

Pipeline Safety and Emergency Preparedness: Guidance on Regional Pipeline Operations and
Developing an Hazard Annex Specific to Pipeline Incidents

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I would like to extend my gratitude and thanks to each and every individual within the emergency management community who has helped learn and succeed thus far in my career. My experience within this new field has been incredibly positive. Everyone that I have met through my coursework, internship, and new position has been willing to lend a hand to help me learn, gain experience and meet other people within the field. I feel fortunate to be entering into a field that has welcomed me with open arms.

LIST OF ABBREVIATIONS

API:	American Petroleum Institute
CFR:	Code of Federal Regulations
CoPA:	Colorado Pipeline Association
CPUC:	Colorado Public Utilities Commission
DHS:	Department of Homeland Security
DOT:	United States Department of Transportation
EOP:	Emergency Operations Plan
ESF:	Emergency Support Function [Annexes]
FEMA:	Federal Emergency Management Agency
FERC:	Federal Energy Regulatory Commission
HSPD:	Homeland Security Presidential Directive
ICS:	Incident Management System
LEPC:	Local Emergency Planning Committee
LNG:	Liquefied Natural Gas
NIPP:	National Infrastructure Protection Plan
NIMS:	National Incident Management System
NPMS:	National Pipeline Mapping System
NRC:	U.S. Coast Guard's National Response Center
NRF:	National Response Framework
NRP:	National Response Plan
NTSB:	National Transportation Safety Board
OEM:	Office of Emergency Management
OEMHS:	Office of Emergency Management and Homeland Security
OPS:	Office of Pipeline Safety
PAPA:	Pipeline Association for Public Awareness
PHMSA:	United States Department of Transportation, Pipeline and Hazardous Materials Safety Administration
ROW:	Right-of-Way
SME:	Subject Matter Expert

EXECUTIVE SUMMARY

This project examined how prepared the City and County of Denver Mayor's Office of Emergency Management and Homeland Security [OEMHS] is in the event of a pipeline incident, and produced several tools to aid preparedness efforts. The history of pipelines, and recommendations and best practices regarding pipeline safety were explored. In addition, current pipeline operations within the City and County of Denver were analyzed via interviews with subject matter experts from the Pipeline Association for Public Awareness (PAPA) and the Colorado Pipeline Association (CoPA). Interviews with local pipeline operators were also conducted by phone in order to gather responses to a brief survey to determine current safety measures of pipeline operators in Denver and the means operators are using to connect with first responders and emergency managers.

Pipeline safety is a shared responsibility between pipeline operators and government agencies. The project concluded that further coordination between pipeline operators, the Denver OEMHS, and other local government agencies is necessary to enhance preparedness. This project has already sparked an effort to coordinate planning efforts and build relationships between these groups, as demonstrated by the planning efforts that are currently underway for a group meeting and regional exercise in 2013.

Pipeline Safety and Emergency Preparedness: Guidance on Regional Pipeline Operations and Developing an Hazard Annex Specific to Pipeline Incidents

Within the City and County of Denver, there are over 80 miles of pipelines carrying gas and other hazardous liquids. Pipelines are critical to the region's energy supply, but they also pose a risk if a pipeline is damaged and product is released. The City and County of Denver Mayor's Office of Emergency Management and Homeland Security [OEMHS] is responsible for coordinating emergency preparedness, mitigation, response, and recovery efforts within Denver for all natural and manmade disasters. In the event of a large-scale pipeline incident, Denver OEMHS would play a key role in coordinating response and recovery.

Denver OEMHS would like to be more prepared for potential pipeline incidents. In an effort to improve preparedness, Denver OEMHS would like to develop a comprehensive list of companies operating pipelines within Denver (including local contact information and material transported), and a hazard annex to the Denver Emergency Operations Plans regarding pipeline incidents. In addition, Denver OEMHS would like to obtain maps of the pipelines in Denver and determine current preparedness measures of companies operating pipelines within the County.

The following research questions helped guide this project:

1. What is the regulatory framework (standards, guidelines and compliance protocols) surrounding the operation of pipelines, including state and federal regulations?
2. What safety information should emergency responders and emergency management officials be aware of in the event of a pipeline incident in their jurisdiction?
3. What are the best practices in emergency management planning, generally and in regards to planning for pipeline hazards?

Background

Pipeline Overview

A key part of the United States energy and transportation supply is the vast network of approximately a quarter million miles of pipelines transporting natural gas, oil and other hazardous liquids (Armstrong, Butters, & Hall, 2012; U.S. Congressional Research Service, 2012). This complex system of pipelines carries over 75% of the nation's crude oil and 60% of its refined petroleum products. Pipelines are generally safe and efficient means to transport oil and gas, but several pipeline failures in recent years, including explosions resulting in fatalities in San Bruno, California, and Allentown, Pennsylvania, have brought attention to pipeline safety (Parformak, 2012).

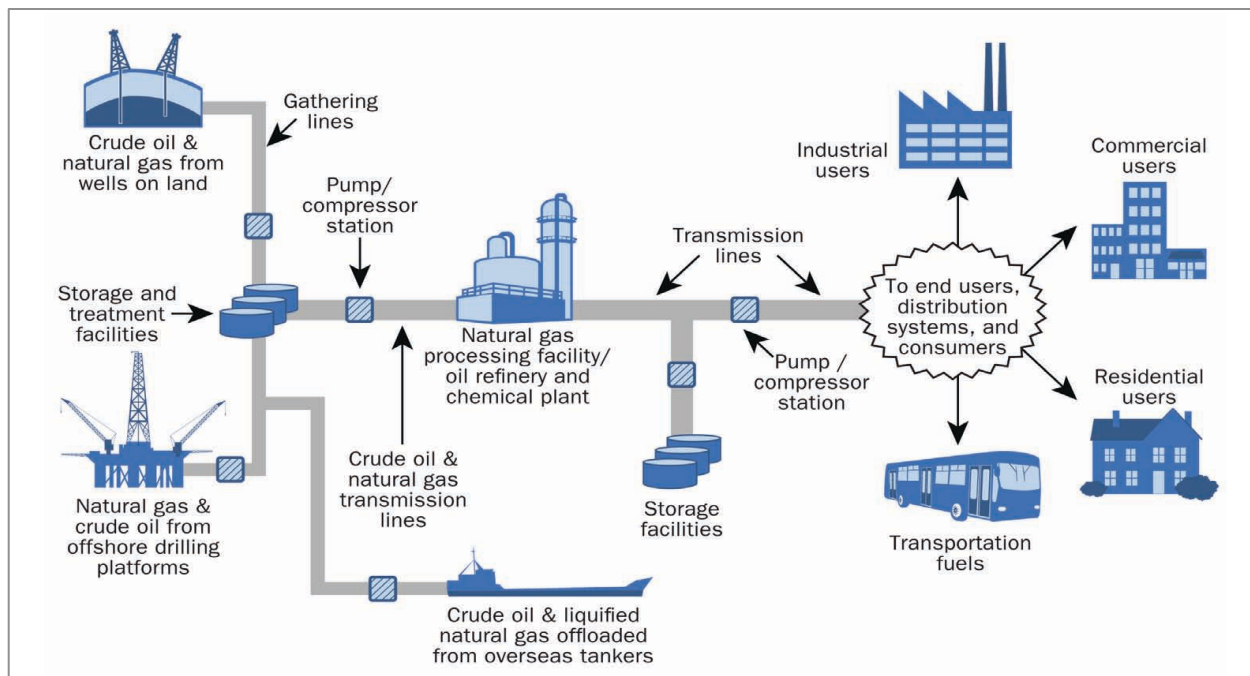
The majority of pipelines in the United States are privately owned and operated and, almost without exception, buried underground. Pipelines are the safest and most reliable way to transport energy products (DHS, 2010). They can move large volumes of product at a significantly lower operating cost than other modes of transportation. There are four types of pipelines as defined in the U.S. Department of Homeland Security (DHS) Transportation Systems Sector-Specific Plan (2010):

1. *Natural Gas Transmissions*- These are mostly interstate pipelines that transport natural gas from sources to communities. There are approximately 320,500 miles of natural gas pipelines in the United States operated by more than 700 operators.
2. *Hazardous Liquid Pipelines*- Primarily interstate pipelines that transport crude oil to refineries and refined petroleum products (fuels) to marketing terminals and airports. There are more than 200 operators of hazardous liquid pipelines and 168,900 miles of pipelines in operation.

3. *Natural Gas Distribution*- Typically intrastate, pipelines operated by local distribution companies that transport natural gas from transmission pipelines to residential, commercial, and industrial customers. More than 1,300 operators operate approximately 202 million miles of natural gas distribution pipelines nation-wide.
4. *Liquefied Natural Gas (LNG) Processing and Storage Facilities*- LNG is stored at processing and storage facilities. When natural gas is needed, the LNG is vaporized and injected into natural gas pipeline systems. There are approximately 109 processing and storage facilities that either receive LNG directly or receive natural gas and process (liquefy) the gas into LNG.

Figure 1 below from the DHS Transportation Systems Sector-Specific Plan (2010) illustrates the transportation system for oil and gas.

Figure 1



Critical infrastructure is defined as “systems and assets, whether physical or virtual, so vital that the incapacity or destruction of such may have a debilitating impact on the security, economy, public health or environment” (DHS, 2009, p. 109). Pipelines are categorized as critical infrastructure (DHS, 2009). Pipelines are also directly connected to other critical infrastructure, like power plants, airports, and military bases. A major pipeline incident will not only impact the local community and environment where an event occurs, but may also have broader consequences on the economy, public health, or national security if the event occurs in an area of pipeline that is within close proximity to other critical infrastructure (U.S. Congressional Research Service, 2012). Pipeline incidents of this scale are low frequency, high consequence event (Armstrong, et al., 2012).

Pipelines present risks because of the potential for corrosion; excavation damage; incorrect operation; material, weld or equipment failure; natural disasters, like flood or earthquake; terrorism; and other outside forces leading to a release of product. According to the U.S. Coast Guard’s National Response Center [NRC](2012a, 2012b), the national point of contact for reporting all oil, chemical, radiological, biological and etiologial discharges of materials into the environment in the United States, there was an average of 1,547 pipeline incidents reported annually from 2000 – 2011. In 2011, there were 1,044 reports of pipeline incidents (NRC 2012b). The threat of pipeline incidents is real and exists in all jurisdictions where pipelines exist.

Regulatory Framework

Pipeline safety and security involves many groups: federal and state agencies, oil and gas pipeline associations, large and small pipeline operators and local communities. Understanding how the laws and these groups work together can be challenging.

Federal. Two of the principal acts that provided the federal government the lead role in pipeline safety are the Natural Gas Pipeline Safety Act of 1968 (P.L. 90-481) and the Hazardous Liquid Pipeline Act of 1979 (P.L. 96-129). These Acts gave the Secretary of the United States Department of Transportation (DOT) primary authority to regulate key aspects of interstate pipeline safety and security, including design, construction, operation, maintenance, and spill response planning (U.S. Congressional Research Service, 2012).

Currently, the Pipeline and Hazardous Materials Safety Administration (PHMSA), an agency under the United States Department of Transportation develops, and enforces regulations to promote safety in the pipeline transportation system via the Office of Pipeline Safety (OPS). DOT and PHMSA also managed the federal pipeline security program until the Department of Homeland Security, was created following the terrorist events of September 11, 2001. At that time, the responsibility and authority for pipeline security was transferred to DHS by the President. DOT and DHS have distinct roles, but they cooperate to ensure the protection and safety of the nation's pipelines (U.S. Congressional Research Service, 2012).

In addition to the role of the DOT and DHS, the Federal Energy Regulatory Commission (FERC) is involved with pipeline regulations. FERC provides the authority to approve the construction of all new gas pipelines. Another federal organization that has a role in pipeline safety is the National Transportation Safety Board (NTSB). The NTSB is an independent federal agency charged with investigating the cause of pipeline accidents, promoting transportation safety (including pipeline safety), and issuing safety recommendations to prevent future accidents (U.S. Congressional Research Service, 2012).

In 2002 and 2006, President George W. Bush signed two key acts into law regarding pipeline safety. The Pipeline Safety Improvement Act of 2002 (P.L. 107-355) strengthened

federal pipeline safety programs, state oversight of pipeline operators, and public education requirements regarding pipeline safety. The Pipeline Inspection, Protection, Enforcement and Safety Act of 2006 (PIPES Act, P.L. 109-468) addressed pipeline damage prevention, integrity management, corrosion control, and enforcement transparency. In addition to these two laws, in 2003, President Bush also issued Homeland Security Presidential Directive-7 (HSPD-7), which lead to the development of planning documents related to pipeline safety and protection which are discussed later (U.S. Congressional Research Service, 2012).

Pipeline operators are subject to federal safety regulations under Title 49 of the U.S. Code of Federal Regulations (49 U.S.C. §190 – 199). Pursuant to Title 49, pipeline operators are responsible for the safe and reliable operation and maintenance of their pipelines. As noted in 49 CFR § 192.615, gas pipeline operators “shall establish written procedures to minimize the hazard resulting from a gas pipeline emergency.” The regulations further states that at a minimum, procedures must provide for “establishing and maintaining adequate means of communication with appropriate fire, police and other public officials”, “prompt and effect response” to all types of emergencies including gas detections, fires and explosions, and natural disasters, and coordination with fire, police, and public office for responses during an emergency.

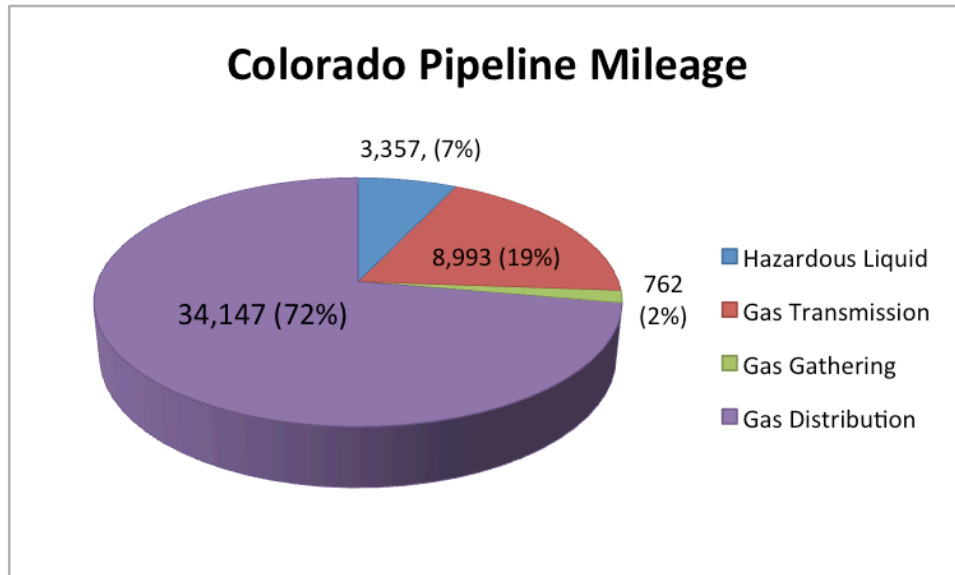
State/Local. The federal OPS is headquartered in Washington, D.C. and supported through five regional offices. The Western Region Office of Pipeline Safety (Western OPS) is located in Denver. The Western OPS inspects, regulates, and enforces all gas pipeline safety requirements regarding interstate pipelines that span Colorado’s borders, as well as all intrastate and interstate hazardous liquid pipelines. Through certification by the OPS, the Colorado Public Utilities Commission [CPUC] enforces regulations, and completes inspections and monitoring activities related to all intrastate gas pipelines (PHMSA, 2012c). The Colorado Public Utilities

Commission is bound by the regulations contained within the Code of Colorado Regulations (4 CCR 723-4).

Private and Non-Profit Entities. The Pipeline Association for Public Awareness (PAPA) is a non-profit corporation located in Golden, CO created by pipeline operators in 2004 to provide education and awareness concerning pipeline safety and emergency preparedness. The Colorado Pipeline Association [CoPA] is an affiliate organization of PAPA. There are approximately 250 members in the PAPA comprised of people, organizations, and other entities that own or operate pipeline facilities. PAPA releases Pipeline Emergency Response Guidelines annually to members and target audiences of emergency responders, public officials and excavators (PAPA, 2012a; CoPA, 2012). In addition to the aforementioned organizations, there are a number of other pipeline associations that represent the interests of owners and operators and promote pipeline safety: the Association of Oil Pipelines (AOPL), the American Gas Association, the American Petroleum Institute (API), the American Public Gas Association (APGA), the Interstate Natural Gas Association of America (INGAA), the Chemical Transportation Emergency Center (CHEMTRAC), and the Common Ground Alliance (CGA).

Pipeline Information- Colorado and Denver

According to the United States Department of Transportation, Pipeline and Hazardous Materials Safety Administration [PHMSA], as of 2010, there were a total of 47,160 miles of pipeline in Colorado (PHMSA, 2012a). The types of pipelines within Colorado include hazardous liquid pipelines, gas transmission pipelines, gas gathering pipelines, and gas distribution pipelines. The chart below demonstrating the mileage and percentage of pipelines within Colorado by pipeline type was created by this author based upon information available on the PHMSA website

Figure 2

Notably, the mileage regarding gas distribution pipelines does not include mileage for gas distribution service lines, the connection between the distribution pipeline and the end user/consumer. There are 1,504,589 service lines in Colorado (PHMSA, 2012a).

According to PHMSA records, the most recent significant pipeline event within the City and County of Denver was in April 2011. Excavation by a third-party (someone not affiliated with the pipeline operator directly or as a contractor) damaged a pipeline resulting in injuries to one person and over a half million dollars of property damage. Other recent notable pipeline incidents in Colorado include two incidents in 2010 caused by equipment failure and corrosion that caused \$2,667,003 and \$955,000 in damages, respectively (PHMSA, 2012a).

Literature Review

The literature review was conducted to explore two key topics; (1) pipeline safety, and (2) emergency management planning practices. The section examining pipeline safety focuses on safety precautions that pipeline operators take on an everyday basis to mitigate the likelihood of damage and accidents, as well as guidance for emergency response should an incident occur.

This information is contained within the Hazard Annex provided to the Denver OEMHS (Appendix E). The second section explores emergency planning, including theories of emergency management planning, the evolution of emergency planning, and a review of key guidance documents.

Pipeline Safety

As outlined earlier, a number of rules and regulations bind pipeline operators to ensure the integrity of pipelines and the safe transport of products. In addition to the precautions that operators must take, it is imperative that the general public (especially emergency responders, emergency management officials, and excavators) be aware of safety precautions, as well as safety measures to follow in the event of a breach of a pipeline. The Pipeline Emergency Response Guidelines issued by PAPA provide comprehensive safety information regarding precautionary measures pipeline operators have taken to prevent an incident and recommendations for response in the event of an incident does occur (PAPA, 2012a).

Safety Precautions. Mitigation and preparedness efforts are those taken in advance of an incident to reduce the likelihood of an incident and if one does occur, the impact to the community (Waugh & Streib, 2006). Pipelines are constructed along a clear corridor of land called the right-of-way (ROW). ROWs may contain one or more pipelines, may vary in width, and will cross through public and private property. The ROW should be free of permanent structures and trees, and be identified with a pipeline marker. Aboveground signs and markers identify the approximate location of the underground pipelines. Markers are required to be present wherever a pipeline crosses under roads, railroads, or waterways. They may also be found at other intervals and locations along the pipeline ROW. Markers indicate the name of the company operating the pipeline, the type of product being transported, and an emergency

number. They do not provide the pipeline's exact location, depth, direction, pressure, or direction of flow (PAPA, 2012a).

The emergency number on the pipeline marker connects to the pipeline operator's control center. The control center is the heart of pipeline operations. Information about the pipeline company's operating equipment and parameters is constantly communicated electronically from the pipelines to the control center where personnel are monitoring pipeline pressure, temperature, flow, alarms, and other conditions in the pipeline. In the event of an emergency, the control center can immediately shutdown a pipeline. The control center may also have the capability to remotely open and close valves and transfer products from the affected pipeline (PAPA, 2012a).

One-call centers can be reached by dialing 811 anywhere in the country and are a free service. The centers are intended to provide a resource for people to use to avoid unintentionally hitting underground utility lines when digging. Colorado law requires that individuals planning to complete a construction project involving digging contact the one-call center at least 48 hours prior to digging. The call center will notify the affected local utility companies regarding the intent to dig and provide information regarding the approximate location of underground pipelines and cables in the vicinity. Pipeline operators (and other utilities) are required to respond to all requests by the end of the second full business day following the request. Emergency requests may be made at times when immediate excavation is necessary to prevent loss of life, damage to property, or damage to underground facilities (Colorado 811, 2012).

Emergency Response. PAPA has developed general guidelines for a stabilizing a pipeline incident. The following basic response steps should take place during any pipeline response:

Situation Assessment. To protect responders from hazards, all individuals attempting to survey the scene should approach cautiously from an upwind and/or crosswind location. Responders shall not approach the scene with vehicles until an isolation zone has been established, as vehicle engines may be an ignition source. The area should be isolated and entry denied to unauthorized persons. PAPA has issued a chart regarding recommended minimum evacuation distances for natural gas pipeline leaks and ruptures. First responders shall employ the National Incident Management System (NIMS) and Incident Command System (ICS). The next steps are to identify the product within the pipeline by contacting the pipeline operator, review the properties and hazards presented by the product via the DOT Emergency Response Guidebook, and use air-monitoring equipment appropriate to the materials in the pipeline to further assess the situation (PAPA, 2012a).

Protection of Life, Property, and the Environment. Protective actions are the steps taken to preserve the health and safety of emergency responders and the public during a pipeline incident. While the pipeline operator concentrates on the pipeline, responders should concentrate on isolating and removing ignition sources and moving the public out of harm's way. Emergency response personnel should focus on the following tasks, which are outlined in more detail in the Pipeline Emergency Response Guidelines (PAPA, 2012a):

- Establish isolation zones and set up barricades
- Rescue and evacuation
- Eliminate ignition sources
- Control fires, vapors and leaks

The pipeline operator should be contacted as soon as possible. This will set into a motion a series of events ranging from dispatching a company representative and other trained personnel,

actions to shutdown the pipeline and isolate the emergency, and activating the company's emergency response plan.

Emergency Preparedness

Emergency management policies have experienced many changes over the last decade. The changes are largely a result of the terrorist attacks of September 11, 2001 and Hurricane Katrina in 2005 (Gerber & Robinson, 2005). The disaster literature has analyzed these policy changes. There is no doubt among researchers that resiliency of the nation has increased since 2001, but there is criticism regarding elements of policy changes, including the role of the federal government in emergency management, the ability of local governments to comply with federal requirements, as well as the effectiveness of written emergency plans (Brown & Eriksson, 2008; Comfort, L., Boin, A., & Demchak, C., 2010; Gerber & Robinson, 2005; Perry & Lindell, 2003; Waugh and Streib, 2006)

Planning. According to Sylves (2008), "Emergency management is by its very nature intergovernmental and intercommunity— it requires government agencies and officials to coordinate and cooperate with each other on the same level and across levels" (p. 133). Government agencies collaborate in emergency planning, a foundational element of both preparedness and response. As outlined in the National Response Framework (2008c), planning provides three principal benefits:

- (1) it allows jurisdictions to influence the course of events in an emergency by determining in advance the actions, policies and processes that will be followed;
- (2) it guides other preparedness activities; and
- (3) it contributes to unity of effort by providing a common blueprint for activity in the event of an emergency (p. 71)

Emergency preparedness is the “readiness of a political jurisdiction to react constructively to threats from the environment in a way that minimizes the negative consequences of impact for the health and safety of individuals and the integrity and functioning of physical structures and systems” (Perry & Lindell, 2003, p. 338). Planning is one of the key components of the preparedness cycle. It is a cycle because the planning process is more than simply putting words to paper. Plans should be continuously evaluated and improved through a cycle of planning, organizing, training, equipping, exercising, evaluating, and taking corrective action (DHS, 2008c).

As noted by Perry and Lindell (2003), “A written plan does not guarantee preparedness; preparedness is dynamic and contingent upon ongoing process. Thus possession of a written plan is an important part of, but not a sufficient condition for, community emergency preparedness” (p. 338). Brown and Eriksson (2008) concur. They are critical of written plans, stating “plans serve to reassure the organizations themselves, policy makers, and the public that they are capable of managing emergencies” (p. 292). The authors call for more realistic forms of emergency plans, which include organizational vulnerabilities and an assessment of the real or actual capabilities of an organization and their counterparts (Brown & Eriksson, 2008).

The current approach in emergency management planning is what is termed the inclusive-authority model. This model emerged following the events of September 11, 2001, and the subsequent passage of the Homeland Security Act of 2002. In contrast to the overlapping authority model, which offered more autonomy to state and local jurisdictions, the federal government plays a key coordinating role in the inclusive-authority. Further, as noted by Sylves (2008),

In this inclusive-authority era, homeland security presidential directives, several new federal laws, and a battery of new federal grant programs were introduced. Collectively, these measures dictated to local governments the exact steps they were expected to take in emergency management .(p. 41)

The transition that emergency management has undergone since 2001 is documented in the disaster literature. Waugh and Streib (2006) explore the evolution of emergency management from the 1940s through September 1, 2001 from a “classic top-down bureaucratic model” to a “more dynamic and flexible network model that facilitates multiorganizational, intergovernmental, and intersectoral cooperation” (p. 131). After 2001, there was a dramatic shift back to a top-down model as a result of the terrorist attacks. This shift is also documented by Gerber and Robinson (2008) who state, “the federal government moved decisively away from its more traditional facilitative role in emergency management...to a more centralized, top down mode of policy development, more explicitly directing state and local government actions” (p. 346). Some of the key emergency management policies enacted following September 2001 are outlined below. These policies directly influence emergency management planning at the local-level, including the hazard annex developed as part of this project.

Post 9/11 Policies and Guidance. One of the first major changes in emergency management following 9/11 was the establishment of the Department of Homeland Security (DHS), pursuant to Homeland Security Act of 2002 (P.L. 107 - 296) issued on November 25, 2002. As part of the Homeland Security Act, 22 different federal departments and agencies, including the Federal Emergency Management Agency (FEMA), were integrated into the newly created, DHS. Prior to moving to DHS, FEMA was an independent agency. In addition, the

director of FEMA was a member of the President's cabinet during the Clinton administration. The shifting of FEMA to DHS was a drastic change for the agency (Syvles, 2010).

In February 2003, President Bush issued Homeland Security Presidential Directive- 5 (HSPD-5). As stated in the purpose, HSPD-5 was intended "to enhance the ability of the United States to manage domestic incidents by establishing a single, comprehensive national incident management system" (p. 1) HSPD-5 spurred the development of the National Response Plan (NRP) in 2003 and the National Incident Management System (NIMS) in 2004. The National Response Plan was updated and reissued as the Nation Response Framework (NRF) by FEMA (under DHS) in 2008. The following explanation regarding the NRF is included in the guidance document itself:

The NRF guides how the nation conducts all-hazards response. As stated in the NRF, it is built upon scalable, flexible, and adaptable coordinating structures to align key roles and responsibilities across the Nation, linking all levels of government, nongovernmental organizations, and the private sector. It is intended to capture specific authorities and best practices for managing incidents that range from the serious but purely local, to large-scale terrorist attacks or catastrophic natural disasters (DHS, 2008c, p. 1)

The NRF is comprised of the core document, emergency support function (ESF), support and incident annexes, as well as partner guides. The core document describes response doctrine and guidance; roles and responsibilities; response actions; planning requirements; and core organizational structures and processes that should guide response. The Incident Annexes section of the NRF outlines core procedures, roles and responsibilities for specific contingencies, although pipeline incidents are not included (DHS, 2008c).

NIMS is a companion document to the NRF (DHS, 2008b). As defined by Sylves (2008), “NIMS incorporated many existing emergency management ‘best practices’ into a comprehensive national approach to domestic incident management, applicable at all jurisdictional levels and across all disciplines to work together more effectively and efficiently” (p. 150). A core component of NIMS is the Incident Command System (ICS), a standard, all-hazards incident management systems with roots in firefighting. ICS structure includes five major functional areas: command, operations, planning, logistics, and finance/administration. NIMS and the ICS integrate effective practices in emergency preparedness and response.

Another federal initiative relative to pipelines is the National Infrastructure Protection Plan (DHS, 2009). In light of the continual threat of terrorism, the NIPP was issued by DHS in 2009 in accordance with Executive Order 13416 (DHS, 2009). The *NIPP* and its sector-specific plans outlined in the Transportation Systems Sector-Specific Plan (DHS, 2010) created a system for protection of critical infrastructure and key resources that includes both the public and private sectors. It establishes protection standards and objectives developed in partnership with each of the 17 sector plans (one of which is pipelines) to specifically address concern related to the protection of critical infrastructure and key resources.

Comprehensive Planning Guide 101 and Emergency Operations Planning. Despite the vast amount of policy and guidance materials that the federal government has handed down to state and local government in the last ten years, an overarching principle of emergency management is that all disasters are local. Emergency management should operate from a bottom up approach, not a top down control and command system. As such, local authorities should be primarily responsible for emergency management within their communities. If and when local resources are overwhelmed, local authorities may ask for state assistance (Sylvles,

2008). In light of that principle, the Denver OEMHS (and all jurisdictions) should incorporate the federal guidance into preparedness and planning efforts in order to be consistent with the best practices in emergency management, but also aim to develop local-centric plans that are specific to the needs and hazards present in their communities.

A critical component of emergency planning in any jurisdiction is the Emergency Operations Plan [EOP]. As noted in the 2013 draft of the City and County of Denver EOP (2012), “The purpose of the [EOP] is to establish an all hazards framework that will help Denver reduce and mitigate the effects of a disaster situation” (p. 1). Thus, an EOP describes the processes and procedures a jurisdiction will use to mobilize resources and initiate response and recovery activities after an emergency. Comprehensive Preparedness Guide (CPG) 101 provides guidelines on developing emergency operations plans (EOP). It promotes a common understanding of the fundamentals of risk-informed planning and decision making to help planners examine a hazard or threat and produce integrated, coordinated, and synchronized plans. The goal of CPG 101 is to make the planning process routine across all phases of emergency management and for all homeland security mission areas (DHS, 2008a).

EOPs typically include a number of annexes: Emergency Support Function (ESF) Annexes, Support Annexes, and Incident/Hazard Annexes. Hazard Annexes define functional responsibilities during specific types of emergencies, such as blizzards, pandemic disease, terrorism, flooding, and so forth (DHS, 2008c). In addition to determining what companies are operating pipelines and the material transported within the jurisdiction, the Denver OEMHS also wanted to develop a Hazard Annex specific to pipeline incidents to be included as part of the City’s Emergency Operations Plan. The draft Hazard Annex provided to Denver OEMHS (see Appendix E) is compliant with CPG 101.

Methodology

The objectives of this study were to provide the Denver OEHMS with the following deliverables:

1. A hazard annex to the Denver Emergency Operations Plans regarding pipeline incidents;
2. An analysis of current preparedness measures pipeline companies the City and County of Denver have in place;
3. A comprehensive list of companies operating pipelines within the City and County of Denver with local contact information and a description of the materials transported; and,
4. Maps of the pipelines within the City and County of Denver.

Data Collection and Processing

The methods for data collection for this project consisted of documentary analysis, SME interviews, and telephone surveys of pipeline operators within the City and County of Denver.

Hazard Annex.

The hazard annex was completed by conducting a documentary analysis of regulatory and policy documents related to pipeline operations within Colorado and nationally. In addition, subject matter expert (SME) interviews of pipeline operators and pipeline policy experts were conducted to assess emergency management planning practices. An SME is an individual who has specialized knowledge in regards to a designated topic area. A snowball technique was utilized to identify a small sample of purposive SMEs in the area of pipeline policy (Miles & Huberman, 1994). Three interviews were conducted, including interviews of two board

members of PAPA and CoPa, as well an instructor from Paradigm, a private contractor that hosts public awareness and training courses regarding pipeline safety.

Concurrently, an assessment of best practices regarding planning in emergency management was completed by examining current planning materials, guidance documents, and research. As noted in *Disaster Policy & Politics* by Sylves (2008), “The best practices approach is a method of producing knowledge by observing (or recounting) field experience and then creating applicable principles” (p. 34). By conducting SME interviews and reviewing current planning documents and guidance, this author was able to gauge the current standards in emergency management field operations. The findings were incorporated into the hazard annex (Appendix E).

Analysis of Denver Pipeline Operators and Preparedness Measures.

A cross-sectional study of pipeline operators within the City and County of Denver was conducted. Key issues related to pipeline safety were identified based upon the literature review and recommendations of the Denver OEMHS. A questionnaire was developed based upon these issues. The main objective of the survey was to gather descriptive data for analysis in support of recommendations for strengthening Denver OEMHS’s emergency preparedness for a large-scale pipeline incident.

A census of pipeline operators in the City and County of Denver was conducted. Given the small, finite population of pipeline operators within the County (nine operators), an attempt was made to contact all pipeline operators. It was not necessary to sample from such a small population size. Seven of the nine operators responded to the request to participate in a survey. A telephone interview was held with each of the respondents to complete the survey. The survey findings are as accurate a representation of the pipeline operator population, as possible.

The survey contained five questions, each with subparts. The first question in the survey was intended to provide a gauge of the company size, which in turn could be an indicator of sophistication and/or depth of safety and preparedness. The second question sought information regarding the material transported via pipeline within the City and County of Denver. The third question was included to determine what types of hazards pipeline companies are most concerned will damage their pipelines and potentially result in an unintended release of product.

The responses to questions 4, 4a, and 4b in the survey are indicators of the emergency preparedness efforts that the operators are taking. The responses to this set of questions were generally predictable as companies are required by law to have emergency plans, and update and exercise them with some frequency. The question ascertained just how frequent updates and exercises are occurring by company. The final set of questions (5a, 5b and 5c) related to the frequency and methods pipeline operators are using to contact with emergency responders and emergency managers.

Research was conducted to locate contact information for local representatives of pipeline companies operating within the City and County of Denver. When a contact was located, the representative was contacted by email and asked to participate in the survey (Appendix A). The Denver OEMHS sent the first request for contact via email and also participated in three of the telephone interviews. The surveys were completed by contacting pipeline operators by telephone, verbally asking the survey questions, and recording the responses in writing. A brief introduction to the Denver OEMHS and this project were provided at the start of each call. This method of completing the surveys was recommended by the Denver OEMHS, in order to develop relationships with pipeline operators.

The results of the surveys were compiled into one document, Appendix B. A chart of pipeline operators in the City and County of Denver, including local contact information and details of the material transported by the company is attached as Appendix C.

Pipeline Mapping

Lastly, in relation to item four above, maps were obtained from the National Pipeline Mapping System (NPMS). The maps were manipulated to include overlays that help identify the company operating each pipeline. The maps are attached as Appendix D. As the maps demonstrate, the majority of pipelines within the City and County of Denver are located in the at or near Denver International Airport, including near Pena Boulevard and along Interstate 70 west of downtown Denver.

Analysis and Findings

Documentary Analysis

In order to develop the Hazard Annex for the City and County of Denver OEMHS, it was necessary to have an understanding of pipeline operation, pipeline safety, and emergency management policy. In large part, documentary analysis informed the development of the Hazard Annex. The Pipeline Emergency Response Guidelines, materials provided by PHMSA, and information obtained in a group meeting hosted by Paradigm, which I attended, were key in developing a knowledge base surrounding pipeline operations and safety. Primary source documents from DHS, including the National Incident Management System and Comprehensive Preparedness Guide 101 were crucial to developing a Hazard Annex that is compliant with federal requirements concerning Emergency Operations Plans. The Hazard Annex provides a tool to the Denver OEHMS to coordinate response and assign responsibilities to City agencies

and partners to reduce potential loss of life and damage following a large-scale pipeline incident. Overall, it enhances the preparedness of the community and region.

Survey Results

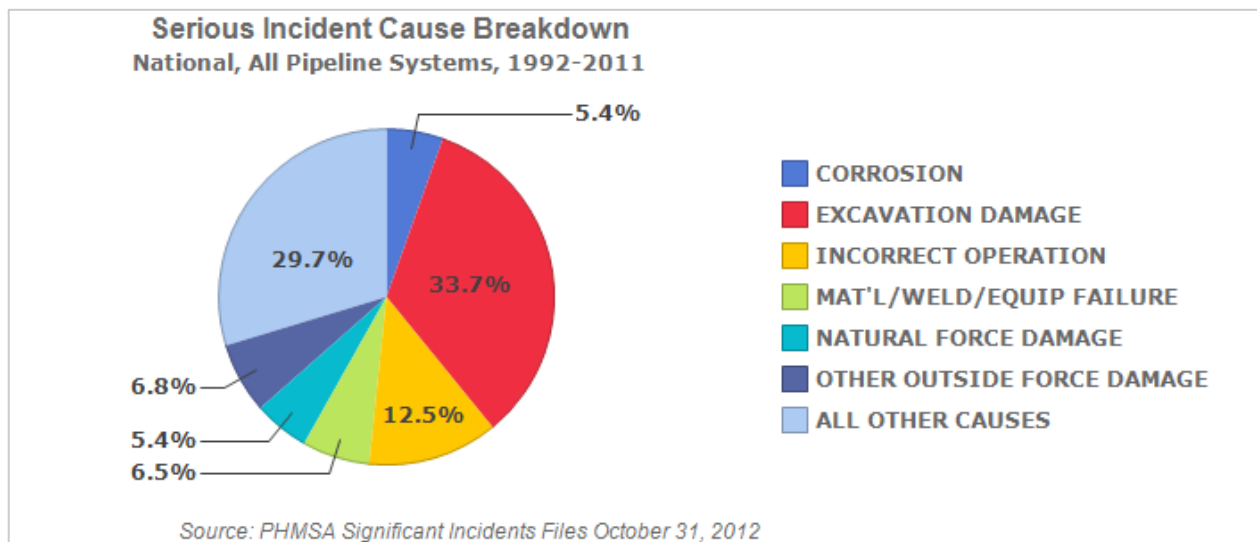
As noted earlier, within the City and County of Denver there are 33 miles of gas pipelines and 48 miles of hazardous liquid pipelines. As reported by the Colorado Pipeline Association (2011), those pipelines are operated by nine different companies. The CoPA and PAPA websites provide the company name and company emergency contact number by jurisdiction, but do not provide the name or contact information for local representatives. The OEMHS reported difficulty locating information for local points of contact for pipeline companies operating in the jurisdiction. Although pipeline companies send mailings to the OEMHS, those materials do always include local contact information. A part of the research for this project was to locate a local point of contact for each pipeline operator. See Appendix C for a chart developed as a part of this project that includes company name, name of a local representative, contact information, and they type of material being transported in the company's pipeline within the City and County of Denver.

The survey of pipeline operators within Denver was successful. Survey respondents were eager to speak with me and provide the requested information. In several cases, multiple company representatives from a single company participated in the telephone interview. The survey responses from pipeline operators demonstrated differences in regards to the size of the companies operating in the City and County of Denver, as well as the materials they transport, but were fairly consistent in regards to the hazard the companies are most concerned about, the measures the companies are taking in regards to emergency preparedness, and the frequency and

methods of outreach to emergency responders and emergency managers. A summary of survey responses is included as Appendix B.

All pipeline operators responded that of all possible hazards, including natural disasters, terrorism and pipeline/equipment failure, they are most concerned about damage to pipelines as a result of excavation by third parties (individuals not associated with the company directly or via a contractor). Survey respondents reported that damage as a result of excavation is the leading cause of pipeline damage. This is consistent with PHMSA findings, which demonstrate that over one-third of serious pipeline incidents from 1992 – 2011 were the result of excavation damage (PHMSA, 2012d).

Figure 3



Respondents stated that third-party damage is their primary concern over all other threats, because they do not have control over it (much like natural disasters, but excavation is much more frequent as demonstrated in the PHMSA findings above). Pipeline companies are able to perform maintenance, regularly monitor their systems, and train employees, but they cannot directly control the incidence of third-party damage to their pipelines.

All of the pipeline operators have emergency operations plans that are updated annually. Additionally each company conducts training and exercises regarding their plan. This finding was consistent among all of the pipeline operators interviewed. This finding is not surprising because pipeline operators are required to engage in such emergency preparedness activities pursuant to Title 49 of the U.S. Code of Federal Regulations. It is important to note that training and exercising is occurring primarily internally, and for the most part the does not include participation with local emergency responders and local emergency management officials.

Numerous operators indicated that they do occasionally invite local emergency responders and local emergency management officials to training and exercises, but they rarely participate. Similarly, pipeline operators indicated that their attempts to meet with emergency responders and emergency managers (usually on an annual basis) are generally unsuccessful. In contrast, the Denver OEMHS indicated that the pipelines operators are not communicating with them regularly. The survey explored this issue and found that there is no consistency among the method or frequency of contact with local emergency responders and emergency management officials by pipeline operators.

Survey respondents indicated that they provide outreach annually. Survey results show that pipeline operators have contact with pipeline operators via mail by sending company information to the agency, and/or by hosting an annual group meeting. Pipeline operators (either independently, through an association or via a third-party contractor) send mailings and/or invitations for group meetings to emergency responders and emergency management officials. There is no tracking system or follow-up to ensure that information (company information and/or meeting invitation) is received or to ensure that emergency responders and emergency

management officials are attending the meetings. This problem was explored in interviews with a Paradigm representative, and CoPA and PAPA board members.

Interviews

On November 9, 2012, a meeting was held with Patricia Williams from the Denver OEMHS, as well as Jonathan Brown and Karen Riggerbach-Vaughn. Mr. Brown and Ms. Riggerbach-Vaughn are board members of CoPA and PAPA (and also represent pipeline operators in the jurisdiction). They outlined that in most states, there is one group that conducts annual meetings with emergency responders and emergency personnel for purposes of public outreach and education. Pipeline companies, as a group, either agree to use the services of a private, paid contracting company, like Paradigm, or to deliver this information via a non-profit, like PAPA or CoPA. The objective is to use one source to convey information in order to provide consistent messaging and fewer meetings for emergency responders and emergency managers. According to CoPA/PAPA board members, this model is successful in most states (J. Brown, K. Riggerbach-Vaughn, & P. Williams, personal communication, November 9, 2012).

According to the board members, there is currently a conflict in Colorado as some pipeline operators are conducting public outreach and education via Paradigm, other operators are using CoPA, and some companies are conducting outreach independently. The lack of uniform messaging results in confusion among local officials and ultimately less participation in pipeline safety events hosted on behalf of pipeline operators, as public officials are now being asked to attend several of meetings, when time and resources within local government are already stretched thin. If public officials attend only one meeting, it is likely that they will miss critical information because the meeting does not represent all pipeline operators in a given

jurisdiction. This is a political issue that will need to be resolved between pipeline operators (J. Brown, K. Riggerbach-Vaughn, & P. Williams, personal communication, November 9, 2012).

Two primary issues inhibiting preparedness for a large-scale pipeline incident were identified in the meeting on November 9, 2012 with this author, Ms. Williams, Mr. Brown, and Ms. Riggerbach-Vaughn. First, emergency management officials and pipeline operators are lacking an effective mechanism for communication. This is evidenced by the Denver OEMHS' inability to easily obtain local points of contacts for pipeline operators, as well as the difficulty pipeline operators expressed in getting emergency responders and emergency management officials to attend pipeline safety events. Second, pipeline operators, emergency responders, and emergency management officials are planning, training and exercising separately to respond to a large-scale pipeline incident. In an actual event each agency will be responding to the event and their response will need to be coordinated (J. Brown, K. Riggerbach-Vaughn, & P. Williams, personal communication, November 9, 2012).

Analysis

Pipeline operators are overall very prepared internally in the event of a pipeline incident. As required by law they have emergency plans, train regularly and take many other precautions to ensure their readiness in the event of a release of product from their pipelines. They also are required to communicate with the emergency responders and emergency management officials regarding the hazards of pipelines. Despite their internal preparedness measures, there are gaps in the preparedness of the pipeline operators. Interviews conducted as part of this project show that the current outreach methods utilized by pipeline operators within the City and County of Denver are not effective and a new method of communication needs to be explored. In addition, pipeline operators, and local emergency responders and emergency management officials are not

planning, training or exercising together. More collaborative planning, training, and exercise needs to take place between these groups in advance of an event to help ensure that response to a real event is successful.

Pipeline operators, emergency responders and emergency management officials are very busy and have competing priorities. Pipeline operators are privately operated companies that must be concerned most about their bottom line and profitability. Emergency responders and emergency management officials are concerned about public safety from a wide array of events, not only pipeline incidents, which are much less probable than many other types of hazards. There are constant demands on each groups' time, but they must find time to work together better to reduce the likelihood of a high consequence pipeline event in their jurisdictions.

Recommendations

As noted, there is room for improvement in preparedness for a pipeline incident among pipeline operators, emergency responders and emergency management officials. Improving communication and better coordinating emergency preparedness activities between these groups are the primary recommendations based upon this study. These shortcomings and ways to improve upon them were discussed at the meeting with Denver OEMHS, and CoPA/PAPA board members. The meeting participants agreed that relationship building before an incident is key to a successful response, should an incident occur. To facilitate relationship building (and better preparedness), the Denver OEMHS and CoPA/PAPA are going to coordinate planning efforts beginning in 2013. The first step will be a meeting hosted by the Denver OEMHS in January 2013 between pipeline operators and city agencies and departments noted in the hazard annex. The second step is coordination to conduct a regional training exercise in the spring of 2013 based upon the scenario of a natural gas pipeline leak near a school.

If these events go forward as planned, Denver OEMHS will have made great strides in preparedness for a pipeline incident. In addition to the items noted above, Denver OEMHS should continue to communicate with pipeline operators via face-to-face meetings on an annual basis, at minimum. Although pipeline companies are saying they are communicating with emergency responders and emergency managers annually, there needs to be a method to confirm that annual outreach is actually occurring. A system should be developed by the Denver OEMHS to ensure the contact is happening on a timely basis with each pipeline operator. In addition, Denver OEMHS should obtain GIS mapping for all area pipelines. This data should also be provided to the Denver Fire Department and be layered onto maps currently used by each agency.

The Denver OEMHS is concerned regarding the pipelines within the community and the danger they present, and is currently taking steps to make sure the City and County is prepared in the event of a large-scale incident. Pipeline companies have been very receptive to this effort by the Denver OEMHS. The result of this motivation by both the Denver OEMHS and the pipeline operators will undoubtedly be a safer community.

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PIPELINE SAFETY AND EMERGENCY PREPAREDNESS

APPENDIX A

Questionnaire: Pipeline Operators

Denver Mayor's Office of Emergency Management and Homeland Security

Our office is working with a graduate student at the University of Colorado Denver to develop a hazard annex to the Denver Emergency Operations Plan regarding pipelines. The following questionnaire is intended to help our office gain an understanding of pipeline operations within our jurisdiction. This survey is confidential and in no way reflects negatively upon your company. Please take a few minutes to answer the following questions.

1. How many states does your company operate pipelines in?

- 1 – 5
- 5 – 10
- 10 – 15
- 15 – 20
- 20+

2. What type of material does your company transport via pipeline within the City and County of Denver? If gas, is it odorized?

3. What is the most significant and/or likely hazard does your company prepares for?

- | | |
|--|---|
| <input type="checkbox"/> Excavation Damage | <input type="checkbox"/> Natural Disasters |
| <input type="checkbox"/> Equipment Failure | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Operator Error | <input type="checkbox"/> Time Dependent Threats
(i.e. Corrosion, Cracks) |
| <input type="checkbox"/> Other: _____ | |

4.

a. Does your company have an emergency plan?

- Yes No

b. If so, approximately how often is it updated?

- Annually

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- Biannually
- Every 3-5 years
- Not Sure

c. Are training and exercises conducted regarding the emergency plan?

- Yes
- No

5. How often does your company communicate with the following local organizations:

a. Emergency Responders (i.e. fire departments)

- Several times per year
- Annually
- Biannually
- Other

b. Emergency Managers

- Several times per year
- Annually
- Biannually
- Other

c. What forum are you communicating with the above organizations?

- Mail
- Group Meetings
- Other: _____

PIPELINE SAFETY AND EMERGENCY PREPAREDNESS

APPENDIX B

Survey Results

Total Pipeline Operators in City and County of Denver							9
Total Surveys Completed							7
	CIG	Magellan	NuStar	Phillips 66	Sinclair	Suncor	Xcel
Question #1 How many states does your company operate pipelines in?							
1-5					X (5)	X (2)	
5-10	X (9)						X
10-15		X (15)	X (17)	X (22)			
20+							
Question #2 What type of material does your company transport in Denver? If applicable, is it odorized?							
	Natural Gas- Not Odorized in Denver	Jet Fuel	Crude and Refined Products	NGLs and Refined Products	Gasoline and Diesel	Crude	Natural Gas- Odorized

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	CIG	Magellan	NuStar	Phillips 66	Sinclair	Suncor	Xcel
Question #3 What is the most significant and/or likely hazard that your company prepares for?							
Excavation Damage	X	X	X	X	X	X	X
Natural Disasters							
Equipment Failure							
Terrorism							
Operator Error							
Time Dependent Threats (i.e. corrosion, cracking)							
Other							
Question #4a Does your company have an emergency plan?							
Yes	X	X	X	X	X	X	X
No							

PIPELINE SAFETY AND EMERGENCY PREPAREDNESS

	CIG	Magellan	NuStar	Phillips 66	Sinclair	Suncor	Xcel
Question #4b If so, how often is it updated							
Annually	X	X (at least)	X	X (at least)	X	X	X
Biannually							
Every 3-5 years							
Not Sure							
Question #4c Are training and exercise conducted regarding the emergency plan?							
Yes	X	X	X	X	X	X	X
No							

PIPELINE SAFETY AND EMERGENCY PREPAREDNESS

	CIG	Magellan	NuStar	Phillips 66	Sinclair	Suncor	Xcel
Question #5a and #5b How often does your company communicate with the following local organizations?							
Emergency Responders							
Several times per year							X
Annually	X	X (mail)	X	X	X	X	
Biannually							
Other		X (Every 3 years face-to- face					
Emergency Managers							
Several times per year							
Annually	X	X (mail)	X	X	X	X	X
Biannually							
Other		X (Every 3 years face-to- face					

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	CIG	Magellan	NuStar	Phillips 66	Sinclair	Suncor	Xcel
Question #5c What forum are you communicating with the above organizations							
Mail	X	X	X	X	X	X	X
Group Meetings	X	X	X	X	X	X	X
Other	X (face-to face meetings; new effort)	X- LEPC Mtgs	X - LEPC Mtgs	X - LEPC Mtgs	X - LEPC Mtgs		Daily if gas pipeline damages (FD)

PIPELINE SAFETY AND EMERGENCY PREPAREDNESS

APPENDIX C

Company	Contact	Phone	Address/Email	Material
Colorado Interstate Gas (Kinder Morgan)	Brian Nave Operations Manager Kenneth Jorenson Operations Supervisor Paul Lopez Supervisor of Damage Prevention	(877) 712-2288 (E) (713) 420-2600 (NE) (303) 261-4243 (D- Nave) (303) 261-4241 (D- Jorenson) (719) 329-5629 (D- Lopez)	24650 East Smith Road Aurora, CO 80019 Brian.Nave@kindermorgan.com Kenneth.Jorenson@kindermorgan.com Paul.Lopez@kindermorgan.com	Natural Gas
DCP Midstream- Wattenberg	Michael Eismont GIS Regulatory Analyst Anthony Wells	(800) 435-1679 (E) (303) 961-0452 (NE) (713) 735-3641 (D- Eismont) (303) 913-7620 (D- Wells)	1907 Powhaton Road Aurora, CO 80019 meismont@dcpmidstream.com	NGLs
Magellan Pipeline Company, LP	Scott Metzger Pipeliner (Colorado) Jeff Binstock Supervisor of Aurora Facility Rick Bondy Coordinator of Emergency Response Preparedness Programs	(800) 720-2417 (E) (303) 344-1511 (D- Metzger and Binstock) (918) 574-7363 (D- Bondy)	1 Williams Center MD 27-2 Tulsa, OK 74172 Richard.Metzger@magellanlp.com Jeff.Binstock@magellanlp.com Richard.Bondy@magellanlp.com	Jet Fuel
NuStar Logistics	Mark Arguelles Manager, Pipeline Safety	(800) 481-0038 (E) (361) 249-9408 (NE) (361) 249-9403 (D- Arguelles)	410 S. Padre Island Drive, Suite 200 Corpus Christi, TX 78405 mark.arguelles@nustarenergy.com Robert.Munguia@nustarenergy.com	Crude & Refined Products

PIPELINE SAFETY AND EMERGENCY PREPAREDNESS

	Robert Munguia, Jr. Environmental Coordinator	(361) 249-9432 (D- Munguia)		
Phillips 66 (Conoco Phillips)	Jeff McBride Denver Area Supervisor Rob Yarbrough Emergency Preparedness, Response & Security Director	(877) 267-2290 (E) (303) 376-4365 (D- McBride) (832) 764-1693 (D- Yarbrough)	Colorado Office: 3690 East 56 th Avenue Commerce City, CO 80022 erpp-support@celeritas.com Jeffrey.McBride@p66.com Rob.Yarbrough@P66.com	NGLs & Refined Products
Plains Pipeline	Tom McCormick Safety & Regulatory Compliance Manager	(866) 800-7677 (D) (307) 783-7500 (D)	1575 Hwy 150 South, Suite E Evanston, WY 82930 tmccormick@pacpipe.com	Crude Oil
Sinclair Pipeline Company	Jonathan Brown Regulatory Compliance Coordinator	(800) 321-3994 (E) (307) 328-3643 (NE & D)	P.O. Box 185 100 E. Washington Rawlins, WY 82334 jbrown@sinclairoil.com	Gasoline & Diesel
Suncor Energy USA Pipeline Company	Megan Romano Right of Way & Public Awareness Coordinator Shelley Messer DOT/PS/Training Coordinator	(866) 978-6267 (E) (303) 793-8006 (NE) (307) 775-8117 (Romano) (307) 775-8112 (Messer)	1715 Fleschli Parkway Cheyenne, WY 82201 MRomano@suncor.com SMesser@suncor.com	Crude/Refined Products
Xcel Energy- Distribution (Public Service Company of Colorado)	Karen Riggerbach- Vaughn Manager, Public Awareness Programs	(800) 895-2999 (E) (303) 571-3939 (D)	1123 W. 3 rd Avenue Denver, CO 80223 Karen.riggerbach- vaughn@xcelenergy.com	Natural Gas
Xcel Energy- Transmission (Public Service Company of Colorado)	Karen Riggerbach- Vaughn Manager, Public Awareness Programs	(800) 698-7811 (E) (303) 571-3939 (D)	18201 W. 10 th Avenue Golden, CO 80402 Karen.riggerbach- vaughn@xcelenergy.com	Natural Gas

(E) = Emergency; (NE) = Non-Emergency; (D) = Direct

Denver County Pipeline Operators – 2012
 Pipeline Safety and Emergency Preparedness
 Lee Ann Steinhour

Company	Contact	Phone	Address/Email	Material
Colorado Interstate Gas (Kinder Morgan)	Brian Nave Operations Manager Kenneth Jorenson Operations Supervisor Paul Lopez Supervisor of Damage Prevention	(877) 712-2288 (E) (713) 420-2600 (NE) (303) 261-4243 (D- Nave) (303) 261-4241 (D- Jorenson) (719) 329-5629 (D- Lopez)	24650 East Smith Road Aurora, CO 80019 Brian.Nave@kindermorgan.com Kenneth.Jorenson@kindermorgan.com Paul.Lopez@kindermorgan.com	Natural Gas
DCP Midstream- Wattenberg	Michael Eismont GIS Regulatory Analyst Anthony Wells	(800) 435-1679 (E) (303) 961-0452 (NE) (713) 735-3641 (D- Eismont) (303) 913-7620 (D- Wells)	1907 Powhaton Road Aurora, CO 80019 meismont@dcpmidstream.com	NGLs
Encana Oil & Gas USA		(877) 366-2200 (E)		Natural Gas
Magellan Pipeline Company, LP	Kenneth Lybarger, Regulatory Compliance Coordinator Jeff Binstock Supervisor of Aurora Facility Rick Bondy Coordinator of Emergency Response Preparedness Programs	(918) 574-7315 (D- Lybarger) (303) 344-1511 (D- Binstock) (918) 574-7363 (D- Bondy)	1 Williams Center MD 27-2 Tulsa, OK 74172 Kenneth.lybarger@magellanlp.com Jeff.Binstock@magellanlp.com Richard.Bondy@magellanlp.com	
NuStar Logistics	Mark Arguelles Manager, Pipeline	(800) 481-0038 (E) (361) 249-9408 (NE)	410 S. Padre Island Drive, Suite 200 Corpus Christi, TX 78405	Crude & Refined Products

Denver County Pipeline Operators – 2012
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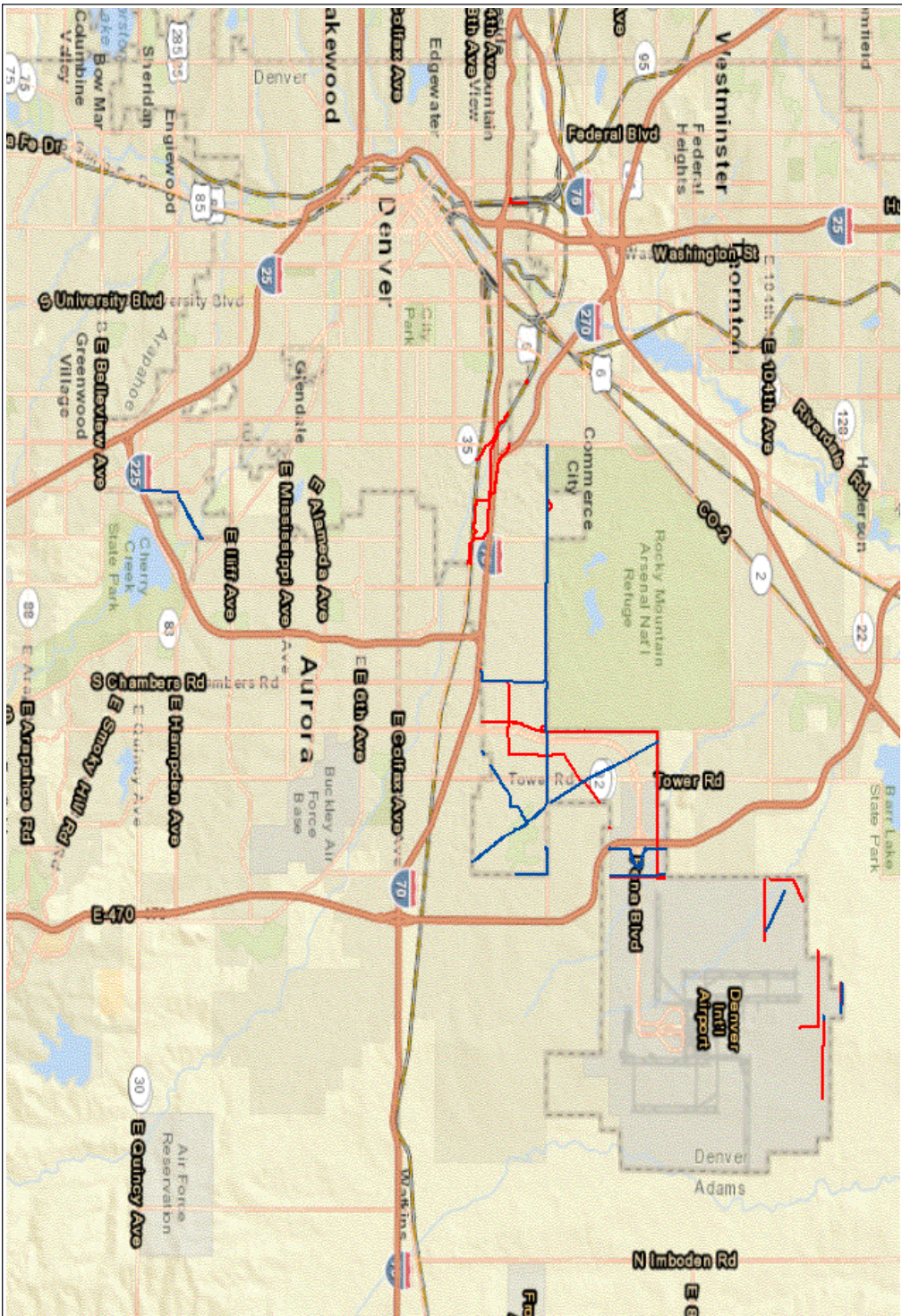
	Safety Robert Munguia, Jr. Environmental Coordinator	(361) 249-9403 (D-Arguelles) (361) 249-9432 (D-Munguia)	mark.arguelles@nustarenergy.com Robert.Munguia@nustarenergy.com	
Phillips 66 (Conoco Phillips)	Jeff McBride Denver Area Supervisor Rob Yarbrough Emergency Preparedness, Response & Security Director	(877) 267-2290 (E) (303) 376-4365 (D-McBride) (832) 764-1693 (D-Yarbrough)	Colorado Office: 3690 East 56 th Avenue Commerce City, CO 80022 erpp-support@celeritas.com Jeffrey.McBride@p66.com Rob.Yarbrough@P66.com	NGLs & Refined Products
Rocky Mountain Pipeline System, LLC	Tom McCormick Safety & Regulatory Compliance Manager	(307) 783-8336 (D)	1575 Hwy 150 South, Suite E Evanston, WY 82930 tmccormick@pacpipe.com	
Sinclair Pipeline Company	Jonathan Brown Regulatory Compliance Coordinator	(800) 321-3994 (E) (307) 328-3643 (NE & D)	P.O. Box 185 100 E. Washington Sinclair, WY 82334 jbrown@sinclairoil.com	Gasoline & Diesel

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Suncor Energy USA	Megan Romano Right of Way & Public Awareness Coordinator LeRoy Haskins, Manager- Regulatory Compliance	(866) 978-6267 (E) (303) 793-8006 (NE) (307) 775-8117 (Romano) (307) 775-8101 (Haskins)	1715 Fleshchli Parkway Cheyenne, WY 82201 MRomano@suncor.com	Crude/Refined Products
Xcel Energy/ PSCo - Distribution		(800) 895-2999 (E) (800) 895-4999 (NE)		Natural Gas
Xcel Energy/ PSCo – Transmission Public Service Company of Colorado	Kenneth Buys	(800) 698-7811 (E) (800) 895-4999	18201 W. 10 th Avenue Golden, CO 80402 Kenneth.P.Buys@XCELENERGY.COM	Natural Gas

- (E) = Emergency
- (NE) = Non-Emergency
- (D) = Direct

NATIONAL PIPELINE MAPPING SYSTEM



- Legend**
- Gas Transmission Pipelines
 - Hazardous Liquid Pipelines
 - LNG Plants
 - Breakout Tanks

0 2.0 Miles

Pipelines depicted on this map represent gas transmission and hazardous liquid lines only. Gas gathering and gas distribution systems are not represented.

This map should never be used as a substitute for contacting a one-call center prior to excavation activities. Please call 811 before any digging occurs.

Questions regarding this map or its contents can be directed to npmis-nr@mbakercorp.com.

Projection: Geographic

Datum: NAD83

Map produced by the NPMIS Public Viewer at www.npmis.primisa.dod.gov

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