DEP Permit # E63-674
DEP Permit HDD Reference # PA-WA-0171.0000-RD
DEP HDD # S1B-0120
Township – Union
County - Washington
HDD Site Name – State Route 88 (SR88) / Wheeling and Lake Erie Railroad Crossing

1st Public Comment Period

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1. **Comment**
   Concerns:
   - (well) loss of water;
   - Told me not to drink my water, been buying it for a year now. Sunoco tested water, said someone would come out to explain results. No one ever did;
   - Worried about house and all the cement sidewalk and driveway shifting;
   - This is just too close to my house;
   - Health, so stressed out! I have lived here for 47 years and never had any problems until last year when Sunoco started digging. I didn't go looking for Sunoco, they ended up in my backyard almost. (1)

2. Comment

Pursuant to the Corrected Stipulated Order entered on EHB Docket No. 2017-009-L on August 10, 2017 ("Order"), and on behalf of Clean Air Council, Mountain Watershed Association, Inc., and the Delaware Riverkeeper Network ("Appellants"), please accept these comments on Sunoco Pipeline L.P.'s ("Sunoco") re-evaluation report ("Report") for the horizontal directional drilling ("HDD") indicated by drawing numbers HDD PA-WA-0171.0000-RR (the "Site").

The Department's Review

Pennsylvanians rely on the Department of Environmental Protection to protect them from dangerous activities that threaten their air, water, land, and health. The Department has recognized that the construction of Mariner East 2 has done damage to the public already. The purpose of Sunoco's re-evaluations of certain HDD sites is to do a better job avoiding harm to the public and the environment in its HDD construction. The Department's role is to review and assess Sunoco's Report before deciding what action to take on it.

It is the Department's duty to review and assess the Report with the goal of protecting the public and the environment placed first and foremost. Looking at the individual circumstances at the site in question is key. Critically important is accounting for input from those who live nearby, who have a deeper connection with—and greater knowledge about—the land than the foreign company building the pipelines through it.

A meaningful, objective and substantive review and assessment by the Department will ensure that new or further HDD operations at the re-evaluated sites will cause minimal, if any, harm to the public and the environment. Anything less than a full, careful, and objective review would endanger the public and the environment. Pennsylvanians place their trust in the Department to do a thorough, science-based assessment, taking into account these and other comments, and approving Sunoco's recommendation only if it would protect the public and the environment from any further harm.

Comments on HDD PA-WA-0171.0000-RR

1. Subsidence is a significant and inadequately explored concern.

Subsidence

The Report asserts that although the Site has been heavily undermined, subsidence will not result in significant problems for the pipeline. However, the content of the Report does not explain the reasoning for such a finding and, in fact, contradicts the assertion at various points.

The Report states at page 5 that:

> Based upon the data obtained from the subsidence analysis, and the results of a Finite Elements Analysis (pipe stress), the pipeline engineers has [sic] concluded "no concern" regarding the open cut/horizontal bore/FlexBor construction plan. The findings by the pipeline engineers is [sic] included within the report provided in Attachment 2.

Yet despite the quotation marks, nowhere in Attachment 2 is the language of "no concern" mentioned, and so it is unclear what the quoted language is in reference to. In Attachment 2 there is a letter signed by Dean Shaurs attesting that Tetra Tech, "[has] confirmed that if the predicted subsidence does in fact occur in the future, the resulting stresses within the pipeline will still be in compliance with ASMEB31.4."

This letter is followed by an analysis of the digital modeling done to determine possible pipeline stresses, called the Dr. Heasley Subsidence Report. This modeling analysis makes no mention of the standards set forth in ASME B31.4, contains no finding of "no concern," and no mention of where the modeling outcomes fall in relation to the standards of ASME B31.4.

Instead, the analysis makes several statements that seem to be of great concern. For example, regarding "Pillar Safety Factors" the analysis finds "that some of these larger pillars may not be as stable as initially assumed" and that "the remaining rib pillars…show very low safety factors." When the modeling is altered by using a different PSI (pounds per square inch) input, the analysis changes: "In this worst case scenario, many of the pillars, in particular many under the pipeline, are shown to lose significant structural integrity as their strength degrades over time." Dr. Heasley Subsidence Report, Post-Mining Model Results, Attachment 2, page 5.

The modeling in Figure 6 even indicates possible subsidence of 1.5 feet. There is no explanation as to how or why, if the pillars under the pipeline lost their structural integrity, the pipeline would be able to survive such pressure without breaking.

The data modeling analysis includes no conclusion section, no recommendations section, and as stated earlier, no finding of "no concern." It also appears that the pipeline engineer is conducting the analysis without full knowledge of how the pipeline is to be constructed. In the only statement that seems to make a recommendation of sorts in the Dr. Heasley Subsidence Report, at pages 5 to 6, the author writes:

> The level of strain that the pipeline may experience is both a function of the ground movement and also a function of how tightly the pipeline is coupled to the ground movement. If the pipe is tight within the horizontal borehole due to the drilling mud confining the pipe or collapse of the borehole, then it may be assumed that the pipe will experience the full ground strain as shown in Figure 9. If the pipeline is simply lying in the open horizontal borehole and

> can easily slide, then areas of tension or compression in the ground can be reasonably canceled by sliding of the pipe between adjacent areas of the opposite strain.

It is difficult to imagine how predictive modeling was done successfully if the author does not know, for instance, how much room the pipeline would be given to slide. Furthermore, if the author is making a specific recommendation for how the pipeline should be laid within the horizontal borehole, this should be clearly reflected in the newly revised plan.

Abandoned Mine Maps

It is well known that it is difficult to discover exact information about older abandoned mines. Many of the mines were constructed in an era with little to no regulation and spotty record- keeping practices. This is why supplemental methods, such as annual coal production data for the mine, are often used to understand the size of an abandoned mine. The inadequacy of mapping abandoned mines has been acknowledged by the Department as a problem that leads to dangerous results.

In 2002, it was discovered that the deadly disaster at the Que Creek Mine in Somerset County was the result of a permittee's having inadequately mapped the adjacent abandoned mine barriers. This prompted the Department to issue new policy that enumerates the ways in which abandoned mines can be mapped. Although this guidance is directed towards mining permittees, it should be taken into consideration for all underground projects that can result in dangerous outcomes due to inadequately locating abandoned mines.

The guidance, titled "Validating Abandoned Underground Mine Maps and Establishing Barrier Pillars" sets forth at pages 4-5 the following instructions for adequately identifying mine barriers:

> The applicant should summarize in narrative form all of the information relied upon to accurately ascertain the full extent and location of adjacent abandoned mine workings, and the steps taken to obtain that information. The narrative will demonstrate, to the Department's satisfaction, that the location and extent of adjacent abandoned mine workings has been accurately determined based upon the information obtained by the permittee. The permittee's burden of demonstration will not be met if, for example, there is irreconcilable conflicting information about the location and extent of the abandoned mine workings, or where there are significant data gaps in the information used to confirm the location and extent of the abandoned workings. The narrative should address the following types of information:
>
> - Identification of all data sources used to verify and validate mine maps;
>
> - listing of all mine map repositories searched during the research process;

- procedures used to orient and locate nearby abandoned mine workings with respect to the proposed mine;

- a description of and results of field reconnaissance used to delineate mine workings;

- identification of all maps found in the search and relied upon to map abandoned mine working, including ID or catalog numbers, archive location, scale, and condition;

- site-specific information from local residents including names and addresses of persons providing information;

- local gas well or water well drill logs that may indicate the presence or absence of mine voids;

- underground mine inspection records;

- annual coal production report data, including mine opening date and last coal extraction;

- permit information cross-checks with the Bureau of Mining and Reclamation;

- mechanical, geologic, or geophysical testing used to verify the mine workings, such as vertical or horizontal drilling or geophysical surveying, an operational history of each adjacent abandoned mine including all ownership changes, dates of operation, dates when the mine was idle, date of mine closure, mine name changes, coal company name changes, and all permit identification numbers including an explanation showing that the map corresponds to the data found in the history;

- an explanation of how mine pool elevation data for each abandoned mine was determined;

- a discussion of how and why any disparities between sources of information were reconciled.

(Emphasis added).

In its "Subsidence Potential Review," Tetra Tech does not give nearly such an in-depth narrative but does state that several map repositories were searched and that the maps discovered "all indicated the same depiction of the mine workings under the planned pipeline area." (Page 6). The review also mentions that the maps were "georeferenced by PA DEP" but it is not clear what that entails.

The author says that although "the maps found were very detailed regarding the mining type and location of mining" there are still "a couple potential areas of uncertainty." p.9/42. For example, "at retreat mined areas we are not certain if all of the coal was removed and at an area shown as cross-hatched it was assumed that the area was solid coal but we are not certain of that." (Page 9).

In Attachment 2, neither the analysis of subsidence nor of stress on the pipeline mention which abandoned mine maps are used. This makes it difficult for the Department to verify the information presented. In the mine map portions used in figures in Attachment 2, there are no cross-hatched areas. It is difficult for the reader to know if that uncertainty may significantly impact the analysis or not. Sunoco should identify and include which maps were used to make its predictions, similar to the way it is suggested in the guidance.

Also, as is stated in the guidance, Sunoco should research and include the annual coal production report data which could answer the author's uncertainty regarding whether at retreat-mined areas, all of the coal was removed or not. This could potentially have huge impacts on the level of subsidence predicted. This is because, as the report states:

> Areas in between the caved production rooms and the large main entry support pillars or areas where the rooms were not retreated for whatever reason (poor mining condition, mine closures, etc.) have the highest risk of future subsidence since their pillars were not planned for long term support. In particular to the Cincinnati Mine, these medium sized pillars are the primary areas of concern regarding the potential for future subsidence.

LaModel Analysis of Subsidence Potential at 1.

It is also briefly mentioned that information was discovered which actually contradicts the information within the mine map. Yet there is no discussion of the basis for such a belief nor is there "a discussion of how and why any disparities between sources of information were reconciled" as the guidance suggests. The report merely states that:

> There are also a few areas where mining did not occur and solid coal remains. Those areas, if not mined as shown on the mine maps, should be safe from future subsidence. As previously discussed, due to potential inaccuracies in the mine map, the final mining plan cannot be guaranteed.

LaModel Analysis of Subsidence Potential at 2.

The report states that that "there are two primary areas of potential future subsidence" where the pipeline runs over areas that were fully retreat mined. However, it goes on

to say that - based on their "interpretation of seismic data" these areas were "not completely retreat mined" - despite what is shown on the maps.

Indeed, the report says that "Tetra Tech employed 3D seismic technology to gain a better understanding of the strata fracturing and anomalies at mine level. The subsidence model was run to reflect this information." Subsidence Potential Review at 7. But the reader is not privy to the 3D seismic data that was gathered, nor the analysis for arriving at such an interpretation. In order to understand whether the subsidence risk has been accurately assessed, Sunoco must submit additional data and explanation of its findings.

Subsidence Complaints

The Report gives contradictory information about the past history of subsidence complaints in the area that must be addressed. The GES Report states at page 8 that:

> A review of the PADEP on-line records revealed a mine subsidence complaint was filed with the PADEP in the area of interest on January 1, 2001. The subsidence complaint was mapped between Mingo Church and the HDD S1B-0120 drill path. However, the available records do not indicate if the complaint was the result of a change in well water quality/quantity or an actual subsidence event involving damage to homes or property.

Then, at page 6 of Attachment 2, the Report says that:

> There have been two subsidence incidents reported and investigated above the Cincinnati Mine. Both of those incidents were not found to be mining related. Thus, there have been no confirmed reported mining-related subsidence events over the Cincinnati mine in the past 40 years.

In all of these instances, there appears to have been no confirmation that the subsidence events were not mine-related. "[W]ere not found to be mining related" is different from "were found to be not mining related." It is unclear whether that was even investigated. This provides no comfort or assurance that similar incidents will not damage the pipes. Further clarification and discussion of subsidence complaints in the area should be submitted by Sunoco.

Open Trench Construction Subsidence Analysis

Throughout the Report, it is presumed that the pipeline will experience no stress in the portions that are constructed using trenchless methods. However, considering the damage that regularly occurs to aboveground structures from underground mine subsidence (this portion of the pipeline is in an area that the Department recommends homeowners should obtain subsidence insurance for) it seems clear that harms do not discriminate. There should be additional analysis of the stress on open trench

pipeline portions and recommendations given to reinforce the pipeline that will be laid using this technique.

There is no explanation given as to why it is believed that pipeline laid using open trench methods are immune to damage from subsidence. In one area which was estimated to subside about 8.6 inches, the Report just implies that it is no longer of concern because the new pipeline is "installed by open trench and falls outside the angle of draw for the Flexbor." It is difficult to imagine that the open trench method somehow shields the pipeline from breaking or stress due to subsidence. If that is believed to be true, Sunoco must include its reasoning for such a belief. Otherwise, the analysis must be conducted in a manner that includes modeling and analysis of stress to pipeline that is laid using open trench techniques.

Overall

The newly revised proposal is a marked improvement over the earlier HDD plan. However, considering that subsidence is predicted to occur here and, considering the gravity of harm that would occur if the pipeline were to stress or fracture, much more analysis should be done before the Department approves of this construction.

2. The Department should not approve plans that are only preliminary.

The new profiles for FlexBor drilling are stamped "PRELIMINARY DESIGN ONLY." It is unclear whether these are Sunoco's proposal to the Department or whether Sunoco intends to move ahead with plans that deviate from these designs. These plans are dated April 5, 2018, and there may be newer or final plans available.

In addition, the "Figure 3. Wheeling Lake Erie RR/Patterson Rd FlexBor Plan" illustrates an area marked "proposed permanent easement." This is in contrast to the area marked "permanent easement" in the companion plan, "Figure 2. State Route 88 FlexBor Crossing Plan." In the Alternatives Analysis section of the body of the Report itself, Sunoco wrote, "Furthermore, a CAB design at Patterson Road would require SPLP to acquire an additional permanent easement. The potentially affected private landowner has rejected all offers for an additional permanent easement, and therefore condemnation of the additional land would likely be necessary."

It is unclear what the "proposed permanent easement" area on Figure 3 indicates, but the context suggests that it may indicate an area where Sunoco does not yet have sufficient property rights to build the pipeline as planned. Sunoco's General Counsel has submitted a sworn statement to say that Sunoco has no need for further condemnation to build the 20″ pipeline.

Thus there are substantial questions about whether Sunoco's proposal is final, and whether it depends on landowner agreement that may not materialize. The Department should ask Sunoco about these issues before it approves the proposal.

Conclusion

For these reasons, there remain significant issues related to subsidence and finality of plans that are not adequately explored or resolved. Approval at this time would be premature and risky.

Thank you for considering these comments. Please keep us apprised of your next steps on this HDD Site. (2-6)
Letter – Clean Air Council – 5-25-18 – SR88 / Wheeling and Lake Erie Railroad Crossing