



PLANNING & DEVELOPMENT SERVICES

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To: Skagit County Planning Commission

From: Carly Ruacho, Senior Planner

Date: May 17, 2011

Proposal:

Amendments to the Skagit County Unified Development Code, Title 14, to include procedures and development standards for lands in close proximity to hazardous liquid/natural gas transmission pipelines.

Rationale for proposal:

1. Address a gap in the existing federal and state regulations related to hazardous liquid and natural gas pipeline corridor management.
2. Promote communication among County government, land owners, developers, and industry representatives to seek improvements in safety measures for transmission pipelines.
3. Reduce opportunities for accidental damage to hazardous liquid and natural gas pipelines.
4. Avoid exposing structures with high on-site populations and/or those uses that are difficult to evacuate, emergency facilities, and similar high consequence structures to risk of injury or damage in the event of a pipeline failure.
5. Promote awareness of the pipeline corridor through education.
6. Reduce opportunities for environmental damage.

Pipeline transmission, and land use compatibility and public safety options available to local governments are:

1. Impose few, if any, public safety measures, hoping that no catastrophic pipeline failures occur within your neighborhood or community. There are no federal or state "mandates" requiring that a local government consider pipeline safety issues.
2. Assume the worst and impose draconian regulations to safeguard the public from all possible risk in the event that a pipeline does rupture and ignite.
3. Choose from the range of recommended practices that seek to protect the pipelines from damage and lessen the injuries and damage if a pipeline failure does occur.

Options one and two are extreme positions. The current proposal reflects the ideas of option three and addresses: education about pipeline safety, recommended land use practices, assessment of the level of safety concern in a community, and reasonable measures to promote the health and safety of the community.

Background

In 2010, Planning and Development Services applied for and received a \$50,000 grant from the US Department of Transportation Pipeline Safety and Hazardous Materials Administration (PHMSA) to study the issue of pipeline safety in Skagit County and develop new procedures and development standards. The PHMSA grant is awarded to 20 recipients nationwide each year. In 2011, approximately 180 jurisdictions applied for the technical assistance. Other Washington state jurisdictions that have previously adopted pipeline safety standards include: King County, Whatcom County, the City of Redmond, and the City of La Center. Municipal Research Center has also produced guidance for local jurisdictions on this issue and has drafted model ordinances relating to pipeline setbacks as well as consultation zones.

During the development of the proposed land use measures pertaining to transmission pipelines, County staff met with pipeline operators from all four major pipelines located in Skagit County (BP, Kinder Morgan, Williams, and Cascade Natural Gas). Affected landowners were also directly notified via an informational mailing sent to the 3,200 individual owners with property in close proximity (1,000) of one or more of the transmission pipelines (see below).

Did you know that your property is located within 1,000 feet of an oil, natural gas, or hazardous liquid transmission pipeline?

You are one of 3,200 land owners in Skagit County with property near a major pipeline.



There are four oil and gas transmission pipelines traveling across approximately 121 miles of Skagit County. These pipelines are operated by BP, Kinder-Morgan, Williams, and Cascade Natural Gas.

Skagit County Planning & Development Services is undertaking a process to adopt new procedures and development standards to address the issue of pipeline safety.

Through this process, it is our goal to promote awareness of the pipelines in our community and develop standards and procedures that ensure development near the pipelines occurs safely.

Public participation is key to good planning.
Don't miss your opportunity to weigh in on this issue!



We would like to hear from you!

Please join us
for an informational meeting on
Monday, May 9, 2011, at 6:00 p.m.
1800 Continental Place
Mount Vernon, WA



Where to go for additional information:

www.skagitcounty.net

"Pipeline Safety Project Beginning"

- Video presentation on pipeline safety
- Interactive pipeline map

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Skagit County Commissioners hearing room. The purpose of the meeting was to allow the public an opportunity to ask questions and discuss the issue and the project in an informal setting prior to the public hearing. There were approximately 40 individuals who attended the meeting. All four of the major transmission pipeline companies were also invited to attend. Three staff members from Williams pipeline participated in answering questions from the public and presenting information about transmission pipelines and pipeline safety. Several Skagit County Planning and Development

Services staff were present as well as two County Commissioners. The discussion and questions pertained primarily to how the regulations will impact landowner's property values, taxes, and uses.

Pipelines

Skagit County has approximately 121 miles of hazardous liquid/natural gas transmission pipelines comprised of the infrastructure of 4 companies: BP (Olympic Pipeline), Kinder Morgan (Trans Mountain Pipeline), Williams (Northwest Pipeline), and Cascade Natural Gas. Each of the companies installed their first pipelines in Skagit County during the same general timeframe (1960's). Several companies have added additional lines within their existing easements over the last 50 years. Many of the pipelines have changed ownership since their initial installation as well as changed characteristics over time. With federal approval, pipelines may transition from one product to another in an existing pipe.

British Petroleum (BP) operates a hazardous liquid pipeline known as the Olympic Pipeline. The pipeline runs north to south through entire length of the County, west of I-5, and additionally, east to west from west of Burlington to the Tesoro refinery on March's Point. The Olympic pipeline is comprised of two parallel lines running within the same corridor. The 16" and 20" lines carry gasoline, diesel, and aviation fuel on a three day cycle. The pressure in the lines is generally 1200 to 1400 psi (pounds per square inch). The pipeline is monitored in and controlled remotely from the Operations Control Center in Renton, WA.

Kinder Morgan operates a hazardous liquid pipeline known as the Trans Mountain Pipeline. The pipeline includes approximately 22 miles within Skagit County and runs generally north to south from the County line near Alger to a pressure station near Hwy 20 at a diameter of 20". The pipe changes direction east of Burlington and runs out to March's Point with a pipe diameter of 16". Kinder Morgan transports strictly crude oil and is monitored from Edmonton, Alberta.

The Williams (Northwest) and Cascade Natural Gas pipelines carry natural gas. The Williams pipeline runs the length of the County from north to south generally along Hwy 9, with pipe diameters of 30" and 36". Cascade Natural Gas pulls it's product from Williams pipeline and runs the transmission line east to west from Sedro-Woolley to Anacortes. Williams pipeline is monitored and controlled from Salt Lake City. Cascade Natural Gas is owned by MDU Resources and is monitored out of Idaho.

The easement width for each pipeline varies, from company to company and even for a single pipeline. The location of the pipelines within their respective easements varies as well. While the pipelines are typically buried at a depth of 3 to 4 feet, this also varies and can change over time due to erosion or excavation. Pipelines in Skagit County have been found to be as shallow as 20" from the surface.



Pipeline Safety

The pipeline infrastructure transporting our nation’s petroleum and natural gas products is a necessary and important part of our everyday life. The alternatives to pipeline transmission of these products include utilizing our freeway and/or railway systems. The use of trucks and/or trains to transport these products is infeasible due to the quantities required on a daily basis by us, the consumers. Pipelines are an efficient, effective, and generally safe means of conveying these volatile products. Although the pipeline companies are vigilant in their efforts to ensure the safety of their pipelines and the public, there are nonetheless several occurrences of pipeline failures each year.

Unfortunately, even though the occurrences of pipeline failures are rare, they often result in environmental and property damage as well as serious injury and even death. Pipeline facilities, if ruptured or damaged, can pose a significant risk to public safety and the environment due to the high operating pressure and the highly flammable, explosive, and toxic properties of the transported products.

The Office of Pipeline Safety reports 583 serious injuries or deaths resulting from transmission pipeline incidents between 1986 and 2003. The rupture of a high-pressure natural gas pipeline can lead to outcomes that can pose a significant threat to people and property in the immediate vicinity of the failure location. The dominant hazard is thermal radiation from a sustained fire. When a natural gas pipeline ruptures and ignites, the blast and heat are centered at the point of rupture rather than a potentially much larger area in the case of hazardous liquid pipelines.

In June 1999, a section of BP's Olympic pipeline in Bellingham ruptured, spilling 237,000 gallons of gasoline into Whatcom Creek. Three people died and eight others were injured when the fuel ignited and burned 1.5 miles in and along the creek channel. Extensive fires burned a 25 acre area for four days. The failure caused extensive damage to the City of Bellingham's water treatment facility and resulted in \$45 million in property damages.

A 30" natural gas transmission line running through a suburban community near San Francisco, CA (San Bruno) failed in September 2010, damaging 120 homes, destroying 38, and killing eight people. The fiery blast caused by the pipeline failure burned at an estimated 2,000 degrees Fahrenheit. The company operating the failed pipeline, Pacific Gas & Electric, had released a list of its 100 riskiest transmission pipeline segments, but the segment of pipe that failed in San Bruno was not on the list. As shown in this instance, pipeline failures can cause catastrophic damage where high density developments are within pipeline hazard area radius.

Proposed Amendments

The proposed amendments to the Skagit County Unified Development Code seek to address the issue of pipeline safety within the unincorporated areas of the County. The purpose of the new code chapter is to help prevent and minimize unnecessary risk to the public health, safety, and welfare due to hazardous liquid and natural gas transmission pipelines. The amendments include four main components:

1. Consultation Zones

The purpose of consultation zones is to improve communication between property owners and transmission pipeline operators early in the development process to provide guidance to property owners about minimizing risk through site design or construction.

2. High Consequence Land Use Restrictions (e.g. schools, hospitals, multi-family housing)

The purpose of this section is to limit exposure of land uses with high on-site populations and/or uses that are difficult to evacuate and essential public facilities that serve critical "lifeline" or emergency functions from the risk of large-scale injury or damage in the event of a pipeline failure.

3. Setbacks

The purpose of the proposed setbacks is to address the potential incompatibility of human occupied structures with hazardous liquid/natural gas transmission pipelines. Increasing distance between structures and pipeline(s) minimizes the risk of inadvertent damage to transmission pipelines and as well as lessens the likelihood of casualties and property damage in the event of a pipeline failure.

4. New Land Division Limitations

Thoughtful planning and site design for additional, newly created lots in close proximity to existing transmission pipeline(s) is desired. Providing for adequate separation of pipelines

and new building lots provides greater protection for both the pipeline as well as building occupants.

Value Ranges

The proposed code amendment is drafted to provide a range of dimensional standards (distances) for consideration by the public and decision makers. Environmental review and public comment will include all values up to the maximum distance indicated in the proposal. The value ranges are indicated in the document by brackets and include the words [up to]. In each instance, the range being proposed is from 0 to the bracketed number (i.e. [up to 660] feet reflects a proposed range from 0 to 660 feet). Although there are models to calculate the expected results of pipeline failures, the hazard area radius for each failure has proven to be unpredictable. Absent any state or federal regulations mandating specific standards, it is left to each jurisdiction to assess the risks and decide on appropriate land use measures. The Department recommends adoption of the “up to” value of each range as the larger distances provide the greatest protection. The values listed as the high end of the ranges were carefully selected. Both higher and lower values were considered for each provision. The proposal relies on research indicating distance offset from pipeline failure sites to fatality, injury, and burn extent. The proposal also considers other jurisdictional approaches, MRSC model ordinances, as well as other recommended planning practices relating to planning near pipelines.

The following figures were excerpted from *A Model for Sizing High Consequence Areas Associated with Natural Gas Pipelines*, Mark J. Stephens, October 2000. 660 feet is the hazard area radius utilized by the industry based on the HCA model (Figure 2.4 below). Although 660’ is the accepted standard for hazard area sizing, significant damage and casualties have occurred at greater distances in several instances. The offset to injury for the incidents shown is just under 300’ and the offset to fatality is 150’.

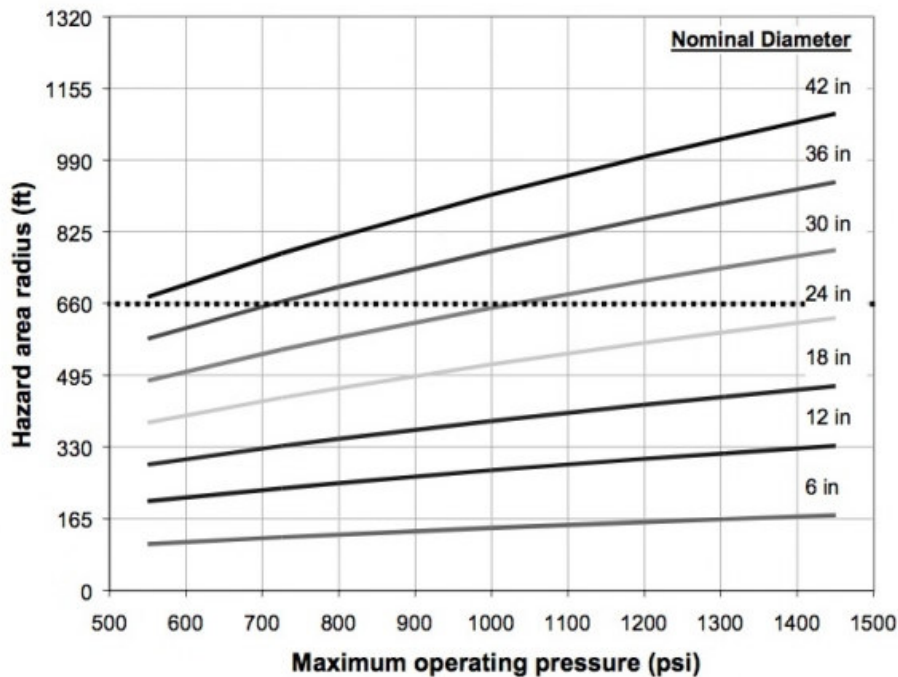


Figure 2.4 Proposed hazard area radius as a function of line diameter and pressure.

3. MODEL VALIDATION

Pipeline incident reports, located in the public domain, were reviewed to provide a basis for evaluating the validity the proposed hazard area model given by Equation [2.8]. The data sources reviewed included reports on pipeline incidents in the United States prepared by the National Transportation Safety Board (NTSB) going back to 1970, and similar reports on incidents in Canada prepared by the Transportation Safety Board (TSB) going back to 1994. Note that the information extracted from these reports required some interpretation due to differences in the way the information was reported. The processed data together with hazard area estimates obtained using Equation [2.8] are summarized in Figure 3.1. A summary of the information that forms the basis for Figure 3.1 is given in Table 3.1.

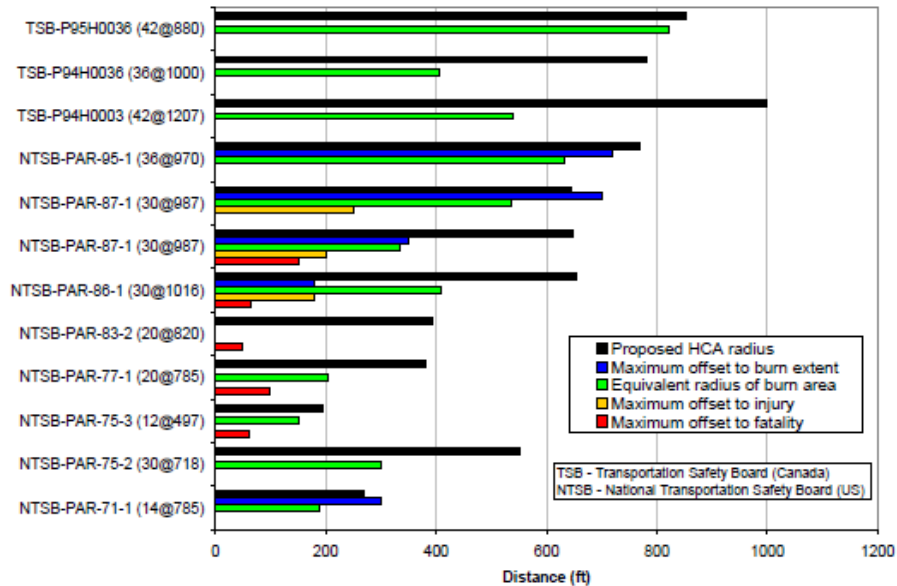


Figure 3.1 Comparison between actual incident outcomes and the proposed hazard area model.

In interpreting the incident outcomes summarized in Figure 3.1 note the following:

- The *equivalent radius of burn area* is the radius of a circle having an area equal to the reported area of burnt ground.
- The *maximum offset to burn extent* is the maximum reported of inferred lateral extent of burnt ground measured perpendicular to a line tracing the alignment of the pipeline prior to failure.
- The *maximum offset to injury/fatality* is the maximum reported or inferred distance to an injury/fatality again measured perpendicular to a line tracing the alignment of the pipeline prior to failure.