

June 24, 2017

Megan Lehman
Environmental Community Relations Specialist
Department of Environmental Protection
The Office of Communications
208 West Third Street Suite 101
Williamsport, PA 17701

Dear Ms. Lehman:

Here is the follow-up information to my three minute presentation at the June 13, hearing. As I said last week, it is very difficult to reduce to 3 minutes, the three years of research and study.

Thanks for the chance to provide a few of my continuing concerns about the Atlantic Sunrise Pipeline.

Among my concerns are the fact that FERC has approved every pipeline request for the past 30 years, the cozy relationship that FERC enjoys with energy companies, and that FERC acted throughout the petition process to support Williams-Transco by announcing Williams-Transco's needs. Instead the applicant should telling citizens' things that the applicant should have included in their application.

I am also concerned that the environmental plank in our Pennsylvania Constitution has been totally ignored by both energy companies and regulatory agencies for more than forty years, and in so doing have inappropriately short-changed citizens with environmental concerns.

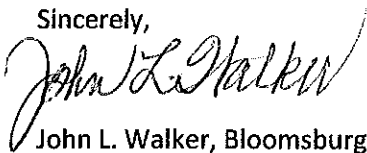
Two recent (December, 2013 and June, 2017) decisions by the Pennsylvania Supreme Court, have finally acted in support of Pennsylvania's environment and the appropriate role for our citizens.

While both decisions were just a beginning, at least our judicial branch of government acknowledged the existence of what our constitution says about citizen's role in future government decisions. That is such a refreshing change from our steamroller legislature and executive branches; both whom have simply ignored the words of our constitution.

My concerns are also about the very significant impact that the Atlantic Sunrise Pipeline will have on Columbia County and its 66,497 citizens as well as the very genuine health and safety issue they will face. Energy companies do not have a good record of responding to the needs of our citizens or the control of issues brought to our doorstep by fracking and pipelines.

Thanks again for this opportunity to comment and I look forward to supporting the Department of Environmental Protection in its new efforts to lead Pennsylvania's efforts to attend to the needs of "-all its citizens".

Sincerely,



John L. Walker, Bloomsburg
Phone: 579-683-5419

PHMSA - The Williams Record

This document was a listing of incident reports from many energy companies. Since I was primarily interested in the Williams Company and the Williams/Parsons company, the person who provided the listing said that Williams was listed under a variety of names, and pointed out to me that the column headings were listed elsewhere in the report and I was able to attach the headings to each column. Since some of the information was not of interest to me at that time I chose 7 of the eleven columns on the report and they are noted on page 1 and again on page 4.

Pages 7, 8, and 9 represents a partial listing of the incidents and events that were related to Williams in the period 2000-2015.

The last paragraph on page 9 will no doubt be affected by the recent PA Supreme Court decision on the Environmental Amendment in the Pennsylvania Constitution.

PHMSA DATA –THE WILLIAMS RECORD

These three pages **(1,2 and 3)** are copied from PHMSA records that have been maintained beginning in 1986. These incidents are not arranged in chronological order, but are the records of Williams Company which reported incidents from 1/17/1988 to 8/18/2009. These records are for Energy companies maintained by PHMSA from incident reports made by those companies until 2009 at which time Williams made a change in their record keeping. In a phone conversation with PHMSA, I asked if I could have the records from 2009 to the present time, for the Williams Companies.

The female voice who answered my call, asked me where I got that information and I responded from a friend. Clearly irritated she said they were changing some procedures, and a male voice advised her to tell me that “they” were trending downward. I assumed that meant that Williams were reporting less incidents, but neither PHMSA person provided any additional information, except to say that it was possible to make a FOIA request but it would be costly and they could not tell me how much until their research in the matter was completed.

Having no resources for asking PHMSA to do the research and charging me an unknown figure, I decided to undertake some research of my own.

Since you will notice that the Williams Company incident reports are in this PHMSA record in a random order, I decided to arrange the incident reports in chronological order. The PHMSA record had ten columns for describing the incidents. Those columns, elsewhere in the PHMSA report and which were of interest in my research, included the significance of the incident, the name of the company, date of the incident, location (town/city), the county, state and the property damage or cost of the incident. The other columns relating to accidents causing injury or death were not chosen for my study.

As I proceeded, I found some of the spaces in this report were blank so I left them blank on my chronological listing. Additionally, I found that the property damage column was irregular in that some had the damages with a dollar sign in front of the number and others did not, so I listed all of the items in the property damage column as a dollar amount on the chronological listing. Some of the incident reports also had missing information in the town, county and state. Missing information in the PHMSA report are recorded as missing in my chronological listing as well.

Although pages **(4, 5 and 6)** are the chronological listing from 1988, for the purposes of this report I will consider only events on this PHMSA listing for the period from 2000 – 2009.

Perhaps the most striking information in PHMSA’s data are the reports of three incidents in September, 2008 where three Williams incidents are reported in one week and totaling **\$70,434,753** in property damage. The listed companies were Williams Gas Pipeline Company-Transco and Williams Energy LLC. The puzzling part about these incidents is the fact that the PHMSA record shows three incidents, two companies, and only two locations.

The additional Williams incidents, although not on the PHMSA listing and no property damage figures, are actual events from Williams incidents during 2009-2015.

Introduction

Significance

Company

Name of President

Location Township

County

State

Property Damage

YES	YOUNG GAS STORAGE COMPANY, LT	19950616	YOUNG COMPRE	MORGAN	CO	No	0	1	0	2160
YES	WILLISTON BASIN INTERSTATE PIPEL	11/10/2008	SAVAGE	RICHLAND	MT	N	0	1	\$41,100	450
YES	WILLISTON BASIN INTERSTATE PIPEL	19960613	WOLFPOINT	ROOSEVELT	MT	No	0	0	238543.9064	750
NO	WILLISTON BASIN INTERSTATE PIPEL	19970320	FAIRVIEW	RICHLAND	MT	No	0	0	0	450
YES	WILLISTON BASIN INTERSTATE PIPEL	19861215	GOATS PASS CO	BILLINGS	ND	No	0	1	598315.7894	0
NO	WILLISTON BASIN INTERSTATE PIPEL	19970319	DEADWOOD	LAWRENCE	SD	No	0	0	0	200
YES	WILLISTON BASIN INTERSTATE PIPEL	19980721	GILLETTE	CAMPBELL	WY	No	0	0	522890.2327	1000
YES	WILLISTON BASIN INTERSTATE PIPEL	19921211	POWELL	PARK	WY	No	0	0	211409.396	800
NO	WILLISTON BASIN INTERSTATE PIPEL	19890127	WORLAND	WASHAKIE	WY	No	0	0	31095.22594	0
NO	WILLIAMS NORTHWEST PIPELINE	8/8/2007	MALTA	CASSIA	ID	N	0	0	\$98,670	850
NO	WILLIAMS NATURAL GAS CO	19961210	TONGANOXIE	LEAVENWORTH	KS	No	0	0	0	720
NO	WILLIAMS NATURAL GAS CO	19950408	BURDEN	COWLEY	KS	No	0	0	0	250
NO	WILLIAMS NATURAL GAS CO	19930512	WICHITA	SEDGWICK	KS	No	0	0	0	375
NO	WILLIAMS NATURAL GAS CO	19930428	OVERLAND PARK	JOHNSON	KS	No	0	0	0	280
NO	WILLIAMS NATURAL GAS CO	19921124	WICHITA	SEDGWICK	KS	No	0	0	0	460
NO	WILLIAMS NATURAL GAS CO	19911025	OSBORNE	OSBORNE	KS	No	0	0	7224.19929	350
NO	WILLIAMS NATURAL GAS CO	19900920	OVERLAND PARK	JOHNSON	KS	No	0	0	0	260
NO	WILLIAMS NATURAL GAS CO	19900908	OVERLAND PARK	JOHNSON	KS	No	0	0	0	160
NO	WILLIAMS NATURAL GAS CO	19900301	UNKNOWN	LABETTE	KS	No	0	0	74953.84615	720
NO	WILLIAMS NATURAL GAS CO	19890429	TOPEKA	SHAWNEE	KS	No	0	0	15547.61297	200
NO	WILLIAMS NATURAL GAS CO	19880117	WICHITA	SEDGWICK	KS	No	0	0	6874.165231	190
NO	WILLIAMS NATURAL GAS CO	19941116	PECULIAR	CASS	MO	No	0	0	22935.31236	570
NO	WILLIAMS NATURAL GAS CO	19921001	RAYMORE	CASS	MO	No	0	0	70469.79865	250
NO	WILLIAMS NATURAL GAS CO	19910312	UNKNOWN	BUCHANAN	MO	No	0	0	0	465
YES	WILLIAMS NATURAL GAS CO	19960616	BUFFALO	HARPER	OK	No	0	0	129643.4274	765
YES	WILLIAMS NATURAL GAS CO	19941220	PERRY	NOBLE	OK	No	0	0	107930.8817	595
YES	WILLIAMS NATURAL GAS CO	19910416	WAKITA	GRANT	OK	No	0	0	577935.9432	0
NO	WILLIAMS NATURAL GAS CO	19950417	EDMOND	OKLAHOMA	OK	No	0	0	0	418
NO	WILLIAMS NATURAL GAS CO	19931222	EDMOND	LOGAN	OK	No	0	0	0	595
YES	WILLIAMS GAS WILLIAMS - TRANSCO	9/27/2005				Y	0	0	\$5,777,031	1440
YES	WILLIAMS GAS PIPELINES/TRANSCO	9/19/2007	LINDEN	MARENGO	AL	N	0	0	\$314,681	800
YES	WILLIAMS GAS PIPELINES - TRANSCO	2/11/2005	HOUMA	TERREBONNE	LA	N	0	0	\$800,932	1169
YES	WILLIAMS GAS PIPELINES - TRANSCO	8/6/2005				Y	0	0	\$168,263	1440
YES	WILLIAMS GAS PIPELINES - TRANSCO	8/30/2005				Y	0	0	\$2,838,036	1440
NO	WILLIAMS GAS PIPELINE-TRANSCO	7/15/2005	FRAZER	MONTGOMERY	PA	N	0	0	\$114,419	800
YES	WILLIAMS GAS PIPELINE-TRANSCO	8/3/2005	SPRING	HARRIS	TX	N	0	0	\$307,360	780
YES	WILLIAMS GAS PIPELINE CENTRAL, IN	20011113	WAVERLY	LAFAYETTE	KS	No	0	0	952120.3832	500

Random order based on incident date (1,2,3) PHMSA LISTING

4465

YES	WILLIAMS GAS PIPELINE CENTRAL IN	20010404	ROSE HILL	BUTLER	KS	No	0	0	0	119075.0479	270
NO	WILLIAMS GAS PIPELINE CENTRAL IN	20011212	SOLOMON RAPID	MITCHELL	KS	No	0	0	0	59507.52395	550
NO	WILLIAMS GAS PIPELINE CENTRAL IN	20011206	LEBANON	SMITH	KS	No	0	0	0	59507.52395	400
NO	WILLIAMS GAS PIPELINE CENTRAL IN	20010129	LOUISBURG	MIAMI	KS	No	0	0	0	59507.52395	550
YES	WILLIAMS GAS PIPELINE CENTRAL IN	20010405	BUFFALO	HARPER	OK	No	1	0	0	0	
YES	WILLIAMS GAS PIPELINE -TRANSOCO	11/9/2004	SAYREVILLE	MIDDLESEX	NJ	N	0	0	0	\$283,943	800
YES	WILLIAMS GAS PIPELINE - TRANSOCO	3/4/2002	WEST FRIENDSH	HOWARD	MD	N	0	0	0	\$409,313	780
YES	WILLIAMS GAS PIPELINE - TRANSOCO	6/28/2002			AL	Y	0	0	0	\$585,318	2180
NO	WILLIAMS GAS PIPELINE - TRANSOCO	7/24/2002	ROANOKE	RANDOLPH	AL	N	0	0	0	\$59,058	800
YES	WILLIAMS GAS PIPELINE - TRANSOCO	1/30/2003	COMER	MADISON	GA	N	0	0	0	\$1,517,638	800
YES	WILLIAMS GAS PIPELINE - TRANSOCO	2/26/2004	HEIDELBERG	JONES	MS	N	0	1	0	\$114	800
YES	WILLIAMS GAS PIPELINE - TRANSOCO	5/7/2004	LITTLE FALLS	PASSAIC	NJ	N	0	0	0	\$95,518	638
YES	WILLIAMS GAS PIPELINE - TRANSOCO	6/11/2004	HOUMA	TERREBONNE	LA	N	0	0	0	\$681,462	1169
YES	WILLIAMS GAS PIPELINE - TRANSOCO	6/19/2004				Y	0	0	0	\$102,219	1440
NO	WILLIAMS GAS PIPELINE - TRANSOCO	7/6/2004		OCS		Y	0	0	0	\$90,862	1250
YES	WILLIAMS GAS PIPELINE - TRANSOCO	7/15/2004	PRINCETON	MERCER	NJ	N	0	0	0	\$119,004	800
NO	WILLIAMS GAS PIPELINE - TRANSOCO	8/30/2004				Y	0	0	0	\$57,697	1250
YES	WILLIAMS GAS PIPELINE - TRANSOCO	4/16/2005	SAINT JAMES	SAINT JAMES	LA	N	0	1	0	\$3,758	995
YES	WILLIAMS GAS PIPELINE - TRANSOCO	10/3/2005	CHANTILLY	FAIRFAX	VA	N	0	0	0	\$181,081	780
YES	WILLIAMS GAS PIPELINE - TRANSOCO	10/6/2005				Y	0	0	0	\$2,370,265	1168
YES	WILLIAMS GAS PIPELINE - TRANSOCO	12/12/2006	ELLCOTT CITY	HOWARD	MD	N	0	0	0	\$159,216	
YES	WILLIAMS GAS PIPELINE - TRANSOCO	7/20/2007		LUZERNE	PA	N	0	0	0	\$271,809	1200
YES	WILLIAMS GAS PIPELINE - TRANSOCO	2/18/2008	MOUNTAIN TOP	LUZERNE	PA	N	0	0	0	\$300,000	1200
YES	WILLIAMS GAS PIPELINE - TRANSOCO	3/3/2008	FRANKLIN	HEARD	GA	N	0	0	0	\$185,790	800
YES	WILLIAMS GAS PIPELINE - TRANSOCO	3/20/2008	GALVESTON		TX	Y	0	0	0	\$574,335	1440
YES	WILLIAMS GAS PIPELINE - TRANSOCO	6/10/2008	HOUMA	TERREBONNE	LA	Y	0	0	0	\$575,000	1168
YES	WILLIAMS GAS PIPELINE - TRANSOCO	7/21/2008	FREeport	BRAZORIA	TX	Y	0	0	0	\$180,000	1250
YES	WILLIAMS GAS PIPELINE - TRANSOCO	9/14/2008				Y	0	0	0	\$28,198,753	1168
YES	WILLIAMS GAS PIPELINE - TRANSOCO	9/14/2008	APPOMATTOX	APPOMATTOX	VA	N	0	0	0	\$5,416,000	800
NO	WILLIAMS GAS PIPELINE - TRANSOCO	9/14/2008	HOUMA	TERREBONNE	LA	Y	0	0	0	\$0	1440
NO	WILLIAMS GAS PIPELINE - TRANSOCO	9/22/2008			LA	Y	0	0	0	\$0	
YES	WILLIAMS GAS PIPELINE - TRANSOCO	10/21/2008	FREeport		TX	Y	0	0	0	\$906,000	1250
YES	WILLIAMS GAS PIPELINE - TRANSOCO	11/19/2008	HOUMA	TERREBONNE	LA	N	0	0	0	\$101,990	1440
YES	WILLIAMS GAS PIPELINE - TRANSOCO	3/15/2009				Y	0	0	0	\$756,912	1250
YES	WILLIAMS GAS PIPELINE - TRANSOCO	4/27/2009	GIBSON	TERREBONNE	LA	N	0	0	0	\$179,000	1070
NO	WILLIAMS GAS PIPELINE - TRANSOCO	5/15/2009	HOUMA	TERREBONNE	LA	Y	0	0	0	\$0	
NO	WILLIAMS GAS PIPELINE - TRANSOCO	8/4/2009	GIBSON	TERREBONNE	LA	N	0	0	0	\$100,000	2000

YES	WILLIAMS GAS PIPELINE - TRANSCO	8/14/2009		GOM, BLOCK NP933	Y	0	0	\$200,000	
NO	WILLIAMS GAS PIPELINE - TRANSCO	9/18/2009			Y	0	0	\$0	
YES	WILLIAMS GAS PIPELINE - TEXAS GAS	20010104	SHELBY	BOLIVAR	MS	No	0	126155.9508	700
YES	WILLIAMS GAS PIPELINE - TEXAS GAS	20000502	GREENVILLE	WASHINGTON	MS	No	0	0	840
YES	WILLIAMS GAS PIPELINE - TEXAS GAS	19990923	KENTON	OBION	TN	No	0	388624.2603	840
YES	WILLIAMS GAS PIPELINE - TEXAS GAS	19981029	JACKSON	MADISON	TN	No	0	121910.7845	1279
YES	WILLIAMS FIELD SERVICES	2/15/2002	PECAN ISLAND	VERMILION	LA	Y	0	\$769,090	1168
YES	WILLIAMS FIELD SERVICES	3/13/2002	TERREBONNE	TERREBONNE	LA	Y	0	\$222,199	1440
YES	WILLIAMS FIELD SERVICES	3/3/2003	TERREBONNE	TERREBONNE	LA	Y	0	\$344,055	1169
YES	WILLIAMS FIELD SERVICES	2/26/2004		SAN JUAN	NM	N	0	\$22,715	497
YES	WILLIAMS FIELD SERVICES	4/13/2004				Y	0	\$113,577	1440
YES	WILLIAMS FIELD SERVICES	4/14/2004				Y	0	\$92,679	1440
YES	WILLIAMS FIELD SERVICES	4/14/2004	N/A	N/A		Y	0	\$213,494	1440
YES	WILLIAMS FIELD SERVICES	20010427	EUNICE	ACADIA	LA	No	0	535567.7156	1012
YES	WILLIAMS FIELD SERVICES	19981006	HIGH ISLAND		TX	Yes	0	251782.9458	1440
YES	WILLIAMS FIELD SERVICES	20010920				Yes	0	297537.6198	1440
YES	WILLIAMS ENERGY LLC	9/8/2008	LAROSE	TERREBONNE	LA	Y	0	\$36,820,000	1850
YES	WILLIAMS ENERGY GROUP-FIELD SE	20011206	MOSQUITO BAY	TERREBONNE	LA	No	0	535567.7156	1170
YES	WILLIAMS ENERGY GROUP-FIELD SE	20010630	MOSQUITO BAY	TERREBONNE	LA	No	0	357045.1437	1170
YES	WILLIAMS ENERGY GROUP-FIELD SE	20010405	MOSQUITO BAY	TERREBONNE	LA	No	0	1487688.099	1170
YES	WILLIAMS ENERGY GROUP-FIELD SE	20000223	JOHNSON BAYOU	CAMERON	LA	No	0	146160	1440
YES	WILLIAMS ENERGY GROUP-FIELD SE	20001116			TX	Yes	0	889140	1440
YES	WILLIAMS ENERGY GROUP-FIELD SE	19980518	HIGH ISLAND		TX	Yes	0	94418.60468	1440
YES	WILLIAM FIELD SERVICES	19991027	JOHNSON BAYOU	CAMERON	LA	No	0	310650.8875	1440
NO	WILLIAM FIELD SERVICES	19980225	MISSISSIPPI RIVE	ST. JAMES PARIS	LA	No	0	62945.73645	995
NO	WILLIAM FIELD SERVICES	19991026			TX	Yes	0	74556.213	1250
NO	WILD GOOSE STORAGE INC	19990228	GRIDLEY	BUTTE	CA	No	0	0	2035
NO	WESTERN TRANSMISSION CORP	19980826			WY	No	0	0	1105
YES	WESTERN KENTUCKY GAS CO	19920601	HAWESVILLE	HANCOCK	KY	No	0	2818.791946	320
NO	WESTERN KENTUCKY GAS CO	19860506	CROFTON	CHRISTIAN	KY	No	0	0	410
NO	WESTERN GAS SUPPLY CO	19891024	PAGOSA SPRING	ARCHULETA	CO	No	0	0	854
NO	WESTERN GAS INTERSTATE CO	19980929	SEC 33 -T4 -R16	TEXAS	OK	No	0	62945.73645	850
YES	WESTAR TRANSMISSION CO	10/10/2003	COLORADO	MITCHELL	TX	N	0	\$148,596	960
YES	WESTAR TRANSMISSION CO	19861010		GRAY	TX	No	0	133338.9474	1235
NO	WESTAR TRANSMISSION CO	19980121	FORSAM	HOWARD	TX	No	0	10700.7752	120
NO	WESTAR TRANSMISSION CO	19970724	TERRY COUNT S		TX	No	0	63709.59305	659
NO	WESTAR TRANSMISSION CO	19931227	FRIONA	PARMER	TX	No	0	62608.89343	400

THE WILLIAMS RECORD - FROM PIPELINE & HAZARDOUS MATERIALS SAFETY ADMINISTRATION

Significance	Company	Incident date	Town/City	County	State	Property damage
No	Williams Natural Gas Co	1/17/1988	Wichita	Sedgwick	KS	\$6,874
No	Williams Natural Gas Co.	4/29/1989	Topeka	Shawnee	KS	\$15,547
No	Williams Natural Gas Co.	3/1/1990	Unknown	Labette	KS	\$74,953
No	Williams Natural Gas Co.	9/8/1990	Overland Park	Johnson	KS	\$0
No	Williams Natural Gas Co.	9/20/1990	Overland Park	Johnson	KS	\$0
No	Williams Natural Gas Co.	3/12/1991	Unknown	Buchanan	MO	\$0
YES	Williams Natural Gas Co.	4/16/1991	Wakita	Grant	OK	\$577,936
No	Williams Natural Gas Co.	10/1/1992	Raymore	Cass	MO	\$70,469
No	Williams Natural Gas Co.	10/25/1991	Osborne	Osborne	KS	\$7,224
No	Williams Natural Gas Co.	11/24/1992	Wichita	Sedgwick	KS	\$0
No	Williams Natural Gas Co.	4/28/1993	Overland Park	Johnson	KS	\$0
No	Williams Natural Gas Co.	5/12/1993	Wichita	Sedgwick	KS	\$0
No	Williams Natural Gas Co.	12/22/1993	Edmond	Oklahoma	OK	\$0
No	Williams Natural Gas Co.	11/16/1994	Peculiar	Cass	MO	\$22,935
Yes	Williams Natural Gas Co.	12/20/1994	Perry	Noble	MO	\$107,930
No	Williams Natural Gas Co.	4/8/1995	Burden	Cowley	KS	\$0
No	Williams Natural Gas Co.	4/17/1995	Edmond	Logan	OK	\$0
Yes	Williams Natural Gas Co.	6/16/1996	Buffalo	Harper	OK	\$129,643
No	Williams Natural Gas Co.	12/10/1996	Tonganoxie	Leavenworth	KS	\$0
Yes	Williams Energy Group Field Svc.	5/18/1998	High Island		TX	\$94,418
Yes	Williams Energy Group Field Svc.	10/6/1998	High Island		TX	\$251,782
Yes	Williams Gas Pipeline-Texas Gas	10/29/1998	Jackson	Madison	TN	\$121,910
Yes	Williams Gas Pipeline-Texas Gas	9/23/1999	Kenton	Obion	TN	\$388,624
Yes	Williams Energy Group Field Svc.	2/23/2000	Johnson Bayou	Cameron	LA	\$146,160
Yes	Williams Gas Pipeline Texas Gas	5/2/2000	Greenville	Washington	MS	\$0
Yes	Williams Energy Group Field Svc.	11/16/2000			TX	\$889,140
Yes	Williams Gas Pipeline - Texas Gas	1/4/2001	Shelby	Bolivar	MS	\$126,155
No	Williams Gas Pipeline Central In	1/29/2001	Louisburg	Miami	KS	\$59,507

1999 ↑
2000 ↓

Chronological order, 2000 - 2009 - Williams entries
pages 4, 5 & 6

Yes Williams Gas Pipeline Central In	4/4/2001	Rose Hill	Butler	KS	\$119,015
No Williams Gas Pipeline Central In	4/5/2001	Buffalo	Harper	OK	\$0
No Williams Gas Pipeline Central In	12/6/2001	Lebanon	Smith	KS	\$59,507
No Williams Gas Pipeline Central In	12/12/2001	Solomon Rapids	Mitchell	KS	\$59,507
No Williams Energy Group-Field Services	4/5/2001	Mosquito Bay	Terrebonne	LA	\$1,487,668
Yes Williams Field Services	4/27/2001	Eunice	Acadia	LA	\$535,567
Yes Williams Energy Group-Field Services	6/30/2001	Mosquito Bay	Terrebonne	LA	\$357,045
Yes Williams Field Services	9/20/2001				\$297,537
Yes Williams Gas Pipeline Central In	11/13/2001	Waverly	Lafayette	KS	\$952,120
Yes Williams Energy Group-Field Services	12/6/2001	Mosquito Bay	Terrebonne	LA	\$535,567
Yes Williams Field Services	2/15/2002	Pecan Island	Vermillion	LA	\$769,090
Yes Williams Gas Pipeline-Transco	3/4/2002	W. Friendship	Howard	MD	\$409,313
Yes Williams Gas Pipeline-Transco	3/13/2002	Terrebonne	Terrebonne	LA	\$222,199
Yes Williams Gas Pipeline-Transco	6/28/2002			AL	\$585,318
NO Williams Gas Pipeline-Transco	7/24/2002	Roanoke	Randolph	AL	\$59,058
YES Williams Gas Pipeline-Transco	1/30/2003	Comer	Madison	GA	\$1,517,638
Yes Williams Field Services	3/3/2003	Terrebonne		LA	\$344,055
Yes Williams Field Services	2/26/2004		San Juan	NM	\$22,715
Yes Williams Gas Pipeline- Transco	2/26/2004	Heidelberg	Jones	MS	\$114
Yes Williams Field Services	4/13/2004				\$113,577
Yes Williams Field Services	4/14/2004				\$92,679
Yes Williams Field services	4/14/2004	N/A	N/A		\$213,494
Yes Williams Gas Pipeline-Transco	5/7/2004	Little Falls	Passaic	NJ	\$95,518
Yes Williams Gas Pipeline-Transco	6/11/2004	Houma	Terrebonne	LA	\$681,462
Yes Williams Gas Pipeline-Transco	6/19/2004				\$102,219
Yes Williams Gas Pipeline-Transco	7/6/2004		OCS		\$ 90.862
Yes Williams Gas Pipeline-Transco	7/15/2004	Princeton	Mercer	NJ	\$119.004
NO Williams Gas Pipeline- Transco	8/30/2004				\$57.697
Yes Williams Gas Pipeline-Transco	11/9/2004	Sayreville	Middlesex	NJ	\$283,943
Yes Williams Gas Pipeline-Transco	2/11/2005	Houma	Terrebonne	LA	\$800,932
Yes Williams Gas Pipeline-Transco	4/16/2005	St. James	St. James	LA	\$3758
Yes Williams Gas Pipeline-Transco	7/15/2005	Frazer	Montgomery	PA	\$114,419

Yes Williams Gas Pipeline-Transco	8/3/2005	Spring	Harris	TX	\$307,360
Yes Williams Gas Pipeline-Transco	8/6/2005				\$168,263
Yes Williams Gas Pipeline-Transco	8/30/2005				\$2,838,036
Yes Williams Gas Pipeline- Transco	9/27/2005				\$5,777,031
Yes Williams Gas Pipeline-Transco	10/3/2005	Chantilly	Fairfax	VA	\$181,081
Yes Williams Gas Pipeline-Transco	10/6/2005				\$2,307,265
Yes Williams Gas Pipeline-Transco	12/12/2006	Ellicott City	Howard	MD	\$159,216
Yes Williams Gas Pipeline-Transco	7/20/2007		Luzerne	PA	\$271,809
Yes Williams Northwest Pipeline	8/8/2007	Malta	Cassia	ID	\$98,670
Yes Williams Gas Pipeline Transco	9/19/2007	Linden	Marengo	AL	\$314,681
Yes Williams Gas Pipeline Transco	2/18/2008	Mountain Top	Luzerne	PA	\$300,000
Yes Williams Gas Pipeline Transco	3/3/2008	Franklin	Heard	GA	\$185,790
Yes Williams Gas Pipeline Transco	3/20/2008	Galveston		TX	\$574,335
Yes Williams Gas Pipeline Transco	6/10/2008	Houma	Terrebonne	LA	\$575,000
Yes Williams Gas Pipeline Transco	7/21/2008	Freeport	Brazoria	TX	\$180,000
Yes Williams Energy LLC	9/8/2008	Larose	Terrebonne	LA	\$36,820,000
Yes Williams Gas Pipeline-Transco	9/14/2008				\$28,198,753
Yes Williams Gas Pipeline-Transco	9/14/2008	Appomattox	Appomattox	VA	\$5,416,000
No Williams Gas Pipeline-Transco	9/14/2008	Houma	Terrebonne	LA	\$0
No Williams Gas Pipeline-Transco	9/22/2008			LA	\$0
Yes Williams Gas Pipeline-Transco	10/21/2008	Freeport		TX	\$906,000
Yes Williams Gas Pipeline-Transco	11/19/2008	Houma	Terrebonne	LA	\$101,990
Yes Williams Gas Pipeline-Transco	3/15/2009				\$756,912
Yes Williams Gas Pipeline-Transco	4/27/2009	Gibson	Terrebonne	LA	\$179,000
Yes Williams Gas Pipeline- Transco	5/15/2009	Houma	Terrebonne	LA	\$0
Yes Williams Gas Pipeline-Transco	8/4/2009	Gibson	Terrebonne	LA	\$100,000
Yes Williams Gas Pipeline-Transco	8/14/2009		GOM,Block NP933		\$200,000
Yes Williams Gas Pipeline-Transco	9/18/2009				\$0

Williams Record - with limited details
pages 7, 8 & 9

First four paragraphs are my comments - on
top of page 7

Last 4 paragraphs on page nine are my
comments on page 9.

John L. Walker

Williams' Record from 2000 to 2015 -

Since 2014, a few area residents have been researching the activities reported about the Williams' and Williams-Transco Companies and the activities relating to their proposed Atlantic Sunrise Pipeline project. Because of the enormous changes that the ASP will bring to Columbia County, it is imperative that county residents know as much as possible about these company's actions during the past 15 years. Local citizens have heard the TV and newspaper PR barrage from Williams-Transco, but they need to know much that they have not yet heard.

This document is being sent to the Department of Environmental Protection as a follow-up to the DEP hearing on June 13, 2017 and to share with you what citizens who care deeply about Pennsylvania's environment, have been working so long to bring to fruition.

First, those citizens are thankful that Pennsylvania's Environmental Rights Amendment, has been recognized by our highest court. Those of us who have read our constitution repeatedly and wondered mightily about why Article 1, Section 27, that was enacted 45 years ago, has been virtually ignored by our legislative and executive bodies. Now that our highest court has confirmed the Environmental Rights Amendment, our legislators and governors and the agencies they appoint, must take these constitutional duties more seriously. Most of the major issues that are mentioned in this document, sooner or later, will affect our environment.

Between 2000 and 2009 the Pipeline Hazardous Materials and Safety Administration (PHMSA) records that we were able to review, showed Williams was the company identified in PHMSA'S record to have been involved in 78 incidents, which resulted in property damage of more than \$93,000,000. Three of those incidents occurred in a one week period in 2008 and are noted below with an **

2002 – Williams was reported to be in financial distress, which they failed to reveal and became the subject of a class action lawsuit which was settled in favor of the class action litigants in 2007 for \$290,000,000.

2002 –The LA Times and Bloomberg News reported that Williams Companies gave false information to a company that compiles gas price indexes used by the industry in sales contracts. Two Williams' traders later pled guilty to providing such information to trade publications and to price gouging during the California's energy crisis in 2000 and 2001. Williams was the third energy company to admit to providing false information about energy prices.

2002 – California continued to pursue a suit against Williams for price gouging during the energy crisis, but the LA Times reported on November 17, that California would drop their suit against Williams in exchange for concessions that the state estimated could exceed \$1.8 billion dollars. Williams also agreed to renegotiate \$4.3 billion in long-term power contracts with California.

2003 – Williams Companies agreed to pay a \$20,000,000 civil penalty to the Federal Energy Regulatory Commission (FERC) for engaging in anti-competitive business practices. Williams paid the fine to FERC to settle a claim of willfully providing false data to manipulate the U. S. natural gas market. FERC said it was the largest civil penalty ever levied at that time. The largest previous penalty was \$11,000,000 paid by Transco in 1991, before its acquisition by Williams in 1996.

2003 – On May 1, 2003, a 26 inch Williams Company natural gas transmission pipeline failed near Lake Tapps, Washington. There were four previous failures on this pipeline in the preceding 8 years.

2003 – Another section of the same Williams Companies gas transmission pipeline that failed on May 1, failed in Lewis County, Washington on December 13, 2003. Gas flowed for 3 hours before being shut off. Gas pressure had already been reduced 20% on this pipeline after the May 1 explosion.

2004 – Williams fined \$30,000 for a well in Parachute, Colorado. This began a series of incidents, in Parachute, that Williams was involved in during the next ten years.

2008** On September 8, 2008 the PHMSA record shows an incident in Larose, LA, that resulted in a property damage of \$36,820,000.

2008** On Sept. 14, the PHMSA record shows an incident with property damage of \$28,198,753. The PHMSA record does not show a location for that incident.

2008** A Williams natural gas explosion was reported near Appomattox, VA (Transco), on September 14. The blast ripped a 32-foot section of 30 inch pipe from the ground and caused a 1,100 foot burn zone, and property damage of \$5,416,000.

Note: The three incidents above in one week in 2008, total \$70,434,753 in property damage

2009 – Williams was fined \$952,000 for failure to monitor corrosion adequately in the Appomattox fire.

We identified more details regarding Williams and Williams-Transco from 2011-2015

2011 – Williams had reported significant progress on the Corrective Action Orders issued to Williams Transcontinental Gas Pipeline Corporation by PHMSA for the Appomattox incident, so those orders were closed on **November 3, 2011**.

2011 – One month later on **Dec 3, 2011**, a Williams Companies gas transmission pipeline exploded and burned in Marengo County, Alabama. At that time PHMSA noted that Williams, “has not determined whether the conditions that caused the failure exist on other portions of Transco, “and determined that the continued operation of the Transco pipeline, “would result in likely serious harm to life, property, and the environment”.

2012 – On March 29, a gas leak caused an explosion at the Lathrop Compressor Station, owned by Williams in Springville Township, Susquehanna County, Pennsylvania.

2012 - (Dec 20) The beginning of the Natural Gas Liquid (NGL) pipeline link in Parachute, Colorado (pop. 1,000). Parachute Creek runs through the small town, which is nestled next to the Colorado River.

2013 – (Jan) – Williams discovers leak of NGLs in Parachute plant while working on construction to expand the plant .Reports say the leak was found by accident. Leak stopped, but Benzene, a cancer causing agent, has contaminated soil. Williams says the leak not affecting the creek.

2013 (March 8)- Williams begins cleanup (2 months later) of Benzene leak (NGL) in Parachute CO. Authorities and landowners notified that the soil has been contaminated. No mention that groundwater is poisoned. Reports say that Williams didn't report the spill/leak earlier because they thought less than 25 gallons had leaked.

2013 (Mar. 15) – Groundwater in Parachute is contaminated with Benzene from NGL leak. Spill finally announced to public. Benzene is cancer-causing agent that breaks down bone marrow.

2013 (March) Reports say Williams/Transco rejects U.S. Army Corp of Engineers safety recommendations in connection with the proposed Rockaway Lateral natural gas pipeline, claiming the requirements would “needlessly delay” the project and force cost overruns.

2013 – (March) – Williams Natural gas pipeline in West Virginia ruptures.

2013 – On March 20, another compressor station fire in PA, injured a worker in Bradford County. The fire, and unknown air emissions in Bradford County occurred just ten days before the one-year anniversary of the Lathrop compressor station explosion.

2013 (April) – Parachute, CO., residents question credibility of Williams who is in charge of testing their water and want the government to take over. Contamination continues to spread into their creek.

2013 (April) – Williams say faulty pressure gauge cause of leak in Parachute. Diesel found at gates of Parachute water supply. Benzene detected in creek. State Health Dept. takes over oversight of leak.

2013 (May) – Benzene levels rise in Parachute,, CO. creek. State agency tells Williams it violated the law.

2013 – On May 14, there was a late night explosion and fire at a Williams Co. compressor station near Brooklyn Township, Susquehanna County, PA.

2013 – On May 30 a Williams compressor explosion occurred in Branchburg, N.J. Thirteen workers were injured, two seriously.

2013 – On July 13, the Williams Olefins Plant explosion in Geismar, LA, was triggered by a catastrophic failure on a heat exchanger, with two workers killed and 114 injured. On 12/13/2013 OSHA cited Williams Olefins for six process safety management standard violations, **including one WILLFUL** and fined the company \$99,000. A willful violation, here defined as one “committed with intentional, knowing or voluntary disregard for the law’s requirements”.

2013 – Federal regulators have fined subsidiaries of Williams Company and Boardwalk Pipeline Partners L.P., the firms heading the Bluegrass Pipeline project, nearly 2.4 million dollars over the last five years for 18 incidents.

2014 – Williams Northwest Pipeline plant in Plymouth, Washington, experienced an explosion which injured 5 and prompted evacuation of hundreds. Shrapnel from the explosion pierced a liquefied natural gas storage tank. Local sheriff deputies said the tank contained a billion cubic feet of natural gas.

2014 – Sauvie Island, Portland, Oregon- Three gas leak incidents a gas transfer stations, prompted at least three emergency releases of gas to relieve pressure in a pipeline, causing emergency responders in one case to evacuate nearby residents and close a school. The Williams Company that operates the facility did not notify neighbors or proactively communicate with them about the ongoing problem for two months, despite repeated gas releases. Federal safety inspectors did not visit the facility until repeated phone calls from the Oregonian and Senator Ron Wyden, D-Oregon, prompted the agency too deputize state regulators to inspect the facility.

2014 – Williams gas processing facility in Opal, WY, explosion and fire forced the evacuation of the nearby community of Opal and the closure of its gas operations. Opal citizens were evacuated to an area about 3 miles outside of town as a precaution. A probe into safety practices at pipeline operator Williams Cos (WMB) is being expanded after the company’s third accident in less than 11 months.

2015 – (June 9) A Williams –Transco pipeline exploded near Unityville, PA, along the border between Columbia and Lycoming counties and forced an evacuation of 130 residents. The accident released gas into the atmosphere and residents felt the impact of the explosion, heard a sound like a jet engine and inhaled the released gas. Some residents reported odor from the incident was present five miles from the site.

Between 2012 and 2015, there were four incidents in northeast Pennsylvania that involved Williams Companies facilities experiencing explosions and/or fires on gas pipelines. Two Williams’ spokesmen visited residents on the day after the blowout at Unityville, PA, and shared some little known facts about pipelines in rural areas.

The spokesmen reported that most of the new pipelines in north central and northeast PA are Class 1 lines and information discovered about these lines was equally discomfoting. For instance, Class 1 lines are tested a lower levels of pressure, they are permitted to have fewer welds tested, have thinner sidewalls than level 2, 3, and 4 lines and need not be buried as deeply. Also shut off valves can be located farther apart. Some lines also have a wider Zone of High Consequence.

Perhaps most troubling is the fact that the safety of Class 1 pipelines in PA was not subject to regulation by typical reporting authorities. Some of the residents, who were visited, saw this fact as a major oversight. When it was time to report the incident, local reports indicated that there was some uncertainty about who should hear about the pipeline rupture. Moreover, those with concerns believe that the ASP planned by Williams-Transco is a 42” diameter line with a proposed pressure of 1480 psi and the accompanying compressor stations raise significantly more safety concerns than the 24” Transco line near Unityville.

With 24 Williams incidents in 2008-2015, and Williams sharing fines of \$2,400,000 for 18 additional incidents with Boardwalk Partners in the same 2008-2015 time period, there remain many concerns.

If you read this document carefully, you may feel that those living in one of the 10 Pennsylvania counties that are being asked to host the ASP, may be pawns in the mad rush to ship out the gas that the Pennsylvania Constitution declares is, “the common property of all the people, including generations yet to come”. The Constitution further declares, “As trustee of these resources, the Commonwealth shall conserve and maintain them for.....all the people”.

Unityville Explosion

The yellow page, front and back was written by me to help area residents understand some of the circumstances surrounding the Unityville event and a few of the questions that remain.

UNITYVILLE EXPLOSION – JUNE 9, 2015

On June 9, 2015 a pipeline incident occurred near Unityville and the border between Columbia and Lycoming counties, forcing the evacuation of about 130 people from their homes. The Unityville explosion was the fourth incident in northeast Pennsylvania between 2012 – 2015. It also provided a discussion between residents and Williams representatives, a review of Class 1 regulations, and how the use of bidirectional flow might impact pipelines in general and the safety of citizens in Central Pennsylvania.

Previous incidents were:

- (a) March 12, 2012 – An explosion at the Lathrop Compressor station, owned by Williams in Springville Township, Susquehanna County, PA. It blew a hole in the roof of the building.
- (b) March 20, 2013 – Another Williams compressor station fire injured a worker in Bradford County, Pennsylvania. The fire released unknown air emissions in the region.
- (c) May 14, 2014 – There was a late night explosion and fire at a Williams Companies gas compressor station in Brooklyn Township/Montrose, Susquehanna County, PA. DEP officials said they found evidence of an explosion and fire.
- (d) The fourth incident, in Unityville is described above. All were Williams operations,

The day following the blowout, two Williams employees visited with some of the residents in the area of the pipeline rupture. Two of residents wrote a first person account of the incident and the meeting they had with the Williams representatives on June 10, 2015. In that account the Williams spokesmen emphasized that interstate pipelines are regulated by the federal government and said pipeline integrity is guaranteed by detailed standards about materials, testing, etc. **HOWEVER, federal and state regulations prescribe more lax standards for rural areas than for populated areas. For example, the Williams spokespersons advised the residents that rural Class 1 pipelines:**

- (a) Are tested to lower levels of pressure;**
- (b) Are permitted to have fewer welds tested;**
- (c) Need not be buried as deeply;**
- (d) Can have their shut-off valves farther apart.**

Although not noted in the residents' discussion with Williams, differences in Class 1 level requirements (those required in Columbia County) are described in this manner in the FERC Environmental Impact Statement, "Pipelines constructed on land in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock." All other levels, Class 2, 3 and 4 require greater depth of pipeline coverage.

Other issues such as pipe wall thickness and pipeline design pressures; hydrostatic test pressures; maximum allowable operating pressure; inspection and testing of welds; and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas.

Continuing the report from their discussion, the residents said, "The safety of Class 1 pipelines in Pennsylvania is not subject to regulation by any authority – a major oversight."

Things we know about the Unityville pipeline:

- (a) Pipeline diameter was 24 inches
- (b) Pipeline sidewall thickness was .344 inches
- (c) Pipeline ruptured section was installed in 1963
- (d) Pipeline was being operated at 1141 psi, or more than 95% of maximum pressure at the time of rupture.
- (e) Pipeline bidirectional flow was changed at 9:24 on the morning of the explosion. Natural gas had been flowing east and was switched to flow west. In 2014, federal regulators had advised pipeline companies that, reversing oil and natural gas pipelines or switching the product they're carrying can have a "significant impact" on the line's safety and integrity. The Unityville incident was June 9, 2015
- (f) The Unityville pipeline was examined beginning on September 30, 2010, and as a result 29 pipeline locations were chosen for digs and where necessary repairs. Remediation was completed in 2011.

A FEW QUESTIONS THAT NEED ANSWERS

The information revealed in the Unityville incident raises questions about the Atlantic Sunrise Pipeline that need resolution before the ASP construction begins. Those questions are:

1. Will all the Class Level 1 regulations apply to the 42 inch diameter ASP pipeline at 1400 psi, that applied to a 24 inch diameter pipeline operating at 95% of maximum allowable operating pressure?
2. Will the 42 inch ASP line be tested to a lower level of pressure, as both FERC and Williams representatives report is permitted?
3. Will the 42 inch ASP line be permitted to have fewer welds tested, as FERC and Williams representatives say is OK?
4. Will the 42 inch ASP line not be buried as deeply? 30 inches in normal soil? 18 inches in consolidated rock as FERC and Williams-Transco say is permitted?
5. Will the 42 inch ASP line have its shut-off valves 10 miles apart in Class level 1 locations, as FERC and Williams allow?
6. Will the 42 inch ASP line be bidirectional? Especially in view of the fact that the Class level 1, Unityville 24 inch line, was operated in a bidirectional manner at above 95% of maximum operating capacity, in a line with 29 repairs in the previous four years; and have the line explode in the first 12 hours of bidirectional flow.
7. Why was there no mention of human error in the Unityville incident? Since the pipeline had been operating in bidirectional mode only about 12 hours, and the pressure had been climbing throughout the day why was there no active monitoring of line B?
8. Why has the pipeline remained inactive for more than 20 months as a recent local newspaper reported?
9. How can the safety requirements for a 42 inch pipeline be classified as a level 1 line when the federal government has cautioned the energy companies about the danger of changing single direction lines to bidirectional operation even before the ASP was approved by FERC

Since Williams-Transco representatives reported to the residents the day after the incident, and to the citizens during the June 5, 2014 open house, that pipes are 4-6 feet below the surface, the four foot pipe clearance on the ASP would need to be at least 42"(pipe diameter)+ 48"(space below the surface), a total of 90". If the figure was to be six feet below the surface, the trench would need to be 42"(pipe diameter) + 72"(six feet below the surface) or a total of 114 inches.

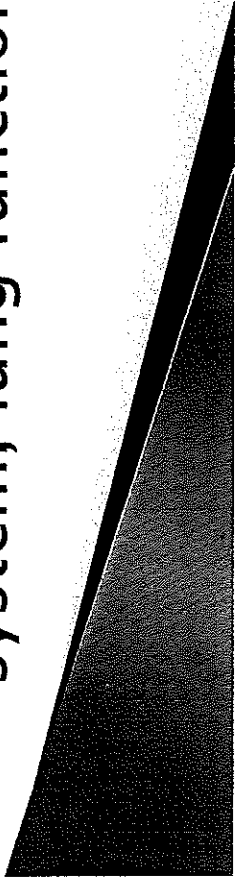
However, the final Environmental Impact Statement for The Atlantic Sunrise Pipeline, developed by FERC and voted on by only 3 of the 5 FERC commissioners (on the day the Commission Chairman was resigning) shows something quite different. As noted on the reverse of this page a FERC quote says, "Pipelines constructed on land in Class 1 locations (like the ASP), must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock." Question # 10 is this:

10. Would citizens with a 42" diameter pipeline located on rock only 18" below the surface be safe if a compressor explosion and/or fire forced them to flee their homes in a matter of seconds? And secondly has anyone in Columbia or any other of the PA counties seen the chart that was discussed when the Leidy line southwest was considered before FERC approved that line several years ago? If not that must be done!

These pages developed by Milma Subra of the Subra company, New Iberia, LA who has served on a number of commissions appointed to consider environmental issues by the Federal government.

The Emissions from Compressor Stations remain a big environmental issue that NRP must consider

Emissions from Compressor Stations

- ▶ Compressor stations along pipelines are used to push the natural gas through the pipeline.
 - ▶ The compressors release combustion products, nitrogen oxide and volatile organic hydrocarbons into the air and degrade the air quality.
 - ▶ The combustion products combine with the volatile organic compounds released by the compressors and heat and sunlight to produce ground level ozone.
 - ▶ Ground level ozone impacts the respiratory system, lung function and cardiovascular system.
- 

Chemicals Released into the Air from Compressor Facilities

- ▶ Benzene
- ▶ Toluene
- ▶ Ethylbenzene
- ▶ Xylenes
- ▶ 1,3-Butadiene
- ▶ n-Butyl Alcohol
- ▶ Carbon Disulfide
- ▶ Carbonyl Sulfide
- ▶ Chlorobenzene
- ▶ Chloromethane
- ▶ 1,2-Dichloroethane
- ▶ Diethyl Benzene
- ▶ Dimethyl Disulfide
- ▶ Formaldehyde
- ▶ Methyl Ethyl Disulfide
- ▶ Naphthalene
- ▶ 1,1,1,2-Tetrachloroethane
- ▶ Trichloroethylene
- ▶ Trimethyl Benzene
- ▶ 1,2,4-Trimethyl Benzene
- ▶ Styrene
- ▶ Methane
- ▶ Ethane
- ▶ Butane
- ▶ Propane
- ▶ Nitrogen Oxide

Acute Health Impacts Experienced by Individuals Living and Working near Compressor Stations

- ▶ Irritates skin, eyes, nose, throat and lungs
- ▶ Respiratory impacts
- ▶ Sinus problems
- ▶ Allergic reactions
- ▶ Headaches
- ▶ Dizziness, Light headedness
- ▶ Nausea, Vomiting
- ▶ Skin rashes
- ▶ Fatigue
- ▶ Weakness
- ▶ Tense and Nervous
- ▶ Joint and muscle aches and pains
- ▶ Vision Impairment
- ▶ Personality changes
- ▶ Depression, Anxiety
- ▶ Irritability
- ▶ Confusion
- ▶ Drowsiness
- ▶ Weakness
- ▶ Irregular Heartbeat

90% of individuals living and working within 2-3 miles of compressor stations report experiencing odor events and health impacts

Chronic Health Impacts Experienced by Individuals Living and Working near Compressor Stations

- ▶ Damage to Liver and Kidneys
 - ▶ Damage to Lungs
 - ▶ Damage to Cardiovascular System
 - ▶ Damage to Developing Fetus
 - ▶ Reproductive Damage
 - ▶ Mutagenic Impacts
 - ▶ Developmental Malformations
 - ▶ Damage to Nervous System
 - ▶ Brain Impacts
 - ▶ Leukemia
 - ▶ Aplastic Anemia
 - ▶ Changes in Blood Cells
 - ▶ Impacts to Blood Clotting Ability
- 