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Via Electronic Mail

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Sunoco Pipeline LP
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Re: Sunoco Pipeline LP ("SPLP") Twin Oaks – Newark 14" Diameter Pipeline Release
Upper Makefield Township, Bucks County, Pennsylvania –
Upper Makefield Township Board of Supervisors' Comments on Interim Site Characterization Report

The Upper Makefield Township ("UMT") Board of Supervisors ("BOS") provides the following comments on the Interim Site Characterization Report ("ISCR"), prepared by Verdantas LLC ("Verdantas"), for Sunoco Pipeline LP ("SPLP"). The ISCR was submitted to the Pennsylvania Department of Environmental Protection ("DEP") on September 2, 2025.

The Twin Oaks Pipeline ("pipeline") is a hazardous liquid pipeline facility that is subject to the authority of the United States Department of Transportation, Pipeline and Hazardous Materials Safety Administration ("PHMSA").

PHMSA confirms that the pipeline transports petroleum products, including jet fuel, diesel, and gasoline, from the Twin Oaks Terminal in Aston, Pennsylvania, to the Newark Terminal in Newark, New Jersey.

A failure of the pipeline was confirmed on January 31, 2025, which resulted in the release of regulated substances to the environment.

The ISCR was prepared pursuant to the Administrative Order ("AO") issued to SPLP on March 6, 2025. The AO defines the purpose of the ISCR as describing the nature, extent, direction, rate of movement, volume, and composition of regulated substances released into the environment from the pipeline in accordance with the remediation standards of Act 2, Pennsylvania's Land Recycling Program.

SPLP advises that, given the ongoing nature of characterization activities, additional investigation is needed before a remedial action plan can be developed.

The BOS acknowledges the iterative nature of the site characterization process and has therefore focused these comments on technical deficiencies and significant data gaps, with the expectation that the ISCR will be amended.

Comment No. 1 Volume of Release

On January 31, 2025, SPLP confirmed a leak location on the pipeline and notified the National Response Center ("NRC") of an estimated release amount of 156 barrels (6552 gallons).

SPLP reports that as of September 17, 2025, site remediation activities have recovered approximately 16 percent of the estimated release from entrained soil from the excavation, and Light, Non-Aqueous Phase Liquids ("LNAPL"), recovered from domestic supply wells and recovery wells, with a diminishing rate of LNAPL recovery.

The ISCR is technically deficient because the report does not describe the means, methods, and procedures used to determine the volume of the release. The ISCR should be amended to include this information.

Comment No. 2 Composition of Regulated Substances Released to the Environment

The ISCR identifies the regulated substances released from the pipeline as Jet-A aviation turbine fuel.

Forensic Hydrocarbon Analysis is readily available and is an industry-accepted best practice to identify extractable petroleum products in environmental samples for comparison with the laboratory's petroleum standard reference library. In this circumstance, forensic hydrocarbon analysis is indicated due to the variety of petroleum products, including diesel and gasoline, transferred via the pipeline, since the pipeline was constructed in 1958.

The ISCR is technically deficient because the report does not include a forensic hydrocarbon analysis of the Light, Non-Aqueous Phase Liquids ("LNAPL") obtained from recovery wells adjacent to the release area, and residential wells impacted with LNAPL, confirming that the release is, in fact, Jet-A aviation turbine fuel.
Section 4.3 of the ISCR, Extent of LNAPL, advises that LNAPL observed at one property on Spencer Road did not appear to be Jet-A based on visual appearance and odor of the recovered LNAPL. If forensic hydrocarbon analysis was performed on LNAPL from this property, the data should be provided in the amended ISCR.

SPLP advises that LNAPL recovery continues from recovery wells on Glenwood Road and from a supply well on Walker Road. Forensic hydrocarbon analysis should be performed on recovered LNAPL from these wells, with the results reported in an amended ISCR.

SPLP has presented its refusal to include the forensic hydrocarbon analysis from the ISCR as an exercise of its right to maintain privilege over an expert report prepared in anticipation of litigation. Pa.R.C.P. No. 4003.5(a)(3). That privilege, though, extends only to reports prepared in anticipation of

litigation or in preparation for trial. The privilege *does not* extend to expert reports prepared by regulatory mandate, even in the context of collateral civil litigation. SPLP should be aware of this principle since it litigated it as recently as 2023 in Cardinal Mainstream II, LLC v. Energy Transfer LP, 295 A.3d 284 (Pa.Super.2023) where the Superior Court held:

> Pursuant to [provisions of DEP Enforcement Statute, Public Utilities Code, and Code of Federal Regulations], ETC was directed to retain experts to compile reports assessing why a section of its pipeline exploded in Beaver County in 2018. These directives required ETC to compile reports analyzing the cause of the incident regardless of the prospect of litigation... Thus, because the reports were produced by experts retained by ETC in response to government directives, the reports were not privileged work product under Rule 4003.5(a)(3).

Id. at 291-92, internal citations omitted.

Comment No. 3 Regional Hydrogeology, Inferred Groundwater Flow Directions

The ISCR advises that regional groundwater flow is expected to be eastward, based on recharge-discharge relationships, and references the work of Lewis (1992), that groundwater flow in Triassic basin rocks may be skewed in the direction of bedrock strike (northeast/southwest).

However, actual lines of equal head, calculated from water level elevation measurements made in the shallow monitoring well network, completed at the time of the ISCR submittal, indicate groundwater flow to the southeast.

Groundwater flow direction for deeper monitoring wells in the network, completed at the time of the ISCR submittal, was not presented in the ISCR.

The ISCR is technically deficient because the groundwater flow direction has not been adequately determined, given a reasonable degree of scientific certainty. It is understood that a water level monitoring Work Plan is under development.

The BOS concurs with the DEP's recommendation that data logging pressure transducers should be installed in monitoring well clusters MW1S/D through MW-10S/D, recovery wells RW-1 through RW-4, and the former domestic potable well located on the property at 108 Spencer Road.

The BOS also recommends that data logging pressure transducers be installed in any additional monitoring wells, recovery wells, or domestic wells converted into monitoring wells, or recovery wells in the future, and that water level monitoring, using data logging pressure transducers, be continued throughout the site characterization, with the data being presented in an amended ISCR.

Comment No. 4 Vertical Hydraulic Gradient

The results of packer testing at the inactive supply well at 108 Spencer Road indicate a strong downward vertical flow gradient throughout the well from the bottom of the casing (24.8') to the total

depth of 460 ft (Appendix N-1 Table 3). The packer testing of this well also identified contaminants related to the pipeline release in samples collected from every tested interval.

The ISCR provides additional data indicating a potential pathway for groundwater impacts greater than 75 feet (the approximate depth of "deep" monitoring wells):

These data include:

- The presence of LNAPL in a supply well on Walker Road in close proximity to the release.
- Extensive vertical fracturing observed in geophysical logs from the inactive supply well at 108 Spencer Road.

This potential contaminant migration pathway may be enhanced by the pumping of domestic water supply wells in the Investigation Area with total depths often exceeding 400 feet, with deep pumping levels. Groundwater deeper than 75 feet should be further evaluated through the installation of additional monitoring wells and through the evaluation of domestic supply wells as described in the following section.

Comment No. 5 Domestic Well Characterization

The Triassic-aged Lockatong Formation underlies the Investigation Area. The bedrock aquifer system ranges from poor to marginal yielding.

The Preliminary Conceptual Site Model ("CSM") acknowledges that the variable pumping of domestic water supply wells in the Investigation Area creates dynamic hydraulic gradients in water-bearing fractures, which are the predominant pathways for groundwater movement.

The ISCR is technically deficient because it does not evaluate the impact of pumping domestic wells on the extent, direction, and rate of movement of the regulated substances released into the environment from the pipeline release.

The BOS recommends that the following be incorporated into the ongoing site characterization process to address this significant data gap:

- An inventory of all domestic supply wells in the Investigation Area, including date drilled, well depth, casing length, casing stickup, yield at time of drilling, pump setting, pump type, non-pumping water level, pumping water level, and treatment.
- Conduct borehole geophysical logging and straddle packer testing on the LNAPL impacted supply well on Walker Road, in close proximity to the release area.
- Conduct borehole geophysical logging and straddle packer testing and on not less than three other domestic supply wells in the Investigation Area. The wells should be located up dip, down dip, and along strike. Transducers should be installed above, between, and below each interval to determine the distribution of hydraulic head in the formation adjacent to the well. Data logging pressure transducers installed in the monitoring well network, recovery wells, and converted domestic supply wells should be activated during the packer testing to log water level changes in response to pumping of each isolated interval. Water samples

should be obtained from each isolated interval to determine the vertical distribution of dissolved-phase contaminants.

The data generated from these activities should be included in an amended ISCR.

Comment No. 6 LNAPL Recovery and Extent of LNAPL

The ISCR states that recovery wells were installed to facilitate LNAPL recovery associated with the pipeline release, and that the locations of the recovery wells were informed by geophysical surveys and LNAPL observations and analytical results from domestic supply well sampling.

SPLP reports that as of September 17, 2025, two recovery wells, RW-1 and RW-4, have recovered no LNAPL. This finding confirms that at this stage of the site characterization, the extent of impact is not known and additional investigation is warranted.

Therefore, SPLP's opinion that the lateral extent of LNAPL is shrinking can not be supported given the available data.

Comment No. 7 Alternative Water Feasibility Study

Groundwater is the sole source of water supply for residents of the Mt. Eyre neighborhood.

On September 22, 2025, in a public meeting format, residents of the neighborhood commented that Point-of-Entry Treatment ("POET") systems are not a long-term water supply solution for the neighborhood and requested that the BOS approve the allocation of Township funds to conduct a Feasibility Study to evaluate the construction and operation of a community water supply system.[1]

The study will evaluate the development of a complete water supply system to include one or more high-yielding supply wells, a water storage tank, a booster station, disinfection and treatment facilities as required. A system of water mains in the streets would distribute water to residences. The water mains and hydrants would also provide a nearby source of water for fire protection.

The Township currently operates similar community water supply systems serving the Enclave, Heritage Hills, and Traditions subdivisions.

The BOS commissioned the Feasibility Study during the October 7, 2025, BOS meeting.

This study is pertinent to the ISCR because one of the potential areas that may be considered for the installation of one or more high-yielding water supply wells to supply the community system is the vacant parcel owned by the Township, northwest of the release area.

Preliminary design calculations are based on 200 parcels with a demand of 83 gallons per minute. To account for dry period reductions, a well or wells capable of supplying 100 gallons per minute would be required.

[1] Despite multiple requests, SPLP has refused to fund the feasibility study.

It is proven science that high-yielding production wells in the Lockatong Formation develop extensive cones of depression to maintain required yields, especially during periods of low groundwater recharge.

Ongoing site characterization and remedial activities should consider the potential for the cone of depression of a well or wells, installed on the Township's vacant property, to encounter LNAPL or impacted groundwater as a result of the pipeline release.

Comment No. 8 Potential Migration of Contaminants to Residential Septic Systems

The Township's consulting engineer advises that residential septic systems, in the Investigation Area, utilize septic tanks to contain waste solids, while waste fluid is discharged to seepage beds.

It is a reasonable assumption that dissolved phase contaminants, contained in groundwater, pumped from impacted supply wells, prior to the installation of POET systems, would have introduced contaminants to on-lot seepage beds.

The ISCR provides no evidence to support SPLP's hypothesis that contaminants that flowed into septic systems would have been adsorbed by the organic material in the septic tank.

The ISCR should fully evaluate SPLP's hypothesis and the potential for groundwater impacts from seepage beds.

Comment No. 9 Precipitation and Groundwater Recharge

Groundwater recharge to wells drilled in the Lockatong Formation, including domestic supply wells, monitoring wells and recovery wells, is derived from infiltration of precipitation.

As such, interpretations and conclusions relative to the nature, extent, direction and rate of movement of LNAPL, and groundwater impacted by dissolved phase regulated substances, from the pipeline release, should consider the seasonality of precipitation in southeastern Pennsylvania, and corresponding groundwater recharge rates.

SPLP advises that groundwater monitoring will be performed on a quarterly schedule to address this data gap.

The BOS requests that SPLP provide the Township with copies of quarterly groundwater monitoring data throughout the site characterization process.

The BOS appreciates the opportunity to provide these comments on the ISCR and looks forward to receiving technical and administrative updates from SPLP and DEP as the site characterization progresses.

Gregg Schuster
Upper Makefield Township Manager