



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF
PREVENTION, PESTICIDES, AND
TOXIC SUBSTANCES

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Attn: Memorandum of Understanding (MOU) between the U.S. Environmental Protection Agency (EPA) and E. I. DuPont de Nemours and Company (DuPont) for a Perfluorooctanoic Acid (PFOA) EPA Comments on DuPont's Responses to the Peer Consultation Panel's Input on the Outline of Phase II Work Plan

Dear Mr. Hartten:

This letter is submitted pursuant to Sections V.E.2.m of the above-identified MOU and includes EPA's Comments on DuPont's Responses to the Peer Consultation Panel's Input on the Outline of Phase II Work Plan dated December 18, 2009. EPA has carefully reviewed DuPont's December 18, 2009 response and EPA agrees with the Peer Consultation Group (PCG) that additional monitoring data are needed to fully address the "Charge" as defined in the MOU. EPA's review of the Final Report of the Peer Consultation Group, dated July 15, 2009, identified a number of significant issues. These issues relate primarily to DuPont's interpretation of concepts within the Charge and DuPont's willingness to conduct further sampling to better define releases and exposures according to the language of the Charge. This summary highlights the major topics of importance that are explained in detail in the attached comments.

The Charge as defined in the MOU does not limit exposure to "on and around the site" but states that "pathways of migration and exposure associated with the site" are to be characterized and assessed. The term "Associated with the Site" as defined in the MOU does not limit Phase III data collection to only characterizing exposure on and around the site but specifically includes characterizing those exposures associated with the site regardless of distance from the site.

EPA does not agree that the Screening Level Exposure Assessment developed by DuPont under the MOU generated screening level estimates of exposure which fully addresses the Charge. Because of the limited spatial extent of the monitoring data

collected to date, it is not possible to estimate exposures to populations further away from the site, even at a screening level.

The Ohio River is a major drinking water source downstream from the site. The limited spatial extent of the data that DuPont generated do not allow an understanding of how the concentration in the river varies with distance, or how the levels of PFOA in river water used as a drinking water source downstream vary. EPA believes that this potential pathway of exposure needs to be understood at a screening level in order to fully address the Charge.

EPA believes that additional sampling is needed for environmental media on and around the site as well as associated with the site to fully address the Charge. The available data are not sufficient to determine the spatial extent of the releases and PFOA exposures at a screening level for air, sediments, ground water, surface water, biota, locally grown produce, milk, meat, game animals and sludge and solid waste generated by the site.

EPA does not agree with DuPont's conclusion that "there is a high degree of certainty that the exposure potential associated with the site has already been characterized". EPA does acknowledge that other work such as that of the C-8 Science Panel, Emmett, and others will inform the characterization of the site, but believes that additional monitoring is needed beyond what DuPont recommends in order to fully meet the Charge as defined in the MOU. Detailed comments are attached.

Sincerely,

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EPA Comments on DuPont's December 18, 2009 Response to the Peer Consultation Panel's Input on the Outline of Phase II Work Plan Pursuant to the Memorandum of Understanding (MOU) Between USEPA and DuPont Company

Introduction

EPA agrees with DuPont that the goal of the November, 2005 MOU between EPA and DuPont is stated by the language of the Charge as written below:

Are current PFOA environmental releases and sources of environmental releases from the Site and the presence of PFOA in environmental media on and around the Site sufficiently understood so that pathways of migration and exposure to PFOA associated with that Site are adequately characterized and assessed on a screening level basis?

In addition, EPA and DuPont agreed to language in Section V.A.2.a .,b.,c., and d of the MOU which establishes the general scope of the PFOA Site-Related Environmental Assessment Program and governs interpretation of the Charge. EPA will use this language in interpreting the Charge as pertains to the MOU. For example, as stated in MOU Section V.A.2.a., "Associated with the Site," is further defined as including "...all activities that may have resulted in the current presence of PFOA in environmental media both on and off the site without regard to distance from the site...". In addition, Section V.A.2.c further defines "Pathways of Migration" as referring to the "...routes by which PFOA moves from any Current or Past Manufacturing Activity through Environmental Media, and includes but is not limited to, leaching to surface water or groundwater from land-applied materials; discharge from areas with contaminated groundwater to surface waters or wells; releases from landfills to air, groundwater and surface water; and air deposition to soils and migration to groundwater." The terms "Environmental media" and "Exposure to PFOA Associated With The Site" are also further defined in the MOU.

Selected comments are presented below from the PCG Report that further clarify the Agency's comments regarding additional data for the Phase III Future Data Needs Assessment (FDNA). In keeping with the MOU, the Agency believes that additional characterization and monitoring is needed to fully address the Charge, in the context of the MOU definition of the Screening Level Exposure Assessment.

Impact of Other Relevant Factors on Phase III Scope

The MOU was signed in 2005, and as DuPont notes, new information has been discovered about PFOA exposures in the Parkersburg, West Virginia area since that time. The revised Screening Level Exposure Assessment (SLEA) should include relevant scientifically credible information collected concerning these exposures. DuPont cites the work by Emmett and the C-8 Science Panel. The

Agency is familiar with these data and analyses.

EPA does not completely agree with the three factors that DuPont has chosen to take into consideration as relevant for Phase III work. The Charge does not limit exposure to “on and around the site” but states that “pathways of migration and exposure associated with the site” are to be characterized and assessed. As stated above, the term “Associated with the Site” is further defined in the MOU. DuPont should not limit Phase III data collection to only characterize exposure on and around the site but instead should characterize those exposures associated with the site regardless of distance from the site, in keeping with the Charge.

To fully address the Charge, collection of additional data are needed to understand sources, pathways exposures to humans and the environment at a screening level.

Scope of Work Considerations- “Screening Level Basis”

DuPont has also provided additional information on a screening level exposure assessment in its comments of December 18, 2009. EPA notes that Section V.D.3. of the MOU defines the term “*Screening Level Exposure Assessment*”. The MOU states that the Screening Level Exposure Assessment (SLEA) “...shall characterize exposure and releases associated with the Site in accordance with EPA’s “*Guidelines for Exposure Assessment*”...” and use the scenario evaluation approach set forth in the Guidelines. The MOU further states that the SLEA for current human exposure “...will include a quantitative, conservative assessment for any exposure pathway for which the data allow quantitative assessment. Where the data do not allow such quantitative assessment of an exposure pathway, the Screening Level Exposure Assessment for current human exposure will present a qualitative or semi-quantitative description of exposure.” Finally, the MOU states that although the SLEA will “... focus primarily on current human exposure, it will characterize the presence of PFOA in environmental media, including biota, on and off the site as a result of current or past manufacturing activities.” EPA will use the language in Section V.D.3 in interpreting the term “Screening Level Exposure Assessment” as used in the MOU.

Collecting sufficient data to support an adequate characterization of environmental releases and sources of PFOA, and characterization of the pathways of migration for PFOA are necessary prerequisites to enabling an adequate Screening Level Exposure Assessment, as defined in the MOU. This is one of the main points that the Peer Consultation Group (PCG) makes throughout their Report. EPA strongly agrees with the PCG on this point.

EPA does not agree that the Screening Level Exposure Assessment developed by DuPont under the MOU generated adequate estimates of exposure. For some pathways and subpopulations close to the site, the SLEA may be adequate, but for some near to the site, and all further from the site, the SLEA is not adequate to fully address the Charge. Because of the limited spatial extent of the monitoring data collected to date, it is not possible to estimate exposures to populations further away from the site, even at a screening level, unless some very

conservative assumptions are made. For example, there is no clear indication of a decreasing trend of PFOA concentrations in environmental media based on the monitoring data which has been collected under the MOU. Thus, a screening level exposure assessment using the available data would conservatively assume that exposures further away from the area sampled were comparable to those in the area sampled. EPA does not agree that the SLEA generated “more realistic central estimates of exposure” for populations beyond the extent of the monitored area.

Mitigation of Exposure

EPA agrees with DuPont that a great deal of additional information has been generated since the MOU was signed and that this information should be included in developing Phase III. EPA also agrees that DuPont has undertaken significant actions to substantially reduce releases from the site. In keeping with the Charge, the Phase III monitoring should include sufficient data to characterize current and future exposures at a screening level. Recent data on environmental concentrations, such as the increasing concentrations in groundwater at the Little Hocking Well Field (Hartten, 2010), suggest that the response of environmental concentrations to the reductions in air and surface water emissions is not a simple linear process. Understanding if the environmental concentration are decreasing as a result of reduced emissions or increasing because of residual PFOA in some environmental compartments requires ongoing monitoring. While ongoing monitoring is beyond the scope of the MOU, until and unless it can be shown that concentrations in environmental media are decreasing it is not valid to say that exposures are decreasing. For a screening level assessment, one should expect to err on the side of being protective, and assume that concentrations are not decreasing, in the absence of data.

DuPont offers descriptions of three types of actions which have been taken that are believed to be highly relevant to whether or not Phase III data collection is required for the drinking water pathway. These three actions are: 1) Washington Works reduction of PFOA manufacturing emissions to air, water, and land by 99% since 2000; 2) DuPont phase out of PFOA manufacturing by 2015 at the latest; and 3) DuPont providing granular activated water treatment to all public and private water districts containing PFOA at or above the site-specific EPA Action Level of 0.5 ppb and Provisional Health Advisory of 0.4 ppb. EPA recognizes the value of the actions DuPont has taken to address drinking water exposures on and around the Washington Works site. However, as stated previously and in the comments below, these actions are not sufficient to relieve DuPont of further data collection in Phase III to fully address the Charge.

In their review of additional information that has been generated since the MOU was signed, DuPont has made several incorrect statements or interpretations.

Emmett et al did not measure exposure. They did not “quantify total exposure” rather they measured levels in human tissue. They were not able to quantify historical exposure, especially for the air pathway exposure.

The C-8 Science Panel Exposure Assessment Study is not complete. The C-8 Science Panel has been constrained in their ability to correlate effects of PFOA with exposure because of the lack of sufficient data. Modeling is being used to try to estimate current and past exposures. This work in ongoing and the reference DuPont cites is a meeting presentation abstract of initial modeling estimations.

The C-8 Science Panel modeling suggests that groundwater concentrations are increasing despite reductions in emissions, and that it will take decades for concentrations to begin to decrease. This is in agreement with the limited ongoing data from the Little Hocking wells and shows that more monitoring is needed to adequately characterize current and future exposures.

DuPont states that PFOA use will be eliminated by voluntary phase out. However, the Charge addresses exposures resulting from Current and Past Manufacturing Practices, as stated above. The SLEA should address exposures resulting from current and past manufacturing practices in keeping with the Charge.

Air Monitoring

Monitoring data submitted by DuPont under the MOU has documented soil and ground water contamination well beyond the boundary of the available air measurements. EPA believes that the available data are not sufficient to determine the spatial extent of the exposure at a screening level, and it is not possible to characterize and assess exposure sufficiently at a screening level for populations further away from the site. EPA agrees that the highest exposures are probably occurring close to the site but does not agree that sufficient data exists to characterize exposure to people further from the site. In the absence of other data, a conservative (protective) screening level assumption would be that individuals further from the site may be exposed at similar concentrations.

Spatial Extent of Surface Water Monitoring

In response to several PCG recommendations, DuPont states that understanding the spatial extent of the PFOA contamination associated with the site is not significant, and that conducting sampling to delineate the extent of the contamination further from the site "would not have a meaningful impact on the results of the screening level exposure assessment". EPA believes that the spatial extent is significant and that the suggested additional monitoring data are needed to adequately evaluate exposure further from the site at a screening level. The distribution of PFOA on and around the site (spatial as well as temporal) determines the breadth of the data collection required for adequate screening level characterization of releases, sources and migration pathways and subsequent exposure assessment.

The MOU states that the Charge includes characterization, at a screening level, of exposures associated with the site regardless of distance. In keeping with this language, EPA interprets the Charge to include all exposures associated with the site,

not only those in close proximity to the site. As stated above, the Charge includes “...all activities that may have resulted in the current presence of PFOA in environmental media both on and off the site without regard to distance from the site...” The screening level exposure assessment should not be limited to only the highest exposure levels close to the site.

For example, the Ohio River is a major drinking water source downstream from the site. DuPont data shows elevated PFOA levels in the river at the downstream limit of sampling. The limited spatial extent of the data that DuPont generated does not allow a sufficient understanding of releases from the site and presence of PFOA in the river. Therefore, the pathway of migration from the site and exposure to PFOA from use of river water as a source of drinking water downstream from the facility cannot be adequately characterized and assessed on a screening level basis. Greater than 2 million people use the Ohio River as a source of drinking water downstream from the site, and potential exposure to PFOA associated with the site is not known. EPA believes that this potential pathway of exposure needs to be understood at a screening level in order to fully address the Charge and that the currently available data are not sufficient.

DuPont's states in paragraph 2 on page 8 of the December 18, 2009 Response that

“The purpose of investigation activity as stated in the MOU is to determine if the presence of PFOA in the environment is sufficiently understood to enable exposures to be characterized on a screening level basis, *“not to characterize the spatial extent of PFOA in the environment generally.”*”

DuPont added the last phrase in the sentence above: *“not to characterize the spatial extent of PFOA in the environment generally.”* This phrase was not included in the MOU. The MOU does not limit the spatial extent of the exposure to be characterized or assessed. The Agency is aware of additional data, including that generated by the Cincinnati Water Works, that show elevated PFOA levels a considerable distance downstream of the site.

EPA agrees with the PCG Report that additional surface water monitoring of the Ohio River downstream of the Washington Works site should be conducted. This should include an evaluation of direct seepage and tests to better understand the hydraulic flow to and beneath the river. Based on the insufficient characterization of Ohio River surface water listed below and on page 8 of the PCG Report, the Agency agrees that additional data are required.

- *Ohio River sampling... intermittent, and lacking in information regarding time of day or week, plant operation, river flow etc....difficult to interpret what the reported river concentrations mean.*
- *Adequate explanation ...not provided for absence of detectable PFOA in river samples along transects near the site, given the presence of PFOA in Ohio River... in drinking water intake samples many miles downstream.*

- *Water samples at the Washington Works outfalls and landfill leachate water samples suggest these locations could have provided potentially important routes of PFOA transport to groundwater and the Ohio River.*
- *No water samples collected from other surface water bodies; neither in the study area nor in any stream or river sediments PFOA in these media could lead to exposure to biota and subsequently through the human food chain.*

Groundwater concentrations in wells in the Little Hocking well field are increasing and do not appear to have reached a plateau or started to decline (Hartten, 2010). Groundwater recharge to the Ohio River is a major source of water input and may be delivering PFOA to the river. As the levels of PFOA in the groundwater increase over time the amount discharged to the river will also increase. EPA does not agree with DuPont's suggestion that additional surface water data are not needed because emissions have been greatly reduced. As stated above, the Charge clearly includes exposures resulting from Current and Past Manufacturing Activities at the site. Without additional data it is not possible to determine the effect of the emission reductions on water concentrations and associated exposures or to support the assertion that levels are declining.

EPA agrees with the PCG recommendations that additional sampling from creeks and shallow water bodies is needed for a screening level characterization in order to fully address the Charge. These are a source of input to the Ohio River as well as possible direct exposure pathways and need to be characterized.

River Sediment Monitoring

DuPont's December 18, 2009 Response regarding sediment monitoring addresses a very narrow scope concerning sediments. DuPont has only considered direct contact of fishermen and swimmers to sediments and has not looked at the bigger role of sediments as the migration pathway for PFOA from sources like the Riverbank landfill and the Aerobic Digestion Ponds to sediments and then on to the Ohio River and drinking water downstream. This is a major point in understanding the migration and exposure pathways. EPA agrees with the PCG suggestion in the Report that the collection of more data and better characterization of sediments, surface water and groundwater is needed at a screening level. The PCG Report contains these points on pages 59 and 60.

- *Bottom sediment samples need to be attained from the Ohio River in areas immediately adjacent to Washington Works outfalls, upstream, and downstream as well as downstream of landfill sites.*
- *Transects should be designed to capture extent of PFOA contamination related to a specific outfall and include differential depth analysis. A related need is to sample a sediment transect running from the Site across the river to the LHWA... designed to detect the existence of any seepage zones emanating from the Riverbank Landfill that could potentially have released PFOA that migrates to the LHWA.*

Groundwater Pump and Tracer Test

DuPont asserts that conducting pump tests, tracer tests or other options suggested by the PCG would not provide significant additional understanding of the groundwater flow between the DuPont site and Little Hocking Water Authority (LHWA). However, DuPont has not, as the PCG Report points out, provided a proper validation of the groundwater model on which they rely for the statement that no further groundwater data are needed. High concentrations of PFOA observed in wells immediately north of the aerobic digestion ponds after removal of material and what appear to be increases in PFOA concentrations in LHWA wells raise questions about the adequacy of the data on PFOA in groundwater near the plant boundary and understanding pathways of migration to the river and beyond. EPA agrees with the PCG recommendation that additional screening level data are needed.

DuPont believes that the flow patterns are greatly controlled by pumping on both sides of the river. As the PCG report describes on page 32, this is not substantiated. EPA agrees with the PCG that additional data are needed to clarify understanding of the hydrogeology and PFOA transport in groundwater at a screening level.

The PCG Report contains the following data collection recommendations on page 60.

- *Pump and Tracer tests... needed to further explore possible hydraulic connections between the Ohio River waters near the Site and ground waters on both sides of the river. These are needed to support assessments of the potential for off-site transport scenarios that may occur with changes in pumping of the Ranney well and the DuPont-Lubeck well field and whether or not pumping at LHWA induces any unexpected hydraulic connection between the groundwater associated with the anaerobic digestion Ponds and waters that eventually enter the LHWA well field.*
- *Modeling in agreement with previously reported data from the USGS of the Parkersburg region indicates a groundwater divide under the Ohio River... however, this modeling effort is in need of further validation... options include monitoring for PFOA in existing or new wells on the bank of the river and monitoring of water level measurements on both sides of the river to determine drawdown in conjunction with recorded pumping conditions.*

Additional Biological Monitoring

EPA agrees with the PCG recommendations that additional screening level biota sampling is needed. Data are also needed on plant products. Because of the widespread soil and water contamination, EPA believes that all crops grown in the area are exposed to soil and may be watered with contaminated groundwater or surface water. Based on available data (Stahl, 2009), plants readily take up and

concentrate PFOA, and the levels in crops need to be measured to estimate screening level exposure to the local population and to others that may consume crops grown in the area. Until the extent of the contamination is determined it is not possible to adequately evaluate exposure by this pathway. Limiting Phase III to within several miles from the site will not allow evaluation of the exposure via consuming contaminated crops further from the site, unless one assumes, as a conservative, screening level assumption, that contamination levels in crops are the same as those measured closer to the site. Crops grown on soil further from the site may be contaminated and the extent and levels of PFOA contamination are needed to conduct a screening level exposure assessment.

Sampling Farm Produce and Locally Produced Meat

DuPont states on page 16 of their response to the PCG Report that examining the levels of PFOA in locally grown crops and evaluating the resulting data using the gardener and farmer receptors will serve as a conservative surrogate for any broader population that could be ingesting locally grown crops as a smaller portion of their daily intake of these foodstuffs. EPA does not agree that garden vegetables are a reliable surrogate for commercial crops. Data collected by DuPont and 3M have shown that different plant species take up PFOA at different extents. Stahl, et al. 2009, reported that bioaccumulation of PFOA in corn straw is hundreds to thousands of times greater than in ears. Bioaccumulation factors in grains (e.g., oats and wheat factors range from one hundred to several thousand) suggest that these crops may be a significant uptake and exposure pathway to humans and non-human species (Stahl, et al, 2009). DuPont has proposed in the FDNA to sample locally grown crops and produce only within 2 miles of the site and optionally milk within 1 mile of the Letart Run Landfill. EPA believes that commercial crops, milk, and home grown produce outside the 2 mile radius also need to be sampled. DuPont bases their interpretation of needed data on the belief that local gardeners and farmers are likely to be the most highly exposed population. Based on available soil and groundwater concentrations, EPA does not agree that it is possible to determine that the most highly exposed population is within 2 miles. Soil and groundwater levels at and beyond the two mile radius are not significantly lower than those within 2 miles. EPA believes that sampling is needed to better understand the extent of the contamination or to document a downward trend in concentrations at specific distances from the site before any assessment of the highest exposures can be made.

Based on the available monitoring data associated with the site, soil and groundwater contamination could result in crops in the area taking up PFOA. There is potential for exposure from consumption of plant items grown on contaminated soil and watered with contaminated water. If the contamination in the area is wide spread, the potential for wide spread exposure is possible. The exposure to PFOA by this pathway needs to be understood in order to fully address the Charge

The monitoring proposed by DuPont in Phase III does not adequately respond to the PCG Report recommendation for addressing human exposure to PFOA through farm produce and locally produced meat. The PCG Report

addresses the PFOA migration pathway from drinking water to livestock and groundwater/surface water irrigation to crops by local farms. Collection of data in actual locations where PFOA has migrated from water through the crops to the humans and from the water into the crops and livestock would enable DuPont to fully address the Charge. Fields in the Parkersburg, WV area with PFOA in the soils and water are the best locations for data collection for characterizing these exposures at a screening level. The PCG Report has the following comments on this topic on pages 39 and 40.

- *Although DuPont reports have argued that airborne deposition has been the only source of PFOA to crops and crop products, studies have documented that PFOA is efficiently transferred from contaminated soil to crops (Stahl et al., 2009). Feeding of livestock with fodder and other crops grown on PFOA contaminated soils can result in food chain transfer of PFOA in and around the site and the landfill areas.*
- *According to US EPA, approximately 37% of households in the South have home gardens. Model exposure analysis has indicated that consumption of locally grown crops, meat products, and milk could contribute exposures similar in magnitude to intakes of PFOA of attained via ingestion of drinking water.*
- *There is a need to determine concentrations of PFOA in homegrown vegetables and fruits, locally grown farm produce, milk and meat... not only for homes located within a two-mile radius of the site but also for the farms along the Ohio River. Data for biota from the Dry Run Landfill and the Letart landfill are needed to accurately assess exposures in these locations.*

Sampling Game Animals:

DuPont's approach of using the results of rodent data to predict that other animals will not be contaminated is not valid. Data from other contaminated areas has shown that deer and other wild game animals take up PFOA from consumption of contaminated vegetation, soil and water (<http://www.epa.gov/region4/water/PFCdaltonindex.html>). Extrapolation from voles to predict that other wild and domestic animals do not accumulate PFOA is not valid. Additional sampling of game animals is needed to fully address the Charge.

Multimedia Fate, Transport, and Exposure Pathways

This section of the report addresses multimedia transport of PFOA from release to exposure and provides specific details on why pathways of migration and exposures need to be characterized with appropriate and sufficient data to fully address the Charge. EPA agrees with the conclusions and recommendations of the PCG Report statements on pages 44- 47.

For the pathways of migration from release to exposure to be adequately characterized on the screening level basis, we expect the following to be

satisfied:

1. *The major pathways of migration from the source to exposure media should be identified.*
2. *A basic understanding of the processes governing this migration and the major factors influencing these processes should be demonstrated.*
3. *A semi quantitative description of the mass flows along the major pathways of migration from the source to exposure media should be presented.*
4. *Sufficient field data should be presented to demonstrate that the basic understanding of the major processes and the semi quantitative mass flow calculations are roughly consistent with the reality in the study area.*

Further, the PCG report summarizes and concludes:

1. *The site conceptual model adequately describes many of the transport pathways to people living close to the source. However neither the exposure to PFOA nor the pathways of migration for people living more distant from the plant are characterized. This deficit is judged to be particularly serious for the population exposed via river water downstream of the site.*
2. *The site conceptual model appears to be factually incorrect in its placement of the SWMU and its correct location, on the rim of the river. The conceptual model also omits a potential transport pathway from this SWMU into the Ohio River and a pathway into groundwater that may also flow away from the site.*
3. *... several intermedia pathways of migration of PFOA are not yet understood at the basic level. Deficits exist particularly regarding the transport of PFOA from surface soil to groundwater, and from air and water to food.*
4. *A semi quantitative description of the mass flows along some partial pathways of migration is presented (for example from air to surface soil). However, no assessment along the entire major pathways (air-surface soil-groundwater-drinking water) is provided.*
5. *Data were collected and assessed to evaluate atmospheric transport and deposition to soil following emissions to air at the Washington Works site. Data were also collected in surface water, but no effort was made to assess the relationship between emissions to surface water and transport via surface water. Measurements were conducted that supported the understanding of the relationship between atmospheric emissions and deposition to terrestrial surfaces, but no effort was identified that evaluated quantitative understanding of the link between atmospheric emissions and the levels in groundwater from the unsaturated or saturated zones. Measurements to assess the transfer of the PFOA from air and water to are fully absent.*
6. *There is very poor understanding of the transfer from groundwater to food.*

7. *The transfer of PFOA from the atmosphere to grass is not sufficiently understood... consequently the transport from the atmosphere into food is also not understood.*
8. *No measurements have been done on pathways leading to food. This is appropriately identified as a future data need in the reports.*

Human Exposures

DuPont did not respond to the PCG comments about human exposures. There are a number of important points in the human exposures section of the PCG Report that the Agency supports. The following points are excerpted from pages 56 through 57 of the Report.

- *Except for possibly drinking water, a screening exposure analysis does not appear to represent the local community "situations" since most of the data... used are from other locations it would not be representative of any of the three sites.*
- *... exposure analysis receptor scenarios selection... has not provided information on the actual local behaviors of the population that supports the selected activities.*
- *The EPCs for PFOA found in food are based on deposition in uptake models. Local data on PFOA in homegrown and locally raised foods are necessary, and consumption practices for local foods need detailed evaluation for use in exposure assessment.*
- *The RME and MTE estimations use many assumptions that are not valid or justified for the local situation. Further, no effort has been made to tie the screening results to a known acute or chronic health outcome. What do the values for the RME or MTE mean in terms of potential health effects? There is no health slope factor or reference dose provided for comparison with data available from other locations where health effects have been demonstrated after exposures to PFOA have been identified.*
- *The Washington Works Facility and Local Landfill should be the focus of any immediate revision for screening characterization since there are actual data available. Concurrently the data needs must be thoroughly discussed and weaknesses removed with a better PFOA data collection.*
- *Any revisions to the Dry Run Landfill, and the Letart Landfill screening exposure characterization must include a logical plan for data collection ...*
- *The screening exposure assessment should be forward-looking in perspective and utilize the extensive biomonitoring data in the population that now receives the drinking water through the Little Hocking Water Association, other public systems and from private wells. The biomonitoring data should offer insights regarding the variability in exposures. Conceptual model for exposure needs to consider additional sampling based upon the recently established emissions from the stacks, and develop air and biota monitoring programs that can achieve the goals of a revamped program.*

Disposal of Sludge and Solid Waste

EPA notes that disposal of sludge and solid wastes generated at the Washington Works plant have occurred on and off the site (Ritchey, 2006). Evaluation of off-site disposal locations and resulting exposures are being addressed through other mechanisms by relevant state and federal agencies. To the extent that exposures from these activities are not addressed by other state and federal agencies activities, Phase III monitoring needs to include sufficient data collection to allow a screening level evaluation of the exposure at these off site locations.

Information provided to West Virginia by DuPont suggests that some contaminated solid wastes were deposited on-site (Ritchey, 2006). Additional Phase III sampling is needed to characterize, at a screening level, the residual PFOA in the East Field, Chestnut farm and other areas which may have received PFOA containing waste, and to quantify transport from these areas to the river and groundwater.

References

Peer Consultation Panel, 2009. Final Report of the Peer Consultation Panel conducting the review for the Scientific Peer Consultation Process for a Site Environmental Assessment Program as part of the DuPont-EPA Memorandum of Understanding and Phase II Workplan, July 15, 2009.

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Ritchey, Robert L., 2006. Letter from to Cliff D. Whyte, WVDEP dated July 12, 2006. Docket # EPA-HQ-OPPT-2003-0012-1098.

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