It's the mass of nitrate. And that 24 the mass of nitrate, as I just explained, at the end of my 25 direct is that the mass of nitrate that would be present in</p>	<p>403</p> <p>1 connective tissue and cartilage and so on would be similar. 2 So the increase in nitrate because of having more fat would 3 be slightly higher, but that is not enough of a low in to 4 counteract the factors, like multiple 2x, 3x conservative 5 method that I used and how I've entered the nitrate mass 6 loading to the model. 7 MR. BROWN: Well, I think there probably are a number 8 of much heavier weight NFL players than there used to be 20 9 years ago who would disagree with your analysis that all of 10 their weight gain has been fat. But putting that aside, how 11 can you say that you use the most conservative parameters 12 when you've assumed that virtually in every case that it's 13 all -- this all going to be fat? 14 DR. DAWSON: That is not what I testified to. The 15 parameter that I entered, mass of the nitrate. It is my 16 opinion that notwithstanding increases or decreases in fat 17 or who is buried, that the nitrate mass that I entered, that 18 parameter, source concentration, is very conservative. 19 MR. BROWN: Let's go back to page 10 of your report. 20 That's two pages earlier. Okay. Towards the bottom of the 21 page you talk about nitrate. You say nitrate was 22 conservatively assumed to be released from soft tissue in 23 four of the linear stages citing Dent, Carter, and Vass, 24 over a period of six years. Where did you get the six-year 25 figure?</p>
<p>402</p> <p>1 a body, in my opinion, in a person who is 20 kg higher would 2 not be that proportion higher because most of that weight 3 gain is in fact. And fat has a small fraction of the 4 nitrate in a body. 5 MR. BROWN: What is your evidence for the conclusion 6 that most of the weight gain would be fat? 7 DR. DAWSON: Body mass -- most of the weight gain that 8 is described has been described as an increase in the BMI, 9 body mass index, and that body mass index is based on the 10 proportion of body fat. And it's that proportion of body 11 fat that has increased. 12 MR. BROWN: And what is your evidence of that? 13 DR. DAWSON: Any medical chart when you go in for a 14 physical has a body mass index, and the source information 15 underneath that describes it as proportion of adipose tissue 16 to overall body weight. 17 MR. BROWN: But I believe you testified that some of 18 that fat increase would still have nitrate mass effects on 19 the total amount of body mass nitrate? 20 DR. DAWSON: So there could be a small increase. That 21 increase, for example, on a 70 kg lean person, the 22 proportion of the nitrate mass in the body that is in fact 23 is 7 percent. And so -- however, it's 72 percent is in the 24 volume of muscle and connective tissue, which would be 25 likely -- and the bones certainly would be similar. The</p>	<p>404</p> <p>1 DR. DAWSON: That is included in Exhibit K. And it is 2 a summary from Dent primarily, but the other references as 3 well, that show the rate of nitrate relief from, I believe 4 it's figure 2 in Exhibit K. I don't have that up. I don't 5 have that with me. 6 HEARING EXAMINER ROBESON-HANNAN: What do you need? 7 DR. DAWSON: I think -- 8 MR. SULLIVAN: Was it table 2, are figured 2? 9 DR. DAWSON: Figure 2, I believe. 10 MR. SULLIVAN: I'll let you get it. 11 MR. BROWN: Let's go -- I'm looking now at page 12 of 12 Exhibit K, and you reference table 7. 13 HEARING EXAMINER ROBESON-HANNAN: Wait. Wait. 14 DR. DAWSON: Figure 2. Oh sorry, that's not in 15 evidence. These are -- it's figure 2, nitrogen mass loss 16 curve. 17 HEARING EXAMINER ROBESON-HANNAN: And what page is that 18 on? 19 MR. SULLIVAN: We don't know, because we didn't expect 20 to use it, unfortunately. 21 HEARING EXAMINER ROBESON-HANNAN: Okay. 22 MR. BROWN: It's not paginated -- it doesn't match your 23 pagination. 24 MR. BROWN: I guess my question is when you cite Dr. 25 Vass's 2011 study didn't he use a formula to determine</p>

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43 (405 to 408)

<p>405</p> <p>1 nitrogen mass for bodies buried at ground temperature?</p> <p>2 DR. DAWSON: Yes, that's my recollection.</p> <p>3 MR. BROWN: And is that the average ground temperature</p> <p>4 in Maryland considered to be about 55 degrees, and that</p> <p>5 would be a factor in the formula?</p> <p>6 DR. DAWSON: In that formula, but we used the data</p> <p>7 provided in Dent for our modeling because we need to know</p> <p>8 how it changes over time, the mass. Given that it doesn't</p> <p>9 make sense to release nitrate over 20 years and consider it</p> <p>10 conservative. And so we understand from the literature that</p> <p>11 nitrate mass loss is fastest in the first couple of years,</p> <p>12 and then, have a much lower in later years. And it tails</p> <p>13 off for up to 20, 30 years it can be in the leaching from</p> <p>14 bones.</p> <p>15 So the values that we used assumed that most of the</p> <p>16 nitrate was lost in the first two years and the remainder of</p> <p>17 the mass within the 2nd to 6th year. That gave us a high,</p> <p>18 very high nitrate mass loading.</p> <p>19 MR. BROWN: But in your table 7 showing the amount of</p> <p>20 migration of nitrates from some of the trench pits that were</p> <p>21 dug to the groundwater showed a much longer period of time</p> <p>22 than the relatively short time in which most of the nitrate</p> <p>23 was decomposed from the body (inaudible)?</p> <p>24 DR. DAWSON: Well, that's travel time in the</p> <p>25 groundwater. As I said, the groundwater flows very slowly.</p>	<p>407</p> <p>1 a table of hydraulic conductivity you will see that for sand</p> <p>2 there's a range of four orders of magnitude and ours was</p> <p>3 near the upper end of that. So this is assuming that it</p> <p>4 silty sand which is what's present there. And that that's</p> <p>5 the length of time that it takes to travel in groundwater.</p> <p>6 Groundwater flow is quite slow.</p> <p>7 The other factor that influences the groundwater flow</p> <p>8 is the gradient. And that is the steepness of the</p> <p>9 groundwater table. And here, on average it's .02 for the</p> <p>10 groundwater table. You can calculate that from just placing</p> <p>11 a ruler down on the potentiometric surface that I am</p> <p>12 prepared and taken the distance -- the difference in</p> <p>13 elevation at one point versus another point divided by the</p> <p>14 horizontal distance.</p> <p>15 Groundwater is not like stream water. It does not flow</p> <p>16 at rapid rates.</p> <p>17 MR. BROWN: Couple more questions. You talk at the</p> <p>18 beginning about surface water as a potential contaminants</p> <p>19 from the site, to the Rocky Gorge Reservoir. Right now, the</p> <p>20 property is essentially 100 percent forest. Would you</p> <p>21 regard that particular condition on the property as more or</p> <p>22 less optimal to minimize the problem of contamination from</p> <p>23 surface groundwater runoff?</p> <p>24 DR. DAWSON: Not necessarily. Vegetation in general</p> <p>25 minimizes surface runoff. It doesn't have to be forest did.</p>
<p>406</p> <p>1 And so there is a time frame at the source over which a mass</p> <p>2 is released, and then that migrates through the vadose zone,</p> <p>3 or the soil between the top of the groundwater, hits the</p> <p>4 groundwater, and then, depending on the distance that test</p> <p>5 pit is to the Endor tributaries.</p> <p>6 And as you saw, the site is several thousand feet long.</p> <p>7 The timeframe that it takes for the nitrate released at the</p> <p>8 western side of the site is considerably longer than the</p> <p>9 timeframe of travel from the Western -- sorry, the eastern</p> <p>10 side of the site. But at both of those the timeframe of</p> <p>11 nitrate released was it that we used as input, and the total</p> <p>12 mass was the same at every grave (inaudible).</p> <p>13 MR. BROWN: Well, I see in your table 7 of your study</p> <p>14 that from trench pits number 25, the distance to the -- the</p> <p>15 distance to the groundwater is only 275 feet, and yet you</p> <p>16 say the first arrival of any contamination is over a year</p> <p>17 and a half?</p> <p>18 DR. DAWSON: Yes, the groundwater flows at about .2 --</p> <p>19 it's .2 feet -- .1 -- .7 -- sorry, .17 feet are a couple of</p> <p>20 inches a day.</p> <p>21 MR. BROWN: Is that because of your analysis of the</p> <p>22 soil of being not very porous and sandy?</p> <p>23 DR. DAWSON: No. That's based on sandy material of</p> <p>24 hydraulic conductivity that we used of the hydraulic</p> <p>25 conductivity of the soil types at the site. If you look at</p>	<p>408</p> <p>1 It can be grass. It can be brush, as well as trees. And</p> <p>2 the primary place where you would like to have trees is to</p> <p>3 minimize erosion, which would be in the riparian zone</p> <p>4 adjacent to streams. And there, the forestation is, as I</p> <p>5 understand it, is planned to leave the forest that are there</p> <p>6 present.</p> <p>7 MR. BROWN: And the plans for development of the</p> <p>8 cemetery are to remove a fairly large chunk of the forests</p> <p>9 covering for the burial grounds, correct?</p> <p>10 DR. DAWSON: My understanding is that there will be</p> <p>11 trees removed in phases in order to make room for the</p> <p>12 graves, and that additional trees will be planted once the</p> <p>13 graves are in place.</p> <p>14 MR. BROWN: Lastly, did you hear -- you heard the</p> <p>15 testimony yesterday concerning the regulation that have been</p> <p>16 imposed in Baltimore County, right?</p> <p>17 DR. DAWSON: Yes, I heard that discussion.</p> <p>18 MR. BROWN: My question for you is based on your</p> <p>19 analysis of the site and its close proximity to a major</p> <p>20 source of drinking water, do you foresee -- can you foresee</p> <p>21 any situation where it would be necessary to prohibit the</p> <p>22 installation of a green burial cemetery anywhere in the</p> <p>23 County along the lines that has been done in Baltimore</p> <p>24 County?</p> <p>25 DR. DAWSON: I am not -- I heard that discussion, but</p>

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<p>409</p> <p>1 I'm not familiar with all of the factors that were used to 2 make the designation that was made in Baltimore. I am 3 familiar with the hydrogeologic characterization that was 4 required, but I have not reviewed that documentation. 5 MR. BROWN: Well, you said that Dr. Abias's testimony 6 was not particularly helpful because he didn't identify what 7 he meant by poorly located. So my question to you is what 8 would be a poor location for this particular cemetery? 9 DR. DAWSON: I have not evaluated all possible 10 locations where one might choose to place a cemetery. My 11 analysis has focused on whether or not this particular 12 cemetery is poorly located. And my opinion is that it is 13 located in materials and slopes and in a geologic setting 14 that is suitable for cemetery construction. And my analysis 15 of potential contaminant transport is that it will not pose 16 a risk to the drinking water resources in the Rocky Gorge 17 Reservoir. 18 MR. BROWN: But you have a lot of expertise in this 19 particular subject and could provide expert advice to 20 someone seeking to locate a cemetery, could you not? 21 DR. DAWSON: I could. But I would do that by 22 evaluating -- doing the hydrologic evaluation that I did 23 here. 24 MR. BROWN: Well when someone -- if someone comes to 25 you and says I want to build a cemetery give me an idea of</p>	<p>411</p> <p>1 recently. 2 MR. BROWN: Have you looked at the record of this case 3 prior to -- as it existed back in July? 4 DR. DAWSON: I don't recall that I have looked at the 5 record from County records. As I have said, I was retained 6 in order to evaluate the -- to provide an opinion on whether 7 or not this particular cemetery would pose a risk. I have 8 described in my testimony that the setting is suitable, and 9 the information that was collected for the site back in 10 2020, and 2021 demonstrated that suitability. And the 11 addition that I have provided was to do the contaminant 12 transport modeling that is based on the site-specific data 13 that was collected in the past for the site. 14 MR. BROWN: Thank you, Dr. Watson [sic] appreciate it. 15 Dawson, I'm sorry. 16 DR. DAWSON: Dawson. My pleasure. 17 HEARING EXAMINER ROBESON-HANNAN: All right. 18 MR. BROWN: I'm all done, thank you. 19 HEARING EXAMINER ROBESON-HANNAN: Dr. Dawson, would 20 your opinion be the same after listening to Dr. Pleyas, I 21 don't want to say cytotoxic drugs, or genotoxic, but if you 22 used some of the drugs, for instance, that have mentioned, 23 like, the chemotherapy drugs, would that change your 24 analysis here? Or can you not say because you don't know 25 what the acceptable water levels would be?</p>
<p>410</p> <p>1 where I should look, because I don't want to find a poor 2 location, what would you tell them -- what kind of locations 3 would you tell them to avoid? 4 DR. DAWSON: I would tell them to avoid karst geologic 5 conditions and very coarse gravels. And I would tell them 6 to avoid building where there is no soil and then evaluate 7 whether or not those conditions were present where they were 8 considering placing a cemetery. 9 MR. BROWN: Would you rule out the possibility of 10 vacant land in residentially zoned areas because there are 11 residences that surround the property? 12 DR. DAWSON: As I have continued to say, it would 13 depend on the hydrogeology of the site and that is an 14 assessment that needs to be done, in my opinion, to place 15 any (inaudible), and for that matter, including a septic 16 system 17 MR. BROWN: Finally, if I understand the last point 18 that you made in direct examination, it was that you, in 19 fact, have done the hydrology -- hydrogeology study that 20 would be appropriate in order to make that kind of 21 determination; is that correct? 22 DR. DAWSON: Yes, that's my opinion. 23 MR. BROWN: And was that kind of study done with this 24 matter was before the Hearing Examiner last July? 25 DR. DAWSON: I would guess not because I was hired</p>	<p>412</p> <p>1 DR. DAWSON: I think I can't say for sure because I 2 don't know the acceptable drinking water levels. But I do 3 know that the literature that he described, I did take a 4 look at that, and it demonstrated that -- 5 HEARING EXAMINER ROBESON-HANNAN: He who? Who is he? 6 DR. DAWSON: Oh, Dr. Pleyas. 7 HEARING EXAMINER ROBESON-HANNAN: Okay. Go ahead, I'm 8 sorry. 9 DR. DAWSON: In the study that he described in his 10 testimony that tested the water from the drinking water 11 sources and did detect those (inaudible) in every case that 12 they did not exceed the drinking water equivalent levels, I 13 think they were called, that they had developed the 14 toxicological analysis for the chemicals that they 15 evaluated. 16 HEARING EXAMINER ROBESON-HANNAN: Or maybe I'm wrong, 17 that does work from a green burial ground, but I could be 18 wrong. So all right. I guess that's the only question. I 19 do appreciate your thorough analysis. And I thank you for 20 coming. 21 Mr. Sullivan, do you have any follow-up questions? 22 MR. BROWN: I think you will be pleased to hear that I 23 do not. 24 HEARING EXAMINER ROBESON-HANNAN: Mr. Brown, since I 25 asked a question after you asked a question?</p>

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45 (413 to 416)

<p style="text-align: right;">413</p> <p>1 MR. BROWN: No, thank you.</p> <p>2 HEARING EXAMINER ROBESON-HANNAN: There are many</p> <p>3 iterations of this. Dr. Dawson, you may be excused. Thank</p> <p>4 you very much.</p> <p>5 Okay. Mr. Klein, I think you are up.</p> <p>6 MR. KLINE: Could we go off-line for a second, please,</p> <p>7 Madame Hearing Examiner? Just to talk about where were</p> <p>8 going to go? Five minutes?</p> <p>9 HEARING EXAMINER ROBESON-HANNAN: Well, I hope you go</p> <p>10 to this room and -- yes. Yes, you may go offline.</p> <p>11 MR. KLINE: Thank you.</p> <p>12 HEARING EXAMINER ROBESON-HANNAN: Let's take a 5-minute</p> <p>13 break.</p> <p>14 (A recess was taken.)</p> <p>15 HEARING EXAMINER ROBESON-HANNAN: We have returned.</p> <p>16 Mr. Kline, do you want to -- are you questioning this</p> <p>17 witness? I'm actually probably not going to question him as</p> <p>18 much as just sort of reintroducing him and let him go. He's</p> <p>19 had the advantage of a day and I have to kind of listen to</p> <p>20 all of this and he would like to kind of try and draw</p> <p>21 together.</p> <p>22 But in particular, he wanted to address something that</p> <p>23 came up yesterday about the -- I'll just call it the</p> <p>24 clearcutting of the property that regardless of what we</p> <p>25 proffered to the Parking and Planning Commission, what are</p>	<p style="text-align: right;">415</p> <p>1 But I was saddened to hear, you know, this potentially</p> <p>2 insinuation that we might clear cut 25 acres because look,</p> <p>3 this is an environmental project. It's a nonprofit project.</p> <p>4 We are volunteers doing this thing. We are not out here to</p> <p>5 go and cut down 25 acres. We joked, we work the 9:00 to</p> <p>6 5:00 shifted. That's a 9:00 p.m. to 5:00 a.m. shift. We</p> <p>7 both have full-time jobs. We also call it the graveyard</p> <p>8 shift.</p> <p>9 But if you think about what we talked about, we said</p> <p>10 300 burials per year. And we talked about the density being</p> <p>11 600 bodies per acre, so when you do that math, that is one</p> <p>12 half of an acre per year of burials. And that is if the</p> <p>13 demand is there for that much. So of the 18 acres that we</p> <p>14 are talking about that's potential for burial land, that</p> <p>15 would take 36 years to fill. So why on earth would we cut</p> <p>16 25 -- cut all of these acres if we're not going to use it</p> <p>17 for 36 years?</p> <p>18 In fact, the trees would be back there by then, and we</p> <p>19 would have to clear it again. So I sort of just want to</p> <p>20 alleviate those fears and concerns. The other thing is the</p> <p>21 purpose of the project is to create these grounds that</p> <p>22 people can walk. And it's not that fun to just walk a big</p> <p>23 clear-cut parking lot. We really do appreciate the</p> <p>24 landscape itself. It's one of the reasons we chose this</p> <p>25 property. And we want to maintain -- we want to have</p>
<p style="text-align: right;">414</p> <p>1 exhibits in the conditional use application show in terms of</p> <p>2 phasing, the suggestion was that we were on limited in terms</p> <p>3 of what we can take down. And I want to -- or actually I</p> <p>4 should say Mr. Matrusada who sought wanted to try and</p> <p>5 address that comment in the context of the pace at which the</p> <p>6 development of the property will occur.</p> <p>7 Mr. Matrusada, do you want to reintroduce yourself?</p> <p>8 MR. MATRUSADA: Sure. Would you like me to be swear</p> <p>9 in?</p> <p>10 HEARING EXAMINER ROBESON-HANNAN: No, you're still</p> <p>11 under oath. Thank you. All right. I -- okay. Go ahead.</p> <p>12 MR. MATRUSADA: I'll try to make it really quick. So I</p> <p>13 would like to --</p> <p>14 HEARING EXAMINER ROBESON-HANNAN: I understand what the</p> <p>15 original conditional use intended. In fact, I think I</p> <p>16 raised it, but I'll let you say it. And I guess I will also</p> <p>17 pose just to avoid any misunderstanding, would you agree to</p> <p>18 a condition saying, you know, as a condition of the special</p> <p>19 exception this is how you're going to do it? But I'll let</p> <p>20 you say what you wish to say -- address what you wish to</p> <p>21 address and think about the other. Okay. Go ahead.</p> <p>22 MR. MATRUSADA: Thank you. And really, I think -- I</p> <p>23 just want to talk a little bit about the math, to be honest.</p> <p>24 I'm not going to get into details of all of our plans and</p> <p>25 stuff like that. Those things are in the record.</p>	<p style="text-align: right;">416</p> <p>1 trails, that's part of the plan. And to have trails, you</p> <p>2 need woods, and you need these features of the property. So</p> <p>3 we plan to keep it.</p> <p>4 And I just want to be clear about this volume. When</p> <p>5 you've got 300 bodies per year, it's just -- if we rounded</p> <p>6 up and got even more, you're talking about one per day on</p> <p>7 average, right? So that's one body per day because there's</p> <p>8 been a lot of talk of there's 10,000 bodies at this cemetery</p> <p>9 and all the material from that. So were talking about one</p> <p>10 body a day. Now, we've talked about colons and things like</p> <p>11 that here. That is one colon per day. It is one bladder</p> <p>12 per day. Right? Meaning if you've got a human being who is</p> <p>13 urinating and emptying their bladder every day that's the</p> <p>14 amount of bladder material that's coming out of these bodies</p> <p>15 because it's one per day and a human being is doing one per</p> <p>16 day. A single person.</p> <p>17 There's been discussion about the chemo patients, and</p> <p>18 so I just want to talk about some of the math there; 21</p> <p>19 percent of people who die have been diagnosed with cancer.</p> <p>20 So the maximum is if every single one of them were on chemo</p> <p>21 and they were on chemo at the time of death you would be at</p> <p>22 21 percent. But the DEP report that's in the record</p> <p>23 estimates to about 2 percent of bodies would have chemo in</p> <p>24 them. And you say well, why would that be, where's the gap</p> <p>25 between 21 percent who have cancer and only 2 percent who</p>

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46 (417 to 420)

<p style="text-align: right;">417</p> <p>1 have chemo in them?</p> <p>2 Well, first of all not all cancer patients to get</p> <p>3 chemo. And then, of those that get chemo there's something</p> <p>4 called hospice care. When you get off of -- when you no</p> <p>5 longer have a chance anymore, you end your treatment and you</p> <p>6 go to hospice care and that's where then, you die. And so</p> <p>7 there is a bunch of time that is between the treatment and</p> <p>8 when you pass. And that is time for the body to flush these</p> <p>9 chemicals out. And so by the time you are deceased you no</p> <p>10 longer have them, often. And that's why you get down to</p> <p>11 something like this 2 percent that they estimate.</p> <p>12 But let's say it was higher. Let's say it was 5</p> <p>13 percent. At 5 percent and you've got 300 bodies a year, 5</p> <p>14 percent of 300 is 15. So you've got 15 colons, or 15</p> <p>15 bladders worth of these chemo chemicals coming to the burial</p> <p>16 site. And by the way, that's not even accurate because it</p> <p>17 bladders and colons often empty in the deceased before they</p> <p>18 get there. But let's assume they didn't, and they were</p> <p>19 full. So you've got 15.</p> <p>20 Now, what if you got a chemo patient living in the</p> <p>21 watershed? How many bladders are they releasing every day,</p> <p>22 in a year? They are releasing 365. One day, basically. So</p> <p>23 we are talking about 15 a year versus one patient is 365</p> <p>24 equivalent bladders full of this material.</p> <p>25 MR. BROWN: Ms. Robeson, you know, I've heard enough of</p>	<p style="text-align: right;">419</p> <p>1 there was also a discussion that trees in later phases might</p> <p>2 not even be there. And when you're talking about 30 years</p> <p>3 from now some of these are very mature trees that actually</p> <p>4 would have fallen down most likely by then anyway.</p> <p>5 So -- but we spent a lot of time on trees, and I just</p> <p>6 want everyone to know we spent a lot of time on trees in the</p> <p>7 plan. The trees are very important to us. One thing is</p> <p>8 that the trees are mostly poplars. There's not a lot of</p> <p>9 other species in there, and we plan to introduce other</p> <p>10 native hardwood trees to the property, which we think will</p> <p>11 be an improvement to the forest.</p> <p>12 HEARING EXAMINER ROBESON-HANNAN: (Inaudible).</p> <p>13 MR. SULLIVAN: Sorry, we're not able to hear you Ms.</p> <p>14 Robeson-Hanan.</p> <p>15 HEARING EXAMINER ROBESON-HANNAN: Sorry. Cross-</p> <p>16 examination for Mr. Brown?</p> <p>17 MR. BROWN: Mr. Matrusada, I'm looking at the</p> <p>18 resolution from the Planning Board and it says that --</p> <p>19 MR. KLINE: Hey David, please clarify which one you're</p> <p>20 talking about.</p> <p>21 MR. BROWN: I'm talking about the one you sent me this</p> <p>22 morning.</p> <p>23 MR. KLINE: Forest conservation. Okay.</p> <p>24 MR. BROWN: Yeah. The proposed project -- the project</p> <p>25 proposes to clear 25.63 acres existing forest based on the</p>
<p style="text-align: right;">418</p> <p>1 this non-expert irrelevant testimony. If he's got something</p> <p>2 to say about the operation of his facility that would be</p> <p>3 welcome, but I object to all of this.</p> <p>4 MR. MATRUSADA: I'm just trying to get at the volume</p> <p>5 that we will be burying. We are talking about the material</p> <p>6 that is going, and I'm just trying to get at the volume.</p> <p>7 HEARING EXAMINER ROBESON-HANNAN: But it is, you know,</p> <p>8 you were not disclosed as a potential -- you were disclosed</p> <p>9 on the prehearing statement as a witness, but not as an</p> <p>10 expert witness.</p> <p>11 MR. MATRUSADA: I'm not trying to give any expert</p> <p>12 testimony here. I'm just talking about how many bodies are</p> <p>13 coming to the property.</p> <p>14 HEARING EXAMINER ROBESON-HANNAN: And you've done that.</p> <p>15 MR. MATRUSADA: Right. So thank you very much for your</p> <p>16 time.</p> <p>17 HEARING EXAMINER ROBESON-HANNAN: Anything else about</p> <p>18 the trees?</p> <p>19 MR. MATRUSADA: Yes.</p> <p>20 HEARING EXAMINER ROBESON-HANNAN: That's what I thought</p> <p>21 you were going to testify to.</p> <p>22 MR. MATRUSADA: Yeah. The last thing about the trees</p> <p>23 is that we actually categorized, you know, we labeled 550</p> <p>24 trees and we had a lot of back-and-forth with the County</p> <p>25 about specific specimen trees that we were to keep. And</p>	<p style="text-align: right;">420</p> <p>1 land use category, and the forest conservation worksheet</p> <p>2 there is no planting requirement generated for the</p> <p>3 application.</p> <p>4 The application is approved, so the way I read this is</p> <p>5 that you have authorization from the Planning Board to</p> <p>6 remove up to 25.63 acres with no replanting requirement. Is</p> <p>7 my understanding of that approval incorrect?</p> <p>8 MR. MATRUSADA: Unfortunately, we actually had</p> <p>9 discussions with the County on this. And we said, guys,</p> <p>10 come on, this isn't our plans. We're going to be replanting</p> <p>11 and stuff. And I said look, the way we work when you're</p> <p>12 talking about clearing, we assume -- we have to assume that</p> <p>13 you're going to make it a parking lot. And we have to make</p> <p>14 sure that it's legal as if you were just going to clear the</p> <p>15 whole thing. We know you're not going to do that, but</p> <p>16 that's the way we do it. And so that's the way they decided</p> <p>17 to go.</p> <p>18 MR. BROWN: So I guess I would appreciate you to give a</p> <p>19 direct answer to the Hearing Examiner about whether or not</p> <p>20 you're willing to condition that license, that authorization</p> <p>21 to something more manageable with regard to the preservation</p> <p>22 of trees on his property.</p> <p>23 MR. MATRUSADA: Well, there is going to be a</p> <p>24 preliminary plan done and we're going to file that, and that</p> <p>25 will have our faces, and that's where, you know, we will</p>

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47 (421 to 424)

<p>421</p> <p>1 have approval for those things.</p> <p>2 MR. BROWN: Well, you can make that point if you</p> <p>3 want -- but I --</p> <p>4 HEARING EXAMINER ROBESON-HANNAN: No. That's --</p> <p>5 MR. BROWN: -- I think it's up to the --</p> <p>6 HEARING EXAMINER ROBESON-HANNAN: Just a second.</p> <p>7 MR. BROWN: -- Hearing Examiner to decide whether or</p> <p>8 not it's appropriate to impose such a condition at this</p> <p>9 juncture.</p> <p>10 HEARING EXAMINER ROBESON-HANNAN: You'll get a final</p> <p>11 Forest conservation plan, but they're not going to go into</p> <p>12 the site plan and details of replanting. It's my</p> <p>13 recollection that you had so much forest on the site, even</p> <p>14 though it was Tulip Poplars that you really didn't have</p> <p>15 any -- well, I better not say that because I can't remember</p> <p>16 for sure. But they're not going to look at that. So you</p> <p>17 can answer --</p> <p>18 MR. KLINE: Madam Hearing Examiner, please clarify.</p> <p>19 I'm not quite sure I understand Dan what you just said</p> <p>20 because I'm looking at your report and on page 16 of your</p> <p>21 report and decision there is a phasing plan and that's what</p> <p>22 Mr. Matrusada is telling you that he plans on following.</p> <p>23 HEARING EXAMINER ROBESON-HANNAN: I don't -- but the</p> <p>24 phasing plan didn't specifically say -- and I'll have to</p> <p>25 look it up. I didn't think it specifically said that areas</p>	<p>423</p> <p>1 issue, but worth consideration.</p> <p>2 HEARING EXAMINER ROBESON-HANNAN: That's what I'm</p> <p>3 saying.</p> <p>4 MR. KLINE: All right. And what I would like -- are</p> <p>5 what I would suggest that then is why don't you let us</p> <p>6 proffer a condition that would maybe address Mr. Brown's</p> <p>7 concern about --</p> <p>8 MR. MATRUSADA: Yeah. I mean, I think the -- you know,</p> <p>9 it's very hard to plan with precision 35 years when you're</p> <p>10 talking about exactly where these trees would go. So it's</p> <p>11 going to depend on, like, local conditions, and how the</p> <p>12 grays, you know, go out. You know, whether we -- whether</p> <p>13 someone -- their wife passes away or not and we have to keep</p> <p>14 an empty grave. It would be very difficult to try to</p> <p>15 delineate where each tree is going to be. That's why it</p> <p>16 can't really be in a landscape plan. If --</p> <p>17 HEARING EXAMINER ROBESON-HANNAN: It's just --</p> <p>18 MR. MATRUSADA: Sorry. Go ahead.</p> <p>19 HEARING EXAMINER ROBESON-HANNAN: I was just suggesting</p> <p>20 a requirement so that the areas that don't sit there after</p> <p>21 you grade them that they be replanted without the need to</p> <p>22 specify. You know, you can say a mix of whatever, however</p> <p>23 you want to describe it.</p> <p>24 MR. MATRUSADA: We --</p> <p>25 HEARING EXAMINER ROBESON-HANNAN: You don't have to</p>
<p>422</p> <p>1 had to be replanted after clearing.</p> <p>2 MR. KLINE: If we're talking about the replanting</p> <p>3 that's a different issue, but that is something we still</p> <p>4 proffered.</p> <p>5 HEARING EXAMINER ROBESON-HANNAN: Well, I think --</p> <p>6 MR. KLINE: And what we'd like --</p> <p>7 HEARING EXAMINER ROBESON-HANNAN: I think that's what</p> <p>8 Mr. Brown is asking about.</p> <p>9 MR. KLINE: Well, I was going to --</p> <p>10 HEARING EXAMINER ROBESON-HANNAN: He's worried about --</p> <p>11 he's -- it's the clear cutting of trees, and I said the</p> <p>12 promise is will replant trees as you go through each burial</p> <p>13 cell, you'll clear -- I don't know what you call the little</p> <p>14 burial areas. But as we clear each burial area, there was a</p> <p>15 representation that we will replant that area in some mix of</p> <p>16 new hardwoods. That wasn't made a specific condition of the</p> <p>17 report, that's my recollection.</p> <p>18 And there was also some question of whether the</p> <p>19 replanting had to be part of a landscape plan. I remember</p> <p>20 that too. So -- and you argue that the landscape was only</p> <p>21 the perimeter, you know under 6.52 or whatever it was.</p> <p>22 MR. KLINE: Well, I referenced the phasing plan on page</p> <p>23 16 in terms of cutting in the first -- at the -- basically</p> <p>24 going in the first place, you're taking it a step further</p> <p>25 saying when you're going to be replacing it. A separate</p>	<p>424</p> <p>1 answer now.</p> <p>2 MR. MATRUSADA: Well, I mean, I would have to confer</p> <p>3 with my partner. I can say that we have zero plans to leave</p> <p>4 it bare. We definitely do not want a large bare piece of</p> <p>5 property. And that is not our plan.</p> <p>6 HEARING EXAMINER ROBESON-HANNAN: Okay. Well, you</p> <p>7 know, I will leave it to you.</p> <p>8 MR. MATRUSADA: Thank you very much.</p> <p>9 HEARING EXAMINER ROBESON-HANNAN: All right. So don't</p> <p>10 you wish you hadn't testified? I'm teasing you.</p> <p>11 MR. MATRUSADA: I enjoy talking to you so much though.</p> <p>12 HEARING EXAMINER ROBESON-HANNAN: Yeah, I know. But I</p> <p>13 do ask just to give some certainty, just if there is</p> <p>14 something that you can put in the special exception that</p> <p>15 will allow you -- are you going to go in and grade -- like</p> <p>16 how big a -- are you going to grade grave by grave? Or are</p> <p>17 you going to take an area and grade that?</p> <p>18 MR. MATRUSADA: Yeah, so the plan is to create a sun</p> <p>19 pocket and clear it for efficiency purposes it's much better</p> <p>20 and easier to do that. You create a sun pocket and then you</p> <p>21 feel that area.</p> <p>22 HEARING EXAMINER ROBESON-HANNAN: Right. But if you</p> <p>23 don't feel that area, I mean how long -- you can't -- can</p> <p>24 you say how long the area is going to be open?</p> <p>25 MR. MATRUSADA: That's going to depend on --</p>

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<p>425</p> <p>1 HEARING EXAMINER ROBESON-HANNAN: Or is that 2 unpredictable?</p> <p>3 MR. MATRUSADA: That depends on that demand, right in 4 the area. In our area of Montgomery County. We don't know. 5 But you don't need to just keep opening new areas if we 6 can't feel, you know, feel that one.</p> <p>7 Yeah, and the clearing, we'd likely due, like, a half 8 an acre at a time. That would probably be the plan for the 9 burial areas.</p> <p>10 HEARING EXAMINER ROBESON-HANNAN: Okay. Did Mr. Kline 11 just hand you -- anyway, it's okay.</p> <p>12 Mr. Brown, do you have any comments based on my 13 comment?</p> <p>14 MR. BROWN: Yeah. My experience with Mr. Kline over 15 the years is that he is extremely competent in his ability 16 to craft conditions that give his client the necessary 17 flexibility to operate in the manner that the client wishes 18 to operate, yet provides adequate precision and assurance 19 that things are going to be done in an environmentally 20 sensitive manner. And so I would really leave it to his 21 talents working with his client to come up with a 22 suggestion.</p> <p>23 HEARING EXAMINER ROBESON-HANNAN: Well, we'll leave 24 that challenge to Mr. Kline. You're too good at what you 25 do, Mr. Kline.</p>	<p>427</p> <p>1 tomorrow. If we're going to have Dr. Moore first thing in 2 the morning, I can give you an answer at that point, if not 3 earlier.</p> <p>4 HEARING EXAMINER ROBESON-HANNAN: Okay. Well, then let 5 me go through some other housekeeping matters. There's 6 still the motion to the -- well to strike out, I guess the 7 motion is now since, PWPA is now a party I guess the motion 8 is whether to consider the technical staff reports that they 9 filed when their charter was forfeited. Is that still an 10 objection? And have you had a chance to look at, I think, 11 3.5.12 of the Corporation's article?</p> <p>12 MR. KLINE: Let's make it easy, Ms. Robeson-Hannon. I 13 won't say we withdraw it, we understand that you can go 14 ahead and deny the motion. We've basically heard 15 everything, we're not going to put on Chinese blinders on it 16 so we'll just live with the circumstances noting, 17 however, --</p> <p>18 HEARING EXAMINER ROBESON-HANNAN: But you're not 19 withdrawing it?</p> <p>20 MR. KLINE: I'm not withdrawing it and we're continuing 21 Mr. Sullivan objection, but let's try and work it all out 22 instead of worrying about fighting about that.</p> <p>23 HEARING EXAMINER ROBESON-HANNAN: Okay. So as the 24 decision goes -- but I -- what I'm really doing is giving 25 you an opportunity, if you feel like you need further</p>
<p>426</p> <p>1 MR. KLINE: Thank you. I guess.</p> <p>2 HEARING EXAMINER ROBESON-HANNAN: Okay. That's all I 3 had. Does anyone have any other questions or redirect or 4 anything like that?</p> <p>5 MR. BROWN: Not here.</p> <p>6 HEARING EXAMINER ROBESON-HANNAN: Mr. Kline, from your 7 side?</p> <p>8 MR. KLINE: What I guess I would say is if Dr. Moore 9 happens to be listening to us, maybe we could listen to her 10 today rather than get together tomorrow. I don't --</p> <p>11 HEARING EXAMINER ROBESON-HANNAN: She was in the 12 meeting. Dr. Moore? Dr. Moore?</p> <p>13 Well, let me go to some other things because we have -- 14 you know, do you have any more witnesses, Mr. Kline?</p> <p>15 MR. KLINE: The Applicant has completed its 16 presentation.</p> <p>17 HEARING EXAMINER ROBESON-HANNAN: Okay. Mr. Brown, do 18 you have rebuttal witnesses?</p> <p>19 MR. BROWN: We hadn't planned on any. None of our --</p> <p>20 HEARING EXAMINER ROBESON-HANNAN: That's fine. You 21 don't have to have them. So you know, you could have them, 22 but you don't have to.</p> <p>23 MR. BROWN: Well, if we have any rebuttal it would 24 probably be from Mr. Putman or Mr. Chamberlin, but they -- 25 that would probably have to wait until we plan that out for</p>	<p>428</p> <p>1 argument on it. That's what I want to make sure that you 2 get a chance to do.</p> <p>3 MR. KLINE: Yeah. No, I think we all had our --</p> <p>4 HEARING EXAMINER ROBESON-HANNAN: So there's no --</p> <p>5 MR. KLINE: I think we all had an adequate opportunity 6 to express our various positions on it and we don't need to 7 pursue that argument anymore.</p> <p>8 HEARING EXAMINER ROBESON-HANNAN: Okay. One more kind 9 of housekeeping measure. I still don't have the -- it must 10 be the Baltimore County executive regulations, or that -- I 11 can't remember. All of a sudden the cite is leaving my 12 head -- COBAR.</p> <p>13 MR. KLINE: You want the COBAR?</p> <p>14 HEARING EXAMINER ROBESON-HANNAN: COBAR, yes. May I -- 15 because there were a number of references both by the 16 opposition and by Dr. Dawson, and it would help me just 17 reviewing the record to take a look at it.</p> <p>18 MR. KLINE: We will submit that to you.</p> <p>19 HEARING EXAMINER ROBESON-HANNAN: Okay. And then the 20 last thing is how long to leave the record open. I would 21 like to give -- I think we had discussed at the pre-hearing 22 conference we had discussed giving DEP and WSSC, who 23 actually operate the reservoir, time to review some of this 24 and I do see somebody from WSSC, Mr. Buglass, and if I said 25 that wrong I apologize, who's been on the hearing the entire</p>

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<p>429</p> <p>1 time. But I thought three weeks if we could ask to give 2 them some time because it's been a lot of material adjusted. 3 And I will have to ask them if that's -- I will by email, if 4 that's sufficient time for them to come back with a 5 recommendation. 6 Do the parties have any objection to that? 7 MR. KLINE: Probably no objection. My comment, or my 8 observation was you would have left the record open at a 9 minimum for 10 days anyway. 10 HEARING EXAMINER ROBESON-HANNAN: Correct. 11 MR. KLINE: You prudently forwarded to them the 12 materials as they came in so that they've had a chance to 13 look at it. But you also indicated that you may be sending 14 a memo to them with specific questions, so I would trigger 15 the time based on your memo rather than what we're doing 16 today. Because they're going to need to look at everything 17 and then respond to your memo as well. If you are still 18 planning on asking some questions. 19 HEARING EXAMINER ROBESON-HANNAN: I do have maybe one 20 or two, not a lot. 21 MR. KLINE: Okay. Well, that's good. That means the 22 evidence that you heard helped address some. That's great. 23 HEARING EXAMINER ROBESON-HANNAN: I'm considering all 24 the evidence. 25 MR. KLINE: Okay.</p>	<p>431</p> <p>1 think the Applicant is a need for the transcript until we 2 see what your report and recommendations to the Board of 3 Appeals has to say. 4 MR. SULLIVAN: I agree. 5 HEARING EXAMINER ROBESON-HANNAN: Okay. Okay. So 6 we'll do that. So tomorrow -- let me try. Dr. Moore? 7 Dr. -- I can't raise her so we're going to -- I told her 8 9:30 tomorrow so that's what we'll go with. Is there a with 9 for closing statements? 10 MR. KLINE: Everybody here, I think, feels that we've 11 trampled over this ground pretty well and everybody 12 understands the issues so I would say not. I will just say 13 the one thing that I would say to Dr. Morris tomorrow and 14 that is you are concerned about the record not having 15 adequate information for you to make a valid decision and I 16 think that has been addressed in the last two days that that 17 is no longer an issue or defect in the record of the case. 18 In which case she will have no cross-examination of Dr. 19 Morris tomorrow. 20 HEARING EXAMINER ROBESON-HANNAN: Mr. Brown, do you 21 wish a closing statement? 22 MR. BROWN: I'd like to answer that question tomorrow 23 morning after conferring with my clients. 24 HEARING EXAMINER ROBESON-HANNAN: Okay. Obviously Ivan 25 jumped the gun on some of this stuff so we'll adjourn this</p>
<p>430</p> <p>1 HEARING EXAMINER ROBESON-HANNAN: From both sides. 2 MR. KLINE: Three weeks would be acceptable to close 3 it, absolutely. 4 HEARING EXAMINER ROBESON-HANNAN: Is that acceptable -- 5 from the time I send the memo. You know better than I do 6 when that would be. If you had said, Jody, I'm going to -- 7 HEARING EXAMINER ROBESON-HANNAN: I might try to get it 8 out the day after this hearing while it's all fresh in my 9 mind. 10 MR. KLINE: Then that would be fine, sure. I was 11 concerned that maybe you wouldn't be ready to send the memo 12 until you got the transcript so you can have the right 13 references of things. 14 HEARING EXAMINER ROBESON-HANNAN: No. 15 MR. KLINE: And that would be a month then. 16 HEARING EXAMINER ROBESON-HANNAN: Yes, you're right. 17 And I can -- if I can, I can upload this -- the tape to 18 YouTube and send you a link. If the parties would like that 19 rather than waiting for it -- will get this transcript 20 beginning 10 calendar days. 21 MR. KLINE: Fine. 22 HEARING EXAMINER ROBESON-HANNAN: From the first 23 hearing. So it's up to you, but that's an option. Usually 24 we just send it to HEARING EXAMINER ROBESON-HANNAN reporter. 25 MR. KLINE: I would defer to Mr. Solomon but I don't</p>	<p>432</p> <p>1 hearing until tomorrow. All right? And with knowing that 2 Dr. Moore will have time to testify at that time. All 3 right. 4 MR. BROWN: Thank you. 5 HEARING EXAMINER ROBESON-HANNAN: Okay. With that, I 6 will adjourn this hearing and will see you tomorrow at 9:30. 7 Thank you. 8 (The recording was concluded at 5:27 p.m.) 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25</p>

Transcript of Hearing
Conducted on April 13, 2022

50 (433 to 436)

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CERTIFICATE OF COURT REPORTER - NOTARY PUBLIC

I, Joe Lorete, the officer
before whom the foregoing deposition was taken, do
hereby certify that said proceedings were
electronically recorded by me; and that I am
neither counsel for, related to, nor employed by
any of the parties to this case and have no
interest, financial or otherwise, in its outcome.

IN WITNESS WHEREOF, I have hereunto set
my hand and affixed my notarial seal this 13th day
of April, 2022.

Joe Lorete

JOE LORETE, NOTARY PUBLIC,
FOR THE STATE OF MARYLAND

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CERTIFICATE OF TRANSCRIBER

I, Molly Bugher, do hereby certify that the foregoing
transcript is a true and correct record of the recorded
proceedings; that said proceedings were transcribed to the
best of my ability from the audio recording as provided; and
that I am neither counsel for, related to, nor employed by
any of the parties to this case and have no interest,
financial or otherwise, in its outcome.

Molly Bugher

Molly Bugher

Date: April 22, 2022

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