

Section 17. Technological Accident/ Hazardous Materials Release

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Why A Technological Accident/Hazardous Materials Release Is a Threat

Hazardous materials come in the form of explosives, flammable and combustible substances, poisons and radioactive materials. A hazardous material (HAZMAT) incident involves a substance outside normal safe containment in sufficient concentration to pose a threat to life, property, or the environment. These substances are most often released as a result of transportation accidents or because of chemical accidents in plants.

Hazardous materials in various forms can cause death, serious injury, and damage to buildings, homes, and other property. Many products containing hazardous materials are used and stored in homes routinely. These products are shipped daily on the nation’s highways, railroads, waterways and pipelines. Varying quantities of hazardous materials are manufactured, used and stored at over 4.5 million facilities in the United States—from major industrial plants to local dry cleaning establishments to gardening supply stores.





Specialized equipment is often required to handle or dispose of hazardous materials safely. Hazardous materials incidents vary in their intensity, size and duration. Most incidents are small in scope and only require a limited response. Occasionally there will be a large incident or one involving a chemical that requires evacuation of the surrounding area.

Generally, local fire departments are responsible for first response to a hazardous materials incident. Local Fire Departments can call on help from private and governmental resources. The Chemical Manufacturers Association has an organization, CHEMTREC, which runs a 24-hour hotline. Additionally, several companies specialize in responding to chemical emergencies. At the federal level, the EPA, Coast Guard and the US Department of Transportation's Bureau of Explosives have strike teams that assist local responders in special situations.

The Federal Government plays a large role in all phases of hazardous materials management. Title III of the 1986 Superfund Amendments and Reauthorization Act (SARA) and the Clean Air Act of 1990 mandate 'cradle to grave' tracking of designated hazardous materials by requiring users to report what chemicals they are using, releasing into the air and how they will respond to an emergency. Under the Act, EPA delegates implementation to the states.

Two categories of hazardous materials incidents are addressed in this risk assessment: 1) incidents at fixed hazardous materials facilities and 2) incidents involving mobile toxic materials being transported.

In a hazardous materials incident, solid, liquid and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. The micro-meteorological effects of buildings and terrain can alter the travel and duration of harmful agents. Shielding in the form of sheltering-in-place can protect people and property from harmful effects. Non-compliance with fire and building codes as well as failure to maintain existing fire and containment features can substantially increase the damage from a hazardous materials release.

The Collin County Local Emergency Planning Committee

In October 1986, Congress enacted the "Emergency Planning and Community Right-to-Know Act (EPCRA) and "Superfund Amendments Reauthorization Act Title III" (SARA Title III). This initiative was in direct response to the 1984 Union-Carbide toxic gas release in Bhopal, India. This one incident resulted in thousands of deaths and injuries in the area surrounding the facility. Under United States Code Title 42, the Local Emergency Planning Committee (LEPC) is the organization responsible for development and implementation at the local level of the plans set forth and required by this legislation.

EPCRA, SARA Title III, and Texas Health and Safety Codes exist to protect and educate the general public. The Collin County LEPC is the organization responsible for development and implementation of hazardous materials planning at the local level.



The LEPC's primary charges are:

- to ensure that residents and workers in Collin County are aware and informed of their right to know what chemicals are being stored, used, released, and discarded; and,
- to facilitate public requests for information as required by law.

EPCRA and SARA Title III also serve business and industry employees as well as first responders (police, firefighters, emergency medical services (EMS)) by protecting their right to know about the chemicals they may be exposed to in the course of performing their jobs.

Federal law requires business and industry operators to perform annual chemical inventories (Tier II Chemical Report) and submit their report to the Texas Department of State Health Services, local Fire Chief and the LEPC no later than March 1st of each year. The Tier II Chemical Report is a standardized form created by the U.S. Environmental Protection Agency (EPA) to rate and identify chemicals and hazardous materials. Whether or not a company must file this annualized list is determined by the type of chemical and how much is on-hand. Having this information readily available to Fire Departments serve two important purposes:

- enhances response time to an incident with the right equipment and personnel; and
- immediately alerts first responders whether the public is at risk and advisories are warranted.

In the event of a chemical release (i.e., spill, leak, emission, gas cloud), a business or industry must report the incident immediately. Texas Health and Safety Codes state a specific timeframe for reporting and failure to do so is a violation of both Federal and State law whether or not First Responders were dispatched to the scene. If First Responders are dispatched to a release incident and a Tier II Report is not on file within the jurisdiction, the operator is in violation. The responding agencies are entitled to recover the costs of securing, containing, and managing the incident. The LEP is an all volunteer organization comprised of members of law enforcement, fire and rescue, health care, public health, communications, risk management, emergency management, Homeland Security, FEMA, EPA, CDC, NOAA, Federal, State and local government, reclamation, charities, and relief organizations like the American Red Cross. The businesses and industries most responsible for the materials in the community are valued members as well. Its objectives are to:

- obtain and provide the general public with information mandated under the EPCRA and SARA Title III, created to protect their right-to-know, and that educates people about their LEPC;
- provide a hazardous substances emergency response plan;



- educate the general public on what to do in event of an emergency;
- work as a partner with business and industry to improve participation in mandatory Tier II chemical annual reporting; promote maximum utilization of Material Safety Data Sheets; and increase awareness and emphasize importance of reporting significant releases and up-to-date inventories; and,
- educate and provide information to the general public that will enhance the performance of First Responders and supporting agencies within Collin County and the region.

Sub-committees include: Public Information and Education, Right-to-Know, Government and Industry Liaison, Emergency Response and Resources, and Executive. Most of the members live and work in Collin County. As an “unfunded mandate” the LEPC has little or no annual budget and relies on support from its members and grants.

The LEPC believes that “practice makes perfect.” First Responder seminars, classes, hands-on training and drills are conducted within the County and on the regional level year around. Drill scenarios have included overturned tankers, toxic gas releases, explosions, terrorism, train derailments, mass casualties, building collapses, bio-terrorism and natural disasters.

Hazard Profile

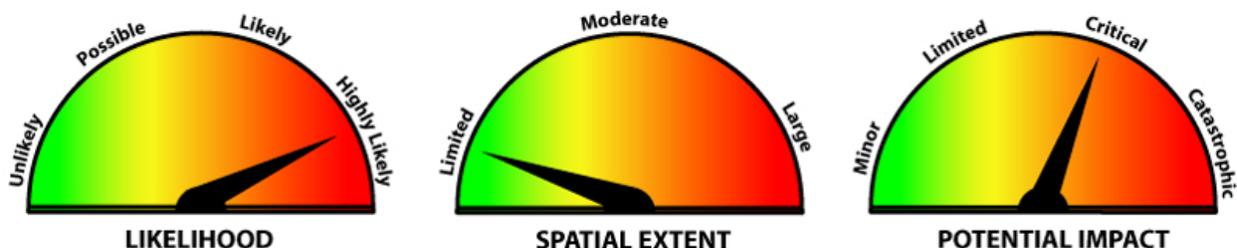


Figure 17-1. Technological Accidents/Hazardous Materials Release Hazard Profile Summary for the City of Plano

The frequency, or likelihood, of a small-scale technological accident/hazardous materials release in the City of Plano is “Highly Likely,” with an event probable in the next year. The spatial extent of the technological accident/hazardous materials release is “Limited,” expected to affect ten percent or less of property. The potential impact is “Critical” and may result in multiple deaths or injuries and more than 25% of property in the affected area being damaged or destroyed. There could be a complete shutdown of facilities for more than one week.

Location of Hazardous Areas

Mobile Transportation Routes

There are significant amounts of hazardous materials being transported in or near the City of Plano every day. As shown in Figure 17-2, Designated Hazardous Cargo Routes in the City of Plano include the Dallas Tollway, the President George Bush Turnpike and Central Expressway. The rail line going through the City of Plano also carries hazardous materials.

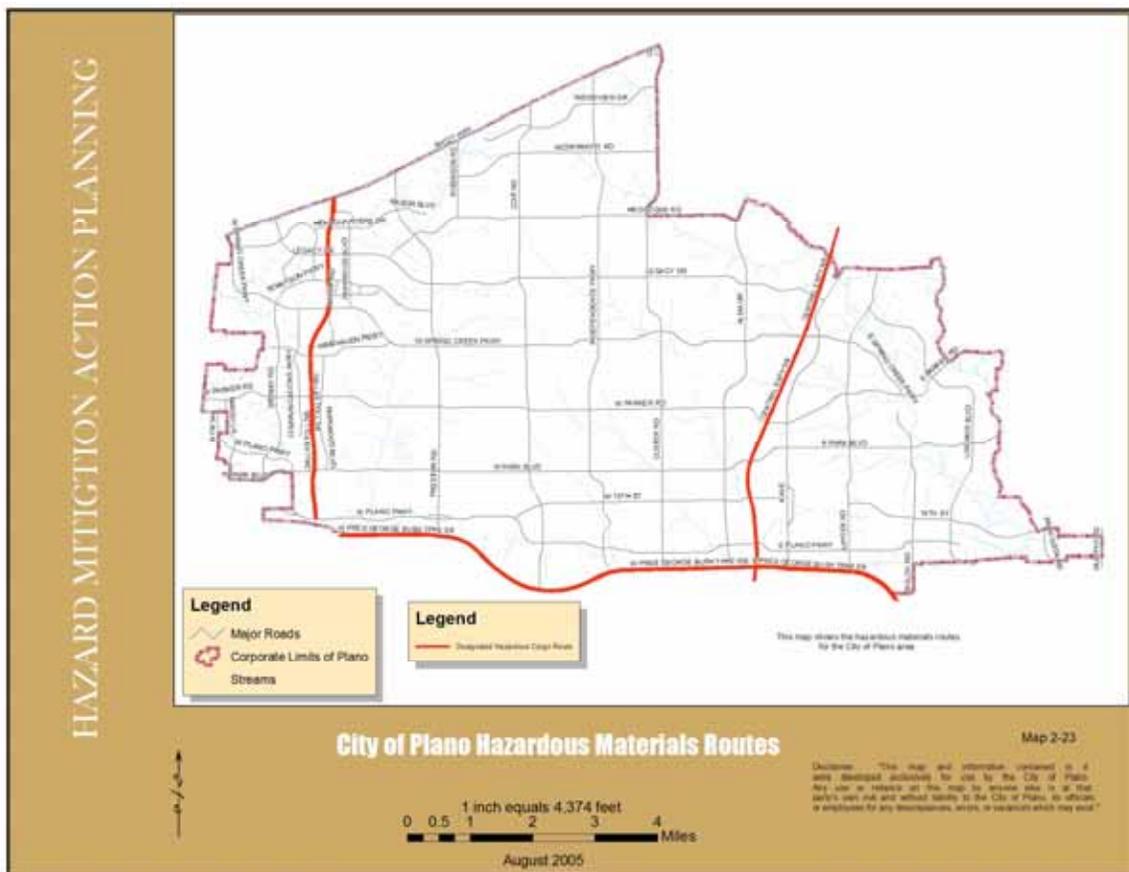


Figure 17-2. City of Plano Hazardous Materials Routes

Fixed Facilities

There are also a number of fixed hazardous materials facilities within the City of Plano. A list of Tier II facilities as reported to the Texas Department of Health is shown in Figure 17-3.

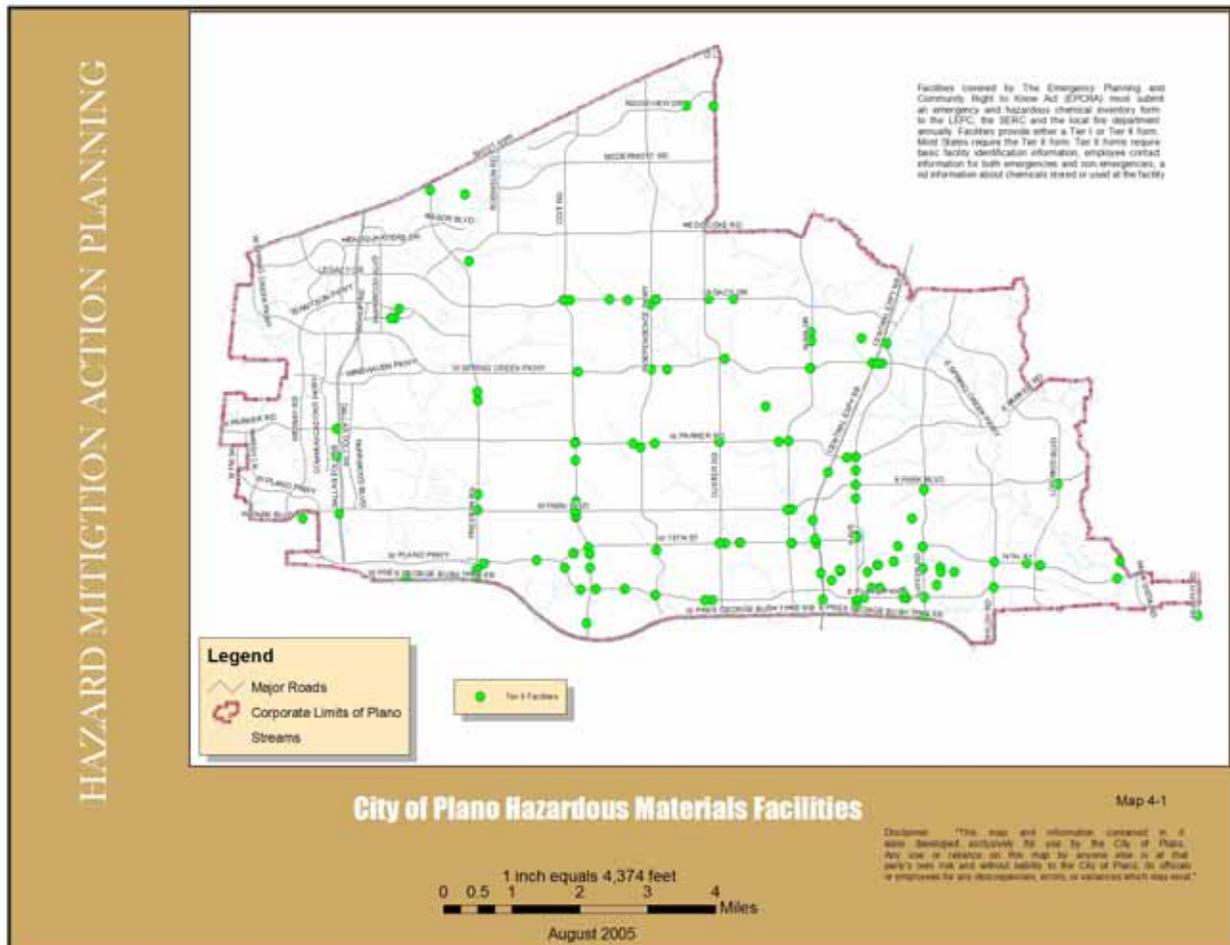


Figure 17-3. City of Plano Hazardous Materials Facilities (Tier II Facilities as Reported to the State Commission on Environmental Quality)



History of Technological Accidents/ Hazardous Materials Releases

Table 17-1 displays the hazardous material releases reported to the Texas Commission on Environmental Quality from 1995 to 2002 for Collin County. Table 17-2 details these releases.

**Table 17-1. Hazardous Materials Incidents Reported to the Texas Commission on Environmental Quality, Collin County
1996-2002**

Date of Release	Hazardous Material Released	Amount of Release
3/12/2002	Diesel	~100 gallons
2/26/2002	Diesel Fuel	60 gallons
12/28/2001	Diesel	~35 gallons
9/28/2001	Hydraulic Oil and Fluids	40 gallons
9/11/2001	Waste Oil	25 gallons
9/9/2001	Gasoline	unknown
8/27/2001	Dust Suppression Oil	unknown
8/18/2001	Diesel	~100 gallons
8/5/2001	Diesel	250 gallons
6/15/2001	29% Ammonia	150 gallons
6/3/2001	Latex Paint And Water	10 gallons
6/1/2001	Lacquer Thinner (Petroleum Distillates)	180 gallons
5/7/2001	Diesel	~500 gallons
5/4/2001	Boiler Blowdown + Stormwater	200,000 gallons
4/11/2001	Diesel	50 gallons
4/2/2001	Fuel Oil 1	14,000 gallons
3/16/2001	Diesel	100 gallons
3/11/2001	Ammonia (Anhydrous)	150 gallons
1/22/2001	Sewage Water	300 gallons
1/5/2001	Diesel	400 gallons
12/22/2000	Mineral Oil	unknown
10/12/2000	Diesel	~300 gallons
10/11/2000	Diesel	~50 gallons





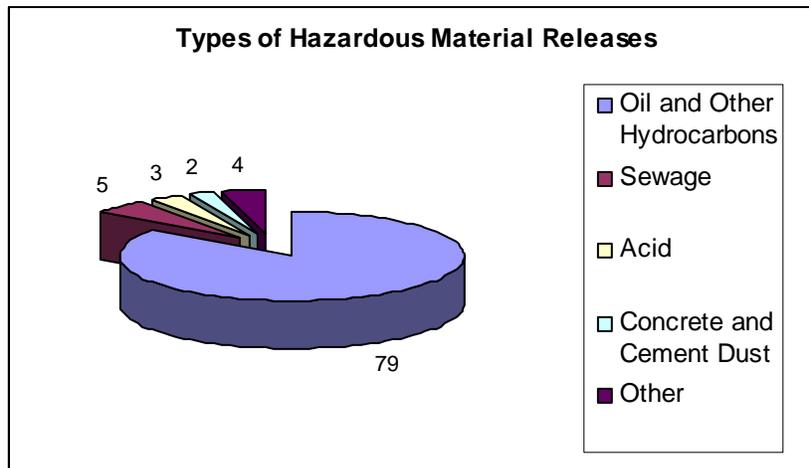
Date of Release	Hazardous Material Released	Amount of Release
8/8/2000	Abandoned Materials	unknown
7/21/2000	Diesel / Motor Oil/ Antifreeze	20 gallons
7/16/2000	Diesel Fuel	50 gallons
7/5/2000	Gasoline	20 gallons
6/20/2000	Diesel Fuel	25 gallons
6/9/2000	Concrete	30 gallons
6/6/2000	Diesel	35 gallons
5/29/2000	Ammonia (Anhydrous)	100 lbs
5/16/2000	Diesel Fuel 2-D	50 gallons
4/22/2000	Diesel Fuel	120 gallons
4/22/2000	Diesel	150 gallons
4/17/2000	Diesel Fuel	100 gallons
3/8/2000	Diesel Fuel	100 gallons
3/6/2000	Waste Oil	unknown
2/21/2000	Ethylene Glycol	1,000+ gallons
1/26/2000	Naphthalene	40 + gallons
1/25/2000	Diesel	75 gallons
1/13/2000	Ethylene Glycol Solution	500 gallons
12/7/1999	Diesel	50 gallons
12/2/1999	Diesel	30 gallons
11/28/1999	Diesel	185 gallons
11/5/1999	Diesel Fuel	30 gallons
11/5/1999	Diesel	70 gallons
8/20/1999	Glacial Acetic Acid	220 gallons
8/9/1999	Debris and Other Wastes	325 cubic yards
7/9/1999	Diesel	30 gallons
7/1/1999	Diesel Fuel	30 gallons
6/2/1999	Diesel	unknown
5/19/1999	Unknown Acid	<1 gallon
4/9/1999	Pesticide/Herbicide	unknown
4/3/1999	Diesel Fuel	75 gallons
3/19/1999	Gasoline	<5 gallons
3/13/1999	Industrial Wastewater	50 gallons
3/13/1999	Lubro Hsel #22-Mw	50 gallons
3/11/1999	Diesel Fuel	300 gallons
2/22/1999	Cement Dust	1800 lbs





Date of Release	Hazardous Material Released	Amount of Release
2/17/1999	Gasoline	unknown
1/4/1999	Gasoline	50 gallons
11/5/1998	Diesel Fuel	30 gallons
10/26/1998	Diesel Fuel	2000 gallons
10/25/1998	Lubro-Hsdl 2.5%	250 gallons
10/14/1998	Gasoline	unknown
10/9/1998	Gasoline	10 gallons
7/14/1998	Diesel	100 gallons
7/8/1998	Diesel	50 gallons
7/2/1998	Diesel	10 gallons
6/26/1998	Deisel	100 gallons
5/27/1998	Jaylfex	800 gallons
5/21/1998	Raw Sewage	> 4000 gallons
5/15/1998	Diesel	100 gallons
3/28/1998	Diesel	20 gallons
3/8/1998	Sewage	35,000 gallons
2/12/1998	Diesel	160 gallons
12/7/1997	Waste Oil	400 gallons
11/26/1997	Diesel Fuel	150 gallons
11/20/1997	Hydraulic Fluid	15 gallons
9/18/1997	Neutralized Plating Solution Containing Pb, Cd, and Cr	20 gallons
9/16/1997	Sulfuric Acid	< 15 gallons
7/29/1997	Diesel	30-35 gallons
7/7/1997	Bisphenyl - A (Epon 828)	950 lbs
4/24/1997	Monex-Lr (Curing Agent for Concrete)	unknown
3/26/1997	Gasoline	1 gallons
2/7/1997	Oil	1 gallons
1/19/1997	Sewage	unknown
12/6/1996	Diesel Fuel 2-D	100 gallons
11/9/1996	Diesel Fuel 2-D	unknowns
10/22/1996	Diesel Fuel	< 5 gallons
10/19/1996	Hydrocarbons	unknown lbs
10/7/1996	Petroleum Products	unknown
10/7/1996	Hydraulic Fluid	30 gallons





Reported to the Texas Commission on Environmental Quality, 1996-2002

Figure 17-4. Types of Hazardous Material Releases in Collin County

People and Property at Risk

To demonstrate the threat of a hazardous materials release, City of Plano officials assessed the potential impact of a chlorine tank explosion using the ALOHA Plume model.

Chlorine gas is poisonous and can be pressurized and cooled to change it into a liquid form so that it can be shipped and stored. When released, it quickly turns into a gas and stays close to the ground and spreads rapidly. Chlorine gas is yellow-green in color and, although not flammable alone, it can react explosively or form explosive compounds with other chemicals such as turpentine or ammonia. Some locations in the United States have stationary chlorine tanks as large as 120,000 gallons. In the City of Plano, however, the principal threat would be from a leak or explosion of chlorine tanks transported by train.

After a hypothetical leak or explosion of one or more chlorine tanks – either intentional by terrorists or an unintentional accident --- the released gas would disperse downwind at a rate dependent on the current wind velocity, possibly spreading as far as 25 miles. According to the U.S. Department of Homeland Security’s (DHS’s) National Planning Scenario Number 8, Chlorine Tank Explosion, of those in its path, about five percent would receive a potentially lethal exposure to chlorine gas and about half of those would die before or during treatment. An additional 15 percent would require hospitalization. Most of these would recover in one to two weeks, except for those with severe lung damage who would require long-term monitoring and treatment. Property damage would be minimal and only limited decontamination would be required since chlorine is a gas.



As part of a table-top exercise, City of Plano officials examined the potential impact of a chlorine gas leak in the City of Plano along the rail lines, using the ALOHA Plume model. Figure 17-5 shows the results of the analyses. In the case of a hypothetical leak occurring from a 24 inch hole in a cylindrical tank of chlorine gas along the rail line, at a release rate of 63,500 pounds per minute, the total release would be 1123,491 pounds of chlorine gas. With winds of 5 knots, the maximum threat zone in the City of Plano (with 20 parts per million of chlorine gas) would be 3.7 miles. Greater than 3 parts per million of chlorine gas could be found greater than six miles from the leak.

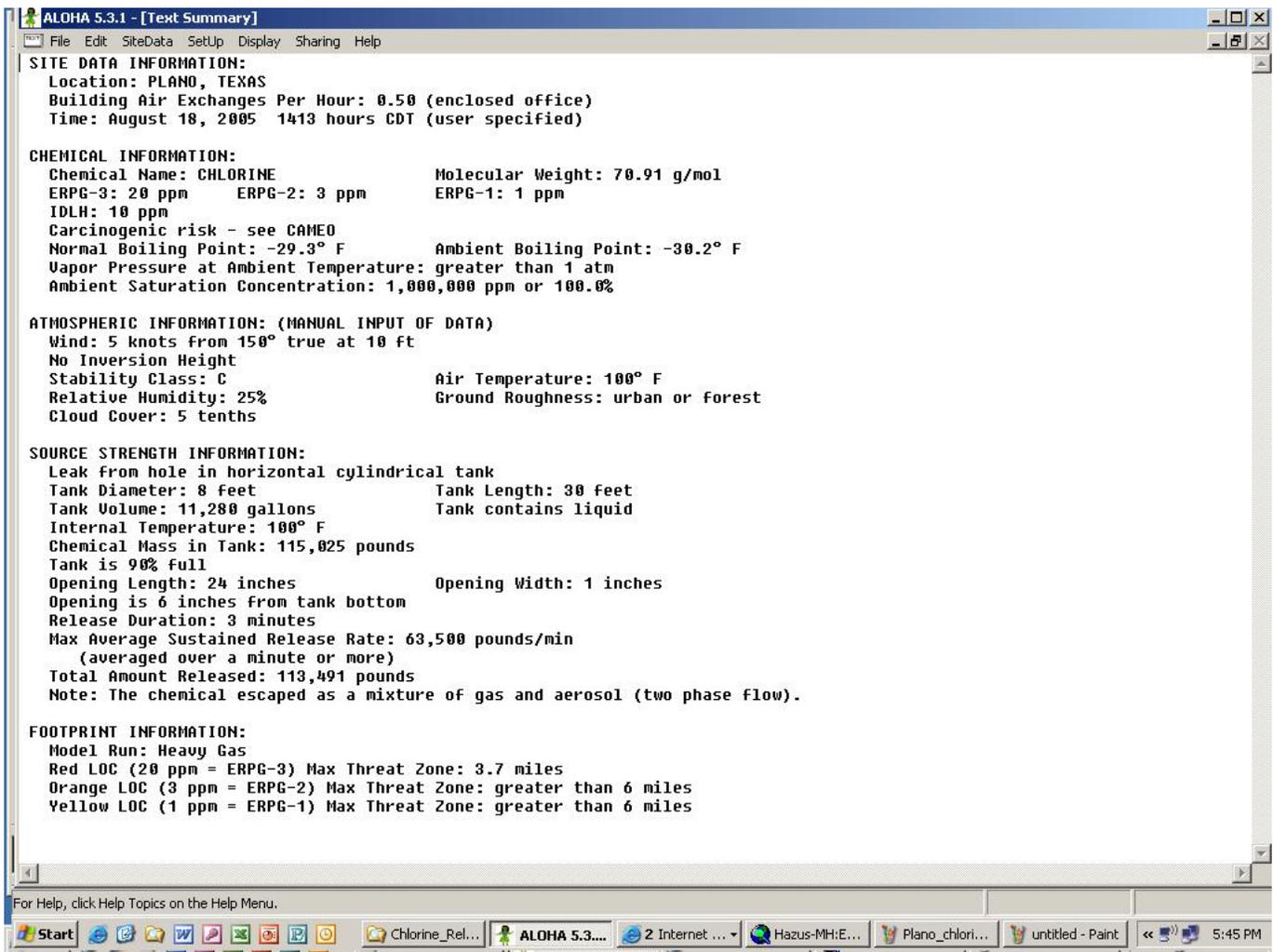


Figure 17-5. Results of ALOHA Plume Model Run Showing Hypothetical Chlorine Gas Leak in the City of Plano



Evacuation or sheltering or protection of the downwind population would be required. As indicated in Figure 17-6, concentrations would be highest outdoors and for a short period of time.

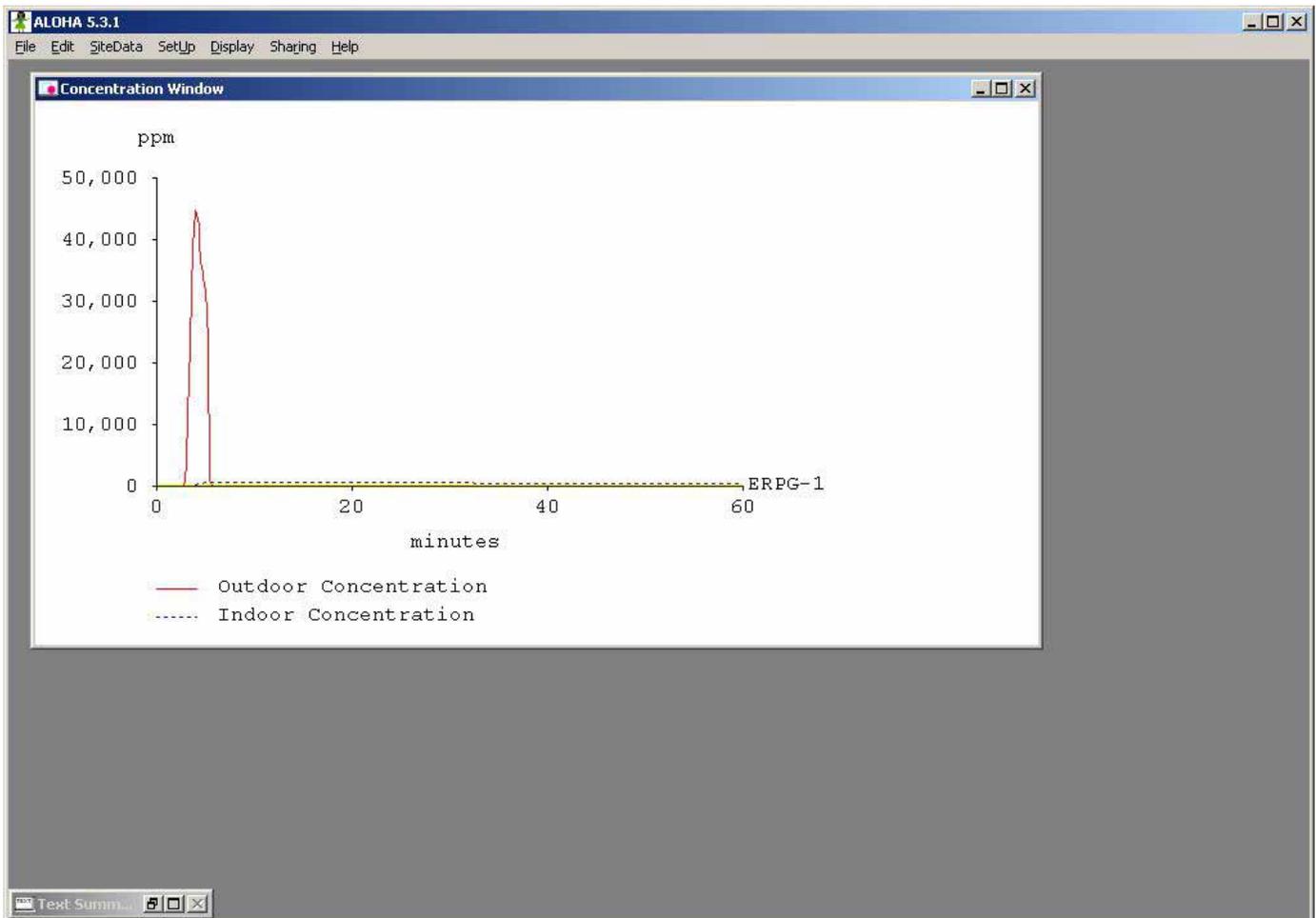


Figure 17-6. Hypothetical Concentrations from Chlorine Gas Explosion (in parts per million) Over Time, ALOHA Plume Model

While a chlorine tank explosion is an unlikely event, it does demonstrate the need to be prepared and to mitigate such hazards. As such, technological hazards/hazardous materials releases merit mitigation consideration by the City of Plano.