

**East Goshen Township**  
**Pipeline Task Force**  
**Meeting Agenda**  
Thursday, March 28, 2019  
5:00 PM

1. Call to Order
2. Pledge of Allegiance
3. Moment of Silence
4. Ask if anyone is recording the meeting
5. Approval of Minutes
  - a. February 28, 2019
6. Chairman's Report
7. Reports
  - a. Legislative Update
  - b. Current Pipeline Events Impacting East Goshen
    - Questions for discussion
    - Sunoco HHD Operations?
    - Pipeline Company Notifications to Township?
8. Old Business
  - a. Improve public communication regarding pipeline issues (such recognizing a leak, ignition issues, evacuation, etc.) and activities (construction, inadvertent returns, noise, etc.). *Enclosed are copies of mailings distributed by Energy Transfer Partners and Interstate Energy.*
  - b. Conduct air quality monitoring at valve locations (Consider fiber optic sensors for pipeline leak prevention/detection). *Enclosed is the January 24, 2019 memo and a report on leak detection.*
  - c. Review Pipeline legislation and determine which bills to support and how to help move them forward. *Pipeline legislation has been previously been distributed.*
  - d. Newsletter Article *Need the article by May 1<sup>st</sup>.*
  - e. Pipeline Coating Degradation *Enclosed is the December 19, 2018 memo and a brief primer on pipeline coatings.*

9. New Business

- c. Dust concerns at HDD sites. *March 21, 2019 memo attached.*

10. Public Comment

11. Action Items

- a. March 28, 2019 Log

12. Adjournment

FYI

Keep East Goshen Beautiful Day Announcement  
Transmission Pipeline Map  
Column about proposed changes to class locations  
Sunoco mailing

**EAST GOSHEN TOWNSHIP  
PIPELINE TASK FORCE WORKSHOP MEETING  
1580 PAOLI PIKE  
THURSDAY, February 28, 2019  
DRAFT MINUTES**

**Present:** Chair Caroline Hughes; Vice Chair Bill Wegemann; Members: Judi DiFonzo, Russ Frank, Karen Miller, Christina Morley, Gerald Sexton; David Shuey (Liaison, Township Supervisor); Marty Shane (Township Supervisor), Township Manager Rick Smith

**Call to Order & Pledge of Allegiance**

Caroline called the meeting to order at 5:03 p.m. and led the pledge of allegiance.

**Moment of Silence**

Caroline called for a moment of silence to honor our first responders and troops.

**Recording**

Caroline asked if anyone was recording the meeting. No one was recording.

**Approval of Minutes**

The minutes were approved as amended.

Caroline opened the meeting welcoming the 2 new members, Christina and Gerald, and all in attendance introduced themselves.

**Reports**

**1. Legislative Updates and Reports**

- a. **PUC Intervention** - Caroline explained that the West Chester Area School District and Chester County are petitioning to intervene in the Flynn litigation. She thanked East Goshen Township (EGT) for their support with this petition and for the comments regarding the Environmental Impact Statement that were submitted to FERC by EGT.

Caroline also reported that Sunoco is challenging the East Goshen petition intervention. Judge Barnes can reject or approve. East Goshen will wait to file an appeal. Caroline and Christina stated that they think Judge Barnes will reject the challenge. Rick ask Caroline when will the hearing take place. Caroline stated that nothing is definite yet, but probably in a few months. Russ asked if these interventions will delay the Pipeline installation. Caroline said that it will not cause a delay; it is still moving forward. She continued that the more interventions, the more powerful the case becomes. Currently there are 7 Townships, 4 School Districts, 2 County Governments and 1 HOA that have filed.

- 1 b. Russ asked Rick if there was any advancement update on Governor  
2 Hogan regarding easements. Rick stated they are still collecting data. It  
3 was reported that the Chester County Commission is pulling their  
4 temporary easements that were granted to Sunoco. The Hankin group has  
5 a civil claim against Sunoco regarding their temporary easements. Rick  
6 stated that Sunoco has only one permanent easement in East Goshen in  
7 Marydell. All other easements in the Township are on private property.  
8 Residents with easement agreements with Sunoco would need legal  
9 counsel if wishing to terminate.
- 10 c. Caroline discussed a filing that was in the Commonwealth court stating  
11 the PUC strongly confirmed the catastrophic public safety risk of the  
12 pipeline. Caroline will send a copy of the brief to the group.
- 13 d. David reported that there was a meeting held by representatives from  
14 Sunoco for the professional public on 2/22/19. Anyone currently  
15 involved in litigation was not invited to attend. It was reported that  
16 Sunoco said at the meeting that they promise to do better in the future.  
17 Emergency Services (ES) was in attendance. Sunoco was told about the  
18 specifics ES has requested from them and still has not received. David will  
19 provide a list of Sunoco reps that attended the meeting.
- 20 e. Bill reported Senator Dinniman and Representative Otten are calling for a  
21 Bipartisan Pipeline Safety Caucus to push the bills forward.
- 22 f. Bill reported that a rally in Harrisburg is scheduled. The Safety Over  
23 Sunoco (SOS) Rally will be held on 3/19/19 at 10 am on the Capitol steps  
24 in Harrisburg. Bill stated that Representative Comitta agreed to meet with  
25 him and Ron Cocco. Caroline and Bill asked taskforce (TF) members to  
26 attend and ask other residents to attend if possible.
- 27 g. Bill discussed a pipeline overlay map. He stated that this is a good tool  
28 and will send out to the TF.

29 2. Current Events Impacting EG

- 30 a. Russ asked Rick about what drilling Sunoco has remaining to complete.  
31 Rick stated that Sunoco still needs to drill from the Firehouse –  
32 Wellington, Giant to Quaker on Boot Road, New Kent to the Executive  
33 Center, Bow Tree to Matlack and Matlack to Saints Simon and Jude  
34 Church (SSJ). Eric Friedman, 2 Fallowbrook Lane, Glenn Mills, Rep from  
35 Andover HOA, stated that the open cut drilling from SSJ to Andover will  
36 take 444 days. Sunoco has installed new Curtains for noise and visuals  
37 throughout. Eric suggested that there is an app, Decibel X, for \$5 that  
38 measures the noise level decibels. Russ questioned if the app would have  
39 an accurate reading.
- 40 b. Gerald stated that the new walls installed on Bow Tree and Route 352 are  
41 obstructing the view to drivers especially when making a left hand turn.  
42 Rick explained that these walls were installed in compliance to PennDOT  
43 regulations. PennDOT has agreed to paint dashed lines and arrows to  
44 help with traffic flow. Christina stated that trucks should not be allowed  
45 to park between the walls and the street to create further visual



1 obstruction. She also suggested a note be put in the newsletter regarding  
2 the extra barriers for all drivers to adhere to traffic rules.

- 3 c. Bill asked Rick if there will be open cut in EG. Rick stated that Sunoco will  
4 continue with HDD. Rick stated that Sunoco was conducting seismic  
5 testing and logging geo samples near the SSJ. Work should start within 2 -  
6 3 weeks. Sunoco is using a new company that should do better than the  
7 previous one.

8 3. Enterprise Update

- 9 a. Rick explained that there is not an Enterprise pipeline in EG. It is in West  
10 Goshen. He also stated that there is nothing regarding the transporting of  
11 product in this pipeline.  
12 b. There was discussion about the Texas Eastern Pipeline. Bill stated that he  
13 heard Texas is looking to come into play. Supposedly, this project is to  
14 install a 24 inch pipe. Rick stated that he is not aware of that and will look  
15 into it. If this is true, this would affect East Goshen.

16  
17 **Old business**

- 18  
19 1. Caroline stated that FERC reopened the comment period to March 1, 2019.  
20 2. Gerald wanted to note that we should be prepared when a blowdown happens.  
21 He stated that he watched a video of a blowdown. The sound that is emitted is  
22 like a jet engine and the large plume comes out of the area. David stated that this  
23 is the type of item that would fall into the communication to residents – Item #9  
24 in the TF Actions Summary List.  
25

26 **New Business**

- 27 1. David referred to Item #11 on the TF Actions Summary List regarding Killian  
28 and Dinniman Pipeline Bills. He stated that the TF needs to discuss a letter of  
29 support for the bills. He continued to refer to Bill #262 Section F2 where it states  
30 that the commission must find and determine if the proposed pipeline will not  
31 create an unreasonable risk of danger. David questioned who determines this  
32 and if there a formula for how many pipelines per population density.  
33 2. David then referred to Bill # 258. He stated that there should be a disclosure  
34 about High Consequence areas.  
35 3. Rick suggested to that the TF compose letter to the Board of Supervisors  
36 encouraging them to support the bills. The TF needs to review the bills and can  
37 add to it. Caroline stated that she can send to Don V. and see which bills are the  
38 most impactful. The letters would be sent to Rep. Killion and cc'd Rep. Comitta.  
39 4. Caroline stated that there is a push to reintroduce Bill #652 (old number; TF did  
40 not know new Bill #. This bill would make protesting any pipelines a felony  
41 charge.  
42 5. David proposed to keep these 3 on the agenda in addition to Legislative Updates:  
43 a. Emergency notification issue  
44 b. Effective evacuation and how to communicate  
45 c. Communication with residents

- 1 6. Russ asked if EG has restrictions on what they can suggest to residents regarding  
2 easements. Rick stated that the Township could instruct residents to read their  
3 temporary easements and consult with solicitors.  
4 7. Judi asked if the TF should have a presence at EG park events; e.g. a booth?  
5 Pamphlets/brochures would be needed.  
6 8. There was discussion that the TF can provide a fact-based article for the  
7 newsletter. The next newsletter deadline is May 1, 2019. Christiania expressed  
8 concerned over the West Chester Area School's District Emergency Plan for  
9 Pipeline accidents. She stated that this is in opposition of others. There are no  
10 proposed routes, or placed to congregate listed. Rick stated that we do not  
11 control the school district's planning. Bill suggested TF could review and send a  
12 letter.  
13 9. David stated that he had a problem with Bill #260 which states that within 6  
14 months of project completion an emergency plan for schools be identified.  
15 10. It was discussed that the article for the newsletter could include information  
16 about home evacuation.  
17 11. Bill explained that in response to his air quality concerns with the upcoming  
18 HDD drilling he discussed at previous meetings, he sent a certified letter to Paul  
19 Metro, PUC (copying Dinniman Comitta, Killion). He asked for guidance on how  
20 he can obtain baseline testing for air quality. He stated that Sunoco uses  
21 bentonite and this is a hazardous airborne material. He has not heard anything  
22 regarding this letter. Caroline stated that the exact product in use is Bara-Kade.  
23 Russ asked if it would be feasible for the Township to conduct the baseline test.  
24 The TF would prefer that Sunoco pays for the testing.  
25

#### 26 **Action Items for TF**

- 27 1. Read the Bills and identify what areas are most impactful and you would like to  
28 see included.  
29 2. Think about addressing the Communication Action Items  
30 3. Think about article for Newsletter.  
31 4. Agenda items to Susan before 7:00 am on the Friday prior to the meeting.  
32

#### 33 **Public Comment**

34 None  
35

36 The next regular meeting is Thursday, March 28, 2019 at 5:00 pm.  
37

#### 38 **Adjournment**

39 The meeting was adjourned at 7:00 pm.  
40

41 Respectfully submitted,  
42

43 *Susan D'Amore*  
44

44 F:\Data\Shared Data\Minutes\Pipeline Task Force\2019\Pipeline TF Mins 02-28-19 DRAFT.docx



# ***FACTS ABOUT PIPELINE SAFETY IN YOUR COMMUNITY***

***HECHOS ACERCA DE LAS TUBERÍAS SEGURO EN SU COMUNIDAD***

**Know**

Infórmese

**Recognize**

Reconozca

**Respond**

Responda







Energy Transfer Partners, a Texas-based energy company founded in 1995 as a small intrastate natural gas pipeline company, is now one of the largest and most diversified master limited partnerships in the United States. Strategically positioned in all of the major U.S. production basins, the company owns and operates a geographically diverse portfolio of energy assets, including midstream, intrastate and interstate transportation and storage assets. Energy Transfer operates approximately 86,000 miles of natural gas, crude oil, natural gas liquids and refined products pipelines and related facilities, including terminalling, storage, fractionation, blending and various acquisition and marketing assets in 38 states.

Approximately two-thirds of the natural gas and petroleum products we use every day are transported through underground pipelines – making them an essential part of the nation's infrastructure. Studies have confirmed that pipelines are the safest way to transport energy in the United States.

You are receiving this information because Energy Transfer, or one of its affiliates, may operate or maintain a pipeline in your community. We ask that you review the following important safety information, encourage you to share it with others and retain for future reference.



If you would like more information, please visit us at [energytransfer.com](http://energytransfer.com) or call our non-emergency number at 877-795-7271.



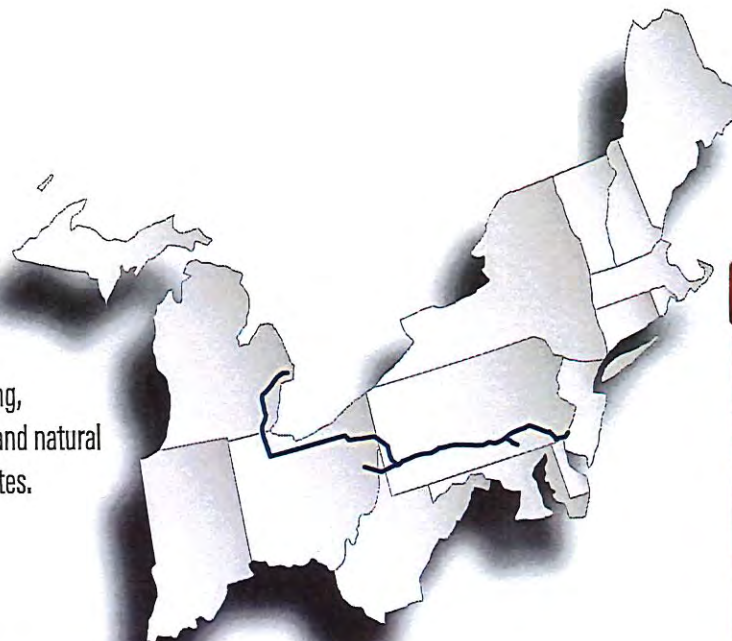


We are strongly committed to operating a safe, reliable pipeline system. As part of that commitment, we strive to enhance public safety and environmental protection through increased public awareness and knowledge.

**Sunoco Pipeline** operates a geographically diverse portfolio of energy assets including, pipelines, terminalling and marketing assets. Crude oil, refined products, natural gas and natural gas liquids are transported through a 12,000-mile pipeline system that traverses 21 states.

**24-HOUR EMERGENCY NUMBER:**  
**800-786-7440**

**PRODUCT: NATURAL GAS LIQUIDS**



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RESPONDA

RECONOZCA

INFÓRMESE

COMUNÍQUESE

**SUNOCO PIPELINE**

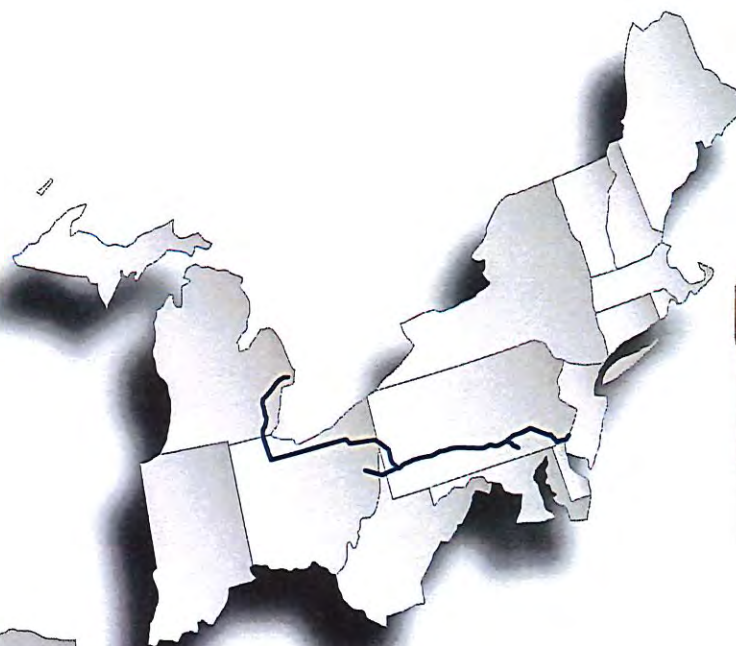
An ENERGY TRANSFER Partnership

Estamos muy comprometidos a operar un sistema de tuberías seguro y confiable. Como parte de nuestro compromiso, nos esforzamos por mejorar la seguridad del público y la protección del medio ambiente a través de un aumento del conocimiento y concientización del público.

**Sunoco Pipeline** opera una cartera de activos energéticos en diversos puntos geográficos que incluyen tuberías, distribución y comercialización. Petróleo crudo, productos refinados, gas natural y líquidos de gas natural son transportados a través de un sistema de tuberías de 12,000 millas que cruza 21 estados.

**TELÉFONO DE EMERGENCIA**  
**LAS 24 HORAS: 800-786-7440**

**PRODUCTO: LÍQUIDOS DE GAS NATURAL**





## National Pipeline Mapping System

Everyone can contribute to safety and security by knowing where pipelines are in their community and recognizing unauthorized activity. To find out who operates transmission pipelines in your area, visit the National Pipeline Mapping System at [www.npms.phmsa.dot.gov](http://www.npms.phmsa.dot.gov).

## Pipeline Safety

Our pipelines are regularly tested and maintained using cleaning devices, diagnostic tools and cathodic protection. We perform regular patrols, both on the ground and in the air, along our routes to ensure the security and integrity of our lines. For the safety of our system and for the people around it, we monitor pipeline operations 24 hours a day, 365 days a year.

## Special Protective Measures

Certain pipelines are designated as being in "High Consequence Areas" (HCA) due to their location in high population or environmentally sensitive areas. In accordance with regulations, we have developed and implemented a written Integrity Management Program that addresses the risks on certain pipeline segments. Baseline and periodic assessments are conducted to identify and evaluate potential threats to our pipelines. Any significant defects discovered are remediated and the company monitors program effectiveness so that modifications can be recognized and implemented.

## Along the Right-of-Way

Rights-of-way provide a permanent, limited access to privately owned property to enable us to operate, inspect, repair, maintain and protect our pipeline. Rights-of-way must be kept free of structures and other obstructions. Property owners should not dig, plant, place or build anything on the right-of-way without first calling 811 and having our personnel mark the pipeline, stake the easement and explain our property development guidelines to you.



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### Sistema Nacional de Mapas de Tuberías

Todos pueden contribuir a la seguridad y protección sabiendo dónde se encuentran las tuberías en sus comunidades y reconociendo si hay actividad no autorizada. Para averiguar quién opera tuberías de transmisión en su zona, visite el Sistema Nacional de Mapas de Tuberías en [www.npms.phmsa.dot.gov](http://www.npms.phmsa.dot.gov).

### La seguridad de las tuberías

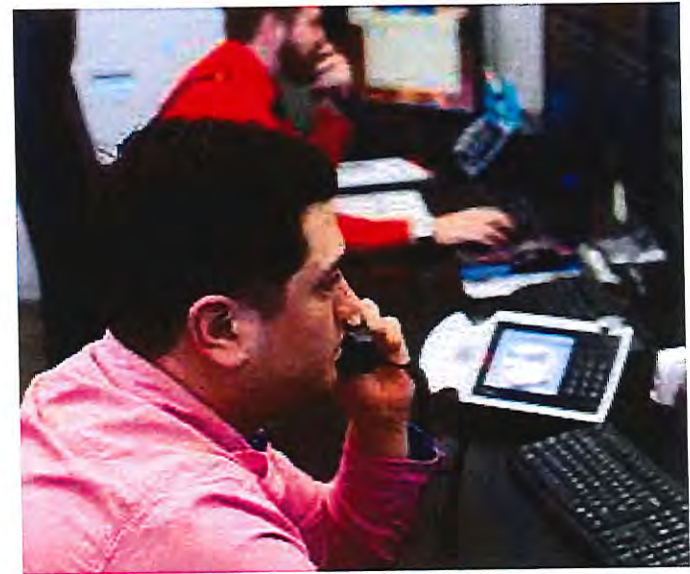
Realizamos pruebas y mantenimiento periódicos a nuestras tuberías usando dispositivos de limpieza, herramientas de diagnóstico y protección catódica. Patrullamos regularmente, tanto por tierra como por aire, nuestras rutas para garantizar la seguridad y la integridad de nuestras líneas. Para conservar la seguridad de nuestro sistema y de las personas a su alrededor, monitoreamos las operaciones de las tuberías las 24 horas del día, los 365 días del año.

### Medidas especiales de protección

Ciertas tuberías son designadas como de "Áreas de altas consecuencias" (High Consequence Areas, HCA) debido a su ubicación en áreas de mucha población o con ecosistemas frágiles. En conformidad con las normas, hemos desarrollado e implementado por escrito un Programa de Gestión de Integridad que trata los riesgos de ciertos segmentos de tuberías. Se realizan evaluaciones iniciales y periódicas para identificar y analizar las amenazas potenciales a nuestras tuberías. Se corrigen todos los defectos significativos detectados y la compañía monitorea la eficacia del programa para que se puedan reconocer e implementar las modificaciones.

### En el derecho de paso




El derecho de paso provee un acceso limitado y permanente a una propiedad privada para permitirnos operar, inspeccionar, reparar, mantener y proteger nuestra tubería. El derecho de paso se debe mantener libre de estructuras y otras obstrucciones. Los dueños de la propiedad no deben excavar, plantar, colocar o construir nada sobre el derecho de paso sin llamar primero al 811. Nuestro personal tiene que indicar la tubería, colocar estacas en el paso y explicarle a usted nuestras directivas para el desarrollo de la propiedad.





Pipelines are typically made of steel, covered with a protective coating and buried several feet underground. For your safety, markers are used to indicate the approximate location of pipelines. The markers contain the name of the pipeline operator and emergency contact information. Keep in mind that pipelines may not follow a straight line between markers nor do markers indicate the exact location and depth of the pipeline.

**Leaks from pipelines are unusual, but we want you to know what to do in the unlikely event one occurs. The table below describes the types of products transported by our pipelines. Refer to the Contact page to find out which products may be transported in your area. You may be able to recognize a leak by the following signs:**

	Natural Gas	Natural Gas Liquids (Butane, Ethane, Propane)	Petroleum (Crude Oil, Gasoline, Diesel, Jet Fuel, Kerosene)	Hydrogen Sulfide (H <sub>2</sub> S)
<b>By Sight</b> 	<ul style="list-style-type: none"> <li>Dust blowing from a hole in the ground.</li> <li>Continuous bubbling in wet or flooded areas.</li> <li>Dead or discolored vegetation in a green area.</li> <li>Flames, if a leak has ignited.</li> </ul>	<ul style="list-style-type: none"> <li>Dust blowing from a hole in the ground.</li> <li>Continuous bubbling in wet or flooded areas.</li> <li>Dead or discolored vegetation in a green area.</li> <li>Flames, if a leak has ignited.</li> <li>Ice around a leak.</li> <li>Vapor cloud or mist.</li> </ul>	<ul style="list-style-type: none"> <li>Pool of liquid on the ground.</li> <li>Rainbow sheen on the water.</li> <li>Continuous bubbling in wet or flooded areas.</li> <li>Ice around a leak.</li> <li>Vapor cloud or mist.</li> <li>Flames, if a leak has ignited.</li> <li>Dead or discolored vegetation in a green area.</li> </ul>	<ul style="list-style-type: none"> <li>Dust blowing from a hole in the ground.</li> <li>Continuous bubbling in wet or flooded areas.</li> <li>Dead or discolored vegetation in a green area.</li> <li>Flames, if a leak has ignited.</li> </ul>
<b>By Sound</b> 	<ul style="list-style-type: none"> <li>Blowing or hissing sound.</li> </ul>	<ul style="list-style-type: none"> <li>Blowing or hissing sound.</li> </ul>	<ul style="list-style-type: none"> <li>Blowing or hissing sound.</li> </ul>	<ul style="list-style-type: none"> <li>Blowing or hissing sound.</li> </ul>
<b>By Smell</b> 	<ul style="list-style-type: none"> <li>An unusual smell or gaseous odor.</li> <li>Odorless unless mercaptan, a chemical odorant, is added to give it a distinctive smell.</li> </ul>	<ul style="list-style-type: none"> <li>An unusual smell or gaseous odor.</li> <li>Odorless unless mercaptan, a chemical odorant, is added to give it a distinctive smell.</li> </ul>	<ul style="list-style-type: none"> <li>An unusual smell or gaseous odor.</li> </ul>	<ul style="list-style-type: none"> <li>Foul sulfur odor, similar to rotten eggs.</li> <li>H<sub>2</sub>S exposure may result in asphyxiation (suffocation) and prolonged exposure to low concentrations can deaden the sense of smell.</li> </ul>

CONTACT

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Las tuberías son típicamente de acero, tienen un revestimiento protector y se entierran a varios pies. Para su seguridad, la ubicación aproximada de las tuberías se indica con señales. Las señales contienen el nombre del operador de la tubería e información sobre a quién contactar en caso de emergencia. Recuerde que la tubería quizá no siga una línea recta entre una señal y otra o quizá las señales no indiquen la ubicación y la profundidad exactas de la tubería.

**Las fugas de tuberías son poco comunes pero queremos que sepa qué hacer si se produce este evento poco probable. El cuadro de abajo describe los tipos de productos que nuestras tuberías transportan. Consulte la página de Contacto para averiguar cuáles productos pueden ser transportados en su zona. Es posible que reconozca una fuga por las siguientes señales:**

	Gas Natural	Líquidos de Gas Natural (Butano, Etano, Propano)	Petróleo (Petróleo crudo, Gasolina, Diesel, Combustible pesado, Kerosén)	Sulfuro de Hidrógeno (H <sub>2</sub> S)
<b>Por la vista</b> 	<ul style="list-style-type: none"> <li>• Polvo que vuela de un orificio en la tierra.</li> <li>• Burbujeo continuo en áreas húmedas o inundadas.</li> <li>• Vegetación muerta o descolorida en un área verde.</li> <li>• Llamas, si la fuga se encendió.</li> </ul>	<ul style="list-style-type: none"> <li>• Polvo que vuela de un orificio en la tierra.</li> <li>• Burbujeo continuo en áreas húmedas o inundadas.</li> <li>• Vegetación muerta o descolorida en un área verde.</li> <li>• Llamas, si la fuga se encendió.</li> <li>• Hielo alrededor de una fuga.</li> <li>• Una nube de vapor o neblina.</li> </ul>	<ul style="list-style-type: none"> <li>• Charco de líquido en el suelo.</li> <li>• Mancha de brillo policromo en el agua.</li> <li>• Burbujeo continuo en áreas húmedas o inundadas.</li> <li>• Hielo alrededor de una fuga.</li> <li>• Una nube de vapor o neblina.</li> <li>• Llamas, si la fuga se encendió.</li> <li>• Vegetación muerta o descolorida en un área verde.</li> </ul>	<ul style="list-style-type: none"> <li>• Polvo que vuela de un orificio en la tierra.</li> <li>• Burbujeo continuo en áreas húmedas o inundadas.</li> <li>• Vegetación muerta o descolorida en un área verde.</li> <li>• Llamas, si la fuga se encendió.</li> </ul>
<b>Por el sonido</b> 	<ul style="list-style-type: none"> <li>• Sonido de soplido o silbido.</li> </ul>	<ul style="list-style-type: none"> <li>• Sonido de soplido o silbido.</li> </ul>	<ul style="list-style-type: none"> <li>• Sonido de soplido o silbido.</li> </ul>	<ul style="list-style-type: none"> <li>• Sonido de soplido o silbido.</li> </ul>
<b>Por el olfato</b> 	<ul style="list-style-type: none"> <li>• Un olor inusual u olor a gas.</li> <li>• Es inodoro a menos que se agregue mercaptano, un odorante químico, para darle un olor característico.</li> </ul>	<ul style="list-style-type: none"> <li>• Un olor inusual u olor a gas.</li> <li>• Es inodoro a menos que se agregue mercaptano, un odorante químico, para darle un olor característico.</li> </ul>	<ul style="list-style-type: none"> <li>• Un olor inusual u olor a gas.</li> </ul>	<ul style="list-style-type: none"> <li>• Olor desagradable a azufre, similar a huevos podridos.</li> <li>• La exposición al H<sub>2</sub>S puede causar asfixia (sofocación) y la exposición prolongada a bajas concentraciones puede reducir el sentido del olfato.</li> </ul>





**Know what's below.  
Call before you dig.**

### **Don't ever assume you know where the underground utilities are located.**

One of the greatest single challenges to safe pipeline operations is the accidental damage caused by excavation. In accordance with state and federal guidelines, a damage prevention program has been established to prevent damage to our pipelines from excavation activities, using non-mechanical or mechanical equipment or explosives to move earth, rock or other material below existing grade. Laws vary by state, but most require a call to 811 between 48 to 72 hours before you plan to dig. Your local One-Call Center will let you know if there are any buried utilities in the area, and the utility companies will be notified to identify and clearly mark the location of their lines at no cost to you.



**ALWAYS CALL 811 BEFORE YOU DIG.**



**WAIT THE REQUIRED AMOUNT OF TIME.**



**RESPECT THE MARKS.**



**DIG WITH CARE.**









If you should happen to strike the pipeline while working in the area, it is important that you phone us immediately. Even seemingly minor damage, such as a dent or chipped pipeline coating, could result in a future leak if not promptly repaired.

### **What should I do if I suspect a leak?**

- Leave the area immediately on foot and warn others to stay away.
- Abandon any equipment being used in or near the area.
- Avoid any open flame or other sources of ignition.
- Call 911 or local law enforcement from a safe location.
- Notify the pipeline company immediately.
- Do not attempt to extinguish a pipeline fire.
- Do not attempt to operate pipeline valves.

Wait for the site to be marked. Marking could be either by paint, flags or stakes.

#### **APWA Color Code**

-  Proposed excavation
-  Temporary survey markings
-  Electric power lines, cables, conduit and lighting cables
-  Gas, oil, steam, petroleum or gaseous materials
-  Communication, alarm or signal lines, cables or conduit
-  Potable water
-  Reclaimed water, irrigation and slurry lines
-  Sewers and drain lines

**CONTACT**

**KNOW**

**RECOGNIZE**

**RESPOND**





Determina lo que está **bajo tierra.**  
**Llama antes de excavar.**

## Nunca suponga que sabe dónde están los servicios públicos subterráneos.

Uno de los retos más grandes a las operaciones seguras de las tuberías es el daño accidental causado por una excavación. De acuerdo con las pautas estatales y federales, se ha implementado un programa de prevención de daños para prevenir que nuestras tuberías sean dañadas durante actividades de excavaciones, donde se emplean equipos mecánicos y no mecánicos o explosivos para mover tierra, piedra o algún otro tipo de material debajo de la superficie actual. Las leyes varían de estado a estado, pero la mayoría de los estados requieren que haga una llamada al 811 de 48 a 72 horas antes de cuando piensa excavar. Su centro One-Call local le informará si hay algún servicio público enterrado en el área, y se notificará a las compañías de servicios públicos para que identifiquen y señalen claramente la ubicación de sus líneas sin costo para usted.



**SIEMPRE LLAME 811 ANTES DE EXCAVAR.**



**ESPERE LA CANTIDAD DE TIEMPO EXIGIDA.**



**RESPETE LAS SEÑALES.**



**EXCAVE CON CUIDADO.**

Si llegara a golpear la tubería mientras trabaja en el área, es importante que nos llame por teléfono inmediatamente. Incluso los daños que parecen mínimos, como una abolladura o el raspón del recubrimiento de la tubería, podrían causar una fuga en el futuro si no se reparan rápidamente.

## ¿Qué debe hacer si sospecha que hay una fuga?

- Retírese inmediatamente del área a pie e indique a otras personas que se mantengan alejadas.
- Abandone cualquier equipo que esté utilizando en el área o cerca de ella.
- Evite llamas abiertas u otras fuentes de ignición.
- Llame al 911 ó a la policía local desde un lugar seguro.
- Notifique inmediatamente a la compañía de la tubería.
- No intente extinguir un incendio de una tubería.
- No intente manipular las válvulas de la tubería.

Aguarde la marcación del sitio. Las marcas pueden ser con pintura, banderas o estacas.

## Código de colores de APWA

-  Excavación propuesta
-  Señales temporales de relevos topográficos
-  Líneas de energía eléctrica, cables, conductos y cables de iluminación
-  Gas, aceite, vapor, petróleo o materiales gaseosos
-  Comunicación, líneas de señales o de alarma, cables o conductos
-  Agua potable
-  Agua recuperada, líneas de irrigación
-  Líneas de drenaje y alcantarillado



Energy Transfer se dedica principalmente al transporte, almacenamiento, colección, procesamiento, compresión y tratamiento de gas natural, y al transporte, fraccionamiento y almacenamiento de líquidos de gas natural (LGN). Energy Transfer, una compañía energética basada en Texas, fundada en 1995 como una pequeña compañía interestatal de tuberías de gas natural, es ahora una de las compañías de transporte de gas natural y líquidos de gas natural de mayor crecimiento en el país. Somos propietarios y operamos un diversificado portafolio de bienes energéticos, que incluyen aproximadamente 86,000 millas de tuberías de gas natural de corriente media, inter e intraestatales y tuberías de LGN.

Aproximadamente dos tercios del gas natural y de los productos del petróleo que usamos a diario se transportan a través de tuberías subterráneas, convirtiéndose en una parte esencial de la infraestructura del país. Los estudios han confirmado que las tuberías son la manera más segura para transportar energía en los Estados Unidos.

Usted está recibiendo esta información porque es posible que Energy Transfer, o uno de sus socios, opere o realice el mantenimiento de una tubería en su comunidad. Le pedimos que repase la siguiente información de seguridad importante, lo alentamos a que la comparta con otros y la conserve para consulta en el futuro.



**Know what's below.  
Call before you dig.**

Please share this important safety information with others - anyone who plans to dig.

Sírvase compartir esta importante información de seguridad con los demás o con cualquiera que tenga planeado hacer trabajos de excavación.

Si desea obtener más información, visítenos en [energytransfer.com](http://energytransfer.com) o llame a nuestro número que no es para emergencias al 877-795-7271.



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**FOR MORE INFORMATION REGARDING PIPELINE  
SAFETY AND AN OVERVIEW OF THE PIPELINE  
INDUSTRY PLEASE VISIT THE FOLLOWING WEBSITES:**

Pipeline Resources and Information

811 - [www.call811.com](http://www.call811.com)

American Gas Association (AGA) - [www.aga.org](http://www.aga.org)

American Petroleum Institute (API) - [www.api.org](http://www.api.org)

Association of Oil Pipe Lines (AOPL) - [www.aopl.org](http://www.aopl.org)

Common Ground Alliance (CGA) - [www.commongroundalliance.com](http://www.commongroundalliance.com)

Interstate Natural Gas Association of America (INGAA) - [www.ingaa.org](http://www.ingaa.org)

National Pipeline Mapping System (NPMS) - [www.npms.phmsa.dot.gov](http://www.npms.phmsa.dot.gov)

Pipeline 101 - [www.pipeline101.com](http://www.pipeline101.com)

Pipeline Association for Public Awareness (PAPA) -  
[www.pipelineawareness.org](http://www.pipelineawareness.org)

Pipeline Emergency Response Training Portal -  
<http://pipelines.training>

Pennsylvania Pipeline Awareness - [www.pennsylvaniapipeline.com](http://www.pennsylvaniapipeline.com)

Government/Regulatory Agencies

Pipeline Hazardous Materials Safety Administration (PHMSA) -  
[www.phmsa.dot.gov](http://www.phmsa.dot.gov)

Pennsylvania Public Utility Commission (PUC) - [www.puc.state.pa.us](http://www.puc.state.pa.us)






**FOR MORE INFORMATION ABOUT INTERSTATE ENERGY  
PIPELINE COMPANY AND PIPELINE SAFETY PROGRAMS  
PLEASE VISIT US AT:**

Web site: [www.iec.energy](http://www.iec.energy) or E-mail: [info@iec.energy](mailto:info@iec.energy)

**EMERGENCY NUMBER: 800-747-3375**



This color code chart will help determine which utilities have marked their underground utility lines.

 WHITE - Proposed excavation	 ORANGE - Communications, alarm or signal lines, cables or conduit
 PINK - Temporary survey markings	 BLUE - Potable water lines
 RED - Electric power lines, cables, conduit and lighting cables	 PURPLE - Reclaimed water, irrigation and slurry lines
 YELLOW - Gas, oil, steam, petroleum or gaseous materials	 GREEN - Sewer lines

# INTERSTATE ENERGY COMPANY



## Important Pipeline Safety Message *for your neighborhood*



### WHAT'S INSIDE

Pipeline Location.....	2
Leak Recognition and Response .....	3
Always Call Before You Dig.....	4

*Please keep for future reference.*



## ABOUT INTERSTATE ENERGY COMPANY

Interstate Energy Company operates and maintains an underground oil and natural gas pipeline near your home or place of work. The purpose of our pipelines and facilities is to provide oil and natural gas to electricity generating facilities, allowing them to operate with the most cost-effective fuel. The natural gas is odorized by suppliers to our transmission pipelines.

## INTEGRITY MANAGEMENT PROGRAMS

Interstate Energy Company invests significant time, capital and maintenance to insure the quality and integrity of our transmission pipelines. Our systems are monitored 24 hours a day every day. Interstate Energy Company also utilizes ground surveillance, aerial patrolling, in-line-inspections and other methods to identify potential risks to our pipelines and facilities. Pipeline valves can be accessed remotely from our Control Room to isolate and minimize a leak. Field personnel are immediately notified if there is a possibility of a leak and appropriate resources are allocated to minimize risks to the public and environment.

## MAINTAINING SAFETY AND INTEGRITY OF PIPELINES

In compliance with federal and state regulations, Interstate Energy Company (IEC) has implemented an Integrity Management Program (IMP) for our pipelines.

In accordance with federal regulations, some segments along pipelines have been designated as High Consequence Areas (HCAs) and supplemental hazard assessment and prevention programs in our IMP have been developed. For an overview of these programs, visit our website at [www.iec.energy](http://www.iec.energy).

## PIPELINE PURPOSE AND RELIABILITY

Pipelines are the safest and most efficient means of transporting natural gas and petroleum products, according to National Transportation Safety Board statistics. These pipelines transport the natural gas, which provides about 24 percent of all the energy used in the United States, and over 700 million gallons of petroleum products per day.

In the United States alone, there are over 200,000 miles of petroleum pipelines and 300,000 miles of natural gas transmission pipelines in use every day. Transmission pipelines are typically larger than gathering and distribution lines. They transport energy products across the country and to storage facilities. Compressor stations and pumping stations are located along transmission and gathering pipeline routes and help push energy products through the line.

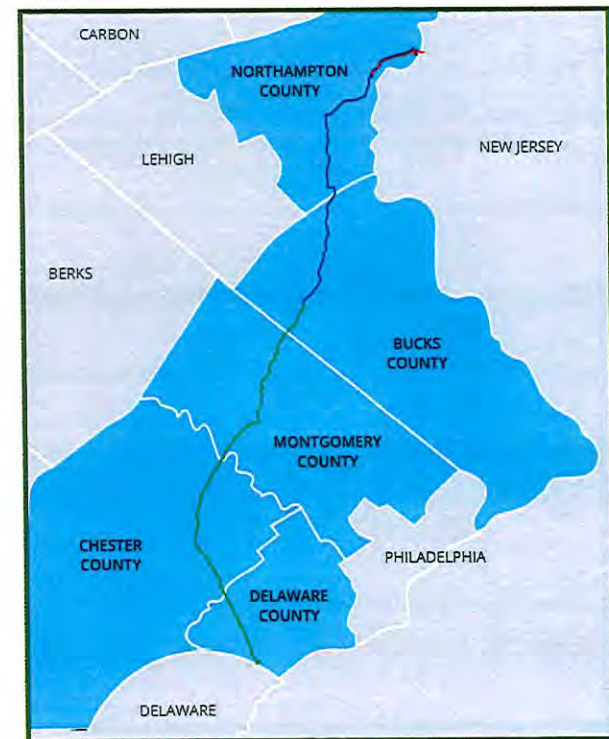


Local Distribution Companies deliver natural gas to most homes and businesses through underground main and utility service lines. These lines cover over 800,000 miles of underground pipeline in the United States. Onshore gathering lines are pipelines that transport gas from a current production operation facility to a transmission line or main. Production operations are piping and equipment used in production and preparation for transportation or delivery of hydrocarbon gas and/or liquids.

## TRANSMISSION PIPELINE MAPPING

The U.S. Department of Transportation's Office of Pipeline Safety has developed the National Pipeline Mapping System (NPMS) to provide information about gas transmission and liquid transmission operators and their pipelines. The NPMS Web site is searchable by zip code or by county and state, and can display a county map that is printable. For a list of pipeline operators with pipelines in your area and their contact information, go to [www.npms.phmsa.dot.gov/](http://www.npms.phmsa.dot.gov/). Operators of production facilities, gas/liquid gathering piping and distribution piping, are not represented by NPMS nor are they required to be.

## INTERSTATE ENERGY COMPANY SYSTEM MAP



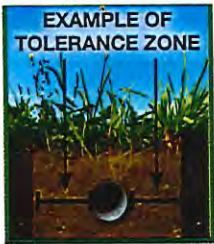
- 18 INCH MAINLINE — oil
- 18 INCH MAINLINE — oil & natural gas
- 20 INCH LOWER MOUNT BETHEL PIPELINE — gas

18 inch diameter 1083 PSIG Gas 1150 PSIG Oil  
20 inch diameter 1200 PSIG



## WHAT TO DO IN CASE OF DAMAGING/ DISTURBING A PIPELINE

State laws require you to maintain a minimum clearance, or tolerance zone, on either side of the pipeline, between the point of excavation and a marked pipeline. Check with your state one-call for tolerance zone requirements in your state.



Even the most minor damage to a pipeline can have serious consequences. If you cause or witness even minor damage to a pipeline or its protective coating, do not cover up or attempt to repair the pipeline. Evacuate the area and call 911 and the pipeline company immediately.

## WHAT IS A RIGHT-OF-WAY AND CAN I BUILD OR DIG ON IT?

Pipeline companies work diligently to establish written agreements, or easements, with landowners to allow for ease of construction and maintenance when they cross private property. Rights-of-way are often recognizable as corridors that are clear of trees, buildings or other structures except for the pipeline markers. A right-of-way may not have markers clearly present and may only be indicated by cleared corridors of land, except where farm land or crops exist. County Clerk's Offices also have record of easements which are public record.

Encroachments upon the pipeline right-of-way inhibit the pipeline operator's ability to reduce the chance of third-party damage, provide right-

of-way surveillance and perform routine maintenance and required federal/state inspections. In order to perform these critical activities, pipeline maintenance personnel must be able to easily and safely access the pipeline right-of-way, as well as areas on either side of the pipeline. Keeping trees, shrubs, buildings, fences, structures and any other encroachments well away from the pipeline ensures that the pipeline integrity and safety are maintained.

For questions concerning the pipeline or right-of-way or about future property improvements or excavations, contact the pipeline operator.

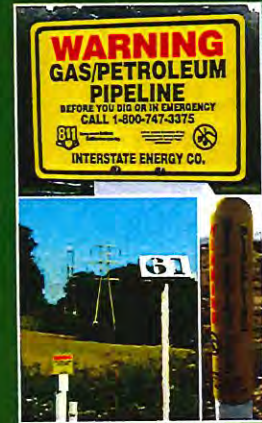
## HOW WOULD YOU KNOW WHERE A PIPELINE IS?

Most pipelines are underground, where they are more protected from the elements and minimize interference with surface uses. Even so, pipeline rights-of-way are clearly identified by pipeline markers along pipeline routes that identify the approximate—NOT EXACT—location of the pipeline. Every pipeline marker contains information identifying the company that operates the pipeline, the product transported, and a phone number that should be called in the event of an emergency. **Markers do not indicate pipeline burial depth, which will vary.** Markers are typically seen where a pipeline intersects a street, highway or railway. For any person to willfully deface, damage, remove, or destroy any pipeline marker is a federal crime.

**Pipeline Marker** — This marker is the most common. It contains operator information, type of product, and an emergency contact number. Size, shape and color may vary.

**Aerial Marker** — These skyward facing markers are used by patrol planes that monitor pipeline routes.

**Casing Vent Marker** — This marker indicates that a pipeline (protected by a steel outer casing) passes beneath a nearby roadway, rail line or other crossing.



## HOW CAN YOU HELP?

While accidents pertaining to pipeline facilities are rare, awareness of the location of the pipeline, the potential hazards, and what to do if a leak occurs can help minimize the number of accidents. A leading cause of pipeline incidents is third-party excavation damage. Pipeline operators are responsible for the safety and security of their respective pipelines. To help maintain the integrity of pipelines and their rights-of-way, it is essential that pipeline and facility neighbors protect against unauthorized excavations or other destructive activities. Here's what you can do to help:

- **Become familiar with the pipelines and pipeline facilities in the area (marker signs, fence signs at gated entrances, etc).**
- **Record the operator name, contact information and any pipeline information from nearby marker/facility signs and keep in a permanent location near the telephone.**
- **Be aware of any unusual or suspicious activities or unauthorized excavations taking place within or near the pipeline right-of-way or pipeline facility; report any such activities to the pipeline operator and the local law enforcement.**





## RECOGNIZING A PIPELINE LEAK



- **Sight:** Liquid pools, continuous bubbling in wet or flooded areas, an oily sheen on water surfaces, and vaporous fogs or blowing dirt around a pipeline area, dead or discolored plants in an otherwise healthy area of vegetation or frozen ground in warm weather are all signs of a pipeline leak. Natural gas is colorless, but vapor and "ground frosting" may be visible at high pressures. A natural gas leak may also be indicated by dust blowing from a hole in the ground or flames if the leak is ignited.
- **Sound:** Volume can range from a quiet hissing to a loud roar depending on the size of the leak and pipeline system.
- **Smell:** An unusual smell, petroleum odor, or gaseous odor will sometimes accompany pipeline leaks. Natural Gas and Highly Volatile Liquids are colorless, tasteless and odorless unless commercial odorants or Mercaptan is added. Gas transmission/gas gathering pipelines are odorless, but may contain a hydrocarbon smell.

## WHAT TO DO IN THE EVENT A LEAK WERE TO OCCUR:

- **Turn off** any equipment and eliminate any ignition sources without risking injury.
- **Leave the area** by foot immediately. Try to direct any other bystanders to leave the area. Attempt to stay upwind.
- If known, from a safe location, notify the pipeline operator immediately and **call 911** or your local emergency response number. The operator will need your name, your phone number, a brief description of the incident, and the location so the proper response can be initiated.

## WHAT NOT TO DO IN THE EVENT A LEAK WERE TO OCCUR:

- **DO NOT** cause any open flame or other potential source of ignition such as an electrical switch, vehicle ignition, light a match, etc. Do not start motor vehicles or electrical equipment. Do not ring doorbells to notify others of the leak. Knock with your hand to avoid potential sparks from knockers.
- **DO NOT** come into direct contact with any escaping liquids or gas.
- **DO NOT** drive into a leak or vapor cloud while leaving the area.
- **DO NOT** attempt to operate any pipeline valves yourself. You may inadvertently route more product to the leak or cause a secondary incident.
- **DO NOT** attempt to extinguish a petroleum product or natural gas fire. Wait for local firemen and other professionals trained to deal with such emergencies.

## ALWAYS CALL BEFORE YOU DIG. IT'S THE LAW!

Because even relatively minor excavation activities like landscaping or fencing can cause damage to a pipeline, its protective casing and/or buried utility lines, always contact your state One-Call Center before engaging in any excavation, construction, farming or digging. Pennsylvania requires 3 work days notice to the One-Call Center to allow the utility operators to mark their pipelines and utilities at your proposed digging site. In fact, most serious damage done to pipelines is done when a third party inadvertently excavates, blasts or drills within a pipeline right-of-way. By contacting the One-Call Center first, this type of damage can be prevented.

Interstate Energy Company requires a representative present to monitor the safe excavation.

One easy **FREE** phone call to 811 starts the process to get your underground pipelines and utility lines marked. When you call 811 from anywhere in the country, your call will be routed to your state One-Call Center. Once your underground lines have been marked for your project, you will know the approximate location of your pipelines and utility lines, and can dig safely. More information regarding 811 can be found at [www.call811.com](http://www.call811.com).



Know what's below.  
**Call before you dig.**





# ELECTRONIC CODE OF FEDERAL REGULATIONS

**e-CFR data is current as of February 14, 2019**

[Title 49](#) → [Subtitle B](#) → [Chapter I](#) → [Subchapter D](#) → [Part 195](#) → [Subpart F](#) → §195.440

Title 49: Transportation

[PART 195—TRANSPORTATION OF HAZARDOUS LIQUIDS BY PIPELINE](#)

[Subpart F—Operation and Maintenance](#)

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## **§195.440 Public awareness.**

(a) Each pipeline operator must develop and implement a written continuing public education program that follows the guidance provided in the American Petroleum Institute's (API) Recommended Practice (RP) 1162 (incorporated by reference, see §195.3).

(b) The operator's program must follow the general program recommendations of API RP 1162 and assess the unique attributes and characteristics of the operator's pipeline and facilities.

(c) The operator must follow the general program recommendations, including baseline and supplemental requirements of API RP 1162, unless the operator provides justification in its program or procedural manual as to why compliance with all or certain provisions of the recommended practice is not practicable and not necessary for safety.

(d) The operator's program must specifically include provisions to educate the public, appropriate government organizations, and persons engaged in excavation related activities on:

- (1) Use of a one-call notification system prior to excavation and other damage prevention activities;
- (2) Possible hazards associated with unintended releases from a hazardous liquid or carbon dioxide pipeline facility;
- (3) Physical indications that such a release may have occurred;

(4) Steps that should be taken for public safety in the event of a hazardous liquid or carbon dioxide pipeline release; and

(5) Procedures to report such an event.

(e) The program must include activities to advise affected municipalities, school districts, businesses, and residents of pipeline facility locations.

(f) The program and the media used must be as comprehensive as necessary to reach all areas in which the operator transports hazardous liquid or carbon dioxide.

(g) The program must be conducted in English and in other languages commonly understood by a significant number and concentration of the non-English speaking population in the operator's area.

(h) Operators in existence on June 20, 2005, must have completed their written programs no later than June 20, 2006. Upon request, operators must submit their completed programs to PHMSA or, in the case of an intrastate pipeline facility operator, the appropriate State agency.

(i) The operator's program documentation and evaluation results must be available for periodic review by appropriate regulatory agencies.

[Amdt. 195-84, 70 FR 28843, May 19, 2005]

[Need assistance?](#)

# **Memo**

## **East Goshen Township**

Date: January 24, 2019

To: Pipeline Task Force

From: Rick Smith, Township Manager

Re: Gas Detection

On Tuesday January 23, David and I attended a meeting at Thornbury Township (DELCO) with representatives from E.A Oliva Company (an equipment supplier) and Instrumentation, Control & Energy Engineering (and engineering company) to discuss what was involved with installing monitoring equipment along a gas or NGL pipeline.

It is technically feasible to install equipment that can detect leaks.

The engineer, Joe Guagno, advised the first step would be to determine what segment of the pipeline that you want to monitor. The engineer could then survey the area, develop a plan, design the system and specify the equipment.

The equipment supplier, Glenn Yanni, said that he can provide a fixed sensor that would monitor an area with a radius of 15 feet. This would probably be suitable for monitoring a valve site. The sensor would send a signal to a programmable logic controller (PLC). The PLC would be connected to an automatic dialer or another piece of equipment programed to call people or sound an alarm, etc. if a leak developed and a gas or NGL was detected.

They also offer an infrared sensor for linier applications like a pipeline. An emitter sends an infrared beam to a receiving unit, similar to the safety sensor on a garage door. The gas or NGL molecules disrupt the beam. This sensor also sends a signal to a PLC. These sensors have a maximum range of 600 feet (closer is better, since the accuracy of the readings decreases as the distance increases) and they need a clear sight line between the emitter and receiving unit.

Both types of sensor allow you to determine the level of gas which would trigger an alarm.

Other issues discussed were

Siting. An easement may be required if the pipeline or valve was located on private property. Since the Sunoco pipelines are located under Boot Road and North Chester Road, the Township could install the equipment in the PennDOT ROW via a highway occupancy permit.

Equipment. The type of gas or NGL that you are detecting determines that height of the sensor. Heavier than air NGLs would require a low mounted sensor, while lighter than air gases like methane would require a high mounted sensor.

Operation. The PLC and/or dialer would need power and a telephone line or a wireless connection. This would be an ongoing cost.

Maintenance. The sensors come with a 3-5 year warranty, they would need to be calibrated (2Xyear). The sensors will wear out in 5-10 years and will need to be replaced. You would need to maintain a clear sight line between the emitter and receiver.

Equipment costs: The fixed sensor costs about \$3,000, the infrared sensor is about \$10,000 and the PLC is about \$10,000. Each PLC could handle up to 64 sensors. All of the sensors need to be hardwired to the PLC.

F:\Data\Shared Data\ABC'S\Pipeline\Memo re Gas Detection 012319.docx



**Glenn Yanni**

**E.A. Oliva Co., Inc.**

Technical Representatives, Distributors

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by  
Richard B. Kuprewicz  
President, Accufacts Inc.  
kuprewicz@comcast.net  
August 30, 2007

**Accufacts Inc.**

“Clear Knowledge in the Over Information Age”

This report, developed from information clearly and readily in the public domain, represents the experience of the author who is solely responsible for its content.



## I. Executive Summary

Based on extensive field experience, Accufacts was asked to comment on approaches to leak detection on transmission pipelines.<sup>1</sup> Transmission pipelines are the arteries of the hydrocarbon-based energy network, and there are many misconceptions, even within the industry, as to the technical capabilities of various leak detection approaches to reliably determine releases. This paper will provide a simple perspective on both liquid and gas transmission pipeline release detection, but, given the greater risks of liquid pipeline releases to seriously impact the environment, the majority of this paper will focus on liquid systems. Computer-based leak detection monitoring conditions within the pipeline (also known as internal leak detection) are utilized on most transmission pipeline systems employing leak detection and are the primary focus of this paper. Various computer-supported external leak detection approaches, which monitor for signs of hydrocarbon outside of the pipeline, are also briefly discussed.<sup>2</sup>

Transmission pipeline leak detection systems should complement appropriate integrity management approaches on a specific pipeline.

This author does not recommend historical approaches utilized in leak detection that focus on lowering alarm thresholds as a percentage of throughput (e.g., set at 1% of throughput) to address all forms of release. Such historical “one-size-fits-all” approaches create an illusion that tighter or lower thresholds are somehow better and this approach does not handle the three types of release (rupture, leaks, and seepage) well.<sup>3</sup> In reality, a one-size-fits-all approach creates a phalanx of false alarms caused by the different natures of releases, and ignores the complexity, system hydraulics, and dynamics of most liquid pipelines. These dynamics set up control room operators with alarm overload such that a real release is not determined, usually missed, or not properly responded to, in the many thousands of false leak alarms, all too many of which occur frequently, even daily. The author would describe the state of false leak detection alarms as epidemic, placing unwarranted and undo burden on, and even setting up for failure, control room operators, the individuals chartered with monitoring and/or operating the pipeline system.

### **“Leak Detection” Regulatory Recommendations**

- 1) Require pipeline leak detection “cover” critical areas.
- 2) Emphasize reliable rupture determination.
- 3) Release alarm thresholds should be based on plausible release rate, not on percentage of pipeline throughput.
- 4) Pipeline operators should set and document the proper alarm thresholds for each type of release.
- 5) Release alarm records and related documentation should be retained for at least 3 years.
- 6) Leak detection alarm records should be made public.

This paper proposes computer-based leak detection approaches for liquid pipelines that are based on and tailored to the three different types of transmission pipeline releases. Such approaches are pipeline system or

<sup>1</sup> The author will utilize the general term “leak detection” to mean all forms of release, unless a specific qualifier for the three types of release is applied or inferred in the context.

<sup>2</sup> Pipeline leak detection is currently not a requirement in U.S. federal pipeline safety regulations, though single phase hazardous liquid pipelines that operate with computational pipeline monitoring must meet the recommendations of API (America Petroleum Institute) publication 1130 as per 49CFR195.444 CPM leak detection.

<sup>3</sup> See State of Alaska, AAC Title 18, Chapter 75, Section 55 - Leak detection, monitoring, and operating requirements for crude oil transmission pipelines, which sets among other requirements “(1) if technically feasible, the continuous capability to detect a daily discharge equal to not more than one percent of daily throughput;...”



pipeline segment specific. The "Leak Detection Regulatory Recommendations" defined in the above textbox will improve leak detection performance. Each of the three types of release should have its own method of approach in determination of alarm threshold, as well as separate alarm indication/alert that eliminates or substantially reduces false leak alarms presented to a control room operator. This paper also discusses several of the serious misconceptions related to pipeline leak detection and response. Core pipeline principles concerning system dynamics put to rest the illusion that the lower a stated alarm threshold, or the more complex a leak detection system, the higher the likelihood of identifying an actual release. Given the difficulty in identifying low rate or intermittent seepage leaks, which can be especially insidious to underground sensitive water supplies such as aquifers, a specific approach to more reliably determine such leaks is also presented (see Figure 2 on page 13).

Lastly, natural gas transmission release determination is briefly discussed, highlighting the additional challenges in computer-based leak detection for gas transmission systems moving highly compressible natural gas.

Release determination involving computers is becoming more important in gas transmission pipeline risk management given the greater propensity of many new gas transmission systems upon rupture to release significantly more tonnage of fuel most likely to detonate than past pipeline operations.

## **II. Liquid Pipeline Leak Detection**

### **General Background**

Many reports from the NTSB (National Transportation Safety Board) related to pipeline failures and poor leak detection alarm action/response have raised awareness for badly needed pipeline regulatory improvements in the area of leak detection and control room management.<sup>4</sup> Congress in the PIPES Act of 2006 included a requirement for PHMSA (Pipeline and Hazardous Materials Safety Administration) to perform a study addressing pipeline leak detection for various types of releases on liquid pipelines.<sup>5</sup>

Leak detection can be subdivided into two major approaches: 1) those based on systems gathering and analyzing data concerning conditions of the fluid within the pipeline, known as internal leak detection, and 2) those leak detection efforts related to monitoring for signs of hydrocarbon outside of the pipeline, known as external leak detection.<sup>6,7</sup> Both major approaches are discussed below though the preponderance of liquid pipeline leak detection systems are internal (covering more miles of pipeline), using manual review or computers to assist in leak evaluation and determination of the outputs. This author has little doubt that regulatory improvements in pipeline leak detection as well as control room

<sup>4</sup> For example, see NTSB Safety Study PB 2005-917005, "Supervisory Control and Data Acquisition (SCADA) in Liquid Pipelines," adopted November 29, 2005.

<sup>5</sup> PIPES, the Pipeline, Inspection, Performance, Enforcement, and Safety Act of 2006, section 21 defines the requirements for a leak detection technology study.

<sup>6</sup> See API 1130, "Computational Pipeline Monitoring for Liquid Pipelines – Second Edition," November 2002.

<sup>7</sup> Computer based systems do not have to include SCADA as many leak detection systems can be set up on a stand alone leak detection computer that feeds a separate alarm system, though many leak systems either utilize or feed into an existing SCADA computer controlling/monitoring a pipeline.



management are warranted, given the increasing role that computers play in many of today's transmission system operations. Both internal and external leak detection systems have various strengths and weaknesses in effectively identifying the three basic types of releases that can occur on a high-stress transmission pipeline: ruptures, leaks, and seepage discharges.

Ruptures are high-mass-rate releases associated with the failure mechanics of highly stressed pipe, such as transmission systems, where an anomaly in a pipeline fails and catastrophically opens rapidly (in microseconds) well beyond the opening for the original defect. Leaks are much lower-rate releases associated with the hole or opening maintaining its original or fairly near its original size through the pipe wall failure. Leaks can still be quite spectacular, dangerous, and expensive as shown by the photo on the cover of this report.<sup>8</sup> Both ruptures and higher-rate leaks usually become obvious in areas where visual detection is readily available, as such high-rate releases will frequently break to the surface even in deeply buried pipelines, and they impact areas well beyond the pipeline right-of-way. It is worth noting that there can be a considerable time span between initial release and visual determination even for these higher-rate releases.

Many slow-rate or intermittent seepage leaks cannot be determined with a "pressure squeeze," where the pipeline is shutdown, initially set at some level of liquid hydrocarbon "static" pressure, and the pipeline segment monitored for signs of pressure loss that might suggest a leak.

Seepage leaks are slow, lower-rate releases associated with very small holes or cracks that permit release through the pipe wall or at welds. Seepage failures can be especially troublesome. Their release may not always be continuous since various factors can cause such small holes or cracks to open and close, resulting in intermittent releases that can be very difficult to quickly find. Depending on the location of a slow-rate-leak or seepage release, even a relatively low-rate release can be quite insidious if located in or near a sensitive area such as

population or a critical drinking water aquifer (e.g., Karst aquifer).<sup>9</sup> Because of their slow rate of release and/or intermittency, a considerable volume of oil can still be released without detection over long periods of time, generating very large underground release plumes. Not all low-rate leaks or seepage releases appear on the surface near a pipeline or on a pipeline right-of-way. As explained below, these slower-rate releases are harder to determine in real time than one might think, as oftentimes the rate of release is much lower than the reliable leak detection threshold rate of determination for a pipeline system or pipeline segment. Fortunately, methods such as that outlined in this paper can assist in capturing such low-rate or intermittent releases, hopefully before the underground plume can become too large or spread too far.

Liquid transmission pipelines move fluid in a liquid state at the operating conditions inside the pipeline. Most liquid transmission pipelines operate liquid full (single phase), but a small number require that one or more segments of their pipeline system operate in slack line condition, or not liquid full (vapor space above the liquid flowing in the line, or two phase). For transmission pipelines, slack line operations are usually connected with very large elevation changes and associated pipeline design limitations. Slack line operation for liquid pipelines introduces another level of noise or magnitude of

<sup>8</sup> Burnaby, BC Canada 24-inch crude oil pipeline puncture "leak" release with no detonation or ignition, June 24, 2007. Photo courtesy of Mr. Shawn Soucy of Spirit Media, [www.spiritmedia.ca](http://www.spiritmedia.ca).

<sup>9</sup> A Karst aquifer is a type of aquifer where the enhanced rock porosity acts like a branching network, creating a faster moving underground creek that can rapidly spread underground oil contamination if it occurs.



complication/challenge to a pipeline's leak detection system(s) as flow is non-single liquid phase. Liquids encompass a wide range and mixture of hydrocarbon compounds ranging from the heavier-end asphalts and fuel oils to light hydrocarbons such as ethane and methane). Volatile compounds such as butane and propane are usually liquids in a pipeline but can easily become gases when released. There are many parameters affecting leak detection design/approaches on liquid hydrocarbon pipelines and API 1130 does an excellent job of summarizing some of these variables, underscoring the challenges of leak detection on liquid hydrocarbon pipelines.<sup>10</sup>

A critical parameter in the ability of liquid pipelines to remotely identify a release is the determination of the actual bulk modulus of the fluid mixture in the pipeline. The bulk modulus of a mixture is often estimated in various more-complex leak detection programs or compensated for by the use of correction factors that attempt to adjust for the change in actual bulk modulus associated with composition (and temperature) that drives the estimated change in the inventory of the fluid in the pipeline (i.e., the linepack).<sup>11</sup> Some of these programs even attempt to compensate for the change in size of the steel pipeline for different pressures and temperatures. Since bulk modulus is not measured (and it changes along a pipeline), a slight deviation in actual conditions from assumed conditions in the pipeline can introduce considerable error in inventory change estimates (i.e., the density changes along a liquid pipeline), raising the threshold requirements for leak detection.<sup>12</sup> It is best to think of a liquid pipeline system as an active compressible spring that never really settles down, even in a mythical steady-state operation. Some transient phases of pipeline operation such as startup and shutdown create more "bounce" or oscillations than normal within the pipeline. Only a rare few hydrocarbon liquid pipeline systems really operate in a true "steady-state" mode, because the liquid is highly compressed and contains considerable stored energy that creates additional noise within the system. Various balance approaches and other internal based leak detection system suppliers utilize different techniques in an attempt to deal with these noises.

A leak detection system is of little or no value if it generates a high number of false leak alarms.

### Leak Misconceptions

- 1) Leak tests actually test a leak detection system.
- 2) Lower leak thresholds mean the system can identify larger releases.
- 3) "Closing" the system can be used to stop a release (the old soda straw trick).

### Major Misconceptions Concerning Liquid Pipeline Leak Detection

Before describing the various leak detection approaches in further detail, the author believes that additional observations related to several serious technical misconceptions summarized in the text box at left are warranted. It is a common misconception that leak tests, usually performed by opening a small valve off the pipeline, simulate an actual leak. While this test may actually indicate that a particular leak detection

<sup>10</sup> See API 1130, "Computational Pipeline Monitoring for Liquid Pipelines – Second Edition," November 2002, section 1.4 "Transportation Systems," page 2.

<sup>11</sup> Bulk Modulus, a fluid property which is usually a range for mixtures of hydrocarbon fluids and also highly dependent on temperature, is the pressure required to produce a specific change in volume. Compressibility for liquids is equal to  $1/(\text{Bulk Modulus})$ , the higher the Bulk Modulus the less compressible the liquid.

<sup>12</sup> For example, 50 miles of 16-inch pipeline contains approximately 65,000 barrels (~9000 tons) of liquid, so bulk modulus imprecision can significantly affect gain/loss balances from inventory correction as further discussed below.

approach can indeed identify such an ideal leak at a specific point, this author has observed on too many occasions that such tests don't represent the real operation of the pipeline under its various changing hydraulic conditions. In other words, this test usually evaluates the system usually under very ideal conditions. Such tests also don't determine or indicate the number of false alarms that are generated by a specific leak detection system looking for "small" leaks.

Another common misconception is the illusion that a lower leak detection limit means the approach is capable of identifying larger releases. The three different types of liquid pipeline releases can and do exhibit substantially different indicators of release. These indicators may be different and can be easily masked. Many are complicated by the hydraulics on a specific pipeline system. Transient hydraulic analysis of a leak detection system applied to a particular pipeline is usually warranted to understand these differences as described later in this report.

Complex hydrocarbon liquid mixtures in pipelines are not soda pop!

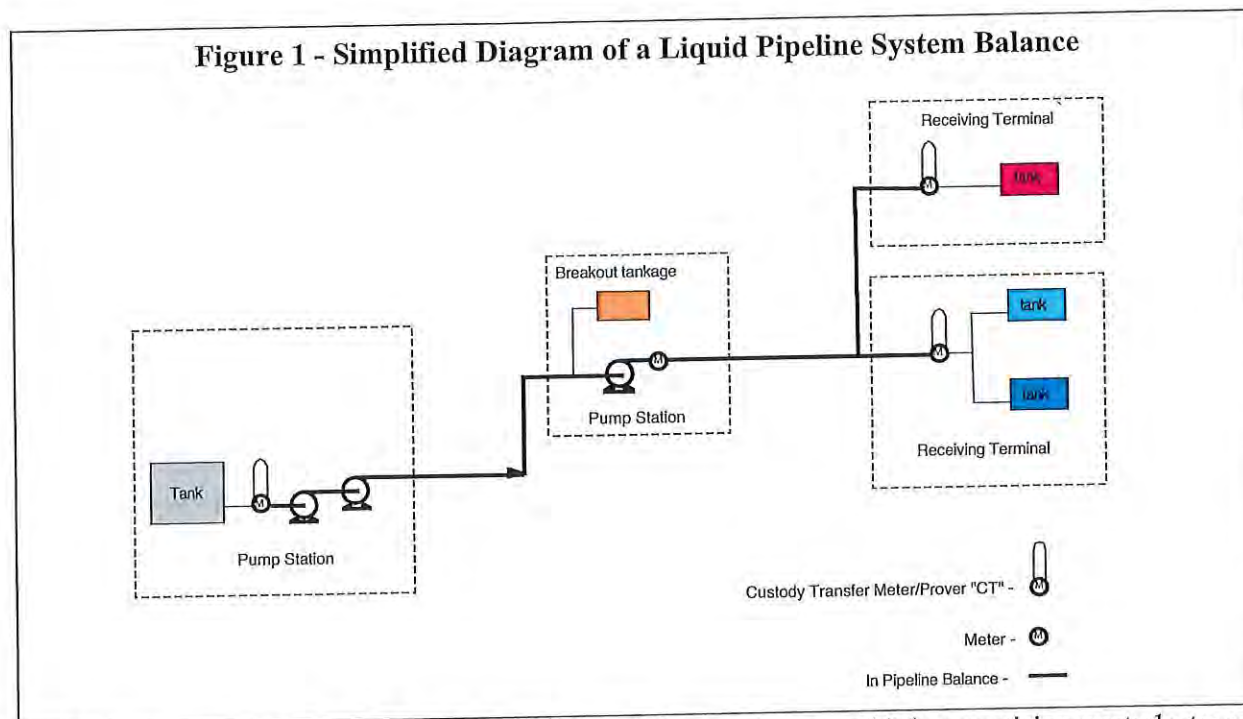
Lastly, this author is continually amazed by the application of very poor engineering approaches, some in often-cited official government reports, demonstrating a clear lack of experience and understanding in the handling of complex hydrocarbon liquid mixtures in pipelines under release conditions. Spill response plans

that recommend uphill valve closure to hold up or reduce downhill drainage of a pipeline into a pipeline break through "suction or siphon lock" (the misapplication of the so-called soda straw effect of holding liquid in a straw by closing your thumb over one end) are going to be in serious trouble as a result of not having sufficient spill response resources on hand. It is a very rare liquid hydrocarbon mixture (most are not that stabilized) that will not separate into gas and liquid under the pull of gravity, breaking any siphon lock that might occur from an uphill valve closure. A yield analysis of any hydrocarbon liquid through refinery crude and vacuum units will demonstrate the ability of even low-pressure hydrocarbon mixtures to easily separate under the pull of gravity. Reid Vapor Pressure and/or Flash Point are very poor indicators of a hydrocarbon liquid's ability to release vapor. Pipelines, especially in hilly conditions, can release out of a break for quite some time, even after pump shutdown and valve closure. Valve closure to limit the pipeline miles that can drain is important, but forget the soda straw effect to reduce possible release volumes.

## Internal Leak Detection for Liquid Pipelines

Figure 1 on the next page represents a simplified diagram indicating the system captured (bolded items) in a typical liquid pipeline balance. Pumps are usually used to provide flow along the pipeline and meters of various types are used to measure or account for the volume of liquid into and out of the pipeline system as well as sometimes along the system. Shipping tankage at the front of the system as well as receiving tankage at the end of the system can also be part of a pipeline system, though not always. Additional tankage may be located along the pipeline for various reasons including overpressure protection, breakout, or receipt/delivery. Various monitoring devices such as pressure, temperature, flow, densitometers, etc., may be placed along a pipeline. And, of course, there are additional remotely operating devices that control pump start, stop, flow rate, pressure, horsepower, and in many cases remote operated valves, all of which are not shown in Figure 1 to keep the drawing simple. The status of all these input devices is usually gathered, monitored, and controlled by a central control computer, or SCADA system, whose design varies considerably from pipeline to pipeline, depending on the complexity and field inputs the operators have designed and installed in the field.





Special attention should be paid to the location and distance between higher precision custody transfer meter/provers ("CT") usually used for volume measurement into and out of the pipeline system. Because of their higher capacity and greater precision, the higher precision custody transfer meters on liquid transmission pipelines are usually specially conditioned turbine meters, though positive displacement meters are also sometimes used to measure volume. Along with the higher precision meters, certain other additional equipment such as "inline mixers," samplers, and a remotely operated fixed "certified" meter prover (to periodically prove the meter) will be sited with the meter (or bank of meters). Meter provers are utilized to maintain appropriate volume correction factors, or identify when a meter needs repair/replacement, on special meters requiring the higher precision. The provers are designed to ensure custody transfer meters maintain their intended higher precision which can degrade over time with wear, throughput, or changes in hydrocarbon composition. On occasion, these higher precision rated meters in combination with fixed meter provers may be installed at certain locations along a lengthy pipeline (i.e., at pump stations) to tighten the precision of a "sensitive" pipeline segment balance, though often lower precision meters or tankage are used for measurement down a pipeline. Some lower-volume throughput pipelines sometimes utilize portable meter provers placed on trailers that can be driven from site to site to prove certain meters.

It is worth noting that not all pipelines utilize the higher precision custody transfer meter/prover combination even for in and out volumes. Depending on the complexity and throughput of the system, some pipelines will utilize lower precision meters (e.g. non prover turbine meters, ultrasonic meters), or even tankage to account for some or all "custody transfer" barrels in and out of a pipeline, or measurement along a pipeline.<sup>13</sup> There are more recently developed flow meters capable of directly measuring mass (e.g., Coriolis meters), but application of mass measurement on transmission systems

<sup>13</sup> Higher precision custody transfer meters and their associated calibration equipment (i.e., meter provers) are more expensive than conventional flow meters, both in capital and expense dollars, and require greater land footprint for the support equipment.



is of limited use or little added value in most transmission systems (see linepack discussion below). Lower precision meters and/or tankage volume measurement introduces much greater imprecision into pipeline measurement and balancing. For example, changes in daily atmospheric pressure can introduce substantial variation in a tank's liquid measurement, especially for large diameter tanks. The imprecision of these other types of meters, and the even greater imprecision of tank measurement, is well understood in the industry, and is usually captured in greater permitted pipeline loss allowance, or PLA, for a specific pipeline or pipeline segment incorporating such imprecision into its design and operation.<sup>14</sup>

### Internal Leak Detection - Balancing Approaches for Liquid Pipelines

Most computer-based systems attempt to perform some form of “real-time” pipeline volume balance that may alarm upon a specified deviation. The balances compare barrels in against barrels out while correcting for pipeline volumetric inventory changes within the pipeline or pipeline segments between the in and out measurements (i.e., the linepack). The system/segment balances tend to take some form of the general equation:

$$\text{Gain/(Loss)} = \text{Barrels Out} - \text{Barrels in} + \text{change in pipeline inventory} \quad (\text{Equation 1})$$

A common form of balance is a simple Line Balance, where the inventory change in Equation 1 is set at zero and the in/out measurement differences are tracked either by running manual calculations performed at specified time intervals on a tabular sheet or by a computer that does real-time comparisons. Line Balances may be appropriate for short, simple pipeline systems. Other forms

Pipelines balance volume  
and this approach creates  
volumetric gains and losses  
in every pipeline operation.

of balance using the basics of Equation 1 are often cited as being a “mass or material balance.” In reality mass-balance measurements are volume measurements corrected to standard volume reference conditions of 60°F and 14.7 psia utilizing industry specified volume measurement correction tables. These tables adjust each volume measurement taken at operating conditions to the standardized conditions required for custody transfer. These correction tables are often incorporated into the leak detection or SCADA computers. Thus these so-called mass or material balances for pipeline systems are actually corrected volume balances in which a mass balance may then be calculated or estimated. Actual mass is never measured and there can be considerable variation in the correction to pipeline-calculated mass or material balances, especially as the change in liquid inventory (linepack) for mass can be considerable with composition, temperature, and pressure variations (i.e., the Bulk Modulus effect). Pipeline balances are based on measured “corrected” volumes resulting in volumetric gains (losses). Mass or material balances derived from such volumetric balances are not true mass balances. Some pipelines actually attempt to measure density in various locations to calculate mass in and out at the measurement point and sometimes along the pipeline, but even these efforts fail to permit a true mass balance (i.e., the inventory change usually negates the accuracy intent of a true mass or material balance). The author discourages the use of the terms “mass” or “material” balances in pipeline operations, as these terms regarding pipelines are serious misnomers that create a false expectation of accuracy in the public's mind (and even in many pipeline operators' minds) that pipelines actually or accurately balance mass.

<sup>14</sup> PLA is an accepted pipeline tariff condition intended to help compensate the operator for the cost of operating the system including a possible bias volume loss or “shrinkage” that may be associated with a specific pipeline design/operation (e.g., tank venting/flaring). Not all pipelines utilize PLA.



In real-time balances, water in will not usually equal water out in wet systems as water inventory varies considerable even on higher velocity pipelines.

Oftentimes complicating the volume balance is an adjustment for water that may be problematic on some systems. This is because water introduces another variable and more possible noise into the leak detection balancing efforts. Given that water should usually be a small percentage compared to the barrels entering or in a pipeline system, for purposes of computer balance leak detection, we advise clients to perform a gross or wet-barrel "balance" corrected to volumetric standard conditions (i.e., temperature/pressure correction) for operational real-time leak detection purposes (i.e., SCADA). An accounting balance is also usually performed at least monthly on the dry hydrocarbon basis (net water) for pipeline systems. Note that many such systems include tankage where water can settle, as well as the mainline pipe.<sup>15</sup> The accounting net balance should, however, not be confused with real-time leak detection efforts as two different purposes are being served. Water may sometimes be removed as it proceeds down a pipeline system, though this is not always a certainty, and attempts at water removal should not deactivate a pipeline leak detection system, at least for extended periods of time.<sup>16</sup>

There are various different approaches to the basic Equation 1 gain/loss volume balance, and space will not permit me to discuss each in detail. All such approaches attempt to provide a gain/loss volume balance across the system. All attempt to correct for the differences in measurement and/or pipeline inventory to tighten the confidence in a specific volume balance. Various balance detection methods may apply slightly different approaches to compensate, correct, or address each part of Equation 1, as well as how that information is interpolated (using different algorithms), displayed, and/or presented to the pipeline control room operator. Some balancing systems go beyond just providing an alarm, for example, in that a chart or graph (more than a trending graph) is also presented to assist the operator in evaluating the system fluid hydraulics and dynamics. Many of these balancing approaches, depending on the pipeline system, work just fine for certain types of releases. One of the proofs or validation points of each of these approaches is the number of false leak alarms they generate. Balancing approaches do not tell the operator the location of a possible pipeline leak, only that a particular pipeline segment or system between the measurements is not "balancing" to a specified precision limit.

The author has taken more time in explaining the basic approach to pipeline balancing than the average reader may first want to know, but these are important core balancing concepts that many misunderstand, even in the pipeline industry. Misunderstanding of these concepts can create serious misperceptions regarding balancing leak detection capabilities and the challenges that each system may face.

The difficulty in all these balancing approaches is that as leak alarm thresholds are lowered to try to capture smaller releases the number of false alarms increases considerably, especially if the alarms are set below the controlling precision measurement(s). Consequently an operator can and often does lose confidence in a particular leak detection system's ability to actually alert to a real release (i.e., too many false alarms).

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<sup>15</sup> In addition to various operational gross (wet barrel) balances to assist operations in leak detection, the industry usually performs a monthly dry or net water basis "accounting balance" to settle customer accounts.

<sup>16</sup> Dollar transfer between parties is usually based on net corrected dry barrels, and pipeline tariffs will usually state the maximum amount of water permitted before the pipeline will take action on a shipper trying to get rid of or shift a water problem onto a transmission pipeline.



### **Important Liquid Pipeline Balancing Concepts**

- 1) The precision of a volume flow in/out measurement is dictated by the lowest precision measurement device (i.e., higher precision meter with certified prover, regular meter, and/or tankage) utilized in the balance.
- 2) Given the vast amount of volume in a transmission pipeline, inventory change/correction to estimate what is really in the pipeline (i.e., linepack is never actually measured in real time), usually controls or dictates the lower limits of “real time” leak detection thresholds utilizing balancing methods.
- 3) Pipelines do not perform real mass or material balances.

## **Internal Leak Detection – Non-Balancing Approaches for Liquid Pipelines**

### ***Pressure, Flow Changes, and/or Statistical Fingerprint Identification***

There are various other non-balancing computer-based leak detection methods tracking fluid hydraulic changes within a pipeline. Such methods usually relate to identifying pressure and/or flow changes or other statistical fingerprints (e.g., acoustic, negative-pressure wave, ultrasonic wave) that are related to signals possibly identifying a pipeline release. Some of these systems attempt to identify the location of the release. Many of these systems require that the operator “tune” a leak detection system to a specific pipeline (reduce certain noise), or require adjustment of statistical algorithms to assure confidence in such approaches. This is because many operating signals are very similar to the “fingerprint(s)” trying to be identified. In the opinion of this author, if the time it takes to tune these systems extends beyond more than a few months, the nature of this leak detection approach may be poor for that specific pipeline because of the changing nature or challenges of that pipeline’s hydraulic dynamics. Serious consideration should be given to changing alarm thresholds or choosing another leak detection approach, especially if too many false leak detection alarms are generated. Depending on the complexity and associated field equipment in a pipeline system, pressure/flow changes may not be the quickest or best method to identify a release, even ruptures, as such changes can take considerable time to show up on a computer system, even with liquid systems.<sup>17</sup> These leak detection approaches can also be very poor at identifying releases during periods of high transients, such as system startup and shutdown, or major flow changes, when hydraulic noise within the system can be significant.

### ***Real Time Transient Modeling***

In an attempt to deal with the many transients associated with a pipeline, this approach utilizes computers to calculate transient hydraulic models of a pipeline or pipeline segment and compares these computed values (i.e., pressure-flow gradients) against actual field measurements. Certain deviations between the calculated and measured parameters trigger leak alarms. This leak detection approach tends to be the most complex and most expensive of the various leak detection system efforts. This method is usually highly dependent on the actual field measurement equipment installed along the pipeline (type and number). This field equipment also needs to be properly placed, calibrated, and

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<sup>17</sup> A pump trip on low suction pressure with increased flow could signal a possible rupture, but this indicator can also be associated with other system hydraulics, so pipeline hydraulic simulator training can be very helpful.



maintained to keep the leak detection system functioning properly. Real Time Transient Modeling usually attempts to identify the type of release and its general location on the pipeline.

The author needs to be very clear that many internal non-balance leak detection systems work just fine at determining certain releases if they are properly applied to specific and usually less-complex pipeline systems. It is all too easy to blame the leak detection vendor or control room operator when leak detection is poorly chosen, badly incorporated, or unwisely maintained in a pipeline system.

Ironically, leak detection computers and software packages are the "cheap" part of an overall effective leak detection system.

This author recalls one case involving a particularly insidious pipeline release in which the pipeline management punished the control room operator and blamed the leak detection system vendor for the failure to properly detect a major and very expensive rupture release. During the discovery phase of litigation it became very clear (in a highlighted statement on the first page of the vendor's manual supplied to the pipeline before purchase) that this specific leak detection product did

not work on pipelines operating in slack-line conditions. A large segment of this particular pipeline operated in slack line (well documented in the pipeline's own operating manual), and this particular leak detection product should never have been installed on this pipeline. Given the many complexities on a pipeline system, installing the cheapest leak detection system, or for that matter the most expensive system, may not be the most technically sound approach or prudent management decision. It is very poor management practice to blame line-operating personnel (e.g. control room operators) for poor management decisions related to equipment selection, installation, operation, and/or maintenance that set up operating personnel for a failure to do their job.

## **External Leak Detection for Liquid Pipelines**

### **Remote monitoring**

External leak detection relies on various approaches such as sound (acoustics) or chemical methods to detect hydrocarbon, once it has left the pipeline. Remote sensors (either fixed or continuous) feed into a computer (e.g., SCADA) to alarm on detection. Many of the external buried systems are limited in the length of pipeline they can monitor, restricting their prudent application. Another difficulty with external leak detection systems is ensuring that the release actually reaches the sensor wherever it is located in proximity to the pipeline. Such contact is not always a certainty given various soil conditions and pipeline release orientation. Murphy's Law also can work against the buried external leak detection system to divert a release away from the sensor, cable, or pickup. A further problem associated with external sensors is assuring that the sensors don't generate too many false alarms from background sources not associated with the pipeline. Several types of sensors and approaches can discriminate between a pipeline and background sources (e.g., utilize tracer compounds introduced into the hydrocarbon stream or selective hydrocarbon pickup), reducing the likelihood of false external leak detection alarms.

In the application of external leak detection in highly sensitive areas using buried sensors, it is not unusual for a new pipeline installation to use gunite, or other types of membrane, to coat the pipe trench walls to try and act as a catch basin for a low-rate release. This approach's intent is to increase the probability that a low-rate release will pool in the soil in the vicinity of an external sensor next to the pipeline, improving the likelihood of sensor detection. There are other forms of external leak detection utilizing some form of annular spacing / gas purging around a new pipeline or vapor pickup

“cable” for an existing pipeline application. In the author’s opinion, these purging or vapor pickup approaches are highly restricted in their field applications. Such restrictions include the inability to be prudently retrofitted to existing pipelines, very limited practicality (especially length) for a specific transmission pipeline/product, or a high likelihood a gas/vapor won’t reach a sensor for various reasons.

## Visual

Visual release detection does not fall into the computer alarm leak detection category but visual observation for actual release plays an important role in determinations. One of the disadvantages of visual inspection is that considerable time can occur between the start of a release and discovery, especially for low-rate or intermittent releases. Not all releases reach the surface, so visual discovery is not guaranteed, nor does no indication of a release on a right-of-way (“ROW”) guarantee no release is occurring. A prudent monitor of a pipeline ROW will look for secondary signs of releases such as vegetation discoloration or oil sheens on nearby land and waterways on and off the ROW. There are many efforts underway to apply various new technologies to externally identify certain types of liquid pipeline releases. Such approaches (i.e., FLIR thermal imaging, aerial laser scan) try to improve external leak detection capability while reducing ROW monitoring cost by utilizing aerial or satellite surveillance covering greater areas of the pipeline. To date, these technical applications are still in the very early stages of development, having highly mixed levels of success on transmission pipelines (most generating too many false alarms) to be considered reliable or creditable.

## A More Prudent Approach to Computer-Based Liquid Pipeline Leak Detection

Given the complexities of pipeline leak detection and the considerable problems associated with false leak alarms creating a loss in confidence within the control room operation, a more pragmatic and technically sound approach is warranted. This more technically sound approach should properly focus on and be tailored to reliably determining the three different types of liquid pipeline releases where warranted, their much different rates of release, and associated different hydraulic characteristics.

## Ruptures

For ruptures, liquid pipeline operators should set their systems to detect high-rate releases, and alarm settings should not be based on a percentage of throughput. A specifically identified “possible rupture” alarm should be clearly indicated for a critical pipeline segment. The alarm rate for rupture release for a pipeline system or critical pipeline segment, such as that spanning a high consequence area, or HCA, should be based on fluid hydraulic determinations based on transient models. Such modeling should be performed by personnel competent and experienced in transient pipeline hydraulic tools and who are sufficiently familiar with a specific pipeline design to properly recommend a prudent rupture release rate alarm value. This value should be reflective of actual field operation using a liquid-pipeline-rupture-appropriate equivalent hole opening (for liquid pipelines the hole is usually not equivalent to a full guillotine break). The alarm values for these very high-rate releases will be substantially higher than the throughput rate of the pipeline. As the pressure loss system curve is reduced, pumps shift out on their pump curves, and the pipeline de-inventories via decompression/gravity out the rupture site. There is considerable margin in these high-rate events to assure a proper alarm set point such that there

Caution is warranted against the temptation to set a rupture alarm level too low under the illusion that lower is better as one of the primary objectives is to avoid false rupture alarms.



is no doubt that a rupture alarm is not a false alarm. Specific checklist actions should be defined for control room personnel for pipeline shutdown and segment isolation in the event of such a rupture alarm (e.g., pump shutdown and valve closure).

It is worth noting that in the U.S., liquid pipeline operators are required to provide spill response plans capable of responding to a worst-case spill.<sup>18</sup> The worst-case scenario calculations must be documented and usually involve some combination of estimated time for leak detection identification, pipeline shutdown response, and other impacts (such as drainage and segment isolation), that are usually developed from a rupture release scenario. There can be great temptation to understate rupture identification, shutdown and isolation (worst-case scenario utilizing optimistic or unrealistic short “reaction” times) if proper transient hydraulic models are not wisely utilized, or field equipment chosen, placed, or maintained poorly. Fifteen minutes can pass very quickly in a centralized control room located many miles from a release during such high intensity adrenalin events.

## **Leaks**

Alarms for liquid leaks should never be developed as a percentage of pipeline throughput, as liquid pipeline leak rates are largely driven by pipeline inventory, pressure, and the size of the “hole” at the release site (see cover photo of a puncture in a pipeline). Leak detection alarms (which should be different than rupture alarms) should be defined based on the minimum rate of release the leak detection system should be reliably able to determine on a specific pipeline. A minimum leak threshold alarm rate (i.e., barrels/hr) for a specific pipeline must be determined that is compatible with the pipeline system and its complexity of operation (i.e., batch product vs. continuous mixture such as crude), including transients. All leak alarm threshold value(s) determinations should be documented and approved by the pipeline management. Any competent engineer can translate a leak alarm rate into an equivalent hole size and pressure. Once established, if the pipeline operator is experiencing frequent false “leak alarms,” the threshold leak alarm value is too low or incompatible with the system dynamics, and management needs to reconsider either changes in the alarm threshold or a different, more appropriate, leak detection approach.

## **Seepage or Intermittent Releases**

In sensitive areas where very slow rate or intermittent seepage leaks can have serious consequences, the following “non real-time” balancing approach is recommended. This determination balances the longer time it takes to identify such a slow rate of release with the much higher probability of actually identifying a true release that may not come to the surface. It must be clearly emphasized that this approach will most likely not determine a slow rate release immediately when it first occurs.

Figure 2 represents a plot of a daily gain/loss (blue solid line) and an accumulated daily gain/(loss) balance (red dashed line) across a sensitive pipeline segment utilizing Equation 1. Each line is plotted for an extended time period (at least month-to-date (M-T-D) and year-to-date (Y-T-D)). The numbers in Figure 2 are for illustrative purposes only, as in all probability the gain/(loss) values and swings will be substantially larger. This graphic presentation is often utilized to assist pipeline operators in identifying possible trouble spots where

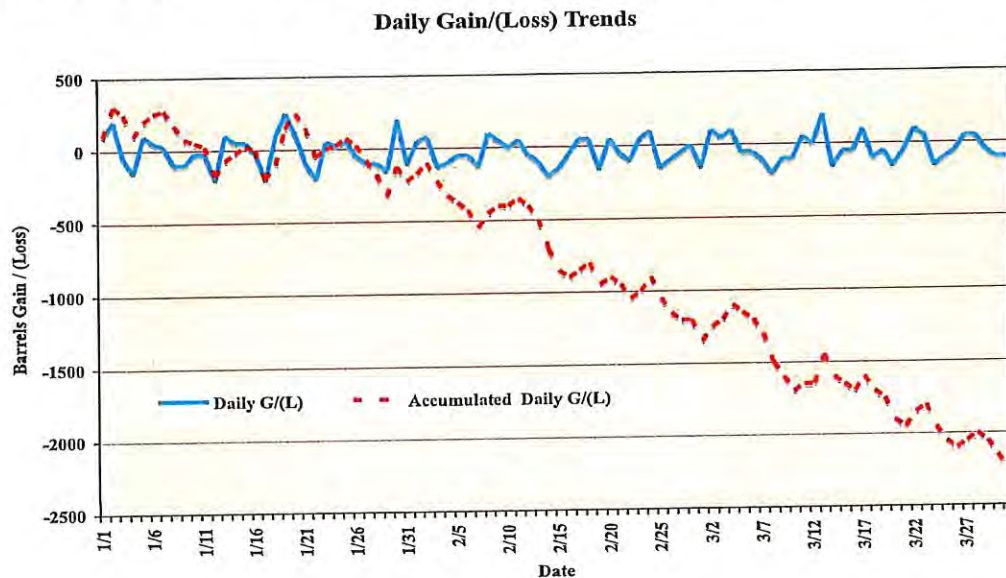
Longer historical graphic trend graphs for Daily Accumulated G/(L) can also be very important and of great value in highly sensitive areas.

<sup>18</sup> 49CFR194.105 Worst case discharge.  
Accufacts Inc.



slow rate or intermittent leaks such as seepage could be especially problematic (i.e., pipeline passes through a very sensitive area). Note that for leak detection purposes a gross (wet) barrel corrected to standard conditions is utilized in developing the trending graphs. Usually the measurements do not have to be directly at the borders of the sensitive area, but just be located within a pipeline segment that is spanning the area or region of concern.

**Figure 2 - Trending Analysis for Slow Rate, Seepage, or Intermittent Releases**



Particular attention should be paid to the slope of the accumulated daily gain/loss line, especially if this line stays continually negative over a sustained period. A negative slope indicates a “bias” in the balance segment that needs to be accounted for, reconciled, and corrected, or a loss (possibly associated with a slow rate/intermittent release or a pipeline theft). An alarm value can be set for when the accumulated daily gain/loss goes beyond a certain preset value in a specific critical pipeline segment indicating further evaluation is warranted. Note that a continual positive slope for the accumulated gain/(loss) line is also not good, as either something is inappropriate in the equipment or process utilized in the balance that is introducing bias, or the operator is unduly taking someone else’s barrels.

One of the purposes of the accumulated trend is to remove the noise associated with pipeline inventory changes as the barrels in/out of a pipeline over time will be substantially greater than the pipeline inventory changes. For no-release, tight pipeline systems, both the daily and accumulated daily gain/(loss) trend lines should remain within a specified precision value range for the particular segment. This is indicated in the first month of data in Figure 2 where accumulated daily gain/(loss) for such tight systems trends above and below the zero value. The decay in the accumulated daily gain/loss in Figure 2 indicates an unexplained bias or loss (leak or theft) showing up after the first month.

### **III. Gas Transmission Releases**

#### **Rupture**

This paper has mainly focused on liquid pipeline releases. The author would be remiss if he failed to briefly mention some of the differences that make gas transmission release determinations via computer more challenging. Because of the highly compressible nature of natural gas, gas transmission pipeline releases occur at the velocity of the speed of sound within the gas at the bore of the rupture. This velocity is fixed by the laws of thermodynamics but the mass flow rate changes (decays) as gas density immediately upstream of the failure changes. This choked flow phenomenon limiting release velocity is characteristic of all gas releases under high pressure. Because of the fracture mechanics, gas transmission pipeline ruptures will tend to fail as full bore (guillotine) releases venting gas from both the upstream and downstream segments of the pipeline out the failure.

It is difficult for many engineers, even more difficult for the public, to fathom that a rupture on a 48-inch gas pipeline will release gas at the same velocity as a rupture on a 12-inch gas pipeline or even a small hole on a gas transmission pipeline, though the mass release rates will be substantially different. Fifty miles of 36-inch gas pipeline operating at approximately 1000 psig contains roughly 3000 tons of gas. Depending on system factors, a 36-inch gas transmission pipeline will release about 300 to 500 tons of gas within the first few minutes following a rupture.<sup>19</sup> Because of the choked flow, the highly

Given the trend in gas pipelines to increase capacity and pressures to improve pipeline efficiency, and given that many of these pipeline segments are being placed in very sensitive areas, this author advises continuing efforts to improve SCADA recognition and emergency response to gas pipeline ruptures, especially in those areas where detonation of a gas rupture can potentially result in massive casualties.

compressible inventory within the pipeline, and other system factors associated with gas transmission pipelines, even with this high mass rate of release, pressure loss as an indicator of release is very difficult to identify via SCADA. The pressure sensing devices on the pipeline have to be placed very close to the rupture site. Ironically, other transient fluid dynamic indicators that might suggest a gas pipeline rupture via SCADA move upstream (and downstream) of the rupture at the speed of sound in the gas. For example, changes in upstream and downstream compressor operation, not pressure loss, can be one of the first indicators via SCADA that a rupture might have occurred on a gas transmission pipeline. Centrifugal compressor gas fired turbines are sensitive mass flow devices.

#### **Leaks**

Because of the high compressibility of natural gas, leaks will not show up as pressure loss in a transmission system as gas inventory within the pipeline will not change substantially with time even though leaks are releasing at the speed of sound. Another way to look at this is that the ratio of mass rate of release for leaks to pipeline inventory mass is very low. A leak will take a very long time to vent the pipeline inventory, even if there are valves to further segment or reduce the line inventory that must be vented. Given the much slower rate of mass release in relation to pipeline inventory, SCADA currently cannot be utilized to reliably identify gas transmission pipeline leaks. Leaks (including

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<sup>19</sup> Some of the newer higher capacity gas transmission pipelines are easily capable of releasing much greater tonnage than these figures in a few minutes.



seepage) are usually identified by the performance of visual inspections walking the ROW and special leak surveys along the pipeline with gas detectors that might identify the presence of gas in the event of a leak. In addition, some transmission pipelines inject odorant (such as that utilized in gas distribution systems) into their gas that can indicate a possible gas leak by smell.<sup>20</sup> There are many attempts underway to advance or use various technologies (e.g. radar, thermal imaging, multi-spectral imaging) to survey large segments of pipeline for indications of natural gas release (i.e. methane). The author would classify these latest efforts as still in the early stages of development as the success rate in field applications for gas transmission pipelines has been highly mixed for many various complex reasons.

## **Abbreviations**

AAC – Alaska Administrative Code	API – American Petroleum Institute
CFR – Code of Federal Regulation	CPM - Computational Pipeline Monitoring
CT – Custody Transfer	FLIR – Forward Looking Infrared thermal imaging
G/(L) – Volumetric Gain or (Loss)	HCA – High Consequence Area
M-T-D – Month to Date	PHMSA – Pipeline and Hazardous Material Safety Administration
PIPES – Pipeline Inspection, Protection, Enforcement, and Safety Act of 2006	NTSB – National Transportation Safety Board
PLA – Pipeline Loss Allowance	ROW – Right-of-way
SCADA – Supervisory Control and Data Acquisition (Computer)	Y-T-D – Year to Date

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<sup>20</sup> U.S. federal pipeline safety regulation 49CFR192.625 Odorization of Gas, exempts the use of odorant on certain gas transmission pipelines or segments.  
Accufacts Inc.

## **Memo**

### **East Goshen Township**

Voice (610) 692-7171

E-mail [rsmith@eastgoshen.org](mailto:rsmith@eastgoshen.org)

Date: December 19, 2018

To: Pipeline Task Force

From: Rick Smith, Township Manager

Re: Sunoco Mariner 2 and 2X Pipeline Project

The lengths of coated steel pipe that Sunoco intends to use for the Mariner 2 and 2X pipelines have been exposed to the weather for approximately 18 months. At the December 18<sup>th</sup> meeting a resident requested that the Board look into the issue of whether or not the sunlight has degraded this coating such that the pipe would have to be re-coated before it can be installed.

The Board has referred this issue to the Pipeline ask Force for its review and comment.



# Pipelines Coating A comparative study



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([https://www.linkedin.com/profile/view?id=AAIAABV1-HcBofwH6MneXdmpam8yBbHTrUza3LQ&trk=nav\\_responsive\\_tab\\_profile](https://www.linkedin.com/profile/view?id=AAIAABV1-HcBofwH6MneXdmpam8yBbHTrUza3LQ&trk=nav_responsive_tab_profile))

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## Introduction

Various organic coatings are in use for pipeline passive external corrosion protection, which are supplemented with active corrosion protection i.e. cathodic protection. The choice and selection of particular coating system is dependent on the various considerations, such as external stresses the coating has to withstand, compatibility with cathodic protection and its current demand, soil characteristics, operating temperature etc.

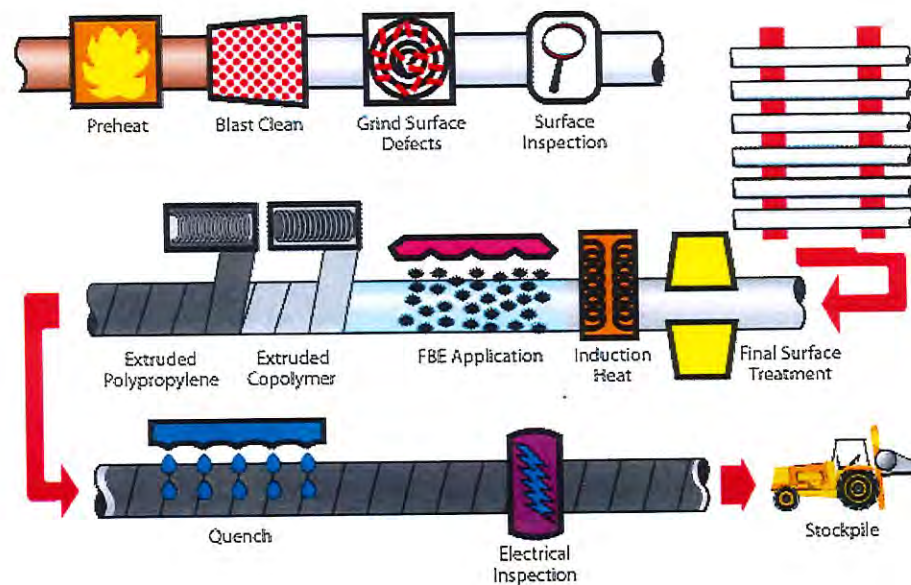
Essential properties that a particular coating system should possess are as under:

- Protective coating must remain defect free with in practical limitations over a period of time, specifically for areas where temperature fluctuations are wide.
- Coating must be tolerant to handling during construction & field bending and in service deterioration.
- Following are the essential properties of coating system:
  - Impact Resistance



- Penetration Resistance
- Resistance to cathodic disbondment
- Stability at elevated temperature
- Resistance to soil stress
- Resistance to water absorption
- Chemical resistance (Acids & alkali)
- Volume resistivity
- Flexibility to bending
- Hardness (abrasion resistance)
- Maintenance and refurbishment frequency
- HSE consideration
- Resistance to damages during handling

*(Some of the above properties are interdependent)*







### Types of Coating Systems

There are various types of coating system which are being applied on hydrocarbon pipelines. However, for the sake of this article, predominantly there are following types of external anti-corrosion coatings:

1. Fusion Bonded Epoxy (FBE) Coating ([https://en.wikipedia.org/wiki/Fusion\\_bonded\\_epoxy\\_coating](https://en.wikipedia.org/wiki/Fusion_bonded_epoxy_coating))
2. Three Layer Poly Ethylene/ Propylene (3LPE/ 3LPP) Coating
3. Coal Tar Enamel (CTE) Coating

#### **Fusion-bonded epoxy powder coating**

Fusion bonded epoxy coating, also known as fusion-bond epoxy powder coating and commonly referred to as FBE coating, is an epoxy-based powder coating that is widely used to protect steel pipe used in pipeline construction from corrosion. FBE coatings are thermoset polymer coatings. The name fusion-bond epoxy is due to resin cross-linking and the application method, which is different from a conventional paint. The resin and hardener components in the dry powder FBE stock remain unreacted at normal storage conditions. At typical coating application temperatures, usually in the range of 180 to 250 °C (356 to 482 °F), the contents of the powder melt and transform to a liquid form. The liquid FBE film wets and flows onto the steel surface on which it is applied, and soon becomes a solid coating by chemical cross-linking, assisted by heat. This process is known as "fusion bonding". The chemical cross-linking reaction taking place in this case is irreversible. Once the curing takes place, the coating cannot be returned to its original form by any means. Application of further heating will not "melt" the coating and thus it is known as a "thermoset" coating.

#### **Three Layer Poly Ethylene/ Propylene (3LPE/ 3LPP) coating**

3LPE/ 3LPP coating system is a multilayer coating composed of three functional components: a high performance fusion bonded epoxy (FBE), followed by a copolymer adhesive and an outer layer of Medium Density Polyethylene (MDPE) or High Density Polyethylene (HDPE), which provides protection against external corrosion.

- The codes and standards for 3LPE are ISO 21809-1, DIN 30670 or CAN/CSA Z245.21.
- **Fusion Bonded Epoxy (FBE):** First layer of FBE shall be 150 microns thick.



- **Adhesive:** Second layer of extruded co-polymer adhesive, 200 microns thick.
- **Polyethylene (MDPE/HDPE):** Third layer of extruded polyethylene (MDPE/HDPE) or polypropylene (MDPP/HDPP), 1.6 – 2.95 mm thick.
- **Application of Coating:** Surface preparation of pipe by blast cleaning, subsequent to pipe heating fusion epoxy powder shall be applied and after that extruded adhesive shall be applied over the pipe. Finally extruded polyethylene (MDPE or HDPE) layer shall be applied over the adhesive layer.
- Total coating thickness is generally < 3.0 mm for pipe dia < 24" and 3.3 mm for pipe dia 32" & above)

### Coal Tar Enamel (CTE)

CTE coating is a thermoplastic polymeric coating. The CTE coating system is made up of four main components: primer, coal tar enamel, glass fibre inner-wrap and glass fibre outer-wrap.

- The codes and standards for CTE are AWWA C203, BS 4164 or IS 10221.
- **Primer:** The primer shall be quick drying synthetic primer for cold application.
- **Coat Tar Enamel:** Coal tar enamel shall consist of uniform mixture of modified coal tar and inert non-fibrous filler.
- **Inner Wrap:** The fibre glass inner wrap shall be thin and flexible, uniform mat of compressed glass fibres. The inner wrap shall be reinforced type.
- **Outer Wrap:** The outer wrap material shall be a coal tar impregnated glass fibre felt.
- **Application of Coating:** Surface preparation of pipe by blast cleaning, primer shall be applied to the pipe surface by air-less spraying equipment, coal tar enamel shall be mechanically applied over the primed pipes with one wrap of glass fiber mat followed by coal tar enamel and followed immediately by an outer wrap of coal-tar impregnated glass fiber felt.
- Total coating thickness is 4.8 mm (for all pipe sizes).



Comparison of various coating systems





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## **Memo**

### **East Goshen Township**

Date: March 21, 2019  
To: Pipeline Task Force  
From: Rick Smith, Township Manager  
Re: Sunoco Mariner Pipeline Project  
Dust Control

RS

At the last Pipeline Task Force Meeting a concern was expressed about dust from the HDD sites.

The state has regulations on dust (attached) and the EPA has established standards for the amount of dust particles in a given volume of air.

I reached out to Pennoni and it would cost us \$2,400 to have Pennoni conduct a 24 hour air quality test and analyze the amount of dust that is collected to see if it exceeds the current standard of 25 micrograms of dust particles that are 2.5 micrometer in size or smaller per cubic meter.

If we wanted to identify what the dust was comprised of it would cost more (up to \$1,000 per sample) depending on how many things we want to test for.



It is our understanding that our services are being requested due to complaints of excessive particulate matter (i.e. dust) from ongoing drilling operations. Several local or state codes apply to nuisances such as particulate matter.

## **BACKGROUND**

Bentonite dust is a low toxicity material; however, can be a nuisance or health hazard if the particulate matter respirable. Bentonite dust (or powder) can be breathed into the lungs when the particles are a very small size. Additionally, the dust can become a nuisance if deposited on the property or visually observed. Based on our knowledge of existing state and local codes, there are two specific codes that apply to this situation:

1. Pennsylvania state code (Chapter 123 - Standards for Contaminants)
2. Chapter 240, Zoning, Article V Supplemental Regulations

### **Pennsylvania state code (Chapter 123 - Standards for Contaminants)**

The Pennsylvania state code (Chapter 123 - Standards for Contaminants) has requirements that pertain to situations like this. Specifically:

#### **FUGITIVE EMISSIONS**

§ 123.1. Prohibition of certain fugitive emissions.

(a) No person may permit the emission into the outdoor atmosphere of a fugitive air contaminant from a source other than the following:

~  
(9) Sources and classes of sources other than those identified in paragraphs (1)—(8), for which the operator has obtained a determination from the Department that fugitive emissions from the source, after appropriate control, meet the following requirements:(i) The emissions are of minor significance with respect to causing air pollution. (ii) *The emissions are not preventing or interfering with the attainment or maintenance of an ambient air quality standard.*

(9) shall take all reasonable actions to *prevent particulate matter from becoming airborne*. These actions include, but not be limited to, the following:(1) Use, where possible, of water or chemicals for control of dust in the demolition of buildings or structures, construction operations, the grading of roads or the clearing of land.

### **Chapter 240, Zoning, Article V Supplemental Regulations**

§ 240-24 General performance standards.

General performance standards applicable to all districts.

#### A.

Nuisances prohibited. No land or structure in any zoning district shall be used or occupied in any manner that creates any dangerous, injurious, noxious or otherwise objectionable condition; fire, explosive or other hazards; noise or vibration; smoke, dust, odor or other form of air pollution; heat, electromagnetic or other radiation or other condition in such a manner or in such amount as to affect adversely the reasonable use or value of the surrounding area or adjoining premises; or be dangerous to public health or safety.

E.

Outdoor storage.

(4)

All materials or wastes which might cause fumes or dust, which constitute a fire hazard or which may be edible or otherwise attractive to rodents or insects, shall be stored outdoors only if enclosed in containers adequate to eliminate such hazards. Applicable Department of Environmental Protection and national OSHA regulations shall apply.

G.

Dust, dirt, smoke, vapors, gases and odors.

(1)

All uses shall comply with all applicable state and federal laws and regulations controlling air pollution, dust, smoke, vapors, gases and odors.

(2)

No use shall generate dust, smoke, soot, glare or odors that travel beyond the subject property, causing nuisances that would be significantly offensive to reasonable persons of ordinary sensitivities.

## **SCOPE OF SERVICES**

We will implement a multi-tasked approach for your proposed project. The following major tasks will be utilized:

### **TASK 1 – PARTICULATE MATTER AIR SAMPLING**

### **TASK 2 – TECHNICAL LETTER REPORT**

#### **Task 1 – Particulate Matter Air Sampling**

Based on The Pennsylvania state code (Chapter 123 - Standards for Contaminants) 123.1(a)(9)(ii) it is our understanding that the ongoing drilling/construction activities should not create dust emissions that interfere with the attainment or maintenance of the national ambient air quality standard (NAAQS) for particulate matter. The primary 24-hour fine particle standard is designed to work with the annual standard to provide supplemental health protection against short term fine particle exposures, particularly in areas with high peak PM<sub>2.5</sub> concentrations. The current 24-hour PM<sub>2.5</sub> standard is 35 micrograms per cubic meter (µ/m<sup>3</sup>).

Based on this requirement, Pennoni proposed to set up a TSI DustTrak II 8530 monitor over a 24 hour period. The TSI monitor will measure particulate concentrations to PM<sub>10</sub>, PM<sub>2.5</sub>, PM<sub>1.0</sub> or respirable size fraction. Our focus will be on the PM<sub>2.5</sub> concentrations; however, we will also use the PM<sub>10</sub> and PM<sub>1.0</sub> as references to overall particulate concentrations.

In addition we will use a Lufft WS600 weather station to measure wind speed and direction, air temperature and pressure, humidity plus precipitation type, intensity, and quantity.

We propose to set up the monitoring station near the resident's house where an electrical source can be provided and where the equipment can be secured against theft. The pump will collect data over a 24-hour period to include working hours and non-working hours.

#### **Task 2 –Technical Letter Report**



Upon completion of the above scope of services, Pennoni will prepare a final report documenting the results of our investigation. The final report will include a summary of our findings as well as recommendations we may have relative to those findings.

#### **SCHEDULE**

Pennoni is prepared to begin work on this project upon receipt of written Notice to Proceed and will endeavor to complete the work in accordance with your scheduling needs. We need at least 3 days notice to order the monitoring equipment.

#### **FEE**

Pennoni will complete the scope of services outlined above on a time and materials basis for an estimated fee of **\$2,400.**

## FUGITIVE EMISSIONS

### § 123.1. Prohibition of certain fugitive emissions.

(a) No person may permit the emission into the outdoor atmosphere of a fugitive air contaminant from a source other than the following:

(1) Construction or demolition of buildings or structures.

(2) Grading, paving and maintenance of roads and streets.

(3) Use of roads and streets. Emissions from material in or on trucks, railroad cars and other vehicular equipment are not considered as emissions from use of roads and streets.

(4) Clearing of land.

(5) Stockpiling of materials.

(6) Open burning operations.

(7) Blasting in open pit mines. Emissions from drilling are not considered as emissions from blasting.

(8) Coke oven batteries, provided the fugitive air contaminants emitted from any coke oven battery comply with the standards for visible fugitive emissions in § § 123.44 and 129.15 (relating to limitations of visible fugitive air contaminants from operation of any coke oven battery; and coke pushing operations).

(9) Sources and classes of sources other than those identified in paragraphs (1)—(8), for which the operator has obtained a determination from the Department that fugitive emissions from the source, after appropriate control, meet the following



requirements:

- (i) The emissions are of minor significance with respect to causing air pollution.
- (ii) The emissions are not preventing or interfering with the attainment or maintenance of an ambient air quality standard.

(b) An application form for requesting a determination under either subsection (a)(9) or § 129.15(c) is available from the Department. In reviewing these applications, the Department may require the applicant to supply information including, but not limited to, a description of proposed control measures, characteristics of emissions, quantity of emissions and ambient air quality data and analysis showing the impact of the source on ambient air quality. The applicant is required to demonstrate that the requirements of subsections (a)(9) and (c) and § 123.2 (relating to fugitive particulate matter) or of the requirements of § 129.15(c) have been satisfied. Upon such demonstration, the Department will issue a determination, in writing, either as an operating permit condition, for those sources subject to permit requirements under the act, or as an order containing appropriate conditions and limitations.

(c) A person responsible for any source specified in subsections (a)(1)—(7) or (9) shall take all reasonable actions to prevent particulate matter from becoming airborne. These actions include, but not be limited to, the following:

- (1) Use, where possible, of water or chemicals for control of dust in the demolition of buildings or structures, construction operations, the grading of roads or the clearing of land.
- (2) Application of asphalt, oil, water or suitable chemicals on dirt roads, material stockpiles and other surfaces which may give rise to airborne dusts.
- (3) Paving and maintenance of roadways.
- (4) Prompt removal of earth or other material from paved streets onto which earth or other material has been transported by trucking or earth moving equipment, erosion by water, or other means.

(d) The requirements contained in subsection (a) and § 123.2 do not apply to fugitive emissions arising from the production of agricultural commodities in their unmanufactured state on the premises of the farm operation.

#### Source

The provisions of this § 123.1 adopted September 10, 1971, effective September 11, 1971, 1 Pa.B. 1804; amended March 3, 1972, effective March 20, 1972, 2 Pa.B. 383; amended August 12, 1977, effective August 29, 1977, 7 Pa.B. 2251. Immediately preceding text appears at serial pages (4620) and (24610).



## Notes of Decisions

### *Agency Authority*

Although the Department of Environmental Resources under the Air Pollution Control Act (35 P. S. § 4001 et seq.) had been granted specific authority by the Legislature to regulate “air contamination sources” producing “air pollution” that includes obnoxious odors, nowhere was there any grant of authority to the Public Utility Commission, either directly or indirectly, to regulate air pollution emanating from a public utility. *Country Place Waste Treatment Co. v. Pennsylvania Public Utility Commission*, 654 A.2d 72 (Pa. Cmwlth. 1995).

### *Application Properly Denied*

The Department was required to deny an application for reactivation of beehive coke ovens, regardless of economic consequences, when the application did not provide information which would show that the ovens would meet the limitations applicable to fugitive emissions, and constitutional rights are not violated even though there is no known method to operate beehive coke ovens in compliance with this title. *Rochez Brothers Inc. v. Department of Environmental Resources*, 334 A.2d 790 (Pa. Cmwlth. 1975).

### *Burden of Proof*

Testimony by the environmental group’s president that the air was polluted (that is, “fuming” resulted from the reaction process used to treat waste at the industrial processors facility) was not credible on the issues relating to the existence or cause of air quality problems as would shift the burden of proof to the Department of Environmental Resources to justify the issuance of the solid waste disposal permit. *Concerned Citizens of Yough, Inc. v. Department of Environmental Resources*, 639 A.2d 1265 (Pa. Cmwlth. 1994).

The Commonwealth need not prove that the fugitive dust emissions in question caused or contributed to a condition of air pollution because the determination that such emissions cause or contribute to a condition of air pollution had already been made at the time the section was promulgated, and the section is reasonably understandable and specific. *Department of Environmental Resources v. Locust Point Quarries, Inc.*, 396 A.2d 1205 (Pa. 1979).

### *Clearing of Land*

Environmental Hearing Board did not err in finding asphalt plant operator’s extracting soil down to bedrock to prepare area for blasting was not exempt from “clearing of land,” Department of Environmental Protection defined clearing of land as the removal of trees, brush and surface vegetation and not the removal of overburden down to bedrock. *Eureka Stone Quarry v. Dep’t of Env’tl. Protection*, 957 A.2d 337, 348 (Pa. Cmwlth. 2008).



### *Construction*

Since § 123.2 (relating to fugitive particulate matter) applies only to the nine exemptions listed in (a)(1)—(9), the two sections do not overlap and either one can stand alone as a basis for a violation. *Medusa Corp. v. Department of Environmental Resources*, 415 A.2d 105 (Pa. Cmwlth. 1980).

### *Criminal Prosecution*

To prove a criminal violation of this section, as modified by § 123.13 (relating to processes), scientific evidence must be introduced proving beyond a reasonable doubt that the offensive fugitive emissions exceeded the permissible maximum set forth in § 123.12 (relating to incinerators). *Department of Environmental Resources v. Locust Point Quarries Inc.*, 367 A.2d 392 (Pa. Cmwlth. 1976).

### *Evidence*

To properly challenge the reasonableness of this section, evidence must be presented to establish that the section will not aid in reaching national ambient air quality standards and that the proscribed activity is insignificant as a cause of air pollution. *Department of Environmental Resources v. Locust Point Quarries, Inc.*, 396 A.2d 1205 (Pa. 1979).

A conviction for violation of this section cannot be sustained absent sufficient visual and/or scientific evidence to establish that the quarry dust observed by Department agents was such as to constitute air pollution as defined by the Air Pollution Control Act. *Commonwealth v. Locust Point Quarries Inc.*, 72 Pa. D. & C.2d 700 (1975).

### *Fugitive Emissions*

A fugitive emission is an emission of an air contaminant in a specific manner and it includes particulate matter, sulfur compounds, odor and visible emissions if emitted other than through a flue. *Department of Environmental Resources v. Locust Point Quarries, Inc.*, 396 A.2d 1205 (Pa. 1979).

### *General Comment*

This section was intended to stand alone and be construed independently of § 123.13 (relating to processes). *Department of Environmental Resources v. Locust Point Quarries, Inc.*, 396 A.2d 1205 (Pa. 1979).

### *Minor Significance*

The comment by the Environmental Hearing Board that the operator failed to invoke the “minor significance” exception of (a)(9) was proper because the exception existed throughout the relevant time period of 1973 to 1976, and the procedural

provisions added by a 1977 amendment were immaterial. *Medusa Corp. v. Department of Environmental Resources*, 415 A.2d 105 (Pa. Cmwlth. 1980).

A rock quarry was not a source of minor significance within the meaning of § 127.14 (relating to exemptions) if nothing in the record supported such a determination and the DER had not so determined. *Mignatti Construction Co., Inc. v. Environmental Hearing Board*, 411 A.2d 860 (Pa. Cmwlth. 1980).

### Review

A request for a grace period for compliance with a temporary variance did not have a res judicata effect on a subsequent request for an exemption from emission control requirements under this provision, since there was no identity of the thing sued for. *Bethlehem Steel Corporation v. Department of Environmental Resources*, 390 A.2d 1383 (Pa. Cmwlth. 1978).

On appeal from the Department's refusal to grant applicant permission to reactivate certain coke ovens, if the appellant did not show that the oven would meet the limitations in this title, but showed only the "dire need" for the coke to be produced, the scope of review is limited to whether constitutional rights were violated, an error of law committed, or any necessary finding of fact was not supported by the evidence. *Rochez Brothers, Inc. v. Department of Environmental Resources*, 334 A.2d 790 (Pa. Cmwlth. 1975).

### Cross References

This section cited in 25 Pa. Code § 77.108 (relating to permit for small noncoal operations); 25 Pa. Code § 121.8 (relating to compliance responsibilities); 25 Pa. Code § 123.2 (relating to fugitive particulate matter); 25 Pa. Code § 123.42 (relating to exceptions); 25 Pa. Code § 129.15 (relating to coke pushing operations); and 25 Pa. Code § 264.521 (relating to design and operating standards).

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**§ 123.2. Fugitive particulate matter.**

A person may not permit fugitive particulate matter to be emitted into the outdoor atmosphere from a source specified in § 123.1(a)(1)—(9) (relating to prohibition of certain fugitive emissions) if the emissions are visible at the point the emissions pass outside the person's property.

**Source**

The provisions of this § 123.2 adopted September 10, 1971, effective September 11, 1971, 1 Pa.B. 1804; amended March 3, 1972, effective March 20, 1972, 2 Pa.B. 383; amended August 12, 1983, effective August 13, 1983, 13 Pa.B. 2478. Immediately preceding text appears at serial page (60646).

**Notes of Decisions***Evidence*

Visual evidence that dust emission left quarry property without witness as to the precise moment when fugitive dust escaped from the property was not proper grounds for dismissal of a violation as de minimis. *Scurfield Coal, Inc. v. Commonwealth*, 582 A.2d 694 (Pa. Cmwlth. 1990).

*Facility Operations*

This section which requires quarry owner to prevent emission into the atmosphere of particulate matter encompasses material stockpiled in both active and inactive operations, since the detriment to the public is the same. *Eureka Stone Quarry, Inc. v. Commonwealth*, 544 A.2d 1129 (Pa. Cmwlth. 1988).

*Prevention*

Quarry owner has an active duty to prevent particulate matter from visibly escaping into the atmosphere onto another's property, which includes a responsibility to provide an adequate suppression system. *Eureka Stone Quarry, Inc. v. Commonwealth*, 544 A.2d 1129 (Pa. Cmwlth. 1988).

Testimony of an air quality specialist who visited the defendant's quarry and viewed dust blowing into the air from actual stone crushing areas, conveying areas, stockpiles and haulage ways was sufficient to prove defendant caused the prohibited emissions to be emitted into the atmosphere outside of its own property. *Eureka Stone Quarry, Inc. v. Commonwealth*, 544 A.2d 1129 (Pa. Cmwlth. 1988).

This section which requires a quarry owner to prevent emission into the atmosphere of particulate matter encompasses material stockpiled in both active and inactive operations, since the detriment to the public is the same. *Eureka Stone Quarry, Inc. v. Commonwealth*, 544 A.2d 1129 (Pa. Cmwlth. 1988).

Quarry owner has an active duty to prevent particulate matter from visibly escaping into the atmosphere onto another's property, which includes a responsibility to provide an adequate suppression system. *Eureka Stone Quarry, Inc. v. Commonwealth*, 544 A.2d 1129 (Pa. Cmwlth. 1988).

Since this section applies only to the nine exemptions listed in § 123.1(a)(1)—(9) (relating to fugitive emissions), the two sections do not overlap and either one can stand alone as a basis for a violation. *Medusa Corp. v. Department of Environmental Resources*, 415 A.2d 105 (Pa. Cmwlth. 1980).

### Cross References

This section cited in 25 Pa. Code § 77.108 (relating to permit for small noncoal operations); 25 Pa. Code § 123.1 (relating to prohibition of certain fugitive emissions); and 25 Pa. Code § 264.521 (relating to design and operating standards).

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East Goshen Township Pipeline Taskforce  
Application Tracking Log

arch 28, 2019 Pipeline Taskforce Meeting

Action Item Name	Priority	Date Assigned	Start Date	Status	Deadline	Comments
Newsletter Article on Pipeline Safety	High	2/28/2019		To be discussed 3/28	5/1/2019	Discussed at 2/28 meeting to compose article regarding home evacuation and safety.
Illion and Dinniman Bill Review	High	2/28/2019		In Progress		<b>Senate Bills</b> 257, 258, 259, 260, 262, 263, 264 distributed week of 2/25. <b>House Bills</b> 492, 187, Senate Bill <b>323*</b> , 156, 242, 280, 281, 282, 261, 40, 283 mailed 3/14
Compose Letter to BOS Supporting Bills	High					
le Petition with PUC to obtain Integrity Management Plan & sk Assessment	High					
le Petition with PUC to obtain Confidential Security formation	High					
Investigate Coating on the pipe break down when exposed UV	High					Requested from 12/18/18 BOS mtg when asked by resident.
Investigate Air Quality Ordinances in other Townships	High					
improve public communication regarding pipeline issues (uch recognizing a leak, ignition issues, evacuation) and ctivities (construction. Inadvertent returns, noise, etc.).	High					
Conduct air quality monitoring at valve locations	High					

SB 323 deals people being liable for the public safety costs they commit a felony during a demonstrations.



## **East Goshen Township Conservancy Board**

### **"KEEP EAST GOSHEN BEAUTIFUL DAY"**

**Saturday, April 13, 2019**

The East Goshen Township Conservancy Board has scheduled the townships annual "Keep East Goshen Beautiful Day" for Saturday, April 13, 2019. This is the 34<sup>th</sup> year for this event and it is a great way to jump-start spring-cleaning efforts in our neighborhoods and throughout the Township.

**WHO: East Goshen Township Conservancy Board**

**WHAT: Annual "Keep East Goshen Beautiful Day"**

**WHEN: Saturday, April 13, 2019**

**WHERE: East Goshen Township, Chester County, Pennsylvania**

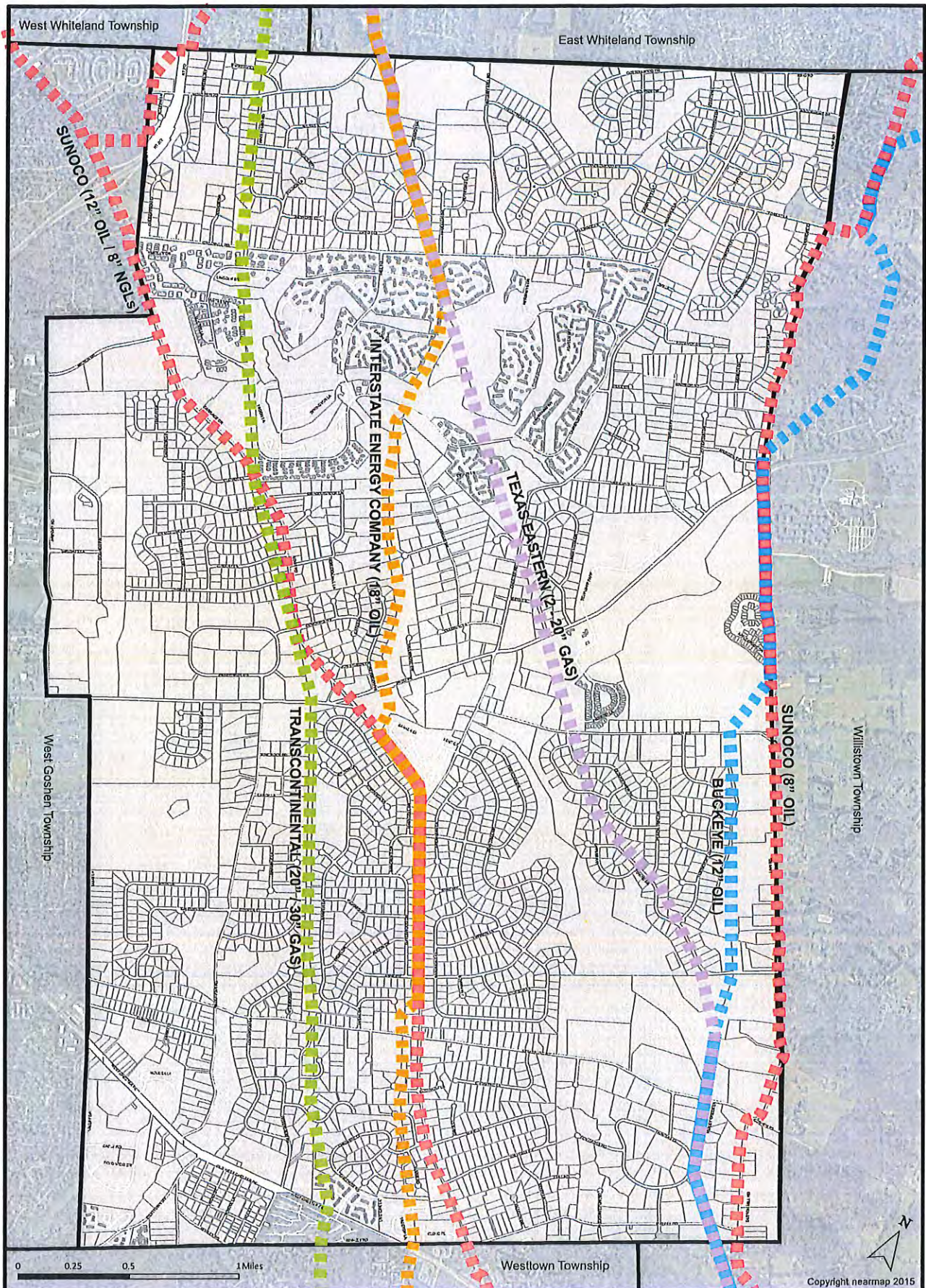
**WHY: To clean up litter from our roadsides and open spaces.**

#### **What to do:**

- Please come to the East Goshen Township Building located at 1580 Paoli Pike in West Chester, PA on Saturday, April 13, 2019 between 8:00 & 9:00 AM to register, refreshments and to pick up supplies (gloves, trash bags and vests.)
- Let us know if April 13<sup>th</sup> does not work for you and/or your group and we can leave supplies at the township building's front desk.
- Also, please let us know what day you will be performing the cleanup. So, when we do the street assignments on Saturday, we can save that stretch of road for you and/or your group and we can inform public works when to pick up the trash bags.

**Please call the Township at 610-692-7171 for more information, to let us know you will help, and/or to reserve a particular stretch of road for your group, organization or family.**





# East Goshen Twp. - Transmission Pipelines





## GOVERNMENT

Stephen Barlas, Contributing Editor, Washington, D.C.

### Change of Class Location Draws Opposition

Citizen organizations and state regulators are opposing interstate pipeline efforts to convince federal regulators to provide an alternative to the class location system, which requires pipelines to take steps when there is population growth around a pipeline.

The Interstate Natural Gas Association of America (INGAA) wants the Pipeline and Hazardous Materials Safety Administration (PHMSA) to, in effect, expand class location safety requirements, which it considers outdated, by allowing an integrity assessment option for managing class location changes for instances in which class locations change from Class 1 to Class 3 and Class 2 to Class 4.

PHMSA raised the possibility of either eliminating or altering class location requirements in August with an advanced notice of proposed rulemaking (ANPR). Pipelines have been pressing for changes to the class location requirements for decades because the cost of replacement in low-density is expensive and sometimes unnecessary.

Increases in population near a pipeline — that can be as few as 500 people — force a pipeline to confirm safety factors and recalculate the maximum allowable operating pressure (MAOP) of the pipeline.

If the MAOP per the newly determined class location is not commensurate with the present class location, current regulations require that pipeline operators (1) reduce the pipe's MAOP to reduce stress levels in the pipe, (2) replace it with pipe that has thicker walls or higher yield strength to yield a lower operating stress at the same MAOP, or (3) test at a higher pressure if the pipeline segment has not been tested at the higher pressure for a minimum of eight hours.

INGAA understands any action on the new ANPR awaits a final rule based on a 2016 proposal that would require interstate pipelines to expand integrity management to areas beyond high-consequence areas (HCA). The final rule, ostensibly modified by suggestions from a PHMSA advisory committee, is due to be published in March 2019. Because that final rule will expand integrity management (IM) requirements, INGAA believes that it is now time to provide the pipelines with an IM option for dealing with class location changes.

A number of citizens groups and the state pipeline safety oppose an IM option to the class location requirements. But C.J. Osman, director of Operations, Safety and

Integrity at INGAA, said he hopes that as ANPR is discussed, including in the forum of the advisory committee meetings, that opponents can be convinced of the merits of the INGAA-sought option.

Pipelines can apply for special permits that allow the circumventing of class location requirements in certain situations.

Lynda K. Farrell, executive director, Pipeline Safety Coalition, a Pennsylvania group, refers to a National Transportation Safety Board (NTSB) study and a PHMSA advisory bulletin to underpin her statement that the "ANPRM is premature and that allowing a relaxation of class location strength requirements is ill-advised."

Farrell also refers to comments from the National Association of Pipeline Safety Representatives to buttress her opposition to any changes in class location requirements.

The NAPS comments said: "Class locations are primarily a design safety measure. Replacing a design measure with an operation measure does not improve safety. Integrity management strategies have been critically important to pipeline safety success, but we feel that the reliability of these measures have not evolved to a level where their total dependency would be practicable. We have observed some recent accidents resulting from misapplication in managing ILI technologies, especially when managing cracks and interactive defects. There are too many accidents related to mismanagement of integrity management issues to justify eliminating class locations in lieu of integrity management."

Pipeline Safety Trust acknowledged the importance of upcoming IM changes in the finalization of the 2016 proposed rule and said any modifications to the class location requirements should wait until "the gas safety rule, now in the works for seven years, is complete and the integrity verification process (IVP) process for identifying and verifying operator system records is in place and shown to be working to improve operator assessments of their systems."

Osman agrees that some of the comments on the ANPR oppose INGAA's position based on technical concerns. He acknowledged, "The onus is on us to prove this is the right change to make, to explain why the integrity management program offers not just equal protection but a safer alternative to the current class location method."

### NTSB Preliminary Report Points Finger at Cast Iron

An NTSB preliminary report published Oct. 11 on the local gas pipeline explosion in Massachusetts in September is likely to spur renewed attention to the safety of cast-iron distribution lines.

Columbia Gas of Massachusetts, a subsidiary of NiSource, is in the process of replacing the 48-mile, cast-iron and bare-steel distribution system in three communities with modern infrastructure and safety features, such as excess flow valves. The current system was installed in the early 1900s and had been partially improved with both steel and plastic pipe upgrades since the 1950s.

The explosion, caused by an over-pressurized system, damaged 131 structures Lawrence, Andover and North Andover. In addition to the one death, at least 21 people, including two firefighters, were transported to the hospital.

The safety of cast-iron pipe in gas distribution systems has been a major concern for some time. In 2012, President Obama signed the Pipeline Safety, Regulatory Certainty and Job Creation Act, requiring a survey by PHMSA of the nation's progress in replacing cast iron gas pipelines. That provision was inspired in part by the death of five people in 2011 in a gas explosion in Allentown, Pa., where cast iron pipe was the culprit.

For the most part, the safety of distribution lines is a matter for state officials, not PHMSA, which issued a 2012 advisory bulletin to owners and operators urging a comprehensive review of cast-iron distribution pipelines and replacement programs, along with acceleration of pipeline repair, rehabilitation, and replacement of high-risk pipelines.

According to statistics, PHMSA has assembled in compliance with the 2012 Pipeline Act, 20 states have completely eliminated cast-iron pipeline from distribution systems. About 97% of natural gas distribution pipelines in the U.S. were made of plastic or steel at the end of 2017. The remaining 3% is mostly iron pipe. Nationally, cast- and wrought-iron distribution main mileage has decreased by almost 38% from 2005 to 2017. The number of cast- or wrought-iron service lines has decreased by almost 77% over the same time period. **PE&GJ**



MARINER EAST 2

# NEWS & VIEWS

Welcome to Mariner East News & Views – information to keep you updated on Energy Transfer's Mariner East system.

## Beyond the Pipeline

The Mariner East 2 pipeline system enables safe and efficient delivery of domestically produced natural gas to Northeast markets, representing new economic opportunity for the commonwealth and its citizens. The ability of new companies to take advantage of affordable feedstock for plastics and energy to fuel new types of manufacturing makes the Mariner East 2 system an exciting part of Pennsylvania's future.

As we look to the future, we feel it is important to stress our great respect for Pennsylvania's rich oil and gas history, and its continued influence within the industry. We also recognize Sunoco's important legacy in the state, once Sun Oil, and the role it has played in local economies and Pennsylvania communities for generations. We have proudly called it our own since 2012.

We currently have 1,035 full-time employees in Pennsylvania, with offices and operations centers in Delaware, Chester, Berks, Dauphin and Butler counties. We safely operate nearly 3,000 miles of pipeline infrastructure and gathering systems, as well as terminal and storage assets, in Pennsylvania.



Energy Transfer employees participated in the Science Festival held at Penn College of Technology. The event saw 1,500 middle school students attend from the area during the day and was open to the public in the evening. Students were able to take a virtual reality tour of an operating compressor station and learn about the numerous safety aspects of a pipeline. Energy Transfer was one of the main sponsors of the festival.

## Energy Transfer Community Contributions

Our presence here as a corporate citizen, employer and benefactor continues to have a positive impact on communities and citizens throughout the commonwealth.

During the last five years, Energy Transfer has contributed more than \$5.8 billion to Pennsylvania's economy, including more than \$7 million in donations to local causes from our Energy Transfer/Sunoco Foundation and corporate commitments. In the last five years, we have contributed:

Energy Transfer's benefits to Pennsylvania 2014-18:

**TOTAL**  
**\$5,854,833,110**

**PAYROLL TAXES**  
**\$50,430,451**

**WAGES**  
**\$3,786,170,472**

**SALES TAX**  
**\$1,958,729,374**

**PROPERTY TAXES**  
**\$52,231,000**


**ENERGY TRANSFER/SUNOCO  
FOUNDATION CONTRIBUTIONS**  
**\$4,224,700**

**COMMUNITY CONTRIBUTIONS**  
**\$3,047,113**





# Mariner East 2X Construction Underway in Pennsylvania

Construction is underway in Pennsylvania to complete work on the Mariner East 2X pipeline. Mainline construction of the 16-inch pipeline is 99 percent complete, with the remaining work including horizontal directional drills, pipeline tie-ins and restoration. We expect the Mariner East 2X pipeline to be in service before the end of 2019. 

## Pipeline Conversion and Safety

We would like to address inaccurate information regarding the requirements, safety and best practices of changing the product being shipped through a pipeline. Changing the type of product transported on a pipeline is commonly done in our industry, and has been for years. Specific to our 12-inch pipeline that has been converted from transporting refined products to transporting natural gas liquids, it is being claimed that converting it is against Pipeline and Hazardous Materials Safety Administration (PHMSA) regulations. This is not true.


In fact, PHMSA released an [advisory bulletin](#) describing specific notification requirements and general operating and maintenance guidelines, as well as integrity management actions regarding flow reversals, product changes and conversion to service.

After making \$30 million worth of upgrades to the 12-inch pipeline in 2016 and working closely with PHMSA, we began the flow of natural gas liquids through a portion of this pipeline as an interim solution to bring Mariner East 2 in service.



PHMSA required that we take specific actions and submit a comprehensive plan to the regulatory agency before using the 12-inch pipeline, which was done prior to the change of product flow. PHMSA was satisfied with our approach to converting the 12-inch pipeline to transport natural gas liquids.

Additionally, West Goshen Township contracted an independent, third-party agency to evaluate the safety of the upgraded 12-inch pipeline. This independent organization issued a report in 2018 that concluded that the 12-inch pipeline meets and often exceeds federal safety regulations for high-volume liquid transmission pipeline service. The report showed that we went above and beyond federal standards to ready this pipeline for the safe transportation of natural gas liquids.

At Energy Transfer, we are proud of the work we've done to bring this pipeline safely into service. We remain committed to Pennsylvania, its regulatory agencies and its local communities, and we plan to continue this momentum as we finish construction of the remaining portions of the Mariner East pipeline system. 

## Pipelines Power Through Polar Vortex

In February, pipelines all over the Northeast were put to the test as a polar vortex descended on the region, creating record-breaking low temperatures. Thankfully, reliable pipelines transported energy to heat our homes and keep the lights on during this cold streak because they are buried below the freeze line. This included local propane access for many Americans, especially critical here at home in Pennsylvania.

According to the Energy Information Administration, more than 200,000 homes in Pennsylvania use propane for heat. With the Mariner East 2 pipeline transporting propane for local distribution in eastern Pennsylvania, this project remains vital to the state and its residents. Besides increasing the supply of propane to eastern Pennsylvania, the Mariner East 2 system helps keep prices affordable, especially during the demand spikes that record-low temperatures bring. 