

INTRODUCTION

We, the members of the Forty-Fifth Statewide Investigating Grand Jury, having received and reviewed evidence regarding allegations of violations of the Clean Streams Law and related laws, occurring in various counties in Pennsylvania, pursuant to Notice of Submission of Investigation Number 56, do hereby make the following findings of fact, conclusions, and recommendation of charges.

FINDINGS OF FACT

This presentment arises from an investigation of environmental crimes that occurred during the installation of the Mariner East 2 Pipeline in the Commonwealth of Pennsylvania. Sunoco Pipeline L.P was the permittee for the pipeline project and in turn hired multiple contractors to oversee the construction. Because of the size of the project, it was divided into six “spreads” within Pennsylvania, with each spread spanning a particular geographical region of the project. Each spread had its own prime construction contractor, who was then in charge of finding subcontractors to handle portions of the project.

Spread 1 covered the westernmost portion of the project and included Washington, Allegheny and Westmoreland counties. Spread 2 included Indiana and Cambria counties. Spread 3 covered Blair, Huntingdon, Juniata and Perry counties. Spread 4 included Cumberland, York and Dauphin counties. Spread 5 spanned Lebanon, Lancaster and Berks counties. Finally, spread 6 included Chester and Delaware counties.

Environmental laws exist to hold various industries accountable for activity that causes pollution—whether to the soil or to the water or to the air. These laws exist to ensure that all citizens of Pennsylvania are able to enjoy their constitutional right to clean air and pure water.

The Grand Jury finds that Sunoco criminally failed to properly report and address the environmental hazards created by its operations during the entirety of the pipeline project.

I. A Description of the Company: Sunoco

Sunoco Pipeline, L.P. was originally incorporated in 1902 and is based in Williamsville, New York. The company is a diversified energy company with \$6.2 billion in assets. The focus of the company is divided into five segments: exploration and production, pipeline and storage, gathering, utility, and energy marketing. Sunoco Pipeline is a subsidiary of Sunoco Logistics Partners, L.P. In 2017, Sunoco Logistics merged with Energy Transfer Partners, L.P. Energy Transfer Partners began in 1996 as a small intrastate natural gas pipeline operator in Texas. Over time and through acquisitions, ETP became a leader in various segments of the energy industry. Its current assets include more than 4,800 miles of pipelines with an aggregate transportation capacity of more than 3,000 million barrels per day (MBbls/d). The pipeline assets transport natural gas liquids (NGLs) across Texas, as well as from the Marcellus and Utica Shales, which run through Pennsylvania, to the Marcus Hook Industrial Complex on the Delaware River. At the end of 2020, the company had the capacity to export just over 1 million barrels of NGL per day.

II. A Brief Primer on Pipeline Installation and Horizontal Directional Drilling

Pipelines are utilized across the Commonwealth for a variety of purposes. They are classified by the type of product they are carrying. “Gathering lines” transport unprocessed natural gas from a well pad to a compressor station or other facility to process the gas. “Transmission lines” move the processed gas to various distribution companies. Transmission lines can span thousands of miles and may be pressurized to between 200 and 1,500 pounds per

square inch (psi). Once the natural gas reaches the distribution company, an odorant is introduced and the pressure is reduced to a distribution level, which is between .25 and 200 psi. “Distribution lines” then transport the gas to consumers.

These various pipelines form a complex spiderweb underneath the ground of Pennsylvania. Natural gas companies are often replacing older lines or installing additional pipeline to transport product across the Commonwealth. In order to install new pipeline or replace older sections, a company must employ one of two methods: trenching or tunneling. Trenching involves using earthmoving equipment to dig out a ditch. Once the trench has been dug, the pipe can be laid inside and covered with earth. The tunneling method is usually used in more heavily populated areas, as it can cross a road or a waterway underground without disturbing the surface. The tunnels are constructed by drilling underground in a horizontal direction, which is most commonly accomplished by a process known as horizontal directional drilling (HDD).

Horizontal directional drilling employs high pressure fluids that help to cut through the rock. The drill follows a path underground that must be carefully surveyed in advance. Various instruments can be utilized to ensure that the drill is following the correct path as it is steered underground. The drilling fluid is often composed of water and bentonite clay as well as other additives that the drilling company determines are necessary. According to one driller who testified before the Grand Jury, the drilling fluid is “the blood or the life line of the drill.” The fluid helps to lubricate the drill bit, but it can also harden and aid in keeping the hole open. The drilling fluid also assists in carrying the drill cuttings out of the hole, because the fluid flows back up and out of the tunnel along with the cuttings made by the drill bit. The fluid is then treated to remove the solids so that it can be injected back down into the drill path.

HDD is the chosen technique to reduce or avoid environmental impacts on the surface of the land. However, when the drilling does not go according to plan, environmental impacts do occur. A professional geologist explained that drillers must pay very close attention to the pressure of the drilling fluid. He explained that the pressures used are so high that they can fracture rock, and therefore must be closely monitored. Fluid can enter a small fracture and “blow that fracture open and continue to follow that fracture for as long as it can, sort of like a pressure relief valve.” The result is a “loss of returns” or “loss of circulation.” Instead of returning to the hole’s entrance to be treated and reused, the fluid disappears into the formation through fractures or voids in the rock that are naturally occurring or the result of prior mining activity. The fluid can also travel through underground water and ultimately end up in drinking supplies. In addition, drilling fluid can also spill out onto the surface. Because of the potential impacts to lands and waters of the Commonwealth, these incidents have to be reported to the Pennsylvania Department of Environmental Protection pursuant to general regulations and the specific permits that authorize the drilling project.

A drilling company can try to prevent such leaks and spills by increasing the viscosity of the drilling fluid. However, this is not foolproof. As a witness testified, “if there is enough water present in the ground, it is going to thin out our drilling fluid,” which then allows it to flow into smaller fractures and travel through the aquifer.

When drilling fluid fails to return to the mouth of the tunnel, the drilling company will send men to walk along the drill path to see if they can find the leak. Regardless of whether fluid comes to the surface, however, it can create significant environmental impact. The Grand Jury heard testimony from Steven Brokenshire, an Environmental Group Manager for DEP’s Bureau of Program Planning and Management, who oversees the Mineral Resource Program Specialists.

He stated that often, the fluid that gets lost below the surface can find its way into private water wells. He noted that the majority of Pennsylvanians get their water supply from private water wells that are drilled into a groundwater source. Ideally, the fluid that is forced into the borehole will remain in the hole, pick up rock cuttings, and travel back up the borehole and into the drilling pit. But the fluid will take the path of least resistance. If that path is a fracture outside of the borehole, the fluid will follow it. Brokenshire explained that a water well is sometimes that least resistant pathway.

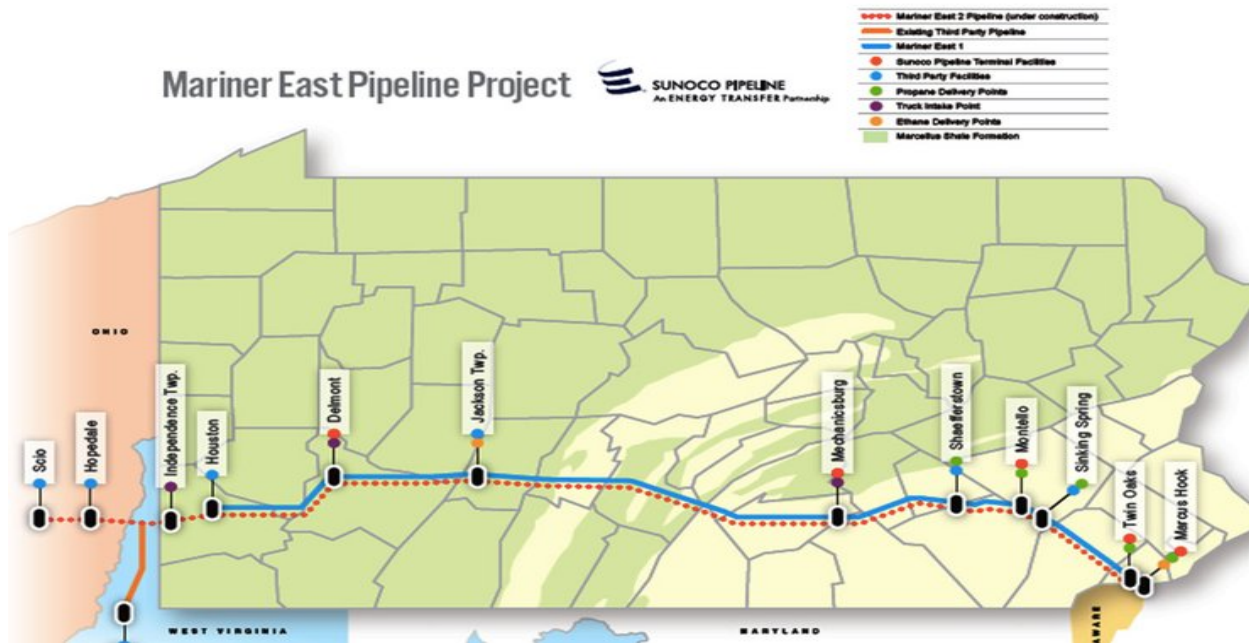
A loss of returning fluid can also be a sign of an “inadvertent return” – industry nomenclature for drilling fluid that does not remain underground, but makes its way to the surface. Fluid can surface in wetlands or in bodies of water, or even in more elevated “uplands.”

The impact of an inadvertent return or a loss of circulation can be compounded by the type of additives used during the drilling process. The Grand Jury learned that additives approved by DEP for use during the HDD process are also used in the drilling of water wells, which presumably makes them safe for consumption if they should happen to get into a drinking supply. The industry certification for products approved for use in the drilling of water wells is called NSF/ANSI 60. The bentonite that is used in drilling fluid for HDD projects is NSF/ANSI 60 certified. Some of the additives used by drillers during this pipeline project, however, were not on DEP’s approved list of additives. In addition, some of these uncertified additives were considered “proprietary,” meaning that drillers are not required to divulge the nature of the chemicals being injected into the ground, and potentially into wells, lands, and bodies of water.

III. The Mariner East 2 Pipeline Project

Sunoco sought approval to construct a new pipeline to transport natural gas liquids from Ohio and the Pittsburgh area to the Marcus Hook facility in Delaware County. The proposal was

for the new pipeline to run generally along the same location as an existing pipeline, Mariner East 1. The new pipeline would traverse 17 counties in the southern tier of Pennsylvania. Along much of the route, the project would actually include two new pipelines, a 16-inch line and a 20-inch line. The route spanned more than 300 miles.



The project proposed that most of Spread 1 (Allegheny, Washington and part of Westmoreland Counties), would include only installation of a 20-inch pipeline. Over the remainder of the Spreads (part of Westmoreland, Indiana, Cambria, Blair, Huntingdon, Juniata, Perry, Cumberland, York, Dauphin, Lebanon, Lancaster, Berks, Chester and Delaware Counties), the project would include installation of the 20-inch line followed by the 16-inch line.

In order to move forward on this project, various permits were required. Sunoco sought three kinds of permits: Water Obstruction and Encroachment Permits under Chapter 105 of DEP’s regulations, which are specific to each county that the project would traverse; an Erosion and Sediment Control Permit under Chapter 102 of the regulations, for each DEP region through

which the pipeline traveled; and a general permit for discharges from hydrostatic testing of tanks and pipelines under the National Pollutant Discharge Elimination System. Additionally, Sunoco submitted requests for approvals for modifications to and additions of pump stations, and for other activities, that are subject to federal and state air regulations.

The Chapter 102 and Chapter 105 permit applications were originally submitted to DEP in the summer of 2015. Thus began a time-intensive review process. DEP deemed the applications “administratively complete” by June 2016. At that time, DEP opened up the applications to a public comment period which included five public hearings held across the Commonwealth. The comment period ran from June 25, 2016 through August 24, 2016. After additional back-and-forth between the Department and Sunoco, the final permits were issued on February 13, 2017.

As a condition of the final permit, DEP required Sunoco to station licensed professional geologists at each HDD site. Witnesses from DEP testified that the reason for this additional layer of oversight was to ensure that issues at these drills could be addressed before they resulted in environmental harm. That precaution, however, did not function as intended. The Grand Jury learned that, although these geologists completed daily reports of their observations, the reports were not turned over to DEP. Desiree Henning Dudley, the Environmental Group Manager for the Waterways and Wetlands Program of DEP’s South Eastern Regional Office, testified that her program could have used a full time geologist just to review these daily reports, which were full of information about losses of circulation and inadvertent returns. She stated that “[i]n my mind, that expertise would have been key in having on my team in order to oversee these types of records for these kinds of activities.”

DEP, however, was not provided the resources to employ such additional expertise – nor did it fully respond to that reality. Mariner East 2 was a massive construction project that literally

spanned the state. It was thus beyond the scope of previous oversight efforts. The lack of geologists to review records from HDD locations was just one manifestation of the difficulty. DEP was also in need of other personnel, such as inspectors to patrol the spreads to oversee the actual construction process. The various regions made up for this by “borrowing” employees from other programs within DEP, and from County Conservation Districts. Yet no special training was provided to this borrowed staff, or to agency employees who had limited institutional knowledge of the HDD process itself. As a result, DEP could not be everywhere it needed to be on a project of this unprecedented magnitude.

IV. Work Begins on the Mariner East 2 Project

Once all the permits had been acquired, work across the various spreads of the project began. Sunoco dispatched prime contractors to each spread to begin the work of preparing the ground for the placement of the pipeline. Each prime contractor in turn hired subcontractors to complete the portions of the project that required horizontal directional drilling. Evidence before the Grand Jury established, however, that Pennsylvania lacked a sufficient number of HDD contractors for the job. A DEP witness testified to

Sunoco's desire to get under construction quickly. And given the number of HDDs that they planned for on this project, they were searching high and low for any HDD driller across the country who could come and work on the pipeline in order to get it done as quickly as possible.

As a result, Sunoco and its prime contractors hired HDD subcontractors from across the country who were unfamiliar with Pennsylvania geology and water features as well as the regulatory landscape that existed in the state. The subcontractors applied their standard practices to an unusual environment, which resulted in environmental impacts.

V. And Problems Follow Almost Immediately

Before the project began in late winter/early spring of 2017, Sunoco representatives had assured DEP that the horizontal directional drilling process it planned to employ would avoid the environmental impacts of conventional pipeline construction because the work would all be in underground rocks. A former Sunoco employee, however, testified before the Grand jury that such an assurance never should have been made, as the geology in Pennsylvania includes fractured rock that can lead to environmental impacts from the HDD process. In addition to the problematic geology, this former Sunoco employee indicated that the people hired to do the work were young and with limited actual experience. Leaks and spills of drilling fluid began to occur almost immediately.

VI. Problems at Specific Locations

The Grand Jury reviewed professional geologist logs, drill logs and other documentation related to 21 specific locations along the pipeline project. The Grand Jury also heard testimony from two Professional Geologists employed by ARM Group, LLC, a science and engineering firm. ARM Group, LLC was retained to review the professional geologist and drilling logs related to these specific locations in order to give an accounting as to the breadth and depth of the environmental incidents that took place.

a. **Raystown Lake**

Raystown Lake is a large recreational lake in Huntingdon County that was first constructed between 1907 and 1912 for hydroelectric power, and was later expanded with the construction of a second dam in 1973. A section of the pipeline was to be routed directly underneath the lake for a distance of 2,100 feet.

Construction on the 20-inch pipe began in March 2017 with Laney Directional Drilling as the subcontractor. In May, however, the drilling equipment broke, and Laney began cleaning up the site to prepare for shutdown over the summer recreation season. During the roughly two months that Laney was on site, the contractor lost circulation—meaning drilling fluid and its additives flowed outside of the drilling path—eight separate times. None of these incidents were reported to DEP, as required. The volume of fluids lost during these eight incidents totaled roughly 780,000 gallons.

Once the recreational season ended and drilling could recommence, work was taken over by a new subcontractor, Michels Directional Drilling. This time drilling was completed, and the 20-inch pipe was installed by the end of October. During this period, Sunoco reported one loss of circulation to DEP on October 12, 2017, but did not report the amount of fluid lost. Work began on the parallel 16-inch line on November 16, 2017. Sunoco reported another loss of circulation on December 11, 2017, a loss of 2,000 gallons. Work continued until December 20, 2017. This time, drilling fluid flowed directly into the lake. The drill was shut down so that DEP could investigate. DEP issued a “Notice of Violation” on December 22, 2017 for the leak, *i.e.*, “inadvertent return.”

Investigation revealed that Michels had lost drilling fluid 22 different times during the drilling of the 20-inch line and another nine times during work on the 16-inch line. The contractor reported these losses to Sunoco, but Sunoco only reported two of them to DEP. The volume of fluid lost totaled close to 3 million gallons.

In an April 24, 2019 letter to DEP, Sunoco claimed that, due to inadvertent miscommunication, its management never learned of the losses of fluid.

Evidence before the Grand Jury indicates that this claim was false. The project manager for Michels, the HDD subcontractor, stated that if something was not reported on this drill, it is not because people were not there to see it. The Construction Manager for the spread testified that it is “preposterous” for someone to imply that Sunoco’s environmental team was unaware.

DEP directed Sunoco to investigate the lake bottom to determine whether or not any of the lost fluids were present. Divers collected samples to analyze for the presence of bentonite, the main additive in drilling fluid. Out of 576 samples collected from the lake bottom, 168 confirmed the presence of bentonite. The total area of the lake bottom on which the bentonite lay was estimated to be approximately 3.67 acres. Subsequent imaging showed that in some areas the bentonite was almost 2 feet deep.

After a hiatus of more than two years, drilling recommenced on January 29, 2020. The pipeline was installed in April 2020, this time without further leaks. ARM Group LLC reviewed the logs and found thirty one instances of losses of circulation on these drills and one inadvertent return. Many of the losses of circulation were not reported to DEP.

b. Loyalhanna Lake

Loyalhanna Lake is a large recreational lake in Westmoreland County. A section of the project was designed to cross below the lake with both 16- and 20-inch pipelines. Lone Star Drilling began work on the 20-inch pipeline in May

2017. The drill experienced a loss of circulation at 9:40 a.m. the very next day. But drilling continued, and within two hours an inadvertent return was observed. Multiple leaks were then discovered at various locations along the eastern side of the lake. In spite of these leaks, drilling continued, and the following day fluid spilled into the lake itself. Drilling still did not stop. On subsequent days, more fluid losses occurred, and more fluid was observed within the lake. Lone Star began using a more viscous drilling fluid, but still lost circulation, and leaks were detected throughout the park area. The problems continued until a relief well was drilled in June 2017 in the hope that some of the lost fluid would flow into the hole, but the fluid overflowed, and there were additional spills into the lake in July, when the 20-inch pipe was finally installed. DEP issued a Notice of Violation for eight different inadvertent returns.

Sunoco was permitted to begin work on the parallel 16-inch pipeline in March 2020, using subcontractor Michels. Losses of circulation occurred on March 16 (1,000 gallons), March 17 (2,000 gallons), and March 19 (650 gallons), April 3 and April 7 before the work was finally completed on April 11, 2020. ARM Group, LLC reviewed the logs and found twenty four instances of losses of circulation on these drills and twenty three inadvertent returns. Most of these losses of circulation were not reported to DEP.

c. Marsh Creek Lake

Marsh Creek Lake in Chester County is another of Pennsylvania's large recreational lakes with fishing and boat rentals offered for visitors. A section of the project was designed to install 20- and 16-inch pipeline underneath Milford,

Little Conestoga and Highview Road as well as an unnamed tributary that flowed to Marsh Creek and some wetlands in the area. The tunneling would run through a residential area, and very close to Marsh Creek Lake.

Drilling began in May 2017, with Mears Group, Inc. as the HDD subcontractor. On June 19, 2017, fluid was lost and the borehole partially collapsed. The following day, 22,113 gallons escaped. Losses continued. A geologist reported at the time that “approximately 42,000 gal of [drilling fluid] mud have been added to the borehole with no returns,” meaning that all the fluid escaped. The next day the report concludes: “Consistent mud loss. No estimate available.”



Photo taken by Lieschen Fish, PG with GES, Inc.

At the same time, fluid emerged from the ground and spilled out into a wetland, resulting in an estimated loss of 200 gallons. This inadvertent return contaminated both the wetland and an unnamed tributary of Marsh Creek Lake. Another leak occurred in August. DEP issued a Notice of Violation for that leak, but two weeks later there was another leak in the same spot. Installation of the 16-inch pipe was completed in November.

Drilling for the 20-inch pipeline began in February 2020, with Michels as the HDD subcontractor. In March, 500 gallons of fluid escaped, and a week later it happened again.

After a work stoppage for COVID-19, drilling resumed in May, but by June fluid was again escaping, eventually totaling approximately 4,600 gallons in a single day. Fluid losses occurred for the next four days: 4,784 gallons; then 6,400 gallons; then 2,250 gallons; then 2,000 gallons.

Drilling continued until August 2020 when fluid emerged from the ground and spilled into Park Cove and nearby wetlands with the estimated loss of approximately 7,712 gallons of drilling fluid. Sunoco estimated approximately 400 gallons escaped into Marsh Creek Lake, but a DEP engineer calculated the loss to actually be between 21,000 and 28,000 gallons. The location was almost exactly the spot where a leak had occurred three years earlier. Aerial photographs show the spread of the drilling fluid plume outward from Park Cove after the fluid was carried into the lake by the water flowing through the unnamed tributary.



Shortly thereafter, drilling was suspended; it took 100 to 150 people to contain and clean up the spread of the fluid. Drilling at the site remains in limbo at the present. ARM Group, LLC reviewed the logs and found eighteen instances of losses of circulation on these drills and five inadvertent returns. Many of these losses of circulation were not reported to DEP.

d. Lisa Drive

Drilling at this location in Chester County was designed to travel underneath the Exton Bypass, Norfolk Railroad, Amtrak Railway, and in close proximity to a wetland and a neighborhood. Drilling began in April 2017 with Oz Directional Drilling as the HDD subcontractor, but the borehole soon began to fill with groundwater. Work was temporarily halted, but started again in late June; by

July, operators realized that drilling fluid was escaping. Drillers decided to give up on the tunnel and start a new one, but fluid escaped there too. In October, drilling fluid emerged from the ground at 479 Lisa Drive.



In November there was another leak, causing approximately 500 gallons of drilling fluid to flow downhill toward 475 Lisa Drive. At the same time, a three-foot wide, two-foot deep sinkhole also opened up at 479 Lisa Drive.



DEP issued a Notice of Violation for the leaks, spills, and subsidences.

While drilling was paused, the subsidence at 479 Lisa Drive expanded to nine feet wide by 9.5 feet long and 3.75 feet deep. Drilling resumed in February 2018, and a 16-inch pipe was pulled into place. But in March, another sinkhole developed, at 491 Lisa Drive, down the road from the initial sinkhole. DEP approved Sunoco's request to forego the HDD process for the installation of the 20-inch pipeline and to instead utilize open trench and direct bore technologies. ARM Group, LLC reviewed the logs and found twelve instances of losses of circulation on these drills and three inadvertent returns. Most of these losses of circulation were not reported to DEP.

e. Glen Riddle

The Mariner East Pipeline cuts through the common parking areas of Tunbridge Apartments and Glen Riddle Station Apartments. These two apartment complexes are situated less than a quarter mile from each other on opposite sides of Glen Riddle Road in Middletown Township, Delaware County. A wetland, leading to Chester Creek, flanks Tunbridge Apartments on the south. About a tenth of a mile north of Glen Riddle Apartments, the pipeline runs beneath the SEPTA railroad tracks.

The original design required HDD installation of a 16-inch and 20-inch pipeline in this densely populated location. The driller subcontractor, Oz, began drilling a 16-inch pipeline in June 2017. A little over one month later, Sunoco reported the first inadvertent return after discharging 1,500 gallons of drilling solution into a nearby stream. During 2017, Sunoco reported a number of inadvertent returns that emerged

either into the surrounding waterways or onto the ground, totaling approximately 1,800 gallons. DEP issued three Notices of Violation to Sunoco in 2017. In requesting permission to restart drilling, Sunoco acknowledged that the recurring inadvertent returns likely resulted from the impact of the HDD on the underlying fractured geology at the site.

After drilling resumed in April 2018, so did the inadvertent returns, beginning with 150 gallons emerging on land at the Tunbridge Apartments. The next day, a third party informed DEP of another inadvertent return, totaling 8,000 gallons. During the next five days, Sunoco notified DEP of three additional inadvertent returns that emerged on the grounds at Tunbridge Apartments. When drilling hit the water table, DEP shut down the drill site and issued a Notice of Violation for the inadvertent returns; for failing to file timely reports, and for failing to notify the Department of the 8,000-gallon inadvertent return. DEP then recommended new geophysical surveys “to ensure the safety of residences, utilities, and waterways.”

Drilling resumed in May 2018, immediately triggering inadvertent returns into a stream and onto the landscaping of Tunbridge Apartments. Four days later, another inadvertent return emerged, discharging 50 gallons of drilling fluid into the landscaping of Tunbridge Apartments. When drilling resumed four days later, so did the inadvertent returns, both into a Chester Creek tributary and onto the grounds of Tunbridge Apartments. Notwithstanding the ongoing inadvertent returns, Sunoco finally completed the pilot hole drilling on May 24, 2018. Reaming, the next phase of drilling, began on June 1, 2018; Sunoco continued to manage the ongoing inadvertent returns that originally surfaced during the pilot hole drilling. In July, four inadvertent returns occurred, discharging about 200 gallons of drilling fluid into the adjacent

wetland. In the weeks that followed, Sunoco's HDD activities resulted in 16 inadvertent returns, totaling approximately 900 gallons of discharged drilling fluid into the adjacent wetland, surrounding streams, and onto land.



In August 2018, a twelve-foot-deep, four-foot-wide hole appeared in the wetland and another similar hole of unknown depth appeared in the middle of the Tunbridge Apartments parking lot the following day. On October 3, 2018, DEP approved Sunoco's requested change in methodology to complete a shortened HDD installation of a segment of the 16-inch pipeline, which triggered additional inadvertent returns.

During a little over a year of drilling at the site, Sunoco’s retrospective analysis revealed inadvertent returns totaling approximately 11,000 gallons of drilling fluid impacting the wetland, nearby waterways, and the Tunbridge grounds. It took eight months of work to clean up and restore the impacted areas around Tunbridge Apartments.

Sunoco thereafter agreed to abandon its HDD methodology entirely at this site and instead to employ a variety of other pipeline construction methodologies, including conventional open trench, conventional auger bore, and direct bore to complete the installation of the 16-inch and 20-inch pipelines through the Tunbridge and Glen Riddle Station Apartment complexes. Construction is ongoing. ARM Group, LLC reviewed the logs and found thirty four instances of losses of circulation on these drills and thirty nine inadvertent returns. Most of these losses of circulation were not reported to DEP.



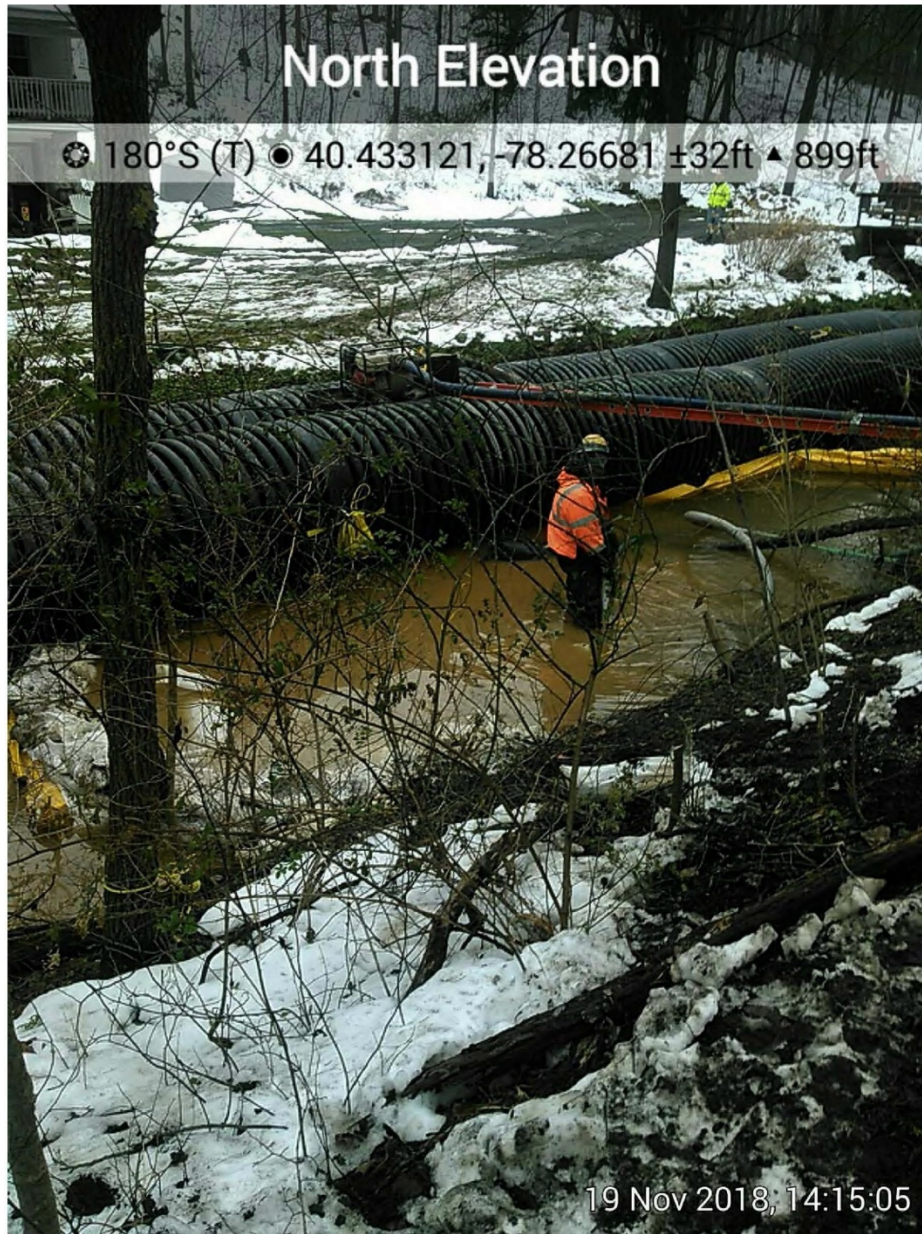
f. Piney Creek

This drilling site is located in Woodbury Township, Blair County and was designed to travel under a wetland, a road and a portion of Piney Creek. Drilling at this location was conducted by Blacklick Drilling and commenced in May 2017. Within two weeks, approximately 6,000 gallons of drilling fluid was lost. Higher viscosity bentonite was injected into the borehole in an attempt to seal off any pathways through which the fluid was leaking, but tens of thousands of gallons continued to escape.

Drilling halted for two months, and a different subcontractor, Michels, was brought in as the driller. By October 2018, however, drilling fluid was observed in two springs, one of which flowed directly into Piney Creek. DEP issued a Notice of Violation.

Drilling continued, but so did the inadvertent returns into Piney Creek. DEP issued another Notice of Violation, but the cycle repeated, with more fluid flowing into waterways, over and over for several weeks.

Sunoco began installing pipes in Piney Creek in order to divert all of the water out of the stream and around the areas where the fluid was surfacing within the stream.



But leaks continued in the creek bed and in areas nearby on an almost daily basis.

A 20-inch pipe was ultimately pulled into place in December 2018.



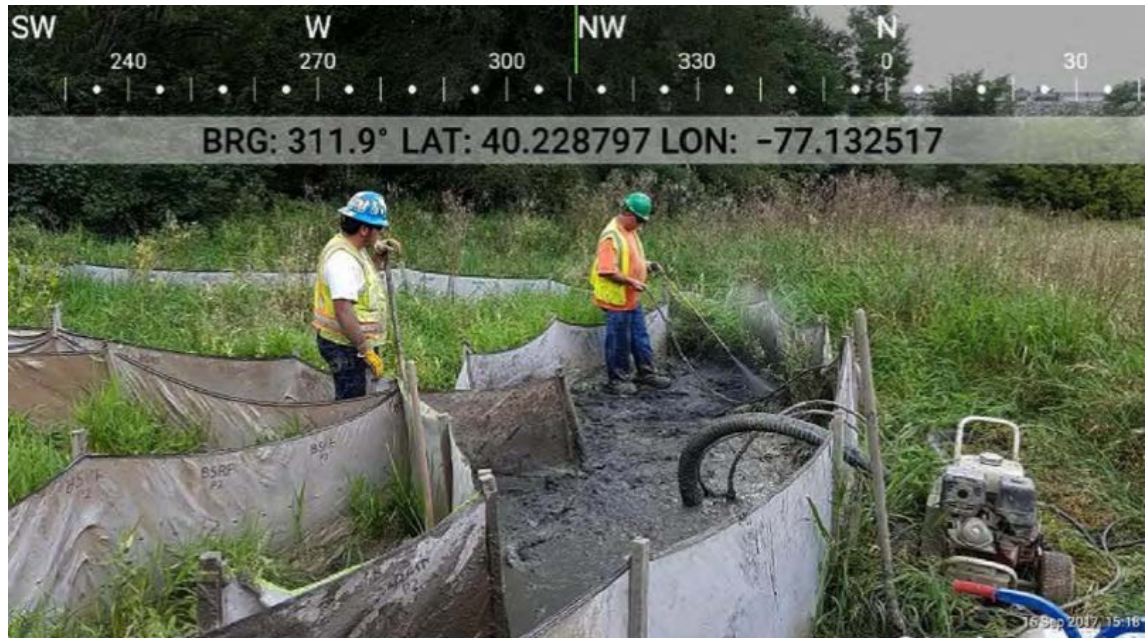
Photo taken by an anonymous source

To complete this segment, Sunoco was ultimately forced to change the route and install the majority of the pipeline through open trenching and then a conventional auger bore under Piney Creek Road/High Street. ARM Group, LLC reviewed the logs and found thirty one instances of losses of circulation on these drills and twenty four inadvertent returns. Almost all of the losses of circulation went unreported to DEP.

g. I-81

This segment of the Mariner project is located in Middlesex Township, Cumberland County and was planned to cross underneath a portion of I-81. Drilling for the installation of a 20-inch pipe began in April 2017 with Pretec

Directional Drilling as the subcontractor. Fluid began escaping within a week. The escaped fluid then surfaced, and DEP issued a Notice of Violation. There were more leaks of drilling fluid in the following weeks, including one that impacted a wetland, and more fluid losses as drilling continued over the following months.



The 20-inch pipe was pulled into place in November 2017.

Drilling for a 16-inch pipe began in February 2020 with Pretec continuing as the subcontractor. One loss of drilling fluid was reported to DEP, but later losses were not. Fluid surfaced into the stream bed of a tributary to LeTort Spring Run and other inadvertent returns followed until drilling was suspended in March due to the coronavirus pandemic. In May 2020 there was a 200-gallon inadvertent return that impacted a wetland. DEP issued another Notice of Violation. ARM Group, LLC reviewed the logs and found twenty three instances

of losses of circulation on these drills and twenty two inadvertent returns. Many of these losses of circulation were not reported to DEP.

h. Blacklog Creek

Yet another segment of the project is located in Shirley Township, Huntingdon County and was planned to cross two wetlands, a road and Blacklog Creek. This drill began in October 2017 with Michels as the HDD subcontractor. Fluid escaped almost immediately, and within days there was an inadvertent return of 7,000 gallons into a wetland. DEP issued a Notice of Violation.



Photo by Sean Sherlock, PG for GES, Inc.

Drilling stopped until the following March, when there was a small release of drilling fluid into a wetland. A 20-inch pipe was installed in June 2018.

Construction on the 16-inch line began in February 2020, with Petra Pipeline Services as the HDD subcontractor. Thousands of gallons of drilling fluid escaped and the hole was abandoned. After approval of a new, longer and deeper drilling profile and moving equipment around to accomplish this, a new pilot hole began to be drilled in March 2020, until the site was shut down due to COVID-19. ARM Group, LLC reviewed the logs and found thirteen instances of losses of circulation on these drills and four inadvertent returns. Many of the losses of circulation were not reported to DEP.

i. Joanna Rd.

Another drilling site was located near Joanna Road in Caernarvon Township, Berks County. The drilling company working at the site was United Piping Inc. Drilling fluid was discovered in an unnamed tributary to Hay Creek in November 2017. DEP issued a Notice of Violation. Work resumed in March 2018, but was delayed by mechanical difficulties. In June a small leak occurred into the [East Branch] Conestoga River and DEP issued a Notice of Violation.

In August a drill pit overflowed, and an estimated 10,000 gallons of drilling fluid spilled into an adjacent stream.



In September the drill pit once again overflowed and drilling fluid again discharged into a stream. Then there was a leak of drilling fluid into a wetland, and another into a wooded area. Containment efforts and notifications were made. The total release was estimated at 30,000 gallons. DEP issued a Notice of Violation and drilling was suspended.



A new subcontractor, Michels, ultimately succeeded in installing a 20-inch pipe in November 2018. ARM Group, LLC reviewed the logs and found one loss of circulation on these drills and six inadvertent returns.

j. Old William Penn Highway

A section of the project in Westmoreland County was designed to route the pipeline underneath William Penn Highway and Turtle Creek. The subcontractor, MAXX HDD, began drilling in July 2017. After unreported leaks of small or undetermined size, in August there was a loss of 65,000 gallons of drilling fluid. Even this loss of fluid went unreported to DEP. Within days, 5,000 to 10,000 gallons of drilling fluid had flowed into Turtle Creek and wetlands nearby.



Photo by Matthew Cousino, PG for GES, Inc.

On September 5, 2017, a fairly large “void” or sinkhole appeared in close proximity, and then another void the day after. Drilling was placed on hold until March 2018, but as soon as it restarted, another 5,400 gallons of fluid surfaced in the same location as before. Losses of drilling fluid continued to occur throughout the month of April, in amounts up to 104,400 gallons. The pipe was successfully installed, but yet another sinkhole, twenty feet in length, opened up along the bore path. ARM Group, LLC reviewed the logs and found twenty four instances of losses of circulation, resulting in the loss of approximately 461,745 gallons of drilling fluid on this drill. ARM Group, LLC also noted six inadvertent returns during the HDD. Most of the losses of circulation went unreported to DEP.

k. Norfolk Southern Railroad

Another site in Westmoreland County was designed to carry pipeline underneath the Norfolk Southern Railroad and a portion of the city of Jeanette. MAXX HDD was again the subcontractor, and began drilling June 2017, but was shut down due to mechanical difficulties until April 2018. After drilling resumed, thousands of gallons of drilling fluid escaped into the ground. Shortly thereafter, 12,000 gallons of drilling fluid surfaced in the town of Jeanette. Drilling was suspended until cleanup could occur.



photos taken by Roman Kyshakevych, GES, Inc. on 4.30.18

But the drilling started up again, and over the following days almost 80,000 gallons of fluid were lost, sometimes without notification to DEP. During efforts to remove some of the fluid, over 1,000 gallons spilled onto a road and into storm drains. A 20-inch pipe was finally pulled into place in June 2018. ARM Group, LLC reviewed the logs and found fifteen instances of losses of circulation on these drills and three inadvertent returns. Most of these losses of circulation went unreported to DEP.

1. Everett Railroad

In Blair County, horizontal drilling was planned in the area of Reservoir Road and Everett Railroad. The drill was designed to bore underneath the railroad as well as the Frankstown Branch of the Juniata River. The contractor, Blacklick Drilling, began work on a 20-inch pipeline in June 2017. There was a loss of circulation and an inadvertent return on the very first day of the drill. The next day resulted in another surfacing of drilling fluid. A different driller, Michels, was soon brought in. After delays until April 2018, drilling fluid again surfaced and entered a wetland nearby. In June, the wetland was again contaminated. The drilling route was then modified, but thousands of gallons of fluid were lost through September, mostly unreported to the DEP, when the pipe was finally inserted.

More drilling began in October 2018 and fluid soon leaked into the wetland. DEP issued a Notice of Violation, and several more the following month after several new leaks.

Work on the parallel 16-inch line began in February 2020, and resulted in another leak affecting the wetland, and another Notice of Violation. ARM Group, LLC reviewed the logs and found nine instances of losses of circulation on these drills and eleven inadvertent returns. Many of these losses of circulation went unreported to DEP.

m. Linden Road

A horizontal drilling site in Washington County was designed to travel underneath Linden Road. Construction began in June 2017 with inadvertent returns occurring on the second day of the drill. In spite of the installation of containment to prevent the drilling fluid from entering a nearby creek, at least 1,000 gallons of fluid surfaced outside of the containment area and affected the creek.



Photo by Josh Hickman, PG with GES, Inc. on June 24, 2017

DEP issued a notice of violation, but in July drilling fluid was observed to be running into the creek once again. Drilling was put on hold until August. In

September, after drilling had ended for the day, approximately 3,000 to 6,000 gallons of drilling fluid overwhelmed containment walls and entered the creek.



Photo taken by Joseph Maule, PG for GES, Inc. on 9/9/17

Drilling resumed in September and a 20 inch pipe was pulled into place later in the month. ARM Group, LLC reviewed the logs and found nineteen instances of losses of circulation on this drill and seventeen inadvertent returns. Most of these losses of circulation went unreported to DEP.

n. Linden Creek Road

Another section of horizontal drilling in Washington County was designed to travel underneath Linden Creek Road and Little Chartiers Creek. Construction of a 20-inch line began in October 2017 with United Piping, Inc. as the subcontractor. Two weeks later, there was a loss of circulation and an inadvertent return totaling 2,000 gallons of drilling fluid. The drill was shut down and didn't restart until May 2018. A week after the restart, another leak, of 1,000 gallons, surfaced just outside the containment area.



Photo by Brian Lipinski, PG for GES, Inc. on May 18, 2018

Drilling was suspended for another month, but then resumed. The pipe was installed in August 2018, but not before five additional inadvertent returns

occurred. ARM Group, LLC reviewed the logs and found one instance of loss of circulation on these drills and nine inadvertent returns. Most of these losses of circulation were not reported to DEP.

o. Buff-Pitt Highway

In Indiana County, a section of pipeline was designed to travel below the Buffalo/Pittsburgh Highway as well as a wetland in the same area. Construction began on a 20-inch line in June 2017. The drilling was completed without incident and the pipe was pulled into place in July.

Construction of a 16-inch line began that month. In September, however, drilling fluid was lost on several occasions, and drilling was shut down when a homeowner reported seeing mud in a nearby stream. Fluid flowed downstream and into Blacklick Creek.

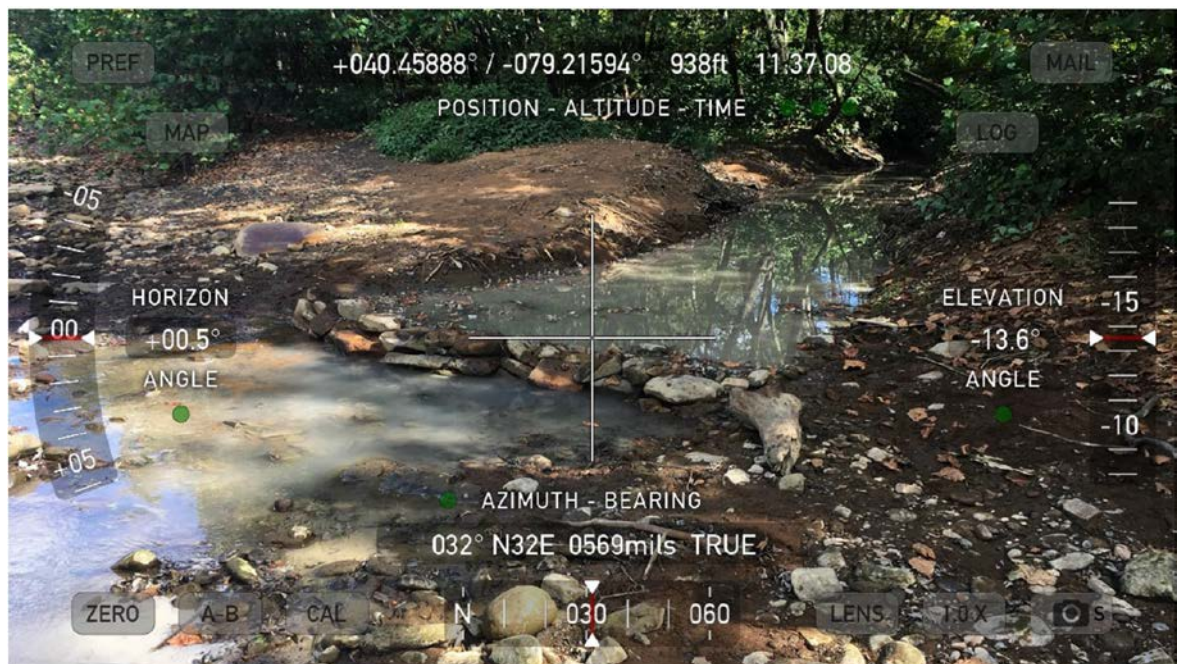


Photo by Matt Fry, PG with GES, Inc. on September 28, 2017

DEP issued a Notice of Violation, and drilling was placed on hold. The work resumed in February 2019. The second day of drilling, there was a loss of circulation reported to the utility inspector and to the professional geologist on site. This was not communicated to DEP. Drilling continued and the pipe was installed. ARM Group, LLC reviewed the logs and found five instances of losses of circulation on these drills and one inadvertent return. Most of these losses of circulation went unreported to DEP.

p. North Zinns Mill Road

A section of the pipeline in Lebanon County was designed to travel underneath North Cornwall Road, Snitz Creek, and Route 72. Horizontal drilling for a 20-inch pipeline began in August with Laney Directional Drilling as the subcontractor. Two days later, drilling fluid emerged from the ground and flowed into Snitz Creek. Drilling stopped, resumed in September, and fluid again surfaced in the creek. DEP issued a Notice of Violation and drilling stopped until March 2018, when there was more fluid flowing into the creek, resulting in another Notice of Violation. The same thing happened in April, in May, and in June, and again in August when the pipe was finally inserted.



Photo taken by PG with GES, Inc. on June 27, 2018

Drilling for a 16-inch line began in May 2020 with Michels as the subcontractor. Between May and August, the drill lost circulation of fluid totaling approximately 100,000 gallons. These losses were not reported to DEP. From August through September, drilling fluid flowed into Snitz Creek five different times, resulting in five more Notices of Violation from DEP.

On October 19, 2020, there were 20 separate inadvertent returns found within and along Snitz Creek that totaled approximately 200 gallons of drilling fluid. Without the required approval from DEP, Sunoco decided to block off the creek entirely with a dam and flume. DEP issued a Notice of Violation. Because of the egregious nature of Sunoco's unilateral act, however, the company was also

the subject of a rarely-employed enforcement proceeding under the Clean Streams Law. The 16 inch pipeline was thereafter pulled into place. ARM Group, LLC reviewed the logs and found thirty eight instances of losses of circulation on these drills and sixteen inadvertent returns. Most of these losses of circulation were not reported to DEP.

q. Goldfinch Lane

Horizontal drilling was employed in Cambria County to carry pipeline under two wetlands and Goldfinch Lane. Drilling for a 20-inch pipe began in May 2018, with Lonestar as the subcontractor. The very next day, drilling fluid surfaced in an upland area. Days later, drilling fluid was observed in the unnamed tributary to Hinckston Run. Drilling was suspended and DEP issued a Notice of Violation. The driller tried to stanch the leaks with loss control materials, but the result was contamination of a nearby spring. After a temporary halt, drilling resumed in June but thousands of gallons of fluid escaped throughout the following weeks. Drilling mud then surfaced on a homeowner's lawn, and 3,500 gallons impacted a nearby wetland. DEP issued another Notice of Violation.

After another halt, drilling started again, in July, and again resulted in fluid coming up from the ground, in a pasture that flowed to an unnamed tributary. At this time, drilling was suspended.

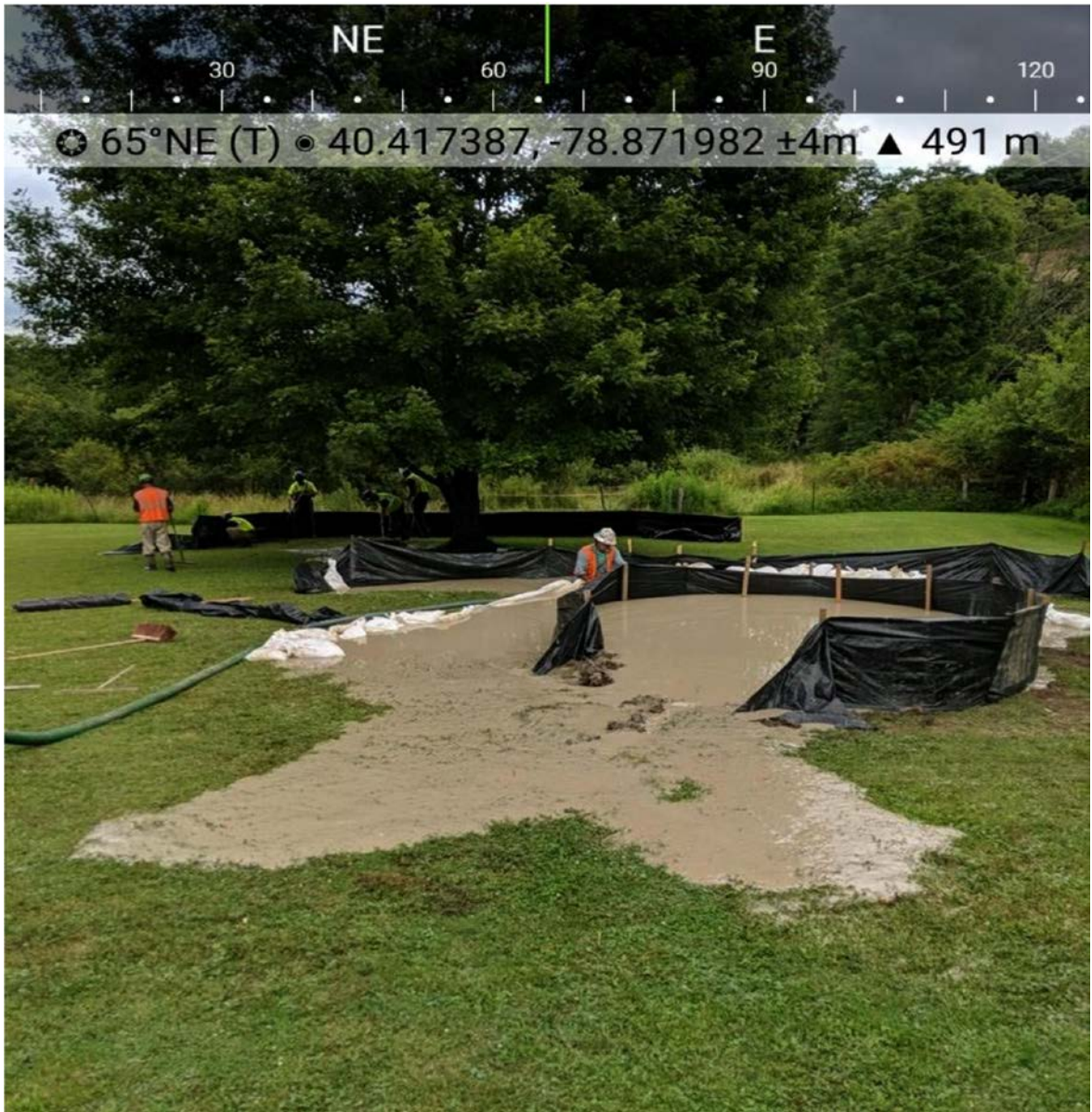


Photo by Mark Klonicke, PG with GES, Inc. on July 22, 2018

In August, once drilling resumed, more fluid was lost, and in September there was another leak outside the containment area.



Photo by Craig B. Clemmens, PG for GES, Inc. on September 15, 2018

The pipe was finally installed in October 2018. Because of the many problems with installation of the 20-inch pipeline, Sunoco abandoned its horizontal directional drilling plan for a nearby area and applied to use an open trench and a conventional bore instead. ARM Group, LLC reviewed the logs and found twelve instances of losses of circulation on this drill and nine inadvertent returns. Many of these losses of circulation went unreported to DEP.

r. William Penn Ave.

Another horizontal drilling site in Cambria County was located proximate to William Penn Avenue in Jackson Township (Johnstown). In June 2018, escaping drilling fluid flowed into a wetland, and into Hinckston Run. The estimated amount of fluid was 1,500 gallons. DEP issued a Notice of Violation.



Photo by Joseph Maule, PG for GES, Inc. on June 21, 2018



After a month-long suspension, drilling began again in July. The result was another leak of 1,500 gallons. Because this was near the same location as the last leak, equipment was on hand to try to clean it up.

Another leak occurred in August; it was estimated that 300 to 400 gallons of drilling fluid surfaced. The fluid affected the adjacent wetland. DEP issued a Notice of Violation.



Photo by Roman Kyshakevych, PG with GES, Inc. on August 24, 2018

The same thing happened again the next day, releasing 500 gallons of drilling fluid.



Photo by Austin Richardson, EI with Tetra Tech on August 25, 2018

DEP issued a Notice of Violation. Inadvertent returns continued to occur until the pipe was pulled into place in late October, 2018. ARM Group, LLC reviewed the logs and found no losses of circulation on this drill and eight inadvertent returns.

s. Spinner Road

An additional horizontal drill in Cambria County was designed to travel underneath Spinner Road and the North Branch of the Little Conemaugh River. Installation of a 20-inch line began in July 2018 with Lone Star as the

subcontractor. In August, drilling fluid was forced out of the ground and traveled into a stream. DEP issued a Notice of Violation



Photo by Mark Klonicke, PG with GES, Inc. on August 4, 2018

Drilling resumed, but fluid was lost on an almost daily basis in August and September and on numerous occasions in October, until the pipe was finally installed in November.

Drilling for a parallel 16-inch line began in February 2020 with Southeast Directional Drilling as the subcontractor. Thousands of gallons of fluid escaped underground throughout the following month, until the site was shut down because of COVID in March.

Workers returned in May but, in the final stretches of drilling, fluid was observed surfacing onto the ground. The company decided it did not have to report the incident, and the pipeline was installed at the beginning of July. ARM Group, LLC reviewed the logs and found sixty four instances of losses of circulation on these drills and thirteen inadvertent returns. Most of these losses of circulation went unreported to DEP.

t. Wheeling & Lake Erie Railroad

Yet another drill site in Washington County was mapped to travel below State Route 88, the Wheeling & Lake Erie Railroad, and Patterson Road. Construction began in May 2017 with Mears as the subcontractor. Days later, loss of fluid resulted in multiple inadvertent returns onto the ground, including approximately 1,500 gallons to an upland area that entered into an unnamed tributary to Froman Run. Two smaller leaks of fluid followed. DEP issued a Notice of Violation.

Ultimately, the use of horizontal directional drilling at this location was abandoned in favor of open trench construction and conventional drilling. Work began in August 2018, but resulted in bubbling and turbidity in a stream bottom

along Patterson Road. In October, the stream was dammed to allow clean-up of the turbid water.



Photo by Joseph Maule, PG for GES, Inc. on October 13, 2018

Turbid water continued flowing in the dammed portion of the stream for much of the month of October. In November, a subsidence opened up at the edge of Patterson Road, in line with the drill path.



A week later, the dam that had been installed across the stream failed and allowed turbid water to flow downstream. The pipe was ultimately pulled into

place on November 13, 2018. ARM Group, LLC reviewed the logs and found twenty instances of losses of circulation on this drill and eighty inadvertent returns. Most of these losses of circulation were not reported to DEP.

u. I-76

Another dig was undertaken in Westmoreland County, within several hundred yards of mile marker 69 on I-76, near Irwin Borough. United Pipe was the HDD subcontractor. Shortly after drilling began there were losses of circulation that were not reported to DEP. Approximately two weeks later, 20,000 gallons of fluid emerged, flowing into two unnamed streams. DEP issued a Notice of Violation.



Photo by Mark Sakino, PG from GES, Inc. on May 23, 2017

A 20-inch pipe was pulled into place on or about June 22, 2018. ARM Group, LLC reviewed the logs and found three instances of losses of circulation on this drill and one inadvertent return. Most of these losses of circulation were unreported to DEP.

ARM Group, LLC noted a total of 301 inadvertent returns over the twenty one locations that we requested they review. They noted a total of 397 losses of circulation at those same twenty one locations.

We are aware that our in-depth review of these 21 locations is roughly 16% of the total number of HDDs that occurred on this project. From a review of the Consent Order and Agreements that DEP has issued to Sunoco during this project, we know that the issues that were discovered at the 16% of the locations that we reviewed were also occurring at other locations throughout the project. For the time period of May 3, 2017 through April 27, 2019, DEP noted a total of 176 inadvertent returns into waters of the Commonwealth that occurred at all the various HDD sites throughout the project. This number does not account for inadvertent returns that did not impact waters of the Commonwealth or for ones that continued to flow day after day into containment that was set up. It also does not account for inadvertent returns that Sunoco failed to report to DEP.

VII. Violations that Span the Entire Project

a. Failure to Notify DEP

Evidence before the Grand Jury showed numerous occasions in which Sunoco failed to properly notify DEP about various aspects of this project. Early in the project,

there were multiple locations where Sunoco did not have authorization to utilize horizontal directional drilling to cross a stream, wetland or road, but began that process without the appropriate permit modification in hand. This came to light in November 2017, when a Berks County Conservation District employee observed HDD equipment at two unpermitted locations. The same thing happened in at least 22 other locations, in Allegheny, Berks, Blair, Cambria, Chester, Cumberland, Dauphin, Huntingdon, Indiana, Lancaster, Washington, Westmoreland, and York Counties, where pipeline crossings of waters of the Commonwealth were permitted as open cuts but were changed in the field to some type of trenchless construction methodology without notification to DEP and without seeking appropriate permits. This behavior was so egregious that DEP suspended Sunoco's permits, and construction across the entire project came to a halt. In a January 3, 2018 Administrative Order, the Department stated that Sunoco's conduct "demonstrates a lack of ability or intention on the part of Sunoco to comply with the Clean Streams Law, the Dam Safety and Encroachments Act, and the permits issued thereunder."

Although this order, early in the project, should have sent a clear message that DEP would not accept anything less than full disclosure from Sunoco, there were failures to report in other areas as well. DEP official Brokenshire testified about the regulations that relate to horizontal directional drilling. He explained that these regulations, codified at 25 PA Code 78a.68a, went into effect in October 2016, and require immediate notification to DEP anytime the drill experiences a drilling fluid discharge or a loss of drilling fluid.

We also reviewed another regulation, at 25 Pa Code 91.33. This regulation requires immediate notification to the Department of Environmental Protection anytime a

substance that would result in pollution, or create a danger of pollution, of the waters of the Commonwealth is discharged into those waters, or into a place from which it might discharge, flow, be washed to or fall into such waters. Mr. Brokenshire explained that the nature of horizontal directional drilling requires drilling through the freshwater aquifer, which is a water of the Commonwealth. He explained that the moment fluid is lost, it is possibly going off the bore path and into the aquifer, which is, in and of itself, an impact to waters of the Commonwealth and requires immediate notification to the Department.

Nonetheless, review of drilling logs and geologists' daily logs from HDD locations revealed many instances in which drills lost fluid, yet Sunoco did not report the loss to the Department, as they were required to do. In testimony before the Grand Jury, Sunoco representatives did not deny most of these failures to report, instead attempting unsuccessfully to justify them. Christopher Embry, the Environmental Project Manager for the Mariner East 2 Pipeline Project, testified that reporting of lost drilling fluid was done only when the size of the loss was "significant to the drill." The question, however, is not whether the loss was "significant to the drill," but whether it was significant to the environment, and specifically the waters of the Commonwealth. The regulations that require immediate notification to DEP contain no qualifier on the amount of the loss or its significance "to the drill."

Embry further testified about cases in which drilling fluid is lost into the ground, a report is made to DEP, and the drill resumes but continues to lose fluid. Embry testified that Sunoco was not required to report such continuing losses. Nothing in the applicable regulations, however, makes exception for repeated losses. Moreover, DEP explicitly advised Sunoco that its alleged understanding of "continuing loss" reporting obligations

was legally incorrect. After DEP issued a Notice of Violation for Sunoco's failure to report losses of circulation that had occurred on a particular drill, there was a meeting held in which this very subject was discussed. That meeting was held in December, 2017. Subsequent to that meeting, Sunoco sent an email to DEP wherein they stated that it was not necessary to report subsequent losses, but they would do so in order to "enhance communications with the Department". In a Notice of Violation issued on December 21, 2017, the Department stated that it "disagrees with your interpretation of the notification requirements for [a continuing] loss of circulation." The NOV goes on to cite the relevant legal authority that requires notification for all losses of circulation that occur.

Such losses may raise even greater environmental concerns than more isolated losses. At Raystown Lake, for example, the drill experienced partial or full losses of circulation on at least 31 occasions. Embry reported only two of these to DEP. Almost four acres of the lakebed wound up covered in drilling fluid.

Sunoco's failures to report were not the product of insufficient information from the field. Evidence before the Grand Jury demonstrated that Sunoco had an elaborate system of record-keeping in which all of the various daily reports would be submitted for uploading to a sharepoint location where designated employees within the company had full opportunity to review them whenever they needed. In addition to this massive compilation of written records related to the project, Sunoco also conducted daily and weekly calls with inspectors, contractors and Sunoco personnel to discuss each active HDD. One individual who was present for these calls indicated that Sunoco Pipeline/Energy Transfer would go spread by spread for updates on the construction and the HDDs. He testified that if there had been an IR mere minutes before the call,

everyone on the call would already be aware of the incident. We learned that there was another daily call that dealt only with the HDDs that were occurring on the project.

The grand jury heard much testimony from on-site subcontractors all the way up the reporting chain. Drillers reported losses of circulation to the project manager and often to the assistant operations manager as well as the inspection team. Once the field crew made its notification, it would wait to receive word from superiors about whether to resume drilling. The decision to restart or not would come from the operator or from the prime contractor. One of the subcontractor project managers testified before the Grand Jury, and confirmed that he received reports from the field crew and then communicated that information to his boss, the regional manager, as well as to the prime contractor's project manager. The witness explained that the subcontractors had no incentive not to report incidents, because they were paid whether they were standing idle or working.

A Project Manager for one of the prime contractors on the project also gave evidence on this point. He confirmed that he received notifications on a daily basis from subcontractor project managers. He stated that any such notifications regarding loss of fluid circulation or fluid spilling out of the ground were conveyed to the Construction Manager for the Spread. He then waited to hear back from the Construction Manager about whether to proceed with the drill or to halt activity. A Construction Manager testified as well. He corroborated the information provided by the Project Manager for the prime contractor. He would receive updates from the prime contractor and relay that information directly to Sunoco. He would likewise relay any directives from Sunoco back down to the Project Manager for the prime contractor.

Overall, the entire Mariner East 2 Pipeline Project involved 132 horizontal directional drills for 20-inch pipeline and 105 such drills for 16-inch pipeline. According

the records received from the Department of Environmental Protection, Sunoco reported less than 100 losses of circulation to DEP over the entire span of the project. In a review of the Professional Geologist logs associated with just 21 of the 132 horizontal directional drill locations, the Grand Jury heard testimony from ARM Group, LLC that there were a total of 397 losses of circulation that were beyond the amount of fluid expected to lose on those drills. Each of those 397 losses should have been reported to DEP. The fact that the number of instances of losses of circulation on the 21 sites reviewed far surpasses the number of notifications that were received over the entirety of the project indicates the breadth of this problem.

b. Impacts to Private Water Supplies

In addition to its requirement to notify DEP of losses of drilling fluid, Sunoco was also required to notify private well owners in the area, in order to protect these water supplies. Evidence before the Grand Jury, however, demonstrated many cases in which the company's actions caused substantial harm to the water on which families depended.

DEP official Brokenshire explained to the Grand Jury the costs of underground losses of drilling fluid. He testified that, if the loss of fluid continues, it will ultimately express itself somewhere—either on the surface or in someone's drinking water well. He explained that the aquifer is an underground reservoir of water that supplies wells. Drilling fluid injected into the earth will try to find the path of least resistance, which is usually along the bore path. Sometimes, however, that path is through fractures in the bedrock or other subterranean voids. If the drilling fluid flows out of the bore path and into the aquifer, it may find that the easiest place to go is into a drinking water well, because it provides a large opening and may be the path of least resistance.

DEP did require that the permits for this project included provisions to deal with impacts to private or public drinking water supplies due to construction activities. From the perspective of many homeowners, however, those provisions did not prove to be successful.

Mr. Eberts testified that Sunoco Pipeline/Energy Transfer had an obligation to notify DEP once they received a well complaint. They were required to put the information into Oil and Gas' OGRE system. Once the complaint was logged into the system, Sunoco Pipeline/Energy Transfer was required to reach out to the complainant and offer an alternative water supply while the investigation was pending. The next step would be for Sunoco Pipeline/Energy Transfer to submit a report sealed by a professional geologist that would be reviewed by a Department geologist to either concur with the report or to ask for additional information. It was rare that DEP conducted their own sampling. Typically, if there is an impact to a water supply, the permit requires the permittee to implement a plan "to the satisfaction of the public and private water supply owners". In addition to requiring remediation of the water supply, DEP has drawn up Consent Assessment for Civil Penalty documents that have included all regional impacts to water supplies from the construction of the Mariner East 2 Pipeline. Mr. Eberts explained that the impact is because a private water supply draws its water from groundwater, which is a water of the Commonwealth. So if the pollution is in the water table, it is considered pollution to waters of the Commonwealth

The Grand Jury received evidence from many well owners who lived in close proximity to the Mariner East 2 Pipeline construction project. Rosemary Fuller lives in Spread 6, or the easternmost portion of the pipeline. She explained that her water is supplied by a private well that had been in place since her family purchased their house in

2003. She testified that they never had any issues with their water well and that, in addition to performing yearly maintenance, they had the water sampled and analyzed for bacteria every year.

Fuller testified about the easement that she signed with Sunoco. A land agent came to her house and represented that the project would require access to only a small amount of her land. He stated that there would be no risk and she wouldn't even know that they were there since the work would be done underground. The agent also told her that Sunoco was just being a good neighbor by asking for the easement because, as a public utility, the company could just exercise eminent domain and take the land anyway.

Fuller testified that construction began in her area in 2017 and cut through a local park. Because construction is still not completed four years later, neighbors still do not have full use of the park. The area has been plagued with sinkholes and fluid spills.

Below is a photograph of two sinkholes that opened along the construction path:



Fuller testified that she observed changes to her water supply after construction began. There was a drop in water pressure, and strangely colored sediment in all the toilet tanks. As time went on, the sediment destroyed one shower, many of the toilets and the water heater. The washing machine and dishwasher no longer function properly.

She notified DEP of the situation at the end of June 2019. Shortly thereafter, Sunoco came to sample her water. Sunoco's initial sampling and analysis showed the presence of bentonite. A Sunoco representative told her there was nothing wrong with bentonite and she could carry on drinking her water and showering in it because it was not harmful. Several weeks later, however, she received a follow-up email informing her that additional test results indicated her water had tested high for e-coli and fecal coliform. In the intervening time period, her daughter drank the water and was hospitalized.

As of the time that she testified in March, 2021, her water issues still remained—she had not been hooked up to public water and was still using the water from her well for showering and washing clothes and dishes.

Another resident, Karen Katz, lives in Glen Mills. Her water wellhead was more than 450 feet from the dig, so her well water was not tested before the start of work in her area. In 2019, during installation of the pipeline, the drill pierced an aquifer in the area of Meadow Lane and Shepherd Lane, causing her to lose water pressure. She recalled seeing a large amount of water flowing onto Shepherd's Lane. She stated that to this day her water pressure is low. Katz stated that Sunoco has declined to test her water so she and her family drink bottled water.

Edward and Alice Mioduski live in New Alexandria, near Loyalhanna Lake. The Mioduski's own a 26-acre farm. Their wellhead is 450 feet from the pipeline right of way. Drilling started on their property in May 2017. About two weeks later, their well water turned a "...cloudy gray. You couldn't even see through it." The water supply has not been remediated. Instead, Sunoco sent a "water buffalo" – a large outdoor water tank – and a Culligan brand bottled water cooler, now located in the couple's kitchen.

Patrick Robinson lives in New Florence. He stated that Sunoco asserted eminent domain against many of his neighbors, so he attempted to negotiate with them to minimize impacts to his property. Robinson's well is also 450 feet from the pipeline project. Robinson stated that, on the day Sunoco began digging at a nearby creek, the water level in his well fell 120 feet. The water turned "...like brown coffee with sediment," and the well soon ran dry. Sunoco offered to provide a "water buffalo," if he signed a release absolving it of any responsibility, but he declined. Robinson stated that Sunoco told him that, because there was no pre-construction water sampling or testing, the company is not responsible for any damage.

Joanne Snyder lives in Hollidaysburg, adjacent to the Everett Railroad horizontal drilling project. Ms. Snyder stated that, before the project, her well water was pristine. The construction right of way is only six feet from her well. After numerous incidents, Snyder was provided a water buffalo. Sunoco attempted to take it back in the fall of 2020, but Snyder would not agree to its removal, because she had received notice of another recent spill. Snyder stated that an agent of the company "told me to settle with them and go build another house. He told me if I didn't settle, they would just come and take my house."

John and Valerie McCarthy live in Jeanette. The pipeline passes on a hill which is above the level of the McCarthy's drinking water source. Valerie McCarthy stated that when samples of their water were taken prior to drilling, it was found to be completely pure. John McCarthy stated that after construction started, however, he began receiving letters advising them not to drink the water anymore, because it contained volcanic ash used in the drilling mud. McCarthy also noticed an oily sheen on the water in his artesian spring, and in the stream coming from it. Sunoco agents verbally promised to connect his home to a municipal water supply, but never executed the agreement once construction in his area was complete.

Mark and Kathy Daugherty live in Johnstown, near the William Penn Avenue horizontal drilling site. Their daughter and her husband live in an adjacent home. The pipeline right of way is approximately 300-400 feet away. Mark Daugherty stated that wells serving both homes were affected by the construction. The water in his daughter's well became gritty and dirty. His own well subsided and the submersible pump failed. Sunoco supplied temporary water for a year, but then stopped. The company claimed that the impacts did not result from its drilling.

Daniel Trantham lives on Goldfinch Lane in Johnstown near the site of another horizontal drilling project. Sunoco offered him an undisclosed amount of money for the use of the property, and informed him they would use eminent domain if he did not sign. They also offered a supplementary water supply even before they started drilling under a wetland that was adjacent to the spring that supplied his house with water. After drilling commenced, late one evening workers approached the house and told Trantham they were losing mud. The workers searched the property for the drilling fluid and

located three areas where it was emerging from the ground. The following day the workers returned and told Trantham not to use his water. Sunoco started supplying bottled water to the house. Ultimately, the company paid the construction costs to connect his home to a public water supply.

The Grand Jury reviewed a spreadsheet the DEP has maintained of all water supply complaints that they were made aware of related to the Mariner East 2 Pipeline Project. Their list contains one hundred eighty three (183) names. We reviewed a similar internal list maintained by Sunoco. That list only included one hundred eighty two (182) names. The possibility exists that the number of families that have had their only water supply impacted by this project is larger than is known. Many of the agreements that Sunoco entered into with homeowners who were affected by pipeline construction included non-disclosure provisions. Some of these prohibit a homeowner from speaking even with DEP or other governmental entities at the township, borough, county, state or federal level.

c. Use of Unapproved Additives

Evidence before the Grand Jury established that, in some geological formations, the normal fluid used for horizontal directional drilling – a mix of water and bentonite – will be insufficient to seal holes or fractures in the rock. In these circumstances, drillers may wish to add other products to the fluid that are better able to plug fractures. These additives, however, must be approved for use by the Department of Environmental Protection.

DEP official Brokenshire testified that the Department began implementing this requirement when horizontal directional drilling was still a new process. Under the Department's regulations, officially adopted in 2016, drillers may only use additives that are "NSF approved." The National Sanitation Foundation has developed a certification, NSF/ANSI/CAN 60, that addresses the human health effects of drinking water treatment chemicals. These additives, as DEP later clarified, must also be function specific. That is, an approved additive may be used in drilling fluid only if its intended use is for drilling, as opposed to some other water treatment function.

DEP maintains a list of approved additives that is available on its website. Because the list changes, a drilling company must check it in a timely fashion to ensure that any intended additive is approved by DEP. If an additive is not NSF/ANSI/CAN 60 certified, it must be submitted to DEP for review along with the safety data sheet for the product.

The Grand Jury learned of multiple incidents throughout the project when products were used that were not on the NSF/ANSI/CAN 60 list of approved drilling fluid additives. Sometimes subcontractors used these unapproved additives without giving advance notice to Sunoco. However, once the product had been used, Sunoco generally found out, since it received regular reports about such matters. Even after it learned of the use of unapproved additives, however, Sunoco did not direct drillers to stop, nor did it alert DEP.

Documentation regarding the Zinns Mill Road/Snitz Creek drill provides an example. An April 2018 report submitted to Sunoco's Environmental Project Manager, Christopher Embry, indicated that the driller had utilized Baroid MagmaFiber and Baroid Fuse-It as additives – the day before a drilling fluid spill into Snitz Creek. Neither

additive was NSF/ANSI/CAN 60 approved. But Sunoco never reported the problem, even after Embry was explicitly advised that Baroid MagmaFiber was inappropriate for use because it is an unapproved additive.

Review of records revealed numerous instances of use of unapproved additives at locations throughout the project. Many of these were used even after DEP's clarification specifying that approved additives must be function specific for use in drilling fluid. But some of the additives used have never been on the NSF/ANSI/CAN60 list for any product function. Additives used without approval included Baroid Magma Fiber, vegetable oil, Platinum PAC, Drill Seal, Dynacell, Diamond Seal, and PolySwell.

Another unapproved additive was Fuse-It, which was used at several different locations on the Mariner East 2 Project. Fuse-It's safety data sheet states that 10-30% of the product consists of hydrotreated light petroleum distillate. The document states that the product may cause skin and eye irritation and may have toxicity to fish. Fuse-It was used at many locations where drilling fluid spilled into the environment, affecting aquatic life in any creeks, streams or rivers it entered. The product was also used near locations where drilling affected aquifers that fed home drinking water supplies.

In general, unapproved additives were most often used in the riskiest situations, in an effort to stop the escape of drilling fluid into the environment. Because these efforts in many cases failed to stop the fluid loss, the unapproved additives themselves undoubtedly escaped into the environment as well.

VIII. Applicable Environmental Statutes

The Grand Jury learned that the relevant portions of the Clean Streams Law define “industrial waste” as any liquid or solid resulting from manufacturing or industry whether or not generally characterized as waste. “Pollution” is any contamination of waters of the Commonwealth that is likely to render those waters harmful, detrimental, or injurious to public health, safety or welfare, or to legitimate beneficial use. “Waters of the Commonwealth” includes any rivers, streams, rivulets, lakes or springs containing surface or underground water.

Within the Clean Streams Law, Section 691.301 makes it a crime to discharge industrial waste into the waters of the Commonwealth. Section 691.401 prohibits the discharge of any substance resulting in pollution into any of the waters of the Commonwealth. Section 691.611 makes it a crime to fail to comply with any order or permit or license of the Department of Environmental Protection, or to hinder, obstruct, prevent or interfere with the Department or its personnel in the performance of any duty.

Finally, we reviewed a Certification of Records from DEP and heard testimony to confirm that Sunoco never applied for or was granted a permit or an exemption to a permit pursuant to the Clean Streams Law to discharge any waste from any source, except water discharged from hydrostatic testing, at or near the Mariner East 2 Pipeline Project located in Allegheny, Washington, Westmoreland, Indiana, Cambria, Blair, Huntingdon, Juniata, Perry, Cumberland, York, Dauphin, Lebanon, Lancaster, Berks, Chester and Delaware Counties, or to discharge any waste from that project into any waters of the Commonwealth.