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REGION 5

Risk Assessment for the Waste Technologies Industries (WTI) Hazardous Waste Incinerator Facility (East Liverpool, Ohio)

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Volume VII:
ACCIDENT ANALYSIS:
SELECTION AND ASSESSMENT OF POTENTIAL RELEASE SCENARIOS

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VOLUME VII

ACCIDENT ANALYSIS: SELECTION AND ASSESSMENT OF POTENTIAL RELEASE SCENARIOS

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I. INTRODUCTION

A. General Methodology

The WTI Risk Assessment includes an analysis of potential human health effects caused by accidents that may occur during operation of the WTI facility. The approach for conducting this analysis has been developed based on guidance published by the United States Environmental Protection Agency (e.g., U.S. EPA 1987; 1995a) and other agencies, such as the U.S. Federal Emergency Management Agency (FEMA 1993). The primary objective of the Accident Analysis is to assess the potential for human health effects associated with general types or classes of accidents that could occur at the WTI facility.

The WTI Accident Analysis also addresses comments from the independent peer review of the WTI Phase II Project Plan (U.S. EPA 1993a). During the peer review, concerns were raised regarding health impacts associated with chemical releases that could occur as a result of on-site and off-site accidents, particularly given the proximity of the WTI facility to schools and residences (U.S. EPA 1994a).

The data base for evaluating the human health risks posed by low frequency accidents at hazardous waste management facilities is limited. Due to this limited data base, there is significant uncertainty in conducting a quantitative analysis of risks posed by accidents at the WTI facility. The Accident Analysis has, therefore, been developed based on scientific judgment as well as available quantitative and qualitative information, an approach consistent with the U.S. EPA's *Accidental Release Prevention Requirements: Risk Management Programs Under Clean Air Act Section 112(r)(7); Proposed Rule* (U.S. EPA 1995a) and *Technical Guidance for Hazards Analysis: Emergency Planning for Extremely Hazardous Substances* (U.S. EPA 1987).

The Accident Analysis for the WTI facility evaluates the potential for acute health effects that may result from short-term (i.e., less than 24 hour) exposures of individuals located within the immediate vicinity of the WTI facility. Of primary interest in the Accident Analysis are the potential health affects associated with events which could have significant short-term off-site consequences, but generally do not have a high probability of occurring. In addition to these conservative scenarios, more typical events with a greater likelihood of occurrence but a lower probability of causing adverse off-site health effects are also examined. For both conservative and typical accident scenarios, a range of meteorological

conditions (including atmospheric inversions) are evaluated, and the effect of emergency response measures is assessed.

Consistent with the peer review comments, both on-site and off-site accidents are included in the analysis. For the on-site accident scenarios, the off-site distance over which human health effects might be anticipated is estimated. The distance over which health effects may occur in the event of an off-site transportation accident along the local access roads to the facility is also identified. In determining the distance over which effects may occur, inhalation is expected to be the primary route of short-term exposure for the off-site community. While direct dermal exposure may also be of concern, exposures through inhalation are predicted to occur over a larger area, and be more likely to result in adverse health effects. Furthermore, this analysis focuses on the short-term, direct exposure to accidental releases, rather than longer-term, indirect exposures that might occur from contamination caused by an accident.

Given that the focus of this assessment is the adequacy of existing design and operation features in protecting the off-site community, risks to on-site workers are not evaluated. Furthermore, as discussed in U.S. EPA guidance (U.S. EPA 1992a), ecological assessments typically focus on risks to ecological communities, rather than risks to individual receptors. Most plausible accident scenarios would affect relatively small areas (i.e., within 5 miles of the facility), and thus are unlikely to affect entire ecological communities. Thus, potential ecological risks associated with facility accidents are not evaluated.

Many different types of events, or combination of events, could lead to the general classes of accidents evaluated in this study. Thus, a rigorous evaluation of the causes of specific accident scenarios, based on fault-tree analyses or other detailed techniques, has not been performed. Instead, probabilities of occurrence of the various classes of accident events considered are estimated using the semi-quantitative methods presented in technical guidance for hazards analysis by U.S. EPA (1987) and FEMA (1993). This approach is consistent with U.S. EPA's *Proposed Rule for Accidental Release Prevention Requirements* (U.S. EPA 1995a).

B. U.S. EPA/FEMA/DOT Approach to Hazards Analysis

The Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act (SARA), requires local emergency planning committees (LEPCs) to develop emergency response plans for facilities in the event of an emergency. Site-specific hazards analysis is one tool LEPCs can use to better understand the potential risks posed by airborne releases of extremely hazardous substances (EHSs) from a facility. An EHS is defined by U.S. EPA as a chemical with high acute lethality, having the potential for causing death in unprotected populations after

relatively short exposure periods at low doses (U.S. EPA 1987). More than 360 chemicals listed under Title III of SARA have been identified by U.S. EPA as EHSs, primarily on the basis of acute toxicity (U.S. EPA 1987). This list of EHSs was considered in selecting chemicals of potential concern in the WTI Accident Analysis. Additional chemicals of potential concern in the WTI Accident Analysis were identified through a review of information on wastes projected to be received during the first year of WTI operations.

To assist in the development of comprehensive emergency plans, U.S. EPA, FEMA and the United States Department of Transportation (U.S. DOT) jointly issued the *Technical Guidance for Hazards Analysis* (U.S. EPA 1987) outlining a three-step "hazards analysis" process for identifying potential hazards facing a community with respect to accidental releases of EHSs. This general approach was also adopted in the FEMA *Handbook of Chemical Hazard Analysis Procedures* (FEMA 1993). The process described in U.S. EPA (1987) consists of the following three components:

- *Hazards Identification*, involving the collection and review of specific information on situations that have the potential for causing injury to life or damage to property and the environment due to a hazardous materials spill or release (e.g., chemical identities; location of storage and use; quantities stored or used; nature of the hazard).

- *Vulnerability Analysis*, involving the identification of areas in the community that may be affected or exposed (vulnerable zones); individuals in the community who may be subject to injury or death from certain specific hazardous materials (including sensitive human subpopulations); and facilities, property or environment that may be susceptible to damage should a hazardous materials release occur (critical facilities and environment).

- *Risk Analysis*, involving an assessment of the likelihood (probability) that an accidental release of a hazardous material might occur, and the severity of consequences that might result from the release. Combining the accident probability analysis with measures of predicted consequences provides an estimation of the overall risk, which can be used for prioritization and planning purposes.

The intent of the *Technical Guidance for Hazards Analysis* (U.S. EPA 1987) is to assist with the development of a community-scale emergency plan. Other guidance has been used as necessary to supplement the *Technical Guidance for Hazards Analysis* as described throughout this report. In developing a methodology for the Accident Analysis for the WTI

facility, the hazards analysis process has been adopted as a general framework, as described below.

1. Hazards Identification

Hazards identification, the first step in hazards analysis, is the process of collecting and reviewing information on:

- the types and quantities of hazardous materials at the facility;
- the locations and conditions of specific areas within the facility where hazardous materials are handled, stored, used, treated or disposed; and
- routes used for transporting hazardous materials to, from and within the facility.

From this information, it is possible to develop potential accident scenarios (both on-site and off-site) that might result in spills or releases that could lead to off-site exposures in the surrounding community. Examples of on-site accident scenarios that might be relevant for a hazardous waste facility include storage tank ruptures, process line failures, fires in storage tank areas, failures of transfer lines and hoses during off-loading of tanker trucks, spills from off-loading tanker trucks, explosions during operation of a combustion system, and failure of the air pollution control equipment. Off-site accident scenarios that could be considered include chemical releases caused by collisions involving tanker trucks or railcars hauling hazardous materials.

In the WTI Accident Analysis, the hazards identification process consists of the following major elements:

- Identification of conservative and typical accident scenarios, based on a general review of the facility layout, a site visit and an evaluation of reports on accidents that have occurred at WTI and at comparable U.S. facilities. The accident scenarios identified for the WTI facility are representative of categories of accidents listed in FEMA (1993), and which could occur during the types of activities performed at the facility.
- Review of chemicals of possible concern with regard to the identified accident scenarios. Chemicals of possible concern are identified primarily through a review of waste profiles received during WTI's first year of operation, acutely hazardous wastes ("P" wastes) as defined in 40 CFR §261.33(e), and hazardous

substances listed under Section 112(r) of the Clean Air Act and Section 302 of EPCRA. Although "P" wastes are not currently received at the WTI facility, these wastes are not prohibited by the permit.

- Compilation of acute toxicity criteria and physical/chemical data for the chemicals of possible concern. For this analysis, predicted off-site concentrations associated with selected accident scenarios relevant to the WTI facility are compared to acute toxicity criteria known as "Immediately Dangerous to Life or Health" (IDLH) values. IDLH values are developed by the National Institute for Occupational Safety and Health (NIOSH), and represent the maximum concentration of a chemical in air from which an individual could escape within 30 minutes without experiencing any escape-impairing or irreversible health effects (FEMA 1993). The IDLH values published by NIOSH were originally developed to be protective for healthy adult male workers, and have not been adjusted to account for the heterogeneous population (e.g., children, elderly,) who might be exposed to chemicals in an event with off-site consequences. In some cases individuals in the general population might require a longer escape time and/or be more sensitive to the chemical exposure compared to healthy adult male workers (U.S. EPA 1987). Therefore, as a sensitivity analysis, predicted off-site concentrations were also compared to "Levels of Concern" (LOCs), which are generally more conservative than the IDLH values. LOCs are defined by U.S. EPA (1987) to be the "concentrations of extremely hazardous substances in air above which there may be serious irreversible health effects or death as a result of a single exposure for a relatively short period of time." LOC values are usually, but not always, equal to the IDLH divided by a factor of ten.

Each of the above steps is described in greater detail in subsequent chapters of this volume of the WTI Risk Assessment.

2. Vulnerability Analysis

According to the *Technical Guidance for Hazards Analysis* document (U.S. EPA 1987), the vulnerability analysis involves the identification of areas of the community surrounding a facility that may be affected in the event of a hazardous release, and the identification of specific subpopulations within this area that may be of particular concern. The vulnerability analysis also includes an evaluation of the consequences of an accident.

In the WTI Accident Analysis, the methodology for the consequence analysis consists of the following steps:

- selecting, on the basis of comparison to published acute exposure levels, specific waste materials and chemical constituents to characterize the potential consequences of each accident scenario. Those substances with the greatest hazard, based on acute toxicity, quantity, and release potential are selected for further evaluation, as these substances would generate the greatest impact if they were carried downwind in sufficient concentrations;

- estimating the chemical constituent release rates for each accident scenario;

- calculating the atmospheric dispersion of released materials or propagation of energy release (e.g., heat effects) to receptors; and

- comparing the resultant modeled exposure levels to published acute exposure levels as a measure of the area over which adverse health effects might occur.

Specific subpopulations within the community that may be at particular risk are identified. A number of residences and an elementary school (East Elementary School) are located approximately 1,000 feet north of the facility. This area is comprised of single-family homes, the elementary school and a business college. The area due west of the facility (approximately one-quarter mile) is also residential/commercial. Based on the peer review Work Group comments (U.S. EPA 1994a), and observations made during a site visit, subpopulations of special concern include children in the nearby school, as well as residents living near the site or along the local access route.

3. Risk Analysis

Risk analysis, the final step in hazards analysis, provides an assessment of the likelihood that an accidental release of a hazardous material will occur, a semi-quantitative assessment of the associated consequences and the potential effect of emergency response measures. Considered together, the outcomes of the accident probability analysis and the consequence analysis can provide an overall measure of the risk. This overall measure of risk can be expressed qualitatively, semiquantitatively or quantitatively, depending on the objectives of the analysis and the nature of the available data.

As discussed previously, because of the limited availability of quantitative data, the probability analysis consists primarily of a semi-quantitative evaluation of the likelihood of an event occurring. The *Technical Guidance for Hazards Analysis* document (U.S. EPA 1987) identifies the following guidelines as examples for evaluating accident probability:

Low Probability of occurrence considered unlikely during the expected lifetime of the facility, assuming normal operation and maintenance.

Medium Probability of occurrence considered possible during the expected lifetime of the facility.

High Probability of occurrence considered sufficiently high to assume event will occur at least once during the expected lifetime of the facility.

In addition to these qualitative guidelines, FEMA (1993) has also developed five categories in cases where more quantitative information is available on accident frequency:

Common Expected to occur one or more times each year on average.

Likely Expected to occur at least once every 10 years on average according to available statistics.

Reasonably Likely Predicted to occur between once every 10 years and once every 100 years on average.

Unlikely Predicted to occur between once every 100 years and once every 1,000 years on average in a specific locale.

Very Unlikely Predicted to occur less than once in 1,000 years.

Based on the guidelines presented in FEMA (1993), common and likely accidents may be equated to "high"; reasonably likely and unlikely accidents to "medium"; and very unlikely accidents to "low" probability categories, as defined by U.S. EPA (1987).

The following qualitative guidelines are provided by U.S. EPA (1987) as an example to evaluate the severity of consequences:

Low Chemical is expected to move into the surrounding environment in negligible concentrations. Injuries expected only for exposure over extended periods or when individual personal health conditions create complications.

Medium Chemical is expected to move into the surrounding environment in concentrations sufficient to cause serious injuries and/or deaths unless prompt and effective corrective action is taken. Death and/or injuries expected only for exposure over extended periods or when individual personal health conditions create complications.

High Chemical is expected to move into the surrounding environment in concentrations sufficient to cause serious injuries and/or deaths upon exposure. Large numbers of people expected to be affected.

FEMA (1993) presents a four tier system for classifying the consequences of accident scenarios:

Minor Low potential for serious human injuries; no potential for human fatalities; and no need for a formal evacuation, although the public may be cleared from the immediate area of the spill or discharge.

Moderate Up to 100 potential human injuries requiring medical treatment or observation; up to 10 potential human fatalities; or evacuation of up to 2,000 people.

Major Up to several hundred potential human injuries requiring medical treatment or observation; up to 100 potential human fatalities; or evacuation of up to 20,000 people.

Catastrophic More than 300 potential human injuries requiring formal medical treatment; more than 100 potential human fatalities; or evacuation of more than 20,000 people.

Although not explicitly indicated by FEMA (1993), it is reasonable to equate minor accidents to "low"; moderate accidents to "medium"; and major and catastrophic accidents to "high" severity of consequence categories, as defined by U.S. EPA (1987).

The accident scenarios identified for the WTI facility are evaluated to determine whether any have likelihood-consequence rankings of high-high, high-medium, medium-high, or medium-medium. Based on the Technical Guidance document (U.S. EPA 1987), such events should be evaluated to determine whether additional mitigation or emergency response measures are feasible. FEMA (1993) suggests that scenarios with likelihood-consequence ranking of low-high and/or high-low also be included in evaluating emergency planning.

C. Previous Accident Analyses for the WTI Facility

An analysis of the potential off-site consequences of accidents at the WTI facility was previously performed by WTI to address the implications for immediate response actions. The results of this analysis were summarized in a report entitled *Waste Technologies Industries Credible Event Analysis for Emergency Planning*, prepared by SE Technologies, Inc. (1992). The objectives stated in the report are to identify credible accident scenarios, assess their impact in terms of release of hazardous agents into the environment, and identify a maximum credible event that could be used as a reasonable basis for on-site and off-site emergency planning. The WTI *Credible Event Analysis* does not include the preparation of a comprehensive list of all potential accident scenarios, or the calculation of the relative probabilities of various accidents occurring.

The final WTI *Credible Event Analysis* incorporated review comments provided by Ohio State Emergency Management Agency, Ohio Department of Public Health, Ohio Environmental Protection Agency, Columbiana County (Ohio) Local Emergency Planning Committee, and the Emergency Management Agencies of Columbiana County (Ohio), Hancock County (West Virginia), and Beaver County (Pennsylvania). The scenarios used in the final report were selected during a meeting held on January 17, 1992 in Columbus, Ohio between WTI, SE Technologies, Inc., Ohio Environmental Protection Agency, Ohio Department of Public Health, and Ohio Emergency Planning Agency.

The *Credible Event Analysis* evaluates eight accident scenarios. Of the eight scenarios, one (a release of 20,000 lb of ammonia), is no longer relevant to the WTI facility due to a change in proposed facility design and operation. Of the seven remaining scenarios, five are predicted to involve off-site hazards, as summarized in Table I-1. The event determined by WTI to have the greatest potential off-site consequences involves mixing of incompatible wastes, which is predicted to result in possible exceedances of the LOC for chlorine up to 7,000 m downwind. Based on these results, the report concludes that it is prudent to plan

for public protection actions within approximately a 5-mile (8,000 m) radius of the WTI site. While this is not the area over which worst-case accident scenarios would be confined, it is identified as the area most likely to be affected in an extreme credible accident event (SE Technologies 1992).

D. History of Emergency Incidents Reported at Commercial Incineration Facilities in the United States

The U.S. EPA (1995b) has compiled a review of reported emergency incidents at hazardous waste incinerators and commercial treatment, storage and disposal facilities (TSDFs) regulated under the Resource Conservation and Recovery Act (RCRA). Information on incidents that were reported at 11 commercial hazardous incinerators, 10 noncommercial incinerators and 23 other commercial TSDFs between 1977 and May 1995 are presented in U.S. EPA (1995b), and summarized in Tables 1 and 2 of Appendix VII-1. The information included in U.S. EPA (1995b) was compiled by contacting combustion experts and permit writers in each of the 10 U.S. EPA Regional offices, as well as individuals within state regulatory agencies. Since U.S. EPA does not maintain a central data base of information on emergency incidents, some information is based on the recollections of U.S. EPA and State staff. Additional limitations of the study include the lack of information on the reporting period for the individual facilities, and that the information is received in response to a voluntary survey.

In the U.S. EPA (1995b) report, an emergency incident is defined as "a hazardous waste spill, unauthorized release, fire, or explosion." Not all incidents identified in the report resulted in releases of hazardous waste to the environment. Furthermore, many of the incidents reported in U.S. EPA (1995b) occurred before facilities received RCRA permits, and full RCRA safeguards were, therefore, not necessarily in effect. The results of the U.S. EPA (1995b) report are summarized on Table I-2.

A total of 50 emergency incidents, as defined by U.S. EPA, were reported at the hazardous waste incinerators identified in the study. For commercial hazardous waste incinerators only, 24 emergency incidents at 11 facilities were reported, with 10 of these incidents involving a release of hazardous waste. It should be noted that no emergency incidents have been reported at 15 commercial incineration facilities (including WTI), so these facilities were not discussed in U.S. EPA (1995b). The combustion facilities with no reported emergency incidents are included in Table 1 in Appendix VII-1 to facilitate evaluation of emergency incidents relative to the number of facilities operating in the United States.

The total operating time for the 26 commercial incinerators during the time period considered by the study is approximately 250-300 years. This operating time total is likely

to be an underestimate, since no information is available for operations before 1981, and no operating dates were available for two facilities. Based on 10 reported emergency incidents involving hazardous waste over a total of 250-300 years of operation, approximately one emergency incident involving a hazardous waste release has been reported for every 25-30 years of operation for the commercial incinerators. None of the 10 reported incidents involving releases of hazardous waste resulted in a fatality or serious injury in off-site communities, although on-site worker injuries and fatalities have occurred (U.S. EPA 1995b). Based on the lack of fatalities or serious off-site injuries associated with reported accidents at commercial hazardous waste combustion units, the probability of an event having moderate, major or catastrophic consequences (i.e., a release of hazardous waste resulting in serious off-site injuries or fatalities) would be classified as unlikely, or very unlikely over the facility lifetime, using the definitions presented in FEMA (1993). The probability of occurrence of an event having minor consequences (i.e., a release of hazardous waste resulting in minor or no off-site effects) would be classified as reasonably likely over the facility lifetime, according to FEMA (1993).

TABLE I-1
Accident Scenarios Evaluated in the WTI *Credible Event Analysis*[1]

Scenario	Consequence
1. On-site spill of 55 gallons of liquid waste containing 10% methyl acrylate (volatile release).	1. Exceedance of LOC up to 16 meters (m) downwind; no off-site hazard anticipated.
2. On-site spill of 50 gallons of liquid waste containing 40% acrolein (volatile release).	2. Exceedance of LOC up to 900 m downwind.
3. On-site spill of 5,000 gallons of liquid waste containing 85% toluene (volatile release).	3. Exceedance of LOC up to 70 m downwind.
4. On-site spill of 5,000 gallons of liquid waste containing 85% toluene (fire).	4. Damage from explosion of vapor cloud could extend up to 375 m; detonation of fireball could result in an injury zone radius of 190 m and a fatality zone radius of 90 m.
5. On-site spill of 50 gallons of liquid waste containing 20% acetone (volatile release).	5. Exceedance of LOC up to 10 m downwind; no off-site hazard anticipated.
6. On-site mixing of incompatible waste, resulting in 10,000 lb release of chlorine gas over 60 minutes.	6. Exceedance of LOC up to 7,000 m downwind, under early morning inversion conditions.
7. On-site spill of 5,000 gallons of liquid waste containing methyl ethyl ketone (MEK) (volatile release).	7. Exceedance of LOC up to 335 m downwind.
8. On-site release of 20,000 lb. of ammonia over 60 minutes.[2]	8. Exceedance of LOC up to 6,300 m downwind.

Notes:

[1] Source: SE Technologies (1992)

[2] This scenario is no longer relevant to the WTI facility due to a change in facility design and operation.

TABLE I-2

Results of the *Report on Emergency Incidents at Hazardous Waste Incinerators and Commercial Treatment, Storage, and Disposal Facilities (TSDFs)*

	Hazardous Waste Combustion Facilities	Commercial Hazardous Waste Combustion Facilities	Other Commercial TSDFs
Number of Facilities Reporting Incidents[1]	21	11	23
Total Number of Incidents Reported	50	24	48
Number of Incidents Involving a Release of Hazardous Waste to the Environment[2]	21	10	27

Notes:

[1] Count adjusted from U.S. EPA (1995b) because (a) there was a typographical error under Region V, in which there are 5 (not 6) combustion facilities and (b) classification of Rollins Environmental Services in Logan Township, New Jersey, as an incinerator and not a TSDF, per Appendix 1 of U.S. EPA (1995b).

[2] Counts in this row are derived from the summary table in U.S. EPA (1995b), which does not specify the criteria used to classify "a release of hazardous waste to the environment." Based on information provided in U.S. EPA (1995b) probable incidents at combustion facilities were identified; of these, 10 occurred at commercial facilities.

II. IDENTIFICATION OF ACCIDENT SCENARIOS

A. Methodology

A first step in performing the Accident Analysis for the WTI facility is to identify accident scenarios that may have the potential to cause adverse human health effects in the surrounding community. Such scenarios are identified through a general review of the design and operation of the WTI facility, and accident events that have occurred at WTI or comparable U.S. facilities. Given the large number of hypothetical scenarios of potential concern, a subset of accident events is selected for quantitative analysis. These events are chosen to represent general types or classes of accidents that might occur, as identified in FEMA (1993), such as a spill or fire.

This chapter provides an overview of the process used to identify possible accident scenarios, and to select the specific scenarios to evaluate in the Accident Analysis.

B. Initial Identification of Accident Scenarios

The initial identification of accident scenarios involves the following steps:

- A general background review of the facility design and layout, along with information on operating procedures and controls. Available accident data reported at WTI and at facilities comparable to WTI are also reviewed.

- Development of a preliminary list of accident events based on the background review.

- A site visit to the WTI facility by the U.S. EPA Accident Analysis team to confirm information gathered during the background review and observe actual facility operations.

- Analysis of information gathered by the U.S. EPA Accident Analysis work group resulted in refinement of the preliminary list of accident scenarios and identification of events of primary concern.

The general background review of information relevant to accidents at the WTI facility focuses on identifying areas where hazardous materials are transported, received, handled, stored or treated. This involves a review of the permit and permit application for the WTI facility, as well as a review of the facility plot plan. An overview of key accident prevention emergency response features of the design and operation of the WTI facility, as presented in WTI (1982) and WTI (1992), is provided below.

Fires and releases at the WTI facility are detected, monitored and controlled through a computerized system that is run by the operator in the control room. Through a control panel, the operator is able to monitor all process areas, thus assuring that they are functioning normally. The operator is able to shut down facility processes and equipment, including the electrical, heating, ventilation, air conditioning and exhaust systems, should a problem arise. The facility was designed for orderly shutdownin the event of an equipment failure or power outage. An emergency power generator is designed to provide electricity for electrical motors, emergency lighting, pumps, instruments, and controls essential to safe plant operation.

According to WTI, the WTI facility was designed so that potential on-site spills would be contained by a combination of sumps, drainage trenches, dikes, walls, curbs, speed bumps, ramps, berms, and other contour features. Table II-1 presents a partial list of passive mitigation features in place at the WTI facility. In the event of a spill, inert or absorbent materials will reportedly be placed in the path of the release to confine the release to as small an area as possible. Materials and equipment that come in contact with waste have been selected to withstand chemical and physical attack. Material thicknesses equal to or exceeding the minimum required industry standards or codes have been specified to provide protection against both corrosion and erosion. Concrete surfaces have been covered or treated, where appropriate, to resist chemical attack. Incompatible wastes are segregated into separate containment areas.

Where possible, piping is visible and easily accessible. Visual inspections are conducted by WTI personnel at least once per day for the tanks and blending vessels, ventilation and exhaust systems; instruments and controls; surfaces and sumps in the unloading, loading, and sampling areas; processing and treatment areas; and paved and concrete surfaces. Inspections of pumps and fans; electrical motors; and the emergency electric power generator are conducted at least once per week. Additionally, more extensive inspection procedures are conducted on a regular basis.

All buildings where hazardous waste is handled are protected by automatic fire suppression systems designed to extinguish fires and keep fires from spreading. For certain buildings or areas, this includes a foam system which is generally regarded as effective in extinguishing and preventing the re-ignition of a wide variety of chemical fires. These

systems are reportedly designed, constructed, equipped, and installed according to all applicable codes and regulations, including those promulgated by the National Fire Protection Association (NFPA), Factory Mutual, the Ohio Fire Code, and the Ohio Basic Building Code. In addition, fire suppression systems have been inspected and certified by the East Liverpool Fire Department. Alarms on the fire monitor are triggered automatically whenever one of the automatic sprinkler systems is activated or manually when one of the fire alarm boxes located throughout the plant is activated.

Temperature, pressure, and fluid level data are available in the control room for each enclosed tank, including the wastewater tanks and process water holding tanks. When pre-set limits are reached, visual and audible alarms in the control room will signal the operator that a problem exists. In the case of a vessel or a tank being filled with a pump, the fluid level control device will automatically deactivate the pump and close the intake valve whenever a high level is indicated. Combustible gas detectors are present in sumps in the organic waste tank farm to detect flammable vapors and thereby alert the operator to the potential for a fire.

In addition to an assessment of the facility design and operation, the background review includes an evaluation of the following:

- reported equipment and procedural failures at the WTI facility between June 1993 and February 1995, as summarized in Table 3 of Appendix VII-1 (Victorine 1995d).

- scenarios described in two accident analyses previously performed for the WTI facility — *Credible Event Analysis for Emergency Planning* (SE Technologies 1992) and WTI's *Emergency Plan Exercise* (Von Roll 1993).

- reported incidents at hazardous waste incinerators and treatment, storage and disposal facilities (TSDFs) in the United States, as compiled by U.S. EPA (1995b). These incidents, which are summarized in Table 3 of Appendix VII-1, tend to be relatively high frequency, low consequence events — primarily minor explosions in incineration and air pollution control equipment. None of the incidents reported in U.S. EPA (1995b) resulted in serious injuries or fatalities off-site, although serious injuries and fatalities have occurred among on-site workers. The results of the U.S. EPA (1995b) study were confirmed through a review of incidents reported at TSDFs in the U.S. EPA *Accident Release Inventory Program* (ARIP) data base, which summarizes information on releases which occurred from 1987 to early 1993 (Chung 1995).

Based on the background review, a preliminary list of conservative on-site and off-site candidate scenarios is developed for consideration in the WTI analysis (Table II-2). Many of the scenarios are very similar, differing only in the location of the accident and the quantities of the chemicals involved. The potential accident scenarios for the WTI facility identified in Table II-2 can be grouped into the following general categories:

- Spill or leak of liquid waste, followed by:
  - — evaporation and atmospheric dispersion of hazardous constituents; or
  - — fire with entrainment and dispersion of hazardous constituents, generation and dispersion of hazardous products of combustion or incomplete combustion, or boiling, vaporization and dispersion of hazardous constituents in close proximity to the fire.

- Mixing of incompatible wastes, followed by:
  - — venting and dispersion of gaseous reaction products; or
  - — bursting of tank or pipe and release of liquid waste.

- Explosion of tank or pipe (hydraulic or thermal over-pressure) with release of liquid wastes.

- Failure of the air pollution control equipment.

- Release and dispersion of hazardous substances from incinerator due to a leak, explosion or component failure.

- Transportation accidents, followed by a spill or leak.

Scenarios that involve fires or rapid gas generation may also involve explosions, depending on the nature of the accident and waste.

Following the background review, these scenarios were further refined based on site specific information resulting from a site visit by members of the U.S. EPA accident analysis work group. Participating work group members included representatives of U.S. EPA Region 5, the Office of Solid Waste and Emergency Response (OSWER) and the Chemical Emergency Preparedness and Prevention Office (CEPPO). The primary objective of the site visit was to examine potential accident scenarios in the context of the WTI facility location, layout and operational practices.

Based on existing guidance, the review of accidents reported at WTI and comparable facilities, a review of the design and operation of the WTI facility, the site visit, and subsequent discussions within the U.S. EPA Accident Analysis team, the following general scenarios are considered to be of primary concern:

- On-site spill
- On-site fire
- On-site mixing of incompatible wastes
- Off-site tanker truck spill
- Off-site tanker truck spill with fire

The criteria used in selecting these general scenarios are: 1) potential for significant off-site consequences, and 2) potential for occurring during the expected operating life of the facility (30 years), based on available data. The on-site scenarios selected for the Accident Analysis (spill, fire, and mixing of incompatible waste) are consistent with those evaluated in the WTI *Credible Event Analysis* (SE Technologies 1992). However, an ammonia release evaluated by SE Technologies (1992) is no longer relevant due to changes in the proposed design and operation of the WTI facility. Furthermore, the Accident Analysis examined several off-site scenarios not included in the *Credible Event Analysis*.

Possible off-site impacts due to upset conditions and accidents occurring inside the incinerator are judged to be of lesser concern than other types of facility accidents, based on a review of the consequences of accidents which have been reported at hazardous waste facilities (U.S. EPA 1995b) and other industrial facilities. The consequences of these types of events relative to accidents involving waste storage, handling or transport are typically lower, primarily because the quantity of waste being processed by the incinerator at any one time is much less than the quantities that are stored, handled or transported. As a result, accidents involving the storage, handling and transport of wastes would be expected to have more severe off-site consequences than accidents directly involving the incinerator.

In assessing off-site accidents, this analysis considers waste transport through the local community. Although it is theoretically possible in the future for wastes to be received by the WTI facility via truck or rail, local waste transport currently occurs by truck. Transport via barge does not occur within the vicinity of the facility, and there are no plans for barge transport in the future. Rail transport represents a future option for the WTI facility, but plans remain at the concept stage. Thus, the Accident Analysis evaluates the potential effects of truck accidents only.

Specific accident events from Table II-2 within each of the five general scenario categories are evaluated. Because many of the events within each general scenario category

are similar in nature, a single conservative site-specific event within each category is selected for quantitative evaluation. A more "typical" event, i.e., one with a higher likelihood of occurrence than the conservative event, was also selected within each category. The five conservative events and five typical events selected for quantitative evaluation and the criteria for their selection are discussed below.

C. Selection of Accident Scenarios for Quantitative Consequence Evaluation

1. On-Site Spill

Spills could be caused by numerous situations, including leaks from drums that are not in good condition or are damaged; leaks from improperly packaged containers; releases from tanks due to overfilling, faulty transfer lines or structural defects; releases of the contents of tanker and trailer trucks from leaks or ruptures resulting from an on-site accident; and releases caused by catastrophic events, such as a tornado. On-site spills have been reported by U.S. EPA (1995b) at several commercial hazardous waste TSDFs. Examples of some larger spills that have occurred include the following:

- In 1982, at the Laidlaw incineration facility in Roebuck, South Carolina, 3,000-gallons of solvent spilled from a corroded pipe. A 6,000-gallon spill of maleic anhydride from a storage tank was reported to have occurred at the same facility in 1988.

- In 1985, at the CP Chemicals TSDF in Sumter, South Carolina, storage tank valves reportedly were left open intentionally by two facility workers (both of whom were later arrested), releasing 2,200 gallons of ammonia and 2,000 gallons of HCl.

- In 1989, a transfer line failure resulted in a 9,600-gallon spill of wastewater with solvents at the Oil and Solvent Process Company TSDF in Azusa, California. A transfer line failure also reportedly resulted in a 30,000-gallon spill of wastewater containing wood treating waste at the International Paper TSDF in Joplin, Missouri in 1992.

At the WTI facility, a total of five spills of waste, all less than 20 gallons have been reported since operations began in June 1993 (see Table 3 of Appendix VII-1).

Spills that occur on-site may result in the formation of a liquid pool, the areal extent and depth of which depends on the release rate and duration, as well as the presence of any containment barriers (e.g., dikes, speed bumps, building walls, etc.) in the spill vicinity. If no containment barriers are present to limit the areal extent of the pool, it can be assumed that the spill will spread to an area with a thickness of approximately 1 cm (U.S. EPA 1987; Moorhouse and Carpenter 1986). Following the release, evaporation of the pool could result in off-site exposure to the spilled chemicals. The evaporation rate of chemicals from a liquid pool is determined primarily by the rate of mass transfer as air flows over the surface of the pool. The mass transfer rate is, in turn, determined largely by the wind speed, the vapor pressure of the spilled material and the surface area of the pool.

Spills could occur at the WTI facility during waste handling, transfer and storage. The WTI facility can store approximately 800,000 gallons of liquid waste in two main permitted storage areas: 1) the Organic Waste Tank Farm, and 2) the Container Processing Building (WTI 1992). The Container Holding Area is allowed to store only solid wastes.

Consistent with the objective of this analysis to evaluate credible events that are expected to result in the most potentially significant off-site consequences, three conservative accident types are considered for quantitative analysis:

- A major spill within the indoor drum storage area of the Container Processing Building. The total capacity of the area is approximately 500,000 gallons of liquid waste in drums. This corresponds to approximately 9,000 55-gallon drums, which are stored in twelve separate rows and placed in racks with three vertical levels. The Container Processing Building is divided into two sections, each having a secondary containment capacity that exceeds 10%, i.e., one-tenth, of the maximum volume of waste that can be accumulated in that area.

- A major spill in the indoor Organic Waste Tank Farm storage area. There is a total capacity of approximately 300,000 gallons of waste in the 16 large tanks in this building, as well as a 20,000-gallon fuel tank. The Organic Waste Tank Farm is divided into four sections, each having a secondary containment capacity that exceeds the volume of the largest tank in that area.

- A major spill outdoors due to an accident involving one full tanker truck, with a capacity of 5,000 gallons of liquid waste. Locations where such an accident could occur include the Truck Holding and Sampling Area, the Truck Unloading

Station, and the paved area between the Truck Unloading Station and the Truck Holding and Sampling Area (see Figure II-1).

Of these three conservative events, the outdoor spill involving a tanker truck in the Truck Unloading Station is selected for quantitative evaluation in the Accident Analysis. This event is selected for the following reasons:

- All three events could involve a spill of large quantities of liquid waste. The composition of the waste could also be the same in each event. While the two indoor scenarios could conceivably result in larger volumes of spilled material, the areas of the spills (and thus the hazardous waste constituent emission rates) would be largely constrained by berms. For example, the Organic Waste Tank Farm is divided into four containment areas of approximately 180 m^2 each. An outdoor spill from a tanker truck potentially could spread and cover a maximum area of approximately 418 m^2 due to the containment barriers. Thus, the area of an outdoor spill, depending on its location, could be significantly larger than the area of an indoor spill.

- For indoor spills that do not exceed the secondary containment capacities, atmospheric emissions will occur primarily via volatilization. Such volatilization would be reduced relative to outdoor spills due to lower air flow rates over the surface of the pool. Furthermore, a significant portion of the releases from an indoor spill would be expected to be contained within the building. Because of this, outdoor spills are expected to have a greater potential for substantial off-site impacts.

- A very large spill in the Container Processing Building or the Organic Waste Tank Farm could possibly spill over the containment barriers, leading to a larger pool area. However, it is unlikely that such pools would be larger than the pool size (418 m^2) estimated for the outdoor tanker truck spill. Although the containment volume for each building is smaller than the maximum storage capacity, the containment volumes should be sufficient for containing spills most likely to occur.

It should be emphasized that the event selected to evaluate the potential off-site impacts of an on-site spill is judged to represent a "worst case" scenario. Thus, other on-site spills, such as a leak from a transfer line, would be expected to have lower off-

site consequences. To evaluate the potential off-site health effects associated with a more "typical" accident scenario, an on-site spill of 100 gallons of liquid waste is also evaluated. The spill volume of 100 gallons is selected based on the review of reported incidents at the WTI facility (the largest spill reported at WTI from June 1993 to February 1995 was approximately 20 gallons), and data from the U.S. DOT (1995). According to U.S. DOT (1995), the average spill of liquid hazardous materials accidentally released during highway transportation was 120 gallons for the 10 year period ending in 1994, and 80 gallons for the 5 year period ending in 1994, indicating that 100 gallons is a reasonable estimate of the size of a typical spill. For the purposes of this assessment, the typical 100-gallon spill is also assumed to occur near the Truck Unloading Station.

In this Accident Analysis, both conservative and typical scenarios are evaluated assuming no active mitigation. In finalizing its proposed rule regarding accidental release prevention requirements (USEPA 1995a), U.S. EPA is considering incorporating effects of passive mitigation systems, but not active mitigation systems, into the worst-case release scenario, if such systems are capable of withstanding destructive events (e.g., fires, explosions, floods, hurricanes and earthquakes). Passive systems would include dikes, catch basins, and drains for liquids, and enclosures for both liquids and gases. Scenarios involving passive mitigation systems that have connections to the environment (such as a rainwater drain valve) would have to assume failure of that connection. In the WTI Accident Analysis, passive systems capable of withstanding destructive events are included in evaluating the no active mitigation scenarios.

In Chapter VII (Uncertainties), a separate evaluation of the potential effect of active mitigation is also assessed. Two mitigation scenarios are evaluated:

- All releases are effectively mitigated within 10 minutes. This mitigation time is conservative for smaller spills and in situations where automatic systems are in place (e.g., foams for fire suppression). However, as discussed in Chapter VII, mitigation of larger spills or accidents may require more than 10 minutes.

- All releases are effectively mitigated in one hour. This mitigation time may be appropriate for high volume spills and in situations where automatic mitigation systems are not in place. Based on a detailed review of emergency response procedures, one hour was determined to be the approximate mitigation time for two major accident scenarios evaluated in WTI's *Emergency Exercise Plan* (Von Roll 1993).

Chapter VII also presents an assessment of the impact of a failure of passive mitigation devices (e.g,. dikes and berms) in the case of a large on-site spill.

2. On-Site Fire

Several events, including an on-site spill, could cause a fire if an ignition source is present. Such a fire could result in the increased volatilization of waste constituents, as well as the formation of combustion products of concern, particularly when wastes containing nitrogen, sulfur or halogens (e.g., chlorine or bromine) are burned. While complete combustion typically results in the formation of relatively simple compounds such as carbon dioxide (CO_2), water (H_2O), nitrogen oxides (NO_x), sulfur dioxide (SO_2) and hydrogen chloride (HCl), other more complex substances may also be produced as a result of incomplete combustion. The types of substances formed will depend on a number of factors, including the chemical makeup of the waste, the combustion temperature, and the extent of mixing with air. In addition to the release of these products of combustion and incomplete combustion, heat effects from the fire could cause the contents of nearby storage tanks to boil.

For a fire scenario, the most significant parameters for determining off-site consequences are the types and quantities of the chemicals ignited, and the location of the fire. Based on a review of U.S. EPA (1995b), most fires and explosions at hazardous waste incineration facilities have been associated with operations of the combustion system. The more frequently reported events include steam explosions resulting from molten slag dropping into the ash quench, and fires and explosions in the air pollution control equipment. These incidents have not been reported to have had off-site human health effects (U.S. EPA 1995b). Additionally, the consequences of incidents of this type are expected to be limited by the small amount of waste present at any one time in these locations.

A fire with greater potential for causing adverse effects in the off-site community was recently reported at the ThermalKem hazardous waste incinerator in South Carolina (U.S. EPA 1995b). In January 1995, almost 1,900 30-gallon fiber drums possibly containing hazardous and nonhazardous waste caught fire and burned, causing extensive damage and one minor injury to an on-site employee. The fire started in two fiber drums containing nonhazardous molybdenum wastes that had been rendered reactive due to mixing with wood flour during shredding. All fire-fighting water was contained, no explosions occurred, and no off-site releases occurred above reportable quantities.

A significantly smaller fire was reported at the WTI facility in February 1995 (see Table 3 of Appendix VII-1). According to facility records, bulk solid waste in a clamshell used to feed bulk solids into the incinerator caught fire. The sprinkler system

was activated, extinguishing the fire within approximately one minute. Damage reportedly was limited to the crane bucket wires, cables and insulation in the immediate area.

WTI reported a second, similar, waste-related fire on July 3, 1995. This time, the fire occurred in one of the two bulk solid waste pits. The automatic water deluge system extinguished this fire quickly, and only minor damage (mostly to the loading door for the pit) was reported. Although the exact cause of this minor fire is unclear, it has been hypothesized that a burning piece of waste somehow escaped the double doors of the incinerator feed chute and either floated through the air back to the waste pit or was carried back to the waste pit via the clamshell bucket. WTI has made changes to operating procedures, equipment, and control logic in response to this event (Victorine 1995c).

Automatic fire protection systems are in place at various locations across the WTI facility, to allow quick response to fires such as those which occurred in February and July of 1995. A summary of the WTI fire protection systems, as reported by Von Roll (1994), is presented in Table II-3. Details regarding the fire protection systems are provided in Von Roll (1994).

For the WTI Accident Analysis, the conservative on-site fire event selected for quantitative evaluation involves a storage tank rupture in the Organic Waste Tank Farm followed by ignition. It is assumed that a 20,000-gallon tank ruptures, emptying its contents into the diked area, which has an area of approximately 180 m^2. With the pool size defined by this diked area, the pool depth is estimated to be 0.42 m, using the methodology outlined in Appendix VII-3. It is assumed that the waste is ignited by an undefined source, such as a spark, generating products of combustion. The primary reason for selecting this indoor fire scenario is the volume of the wastes involved. The storage tanks in the Organic Waste Tank Farm have the largest on-site storage capacity for a single container. The quantities involved in a spill from one of these tanks, followed by ignition, would be expected to result in a more prolonged fire than a spill from any other on-site containers.

In the "typical" on-site scenario, a fire involving 200 gallons of waste is assumed to ignite outdoors on a paved area near the center of the facility, generating products of combustion. This is approximately the equivalent of four 55-gallon drums, and roughly twice the size of a typical transportation spill for the ten-year period ending in 1994, according to U.S. DOT (1995).

As in the on-site spill scenario, the consequences of an on-site fire are evaluated assuming no active mitigation to limit duration of emissions. An evaluation of the

impact of active mitigation measures on the consequences of the accident scenarios described is presented in Chapter VII.

3. On-Site Mixing of Incompatible Wastes

Wastes containing certain chemicals may react when mixed, resulting in a variety of adverse consequences, including the generation of flammable or toxic gases, fires or explosions, or heat effects. Wastes which react to produce such adverse effects are sometimes referred to as "incompatible" wastes. The specific outcome of mixing incompatible wastes depends upon the concentrations and volumes of the reactants, the rate of reaction, the type of vessel in which the reaction occurs, and the presence or absence of mitigation devices. Among these possible consequences, the generation of a gaseous toxic reaction product (e.g., HCl or Cl_2) can affect the largest off-site area because the chemicals can be carried considerable distances downwind. For example, the release and off-site migration of toxic and corrosive fumes such as HCl, phosgene and other gaseous halogenated compounds can occur if halogenated hydrocarbons are mixed with mineral acids (oxidizing or nonoxidizing), amines (aliphatic or aromatic), or strong oxidizing agents (Sax and Lewis 1989; ASTM 1986; Bretherick 1985).

Under the Resource Conservation and Recovery Act (RCRA), incompatible wastes must be segregated, reducing the potential for accidents (40 CFR 264.172). Despite such precautions, a few incidents that may have been caused by mixing of incompatible wastes at commercial hazardous waste treatment facilities have been reported (U.S. EPA 1995b). At the TWI hazardous waste incinerator in Sauget, Illinois, in 1990, mixing of incompatible wastes is believed to have caused the contents of a blending tank to boil over, releasing a plume of chlorinated gas. No off-site effects were reported in the TSDF incident study (U.S. EPA 1995b). At the Washington Chemical Facility in the State of Washington, mixing of incompatible wastes in a drum reportedly caused an explosion, propelling the drum through the air and resulting in the release of waste material. Minor property damage occurred but no on-site or off-site injuries were reported.

Mixing of incompatible wastes is a known hazard and, due to this concern, procedures have been established at the WTI facility to reduce the potential for such an event to occur. For example, incompatible wastes must be segregated as required under RCRA (40 CFR 264.172). This Accident Analysis, however, assumes that an accident or unforeseen circumstance occurs, or there is a failure to follow the established accident prevention procedures, and incompatible wastes are thus allowed to mix. Locations where inadvertent mixing of incompatible wastes is most likely to occur at the WTI facility are the Truck Unloading Stations, Organic Waste Tank Farm and Container

Processing Facility (extruder, pump-out tanks). Other possible scenarios include a release of vapors during truck sampling (if a shipper mixed incompatible wastes, thereby generating vapors within the truck during transport) and an on-site two truck accident involving the release of incompatible materials from the two trucks and subsequent mixing of the materials.

In storage areas where separate tanks of wastes are stored under a common roof (i.e., Organic Waste Tank Farm and Container Processing Facility), incompatible wastes are stored in separate areas, and permanent containment barriers are in place to reduce the potential for mixing of incompatible wastes in the event of a spill. Situations where mixing of incompatible materials might occur in these storage areas would thus likely involve the misidentification or improper storage of incompatible wastes.For example, if two tanks having a common containment barrier were to leak, mixing of incompatible wastes could occur, but only if the operator failed to follow the standard practice of storing incompatible wastes in separate areas. Similarly, a misidentified waste could be accidently pumped into a storage vessel already containing an incompatible material.

For the WTI analysis, two possibilities for on-site mixing of incompatible wastes are considered for quantitative evaluation:

- An on-site collision between two tanker trucks, each containing 5,000 gallons of different wastes that are incompatible, resulting in toxic gases being released to the atmosphere.

- The inadvertent addition of 5,000 gallons of waste from a tanker into a 20,000 gallon Organic Waste Tank Farm storage tank containing 5,000 gallons of an incompatible material, resulting in an incompatible mixture and the release of toxic gases.

Between these two events, the scenario involving inadvertent mixing in the storage tank is selected for quantitative evaluation because it is highly unlikely that complete mixing of incompatible wastes from two tanker trucks would occur on-site due to the low volume of on-site traffic and the low speed restriction at the facility. Pumping of a potentially incompatible waste from a tanker truck to the wrong storage vessel is representative of accidents which could occur because of sampling/analysis uncertainty or error, operator error, or other circumstances believed to have a higher probability of occurrence than the collision of two tanker trucks.

In addition to the conservative scenario described above, a more "typical" scenario involving the mixing of incompatible wastes is evaluated. In the typical scenario, a total

of 200 gallons of incompatible wastes are mixed together outdoors near the center of the WTI facility, resulting in the generation of toxic gases. The 200-gallon volume corresponds to the approximate volume of four 55-gallon drums.

In the Accident Analysis both conservative and typical scenarios are evaluated assuming no active mitigation, although active mitigation measures are available at the WTI facility. A separate evaluation of the potential effect of active mitigation is assessed and presented in Chapter VII.

4. Off-Site Tanker Truck Spill

Off-site spill scenarios involve the release of the contents, or a portion of the contents, of a tanker truck. Collisions, which could result in the release of a majority of the contents of the tanker in a single location, would generally be expected to have the greatest potential for adverse consequences in the community.

The U.S. DOT maintains a database entitled Hazardous Materials Information System (HMIS) regarding accidents during the transport of both hazardous wastes and hazardous materials (e.g., gasoline, process chemicals). A review of data between 1984 and 1993 indicates that during that 10-year period, there were 1,959 transportation incidents involving hazardous waste on highways in the U.S., resulting in 143 reported injuries and one reported fatality (U.S. DOT 1995). By comparison, during the same ten year period, there were 63,577 highway transportation incidents involving hazardous materials, resulting in 2,781 reported injuries and 115 reported fatalities (U.S. DOT 1995).

In the WTI Accident Analysis, the subpopulation that is most likely to be adversely affected by an off-site accident would be individuals who live or work along the local access route. In the East Liverpool area, trucks transporting waste to the facility are expected to travel along Pennsylvania Avenue (Route 39), a two-lane city street that serves as the main thoroughfare for East Liverpool. Residences and commercial establishments are located along this portion of the route, immediately adjacent to the roadway. Approximately one-half mile from the facility, trucks turn to the south along Virginia Avenue, a two-lane residential street with houses located within 20 feet of the street. A street light and gas station are located at the intersection of Virginia and Pennsylvania Avenues. Trucks travel approximately three blocks along Virginia Avenue, cross a set of railroad tracks, and proceed to the facility gate. A map of the local access route is shown on a topographic map in Figure II-2. This topographic map was rendered prior to construction of the WTI facility, and thus depicts tanks at the current site of the WTI facility.

For the purposes of the WTI Accident Analysis, a spill on a local access road near the facility is assumed for the conservative off-site spill scenario. For this scenario category, a 5,000-gallon tanker is assumed to rupture, releasing its entire contents. According to U.S. DOT data covering the period from 1971 through 1986, as shown in Table II-4, approximately 95% of all spills involving full-size tankers were less than 5,000 gallons (U.S. DOT 1986). Furthermore, FEMA (1993) estimates that about 20% of all spills would involve loss of the entire tanker contents. The pool is assumed to spread in all directions at an equal rate, with liquids reaching the edge of the road running off onto soil or into a ditch. Assuming the road on which the spill occurs is flat and has no curbs capable of acting as a containment barrier, the liquid pool is assumed to reach a maximum length and area defined by the width of the road and a 1 cm pool depth. In reality, the road is likely to be sloped from the center line to the sides, reducing the spill area; thus the assumption of a non-sloped road surface is believed to be conservative and tends to overestimate potential off-site consequences. The location assumed for the spill is shown in Figure II-3.

In addition to a spill onto the roadway, a spill into surface water is also theoretically possible. For example, a collision on the Route 30 Bridge might possibly lead to a spill into the Ohio River. In the event of a spill into surface water, chemicals in the waste may either: 1) float; 2) sink; or 3) mix with the water. The greatest potential for acute human exposures would involve inhalation of volatilizing chemicals that are floating on, or mixed in, the water. Other potential pathways (such as fishing or drinking water ingestion) might represent potential longer-term exposure routes, if remediation were not undertaken, but would be less likely than inhalation to pose an acute risk. Short-term exposures associated with a spill into surface water will not be quantified in the Accident Analysis because the potential resulting acute impacts are judged to be less significant than the impacts from a spill onto the road, for the following reasons:

- A spill into surface water is less likely to occur than a spill onto the roadway.

- Chemical mixing with the water, or sinking below the surface of the water, would reduce emission rates relative to a spill onto the road.

- Potential human receptors are likely to be closer to a spill on the roadway than to one into surface water, and thus receive higher levels of exposure as a result of a roadway spill.

Potential adverse ecological effects associated with a spill into surface water are not evaluated in this analysis. Although the ecological consequences of a spill into surface water could possibly be significant, the probability of occurrence of such an event is judged to be very low based on the accident frequency data from U.S. DOT (1995) and the relatively short distance travelled over surface water.

In the "typical" off-site accident scenario, a spill of 100 gallons is assumed. As previously discussed, a 100 gallon spill can be considered typical based on data reported by U.S. DOT (1995). The location of the spill is assumed to be the same in the typical scenario as in the conservative scenario.

5. Off-Site Tanker Truck Spill with Fire

If an ignition source is present at the time of the off-site tanker truck spill described above, a fire could occur. U.S. DOT (1995) does not identify the number of hazardous waste or hazardous material transportation incidents involving fire. Therefore, it is not known what percentage of the 1,959 incidents between 1984 and 1993 involved fire.

In the WTI Accident Analysis, 5,000 and 100-gallon spills are considered for the conservative and typical off-site spill with fire scenarios, respectively. The rationale for selecting these volumes is the same as the rationale for the volumes used in the off-site spill scenarios. Emissions were assumed to consist of the same types of products of combustion and incomplete combustion as those evaluated in the on-site fire scenario.

As in the off-site spill scenario, no mitigation or emergency response is assumed which could limit emissions.

D. Summary of Results and Key Assumptions

As shown on Table II-5, the scenarios selected for quantitative evaluation in the Accident Analysis are an on-site spill, an on-site fire, on-site mixing of incompatible wastes, an off-site spill and an off-site fire.

Major assumptions made in the identification of accident scenarios are summarized in Table II-6.

TABLE II-1
Partial List of Passive Mitigation Features at the WTI Facility[1]

Source	Type of Containment or Diversionary Structures
Organic waste reception tanks	Contoured surfaces and reinforced concrete dikes and sumps
Organic waste holding tanks	Contoured surfaces and reinforced concrete dikes and sumps
Organic waste sludge tanks	Contoured surfaces and reinforced concrete dikes and sumps
Organic waste blending tanks	Contoured surfaces and reinforced concrete dikes and sumps
Tank truck unloading stations	Contoured surfaces, speed bumps, curbs, building walls, reinforced concrete and sumps
Truck unloading docks - Drum Processing Building.	Contoured surfaces, speed bumps, curbs, building walls and reinforced concrete drainage trenches and sump
Container holding rooms or areas	Contoured surfaces and reinforced concrete dikes and sumps
Container processing areas	Contoured surfaces and reinforced concrete dikes and sumps
Drum Extruder Area	Contoured surfaces and reinforced concrete dikes and sumps
Drum pumpout tank	Reinforced concrete dikes and sumps
Drum staging area	Contoured surfaces and reinforced concrete curbs and sumps
Short-term containerized staging areas	Contoured surfaces and reinforced concrete curbs and sump
Scrubber water holding tanks	Contoured surfaces and reinforced concrete dikes and sump
Exterior truck wash	Contoured surfaces and reinforced concrete curbs and sump
Storm water tanks	Contoured surfaces and reinforced concrete dikes and sumps
Caustic tank	Contoured surfaces and reinforced concrete dikes and sump
Scrubber	Contoured surfaces and reinforced concrete dikes and sump
Fuel oil tank	Contoured surfaces and reinforced concrete dikes and sumps
Diesel generator day-tank	Contoured surfaces and reinforced concrete sump
Fire pump No. 1 day-tank	Reinforced concrete dike
Fire pump No. 2 day-tank	Reinforced concrete dike

Note:

[1] Source: WTI 1992.

TABLE II-2
Preliminary List of Potential Accident Scenarios at WTI

Location	Accident Scenario	Assumptions/Considerations
Off-site Transportation	• Tanker/Drum Truck — Spill onto roadway (evaporation) — Spill onto roadway (fire) — Spill into Ohio River	• Transportation routes within a 5-mile radius of WTI facility will be evaluated • River barge not considered as a transport option • Tank truck volume assumed to be 5,000 gallons • Trailer truck capacity assumed to be 80 55-gallon drums • Transported wastes are similar to WTI waste profile for first year of operation
Truck Holding and Sampling Area	• Tanker truck rupture (evaporation) • Tanker truck rupture (fire) • Incompatible wastes in tanker (vapor release upon opening)	• 60'×96' (60 ft by 96 ft) area • Tank truck volume assumed to be 5,000 gallons • 6" (6 inch) curbs and speed bumps (connected) and paved surface sloped toward a reinforced concrete sump. Containment capacity is 31,000 gallons.

TABLE II-2
Preliminary List of Potential Accident Scenarios at WTI

Location	Accident Scenario	Assumptions/Considerations
Truck Unloading Stations (drum and bulk)	• Drum Scenarios — Spill from pallet of drums during transfer (evaporation) — Truck of drums catches fire — Spill of truck load of drums — Release from leaking drums within trailer • Bulk Pumpable Scenarios — Spill from tanker truck (evaporation) — Spill from tanker truck (fire) — Failure of transfer lines/hoses — Overflow due to improper unloading — Mixing of incompatible wastes — Collision of trucks — Release of combined contents of truck and tank due to siphoning • Solids Scenarios	• 60'×75' area • A combination of 7½" high speed bumps, 8" high curbs, and building walls surround each of three unloading stations. Paved surface in each unloading station sloped toward concrete sump. Containment capacity in each unloading station is 10,000 gallons.

TABLE II-2
Preliminary List of Potential Accident Scenarios at WTI

Location	Accident Scenario	Assumptions/Considerations
Organic Waste Tank Farm	• Tank spill (multiple/single) • Fire (multiple/single) • Fire with boil-off • Ventilation fan failure • Mixing of incompatible wastes	• 52'×162' area • Storage capacity is 300,000 gallons • Tank farm divided into two groups of tanks by a reinforced concrete aisle, which acts as a common containment curb. Entire combined containment area surrounded by an exterior dike wall; surface in each containment area sloped toward two concrete sumps. Capacity of each containment area is 21,500 gallons.
Drum/Container Storage Area (Container Processing Facility)	• Multiple drum spill • Fire (maximum number of drums) • Ventilation fan failure	• 100'×210' area • Storage capacity of entire Container Processing Facility is 500,000 gallons • Storage area divided into two areas by a reinforced concrete aisle, which acts as a common containment curb. The entire combined containment area is surrounded on three sides by an exterior wall and on the fourth side by a curbed fire wall with three doors having 1½" high speed bumps. The surface in each containment area is sloped toward a concrete sump. Capacity of each containment area is 20,000 gallons.

TABLE II-2
Preliminary List of Potential Accident Scenarios at WTI

Location	Accident Scenario	Assumptions/Considerations
Drum Processing/Extruder (Container Processing Facility)	• Drum Processing — Drum spill — Vapor release — Transfer line failure — Ventilation fan failure • Extruder — Drum spill — Mixing of incompatible wastes — Explosion in hydropulper • Pump-Out Tanks — Mixing of incompatible wastes	• 100'×237' area • Storage capacity of entire Container Processing Facility is 500,000 gallons • Drum processing area surrounded by 6" high concrete curb with 1½" high speed bumps at the three interior doors to the storage area and at the unloading platform. All other exterior doors for the area have either a 6" high concrete sill or speed bump. The floor is sloped towards three concrete sumps. Containment capacity is 50,000 gallons. • Drum extruder area surrounded by a 6" high concrete curb. The floor is sloped toward a concrete sump. Containment capacity is 9,000 gallons. • Outdoor tanks area contains three pump-out tanks and one sludge reception tank. The capacity of the pumpout tanks is 2,500 gallons; the capacity of the sludge reception tank is 7,000 gallons. Area surrounded by a 16" high concrete containment wall. Surface is sloped toward a concrete sump. Containment capacity is 11,000 gallons. • Total containment capacity is 70,000 gallons.

TABLE II-2
Preliminary List of Potential Accident Scenarios at WTI

Location	Accident Scenario	Assumptions/Considerations
Incinerator Feed Building	• Fire in containerized waste area • Fire in feed chute	• 61' × 55' area • Stores approximately 500 cubic yards of bulk solids.
Incinerator Train (e.g., kiln, secondary combustion chamber [SCC], air pollution control equipment)	• Explosion in kiln • Steam explosion in quench water • Release due to power failure • Failure of air pollution control equipment — Acid gas release — Non-combusted waste release — Particulates release • Boiler explosion • Failure of ID fan	• 6" curb and/or speed bumps run along the outer edge of the incinerator area that is not bordered by the Feed Building, the Steam Plant Building, the Scrubber Building, and the Caustic Tank Containment walls. Paved surfaces inside the curbs are sloped toward either the incinerator train storm water sump, the spray dryer sump, or the slag quench tank sump. Containment capacity is 176,000 gallons.
Steam Plant Building	• Explosion	• 50' × 80' area • No hazardous materials released.
Wastewater Treatment Building and Collection Tank Area	• Release of wastewater • Vapor release	• 35' × 48' building with 46.5' × 202' collection tank area (5 tanks) • Tanks are surrounded by a 6' 8" high concrete containment wall. An intermediate concrete wall 3" lower than the surrounding walls separates the tanks into two groups. Total containment capacity is 290,000 gallons.
Analytical Lab	• Fire • Release from lab collection tank	• Located within 100' × 120' Administration Building

TABLE II-3 WTI Fire Protection Systems	
Facility Area	**Fire Protection System**
Administration	Wet System
Laboratory	Wet System and Halon 1301 System
Maintenance Building	Wet System
Steam Plant	Wet System
Utility Bridge	Water Deluge
Incinerator Feed Building	Water Deluge
Container Holding Area	Dry System
Truck Holding Area	Water Deluge
Fire Water Pump House	Wet System
Organic Waste Tank Farm	Foam Deluge
Foam Pump House	Foam Deluge
Truck Wash	Dry System
Container Processing Building	Foam Deluge
Truck Unloading	Foam Deluge
Rack Storage Building	Foam Deluge
Source: Von Roll (1994)	

TABLE II-4
Distribution of Cargo Losses from Full Size Tankers During Highway Transit in the U.S. from 1971 to October 1986

Size of Spill (gallons)	Number of Incidents Less Than or Equal to Size of Spill	Cumulative Frequency of Spill
1	452	0.03
10	2,937	0.20
20	4,378	0.30
40	6,017	0.42
60	7,340	0.51
100	8,695	0.60
400	10,966	0.75
700	11,517	0.80
3,000	13,097	0.90
5,000	13,740	0.95
8,000	14,247	0.98
15,000	14,475	1.00

Source: USDOT, 1986.

TABLE II-5 Scenarios Selected for Quantitative Evaluation		
Scenario	**Description**	
	Conservative Event	**Typical Event**
On-Site Spill	5,000 gallon spill due to a tanker truck accident, resulting in volatile emissions	100 gallon spill due to tanker truck accident, resulting in volatile emissions
On-Site Fire	20,000 gallon spill in the Organic Waste Tank Farm ignites, generating toxic products of combustion	200 gallon spill ignites, generating toxic products of combustion
On-Site Mixing of Incompatible Wastes	Accidental pumping of 5,000 gallon of wastes from a tanker truck to a storage vessel containing 5,000 gallons of an incompatible waste, generating toxic gases	200 gallons of incompatible wastes are mixed, generating toxic gases
Off-Site Spill	5,000 gallon spill along local access road, resulting in volatile emissions	100 gallon spill along local access road, resulting in volatile emissions
Off-Site Fire	5,000 gallon spill ignites, generating toxic products of combustion	100 gallon spill ignites, generating toxic products of combustion

TABLE II-6
Key Assumptions Made in the Identification of Accident Scenarios

Assumption	Basis	Magnitude of Effect	Direction of Effect
1. Waste will continue to be received at the facility by truck only.	There are currently no proposals to U.S. EPA to transport waste to WTI via rail or barge. Accidents that could be associated with rail or barge transport, if they were to occur in the future, are not evaluated.	Low	Unknown
2. For off-site spill and fire scenarios, assumed conservative spill size of 5,000 gallon; typical spill size of 100 gallon	Based on USDOT (1995) data, 95% of all spills are less than 5,000 gallon, and 50% of all spills are less than 100 gallon	Medium	Conservative spill size likely to overestimate, typical spill size may over- or under-estimate
3. For the mixing of incompatible waste scenarios, assumed 10,000 gallon of waste for the conservative scenario, 200 gallon of waste for the typical scenario	Conservative scenario volumes based on tank truck and storage vessel capacities. Typical scenario based on assumed spill from multiple drums (four)	Medium	Conservative scenario likely to overestimate, typical scenario may over- or under-estimate
4. For on-site fire scenario, assumed 20,000 gallon of waste for conservative scenario; 200 gallon of waste of typical scenario	Conservative scenario based on storage vessel capacities. Typical scenario based on assumed spill from multiple drums (four)	Medium	Conservative scenario likely to overestimate, typical scenario may over- or under-estimate
5. Typical spill sizes associated with on-site accidents are comparable to the typical spill sizes reported by U.S. DOT for off-site accidents.	Some failures which may lead to spills are relevant to both on-site and off-site scenarios. Limited data from spills at WTI suggest that the assumption made in the Accident Analysis is conservative, however.	Medium	Overestimate
6. Off-site spills into surface water not expected to pose significant human health risks, and thus not quantitatively evaluated.	Off-site spills onto the roadway more likely to occur, and more likely to affect the off-site community, than spills into surface water.	Low	Underestimate

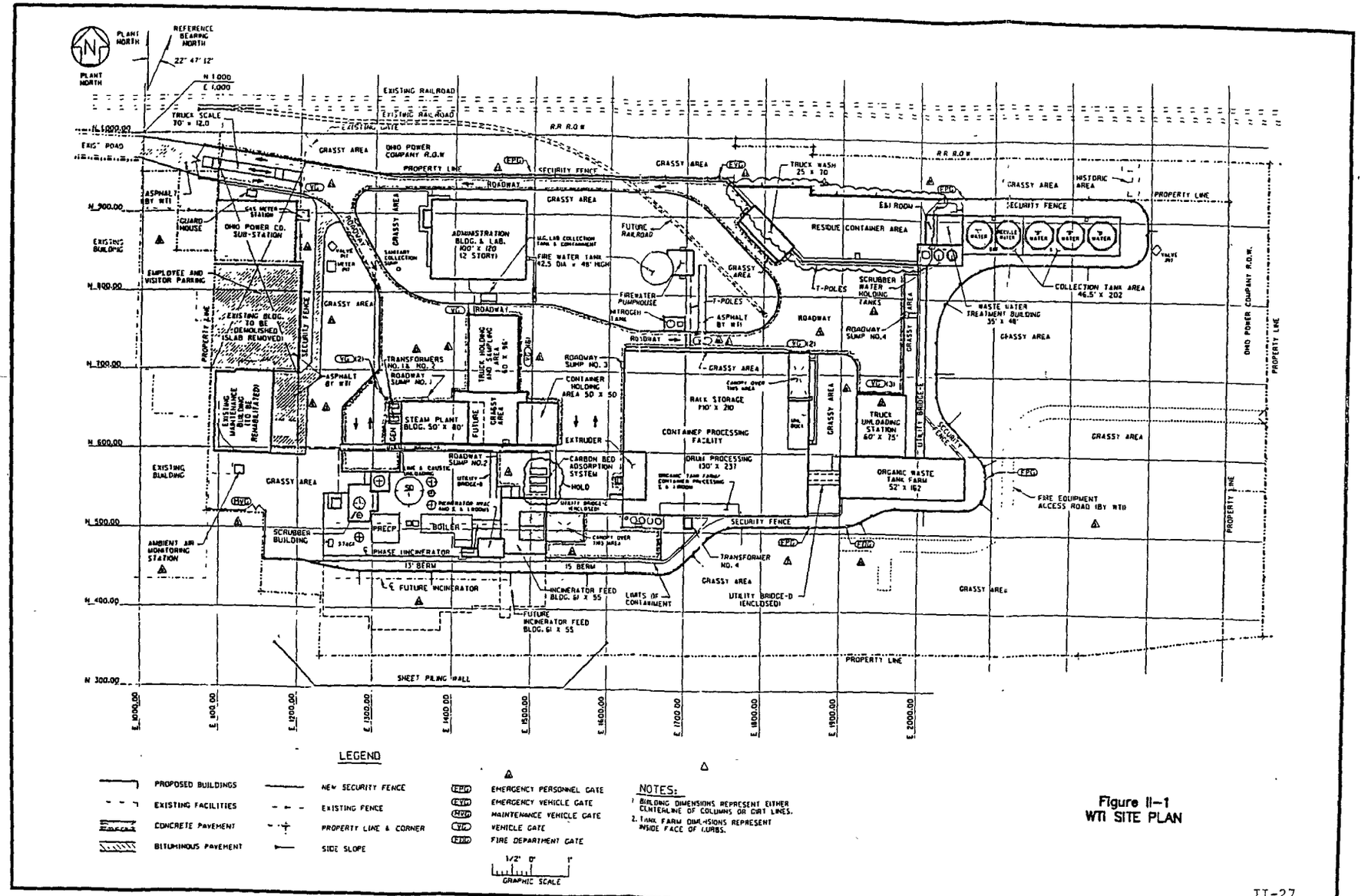

Figure II-1
WTI SITE PLAN

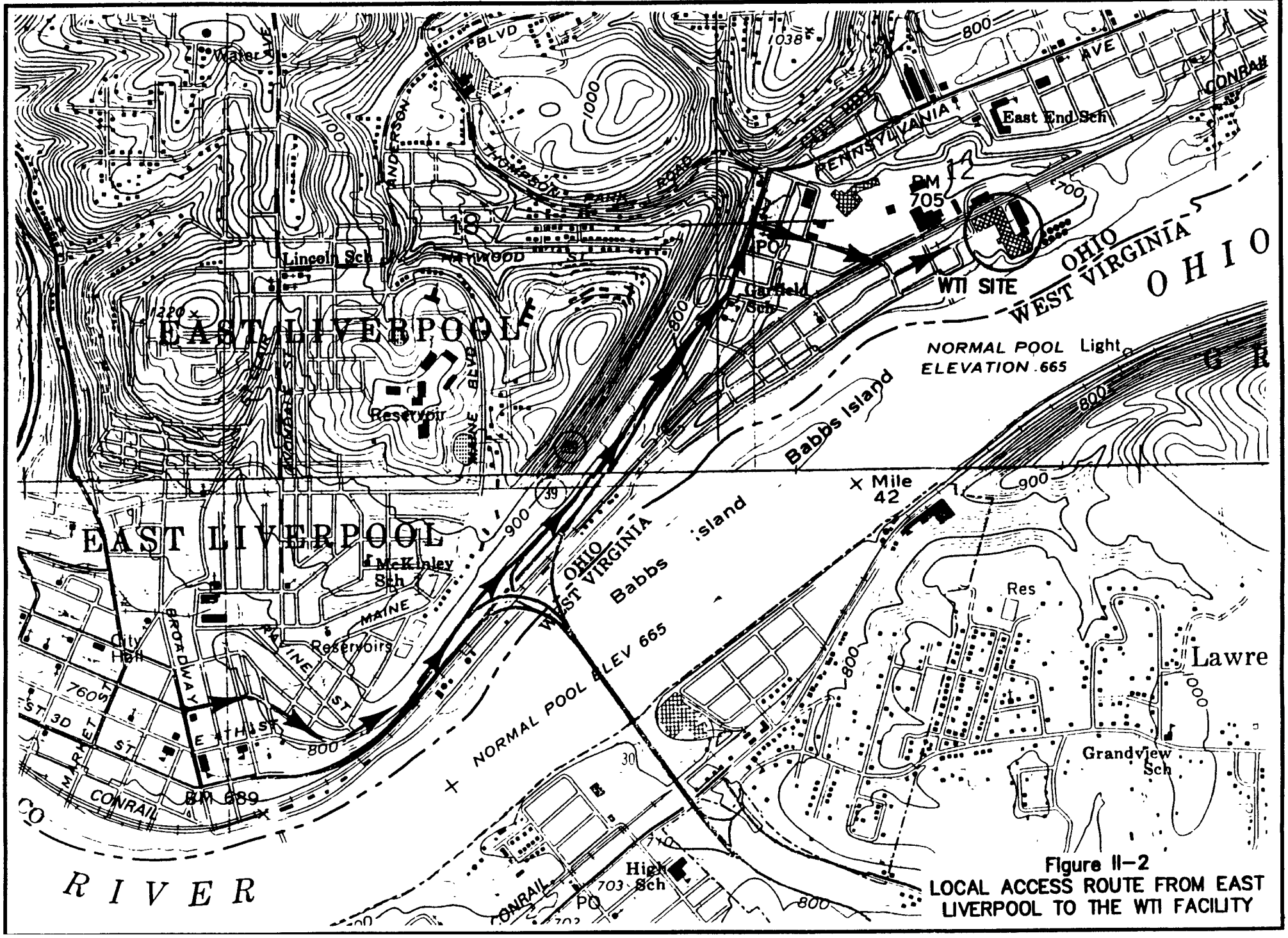

Figure II–2
LOCAL ACCESS ROUTE FROM EAST LIVERPOOL TO THE WTI FACILITY

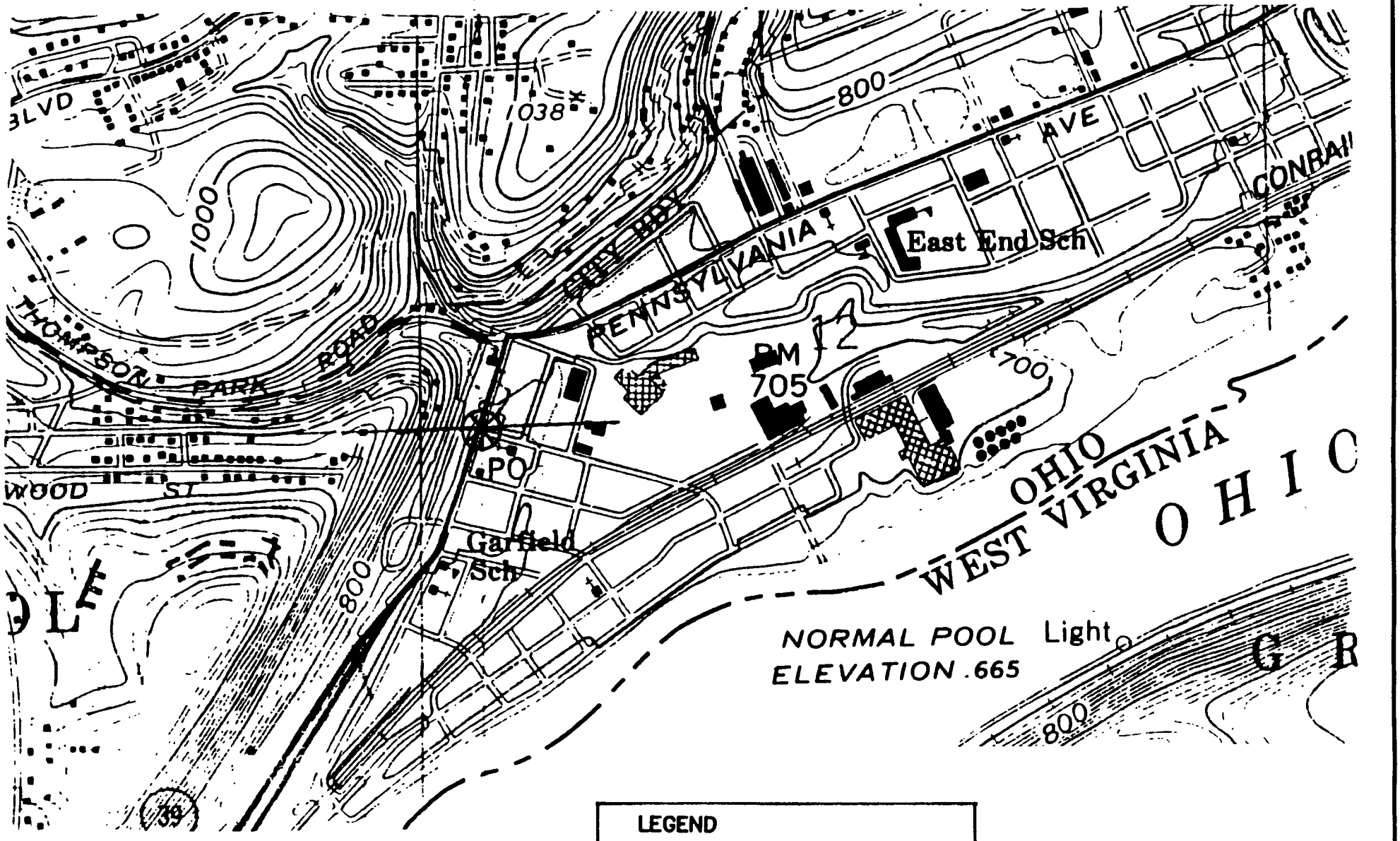

Figure II-3
LOCATION FOR THE OFF-SITE SPILL

III. CHEMICALS OF POTENTIAL CONCERN

A. Methodology

In addition to developing a list of candidate accident scenarios for consideration, the types of waste that may be involved in each accident scenario and the specific chemicals released into the environment must be identified. Specific chemicals to evaluate quantitatively in each scenario in the WTI Accident Analysis are selected according to the following procedure:

- Development of a preliminary list of acutely hazardous substances that may be expected to be handled at the WTI facility.

- Identification of chemicals of potential concern from the preliminary list of acutely hazardous substances, including an initial screening of chemicals based on availability of U.S. EPA or NIOSH acute toxicity criteria (FEMA 1993) and a subsequent ranking of chemicals according to: 1) acute toxicity; 2) acute toxicity and volatility; and 3) acute toxicity, volatility, and estimated maximum concentration in waste. Acute toxicity criteria are used because they apply to the evaluation of short-term (e.g., less than 1-day) exposures, which are the focus of hazards analysis (U.S. EPA 1987).

- Selection of specific chemicals to be used in evaluating each accident event, based on the type of scenario and the chemical ranking.

These steps are described below.

B. Preliminary Identification of Chemicals of Potential Concern

Several sources of information have been used to compile a preliminary list of wastes and chemicals of potential concern:

- Projected waste composition based on Waste Profiles from WTI.

- Acutely hazardous wastes (i.e., "P" list hazardous wastes) as defined under Subpart D of 40 CFR 260, Hazardous Waste Management System: General [*40 CFR §261.33(e)*]; WTI has applied for acceptance of "P" wastes, but this request has not yet been granted by U.S. EPA.

- Chemicals regulated under Section 112(r) of the Clean Air Act (CAA) as toxic or flammable substances that could be involved in an accidental release (*59 FR 4478*).

- Chemicals listed as Extremely Hazardous Substances (EHSs) under Section 302 of EPCRA.

The preliminary list of acutely hazardous substances consists of 309 chemicals. From this list, a subset of 139 chemicals are identified which pose the greatest off-site risks in the event of an accidental release, and for which acute toxicity criteria are available. The chemicals selected for further analysis are presented in Table III-1. Chemicals eliminated from further analysis are shown in Table 1 of Appendix VII-2.

A key factor in evaluating the consequences of accidental releases is the acute toxicity criterion. The acute toxicity criterion is used in determining the area potentially affected by a vapor cloud resulting from an accidental release of hazardous material. The potentially affected area as defined as the area over which the concentration of substance in the air exceeds the selected acute toxicity criterion.

The acute toxicity criterion must be selected based on the objectives of the hazard or consequence assessment. For example, if the objective of the hazard assessment is to determine the area where fatalities are most likely to occur, then the acute to lethal criterion used in the assessment should be based on the lethal concentrations. Conversely, if the purpose is to assess irritation or odor detection, the criterion used must reflect a concentration where irritation or odor detection is likely to occur.

The purpose of the WTI Accident Analysis is to determine the areas where, if an accidental release were to occur, serious irreversible health effects are possible. This type of evaluation is often conducted for emergency preparedness and planning activities, and is nearly identical to the hazard assessment required for risk management program and planning regulations soon to be promulgated under Clean Air Act (CAA) Section 112(r). Note, however, that the results of this evaluation cannot be used to confidently predict health effects during an actual accidental release because weather, atmospheric dispersion and human exposure conditions may be much different than those assumed in the Accident Analysis. The uncertainties associated with this Accident Analysis are discussed in Chapter VII.

Immediately Dangerous to Life or Health (IDLH) values established by the National Institute for Occupational Safety and Health (NIOSH) are used in the Accident analysis as the acute toxicity criteria for evaluating potential off-site consequences, because they represent a consistent, relatively comprehensive set of criteria for assessing the acute effects of short-term exposures. IDLH values are defined by NIOSH as the maximum airborne contaminant concentrations from which an individual could escape within 30 minutes without any escape-impairing symptoms or any irreversible health effects (FEMA 1993). This definition is consistent with the purpose of the Accident Analysis. Although the IDLH is primarily used for selection of occupational respiratory protection levels, the IDLH values represent a consistent, relatively comprehensive set of criteria that can be used to estimate the areas in an accidental release situation where people may be potentially exposed to harmful concentrations of hazardous substances. The IDLH values used in the Accident Analysis can be found in U.S. EPA (1995c).

In addition to the IDLH values, Level of Concern (LOC) values developed by U.S. EPA under the Emergency Planning and Community Right to Know Act of 1986 (EPCRA) are used and compared in a sensitivity analysis to the results obtained using IDLH values (Chapter VII). LOC values were created to guide local emergency planning personnel for screening and prioritizing acute hazards for purposes of community emergency preparedness and response. LOC values are generally derived by dividing the IDLH, or an estimate of the IDLH if none is available, by 10 (U.S. EPA 1987). The LOCs have been peer reviewed and accepted for the purposes of emergency planning assessments since 1987.

Alternatively, Emergency Response Planning Guideline (ERPG) levels could have been used in the Accident Analysis for the acute toxicity criteria. ERPGs are prepared by the American Industrial Hygiene Association (AIHA) and represent concentrations of hazardous substances in air above which some members of the public may begin to experience adverse effects if exposed for greater than 60 minutes. U.S. EPA is considering requiring the use of ERPG values, followed by the IDLH if there is no ERPG, for hazard assessments under the CAR Section 112(r) risk management program and planning regulations. However, only a portion of the substances considered for quantitative evaluation in the Accident Analysis have published ERPG levels. Consequently, the results of the off-site consequence evaluation would be based on a 60 minute exposure concentration (ERPG) for some substances and a 30 minute exposure concentration (IDLH) for others. U.S. EPA chose to use the IDLH values for the quantitative evaluation to generate consistent, comparable results.

To assist in selecting chemicals from Table III-1 to evaluate quantitatively in each accident event, chemicals are ranked according to the following criteria:

- Acute toxicity, as represented by IDLH value:

$$R_1 = IDLH$$

This ranking identifies chemicals of greatest concern with respect to toxicity only. Chemicals with low IDLHs (and thus low values of R_1) are the most highly ranked. For chemicals without IDLH values, but for which U.S. EPA has established an LOC, the LOC multiplied by a factor of 10 is used in ranking according to acute toxicity.

- Acute toxicity and volatility. Chemicals are ranked as follows:

$$R_2 = \frac{IDLH}{VP}$$

where VP represents the vapor pressure of the chemical. This ranking considers both the acute toxicity and release potential (for example, in the event of an on-site or off-site spill). Chemicals with a combination of a low IDLH value and high volatility would have the lowest R_2 values, and thus be the most highly ranked.

- Acute toxicity, volatility and concentration. Chemicals are ranked as follows:

$$R_3 = \frac{IDLH}{(VP)(C)}$$

where C represents the concentration reported in waste streams expected to be received at the WTI facility. Specifically, the concentration is calculated for each chemical where data are available as the average of the maximum concentrations reported for individual waste streams containing that chemical. Chemicals with a combination of a low IDLH value, high volatility, and high concentrations in waste would have the lowest R_3 values, and thus be the most highly ranked. Concentrations, expressed as a percent composition, are

estimated from information provided in waste profiles from WTI's first year of operation (see Appendix III-1). It should be noted that concentration data are available for only a relatively limited number of possible chemicals of concern.

The acute toxicity values, vapor pressure data and concentration data used in ranking each chemical are presented in Table III-1. The results of the rankings are presented in Table 2 of Appendix VII-2.

C. Selection of Specific Chemicals for Each Accident Event

1. On-Site Spill

Two chemicals, formaldehyde and acetone, are selected for evaluation in the on-site spill scenario. Formaldehyde is selected as a "worst-case" chemical for evaluating spills of a conservative waste; acetone is selected as a "typical" chemical for evaluating more typical waste spills.

In the spill scenario, the combined ranking of acute toxicity, volatility and concentration is most significant, because it considers both the toxicity of the chemical and the potential magnitude of exposure. Of all chemicals of potential concern, formaldehyde is the second most highly ranked chemical on the basis of acute toxicity, volatility and concentration combined. The most highly ranked chemical was hydrogen chloride (HCl), largely because of the extremely high vapor pressure of pure phase HCl (31,000 mm Hg at 20°C). However, HCl would not be expected to be received in significant concentrations, except in aqueous mixtures, where its vapor pressure is greatly reduced. For example, according to Perry and Green (1984) the vapor pressure of HCl in a 20% aqueous solution is only 0.2 mm Hg at 20°C. (The concentration of HCl used in the ranking is 18%). While the vapor pressure of formaldehyde is also greatly reduced in an aqueous solution (Gallant 1968), formaldehyde may also be present in an organic solution.

While formaldehyde ranks about 35th out of 133 chemicals of potential concern based on acute toxicity alone, it ranks 7th out of 108 chemicals according to acute toxicity and volatility combined. The 6 chemicals ranked more highly than formaldehyde on the basis of toxicity and vapor pressure (i.e., arsine, diborane, nitrogen oxide, hydrogen chloride, chlorine and hydrogen selenide) usually exist in gaseous form and are, therefore, highly unlikely to be present at high concentrations in large quantities of liquid waste. Thus, on the basis of toxicity and volatility alone, formaldehyde would also be appropriate as a "worst-case" chemical for modeling in the spill scenario.

It should be recognized, however, that formaldehyde is a relatively minor constituent in the overall waste feed at the WTI facility. Based on waste profiles for the first year of WTI operations, the ten constituents estimated as being received in the largest quantities in pumpable waste at the WTI facility are listed in Table III-2. According to the waste profile data for the first nine months of operation at the WTI facility, approximately 100,000 lb/yr of formaldehyde were estimated to be received, constituting approximately 0.5% of the pumpable waste at the WTI facility. As shown in Table 2 of Appendix VII-2, of the ten chemicals reported in the largest quantities in the liquid waste, acetone is ranked highest on the basis of both: 1) acute toxicity and volatility; and 2) acute toxicity, volatility and concentration. Overall, on the basis of acute toxicity, volatility and concentration, acetone ranks 9th of the 47 chemicals of potential concern for which data on acute toxicity, volatility, and concentration are available. Thus, acetone was also selected as a "typical" constituent for evaluating the spill scenarios.

A mixture containing 10% formaldehyde was selected as a reasonable "worst-case" waste for spill scenarios. This is approximately equal to the combined average of the maximum (i.e., highest) concentrations reported for individual waste streams containing formaldehyde. For the purpose of modeling formaldehyde emissions, the remaining 90% of the waste is assumed to be methanol, a chemical in which formaldehyde is soluble, and which is projected to be received in high quantities at the WTI facility (see Table III-2). Methanol is selected only to provide representative waste mixture properties for estimating formaldehyde emissions; in reality, wastes are typically composed of many individual chemicals. The selection of methanol is relatively conservative, i.e., more likely to overestimate than underestimate formaldehyde emissions. However, formaldehyde emissions from a more complex waste mixture with physical/chemical properties similar to methanol would be approximately the same as assuming a 10% formaldehyde/90% methanol mixture. For example, the formaldehyde emission rate from a 10% formaldehyde/90% toluene mixture would be lower than from a 10% formaldehyde/90% methanol mixture because the vapor pressure of the formaldehyde/toluene mixture is lower than the formaldehyde/methanol mixture.

A mixture containing 10% acetone was selected as a reasonable "typical" waste for spill scenarios. A concentration of 10% is approximately equal to the combined average of the mean concentrations of acetone reported for individual waste streams containing acetone. The remainder of the waste stream was assumed to consist of toluene to estimate waste mixture properties for the purposes of predicting acetone emission rates. Like methanol, toluene has been reported to be received in high quantities in the pumpable wastes (See Table III-2). The selection of other commonly received chemicals

from Table III-2 to determine waste mixture properties would not substantially affect acetone emission rates.

In evaluating the on-site spill scenario, four cases are examined:

- Conservative spill (5,000 gallons) of a worst-case waste (10% formaldehyde in methanol).
- Conservative spill (5,000 gallons) of a typical waste (10% acetone in toluene).
- Typical spill (100 gallons) of a worst-case waste (10% formaldehyde in methanol).
- Typical spill (100 gallons) of a typical waste (10% acetone in toluene-like chemicals).

These events were developed to bracket the types of credible on-site spills at the WTI facility.

2. On-Site Fire

Typical combustion products that could result from a fire include CO_2, NO_x, SO_2, HCl and phosgene. Phosgene and HCl were selected as the chemicals to be modeled in the on-site fire scenario.

Phosgene is one of the most highly ranked chemicals on the basis of both acute toxicity alone (tied for 18th of 133 chemicals) and acute toxicity and volatility combined (8th of 108 chemicals with both IDLH and vapor pressure data). However, based on O'Mara et al. (1971) and Sjoberg (1952), phosgene emissions would be expected to be at least 20-fold lower than HCl emissions when common chlorinated compounds are burned. Based on Sjoberg (1952), higher emissions of phosgene relative to HCl are possible, but only at thermal decomposition temperatures well below those expected in an open fire. Thus, HCl, which ranked 65th of 133 chemicals on the basis of acute toxicity, and 4th of 108 chemicals on the basis of acute toxicity and volatility combined, is also assessed.

Phosgene and HCl may be produced when chlorinated wastes are burned. Sjoberg (1952) measured the amount of HCl and phosgene formed when seven different chlorinated substances were placed in contact with an open flame. Of the chemicals listed on Table III-3, four (carbon tetrachloride, chloroform, tetrachloroethene and trichloroethene) are among the 50 chemicals received in pumpable wastes in the highest

quantities, according to waste profile sheets from the first year of operation. Each of the four are estimated to represent approximately 0.5% of the pumpable waste. Furthermore, the concentrations of each of the four chemicals in individual waste streams are also similar (see Table III-1). Since the quantities and concentrations of the four chemicals are comparable, tetrachloroethene was selected to quantitatively evaluate the fire scenario based on its relatively high formation rates for both phosgene and HCl.

According to the waste profiles estimated for the first year of operation, the average of the maximum tetrachloroethene concentrations reported for individual waste streams containing tetrachloroethene is about 15%. Thus, a waste consisting of 15% tetrachloroethene was assumed for the fire scenarios. The remainder of the waste was assumed to be toluene, a highly flammable chemical projected to be received in large quantities in pumpable waste at the WTI facility.

3. On-Site Mixing of Incompatible Wastes

ASTM (1986) has proposed guidelines for estimating the incompatibility of selected hazardous wastes. The ASTM guidelines provide a systematic method for determining the incompatibility of most binary combinations of hazardous wastes. The consequences of mixing various "reactivity" classes of chemical compounds (e.g., amines, halogenated organics, metals) are summarized here.

A review of various hazardous chemical handbooks (Bretherick 1985; Sax and Lewis 1989), indicates that the chlorinated chemical most likely to be generated by the mixing of incompatible wastes is HCl. According to ASTM (1986), HCl formation can occur when chlorinated hydrocarbons are mixed with mineral acids (oxidizing or nonoxidizing) or strong oxidizing agents. For this event, the production of HCl resulting from the mixing of tetrachloroethene (a hydrocarbon with high chlorine content that is reportedly received at the WTI facility) with a 70% nitric acid solution (an oxidizing mineral acid) is quantitatively evaluated. The selection of tetrachloroethene is reasonably conservative, i.e., is more likely to overestimate than underestimate HCl emissions, because of its high chlorine content relative to other common chlorinated hydrocarbons, e.g., dichloroethene, trichloroethene and trichloroethane. In the 1993 Toxic Release Inventory, nitric acid is listed among the top ten chemicals managed via off-site waste treatment, including incineration (USEPA 1995d), and thus can reasonably be assumed to be among the wastes to be received by WTI. Sulfuric acid, which is also listed among the top ten chemicals in the 1993 Toxic Release Inventory, could be used in place of nitric acid in evaluating this accident scenario. Using sulfuric acid would, however, not affect the results, since the HCl release is dependent upon the amount of chlorine available in the tetrachloroethene solution. HCl is selected on the basis of toxicity and

volatility ranking, compared to other gases (such as chlorine) that may be produced during mixing of incompatible wastes. The organic waste stream is assumed to contain 15% tetrachloroethene, based on projected estimates from the first year of operation at the WTI facility.

4. Off-Site Tanker Truck Spill

As in the on-site spill scenario, mixtures of 10% formaldehyde/90% methanol and 10% acetone/90% toluene are both evaluated in the off-site spill scenario. The basis for these selections is the same as for the on-site spill scenario, since the critical chemical-specific factors affecting exposure and the potential for acute adverse health effects are identical.

5. Off-Site Tanker Truck Spill with Fire

Phosgene and HCl are selected for evaluation of the off-site tanker truck spill with fire. The rationale for selection of phosgene and HCl for the off-site fire scenario is the same as for the on-site fire scenario. As in the on-site fire scenario, the type of waste selected for evaluation is a mixture of 15% tetrachloroethene and 85% toluene.

D. Summary of Results and Key Assumptions

The wastes and chemicals selected to be evaluated for the accident scenarios are summarized in Table III-4.

Major assumptions made in selecting the chemicals to be quantitatively evaluated in the Accident Analysis are summarized in Table III-5.

TABLE III-1 Summary of Chemicals of Potential Concern for Short-Term Exposures[a]					
CAS Number[1]	Substance	Basis[2]	IDLH[3] (g/m^3)	Vapor Pressure[4] (mm Hg @20°C)	Conservative Percent Composition[5]
107-20-0	Acetaldehyde, chloro-	B	0.1442	100	NA
640-19-7	Acetamide, 2-fluoro-	B	0.058	NA	NA
62-74-8	Acetic acid, fluoro-, sodium salt	B	0.0025	NA	NA
67-64-1	Acetone	A	5.9	180	21
107-2-8	Acrolein	B, C, D	0.0046	220	NA
107-13-1	Acrylonitrile	A, C, D	0.1842	83	3
116-6-3	Aldicarb	B, D	0.003	0.0001 (25°C)	NA
309-0-2	Aldrin	B, D	0.025	0.000075	NA
107-18-6	Allyl alcohol	B, C, D	0.0474	17	NA
20859-73-8	Aluminum phosphide	B, D	0.2	NA	NA
2763-96-4	Aminomethyl-3-isoxazolol, 5-	B	0.17	NA	NA
504-24-5	Aminopyridine, 4-	B	0.2	0.00037 (25°C)	NA
7664-41-7	Ammonia	C	0.2082	6500	NA
62-53-3	Aniline	A, D	0.38	0.6	7
506-61-6	Argentate(1), bis(cyano-C)-, potassium	B	0.2	NA	NA
1327-53-3	Arsenic oxide	B	0.014	NA	NA
1303-28-2	Arsenic pentoxide	B, D	0.08	NA	NA
7784-34-1	Arsenous trichloride	C	0.012	10 (23.5°C)	NA
7784-42-1	Arsine	C	0.0095	11000 (21°C)	NA
71-43-2	Benzene	A	1.59	75	7
108-98-5	Benzenethiol	B	0.014	2 (25°C)	NA
100-44-7	Benzyl chloride	B, D	0.005	1	NA
71-36-3	Butanol	A	4.234	6	19
75-15-0	Carbon disulfide	A, B, C, D	1.553	300	19
56-23-5	Carbon tetrachloride	A	1.256	91	17

TABLE III-1 Summary of Chemicals of Potential Concern for Short-Term Exposures[a]					
CAS Number[1]	Substance	Basis[2]	IDLH[3] (g/m^3)	Vapor Pressure[4] (mm Hg @20°C)	Conservative Percent Composition[5]
57-74-9	Chlordane	D	0.5	0.00001	3
7782-50-5	Chlorine	C	0.0289	5200	NA
10049-4-4	Chlorine dioxide	C	0.0138	760	NA
67-66-3	Chloroform	A, C, D	2.437	160	8
542-88-1	bis-Chloromethyl ether	C	0.0025	30 (22°C)	NA
5344-82-1	1-(o-Chlorophenyl)thiourea	B	0.046	NA	NA
542-76-7	Chloropropionitrile, 3-	B	0.09	5 (46°C)	NA
8001-58-9	Creosote (coal tar)	A	NA	NA	8
95-48-7	Cresol, 2-	A, D	1.104	0.31 (25°C)	20
4170-30-3	Crotonaldehyde	A, C, D	0.143	19	3
98-82-8	Cumene	A	4.416	8	8
506-77-4	Cyanogen chloride	B, C	3.6	1010	NA
110-82-7	Cyclohexane	A	4.468	78	13
108-94-1	Cyclohexanone	A	2.806	5	19
19287-45-7	Diborane	C	0.017	30000 (17°C)	NA
95-50-1	Dichlorobenzene, 1,2-	A	1.2	1	19
541-73-1	Dichlorobenzene, 1,3-	A	NA	2.3 (25°C)	11
106-46-7	Dichlorobenzene, 1,4-	A	0.9	1.3	4
696-28-6	Dichlorophenylarsine	B	0.4	0.087 (25°C)	NA
84-66-2	Diethylphthalate	A	NA	0.00165 (25°C)	3
297-97-2	Diethyl O-pyrazinyl phosphorothioate, O,O-	B	0.035	0.003 (30°C)	NA
55-91-4	Diisopropylfluorophosphate (DFP)	B	0.036	0.579	NA
60-51-5	Dimethoate	B, D	0.3	8.3E-06 (25°C)	NA
540-73-8	Dimethylhydrazine	A, C, D	0.037	68 (24.5°C)	3
77-78-1	Dimethyl sulfate	A, D	0.036	0.5	4

TABLE III-1
Summary of Chemicals of Potential Concern for Short-Term Exposures[a]

CAS Number[1]	Substance	Basis[2]	IDLH[3] (g/m^3)	Vapor Pressure[4] (mm Hg @20°C)	Conservative Percent Composition[5]
534-52-1	Dinitro-o-cresol, 4,6- & salts (2)	B, D	0.005	0.00032	NA
88-85-7	Dinoseb	B, D	0.045	0.075	NA
123-91-1	Dioxane, 1,4-	A	1.798	29	12
152-16-9	Diphosphoramide, octamethyl-	B, D	0.008	0.001 (25°C)	NA
107-49-3	Diphosphoric acid, tetraethyl ester	B	0.005	0.0002	NA
298-4-4	Disulfoton	B, D	0.02	0.00018	NA
541-53-7	Dithiobiuret	B, D	0.05	NA	NA
115-29-7	Endosulfan	B, D	0.008	1E-05 (25°C)	NA
72-20-8	Endrin, & metabolites	B, D	0.002	0.000003	1
106-89-8	Epichlorohydrin	A, C, D	0.283	13	6
16752-77-5	Ethanimidothioic acid, N-[[(methylamino)carbonyl]oxy]-, methyl ester (Methomyl)	B	0.1	5E-05 (25°C)	NA
64-17-5	Ethanol	A	6.209	44	24
110-80-5	Ethoxyethanol, 2-	A	1.839	4	24
140-88-5	Ethyl acrylate	A	1.226	29	3
100-41-4	Ethylbenzene	A	3.468	7	20
151-56-4	Ethyleneimine	B, C, D	0.176	160	NA
82-41-4	Fluorine	B, C, D	0.039	76	NA
640-19-7	Fluoroacetamide	B, D	NA	NA	NA
50-0-0	Formaldehyde	A, C, D	0.0245	3883 (25°C)	11
142-82-5	Heptane	A	3.067	40 (22°C)	17
302-1-2	Hydrazine	A, C, D	0.0655	10	3
79-19-6	Hydrazinecarbothioamide	B	0.092	NA	NA
74-90-8	Hydrocyanic acid	B, C, D	0.0551	630	NA
7647-1-0	Hydrogen chloride	C	0.0745	31000	18
7664-39-3	Hydrogen fluoride	C	0.0245	783	3

TABLE III-1
Summary of Chemicals of Potential Concern for Short-Term Exposures[a]

CAS Number[1]	Substance	Basis[2]	IDLH[3] (g/m^3)	Vapor Pressure[4] (mm Hg @20°C)	Conservative Percent Composition[5]
7783-7-5	Hydrogen selenide	C	0.0033	7200 (21°C)	NA
7783-6-4	Hydrogen sulfide	C	0.139	13000	NA
13463-40-6	Iron, pentacarbonyl-	C	0.008	40 (31°C)	NA
78-83-1	Isobutanol	A	4.839	9	20
465-73-6	Isodrin	B, D	0.07	0.000006	NA
62-38-4	Mercury, (acetato-O)phenyl-	B	0.22	0.00012 (25°C)	NA
62-75-9	Methanamine, N-methyl-N-nitroso-	B	0.19	3	NA
67-56-1	Methanol	A	7.861	96	20
78-93-3	Methyl ethyl ketone (2-Butanone)	A	8.829	77.5	34
60-34-4	Methyl hydrazine	B, C, D	0.0376	38	NA
108-10-1	Methyl isobutyl ketone (2-Methyl-4-pentanone)	A	2.045	16	19
624-83-9	Methyl isocyanate	B, C, D	0.007	348	NA
75-86-5	Methylactronitrile, 2-	B	0.12	0.8	NA
298-0-0	Methyl parathion	B	0.0034	0.00001	NA
91-20-3	Naphthalene	A	1.308	0.08	9
86-88-4	Naphthylthiourea, alpha-	B	0.1	NA	NA
13463-39-3	Nickel carbonyl	B, C, D	0.0139	315	NA
54-11-5	Nicotine, & salts (2)	B, D	0.005	0.08	NA
98-95-3	Nitrobenzene	A, D	1.005	0.27	25
10102-44-0	Nitrogen dioxide	B, D	0.0376	720	NA
10102-43-9	Nitrogen oxide NO	B, C, D	0.1224	26000	NA
79-46-9	Nitropropane, 2-	A	0.364	13	20
62-75-9	N-nitrosodimethylamine	B, D	0.19	2.7	NA
20816-12-0	Osmium oxide OsO4, (T-4)-	B	0.001	7	NA
56-38-2	Parathion	B, D	0.01	0.00004	NA

TABLE III-1 Summary of Chemicals of Potential Concern for Short-Term Exposures[a]					
CAS Number[1]	Substance	Basis[2]	IDLH[3] (g/m^3)	Vapor Pressure[4] (mm Hg @20°C)	Conservative Percent Composition[5]
108-95-2	Phenol	A, D	0.96	0.4	10
62-38-4	Phenylmercury acetate	B, D	0.22	9E-06 (35°C)	NA
103-85-5	Phenylthiourea	B, D	0.03	NA	NA
298-2-2	Phorate	B, D	0.001	0.0008	NA
75-44-5	Phosgene	B, C, D	0.0081	1215	NA
7806-51-2	Phosphine	B, C, D	0.069	NA	NA
151-50-8	Potassium cyanide	B, D	0.025	NA	NA
506-61-6	Potassium silver cyanide	B, D	0.2	NA	NA
107-12-0	Propanenitrile	B, C	0.037	35	NA
75-55-8	Propylenimine, 1,2-	B, C, D	0.233	112	NA
110-86-1	Pyridine	A	3.229	16	17
26628-22-8	Sodium azide	B, D	0.2	NA	NA
143-33-9	Sodium cyanide	B, D	0.025	NA	NA
57-24-9	Strychnidin- 10-one, & salts (2)	B, D	0.003	NA	NA
7783-60-0	Sulfur tetrafluoride	C	0.092	8000 (21°C)	NA
7446-11-9	Sulfur trioxide	C	0.03	344 (25°C, beta)	NA
7446-18-6	Sulfuric acid, dithallium (1+) salt	B	0.02	NA	NA
95-94-3	Tetrachlorobenzene (assumed 1,2,4,5-)	A	NA	40 (146°C)	10
127-18-4	Tetrachloroethylene	A	1.015	14	13
3689-24-5	Tetraethyldithiopyrophosphate	B	0.01	0.00017	NA
78-0-2	Tetraethyl lead	B, D	0.04	0.2	NA
109-99-9	Tetrahydrofuran	A	5.886	132	16
509-14-8	Tetranitromethane	B, C, D	0.032	8	NA
1314-32-5	Thallic oxide	B	0.02	NA	NA
39196-18-4	Thiofanox	B, D	0.085	0.00017 (25°C)	NA

TABLE III-1
Summary of Chemicals of Potential Concern for Short-Term Exposures[a]

CAS Number[1]	Substance	Basis[2]	IDLH[3] (g/m^3)	Vapor Pressure[4] (mm Hg @20°C)	Conservative Percent Composition[5]
108-98-5	Thiophenol	B, D	0.014	2 (25°C)	NA
79-19-6	Thiosemicarbazide	B, D	0.092	NA	NA
5344-82-1	Thiourea, (2-chlorophenyl)-	B, D	0.046	NA	NA
7550-45-0	Titanium tetrachloride	C	0.01	NA	NA
108-88-3	Toluene	A	1.88	21	24
584-84-9	Toluene-2,4-diisocyanate	A, C, D	0.0178	0.01	4
91-8-7	Toluene-2,6-diisocyanate	A, C, D	0.009	0.02	4
8001-35-2	Toxaphene	B	0.2	0.4 (25°C)	1
71-55-6	Trichloroethane, 1,1,1-	A	3.811	100	16
79-1-6	Trichloroethylene	A	5.363	57.9	17
1314-62-1	Vanadium oxide	B, D	0.035	NA	NA
1330-20-7	Xylene	A	NA	8.763 (25°C)	22
81-81-2	Warfarin, & salts, when > 0.3% (2)	B, D	0.1	0.09	NA
1314-84-7	Zinc phosphide, when > 10%	B, D	0.12	NA	NA

TABLE III-1
Summary of Chemicals of Potential Concern for Short-Term Exposures[a]

CAS Number[1]	Substance	Basis[2]	IDLH[3] (g/m^3)	Vapor Pressure[4] (mm Hg @20°C)	Conservative Percent Composition[5]

Notes:

[a] 139 chemicals were selected for further analysis.

[1] CAS Number given for parent compound only.

[2] A — Wastes projected to be received by WTI during first year of operation
B — Constituents listed as "P" wastes (acutely hazardous according to RCRA)
C — Acutely toxic chemicals identified in CAA 112(r)
D — Extremely hazardous substances from EPCRA

[3] Immediately Dangerous to Life or Health (IDLH) value (U.S. EPA 1995c). For chemicals without an IDLH value, but for which a Level of Concern (LOC) value has been established by U.S. EPA, the LOC multiplied by a factor of 10 was used in place of the IDLH.

[4] Vapor Pressure data compiled from the following sources:
-- Hazardous Substances Data Bank (HSDB). 1991. National Library of Medicine.
-- Howard, P. H. 1989. Handbook of environmental fate and transport data (Vol. I. Large production and priority pollutants). Chelsea, MI: Lewis Publishers
-- Howard, P. H. 1990. Handbook of environmental fate and transport data (Vol. II. Solvents). Chelsea, MI: Lewis Publishers.
-- Montgomery, J.H., and L.M. Welkom. 1990. Groundwater chemicals desk reference. Chelsea, MI: Lewis Publishers.

[5] Average of the maximum concentrations reported for all waste streams containing the compound, according to WTI waste profiles for first year of operations.

NA Not available.

TABLE III-2
Constituents Received in Largest Quantities in Pumpable Waste at the WTI Facility

Constituent	Approximate Quantity in Pumpable Waste (lb/yr)	Percent of Total Pumpable Waste
1. Hydrocarbon (unspecified)	3,200,000	16.8%
2. Cresol	1,000,000	5.2%
3. Toluene	770,000	4.0%
4. Methyl Ethyl Ketone	680,000	3.5%
5. Methanol	590,000	3.1%
6. Acetone	560,000	2.9%
7. Cyclohexanone	480,000	2.5%
8. Ethyl Acrylate	470,000	2.4%
9. Butanol	460,000	2.4%
10. Xylene	450,000	2.3%

Note:

Source: Appendix 1, Volume III

TABLE III-3
Hydrogen Chloride and Phosgene Formation from Decomposition of Chlorinated Hydrocarbons in Contact with Flame[3]

Substance	HCl Formed (mg/g chemical combusted)	Phosgene Formed (mg/g chemical combusted)
Carbon tetrachloride[1]	199	8
Chloroform[2]	138	6
Dichloroethane[2]	240	ND
Pentachloroethane[2]	332	2
Tetrachloroethane[2]	326	3
Tetrachloroethene[2]	238	7
Trichloroethene[2]	266	1

Notes:

1 Average of three trials.
2 Average of two trials.
3 Source: Sjoberg (1952)

TABLE III-4
Wastes and Chemicals Evaluated

Scenario	Waste/Chemical Evaluated
On-Site Spill	Waste consists of 90% methanol/10% formaldehyde ("worst-case" waste) or 90% toluene/10% acetone ("typical" waste). Consequences of formaldehyde and acetone releases are assessed.
On-Site Fire	Waste consists of 15% tetrachloroethene/ 85% toluene. Consequences of HCl and phosgene releases are assessed.
On-Site Mixing of Incompatible Wastes	Waste consisting of 15% tetrachloroethene/85% methanol mixed with waste consisting of 70% nitric acid. Consequences of HCl releases are assessed.
Off-Site Spill	Waste consists of 90% methanol/10% formaldehyde ("worst-case waste) or 90% toluene/10% acetone ("typical" waste). Consequences of formaldehyde and acetone releases are assessed.
Off-Site Fire	Waste consists of 85% toluene/15% tetrachloroethene. Consequences of HCl and phosgene releases are assessed.

TABLE III-5
Key Assumptions Made in Selecting Chemicals of Potential Concern

Assumption	Basis	Magnitude of Effect	Direction of Effect
1. Waste composition data from WTI waste profile sheets for first year of operations adequately characterizes future waste.	Site-specific waste profile information. The potential for underestimating risk is reduced by making conservative assumptions in calculating chemical concentrations in waste from the information in the profiles.	Medium	Unknown
2. Chronic human impacts off-site could be avoided through mitigation measures.	Mitigation measures in effect at the WTI facility will limit migration of spilled wastes and duration of fire scenarios.	Low	May underestimate
3. IDLH values can be used to evaluate the potential for acute health effects. The more stringent LOC values were evaluated in a sensitivity analysis.	IDLH values represent a consistent, relatively comprehensive set of criteria for assessing the acute effects of short-term exposures.	High	May over or underestimate risk, depending on the basis for and uncertainty associated with the IDLH for a specific chemical.
4. Substances for which acute data are not available are less toxic than those for which data are available.	Chemicals for which no acute toxicity data are available are ranked below chemicals with acute toxicity data.	Low	Unknown
5. Use of vapor pressure to reflect release potential.	Represents a consistent basis for comparison.	Low	Unknown
6. Selection of tetrachloroethene and toluene as the chemicals of concern for fire scenarios.	Selection of toluene for examining heat effects is believed to be appropriate, given its high flammability, and high quantity in pumpable waste. Selection based on review of WTI waste profile and evaluation of toxic byproducts of combustion.	High	Probably overestimates risk, given high HCl and phosgene formation rates for tetrachloroethene. Selection of toluene for examining heat effects is believed to be appropriate, given its high flammability, and high quantity in pumpable waste.
7. Selection of HCl as the chemical of concern for mixing of incompatible wastes.	HCl represents a high hazard chemical given its relatively high acute toxicity.	High	Overestimates

IV. CHARACTERIZATION OF ACCIDENTAL RELEASES

A. Methodology

Atmospheric release rates for the chemicals of primary concern are estimated for each accident scenario selected for quantitative evaluation. Release rates and durations are developed for specific constituents based on facility-specific parameters (e.g., tank volumes, dike sizes), and short-term modeling techniques. The models account for the physical/chemical properties of the chemicals (e.g., volatility, density, liquid or gas phase), and the presence of passive mitigation devices (e.g., concrete dikes and berms). As discussed in Chapter II, two release scenarios are evaluated for each on-site accident event:

- No active or automatic mitigation devices (e.g., nitrogen blankets or sprinkler systems) assumed. Passive mitigation (e.g., dikes, berms) are assumed to be effective, however.

- Active or automatic mitigation devices are assumed to control emissions. The effect of mitigation is evaluated through two separate cases, with assumed response times of ten minutes and one hour, respectively (see Chapter VII).

For the off-site accident events, only scenarios without any active mitigation are considered.

Wastes consisting of a mixture of chemicals are modeled for all of the events in this Accident Analysis. Physical and chemical properties for these mixtures are estimated from the properties of the pure chemicals, weighted by the mass fraction of each chemical constituent. The procedures used to estimate chemical emission rates for each accident scenario are summarized below. Details regarding the calculations are presented in Appendix VII-3.

B. Chemical-Specific Release Rate Calculations

1. On-Site Spill

The on-site spill scenario selected for quantitative evaluation results from a collision involving one tanker truck hauling liquid waste. To model the single-phase release of a

liquid waste and the subsequent evaporation of the resulting liquid pool, two emission rates must be determined and compared — the liquid release rate from the truck, E, and the rate of evaporation from a liquid pool, E_{pool}. The liquid release rate from the truck is estimated (U.S. EPA 1993b) assuming that the temperature of the liquid after release is the same as the ambient temperature. The liquid release rate is compared to the evaporation rate of a liquid pool, as calculated based on U.S. EPA (1993). Comparing these two emission rates determines the rate of release to the atmosphere.

In modeling emission rates, the ambient temperature is assumed to be 68°F (or 20°C), which may underestimate emission rates somewhat on very hot days, and overestimate emission rates somewhat on very cold days. The annual average temperature in Pittsburgh is 50°F (or 10°C); the average of the daily maximum temperatures during July, the hottest month of the year, is 83°F (or 28°C), according to the historical climatic data (1961-1990) published by the U.S. Department of Commerce (U.S. DOC 1993). While the temperature of 68°F (or 20°C) used in the emission modeling may not cover all the possible high temperatures that could occur at the WTI site, the value is considered adequate for characterizing the ambient temperature in the WTI vicinity.

In general, if the boiling point of a waste mixture is greater than normal ambient temperatures, the evaporation rate from the pool determines the rate at which the chemical enters the atmosphere (U.S. EPA 1993b). In this analysis, the boiling points of both the formaldehyde/methanol mixture, 97°F (or 36°C) and the acetone/toluene mixture 201°F (or 94°C), are well above ambient temperatures. Thus, chemical emission rates can be estimated by multiplying the total pool evaporation rate, E_{pool}, by the mass fraction of the chemical in the vapor.

The size of the pool being formed depends on the release rate and duration, and the presence of containment barriers (e.g., dikes, speed bumps, building walls, etc.) in the spill vicinity. In the spill scenario, the tanker is assumed to be 9.5 m long and 1.6 m in diameter. The area of the hole in the tanker is assumed to be 0.009 m^2 (approximately equivalent to a 1¼-inch diameter hole), and is located at the bottom of the tank such that the full content could be released in 10 minutes, consistent with the *Accidental Release Prevention Requirements: Risk Management Programs under Clean Air Act, Section 112(r)(7); Proposed Rule (40 CFR Part 68)* (U.S. EPA 1995a). For the conservative case, assuming the 5,000 gallon spill (the assumed volume for one truck) is contained within the berms in the truck unloading area, the area of the liquid pool would be approximately 418 m^2. For the typical case, assuming the 100 gallon spill spreads to a depth of 1 cm, the area of the liquid pool would be approximately 38 m^2. Calculations

of spill areas and formaldehyde and acetone release rates for the spill scenarios are described in Appendix VII-3.

2. On-Site Fire

The on-site fire scenario selected for quantitative evaluation is a storage tank rupture in the Organic Waste Tank Farm in the presence of an ignition source, resulting in a pool fire. The contents of the storage tanks are a mixture of 15% tetrachloroethene and 85% toluene, as discussed in Chapter III. The total burning rate is estimated from two factors: 1) the burning velocity; and 2) the size of the burning pool. The burning velocity for a liquid with a boiling point above ambient temperature is given by FEMA (1993) and Burgess et al. (1961). The pool size is defined by the size of the secondary containment area in the building, or 180 m^2 in this scenario.

Combustion products that may be emitted during a fire include NO_x, SO_2 or HCl. Phosgene emissions are also possible as a product of incomplete combustion. O'Mara et al. (1971) reported that the potential for phosgene formation during combustion of chlorinated hydrocarbons could be evaluated based on the following parameter:

$$a = \frac{\text{Number of Chlorine Atoms} - \text{Number of Hydrogen Atoms}}{\text{Number of Carbon Atoms}}$$

Phosgene formation is likely when $a \geq 0.4$. Thus, for example, phosgene could be formed during the combustion of carbon tetrachloride ($a=4$), chloroform ($a=2$), tetrachloroethene ($a=2$), and trichloroethene ($a=1$), but would not be expected during the combustion of chlorobenzene ($a=-0.7$), dichlorobenzene ($a=-0.3$), or trichloroethane ($a=0$). The formation of HCl and phosgene from the combustion of several chlorinated hydrocarbons was estimated by Sjoberg (1952), as discussed in Chapter III. According to Sjoberg (1952), combustion of tetrachloroethene is estimated to form 238 mg/g of HCl, and 7.0 mg/g of phosgene. These values were used for estimating HCl and phosgene releases. Details regarding the calculation of HCl and phosgene release rates are presented in Appendix VII-3.

In the WTI Accident Analysis, the Automated Resource for Chemical Hazard Incident Evaluation (ARCHIE) model developed by FEMA (1993) is used to assess heat effects of fires. For fires and explosions, ARCHIE can be used to estimate the size of a pool of burning substances, the height of the expected resulting flame, the radius from the center of the burning pool within which individuals could be potentially fatally

burned, and the radius from the center of the burning pool within which individuals could potentially experience second degree burns or severe pain. ARCHIE modeling is performed to examine the heat impacts resulting from a fire ignited both immediately after a spill, and after a pool achieves its maximum size. The radius of the fire, the fatal zone radius, and the injury zone radius are calculated.

The hazards associated with a possible fireball incident are also estimated using the ARCHIE model. A fireball could be formed if a sealed or inadequately vented container of a flammable liquid or liquefied compressed gas is exposed to an external fire or other source of heat sufficient to cause explosion or violent rupture of the container (FEMA 1993). If the container is fairly full and is fitted with a pressure relief device, it may vent a considerable portion of its contents before the occurrence of a boiling liquid expanding vapor explosion (BLEVE).

The fireball scenario can occur if (1) the container releases only a portion of its content (e.g. a hole one foot below the liquid level); (2) the spill ignites immediately after the spill; and (3) the container's ventilation system malfunctions. It is highly unlikely that all three of these conditions would occur during an on-site or off-site accident. Nazario (1988) indicates that the critical parameter for a BLEVE to occur is the degree of vaporization of the chemical inside the container. If more than 10% of the vessel contents will vaporize when depressurized (or pressure-relief-valve setpoint), the vessel has the potential for a BLEVE (Nazario 1988). Based on the relatively low vapor pressures of tetrachloroethene and toluene and the storage conditions for the chemicals, it is unlikely that a BLEVE would occur during a fire incident involving only a contained on-site storage tank or an off-site tanker truck. However, a fireball scenario may occur if an on-site (or off-site) spill spreads, ignites, and the flames engulf another tank (or tanker truck) with sufficient heat to cause an explosion.

In assessing fireballs, ARCHIE assumes that the fuel is similar in characteristics (both physical and chemical) to liquefied compressed propane and treats the fuel as if it were liquefied propane. Propane has a boiling point much lower than a tetrachloroethene/toluene mixture and is normally stored under pressure. A tetrachloroethene/toluene spill, where the liquid has a boiling point greater than the ambient temperature and is stored under ambient temperature and pressure, is not expected to result in a fireball. A large amount of heat would be required to raise the tetrachloroethene/toluene temperature to the boiling point and to transfer the liquid-phase chemical to the gas-phase, so that vapors can be formed rapidly. In addition, tetrachloroethene/toluene vapors will continue to escape from the tank during the heating through the ventilation system, reducing the quantity of chemical available for a possible fireball scenario if the tank temperature actually reached the chemical boiling point.

Detailed information regarding the ARCHIE modeling and the heat impacts due to fires is presented in Appendix VII-3.

3. On-Site Mixing of Incompatible Wastes

The on-site mixing of incompatible wastes scenario selected for quantitative evaluation results from an accidental pumping of incompatible waste into an improper storage vessel. This assumes pumping of 5,000 gallons of a mixture of chlorinated hydrocarbons (15% tetrachloroethene/85% methanol mixture) into a storage vessel containing 5,000 gallon of mineral acids (70% nitric acid solution). The mixing results in the release of gaseous hydrogen chloride (ASTM 1986).

To model the release of HCl resulting from the mixing of incompatible wastes, it is assumed that as the two wastes mix inside the storage vessel, the reaction between the two wastes to produce HCl is instantaneous. The pumping rate of the contents of the tanker truck into the storage vessel is estimated to be 250 gallon/min (Victorine 1995b). The release of HCl into the atmosphere is assumed to occur at ambient temperature and pressure through the vapor recovery system and vent.

The total amount of HCl released is calculated by assuming that all chlorine in the waste reacts instantaneously to form HCl. Using this approachresults in a potentially significant overestimate of HCl releases. Details regarding the calculation of HCl emissions are presented in Appendix VII-3.

4. Off-Site Tanker Truck Spill

The size of the off-site spill depends on the release rate and duration, and the presence of containment barriers (e.g., street curbs, speed bumps, building walls, etc.) in the spill vicinity, if any. As in the case of the on-site spill, chemical emission rates would be determined by the rate of evaporation from the liquid pool.

Assuming the road on which the spill occurs is flat and has no curbs that are capable of acting as a containment barrier, the liquid pool resulting from the conservative 5,000-gallon spill is assumed to reach a maximum length of approximately 49 m, assuming pool depth of 1 cm (see Appendix VII-3). This assumes the pool spreads in all directions at an equal rate, with liquids reaching the edge of the road running off onto soil or into a ditch. Assuming that the road is not sloped from the center line to the sides is conservative; in reality, it is likely that liquid would run off from the center of the road to the sides, reducing the size of the spill. The assumption of no roadway curbs appears to be appropriate for the local access route based on observations made during a site visit. Assuming the width of the road is 15 m, the area of the pool is approximately

735 m^2 (Figure IV-1). In the typical 100-gallon spill case, the pool size is approximately 38 m^2 (assuming a pool depth of 1 cm), and would not reach the edge of the road.

Details regarding emission calculations for the off-site soil scenario are provided in Appendix VII-3.

5. Off-Site Tanker Truck Spill with Fire

The off-site fire scenario is similar to the off-site spill scenario, with the additional presence of an ignition source. Chemical emission rates are calculated using the same approach as for the on-site fire scenario. Details regarding emission calculations are presented in Appendix VII-3.

The ARCHIE model is used to estimate the heat effect posed by the off-site fire scenario. Detailed information regarding the ARCHIE modeling and the heat impacts is presented in Appendix VII-3.

C. Summary of Results and Key Assumptions

The chemical-specific emission rates calculated for each accident scenario are summarized in Table IV-1. The major assumptions made in estimating chemical emission rates in the Accident Analysis are summarized in Table IV-2.

TABLE V-6
Summary of Downwind Air Concentrations for the Off-Site Fire Scenarios

Chemical of Concern	Spill Volume (gal)	Meteorology	Downwind Concentration (ppm)[2]			
			100 m	500 m	1000 m	2000 m
Phosgene	5,000	Typical	0.011	0.0062	0.0014	0.00063
		Conservative	2.6	0.42	0.25	0.11
		Calm/Inversion	NE[1]	NE	NE	NE
HCl	5,000	Typical	1.0	0.57	0.13	0.058
		Conservative	243	39	23	10
		Calm/Inversion	NE	NE	NE	NE
Phosgene	100	Typical	0.001	0.0006	0.0001	0.00006
		Conservative	0.26	0.042	0.025	0.011
		Calm/Inversion	NE	NE	NE	NE
HCl	100	Typical	0.10	0.057	0.013	0.0058
		Conservative	24.3	3.9	2.3	1.0
		Calm/Inversion	NE	NE	NE	NE

Notes:

[1] NE: Not Evaluated.
[2] Downwind distance from the edge of the fire.

TABLE V-5
Summary of Downwind Air Concentrations for the On-Site Fire Scenario

Chemical of Concern	Spill Size (gal)	Meteorology	Downwind Concentrations (ppm)[2]			
			100 m	500 m	1000 m	2000 m
Phosgene	20,000	Typical	3	--	0.0046	0.0043
		Conservative	--	0.0080	0.14	0.053
		Calm/Inversion	NE[1]	NE	NE	NE
HCl	20,000	Typical	--	--	0.42	0.40
		Conservative	--	0.72	12.8	4.9
		Calm/Inversion	NE	NE	NE	NE
Phosgene	100	Typical	--	--	0.0005	0.0004
		Conservative	--	0.0008	0.014	0.005
		Calm/Inversion	NE	NE	NE	NE
HCl	100	Typical	--	--	0.04	0.04
		Conservative	--	0.07	1.3	0.5
		Calm/Inversion	NE	NE	NE	NE

Notes:

[1] NE: Not Evaluated.

[2] Downwind distance from the property line to the east or west across the Ohio River to the south, or the existing railroad to the north, whichever is closer to the location of the release. For the on-site fire, maximum downwind distance was calculated from the railroad to the north, approximately 75 m from the edge of the fire.

[3] --: Concentration less than 0.0001 ppm.

TABLE V-4
Summary of Downwind Air Concentrations for the Off-Site Spill Scenarios

Chemical of Concern	Spill Volume (gal)	Meteorology	Downwind Concentration (ppm)[1]			
			100 m	500 m	1000 m	2000 m
Formaldehyde	5,000	Typical	660	61	19	5.7
		Conservative	6100	830	280	100
		Calm/Inversion	6700	1000	440	170
Acetone	5,000	Typical	64	6.0	1.9	0.56
		Conservative	450	63	28	12
		Calm/Inversion	1,000	175	81	37
Formaldehyde	100	Typical	25	1.5	0.5	0.1
		Conservative	260	27	9.3	2.7
		Calm/Inversion	280	55	22	6.8
Acetone	100	Typical	5.4	0.32	0.10	0.03
		Conservative	42	5.3	2.2	0.9
		Calm/Inversion	82	14.9	6.6	2.5

Note:

[1] Downwind distance from edge of spill

TABLE V-3
Summary of Downwind Air Concentrations for the On-Site Mixing of Incompatible Wastes Scenario

Chemical of Concern	Waste Volume (gal)	Meteorology	Downwind Concentration (ppm)[1]			
			100 m	500 m	1000 m	2000 m
HCl	5,000	Typical	260	78	26	8.1
		Conservative	4100	600	260	100
		Calm/Inversion	3700	920	420	170
HCl	200	Typical	11	1.5	0.5	0.15
		Conservative	120	25	9.5	3.0
		Calm/Inversion	170	51	22	7.5

Note:

[1] Downwind distance from the property line to the east or west across the Ohio River to the south, or the existing railroad to the north, whichever is closer to the location of the release. For the on-site spill mixing of incompatible waste, maximum downwind distance was calculated from the railroad to the north, approximately 75 m from the edge of the spill.

TABLE V-2
Summary of Downwind Air Concentrations for the On-Site Spill Scenario

Chemical of Concern	Spill Size (gal)	Meteorology	Downwind Concentrations (ppm)[1]			
			100 m	500 m	1000 m	2000 m
Formaldehyde	5,000	Typical	194	30	10	3
		Conservative	2016	491	224	82
		Calm/Inversion	3465	868	404	159
Acetone	5,000	Typical	19	2.7	1.0	0.3
		Conservative	140	35	16	7.2
		Calm/Inversion	370	100	51	25
Formaldehyde	100	Typical	9.7	1.2	0.40	0.12
		Conservative	120	22	8.1	2.6
		Calm/Inversion	160	46	20	6.4
Acetone	100	Typical	2.0	0.25	0.08	0.03
		Conservative	21	4.3	2.0	0.81
		Calm/Inversion	45	13	6.0	2.3

Note:

[1] Downwind distance from the property line to the east or west across the Ohio River to the south, or the existing railroad to the north, whichever is closer to the location of the release. For the on-site spill, maximum downwind distance was calculated from the railroad to the north, approximately 75 m from the edge of the spill.

TABLE V-1
Stability Wind Speed Combinations Used to Determine "Conservative" Meteorological Conditions

Atmospheric Stability Categories	Wind Speed (meters/sec)												
	1	1.5	2	2.5	3	3.5	4	4.5	5	8	10	15	20
A	*	*	*	*	*								
B	*	*	*	*	*	*	*	*	*				
C	*	*	*	*	*	*	*	*	*	*	*		
D	*	*	*	*	*	*	*	*	*	*	*	*	*
E	*	*	*	*	*	*	*	*	*				
F	*	*	*	*	*	*	*						

Note:

Matrix of conditions taken from U.S. EPA 1992b. It is only necessary to consider the stability-wind speed conditions relevant to the WTI site, which are marked with an asterisk (*).

C. Summary of Results and Key Assumptions

Tables V-2 through V-4 summarize the downwind concentrations at four downwind distances for the accident scenarios evaluated using the SLAB model (on-site spill, on-site mixing of incompatible wastes, and off-site spill). Complete SLAB model outputs and modeling parameters are presented in Appendix VII-4 and associated attachments.

The one-hour average concentrations predicted by the ISC-COMPDEP model for the typical meteorology and each of the 54 screening meteorological conditions are presented in Appendix VII-4 for both the on-site and off-site fire accident scenarios. Tables V-5 and V-6 summarize the downwind concentrations at four downwind distances for the two fire scenarios evaluated. In the Accident Analysis, concentrations resulting from the fire scenarios associated with large quantity releases (on-site 20,000-gallon spill and off-site 5,000-gallon spill) are modeled directly using ISC-COMPDEP. Fire scenarios associated with the small quantity releases (on-site spill of 200 gallons, and off-site spill of 100 gallons) can not be reliably modeled using ISC-COMPDEP because the releases associated with such small fires are short-lived and should not be treated as continuous plumes. However, the off-site impacts associated with the small quantity fire scenarios can be estimated from the ISC-COMPDEP results for the large quantity fire scenarios. As discussed in Appendix VII-4, the off-site concentrations resulting from the large volume fire scenarios, based on the considerations of source size, emission rate, emission duration, and concentration averaging time are predicted to be at least 10-fold lower than concentrations resulting from small volume fire scenarios. Thus, in the Accident Analysis, air concentrations for the typical fire events are conservatively estimated to be 10-fold lower than the concentrations modeled using ISC-COMPDEP for the large fire scenarios.

The major assumptions made in order to perform the SLAB or ISC-COMPDEP dispersion modeling are listed in Table V-7.

same stack. Thus, only by screening all 54 conditions can the worst-case meteorology and maximum ground-level concentration be identified at each downwind distance. In general, however, the conservative meteorological condition reflects a stable atmosphere with low windspeed, e.g., a windspeed of 1.5 m/sec and Stability Category F, as indicated in U.S. EPA (1987).

As a sensitivity analysis, ISC-COMPDEP is also used in conjunction with the one-year real-time meteorological data to further evaluate the off-site impacts of the fire scenarios during conservative meteorology. A more detailed discussion of the SLAB and ISC-COMPDEP modeling of conservative meteorological conditions is presented in Appendix VII-4.

3. Calm/Inversion Conditions

Calm/inversion meteorology represents the most stable meteorological condition that may occur at the WTI site, and thus results in the highest off-site concentrations in air in the event of an accidental release. This hypothetical meteorology assumes that emissions accumulate in the air immediately above the source for one hour during calm conditionsand stable atmosphere, and are then transported downwind under low wind speeds. Additional emissions from the spill, if there is sufficient quantity for further volatilization after the calm hour, would travel downwind as a continuous plume.

The limited mixing in the surface layer imposed by the temperature inversion is represented by a mixing height of 100 m in the SLAB model, and the worst-case meteorology is represented by the combination of low wind speed (1 m/sec) and stable atmosphere (Monin-Obukov length of 8.3m, approximately equivalent to Pasquill-Gifford atmospheric stability of E or F based on the Liu-Durran regression equation, as referenced by Randerson (1984). It is similar, in theory, to the calm meteorological condition evaluated for the routine stack and fugitive emissions study for WTI, where emissions during the calm hours are accumulated and released at the end of the calm period (see Volume IV).

As previously stated, the ISC-COMPDEP model is not appropriate for use when evaluating atmospheric dispersion of accidental releases under calm wind conditions. Potential releases associated with the on-site and off-site fire scenarios under calm/inversion conditions have therefore not been evaluated. However, the impacts for the fire scenarios under this calm/inversion meteorological condition are not expected to differ significantly from those predicted for the conservative meteorology.

with the health-based reference concentrations. The 30-minute average concentrations are obtained by multiplying the ISC-COMPDEP results by a factor of 1.15 (U.S. EPA 1992b, Turner 1967).

The three meteorological conditions evaluated in the Accident Analysis are described below.

1. Typical Conditions

A hybrid surface meteorological data set was developed for use in the dispersion modeling of the stack and fugitive emissions from the WTI facility (see Volume IV). This database represents meteorological conditions from April, 1992 through March, 1993. Based on these data, a "typical" meteorological condition was determined to be neutral atmosphere (Pasquill-Gifford Stability Category D) with average wind speed (3.2 m/sec). Specifically, neutral atmospheric conditions (Stability Category D) are the most frequently measured at the WTI facility, occurring approximately 57% of the time, and the average windspeed during non-calm hours at the WTI facility is 3.2 m/sec (see Volume IV). This set of conditions was used to represent typical conditions using both the SLAB model (for non-fire scenarios) and the ISC-COMPDEP model (for fire scenarios). As a sensitivity analysis, ISC-COMPDEP is also used in conjunction with the one-year real-time meteorological data to evaluate the off-site impacts of the fire scenarios during typical meteorology. The selection of the wind speed and atmospheric stability characterizing the typical meteorological condition is discussed in Appendix VII-4.

2. Conservative Conditions

For each accident scenario, 54 combinations of atmospheric stability and wind speed are evaluated to determine which combination results in the maximum downwind ground level concentrations off-site. These combinations correspond to non-calm meteorological conditions at the WTI site, and are identified from the matrix of possible conditions presented in U.S. EPA (1992b). The 54 combinations shown in Table V-1 are evaluated to determine the conservative meteorological conditions and resulting concentrations using both the SLAB model (for non-fire scenarios) and the ISC-COMPDEP model (for fire scenarios).

It is necessary to examine all 54 meteorological conditions to determine the maximum ground-level concentrations at different downwind distances. For example, the maximum ground-level concentration for a receptor far from a stack would occur during a stable low-wind condition, while an unstable high-wind condition would result in the highest ground-level concentration for a receptor immediately downwind of the

V. ATMOSPHERIC DISPERSION MODELING

A. Model Selection

In the Accident Analysis, atmospheric dispersion modeling of accidental releases was performed using the SLAB and ISC-COMPDEP models. SLAB is selected for modeling vapor releases from the spill and mixing of incompatible waste scenarios. It is a fully-documented model released by Lawrence Livermore National Laboratory (Ermak 1990), and listed by the U.S. EPA for use in modeling hazardous/toxic air pollutant releases (U.S. EPA 1993b). The model simulates both neutral and denser-than-air releases, and allows for continuous, finite duration, and instantaneous releases as well as automatic transition of continuous plume into transient plume with various time-averaged concentrations at the receptor locations.

The ISC-COMPDEP model is selected for modeling the on-site and off-site fire scenarios for several site-specific reasons. ISC-COMPDEP is a steady-state Gaussian model that can be used for both simple and complex terrain situations. Because of the high temperatures associated with the fire scenarios, the ability to model plume rise is critical. In addition, unlike SLAB, ISC-COMPDEP incorporates buoyant plume rise algorithms that allow the gradual or transitional rise of plumes to be computed. A complete description of ISC-COMPDEP is provided in Volume IV (Air Dispersion Analyses).

Details regarding the use of the SLAB and ISC-COMPDEP models in the Accident Analysis are provided in Appendix VII-4.

B. Meteorological Conditions

For the accident scenarios modeled using SLAB (on-site and off-site spills, and on-site mixing of incompatible wastes), off-site chemical concentrations in air are evaluated for three meteorological conditions: 1) "typical;" 2) "conservative;" and 3) calm/inversion. For each meteorological condition, 30-minute average concentrations were calculated using SLAB, to allow for a direct comparison of IDLH values. For the on-site and off-site fire accident scenarios modeled using ISC-COMPDEP, "typical" and "conservative" meteorological conditions are evaluated. The ISC-COMPDEP model is not appropriate for use when calculating atmospheric dispersion under calm/inversion conditions because the basic Gaussian steady-state assumption becomes invalid. The one-hour average concentrations predicted by the ISC-COMPDEP model are converted to 30-minute averages for comparison

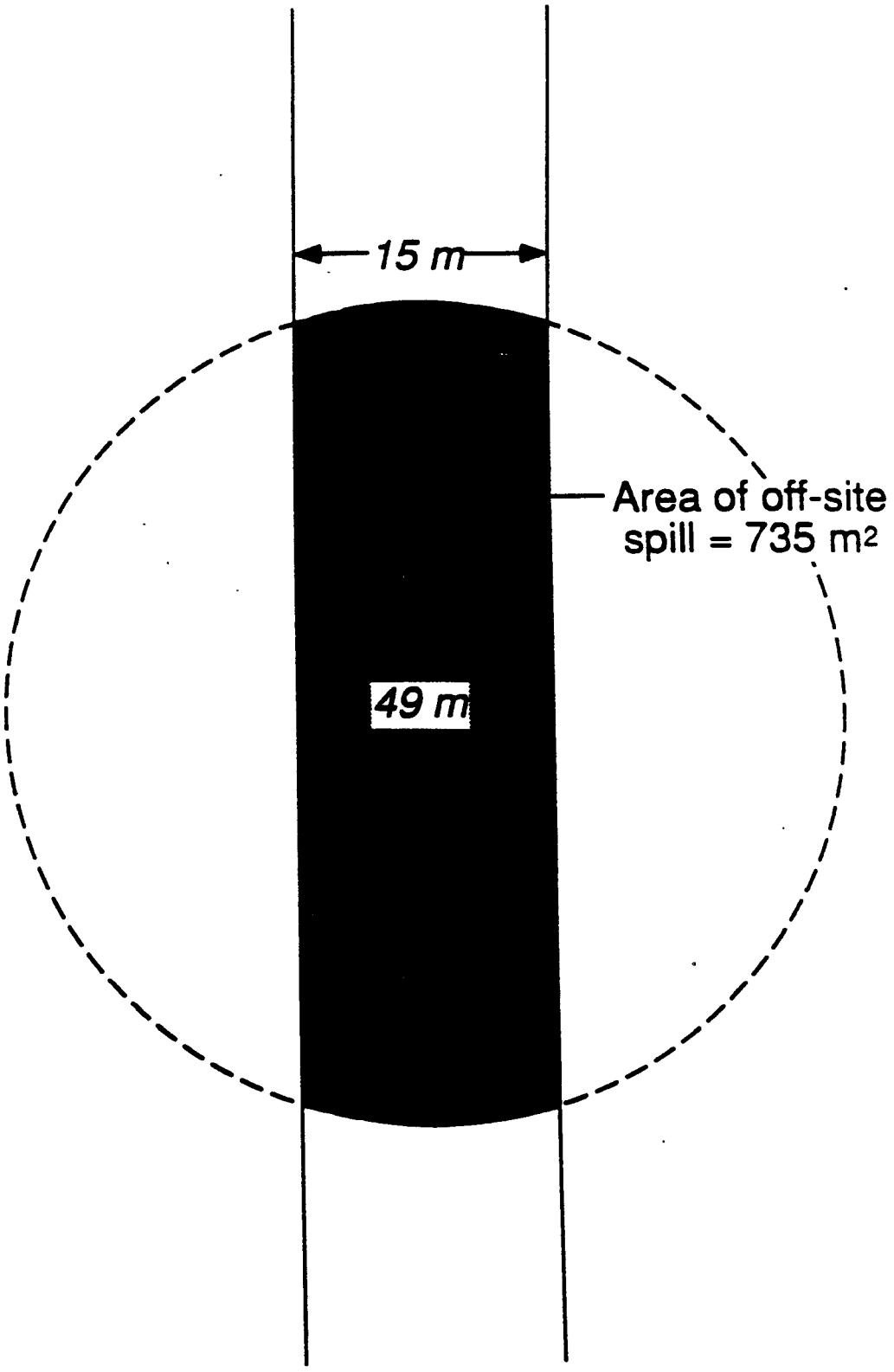

Figure IV-1
WTI ACCIDENT ANALYSIS, OFF-SITE SPILL ANALYSIS
AREA OF OFF-SITE SPILL

TABLE IV-2
Key Assumptions Made in Estimating Chemical Emission Rates

Assumption	Basis	Magnitude of Effect	Direction of Effect
1. All chlorine in the waste is converted to HCl in the mixing of incompatible waste scenario.	Conservative assumption due to lack of data regarding actual conversion rates. A fraction of the chlorine would be expected to react to form less hazardous compounds.	High	Overestimates
2. Ambient temperature assumed to be 68°F (or 20°C).	Typical temperatures in the East Liverpool area.	Low	Likely to overestimate emissions expected on most days, while underestimating emissions on some days.
3. Roadway is assumed to be flat for the off-site spill scenario.	Conservative assumption due to variability in actual in actual road conditions.	Medium	Likely to overestimate emissions in most cases. If hilly, could overestimate if near bottom of hill; or could underestimate if near top of hill. A peaked road would likely reduce the size of the pool.
4. The limited available data from Sjoberg (1952) can be used to quantify emissions of HCl and phosgene in the event of a fire.	The Sjoberg (1952) is an older investigation, but provides the most complete data for quantifying emissions in the event of a fire involving chlorinated waste.	Medium	Unknown
5. Spills will spread to a depth of 1 cm.	U.S. EPA (1987); Moorhouse and Carpenter (1986)	Low	Expected to somewhat overestimate emissions if surface is not flat, or if berms or drains are present.
6. Ambient wind speed assumed to be 3.2 m/sec.	Average windspeed at the WTI facility based on site-specific data.	Medium	Likely to overestimate emissions under low wind or calm conditions.

TABLE IV-1
Chemical-Specific Emission Rates

Scenario	Conservative Event		Typical Event	
	Average Emission Rate (kg/min)	Duration (min)	Average Emission Rate (kg/min)	Duration (min)
On-Site Spill				
• Formaldehyde	62.4	52	5.7	11
• Acetone	27.9	304	2.5	66
On-Site Fire				
• HCl	21.6	117	9.1	2.8
• Phosgene	0.62	117	0.27	2.8
On-Site Mixing of Incompatible Wastes				
• HCl	107.4	20	4.3	10
Off-Site Spill				
• Formaldehyde	110.4	29	5.6	11
• Acetone	49.1	172	2.5	66
Off-Site Fire				
• HCl	88.2	7.2	4.5	2.8
• Phosgene	2.6	7.2	0.13	2.8

TABLE V-7
Key Assumptions Made in Dispersion Modeling

Assumption	Basis	Magnitude of Effect	Direction of Effect
SLAB Modeling			
1. Source temperature assumed to be 20°C	Reflects typical temperatures in the East Liverpool Area. The source temperature variation is insignificant in the dispersion analysis.	Low	Unknown
2. Source height assumed to be 0.	Simplifying assumption.	Low	Overestimates
3. Receptor elevation assumed to be 0.	Simplifying assumption. May overestimate downwind concentrations.	Low	Overestimates. The overestimation is not significant based on the terrain elevations in the area near the WTI facility.
4. Building wake effect not considered.	Simplifying assumption.	Medium	May over or underestimate downwind concentrations for elevated stack release. May overestimate downwind concentrations for ground-level spill.
5. Typical meteorology represented by D-stability and 3.2 m/sec winds.	Site-specific meteorology data.	Low	Unknown. May over or underestimate during any given event.
6. Conservative meteorology defined by screening meteorology	Approach outlined in U.S. EPA (1992b), allows for selection of meteorology which results in maximum concentrations under different accident scenarios	Low	Overestimates for almost all meteorologic conditions
7. Calm/Inversion meteorology assumed to be calm hours followed by stable low wind condition.	Simplifying assumption.	Low	Significant overestimates for almost all meteorologic conditions
ISC-COMPDEP Modeling			
1. Highest terrain elevation assumed for receptors of the same downwind distance.	Simplifying assumption.	Low	Likely overestimates
2. 30-minute average concentrations converted from 60-minute averages calculated by ISC-COMPDEP Model.	Required to allow comparison to IDLH values.	Low	Likely overestimates

VI. SEVERITY OF CONSEQUENCES AND PROBABILITY OF OCCURRENCE

The results of the Accident Analysis for the WTI facility are characterized in terms of both severity of consequence and probability of occurrence. This approach is consistent with the guidance established by U.S. EPA (1987) and FEMA (1993), as discussed in Chapter I.

As shown in Table VI-1, the severity of consequence is ranked as minor, moderate, major, or catastrophic, based on the distance over which predicted concentrations in potentially inhabited areas could potentially exceed the NIOSH Immediately Dangerous to Life or Health (IDLH) values. For on-site accident scenarios, the nearest inhabited areas are conservatively assumed to be the property line to the east or west, across the Ohio River to the south, or across the existing railroad tracks to the north. In each case, the nearest inhabited area is at least 75 m from the location of the on-site accident. For off-site accident scenarios, inhabited areas are assumed to be immediately adjacent to the location of release. These assumed locations of inhabited areas are conservative because they represent the closest possible resident; in most situations, the closest resident would be further away from the release.

In developing the criteria shown in Table VI-1, the guidelines presented in FEMA (1993) have been modified to correspond to distances over which IDLH values are predicted to be exceeded. This involves a consideration of the population density within specific distances of the site, and the width of a contaminant plume in air as it moves away from the source. Based on 1990 census data approximately 25 to 50 people live within about 175 m of the facility, and approximately 1,000 to 1,500 people live within about 1,100 m of the facility. As a plume moves away from the source, its width (as described as concentrations within one standard deviation of the maximum, centerline concentration) would cover an arc of about 5° to 10°.

For example, given the location of the WTI facility along the Ohio River, it can be assumed that approximately 1,000 to 1,500 people live within a rough semicircle (a 180° arc) with a radius of 1,100 m. Assuming that a contaminant plume with concentrations higher than IDLH values has a width of 10°, the average number of individuals within 1,100 m who would be exposed to concentrations in excess of the IDLH would be approximately 50 to 100. Within 175 m of the site, the average number of individuals exposed to concentrations in excess of the IDLH would be less than 10. In the Accident

Analysis, it was assumed that an exceedance of an IDLH value in inhabited areas would have the potential to cause injuries. Thus, the consequence of any event for which IDLH values are predicted to be exceeded up to a distance of 100 m into inhabited areas (i.e., about 175 m from the source for on-site events, or 100 m from the source for off-site events) is ranked as moderate, corresponding to less than 10 people on average exposed to concentrations exceeding the IDLH. The consequence of any event for which IDLH values are predicted to be exceeded up to a distance of 1,000 m into inhabited areas is ranked as major, corresponding to up to 100 people on average exposed to concentrations exceeding the IDLH. Events which do not result in exceedances of IDLH values are ranked as minor, whereas events where IDLH values are exceeded to distances greater than 1,000 m are ranked as catastrophic.

Ranking by probability of occurrence is performed using the general criteria presented in FEMA (1993) and shown in Table VI-2. As indicated in Table VI-2, probability of occurrence has been ranked as common, likely, reasonably likely, unlikely, or very unlikely, based on the likelihood of the accident event, the composition of the waste, and the meteorological conditions. FEMA (1993) presents the following guidelines for evaluating accident probability: common, expected to occur one or more times each year on average; likely, expected to occur at least once every 10 years on average; reasonably likely, predicted to occur between once every 10 years and once every 100 years on average; unlikely, predicted to occur between once every 100 years and once every 1,000 years on average; and very unlikely, predicted to occur less than once in 1,000 years.

A. Severity of Consequences

The consequence rankings developed for the various accident scenarios are summarized for on-site and off-site events in Tables VI-3 and VI-4, respectively. The basis for these rankings is discussed below.

1. On-Site Spill

For the on-site spill scenario, four separate events are evaluated:

- Conservative spill (5,000 gallon) of formaldehyde-containing waste.
- Conservative spill (5,000 gallon) of acetone-containing waste.
- Typical spill (100 gallon) of formaldehyde-containing waste.
- Typical spill (100 gallon) of acetone-containing waste.

The results of the consequence analysis for these events are summarized in Table VI-5, and are discussed below.

a) Conservative Spill of Formaldehyde-Containing Waste

In the event of a 5,000 gallon spill of liquid waste containing 10% formaldehyde, and assuming no active or automatic mitigation measures or emergency response, exceedances of the IDLH value were predicted to occur up to 640 meters (m) downwind in potential receptor areas under typical meteorological conditions. Under conservative and calm/inversion meteorological conditions, exceedances of the IDLH for formaldehyde are predicted to occur up to 4,800 m and 8,500 m downwind, respectively.

Given the large distance over which the IDLH value for formaldehyde could potentially be exceeded, the severity of consequence for this scenario is judged to be major to catastrophic, depending on the meteorological conditions.

b) Conservative Spill of Acetone-Containing Waste

In the event of a 5,000 gallon spill of liquid waste containing 10% acetone, exceedances of the IDLH value for acetone are not predicted to occur at any off-site inhabited locations. Thus, the severity of consequence for this event is judged to be minor.

c) Typical Spill of Formaldehyde-Containing Waste

In the event of an on-site spill of 100 gallons of liquid waste containing 10% formaldehyde, exceedances of the IDLH value are predicted to occur up to about 40 m downwind in potentially inhabited areas under typical meteorological conditions, assuming no active mitigation or emergency response. Under conservative and calm/inversion meteorological conditions, exceedances of the IDLH for formaldehyde are predicted to occur up to 550 m and 1,000 m downwind, respectively.

Given the areas over which IDLH values are predicted to be exceeded, the severity of consequences for this event is judged to be moderate to major, depending on the meteorology at the time of the spill.

d) Typical Spill of Acetone-Containing Waste

Off-site exceedances of IDLH values are not predicted under any set of meteorological conditions. Thus, the severity of consequence is judged to be minor.

2. On-Site Fire

For the on-site fire scenario, two events are evaluated:

- A fire involving a spill of 20,000 gallons of waste containing 15% tetrachloroethene and 85% toluene.

- A fire involving a spill of 200 gallons of waste containing 15% tetrachloroethene and 85% toluene.

The results of these events are summarized in Table VI-6, and are discussed below.

a) Conservative Fire Event

In the conservative fire event, exceedances of the IDLH values for HCl and phosgene are not expected off-site under either typical or conservative meteorology.

Based on the ARCHIE model, an on-site fire involving the 20,000 gallon release assumed for this scenario could potentially result in a heat effect fatality zone radius of 20 m, and an injury zone radius of 28 m. The fatality zone radius is defined as the distance from the center of the pool within which individuals may suffer from third-degree burns likely to be fatal. The injury zone radius is defined as the distance from the center of the pool within which individuals may suffer from second-degree burn injuries or severe pain on bare skin. Because inhabited areas are at least 75 m from the fire location, neither fatalities nor injuries would be expected off-site, although on-site impacts might occur.

The consequences of a fireball, which would be less likely to occur than a simple fire, could be more significant. According to the ARCHIE model, the fatality zone radius would be 365 m, or possibly extending nearly 300 m into inhabited off-site areas. The injury zone radius would be 695 m, or possibly extending to almost 625 m in inhabited off-site areas.

On the basis of potential vapor emissions only, the severity of consequences for the large on-site spill would be minor. When the heat effects are considered, the severity of consequence would remain minor. However, the severity of consequence in the unlikely event a fireball should form is classified as major.

The severity of consequence for this event does not change whether ignition occurs during the release, or after the pool reaches its maximum size (see Appendix VII-3 for details).

b) **Typical Fire Event**

In the typical fire event, off-site exceedances of IDLH values are not predicted for either HCl or phosgene under either typical or conservative meteorology.

For the on-site fire involving a 200 gallon spill, the fatality zone radius for heat effects from a pool fire is 13 m, and the injury zone radius is 18 m, assuming that the fire did not occur until the spill area reached its maximum size. If the waste were to ignite upon discharge, both radii would be less. Thus, while on-site impacts might occur, neither fatalities nor injuries are expected off-site.

For a fireball, the calculated fatality zone radius is about 30 m, and the calculated injury zone radius is about 65 m. Given that the closest inhabited areas are over 75 m from the on-site fire location, neither fatalities nor injuries would be expected off-site. As discussed in Chapter IV of this report, it is highly unlikely that a fireball could occur, given the wastes expected to be received at the WTI facility.

Based on the results, the severity of consequence for the typical on-site fire is judged to be minor.

3. **On-Site Mixing of Incompatible Wastes**

Two on-site events involving mixing of incompatible wastes are evaluated:

- Mixing of a total of 10,000 gallons of incompatible wastes (by inadvertently pumping 5,000 gallons of waste, at a rate of 250 gallons/min, into a tank which contains 5,000 gallons of an incompatible waste), resulting in the generation of HCl emissions.

- Mixing of a total of 200 gallons of incompatible wastes, resulting in the generation of HCl emissions.

The results of these events are summarized in Table VI-7, and are discussed below.

a) **High Volume Mixing Event**

In the Accident Analysis, HCl emissions are calculated using a simple mass balance, assuming that 100% of the chlorine in the waste reacts instantaneously to form HCl, and are likely to be significant overestimates. Based on this assumption, in the mixing event involving 10,000 gallons of incompatible wastes, exceedances of the IDLH for HCl are predicted to occur to a distance of about 680 m downwind in potentially inhabited areas under typical meteorological conditions, assuming no

active mitigation or emergency response. Under conservative and calm/inversion meteorological conditions, exceedances were predicted to occur up to distances of about 3,200 m and 4,600 m, respectively.

Based on the assumptions of this analysis, the severity of consequence for this event is judged to be major to catastrophic, depending on the meteorological conditions.

b) **Typical Volume Mixing Event**

In the typical volume mixing event involving 200 gallons of waste, no exceedance of the IDLH is predicted under typical meteorology. Exceedances of the IDLH for HCl are predicted to occur up to approximately 270 m downwind in potentially inhabited areas under conservative meteorological conditions. Under calm/inversion meteorological conditions, exceedances of the IDLH are predicted for off-site distances up to about 500 m.

Based on the areas over which potential exceedances of the IDLH are predicted, the severity of consequence for this event is judged to be minor to major, depending on the meteorology at the time of the accident. As previously noted with respect to the conservative mixing scenario, emissions of HCl were estimated using a mass balance approach, and are likely to be a significant overestimate.

4. **Off-Site Spill**

Four off-site spill events are evaluated:

- Conservative off-site spill of 5,000 gallons of liquid waste consisting of a 10% formaldehyde/90% methanol mixture.

- Conservative off-site spill of 5,000 gallons of liquid waste consisting of a 10% acetone/90% toluene mixture.

- Typical off-site spill of 100 gallons of liquid waste consisting of a 10% formaldehyde/90% methanol mixture.

- Typical off-site spill of 100 gallons of liquid waste consisting of a 10% acetone/90% toluene mixture.

The results of these events are summarized in Table VI-8, and are discussed below.

a) Conservative Spill of Formaldehyde-Containing Waste

Under the typical meteorological conditions, exceedances of the IDLH for formaldehyde are predicted up to approximately 1,000 m downwind of the spill. Exceedances of the IDLH are predicted up to about 5,100 m and 8,600 m downwind under conservative and calm/inversion meteorological conditions, respectively.

Based on the large area over which the IDLH could potentially be exceeded, and the magnitude of the exceedances of the IDLH value, the severity of consequence of this event is judged to be major to catastrophic, depending on the meteorological conditions.

b) Conservative Spill of Acetone-Containing Waste

In the event of a large spill of acetone-containing waste, IDLH values are predicted to be exceeded only immediately adjacent to the spill under both typical and conservative meteorological conditions. The IDLH could be exceeded up to about 50 m downwind under calm/inversion conditions. On this basis, the severity of consequence is judged to be minor to moderate depending on the meteorology at the time of the spill.

c) Typical Spill of Formaldehyde-Containing Waste

Under typical meteorological conditions, potential exceedances of the IDLH for formaldehyde are predicted to occur up to a distance of about 130 m from the spill. Under conservative and calm/inversion meteorological conditions, exceedances are predicted to occur up to distances of about 630 m, and 1,100 m respectively.

Based on the areas over which exceedance of the IDLH value are predicted, the severity of consequence for this event is judged to be major to catastrophic, depending on meteorological conditions.

d) Typical Spill of Acetone-Containing Waste

Exceedances of the IDLH for acetone are predicted to occur over a relatively short distance (i.e., less than 10 m) under all meteorological conditions. Thus, the severity of consequence for this event is judged to be minor.

5. Off-Site Fire

Two off-site fire events are evaluated:

- A fire involving a spill of 5,000 gallons of waste containing 15% tetrachloroethene and 85% toluene, resulting in HCl and phosgene emissions.

- A fire involving a spill of 100 gallons of waste containing 15% tetrachloroethene and 85% toluene, resulting in HCl and phosgene emissions.

The results of these events are summarized in Table VI-9, and are discussed below.

a) Conservative Fire Scenario

In the off-site fire scenario, under typical meteorology, exceedances of the IDLH are not predicted for either HCl or phosgene. Under conservative meteorology, exceedances of the IDLH are predicted to occur within distances of 275 m (for HCl) and 125 m (for phosgene). Any exceedances which occur would be in "pockets", with the site and location of these pockets dependent upon terrain elevation in the vicinity of the accident.

Based on the results of the ARCHIE model, the fatality zone radius for heat effects would be 40 m, and the injury zone radius would be about 60 m, assuming the fire did not occur until the spill area reached its maximum size. If the fire were to start at the time of the discharge, the fatality and injury zone radii would be reduced to about 35 m and 50 m, respectively.

If a fireball were to form, the ARCHIE model predicts a fatality zone radius of approximately 170 m, and an injury zone radius of about 340 m. As discussed in Chapter IV of this report, it is highly unlikely that a fireball would form given the types of wastes transported to the WTI facility.

On the basis of potential HCl and phosgene emissions, the large off-site transportation spill is judged to have minor consequences under typical meteorology, and potentially major consequences under conservative meteorology. Given the potential heat effects of the fire, the event is assigned a severity of consequence ranking of moderate, while the severity is ranked as major if it is assumed a fireball can form.

b) Typical Fire Scenario

In the typical off-site fire scenario, exceedances of the IDLH values for HCl and phosgene are not expected.

In the off-site fire scenario involving a 100 gallon spill, the fatality zone radius for heat effects is 9 m, and the injury zone radius is 13 m, assuming the fire does not occur until the spill area reached its maximum size. If the fire is assumed to

start during the discharge, the fatality and injury zone radii decrease to 5 m and 7 m, respectively.

If a fireball formation is assumed, the ARCHIE model predicts a fatality zone radius of 20 m, and an injury zone radius of 45 m. However, a fireball is not likely to form in a typical off-site fire scenario due to the small size of the spill leading to the fire.

Given that no exceedances of IDLH values are expected, and the small area for potential heat effects, the typical off-site fire event is categorized as moderate. The event is classified as having moderate severity if a fireball is assumed to form.

B. Probability of Occurrence

1. On-Site Events

As discussed in Chapter I, the probability of occurrence in an Accident Analysis can be assessed qualitatively, semiquantitatively or quantitatively. In this Accident Analysis, the probability has been assessed qualitatively, or semiquantitatively, depending on the data available for the specific accident scenario. Furthermore, the probability rankings that are assigned correspond to accident classes, rather than specific accident events. This approach was adopted given the limited information available on the likelihood of specific events, as discussed below.

As discussed in Chapter I, the U.S. EPA *Summary of Incidents at Incinerators and Commercial TSDFs Report on Emergency Incidents at Hazardous Waste Incinerators and Commercial Treatment, Storage, and Disposal Facilities (TSDFs)* (U.S. EPA 1995b) provides information regarding incidents reported at hazardous waste facilities. A total of 50 emergency incidents, as defined by U.S. EPA, were reported at the hazardous waste incinerators identified in the study. For commercial hazardous waste incinerators only, 24 emergency incidents at 11 facilities were reported, with 10 involving a release of hazardous waste. No emergency incidents have been reported at 15 commercial incineration facilities, so these facilities were not discussed in U.S. EPA (1995b). In all, 26 commercial hazardous waste incineration facilities were identified to have operated in the U.S. sometime during the period from 1981 through 1994.

The total operating time for the 26 commercial incinerators during the time period considered by the study is approximately 250-300 years. This operating time total is conservative, since no information was available for operations before 1981, and no operating dates were available for two facilities. Thus, approximately one emergency incident involving a hazardous waste release has been reported for every 25 to 30 years of operation for the commercial incinerators. None of the 10 incidents reported at

commercial combustion facilities involving releases of hazardous waste has resulted in a fatality or serious injury in off-site communities, although on-site worker injuries and fatalities have been reported (U.S. EPA 1995b).

According to the U.S. EPA Chemical Emergency Preparedness and Prevention Office (CEPPO), the Emergency Response Notification System (ERNS) database includes first-hand reports of incidents. Further detailed information on selected incidents from ERNS is maintained in the Accidental Release Inventory Program (ARIP) database. However, neither the ERNS nor ARIP databases provide comprehensive information on incidents at specific incinerators or other TSDFs (Chung 1995). Finally, the RCRA Corrective Action database and the Bureau of Labor Statistics database do not provide relevant information specific to incidents at hazardous waste TSDFs. In summary, a rigorous quantitative analysis for hazardous waste-related accidents can not be performed based solely on data from the operating history of commercial hazardous waste incinerators or TSDFs.

The estimated probability of occurrence rankings for the various on-site accident events are discussed separately below. These rankings do not explicitly take into account WTI procedures and design features for preventing spills, leaks, fires, and mixing of incompatible wastes, as discussed in Chapter II and are thus considered conservative. Furthermore, the probability of occurence rankings correspond to accident classes rather than specific accident events. For example, the probability ranking for a "typical" size spill of "typical" waste represents the ranking for spills on the order of 100 gallons involving wastes received by the WTI facility in relatively high volumes.

a) On-Site Spill

As indicated by the summary of incidents reported at the WTI facility (in Table 3 of Appendix VII-1), it is reasonable to assume that small spills (i.e., less than 20 gallons) are expected to be relatively common, using the definition of FEMA (1993). According to FEMA (1993), accidents can be classified as common if they are expected to occur one or more times per year on average; there have been 5 spills of 20 gallons or less in about 2 years of operation at the WTI facility.

There have been no spills greater than 20 gallons reported at WTI in the past two years. However, as documented in Table 1 of Appendix VII-1, several spills of 100 gallons or more have been reported at TSDFs in the U.S. since 1981. While data for quantifying the frequency of larger (i.e., greater than 100 gallon) spills at hazardous waste incinerators are not available, the available information summarized in Table 2 of Appendix VII-1 would suggest that spills of approximately 100 gallons might be considered at most reasonably likely (i.e., expected to occur at least once

every 10 years on average), while spills of 5,000 gallons might be considered at most reasonably likely (i.e., expected to occur between once every 10 years and once every 100 years on average). These relative rankings are generally consistent with available data on the distribution of spill sizes from full-size tankers during highway transit between 1971 and 1986, which indicate that 70% of all spills were 20 gallons or more; 40% were 100 gallons or more, but only 5% were 5,000 gallons or more (U.S. DOT 1986). Thus on-site spills of about 5,000 gallons are estimated to be about 10-fold less likely to occur than on-site spills of about 100 gallons.

The likelihood of spills involving a "worst-case" chemical, such as formaldehyde, is believed to be significantly lower than the likelihood of a spill involving a "typical" chemical, such as acetone. For example, acetone represents approximately 3% of the total pumpable feeds based on waste profiles for the first nine months of operation, while formaldehyde represents only about 0.5%. Thus, the probability of occurrence for spills of "worst-case" chemicals are ranked lower than for spills of "typical" chemicals.

Finally, it is less likely that spills will occur during conservative or calm/inversion meteorological conditions than during typical meteorological conditions. Conservative conditions, which reflect a stable atmosphere along with low wind speeds (<1 m/sec), would be expected to occur less than 10% of the hours in a year, according to the meteorological data discussed in Chapter V. The calm/inversion scenarios evaluated in this analysis (a period of windspeed less than 1.0 m/sec, followed immediately by a period of stable atmosphere), would be expected to occur less than 5% of the hours in a year. For example, based on the one-year hourly surface meteorological data (April 1992 - March 1993) recorded at the WTI site, a stable atmosphere (F-stability) with low wind speed (windspeeds between 1.0 and 1.5 m/sec) would occur immediately after a calm hour only about 1.7% of the time.

On the basis of the information provided above, the on-site spill scenarios have been assigned the rankings for probability of occurrence shown in Table VI-10.

b) On-Site Fire

Data on the frequency of fires at hazardous waste incineration facilities and other TSDFs are very limited. Relatively few fires have been reported since 1981, when reporting under RCRA began. Thus, there is considerable uncertainty in estimating the likelihood of occurrence for an on-site fire.

The frequency of ignition in the event of a spill depends on a number of factors, including the flammability of the waste, the proximity of an ignition source, and the atmospheric conditions. However, based on data from oil refinery operations, Battelle (1987) estimated an ignition frequency of one in every 25 spills. On this basis and the likelihood rankings assigned to the on-site spills, the probability of occurrence rankings assigned for the on-site fire scenarios are listed in Table VI-10. The rankings do not take into account the probability of chlorinated wastes being involved in the fire, and thus may overstimate the likelihood of adverse consequences.

c) On-Site Mixing of Incompatible Wastes

Data on the frequency of incidents involving the mixing of incompatible wastes at hazardous waste incineration facilities and other TSDFs are very limited. As shown in Table 2 of Appendix VII-1, very few such incidents have been reported at other TSDFs since 1981. However, based on the *Report on Emergency Incidents at Hazardous Waste Incinerators and Commercial Treatment, Storage, and Disposal Facilities (TSDFs)* (U.S. EPA 1995b), it does not appear that incidents involving mixing of incompatible wastes are any more likely than fires. Thus, the rankings assumed for on-site fires are also assigned for mixing of incompatible wastes, as shown on Table VI-7. Given the lack of frequency data for events involving mixing of incompatible wastes, there is considerable uncertainty associated with these rankings.

2. Off-Site Events

a) Off-Site Spill Events

Site-specific calculations used to calculate the off-site accident and spill frequency of trucks carrying waste to WTI are described in Appendix VII-5. Spills may occur during waste transport as a result of both major accidents and minor valve and fitting leaks. Based on an evaluation of site-specific traffic accident data, a collision-related spill involving trucks bringing waste to the WTI facility is estimated to have about a 1 in 60 chance of occurring each year on State Route 39 (SR 39) in East Liverpool, Ohio. Non-collision related spills are estimated to have about a 1 in 40 chance of occuring each year on the same route. Considering both collision and non-collision related releases and based on data regarding spill size, a spill of greater than 100 gallons is estimated to have a 1 in 60 chance of occurring

each year. A spill of greater than 5,000 gallons is estimated to have a 1 in 295 chance of occurring each year.

An estimate of the likelihood of a spill occurring during transport of waste to the WTI facility can also be roughly approximated using national data for 1991, the most recent year for which data on the total quantity of hazardous waste shipped in the U.S. are available (U.S. EPA 1994b). Based on U.S. EPA (1994b), there were approximately 15 million tons of hazardous waste transported within the United States in 1991. During that same year, there were 175 highway-related incidents involving hazardous waste, with an average spill size of 92 gallons (U.S. DOT 1995). Thus, there was approximately one incident per every 75,000 tons of hazardous waste transported on the highway.

According to the RCRA permit for the WTI incinerator (U.S. EPA 1983), up to approximately 75,000 tons of waste is allowed to be incinerated at the WTI facility each year. Thus, one transportation-related incident might be expected during each year of operation at the WTI facility over the entire transportation network for the facility. However, only 25 injuries were reported to result from the 175 highway-related incidents in 1991, or about one injury for every 7 incidents (U.S. DOT 1995). All injuries and fatalities listed in U.S. DOT (1995) were the result of chemical exposure (Duyzh 1995). Thus, there is approximately a 1 in 7 chance that exposure-related injury might occur each year over the generator to WTI transportation route (the likelihood of an injury along the local access route in East Liverpool only would be considerably lower).

Finally, during the 10 years between 1984 and 1993, there were one fatality and 143 injuries reported involving highway transport of hazardous waste (U.S. DOT 1995). For highway transport of hazardous materials, there were 115 fatalities and 2,781 injuries. Thus, it can be estimated that there are between 1 fatality for every 25 injuries (using the hazardous materials data) and 1 fatality for every 140 injuries (using the hazardous waste data). Based on the 1 in 7 probability for an injury each year along the WTI transportation route, there would be between 1 chance in 175 and 1 chance in 980 each year of an exposure-related fatality along the overall generator to WTI transportation route. Again, the likelihood of a fatality along the local access route in East Liverpool only would be lower.

Considering the U.S. DOT and U.S. EPA data summarized above, the likelihood of occurrence rankings are assigned to the off-site spill events, based on the general guidance provided in U.S. EPA (1987) and FEMA (1993). These rankings are shown in Table VI-11, and correspond to the liklihood of a spill along the local access route in East Liverpool.

b) Off-Site Fire Events

As previously discussed, there is considerable uncertainty in estimating the probability of a fire resulting from a spill. The likelihood of a fire depends on the nature of the waste spilled, and the proximity of an ignition source, among other factors. Based on data from oil refinery operations, Battelle (1987) estimated a fire frequency of one in every 25 spills. According to data cited in FEMA (1993), about 1% of most types of truck accidents result in a fire; this corresponds to a fire frequency of about one in every 20 to 50 spills.

Considering the estimated likelihood of an off-site spill, and the reduced likelihood of a spill leading to a fire, the likelihood of occurrence rankings are assigned to the off-site fire events and listed in Table VI-11.

C. Summary of Results and Key Assumptions

The severity of consequence and probability of occurrence results for on-site accident scenarios are summarized in Table VI-12. As shown in Table VI-12, only on-site events with "minor" off-site consequences are judged "likely" to occur at the WTI facility, and only on-site events with "minor" or "moderate" off-site consequences are judged to be "reasonably likely" to occur. All on-site accident scenarios with "major" off-site consequences are judged "unlikely" to occur. All on-site accident scenarios with "catastrophic" off-site consequences are judged "very unlikely" to occur.

The results of the Accident Analysis described in this report are consistent with the results of the *Credible Event Analysis* performed by S.E. Technologies (1992) for WTI. The results of the Credible Event Analysis (SE Technologies 1992) are not directly comparable to the results of this Accident Analysis, because the *Credible Event Analysis* compared downwind distances to U.S. EPA Level of Concern (LOC) values, rather than IDLH values. However, the results of one type of accident, mixing of incompatible wastes, can be compared. In both the *Credible Event Analysis* and the current Accident Analysis, the mixing of incompatible waste scenario resulted in the potential for significant off-site exposures. In the *Credible Event Analysis*, a "hazard distance" (i.e., distance over which an LOC would be exceeded) was calculated to be approximately 7,000 m for the mixing of incompatible waste scenario. As shown on Table VI-7 in this Accident Analysis, the downwind distance over which an IDLH is predicted to be exceeded for a comparable mixing of incompatible waste scenario ranges from 680 m to 4,620 m, depending on meteorology. (As discussed in Chapter VII, the downwind distance over which an LOC is predicted to be exceeded for this scenario ranges form 1,280 m to 12,200 m, depending on meteorology). Consistent with this Accident Analysis, the *Credible Event Analysis* determined that the probability of occurrence for this type of accident is low. The results of the *Credible Event*

Analysis and this Accident Analysis for the other types of on-site events (i.e., spills and fires) are also comparable, with "hazard distances" potentially extending several hundred meters downwind due to spills, and potential heat effects off-site due to major fires. However, this Accident Analysis examined several scenarios involving large spills of very toxic, volatile waste not considered in the *Credible Event Analysis*, and thus has projected greater possible consequences associated with spill events.

The severity of consequence and probability of occurrence results for off-site accident scenarios are summarized in Table VI-13. For the off-site accident scenarios, events with minor consequences were determined to be at most, reasonably likely to occur. Off-site accidents with moderate or major consequences are judged to be unlikely or very unlikely to occur. Events classified as having potentially catastrophic consequences were determined to be very unlikely to occur. The *Credible Event Analysis* performed by S.E. Technologies (1992) for WTI did not assess off-site accidents.

Major assumptions made in ranking the accident events according to severity of consequence and likelihood of occurrence are listed in Table VI-14.

TABLE VI-1 Criteria Used in Ranking the Severity of Consequence	
Severity of Consequence Ranking	**General Criteria**
Minor	No exceedance of an IDLH value in inhabited off-site areas; and negligible potential for off-site fatalities or serious injuries due to heat effects from a fire.
Moderate	Exceedance of IDLH values in inhabited off-site areas over distances of 100 m or less; injuries due to heat effects limited to a distance of 100 m into inhabited areas.
Major	Exceedance of IDLH values in inhabited off-site areas over distances between 100 m to 1000 m; injuries due to heat effects limited to a distance of 1000 m into inhabited areas.
Catastrophic	Exceedance of IDLH values in inhabited off-site areas over distances greater than 1000 m; injuries due to heat effects extend to distances greater than 1000 m into inhabited areas.

TABLE VI-2 Criteria Used in Ranking Probability of Occurrence	
Probability of Occurrence Ranking	**General Criteria**
Common	Expected to occur one or more times each year on average.
Likely	Expected to occur at least once every 10 years on average according to available statistics.
Reasonably Likely	Predicted to occur between once every 10 years and once every 100 years on average.
Unlikely	Predicted to occur between once every 100 years and once every 1,000 years on average in a specific locale.
Very Unlikely	Predicted to occur less than once in 1,000 years.

TABLE VI-3
Severity of Consequence for On-Site Scenarios

	Meteorological Conditions		
	Typical	**Conservative**	**Calm/Inversion**
On-Site Spills			
5,000 gallon spill - Formaldehyde - Acetone	 Major Minor	 Catastrophic Minor	 Catastrophic Minor
100 gallon spill - Formaldehyde - Acetone	 Moderate Minor	 Major Minor	 Major Minor
On-Site Fires			
20,000 gallons of waste	Minor[1]	Minor[1]	NE[3]
200 gallons of waste	Minor[2]	Minor[2]	NE[3]
Mixing of Incompatible Wastes			
10,000 gallons of waste	Major	Catastrophic	Catastrophic
200 gallons of waste	Minor	Major	Major

Notes:

[1] On the bases of potential HCl and phosgene emissions and heat effects, the conservative fire is judged to have minor consequences. If a fireball were to form, the consequences would be classified as major, but the probability of occurrence is very unlikely.

[2] On the bases of potential HCl and phosgene emissions, heat effects and assumed fireball formation, the typical fire is judged to have minor consequences.

[3] NE: Not evaluated. Calm/inversion conditions not evaluated for the fire scenarios.

TABLE VI-4
Severity of Consequence for Off-Site Scenarios

	Meteorological Conditions		
	Typical	**Conservative**	**Calm/Inversion**
Off-Site Spills			
5,000 gallon spill - Formaldehyde - Acetone	 Major Minor	 Catastrophic Moderate	 Catastrophic Moderate
100 gallon spill - Formaldehyde - Acetone	 Major Minor	 Catastrophic Minor	 Catastrophic Minor
Off-Site Fires			
5,000 gallons of waste	Moderate[1]	Major[1]	NE[3]
100 gallons of waste	Moderate[2]	Moderate[2]	NE[3]

Notes:

[1] On the bases of potential HCl and phosgene emissions, the conservative fire is judged to have minor consequences under typical meteorology, and potentially major consequences under conservative meteorology. Given the potential heat effects of the fire, the event would be judged to have moderate consequences. If a fireball were to form, the consequences would be classified as major, but the probability of occurrence is very unlikely.

[2] On the bases of potential HCl and phosgene emissionsand heat effects the typical fire is judged to have moderate consequences.

[3] NE: Not evaluated. Calm/inversion conditions not evaluated for the fire scenarios.

TABLE VI-5
Consequence Assessment, On-Site Spill

Spill Size (gallons)	Meteorology	Contaminant	Max. Downwind Dist. to IDLH, no active mitigation[1,2] (m)
5,000	Typical	Formaldehyde	640
5,000	Conservative	Formaldehyde	4800
5,000	Calm/Inversion	Formaldehyde	8450
5,000	Typical	Acetone	--
5,000	Conservative	Acetone	--
5,000	Calm/Inversion	Acetone	--
100	Typical	Formaldehyde	40
100	Conservative	Formaldehyde	550
100	Calm/Inversion	Formaldehyde	1000
100	Typical	Acetone	--
100	Conservative	Acetone	--
100	Calm/Inversion	Acetone	--

Notes:

1 Maximum Downwind Distance calculated from the property line to the east or west, or the existing railroad to the north, whichever is closer to the location of the release. For the on-site spill, maximum downwind distance was calculated from the railroad line to the north, approximately 75 m from the edge of the spill.

2 --: IDLH not exceeded in potential off-site receptor areas.

TABLE VI-6
Consequence Assessment, On-Site Fire

				Max. Downwind Dist. Affected by Heat Effect (m)[1]		Max. Downwind Dist. Affected by Fireball(m)[1]	
Waste Volume Ignited (gallons)	**Meteorology**	**Contaminant**	**Downwind Dist. to IDLH, no active mitigation[1] (m)**	**Fatality**	**Injury**	**Fatality**	**Injury**
20,000	Typical	HCl	--	--	--	300	625
		Phosgene	--				
20,000	Conservative	HCl	--	--	--	300	625
		Phosgene	--				
200	Typical	HCl	--	--	--	--	--
		Phosgene	--				
200	Conservative	HCl	--	--	--	--	--
		Phosgene	--				

Note:

[1] --: not exceeded in potential off-site receptor areas.

TABLE VI-7
Consequence Assessment, On-Site Mixing of Incompatible Wastes

Waste Volume (gallons)	Meteorology	Contaminant	Max. Downwind Dist. to IDLH, no active mitigation[1,2] (m)
10,000	Typical	HCl	680
10,000	Conservative	HCl	3190
10,000	Calm/Inversion	HCl	4620
200	Typical	HCl	--
200	Conservative	HCl	270
200	Calm/Inversion	HCl	520

Notes:

[1] Maximum Downwind Distance calculated from the property line to the east or west, or the existing railroad to the north, whichever is closer to the release. For the on-site mixing of incompatible wastes, the maximum downwind distance was calculated from the railroad line to the north, or approximately 75 m from the edge of the release.

[2] --: IDLH not exceeded in potential off-site receptor areas.

TABLE VI-8
Consequence Assessment, Off-Site Spill

Spill Size (gallons)	Meteorology	Contaminant	Max. Downwind Dist. to IDLH, no active mitigation[1,2] (m)
5,000	Typical	Formaldehyde	980
5,000	Conservative	Formaldehyde	5120
5,000	Calm/Inversion	Formaldehyde	8550
5,000	Typical	Acetone	< 10
5,000	Conservative	Acetone	< 10
5,000	Calm/Inversion	Acetone	50
100	Typical	Formaldehyde	130
100	Conservative	Formaldehyde	630
100	Calm/Inversion	Formaldehyde	1080
100	Typical	Acetone	< 10
100	Conservative	Acetone	< 10
100	Calm/Inversion	Acetone	< 10

Notes:

1 Maximum Downwind Distance calculated from edge of spill.
2 --: IDLH not exceeded in off-site potential receptor areas.

TABLE VI-9
Consequence Assessment, Off-Site Fire

				Max. Downwind Dist. Affected by Heat Effect (m)[2]		Max. Downwind Dist. Affected by Fireball(m)[2]	
Waste Volume Ignited (gallons)	**Meteorology**	**Contaminant**	**Downwind Dist. to IDLH[1,2] no active mitigation**	**Fatality**	**Injury**	**Fatality**	**Injury**
5,000	Typical	HCl	--	35	50	170	340
		Phosgene	--				
5,000	Conservative	HCl	275[3]	40	60	170	340
		Phosgene	125[3]				
100	Typical	HCl	--	5	7	20	45
		Phosgene	--				
100	Conservative	HCl	--	9	13	20	45
		Phosgene	--				

Notes:

[1] For the off-site fire scenarios, IDLH values for HCl and phosgene are predicted to occur in areas within approximately 275 m and 125 m, respectively, downwind from the center of the fire under conservative meteorological conditions. The areas of exceedance within this zone are expected to be "pockets" corresponding to locations of elevated terrain.

[2] --: Not exceeded in potential receptors areas.

TABLE VI-10
Probability of Occurrence for On-Site Scenarios

	Meteorological Conditions		
	Typical	**Conservative**	**Calm/Inversion**
On-Site Spills			
5,000 gallon spill			
- Formaldehyde	Unlikely	Very Unlikely	Very Unlikely
- Acetone	Reasonably Likely	Unlikely	Unlikely
100 gallon spill			
- Formaldehyde	Reasonably Likely	Unlikely	Unlikely
- Acetone	Likely	Reasonably Likely	Reasonably Likely
On-Site Fires			
20,000 gallons of waste	Unlikely	Very Unlikely	Very Unlikely
200 gallons of waste	Reasonably Likely	Unlikely	Unlikely
Mixing of Incompatible Wastes			
10,000 gallons of waste	Unlikely	Very Unlikely	Very Unlikely
200 gallons of waste	Reasonably Likely	Unlikely	Unlikely

TABLE VI-11
Probability of Occurrence for Off-Site Scenarios

	Meteorological Conditions		
	Typical	**Conservative**	**Calm/Inversion**
Off-Site Spills			
5,000 gallon spill			
- Formaldehyde	Very Unlikely	Very Unlikely	Very Unlikely
- Acetone	Unlikely	Very Unlikely	Very Unlikely
100 gallon spill			
- Formaldehyde	Unlikely	Very Unlikely	Very Unlikely
- Acetone	Reasonably Likely	Unlikely	Likely
Off-Site Fires			
5,000 gallons of waste	Very Unlikely	Very Unlikely	Very Unlikely
100 gallons of waste	Unlikely	Very Unlikely	Very Unlikely

TABLE VI-12
Severity of Consequence and Probability of Occurrence Results for On-Site Scenarios

Scenario	Meteorological Conditions					
	Typical		Conservative		Calm/Inversion	
	Severity of Consequence	Probability of Occurrence	Severity of Consequence	Probability of Occurrence	Severity of Consequence	Probability of Occurrence
On-Site Spill						
• 5,000 gallon spill						
- Formaldehyde Waste	Major	Unlikely	Catastrophic	Very Unlikely	Catastrophic	Very Unlikely
- Acetone Waste	Minor	Reasonably Likely	Minor	Unlikely	Minor	Unlikely
• 100 gallon spill						
- Formaldehyde Waste	Moderate	Reasonably Likely	Major	Unlikely	Major	Unlikely
- Acetone Waste	Minor	Likely	Minor	Reasonably Likely	Minor	Reasonably Likely
On-Site Fire						
• 20,000 gallon waste	Minor[1]	Unlikely	Minor[1]	Very Unlikely	NE[3]	Very Unlikely
• 200 gallon waste	Minor[2]	Reasonably Likely	Minor[2]	Unlikely	NE[3]	Unlikely
Mixing of Incompatible Wastes						
• 10,000 gallon	Major	Unlikely	Catastrophic	Very Unlikely	Catastrophic	Very Unlikely
• 200 gallon	Minor	Reasonably Likely	Major	Unlikely	Major	Unlikely

Notes:

1 On the bases of potential HCl and phosgene emissions and heat effects, the conservative fire is judged to have minor consequences. If a fireball were to form, the consequences would be classified as major, but the probability of occurrence is very unlikely.

2 On the bases of potential HCl and phosgene emissions, heat effects and assumed fireball formation, the typical fire is judged to have minor consequences.

3 NE: Not Evaluated.

TABLE VI-13
Severity of Consequence and Probability of Occurrence Results for Off-Site Scenarios

Scenario	Meteorological Conditions					
	Typical		Conservative		Calm/Inversion	
	Severity of Consequence	Probability of Occurrence	Severity of Consequence	Probability of Occurrence	Severity of Consequence	Probability of Occurrence
Off-Site Spill						
• 5,000 gallon spill						
- Formaldehyde	Major	Very Unlikely	Catastrophic	Very Unlikely	Catastrophic	Very Unlikely
- Acetone	Minor	Unlikely	Moderate	Very Unlikely	Moderate	Very Unlikely
• 100 gallon spill						
- Formaldehyde	Major	Unlikely	Catastrophic	Very Unlikely	Catastrophic	Very Unlikely
- Acetone	Minor	Reasonably Likely	Minor	Unlikely	Minor	Unlikely
Off-Site Fire						
• 5,000 gallon waste	Moderate[1]	Very Unlikely	Major[1]	Very Unlikely	NE[3]	Very Unlikely
• 100 gallon waste	Moderate[2]	Unlikely	Moderate[2]	Very Unlikely	NE[3]	Very Unlikely

Notes:

[1] On the bases of potential HCl and phosgene emissions, the conservative fire is judged to have minor consequences under typical meteorology and potentially major consequences under conservative meteorology. Given the potential heat effects of the fire, the event would be judged to have moderate consequences. If a fireball were to form, the consequences would be classified as major, but the probability of occurrence is very unlikely.

[2] On the bases of potential HCl and phosgene emissions and heat effects, the typical fire is judged to have moderate consequences.

[3] NE: Not Evaluated.

TABLE VI-14
Key Assumptions Made in
Ranking of Accident Events

Assumption	Basis	Magnitude of Effect	Direction of Effect
1. Concentrations predicted by modeling averaged over a 30-minute duration for comparison to IDLH values.	IDLH based on a 30-minute exposure.	Medium	May underestimate. Individuals may be exposed to higher peak concentrations over short periods of time.
2. IDLH values can be used as a benchmark to evaluate extent of possible off-site health effects.	IDLH values represent a consistent, relatively comprehensive set of acute toxicity criteria.	High	Unknown. May over or underestimate size of area over which effects may be observed, depending on derivation of IDLH value.
3. Wind is continuously blowing toward the nearest off-site inhabited area during the entire duration of emissions.	Simplifying assumption.	High	Overestimates
4. A fireball forms in the event of a fire.	Simplifying assumption.	Medium	Overestimates hazard; a fireball may form only under specific circumstances.
5. Likelihood of occurrence can be estimated based on historical data from TSDFs, and from USDOT and ODPS highway accident data.	Historical data believed to be relevant to the WTI facility.	Low	Variable. May over or underestimate actual accident frequencies, especially for low probability events.
6. The largest volume of a storage tank/container is used in the fireball scenario.	Simplifying assumption.	Medium	Overestimates the quantity available for forming a fireball.
7. Population data from 1990 census and estimated plume width used to develop consequence criteria relating IDLH to potential for injuries and fatalities.	Number of people potentially impacted is based on population density, size of plume, and chemical concentration in plume relative to toxicological criteria.	Medium	Approach used is likely to overestimate severity of consequence, using FEMA (1993) guidance.

VII. UNCERTAINTIES

As emphasized in the U.S. EPA's exposure assessment guidelines (U.S. EPA 1992c), identification and quantification of uncertainties is an important element of the risk assessment process. The primary sources of uncertainty in a risk assessment are associated with both the toxicity evaluation of chemicals of concern and the exposure assessment. These two sources of uncertainty are discussed separately below.

A. Toxicity Evaluation

It is widely recognized that there is significant uncertainty associated with current assessments of the toxicity of various chemicals. Sources of uncertainty in current toxicity assessments for various chemicals may include inadequate toxicological data, extrapolation from animals to humans, and a lack of knowledge regarding potential interactions among various chemicals. The regulatory approach to dealing with these sources of uncertainty is to use conservative techniques in deriving dose-response parameters. Because U.S. EPA relies primarily upon the same data base (IRIS) for all its risk assessments, uncertainty in the dose-response assessment is common to any risk assessment that uses toxicity data. More sophisticated analyses of these uncertainties have not been included in the Accident Analysis and the comparative rankings.

In the Accident Analysis, NIOSH IDLH values are used to evaluate the downwind distance over which adverse human health effects might be anticipated in the event of an accident. IDLH values were originally developed by NIOSH to be protective of healthy adult male workers. To determine the effect of using a more stringent measure of potential health effects, a quantitative sensitivity analysis is conducted with U.S. EPA LOC values. This sensitivity analysis is described in Section C of this chapter.

B. Exposure Assessment

The sources and magnitude of the uncertainties associated with exposure assessment may vary greatly from one risk assessment to another. These uncertainties are largely determined by the media, chemicals, populations, pathways, data, and models involved in the assessment. The U.S. EPA Exposure Assessment Guidelines (U.S. EPA 1992c) identify three types of uncertainty typically associated with an exposure assessment: (1) scenario

uncertainty, (2) parameter uncertainty, and (3) model uncertainty. These types of uncertainty are discussed in the context of the Accident Analysis in the following sections.

1. Scenario Uncertainty

Scenario uncertainty is the term used for uncertainty arising from the absence of information needed to fully define the exposure and dose. Sources of scenario uncertainty include errors in descriptive information; inaccurate professional judgment; and incomplete analysis (e.g., failure to consider all exposed sub-groups and significant routes of exposure).

Scenarios in the Accident Analysis are selected for quantitative evaluation to provide a range of credible accident events. More extreme events, with potentially greater off-site consequences, but significantly lower probabilities of occurrence, are also theoretically possible. Such extreme events might include an on-site spill of 10,000 gallons of volatile waste in an unbermed area, resulting from a collision of two full tankers, leading to high volatile emissions. If these tank trucks in the scenario above carried incompatible wastes, or the wastes were highly flammable, potential adverse consequences could be further exacerbated. Under such scenarios, IDLH values could be exceeded over very large off-site distances (e.g., > 10,000 m). However, the likelihood of occurrence is judged to be extremely small, given the very low probability of two trucks colliding on-site, the low probability of the entire contents of both trucks being released, and the presence of berms and drains in most paved areas where a large pool could otherwise form.

Another major source of uncertainty is the incomplete information on waste composition. Assumptions regarding the waste composition are critical in defining both the nature and magnitude of accidental emissions. While the availability of data on waste composition during the first year of operations at the WTI facility reduces this uncertainty, some amount of scenario uncertainty is unavoidable because waste composition may change over time.

A third major source of scenario uncertainty is the limited information available for predicting emissions resulting from fires or the mixing of incompatible wastes. Under these scenarios, substances are created as a result of chemical reactions involving constituents in waste. The type and extent of these reactions is difficult to predict, and there are also little relevant empirical data. For example, literally dozens of chemical reactions could hypothetically occur during an open fire involving a complex waste mixture, and data gaps exist regarding the initial composition of the waste mixture, the reactions which may occur between the constituents and the emission rates for toxic substances which are produced by the combustion process. To offset such data gaps,

conservative assumptions are made regarding the composition of the wastes involved in the accidents, and the rate of generation of toxic by-products. For example, a mass balance approach is used to predict HCl emissions due to mixing of incompatible wastes.

2. Parameter Uncertainty

The U.S. EPA Exposure Assessment Guidelines (U.S. EPA 1992c) indicate that parameter uncertainty may arise from measurement errors, sampling errors, variability, and the use of generic or surrogate data. Parameters that are subject to uncertainty include those used to estimate emission rates (e.g., spill pool size and temperature) and chemical concentrations in the media and locations of interest (e.g., wind speed and other meteorological conditions).

Unlike uncertainty associated with scenario development, there are methods available to quantify the magnitude and effect of uncertainty in a parameter value, such as spill size. Sensitivity analysis is included in the Accident Analysis to examine the effects of certain types of parameter uncertainty by developing both conservative and typical accident scenarios, and evaluating the effect of a variety of meteorological conditions. For example, in the on-site spill scenario, two different spill volumes are evaluated. For each spill volume, two different chemicals (one higher hazard, one lower hazard), are assessed, each under three different sets of meteorological conditions (typical, conservative and calm/inversion). Finally, each combination of spill volume, chemical composition and meteorological condition is evaluated with and without mitigation, resulting in a total of 24 conditions being quantitatively analyzed for the on-site spill scenario.

Meteorological uncertainty is partially offset by examining typical, conservative, and calm/inversion weather conditions, and assuming that the wind is blowing continuously in the direction of the nearest inhabited off-site area. The actual downwind distance impacted by the potential release could be significantly less than that predicted for the calm/inversion or conservative meteorological conditions, depending on the conditions at the time of release. Other parameters such as humidity, height of the release, and ground terrain features introduce additional uncertainty in the results.

Another potential source of parameter uncertainty is the need for physical/chemical data for the substances of concern. Data on vapor pressure, molecular weight, boiling point, density, and other properties are needed to model chemical emission rates. While the uncertainty associated with some of these parameters is negligible (e.g., molecular weight), it can be significant for other parameters (e.g., vapor pressure) for certain chemicals. Where such uncertainty is potentially significant, specific property values are

selected to overestimate, rather than underestimate, off-site chemical concentrations in air.

3. Model Uncertainty

Several models are used in the Accident Analysis to predict chemical releases and subsequent atmospheric dispersion. Models required to predict release rates include the following:

- Approaches to predict the physical/chemical properties of a waste mixture based on the properties of the pure components.
- Models to predict liquid release rates from trucks.
- Models to predict chemical evaporation rates from spills.
- Methods to predict the rate of generation of toxic gases as the result of mixing two incompatible wastes.
- Methods to predict the flame temperature and vapor cloud buoyancy in the event of a waste fire.
- Methods to predict the heat flux at various distances from a waste fire.

It is not feasible to quantify the extent of uncertainty inherent in each of these modeling techniques. Thus, the modeling is generally implemented using assumptions expected to result in an overestimate, rather than an underestimate, of chemical releases.

Many models have been developed to simulate the dispersion of short-term accidental chemical releases. Each model has its own unique advantages and disadvantages. In the Accident Analysis, two dispersion models (SLAB and ISC-COMPDEP) are used, matching the appropriate model to the emission release condition. However, significant uncertainties exist in the application of these models, particularly given the complex topography in the immediate vicinity of the facility. Conservative assumptions are generally made in applying these models to avoid underestimating potential off-site consequences.

C. Sensitivity Analyses

In order to evaluate the sensitivity of the results described in Chapter VI, a further assessment is performed to examine the following specific issues:

- The effect of active mitigation measures on severity of consequence. The effects of terminating releases through active mitigation are assessed. Two active mitigation time frames, 10 minutes and 60 minutes, are evaluated for the on-site accident scenarios. In addition, the effect of an unconfined (i.e., no berms) on-site spill is evaluated to assess the highly unlikely failure of passive mitigation measures. Off-site scenarios are not included in the sensitivity analysis because active mitigation would likely take longer to occur.

- The effect of averaging time in comparing downwind concentrations to IDLH values. In the Accident Analysis, downwind concentrations in air are averaged over a 30 minute period, and then compared to IDLH values developed by NIOSH based on a 30-minute exposure. For scenarios with maximum emission durations shorter than 30 minutes, the maximum exposure may be considerably higher than the 30-minute average exposure. The effect of averaging downwind concentrations over a 30-minute period is examined in the sensitivity analysis by comparing unaveraged maximum exposure concentrations directly with the IDLH values.

- The effect of using LOCs rather than IDLHs to determine the extent of the potentially impacted area. Modeled off-site concentrations are compared to LOC values to evaluate the sensitivity of the conclusions with respect to the selection of acute health effects criteria.

Each of these issues is addressed separately below.

1. Effect of Mitigation Measures

In evaluating the effect of active mitigation, two time periods (10 minutes and 60 minutes) were assessed. Ten minutes is believed to be a conservative estimate of the time it might take for automatic active mitigation procedures which are already in place to halt emissions to air (e.g., foam or water deluge for fire suppression), or for a small spill to be remediated. The time period for other active mitigation measures to be effective in stopping emissions could be longer in the event of a conservative spill or fire situation, or in the event that automatic active mitigation devices are not readily available

or fail. In these situations, sixty minutes or more may be required to effectively stop emissions.

In the WTI *Emergency Plan Exercise* (Von Roll 1993), a scenario was evaluated involving two accidents which occur in sequence. The first accident is the shearing of the cap and stem of a valve from the side of a tanker truck, resulting in a leak of hazardous waste. In this exercise, it was estimated to take 10 minutes for the appropriate personnel to reach the scene, and approximately an additional hour for the situation to be assessed, the potential immediate off-site impact to be determined, the leak to be stopped and the spill to be cleaned up.

The second accident involves a second truck colliding with the first truck, resulting in the mixture of the (incompatible) contents of the two tankers. In this hypothetical incident, two people have been injured. Therefore, the first twenty minutes are spent removing the individuals from the accident area and assessing the situation. The leak of materials is stopped after an additional 40 minutes.

In each of these accident scenarios, it appears that active mitigation measures and emergency response can limit the release of chemicals to approximately one hour. Because of the time required to notify the appropriate personnel and assess the situation before proceeding, it is unlikely that a conservative release could be terminated within 10 minutes. In these two scenarios, 10 to 20 minutes have passed before any active response designed to terminate emissions is initiated. Therefore, a mitigation time period of 60 minutes is also considered in this sensitivity analysis.

In the Accident Analysis, it was assumed that passive mitigation (e.g., berms, drains and dikes) would be in place and effective for on-site scenarios. The likelihood of a simultaneous accident and failure of the passive mitigation system is very small. However, the impact of the failure of passive systems is illustrated through an evaluation of the on-site spill in this sensitivity analysis.

a. On-Site Spills

Active Mitigation

As shown in Table VI-5, assuming no active mitigation of a 5,000 gallon on-site spill of "worst-case" waste, exceedances of the IDLH for formaldehyde extend to approximately 8,500 m, 4,800 m and 640 m, under calm/inversion, conservative and typical meteorological conditions, respectively. If it is assumed that mitigation and emergency response limit emissions to a duration of 10 minutes, exceedances of the IDLH for formaldehyde are reduced to 6,700 m, 3,900 m and 640 m, respectively (Table VII-1). Therefore, the effect of mitigation, even assuming the 10 minute

response time, reduces the predicted downwind distance to the IDLH by approximately 20% or less, depending on the meteorological conditions. If active mitigation takes 60 minutes, the maximum downwind distance is the same as for no active mitigation.

Active mitigation has no effect on the maximum distance downwind to the IDLH value for the 100 gallon spill of formaldehyde waste. Additionally, as was discussed in Chapter VI, exceedances of the IDLH value for acetone are not predicted to occur at any off-site inhabited locations, with or without active mitigation.

Failure of Passive Mitigation

The size of the on-site spill scenario dictates the size of the off-site area that could be impacted by the release. The larger the source area, the higher the downwind concentration will be. To assess the increased spill size associated with a failure of passive mitigation systems, the 5,000 gallon on-site spill of "worst-case" waste was considered in the sensitivity analysis.

If a 5,000 gallon spill occurs on-site at a location without the berms or drains, the source area would be approximately 4.5 times greater than the area confined by the berms, based on the assumption that the spill will form a liquid pool of 1 cm in depth. A sensitivity analysis is performed to examine the distance to the IDLH concentration for the on-site spill scenario.

For the 5,000 gallon spill of formaldehyde/methanol waste, the distance to the IDLH concentration increases slightly for a release with no passive mitigation. Under the typical meteorological condition, the distance to the IDLH concentration increases by approximately 50%, from 640 m (for the confined release) to 980 m. Under the conservative meteorological condition, the distance to the IDLH concentration increases from 4,800 m to 5,000 m. There would be no significant increase in maximum downwind distance under calm/inversion conditions. The slight increase is primarily to the following:

- The off-site concentration increases as the source area increases.

- For the same concentration averaging time at the receptor, the off-site. concentration decreases as the emission duration decreases

In summary, distances to the IDLH concentration increase by as much as 50% in comparison to the scenarios evaluated assuming passive mitigation. However, the

severity of consequence ranking would not be significantly affected for the accident event considered. It should be emphasized that the passive mitigation measures are already in place at the WTI facility, as shown in Table II-1.

b. On-Site Fires

As shown in Table VII-2 and discussed in Chapter VI, exceedances of the IDLH values for HCl and phosgene are not expected off-site with any combination of waste volume ignited and meteorology conditions. Active mitigation procedures, therefore, would not affect the results of these scenarios.

c. On-Site Mixing of Incompatible Wastes

For the mixing of compatible waste scenario involving 10,000 gallons of waste, the maximum downwind distance to reach exceedances of the IDLH value for HCl without active mitigation are 4,620 m, 3,190 m and 680 m, for calm/inversion, conservative and typical meteorological conditions, respectively (Table VI-7). Mitigation within 10 minutes decreases the projected downwind distances under calm/inversion and conservative conditions by approximately 30%, to 3,380 m and 2,170 m, respectively (Table VII-3). Mitigation within 10 minutes effectively contains emissions to within the site boundaries under typical meteorological conditions.

For the mixing of incompatible waste scenario involving 200 gallons of waste, active mitigation within 10 minutes does not significantly reduce the maximum downwind distance to the IDLH. Similarly, active mitigation requiring 60 minutes to implement would not effect the results of the no-mitigation scenarios for either the 10,000 gallon or 200 gallon events.

2. Effect of Averaging Time

In order to make a direct comparison between the modeled off-site concentrations and the IDLH value, which is based on a 30-minute exposure period, the modeled off-site concentrations are also averaged over a 30-minute period. For events where exposures are shorter than 30 minutes, this averaging serves to effectively decrease the modeled concentration, therefore decreasing the downwind distance over which the IDLH is exceeded.

For a continuous plume, which applies to the on-site and off-site fire scenarios, the concentrations downwind of a source generally decrease with increasing averaging time due to the increased meandering of wind direction (Turner 1967):

$$C_s = C_{1\text{-}hr}\ (60/t_s)^p \qquad (5)$$

where, C_s = Concentration averaged over t_s, (ppm);
t_s = the averaging time (minutes);
$C_{1\text{-}hr}$ = the 1-hr average concentration (ppm); and
p = 0.2 (U.S. EPA 1988).

The decrease in concentration follows a one-fifth power law with the averaging time for averaging periods from about 3 minutes to about 30 minutes (Steward et al, as cited by Turner 1967). Studies also indicate the power law exponent could vary between 0.17 and 0.2 and the power law relationship could be applied to averaging times up to 24 hours (Turner 1967). Based on the one-fifth power law relationship, a 15-minute average concentration will be approximately 15% greater than a 30-minute average.

For a continuous finite duration release, which applies to the spill events and the mixing of incompatible waste scenarios, the average concentration will be reduced from the peak concentration if the averaging time is greater than the source release time, because the release is relatively short and the receptor is exposed to the material for only a fraction of the concentration averaging time. For receptors located within a short distance downwind of the source (e.g. with 1 km downwind of the source), the exposure time is approximately the same as the source release time. Therefore, a 10-minute average concentration would be 3 times higher than a 30-minute average concentration if the release duration is only 10 minutes. Accordingly, the distance to the IDLH concentration, based on the 10-minute average concentration, will be greater than that defined based on the 30-minute average concentration.

To quantitatively evaluate the effect of averaging time on the downwind distance exceeding the IDLH, two scenarios are examined in the sensitivity analysis:

- On-site spill of 100 gallons of formaldehyde waste
- On-site mixing of 10,000 gallons of incompatible wastes

The results of this analysis are shown in Table VII-4. For the on-site spill of formaldehyde waste, the predicted emission duration is approximately 11 minutes. In the Accident Analysis, the downwind concentrations from this 11 minute release are averaged over 30 minutes and then compared to the IDLH. In this sensitivity analysis,

the downwind concentrations averaged over the 11-minute time span are compared directly to the IDLH.

As shown in Table VII-4, there is an increase in the maximum distance to the IDLH, if the IDLH is compared directly to the downwind concentration averaged over the 11-minute time span. The greatest relative increase is under typical meteorological conditions, where the downwind distance to the IDLH increases from 40 m to 140 m. This would result in the event being reclassified as having major rather than moderate consequences. The downwind distance increases from 550 m to 850 m under conservative meteorological conditions, and from 1,000 m to 1,300 m under calm/inversion meteorological conditions. Thus, the event would remain classified as having major consequences under conservative meteorological conditions, but reclassified as having catastrophic consequences under calm/inversion conditions. The probability of occurrence ranking would not change for any meterological condition.

The relative increases in maximum distance to IDLH are less significant for the on-site mixing of incompatible waste scenario. The maximum distance to the IDLH increases by about 30% for typical meteorological (680 m to 870 m), by about 10% for conservative meteorology (3,190 m to 3,480 m), and by about 5% for calm/inversion meteorology (4,620 m to 4,800 m). The severity of consequence classifications and the probability of occurrence ranking would not change for any meteorological condition.

3. Effect of Using LOCs to Estimate Downwind Distance

To evaluate the sensitivity of the conclusions with respect to the selection of acute toxicity criteria, the effect of using U.S. EPA LOC values, rather than NIOSH IDLH values, was assessed. As discussed in Chapter I, U.S. EPA LOC values are generally lower (i.e., more stringent) than corresponding NIOSH IDLH values. The IDLH and LOC values for the chemicals quantitatively evaluated in the Accident Analysis are summarized on Table VII-5. As shown, the LOC value can be up to 10-fold lower than the corresponding IDLH, as in the case of phosgene.

The results of the Accident Analysis using the LOC values are shown for the on-site spill, on-site fire, on-site mixing of incompatible wastes, off-site spill, and off-site fire scenarios in Tables VII-6 through VII-10. Key results of the sensitivity analysis are the following:

- For on-site spills involving formaldehyde, exceedances of the LOC value extend approximately 35% to 100% further than exceedance of the IDLH value, depending on the meteorological conditions.

- No off-site exceedances of the IDLH or the LOC for acetone are predicted for the on-site spill scenarios.

- For the on-site fire scenarios, IDLH values are not expected to be exceeded for either HCl or phosgene. LOC values for both HCl and phosgene could be exceeded, however, in the event of a large (20,000) gallon spill, under conservative meteorology.

- In the on-site mixing of incompatible waste scenarios, exceedances of LOC values are predicted to extend about 3-fold to 4-fold further off-site than are exceedances of IDLH values.

- For on-site spills, exceedances of the LOC value for formaldehyde are predicted to extend between 35% and 100% further than exceedances of IDLH values for off-site spills. In addition, the LOC value for acetone is predicted to be exceeded up to a distance of approximately 120 m in the event of a 5,000 gallon spill.

- For on-site fire scenarios, exceedances of the LOC values for HCl and phosgene are predicted under conservative meteorological conditions. For off-site fire scenarios, exceedances of the IDLH values are not predicted.

Thus, as expected, use of LOC values instead of IDLH values as a benchmark for acute toxicity results in a larger potential impact area in terms of the maximum downwind distance from the accident location. The criteria developed to rank severity of consequence for the Accident Analysis (shown in Table VI-1), should not be used in evaluating LOC values, because they were developed specifically for comparison to IDLH values.

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TABLE VII-1
Consequence Assessment, On-Site Spill with Mitigation[1,2]

Spill Size (gallons)	Meteorology	Contaminant	Max. Downwind Dist. to IDLH, 60 min mitigation time[3] (m)	Max. Downwind Dist. to IDLH, 10 min mitigation time[4] (m)
5,000	Typical	Formaldehyde	640	640
5,000	Conservative	Formaldehyde	4800	3920
5,000	Calm/Inversion	Formaldehyde	8450	6720
5,000	Typical	Acetone	--	--
5,000	Conservative	Acetone	--	--
5,000	Calm/Inversion	Acetone	--	--
100	Typical	Formaldehyde	40	40
100	Conservative	Formaldehyde	550	550
100	Calm/Inversion	Formaldehyde	1000	1000
100	Typical	Acetone	--	--
100	Conservative	Acetone	--	--
100	Calm/Inversion	Acetone	--	--

Notes:

1 Maximum Downwind Distance from the property line to the east or west, or the existing railroad to the north, whichever is closer to the location of the release. For the on-site spill, maximum downwind distance was calculated from the railroad line to the north, approximately 75 m from the edge of the spill.

2 --: IDLH not exceeded in potential off-site receptor areas.

3 Active mitigation assumed to stop emissions within 60 minutes. The maximum downwind distance to IDLH using a 60-minute mitigation time is the same as the maximum distance to IDLH with no active mitigation.

4 Active or automatic mitigation assumed to stop emissions within 10 minutes.

TABLE VII-2
Consequence Assessment, On-Site Fire with Mitigation[1]

Waste Volume Ignited (gallons)	Meteorology	Contaminant	Downwind Dist. to IDLH, 60 min mitigation time[2] (m)	Downwind Dist. to IDLH, 10 min mitigation time[3] (m)
20,000	Typical	HCl	--	--
		Phosgene	--	--
20,000	Conservative	HCl	--	--
		Phosgene	--	--
200	Typical	HCl	--	--
		Phosgene	--	--
200	Conservative	HCl	--	--
		Phosgene	--	--

Notes:

1 --: IDLH not exceeded in potential off-site receptor areas.

2 Active mitigation assumed to stop emissions within 60 minutes. The maximum downwind distance to IDLH using a 60-minute mitigation time is the same as the maximum distance to IDLH with no active mitigation.

3 Active or automatic mitigation assumed to stop emissions within 10 minutes.

TABLE VII-3
Consequence Assessment, On-Site Mixing of Incompatible Wastes with Mitigation[1,2]

Waste Volume (gallons)	Meteorology	Contaminant	Max. Downwind Dist. to IDLH, 60 min mitigation time[3] (m)	Max. Downwind Dist. to IDLH, 10 min mitigation time[4] (m)
10,000	Typical	HCl	680	--
10,000	Conservative	HCl	3190	2170
10,000	Calm/Inversion	HCl	4620	3380
200	Typical	HCl	--	--
200	Conservative	HCl	270	270
200	Calm/Inversion	HCl	520	520

Notes:

1 Maximum Downwind Distance from the property line to the east or west, or the existing railroad to the north, whichever is closer to the release. For the on-site mixing of incompatible wastes, the maximum downwind distance was calculated from the railroad line to the north, or approximately 75 m from the edge of the release.

2 --: IDLH not exceeded in potential off-site receptor areas.

3 Active mitigation assumed to stop emissions within 60 minutes. The maximum downwind distance to IDLH using a 60-minute mitigation time is the same as the maximum distance to IDLH with no active mitigation.

4 Active or automatic mitigation assumed to stop emission within 10 minutes.

TABLE VII-4
Results of Averaging Time Sensitivity Analysis

Scenario	Chemical of Concern	Emission Scenario	Meteorology	Concentration Averaging Time (sec)	IDLH (ppm)	Max. Dist. to IDLH (m)[1]
On-site spill of 100 gallons of formaldehyde waste	Formaldehyde	Typical	Typical	680	19.6	140
				1800	19.6	40
			Conservative	680	19.6	850
				1800	19.6	550
			Inversion/Calm	305	19.6	1300
				1800	19.6	1000
On-site mixing of 10,000 gallons of incompatible wastes	HCl	Conservative	Typical	1200	49.1	870
				1800	49.1	680
			Conservative	1200	49.1	3480
				1800	49.1	3190
			Inversion/Calm	759	49.1	4800
				1800	49.1	4620

Notes:

[1] Maximum Downwind Distance calculated from the property line to the east or west, or the existing railroad to the north, whichever is closer to the location of the release. For the on-site spill, maximum downwind distance was calculated from the railroad line to the north, approximately 75 m from the edge of the spill.

TABLE VII-5 IDLH and LOC Values Used for Chemicals Evaluated in the Accident Analysis		
Substance	**IDLH (g/m^3) (U.S. EPA 1995c)**	**LOC (g/m^3) (U.S. EPA 1995c)**
Acetone	5.9	4.7
Formaldehyde	0.025	0.012
Hydrogen Chloride (HCl)	0.075	0.015
Phosgene	0.0081	0.0008

TABLE VII-6
Summary of Downwind Distance to LOC, On-Site Spill

Spill Size (gallons)	Meteorology	Contaminant	Max. Downwind Dist. to LOC, no active mitigation[1,2] (m)
5,000	Typical	Formaldehyde	1000
5,000	Conservative	Formaldehyde	8190
5,000	Calm/Inversion	Formaldehyde	11400
5,000	Typical	Acetone	--
5,000	Conservative	Acetone	--
5,000	Calm/Inversion	Acetone	--
100	Typical	Formaldehyde	100
100	Conservative	Formaldehyde	900
100	Calm/Inversion	Formaldehyde	1600
100	Typical	Acetone	--
100	Conservative	Acetone	--
100	Calm/Inversion	Acetone	--

Notes:

1 Maximum Downwind Distance calculated from the property line to the east or west, or the existing railroad to the north, whichever is closer to the location of the release. For the on-site spill, maximum downwind distance was calculated from the railroad line to the north, approximately 75 m from the edge of the spill.

2 --: LOC not exceeded in potential off-site receptor areas.

TABLE VII-7
Summary of Downwind Distance to LOC, On-Site Fire

Waste Volume Ignited (gallons)	Meteorology	Contaminant	Downwind Dist. to LOC, no active mitigation[1,2] (m)
20,000	Typical	HCl	--
		Phosgene	--
20,000	Conservative	HCl	675-1125
		Phosgene	--
200	Typical	HCl	--
		Phosgene	--
200	Conservative	HCl	--
		Phosgene	--

Notes:

1 For the on-site fire scenarios, LOC values are predicted to be exceeded in areas in a zone approximately 675 m to 1125 m downwind from the center of the on-site fire source, under conservative meteorological conditions. The areas of exceedance within this zone are expected to be "pockets" with radii of approximately 25 m.

2 --: LOC not exceeded in potential off-site receptor areas.

TABLE VII-8
Summary of Downwind Distance to LOC, On-Site Mixing of Incompatible Wastes

Waste Volume (gallons)	Meteorology	Contaminant	Max. Downwind Dist. to LOC, no active mitigation[1,2] (m)
10,000	Typical	HCl	1780
10,000	Conservative	HCl	8790
10,000	Calm/Inversion	HCl	12200
200	Typical	HCl	130
200	Conservative	HCl	980
200	Calm/Inversion	HCl	1700

Notes:

1 Maximum Downwind Distance calculated from the property line to the east or west, or the existing railroad to the north, whichever is closer to the release. For the on-site mixing of incompatible wastes, the maximum downwind distance was calculated from the railroad line to the north, or approximately 75 m from the edge of the release.

2 --: LOC not exceeded in potential off-site receptor areas.

TABLE VII-9
Summary of Downwind Distance to LOC, Off-Site Spill

Spill Size (gallons)	Meteorology	Contaminant	Max. Downwind Dist. to LOC, no active mitigation[1,2] (m)
5,000	Typical	Formaldehyde	1490
5,000	Conservative	Formaldehyde	8490
5,000	Calm/Inversion	Formaldehyde	11540
5,000	Typical	Acetone	<10
5,000	Conservative	Acetone	<10
5,000	Calm/Inversion	Acetone	57
100	Typical	Formaldehyde	190
100	Conservative	Formaldehyde	980
100	Calm/Inversion	Formaldehyde	1670
100	Typical	Acetone	<10
100	Conservative	Acetone	<10
100	Calm/Inversion	Acetone	<10

Notes:
[1] Maximum Downwind Distance calculated from edge of spill.
[2] --: LOC not exceeded in off-site potential receptor areas.

TABLE VII-10
Summary of Downwind Distance to LOC, Off-Site Fire

Waste Volume Ignited (gallons)	Meteorology	Contaminant	Downwind Dist. to LOC, no active mitigation[2] (m)
5,000	Typical	HCl	--
		Phosgene	--
5,000	Conservative	HCl	2100[1]
		Phosgene	1100[1]
100	Typical	HCl	--
		Phosgene	--
100	Conservative	HCl	--
		Phosgene	--

Notes:

[1] For the off-site fire scenarios, LOC values for HCl and phosgene are predicted to occur in areas within approximately 2100 m and 1100 m, respectively, downwind from the center of the fire under conservative meteorological conditions. The areas of exceedance within this zone are expected to be "pockets" in locations of elevated terrain.

[2] --: LOC not exceeded in potential receptors areas.

VIII. SUMMARY AND CONCLUSIONS

The results of the Accident Analysis are summarized in Table VIII-1 (typical meteorology), Table VIII-2 (conservative meteorology) and Table VII-3 (calm/inversion), in terms of severity of consequences and probability of occurrence. The rankings in Tables VIII-1, VIII-2, and VIII-3 were developed according to the guidelines established by U.S. EPA (1987) and FEMA (1993). As shown in the summary tables, the probability of an accident with major or catastrophic consequences is classified as unlikely or very unlikely. With one exception (on-site spill of 100-gallons of formaldehyde waste) the probability of an accident with moderate consequences is also classified as unlikely or very unlikely. The on-site typical-sized spill of a worst-case chemical (e.g.100 gallons of formaldehyde waste) during typical meterology was classified as reasonably likely. It should be recognized that this event represents the general class of small on-site spills of highly volatile, highly toxic chemicals rather than a 100 gallon spill of formaldehyde waste only. Events with minor consequences are classified as likely to occur; no accidents evaluated in this assessment are classified as common.

There is no standard approach for interpreting the results of an Accident Analysis. As stated in FEMA (1993), "Special circumstances may require special consideration on a case by case basis. Specific guidelines should be worked out by each locale to represent the resources and relationships between organizations applicable to that community" (p. 13-5). According to U.S. EPA (1987) and FEMA (1993), however, an accident frequency/severity screening matrix approach can be useful in considering the results of an Accident Analysis. An illustrative matrix suggested by FEMA (1993) is presented in Figure VIII-1. In this matrix, the need for comprehensive planning and preparedness is linked to the probability of occurrence and severity of consequence of an event. Based on Figure VIII-1, and Tables VIII-1 to VIII-3, the results of the WTI Accident Analysis can be presented as follows:

"Events for which comprehensive planning and preparedness are essentially mandatory at the appropriate levels of government or industry" (FEMA 1993)

- On-site spills of 100 gallons acetone waste

"Events for which comprehensive planning is optional and does not necessarily warrant any major efforts or costs" (FEMA 1993)

- On-site spills of 100 gallons of formaldehyde waste
- On-site spill of 5,000 gallons of formaldehyde waste
- On-site mixing of 200 gallons of incompatible wastes
- On-site mixing of 10,000 gallons of incompatible wastes
- Off-site spill of 100 gallons of formaldehyde waste
- Off-site spill of 5,000 gallons of formaldehyde waste
- Off-site fire involving 100 gallons of chlorinated waste

"Events for which comprehensive planing may be unwarranted and unnecessary" (FEMA 1993)

- On-site spill of 5,000 gallons of acetone waste
- On-site fire involving 200 gallons of chlorinated waste
- On-site fire involving 20,000 gallons of chlorinated waste
- Off-site spill of 100 gallons of acetone waste
- Off-site spill of 5,000 gallons of acetone waste
- Off-site fire involving 5,000 gallons of chlorinated waste

In general, the consequence-probability rankings summarized in Tables VIII-1 to VIII-3 are consistent with the information presented in the *Report on Emergency Incidents at Hazardous Waste Incinerators and Commercial Treatment, Storage and Disposal Facilities (TSDFs)* (U.S. EPA 1995b). Using the data from U.S. EPA (1995b), and the rankings based on FEMA (1993), the probability of an event having moderate, major, or catastrophic consequences would be classified as unlikely or very unlikely over a facility lifetime. The probability of an event having minor consequences would be classified as likely or reasonably likely. This generally agrees with the consequence-probability rankings used in this Accident Analysis.

TABLE VIII-1
Probability/Severity Matrix
Typical Meteorological Conditions

Possibility of Occurrence	Severity of Consequence			
	Minor	Moderate	Major	Catastrophic
Common				
Likely	Scenario 1A			
Reasonably Likely	Scenario 1C Scenario 2A Scenario 3A Scenario 4A	Scenario 1B		
Unlikely	Scenario 2B (no fire ball) Scenario 4C	Scenario 5A	Scenario 1D Scenario 3B Scenario 4B	
Very Unlikely		Scenario 5B (no fireball)	Scenario 4D Scenario 5B (with fireball) Scenario 2B (with fireball)	

Scenario 1A: On-site spill, 100 gallons, acetone waste
Scenario 1B: On-site spill, 100 gallons, formaldehyde waste
Scenario 1C: On-site spill, 5,000 gallons, acetone waste
Scenario 1D: On-site spill, 5,000 gallons formaldehyde waste
Scenario 2A: On-site fire, 200 gallons, chlorinated waste
Scenario 2B: On-site fire, 20,000 gallons, chlorinated waste
Scenario 3A: On-site mixing of incompatible wastes, 200 gallons
Scenario 3B: On-site mixing of incompatible wastes, 10,000 gallons
Scenario 4A: Off-site spill, 100 gallons, acetone waste
Scenario 4B: Off-site spill, 100 gallons, formaldehyde waste
Scenario 4C: Off-site spill, 5,000 gallons, acetone waste
Scenario 4D: Off-site spill, 5,000 gallons, formaldehyde waste
Scenario 5A: Off-site fire, 100 gallons, chlorinated waste
Scenario 5B: Off-site fire, 5,000 gallons, chlorinated waste

TABLE VIII-2
Probability/Severity Matrix
Conservative Meteorological Conditions

Possibility of Occurrence	Severity of Consequence			
	Minor	**Moderate**	**Major**	**Catastrophic**
Common				
Likely				
Reasonably Likely	Scenario 1A			
Unlikely	Scenario 1C Scenario 2A Scenario 4A		Scenario 1B Scenario 3A	
Very Unlikely	Scenario 2B (no fireball) Scenario 5A	Scenario 4C	Scenario 2B (with fireball) Scenario 5B (with or without fireball)	Scenario 1D Scenario 3B Scenario 4B Scenario 4D

Scenario 1A: On-site spill, 100 gallons, acetone waste
Scenario 1B: On-site spill, 100 gallons, formaldehyde waste
Scenario 1C: On-site spill, 5,000 gallons, acetone waste
Scenario 1D: On-site spill, 5,000 gallons formaldehyde waste
Scenario 2A: On-site fire, 200 gallons, chlorinated waste
Scenario 2B: On-site fire, 20,000 gallons, chlorinated waste
Scenario 3A: On-site mixing of incompatible wastes, 200 gallons
Scenario 3B: On-site mixing of incompatible wastes, 10,000 gallons
Scenario 4A: Off-site spill, 100 gallons, acetone waste
Scenario 4B: Off-site spill, 100 gallons, formaldehyde waste
Scenario 4C: Off-site spill, 5,000 gallons, acetone waste
Scenario 4D: Off-site spill, 5,000 gallons, formaldehyde waste
Scenario 5A: Off-site fire, 100 gallons, chlorinated waste
Scenario 5B: Off-site fire, 5,000 gallons, chlorinated waste

TABLE VIII-3
Probability/Severity Matrix
Calm/Inversion Meteorological Conditions

Possibility of Occurrence	Severity of Consequence			
	Minor	Moderate	Major	Catastrophic
Common				
Likely				
Reasonably Likely	Scenario 1A			
Unlikely	Scenario 1C Scenario 4A		Scenario 1B Scenario 3A	
Very Unlikely		Scenario 4C		Scenario 1D Scenario 3B Scenario 4B Scenario 4D

Scenario 1A: On-site spill, 100 gallons, acetone waste
Scenario 1B: On-site spill, 100 gallons, formaldehyde waste
Scenario 1C: On-site spill, 5,000 gallons, acetone waste
Scenario 1D: On-site spill, 5,000 gallons formaldehyde waste
Scenario 3A: On-site mixing of incompatible wastes, 200 gallons
Scenario 3B: On-site mixing of incompatible wastes, 10,000 gallons
Scenario 4A: Off-site spill, 100 gallons, acetone waste
Scenario 4B: Off-site spill, 100 gallons, formaldehyde waste
Scenario 4C: Off-site spill, 5,000 gallons, acetone waste
Scenario 4D: Off-site spill, 5,000 gallons, formaldehyde waste

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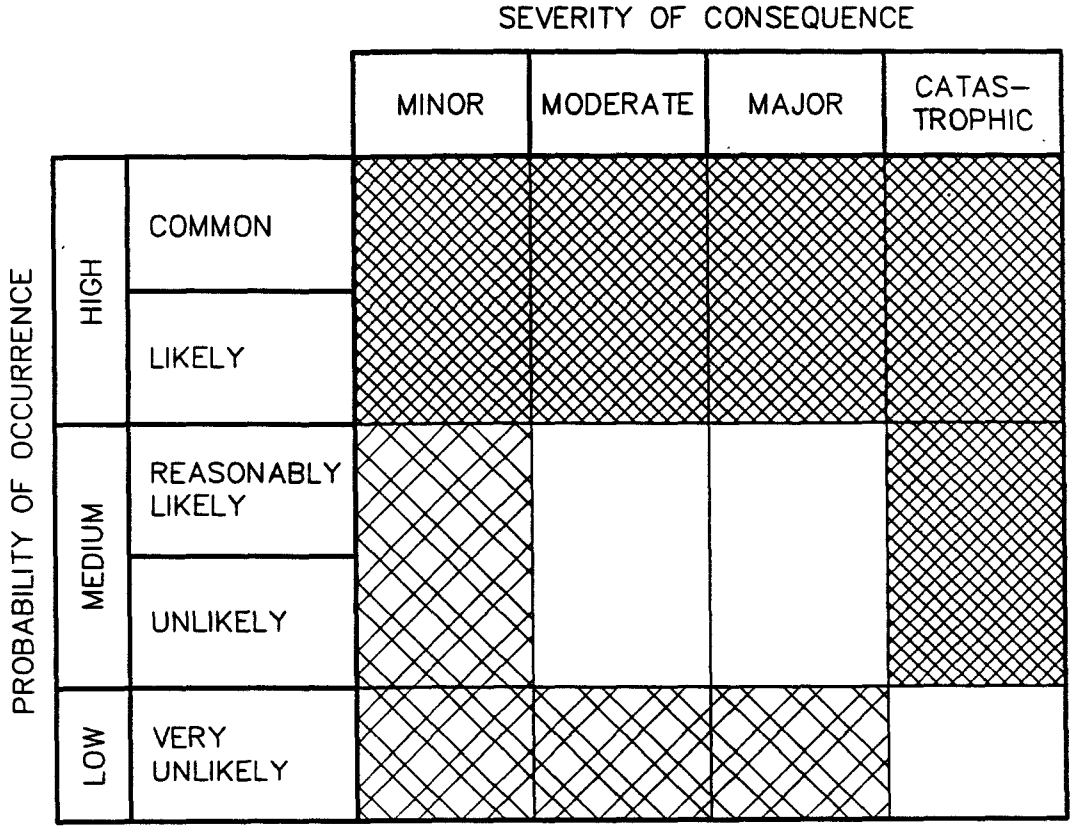

COMPREHENSIVE PLANNING AND PREPAREDNESS ARE ESSENTIALLY MANDATORY AT THE APPROPRIATE LEVELS OF GOVERNMENT OR INDUSTRY.

COMPREHENSIVE PLANNING IS OPTIONAL AND DOES NOT NECESSARILY WARRANT ANY MAJOR EFFORTS OR COSTS. GIVE CONSIDERATION TO SHARING ANY NECESSARY SPECIAL RESPONSE RESOURCES ON A REGIONAL BASIS.

COMPREHENSIVE PLANNING MAY BE UNWARRANTED AND UNNECESSARY.

TAKEN FROM ***FEMA*** (1993)

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DRAFTED BY: JT / DATE: 8/28/95	ILLUSTRATIVE ACCIDENT FREQUENCY/SEVERITY SCREENING MATRIX	Figure VIII–1 / 01–3999CP01

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APPENDIX VII-1

Incidents Reported at the WTI Facility and Comparable Facilities

TABLE 1
Hazardous Waste Combustor Facilities[1]

Facility	Commercial Incinerator?/ Capacity (tpy)[2]	Years of Operation[3]	Reported Incidents[4]	Incident Date and Description	Reported Impact
3-M Cottage Grove, MN	No	15+ (since at least early 80s, per U.S. EPA 1995a)	(1) incinerator operations; explosion (2) incinerator operations; explosion	(1) Date: Early 1980s Description: hot slag contacted low temperature ash quench water, resulting in a thermal explosion. (2) Date: 9/18/92 Description: molten metal in slag dropped into ash quench, trapping some water and creating a steam explosion.	(1) no injuries; no releases to the environment (2) no injuries; brief release of smoke from burning fuel oil; no other releases of hazardous waste
Allied Chemical (aka "Allied Signal, Inc.-Environmental Systems and Services" in HWC [1995]) Birmingham, AL	Yes PAIC & RC(1): 2,200	15+ (pre-81)	NR		
Aptus Coffeyville, KS	Yes PAIC: 60,850 RC(1): 219,000 (Per Victorine 1995b, facility says permit limit is same as PAIC, not higher RCRIS value.)	10 (since 86)	incinerator operations; explosion	Date: Fall 1990 Description: waste with high BTU level introduced to incinerator; gas accumulated in scrubber and was set off by spark, causing an explosion in the scrubber.	no injuries; no natural resource damages; no hazardous waste released; possible exceedances of hydrochloric acid and particulate in air emissions
Aptus Aragonite, UT	Yes RC(3): 86,000	4 (Since late 91)	NR		

TABLE 1
Hazardous Waste Combustor Facilities[1]

Facility	Commercial Incinerator?/ Capacity (tpy)[2]	Years of Operation[3]	Reported Incidents[4]	Incident Date and Description	Reported Impact
Atochem Carrollton, KY	Yes RC(3): 11,000 (Per Victorine 1995b, EPA Reg.4 calls this a "limited commercial incinerator," allowed to receive only 3,800 tpy off-site haz.waste; feed limits total 13,700 tpy.)	15+ (pre-81)	NR		
Bridgeport Rental and Oil Services (BROS), NJ	No		(1) incinerator operations; explosion (2) incinerator operations; release	(1) Date: 9/20/92 Description: explosion caused by rapid steam generation that resulted when a slag ring that formed in the kiln fell into the water in the ash quench; fugitive emissions resulted. Total hydrocarbon (THC) monitor readings unusual prior to explosion. (2) Date: 9/21/92 Description: release of large amount of ash; particulate matter released for 8 minutes.	(1) fugitive emissions; no injuries or natural resource damage reported. (2) particulate matter traveled off-site; no impacts reported
Chemical Waste Management (CWM) Chicago, IL	Yes	10+ (pre-81 to 2/91)	incinerator operations; explosion	Date: 2/13/91 Description: drum with a packet containing tetrazole fed into rotary kiln, causing an explosion.	no injuries or releases to environment

TABLE 1
Hazardous Waste Combustor Facilities[1]

Facility	Commercial Incinerator?/ Capacity (tpy)[2]	Years of Operation[3]	Reported Incidents[4]	Incident Date and Description	Reported Impact
Chemical Waste Management (CWM) Port Arthur, TX	Yes	6 (since ~90)	(1) incinerator equipment failure; fire (2) equipment failure; spill	(1) Date: 6/92 Description: kiln fire that resulted from overheating during normal operation. (2) Date: 12/24/92 Description: one gallon of air pollution control train waste leaked; workers assumed it contained PCBs; immediate cleanup, including removal of asphalt and soil, until no visible waste (tests showed waste did not contain PCBs).	(1) no information provided (2) no injuries or environmental impacts
Chemron[6] Palmer, AK	Yes RC(2) & RC(3) combined: 13,000		NR		
Diversified Scientific Services, Inc. (DSSI) Kingston, TN	No		operations; fire	Date: 7/31/92 Description: electrical outage allowed some unburned propane to go through boiler; charcoal filters in secondary air pollution control (APC) system caught fire and burned for 4 minutes.	no injuries; no hazardous waste releases
Dow Chemical Midland, MI	No		(1) incinerator operations; explosion (2) incinerator operations; explosion	(1) Date: 1/25/92 Description: feed line to incinerator blocked; nozzle removed improperly and natural gas leaked out, causing an explosion. (2) Date: 2/4/93 Description: explosion in incinerator; solid, non-regulated rubbish released, visible flames and hot gases emitted.	(1) one worker injury; no hazardous waste released; no natural resource damage (2) no injuries or exposures to hazardous waste

TABLE 1
Hazardous Waste Combustor Facilities[1]

Facility	Commercial Incinerator?/ Capacity (tpy)[2]	Years of Operation[3]	Reported Incidents[4]	Incident Date and Description	Reported Impact
E.I. DuPont de Nemours[7] Axis, AL	No		(1) equipment failure; spill (2) operations; explosion	(1) Date: 6/9/94 Description: approx. 3,800 gallons sulfuric acid released from leaking transfer pipe; 2,500 gallons recovered. (2) Date: 6/10/94 Description: One drum containing hydrogen peroxide and ground corncobs burst.	(1) 300 yd^3 contaminated soil removed (apparently on-site) (2) none reported
Eastman Kodak Company Kodak Park, NY	No		incinerator eqpt failure	Date: 7/12/90 Description: Recycle cooling water system ruptured, spilling 75¼gal water (2 gal onto ground, 73 gal into industrial sewer). Loss of pressure in system following rupture caused an automatic shutdown of the facility; emergency stack opened, resulting in a visible plume (wastes in the kiln at the time were 10-chloro-2,4-dinitrobenzene and 2-methylhydroquinone) from stack that lasted 7 minutes.	visible soil contamination from spill to ground (cleaned up immediately); visible plume; no other information available
ECOVA (formerly Waste-Tech) Kimball, NE	Yes PAIC: 45,000	New	NR		
ENSCO El Dorado, AR	Yes	15+ (pre-81)	(1) incinerator eqpt failure; explosion (2) operations; fire	(1) Date: 4/20/89 Description(s): explosion in waste heat recovery unit due to equipment failure; no hazardous waste involved. (2) Date: 8/10/93 Description: spontaneous combustion due to worker leaving cap off container of bromine and chlorine.	(1) no injuries or significant releases (2) no injuries; no information on environmental impacts
General Electric Pittsfield, MA	Yes	15+ (pre-81)	NR		

TABLE 1
Hazardous Waste Combustor Facilities[1]

Facility	Commercial Incinerator?/ Capacity (tpy)[2]	Years of Operation[3]	Reported Incidents[4]	Incident Date and Description	Reported Impact
ICI Environmental Joplin, MO	Yes	New	NR		
Johnston Atoll Chemical Agents Disposal System (JACADS), Johnston Atoll	No	5 (trial burn 2/90, per app. to U.S. EPA 1995a)	(1) incinerator eqpt failure	(1) Date: 12/90 Description: short-term leakage of nerve agent from agent feed system after feed shut off; emissions lasted for 45 minutes.	(1) emissions below permitted levels
			(2) incinerator eqpt failure; fire	(2) Date: 3/11/91 Description: instrumentation malfunction resulting in smoke release, no chemical agent being processed.	(2) no information provided
			(3) incinerator eqpt failure	(3) Date: 5/2/91 Description: small bearing cooling oil fire, caused by an overheated bearing.	(3) no harmful releases reported
			(4) incinerator eqpt failure	(4) Date: 6/26/91 Description: pressure transient occurred during start-up, resulting in deformation of furnace chamber and building.	(4) no information provided (5) no releases reported
			(5) incinerator eqpt failure	(5) Date: 1/21/92 Description: kiln stopped rotating, system shut down.	(6) no information provided
			(6) spill	(6) Date: 12/18/92 Description: spill onto coral of 50 gal xylene, 1.6 gal hexane, 0.6 gal isopropanol, due to wind storm; contingency plan implemented, soil (coral) sampling performed.	

TABLE 1
Hazardous Waste Combustor Facilities[1]

Facility	Commercial Incinerator?/ Capacity (tpy)[2]	Years of Operation[3]	Reported Incidents[4]	Incident Date and Description	Reported Impact
Johnston Atoll Chemical Agents Disposal System (JACADS), continued			(7) operations[5]	(7) Date: 12/27-28/92 Description: losses of ventilation due to power loss in Munitions Demilitarization Building (MDB); contingency plan implemented.	(7) no chemical agent migration outside building
			(8) leak[5]	(8) Date: 12/28/92 Description: small amount of leakage from rocket.	(8) off-site: no hazards to human health or environment
			(9) operations[5]; fire	(9) Date: 1/2/93 Description: fire in Explosion Containment Room.	(9) no information provided
			(10) operations; release	(10) Date: 5/31/93 Description: potential release of 0.012 mg/m^3 mustard gas outside building (allowable stack conc., 0.03 mg/m^3).	(10) no information provided
			(11) operations[5] spill	(11) Date: 12/9/93 Description: spill of 500 lbs of chemical agent in MDB.	(11) spill contained in building
			(12) incinerator eqpt malfunction; fire	(12) Date: 3/14/94 Description: small fire caused by hot gases in feed chute, due to feed gates jamming.	(12) no migration of hazardous waste inside or outside facility
			(13) incinerator eqpt malfunction, etc.; release	(13) Date: 3/24/94 Description: release of chemical agent above allowable limit for 25 minutes, due to design and procedural problems, equipment malfunction, operator error.	(13) maximum ground level concentrations below General Population Limit

TABLE 1
Hazardous Waste Combustor Facilities[1]

Facility	Commercial Incinerator?/ Capacity (tpy)[2]	Years of Operation[3]	Reported Incidents[4]	Incident Date and Description	Reported Impact
Laidlaw Environmental Roebuck, SC	Yes PAIC & RC(1): 39,000	15+ (pre-81)	(1) transfer line failure (2) bulk liquid storage (3) incinerator eqpt failure (4) operations[5] (5) operations[5], fire	(1) Date: 3/17/82 Description: 3,000-gal solvents spilled from corroded pipe that connects the blend tanks to the incinerator. (2) Date: 2/9/88 Description: 6,000-gal maleic anhydride spilled from storage tank. (3) Date: 3/22/91 Description: thermal relief vent from incinerator vaporizer blown off the unit; fell down to the direct burn containment pad. (4) Date: 2/8/94 Description: vapor cloud emitted during redrumming of orthochlorophenol. (5) Date: 9/19/94 Description: small fiberglass fire, contained and extinguished in 3 minutes.	(1) on-site: soil contamination (removed) off-site: no impacts noted (2) on-site: soil contamination (removed) off-site: no impacts noted (3) no injuries or known hazardous waste releases (4) off-site: vapor cloud drifted off-site; one person reported sinus problem (5) none reported
Laidlaw Environmental Services Clarence, NY	Yes RC(1): 131 (Per Victorine 1995b, NYDEC indicates this is a non-RCRA incinerator due to ICR exemption)	15+ (pre-81)	NR		
Lake City Army Ammunition Plant Independence, MO	No		incinerator operations	Date: 3/29/91 Description: During trial burn, live rounds put through incinerator, not completely treated, fell off of conveyor belt and set off.	no injuries; no significant releases

TABLE 1
Hazardous Waste Combustor Facilities[1]

Facility	Commercial Incinerator?/ Capacity (tpy)[2]	Years of Operation[3]	Reported Incidents[4]	Incident Date and Description	Reported Impact
LWD Clay, KY	Yes	15+ (pre-81)	transportation; fire	Date: 2/2/82 Description: direct-feed tank truck containing acetone exploded and caught on fire; three other trucks also caught fire; no releases. Facility now closed.	on-site: operator had burns, fractured leg; oil/acetone mixture released; releases contained in berm off-site: fire-fighting water reached drainage ditch, then creek
Monsanto Company Muscatine, IA	No		incinerator eqpt failure; fire	Date: 7/92 Description: loss of quench water flow that caused temperature in scrubber to rise, causing fire. Incinerator only burning natural gas at the time.	no injuries; no release of hazardous waste
Rhone-Poulenc Basic Chemical Company--Hammond Plant[6] Hammond, IN	Yes PAIC: 80,000 (converted from 20 mil. gpy assuming 8 lb/gal) RC(3): 84,000		NR		
Rhone-Poulenc Basic Chemicals Company Baton Rouge, LA	Yes	15+ (pre-81)	NR		
Rhone-Poulenc Basic Chemicals Houston, TX	Yes	15+ (pre-81)	NR		
Rollins Environmental Services Logan Township, NJ (aka Bridgeport)	Yes RC(1): 81,796	25 (since 70 per U.S. EPA 1995a, App. 1)	bulk liquid storage; fire[5]	Date: 12/8/77 Description: series of explosions and fires at a tank farm.	on-site: 6 fatalities, 12 injuries, soil and ground water contamination off-site: no contamination

TABLE 1
Hazardous Waste Combustor Facilities[1]

Facility	Commercial Incinerator?/ Capacity (tpy)[2]	Years of Operation[3]	Reported Incidents[4]	Incident Date and Description	Reported Impact
Rollins Environmental Services Baton Rouge, LA	Yes RC(3): 59,000 or RC(1): 289,605 (converted from 30 metric tons/hr, assuming 1 metric ton = 1.102 tons)	15+ (pre-81)	NR		
Rollins Environmental Services Deer Park, TX	Yes RC(3): 122,000	15+ (pre-81)	operations; fire	Date: 11/91 Description: fire in furnace duct.	no information provided
Ross Incineration Services Grafton, OH	Yes RC(1): 140,160 or RC(2): 105,000	15+ (pre-81)	(1) incinerator operations; fire (2) incinerator operations; explosion	(1) Date: 8/12/94 Description: drum ignited due to acid residue improperly left on skid; cyclohexane, styrene, and mineral spirits released to air. (2) Date: 5/1/95 Description: explosion in secondary combustion chamber while feeding drummed waste; chamber damaged; roof left open to environment.	(1) one worker injured; no information on environmental impacts (2) no injuries; fugitive emissions; no information on environmental impacts

TABLE 1
Hazardous Waste Combustor Facilities[1]

Facility	Commercial Incinerator?/ Capacity (tpy)[2]	Years of Operation[3]	Reported Incidents[4]	Incident Date and Description	Reported Impact
ThermalKEM Rock Hill, SC	Yes PAIC: 25,000	15+ (pre-81)	(1) incinerator operations; explosion	(1) Date: 7/10/87 Description: three explosions resulted when incorrectly identified nitroglycerine/ lactose material introduced into incinerator.	(1) no environmental releases or fires
			(2) incinerator operations; explosion	(2) Date: 12/8/88 Description: drum caused strong reaction in incinerator, which caused release of safety pressure relief door and fuel line rupture, caused by nitrocellulose incorrectly identified as non-reactive	(2) no information provided
			(3) incinerator eqpt failure; explosion	(3) Date: 3/24/91 Description: low water pressure caused boiler tube to fail, causing the package boiler to explode. The incinerator was burning natural gas at the time of the explosion.	(3) no off-site impact; diesel/water spill was contained
			(4) fire[5]	(4) Date: 4/25/93 Description: hydraulic hoses and oil, part of drum repackaging system, caught fire	(4) no releases or injuries
			(5) mixing wastes[5]; fire	(5) Date: 1/14/95 Description: fire in Drum Repackaging Building, caused by improperly mixed wastes; off-site response agencies notified	(5) off-site: no releases above reportable quantity

TABLE 1
Hazardous Waste Combustor Facilities[1]

Facility	Commercial Incinerator?/ Capacity (tpy)[2]	Years of Operation[3]	Reported Incidents[4]	Incident Date and Description	Reported Impact
TWI Sauget, IL	Yes RC(3): 50,000	15+ (pre-81)	(1) mixing of incompatible wastes (2) operations; explosion (3) incinerator operations; explosion	(1) Date: 1/16/90 Description: blending tank released plume of 196 lbs of hydrochloric acid, due to improper identification of corrosivity of waste being added to tank (2) Date: 1/26/91 Description: sodium azide incinerated; ash placed in a dumpster; ash exploded a few hours later (3) Date: 2/5/91 Description: molten slag partly blocked exit from incinerator during operation; slag dislodged and fell into standing water below, causing a steam explosion.	(1) no information provided (2) no injuries or environmental impacts reported (3) one worker injury; vaporized hazardous waste released; no environmental impacts
USDOE Oak Ridge, TN	No		incinerator eqpt failure	Date: 6/15/89 Description: induced draft fan for incinerator failed; flying debris damaged stack	no injuries; no detectable off-site releases of toxic material
United States Pollution Control Inc. (USPCI) Clive, UT	Yes RC(1): 359,160	1 (Since 94)	NR		
Waste Reclamation and Research Eau Claire, WI	Yes PAIC: 2,500 (converted from 624,000 gpy to tpy assuming 8 lb/gal) RC(2): 3,500	15+ (pre-81)	NR		
Waste Technologies Industries East Liverpool, OH	Yes PAIC & RC(3): 60,000	2 (Since 93)	NR, No major incidents reported in U.S. EPA (1995b).		

TABLE 1
Hazardous Waste Combustor Facilities[1]

Facility	Commercial Incinerator?/ Capacity (tpy)[2]	Years of Operation[3]	Reported Incidents[4]	Incident Date and Description	Reported Impact

Notes:

[1] Sources:

- U.S. EPA 1995a. Report on Emergency Incidents at Hazardous Waste Incinerators and Commercial Treatment, Storage, and Disposal Facilities (TSDFs). Draft. May.
- Victorine, G. U.S. EPA Region 5. 1995a. Facsimile memo to Staff Members in OSW and EPA Regions, with List of Commercial Hazardous Waste Incinerators, Providing Years of Operation under RCRA Regulations.
- Victorine, G. U.S. EPA Region 5. 1995b. Facsimile memo to M. Mangino Providing Capacity Information on Selected Commercial Incinerators. July 27.
- *The Hazardous Waste Consultant* (HWC). 1995. Commercial Hazardous Waste Management Facilities: 1995 Survey of North America. Vol. 13, Issue 2, March/April.

[2] "Yes" signifies facility was identified as a commercial incinerator in Victorine (1995a).

Capacity Information (all capacities listed in tons per year (tpy)):
PAIC = permitted annual incineration capacity listed in HWC (1995).
Capacities from RCRIS, obtained from Victorine (1995b):
RC(1) = capacity per RCRIS in tpy, converted from tons/hr or lb/hr
RC(2) = capacity per RCRIS in tpy, converted from gal/day or gal/hr assuming 1 gal=8 lbs (based on 128 ounces per gallon/16 ounces per pound)
RC(3) = capacity per RCRIS in tpy, converted from MMBTU/hour based on note in Victorine (1995b) indicating that at one incinerator, 98 MMBTU/hr is approximately equal to 60,000 tpy
Values of RC(2) and RC(3), converted from liquid or thermal capacities, are rounded to two significant figures to reflect uncertainty in conversion factors.
All calculations assume 24 hour/day operation.

[3] Years of operation are from Victorine (1995a) unless otherwise noted.

[4] NR = No incidents reported in U.S. EPA (1995a).

[5] Incident related to waste handling or storage, not incineration.

[6] Facility identified in HWC (1995); not listed in Victorine (1995a). Victorine (1995b) provides capacity information for rotary calciner and boiler.

[7] This facility is identified as a "permitted DuPont commercial combustion facility" in U.S. EPA (1995a), but not listed as such elsewhere. According to Chip Crockett of the Alabama Environmental Management Agency (telephone call, 7/13/95), this facility burns only hazardous waste generated on-site, and is not a commercial combustion facility.

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TABLE 2
Summary of Incidents Reported at Treatment, Storage and Disposal Facilities[1]

Facility	Reported Incidents	Incident Date and Description	Reported Impact
Albright and Wilson Charleston, SC	(1) explosion and fire	(1) Date: 6/17/91 Description: explosion and fire in Special Products Unit	(1) nine deaths (apparently on-site), fire fighting water flowed to containment pond
	(2) equipment failure	(2) Date: 1/14/93 Description: rupture in steam jacket and piping released steam and by-products Note: Neither incident involved hazardous waste.	(2) no information
Carolina Solite, Norwood, NC	(1) equipment failure; spill	(1) Date: 11/4/93 Description: waste blend tank burst pipe, spilled 2,500 gal of waste; most of spill contained; 50 to 100 gal escaped to soil; cleaned up	(1) soil contamination (remediated); no human or environmental impacts reported
	(2) equipment failure; spill	(2) Date: 1/94 Description: similar to 11/93	
Chemical Waste Management (Commercial TSD) Emelle, AL	(1) mixing waste; fire	(1) Date: 11/10/92 Description: while oil was being added to drum of epichlorohydrin, mixture ignited.	(1) no injuries
	(2) operations	(2) Date: 12/5/92 Description: 170,000 gal water pumped from fire water tank to crusher dispersion unit, found to be contaminated with D039 waste; ditch through which water flowed had contaminated soil.	(2) soil contamination (remediated)
	(3) mixing waste; fire	(3) Date: 12/8/92 Description: fire in vat of D004/D018 hazardous waste after addition of portland cement.	(3) no injuries, no releases
	(4) "ball of fire"	(4) Date: 1/9/93 Description: employee observed ball of fire rising above active trench, followed by puff of smoke and another ball of fire.	(4) no information
	(5) flash fire	(5) Date: 2/26/93 Description: flash-ignition of the reagent sulfur as it was mixed with waste; lasted 1-2 seconds.	(5) no visible releases of hazardous substances

TABLE 2
Summary of Incidents Reported at Treatment, Storage and Disposal Facilities[1]

Facility	Reported Incidents	Incident Date and Description	Reported Impact
Chemical Waste Management Arlington, OR	fire	Date: 5/5/94 Description: fire in landfill, believed to be due to disposing wood debris near stabilized, heat-generating waste streams.	no injuries; fire contained in landfill
ChemPro Tacoma, WA	operations; spill	Date: ~ 87 Description: 10,000-gal spill of chromic acid through loose valve.	soil contamination
Chem-Tech Systems Los Angeles, CA	bulk liquid handling	Date: 8/29/94 Description: release of nitrous oxide--acute emissions lasting 20 minutes to 1 hour, during transfer of water with chrome into tank with mixed acids.	two on-site employees complained of dizziness and nausea; air emissions dispersed by wind
CP Chemicals Sumter, SC	bulk liquid storage	Date: 11/29/85 Description: spill of 2,200-gal ammonia and 2,000-gal hydrochloric acid from two storage tanks (tank valves left open by employees [intentionally]).	no information provided
Delaware Container Company Coatesville, PA	mixing of incompatible wastes	Date: 10/14/85 Description: waste containing aluminum-based paint (not on manifest) released "some gas"; residents detected odor; emergency personnel called.	32 residents (or 100, per community) treated for nose and throat irritations; no hospitalizations or deaths
Fisher Industrial Services, Inc. (Commercial TSD) Glencoe, AL	fire	Date: 8/13/93 Description: small fire in roll-off, including various D- and F- listed wastes; fire restricted to container.	no information (fire restricted to container)
Holnam/Safety-Kleen Holly Hill, SC	(1) bulk liquid storage; explosion (2) transportation	(1) Date: 10/23/87 Description: 100,000-gal fuel tank exploded. (2) Date: 8/13/92 Description: 638-gal spill during railcar transfer.	(1) no information provided (not a regulated unit) (2) site remediated
International Paper Joplin, MO	transfer line failure	Date: 10/1/92 Description: water contaminated with wood-treating wastes released during transfer from one closed surface impoundment to another; 30,000 gal released to the environment	no information on waste concentration in water or result of release

TABLE 2
Summary of Incidents Reported at Treatment, Storage and Disposal Facilities[1]

Facility	Reported Incidents	Incident Date and Description	Reported Impact
Laidlaw Environmental Services (GSX Laidlaw Landfill) Pinewood, SC	(1) operations; fire	(1) Date: 1991 Description: fire at drum shredder unit.	(1) no major release
	(2) operations	(2) Date: 2/92 Description: spill at waste solidification unit.	(2) soil contaminated (remediated)
	(3) operations; fire	(3) Date: 9/9/93 Description: fire at drum shredder unit, involving two drums of lithium manganese batteries.	(3) no injuries reported
	(4) fire	(4) Date: 4/12/94 Description: fire involving alkaline batteries.	(4) no injuries reported
	(5) waste mixing; fire	(5) Date: unknown Description: smoke and small pockets of flame from oil and grease treatment tanks; later discovered load also contained caustic manure and aluminum.	(5) no information provided
Mill Service Yukon, PA	(1) operations	(1) Date: 11/12/91 Description: partially treated waste sludges accidentally placed in a surface impoundment.	no information provided
	(2) bulk liquid unloading	(2) Date: six times in last 10 years, none since '92 Description: nitric acid puffs occur from waste pickle liquor. This occurs when the dome of a tank truck that was not cleaned out properly is removed.	

TABLE 2
Summary of Incidents Reported at Treatment, Storage and Disposal Facilities[1]

Facility	Reported Incidents	Incident Date and Description	Reported Impact
Northwest Enviro Service Seattle, WA	(1) operations; fire	(1) Date: 1988 Description: welding sparks ignited fumes from below-grade pit, causing fire.	(1) no injuries or natural resource damage
	(2) operations	(2) Date: 10/89 Description: during processing of oil wastes, workers from neighboring building hospitalized, complaining about fugitive emissions.	(2) hospitalized off-site workers
	(3) mixing waste	(3) Date: 3/28/92 Description: heat, flames and toxic fumes generated due to mixing incompatible wastes.	(3) no information
	(4) spill	(4) Date: 2/14-15/94 Description: spill into storm drain of 5,500 gal of hazardous waste and oil; migrated to river and wetland (company claimed sabotage).	(4) contamination of site, wetlands, and river
Oil and Solvent Process Company Azusa, CA	bulk liquid handling	Date: 4/21/89 Description: 9,611-gal spill of wastewater containing 1.3% solvents (mostly acetone) due to transfer line failure.	5 gallons onto public road; soil contamination cleaned up; no threat human health or environment
Phillips Environmental (formerly ChemPro) Pier 91 Port of Seattle, WA	operations	Date: 1990 Description: welders ignited fumes in an empty tank at tank farm/waste oil facility.	one worker killed; fugitive emissions released
Rhone Poulenc Basic Chemical Company Martinez, CA	industrial operations; fire; release	Date: 7/23/92 Description: release of corrosive sulfonation acid sludge caused fire and explosion; U.S. EPA criticized response actions and capabilities. NOTE: This facility has never operated as a commercial TSDF under RCRA. RCRA incinerator permit had been submitted at time of release, but was withdrawn.	one Pacific Gas & Electric worker seriously injured (apparently on-site) due to contact with sludge; elevated air concentrations of hydrogen sulfide and sulfur dioxide in damaged area
Safety-Kleen Lexington Recycling Center Lexington, SC	bulk liquid handling	Date: 4/8/92, 6/19/92 Description: two spills (300 gal and 40 gal) while filling tanks, substances unknown.	no information provided

TABLE 2
Summary of Incidents Reported at Treatment, Storage and Disposal Facilities[1]

Facility	Reported Incidents	Incident Date and Description	Reported Impact
Sol-Pro Tacoma, WA	(1) operations; explosion	(1) Date: ~1991 Description: welders working on a feed tank ignited fumes inside the tank, resulting in explosion.	(1) no injuries; small fugitive emission releases
	(2) operations	(2) Date: unknown Description: fugitive emissions from solvent recyclers, evaporators, and process vents containing acetone, toluene, and lacquer thinner, and from a hopper for empty chemical drums; leaks from vats and containers.	(2) hazardous emissions; releases to surface water; no physical or health problems
Southeastern Chemicals Sumter, SC	fires	Date: 4/12/92, 4/14/92, 4/20/92, 6/6/92 Description: four fires in 1992.	no major releases
Statewide Environmental Services Los Angeles, CA	operations	Date: 3/21/91 Description: solidified organic peroxides transferred into polyethylene drum for incineration, resulting in unexpected reaction.	release of water vapor and carbon dioxide; on-site workers visited hospital, released same day
United States Pollution Control, Inc. (USPCI) Grassy Mountain Landfill, Tooele County, UT	spill	Date: 9/16/88 Description: 50 gal of unknown liquid hazardous waste spilled onto ground from truck.	no damage to liners, no ground water contamination
Washington Chemical	mixing of incompatible wastes; explosion	Date: 3/90 or 4/90 Description: incompatible wastes mixed together and sealed in a 55-gal drum, causing explosion. Drum propelled through air, spraying waste in all directions.	no injuries; minor property damage

Notes:

[1] Sources:

- U.S. EPA 1995a. Report on Emergency Incidents at Hazardous Waste Incinerators and Commercial Treatment, Storage, and Disposal Facilities (TSDFs). Draft. May.
- Victorine, G. U.S. EPA Region 5. 1995. Facsimile memo to Staff Members in OSW and U.S. EPA Regions, with List of Commercial Hazardous Waste Incinerators, Providing Years of Operation under RCRA Regulations.

TABLE 3
Reported Equipment/Procedural Failures at the WTI Facility (Victorine 1995d)

Date	Reported Equipment/Procedural Failures
05/27/93	Kiln brought down due to brick failure. Rebrick kiln.
09/15/93	More brick failure. Rebrick back half of kiln.
11/02/93	Spill of 10 gallons of high-BTU waste onto soil. All potentially contaminated soil was removed.
12/10/93	Quench pump system failure results in ID fan trip while drums of waste were still in the kiln; kiln reportedly released smoke for 3 minutes. (Apparently violation of RCRA permit condition requiring negative pressure at all times.)
12/14/93	Tertiary air fan bearing failure: trial burn condition 2 rerun delayed for repairs.
12/15/93	Scrubber pump cavitation reportedly causes unacceptable flow variation; attributed to check valve failure: trial burn delayed while adjustments made.
12/15/93	Tank lining failure due to poor adhesion. Unacceptably high flow swings in the organic feed lance system result as the pieces of lining flow through the pipes and out the lance. Also, minor problems associated with spurious readings from a failed redundant thermocouple (measuring kiln temperature).
12/16/93	Ball of slagged clay falls out of kiln and ruptures pressure relief panels in slag quench tank. Trial burn delayed for repairs. Failed tank linings which caused problem on previous day are confirmed. Trial burn stopped due to delays.
12/22/93	Automatic Waste Feed Cutoff (AWFCO) due to low voltage in third field of the Electrostatic Precipitator (ESP). Problem was due to "ash bridge" in the hopper. In cleaning out ash bridge, Permittee spilled 10 lbs of ash (HW) onto concrete containment. Ash is cleaned up.
12/23/93	Malfunction of flyash handling system baghouse, 0.1 lb of dust (HW) is released.
12/27/93	Feed of drum into kiln with higher than expected BTU release rate causes process oscillation and AWFCO for LOW TEMP. Also results in process steam venting for several minutes.

TABLE 3
Reported Equipment/Procedural Failures at the WTI Facility (Victorine 1995d)

Date	Reported Equipment/Procedural Failures
12/28/93	Exceed Ohio Environmental Protection Agency (EPA) temporary solids feed limit of 8000 lb/hr for one hour by 98 lbs. (Permittee subsequently reported that drum weighing sequence was changed to prevent this problem from occurring again.)
12/29/93	Chain conveyor which drags quenched slag out of the slag quench tank breaks and falls into slag quench tank at 2:00 am. Facility burns out waste for four hours, drains tank, shuts down kiln and makes repairs.
01/09/94	C-water tank W5 overflows into containment while transferring C-water from recycle tank W4 (which was temporarily being used for C-water). No wastewater is released from containment.
01/10/94	Replace 5 rings of bricks on the discharge end of kiln.
01/11/94	More C-water overflows tank W5 into containment reportedly due to a valve being partially stuck open. No wastewater is released from containment.
01/14/94	AWFCO due to high flow after Hi-BTU lance pump failed; response measures (viz., increasing feed through the organic liquids lance) evidently were too aggressive. Exceeded 65,000 standard cubic feet per minute (scfm) permit limit. Not burning any solids at the time.
01/14/94	One of three drums of the same waste was opened for sampling and began smoking. Fumes were caught by the vapor recovery system, while fire extinguisher was directed on drum and the drum resealed. No significant releases.
01/17/94	Neutralization pump to spray dryer head tank leaks and spills spray dryer feed water onto concrete containment. No releases to environment.
01/17/94	Steam (not HW) release due to frozen pressure transmitters in steam loop.
01/18/94	Spilled 3-5 pounds of lime (not HW) onto concrete area after the lime screw unit which feeds tank N1 is repaired and returned to service. Initial report was that a gasket was evidently not correctly tightened after the lime screw unit was repaired.
01/19/94	Leak in condenser due to cold weather necessitates more than normal venting of steam (not HW).

TABLE 3 Reported Equipment/Procedural Failures at the WTI Facility (Victorine 1995d)	
Date	**Reported Equipment/Procedural Failures**
01/22/94	Damage caused by cold weather reportedly caused some of the steam coils in the flue gas reheat system to rupture, causing high opacity readings. Facility brought off waste and down onto natural gas (for 2 days) while repairs were made. Welding on heat exchanger results in observations of smoke for several hours near the stack..
01/24/94	Failed check valve causes "C" water to backflow into a sump below the process water storage tanks. Valve is isolated and replaced; no release to the environment.
01/28/94	3 second positive pressure excursion in secondary combustion chamber (SCC) results in AWFCO. The pressure excursion is reportedly due to slag falling of the wall of the SCC and into the slag quench tank, resulting in a large amount of steam being generated and released into the SCC.
01/31/94	Corrosion of an "air bell" inside the ESP causes air bell to fall and short out the first field of the ESP. This shuts down the first ESP field and triggers an AWFCO. Since fields 2 and 3 remained operative as the facility came off waste, it is believed that only a minor increase in emissions would have been experienced for a very short time, with emissions remaining within allowable limits. Quarterly ECIS performance test scheduled to start on 2/1 has to be postponed until 2/15.
2/14/94	One atomizer in the spray dryer plugs up or malfunctions, so service water is fed to spray dryer to maintain proper attemperation. However, since there was insufficient blowdown from the scrubber (the scrubber is normally blown down to the spray dryer through the atomizers, and blowdown evidently had to be reduced since the spray dryer couldn't handle it all), SO_2 removal in the scrubber evidently decreased and resulted in an SO_2 exceedance. Between 2013 and 2119 hours, the facility emitted up to 15.9 pounds per hour of SO_2; OEPA air permit limit is 11.3 pounds per hour.
02/15/94	ID fan trips due to mistake made while electrical work is being done on control system. No drums/bulk waste in the kiln.
02/16/94	AWFCO due to high carbon monoxide caused by plugging in high-BTU lance. Evidently, plugging caused "spurting" flow which led to less complete combustion than does smooth flow.

TABLE 3
Reported Equipment/Procedural Failures at the WTI Facility (Victorine 1995d)

Date	Reported Equipment/Procedural Failures
02/23/94	Same as 02/16; delays start of trial burn test. No drums or bulk waste in the kiln. Attributed to specific conditions of the trial burn.
02/25/94	Same as 02/16; trips incinerator 10 minutes before the 4-hour test run is complete per the trial burn plan. No drums or bulk waste in the kiln. Attributed to specific conditions of the trial burn.
03/03/94	Spill of 5-8 gallons of acidic/solvent sludge when rupture disk blows in tank PT-3, due to level alarm failure and related overfilling. Waste is contained in secondary containment, but apparently gets pumped from sump into C-water system, contaminating C-water.
03/08/94	Power fluctuations caused problems for variable drives on spray dryer atomizers, atomizers trip off, system has AWFCO at 6:00 am due to high temperature at the outlet of the spray dryer. System is checked out and returned to service, but has a similar AWFCO around 8:00 am due to failure of spray dryer atomizer vacuum pump which, under present logic, automatically tips off the atomizer.
03/12/94	Rebrick kiln.
03/26/94	Spill of 15-18 gallons of HW into secondary containment in the drum pumpout tank area. Due to apparent failure of maintenance personnel to reconnect a vent line on a sludge pump after a service operation. HW cleaned up and put in drums.
04/06/94	Spill of <5 gallons of waste into and just outside of secondary containment for the pumpout tanks. Workers were disconnecting hoses used for temporary waste routing, hoses were evidently under more pressure than anticipated. All spillage was onto pavement, and was cleaned up.
04/16/94	Problems with slag conveyor, plant is brought down for three days for repairs.
04/26/94	While repackaging reactive wastes from drums into 5-gallon pails, three pails start liberating strong tar-like odor. Pails were immediately sent to the kiln and were destroyed, all within 20 minutes. Waste was cumene hydroperoxide.
05/10/94	Large piece of slag rolled out of the kiln and into the slag quench tank, causing pressure relief panels in the quench tank to release. Plant brought down for repairs, plans are made to modify the design of the slag quench tank and conveyor system.

TABLE 3
Reported Equipment/Procedural Failures at the WTI Facility (Victorine 1995d)

Date	Reported Equipment/Procedural Failures
05/14/94	Slag conveyor jammed, came off track, and fell into the slag quench tank. Plant brought down for repairs. Upon re-start on Sunday morning, ESP field #3 was found to be shorting out. Plant brought back down so that ceramic insulators on ESP field #3 could be changed. Plan to be back on waste 5/17.
06/08/94	Problems with slag quench tank and conveyor.
06/15/94	Shut down to inspect brickwork in kiln, need to replace several rows of bricks.
07/12/94	Unit down for repairs to slag conveyor.
07/28/94	Unit down for rebricking of kiln and repairs to slag conveyor.
08/19/94	Unit down for repairs to slag conveyor.
08/25/94	Problem with large piece of slag falling into quench tank causes SCC overpressure and visible puff for 3-5 seconds.
09/01/94	During monitor recertification, CO monitors are found to be reading high and hence out of certification. Even though this could be considered to be "overprotective," facility is instructed not to burn waste until at least one monitor can be certified. WTI goes down for about two weeks to install new slag quench tank, and also decides to lease a new CO monitor, while also ordering two brand-new CO units. Temporary CO monitor is successfully certified, and facility operates on this monitor until new units arrive.
09/29/94	Unit down until 10/24/94 due to problems with spray dryer pump(s) and sensor(s).
10/23/94	Unit down (reason not recorded) until 10/25/94
10/31/94	Electrical technician causes fuse to blow while changing an indicator lamp for the water level in the waste heat boiler. The process computer interprets this as meaning that the boiler has gone dry, and responds by tripping the plant off. Hot gases remaining in the kiln evidently flow backward through the vapor recovery system piping and out the three carbon absorber boxes associated with the vapor recovery system. Event lasts approximately 10 minutes, with some visible emissions reportedly seen at ground level.
11/04/94	Plant down for minor brick repairs.
12/08/94	Leaking piping at scrubber water pump inside scrubber building.

TABLE 3
Reported Equipment/Procedural Failures at the WTI Facility (Victorine 1995d)

Date	Reported Equipment/Procedural Failures
12/29/94	Rolled up cloth-like item in bulk waste feed got caught in hot-side doors of bulk feed chute, and began smoldering. Technicians reportedly used a hose to extinguish the item and knock it free.
01/04/95	Steam release due to frozen condensate line at heat exchanger. Corrective action included revision to control system to send information concerning temperature and valve position up to the control room.
01/08/95	Unit down for partial rebricking.
02/14/95	Small electrical fire in a control cabinet within the spray dryer penthouse, immediately extinguished by plant personnel with fire extinguisher. The spray dryer is controlled both electrically and hydraulically, and some of the hydraulic piping which runs through the cabinet ruptured and spilled into penthouse, onto floor grating, and through grating onto insulation. Oil is steam-cleaned off the following evening.
02/15/95	When upper doors were opened to drop a load of bulk solids into the kiln, the bulk waste which was in the clamshell caught fire. Sprinkler system activated, extinguishing fire reportedly within 1 minute. This event was reportedly caused by a "flashback" of powdery material falling out of clamshell bucket. Damage was reportedly limited to the crane bucket wires, cables, and insulation in the immediate area.
3/15/95	Release of a repulsive odor, affecting much of East Liverpool, due to the receipt and unloading of a tanker of waste which contained the mercaptan thiophenol. No exact release point was ever identified with certainty, but reportedly only a few drops of this waste (which reportedly has an odor threshold of 0.3 ppb) could result in this kind of problem. The possibility exists that this odor was at least in part due to releases from the truck after it left the plant site. WTI stopped receiving shipments of this waste until it completed enclosure of the tanker truck unloading pad and venting of this enclosure to the vapor recovery system.

TABLE 3
Reported Equipment/Procedural Failures at the WTI Facility (Victorine 1995d)

Date	Reported Equipment/Procedural Failures
7/03/95	The waste in one of the two enclosed bulk solid waste pits caught fire. Fire was quickly extinguished by the automatic water deluge system. No injuries; minor damage to the door into the pit. Since this enclosure is vented to the vapor recovery system, no significant releases were suspected, but some smoke was reported as leaking out from under and around the door. Ignition source is attributed to a burning piece of waste, either travelling through the air from the incinerator feed chute doors to the pit, or being carried from the chute doors to the pit via the clamshell bucket.
7/18/95	An incoming truck load of caustic waste was mistaken for an expected shipment of virgin caustic from the same trucking company, and therefore the truck driver was mistakenly directed by facility personnel to off-load the material into the caustic tank (this caustic tank is used for neutralization of the scrubber liquor). The mistake was immediately caught, and all the material (mixture of waste and virgin caustic) in the caustic tank was subsequently treated as a hazardous waste. WTI cleaned out the tank and instituted additional verification procedures for bill-of-lading.

APPENDIX VII-2

Ranking of Chemicals of Potential Concern

TABLE 1
Chemicals Eliminated from the Preliminary List[a]

CAS Number	Substance
591-08-2	Acetamide, N-(aminothioxomethyl)-
98-86-2	Acetophenone
53-96-3	Acetylaminofluorene, 2-
591-08-2	1-Acetyl-2-thiourea
111-65-9	Aliphatic hydrocarbons (assumed octane)
131-74-8	Ammonium picrate
7803-55-6	Ammonium vanadate
7778-39-4	Arsenic acid H_3AsO_4
692-42-2	Arsine, diethyl-
696-28-6	Arsonous dichloride, phenyl-
151-56-4	Aziridine
75-55-8	Aziridine, 2-methyl-
542-62-1	Barium cyanide
100-01-6	Benzenamine, 4-nitro-
106-47-8	Benzenamine, 4-chloro-
100-21-0	Benzenedicarboxylic acid, 1,2-
51-43-4	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-
122-09-8	Benzeneethanamine, α,α-dimethyl-
92-87-5	Benzidine
50-32-8	Benzo(a)pyrene
81-81-2	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations greater than 0.3%
50-32-8	Benzoquinone, p-
7440-41-7	Beryllium
598-31-2	Bromoacetone
357-57-3	Brucine
39196-18-4	2-Butanone, 3,3-dimethyl-1-(methylthio)-,O-[methylaminocarbonyl] oxime
111-76-2	Butoxyethanol, 2- (Butyl cellosolve)
123-86-4	Butyl acetate
592-01-8	Calcium cyanide

CAS Number	Substance
75-44-5	Carbonic dichloride
107-20-0	Chloroacetaldehyde
106-47-8	p-Chloroaniline
108-90-7	Chlorobenzene
218-01-9	Chrysene
544-92-3	Copper cyanide
106-44-5	Cresol, 4-
108-39-4	Cresol, 3-
	Cyanides (soluble cyanide salts), not otherwise specified
460-19-5	Cyanogen
131-89-5	2-Cyclohexyl-4, 6-dinitrophenol
53-70-3	Dibenz(a,h)anthracene
106-93-4	Dibromoethane
1649-08-7	Dichlorodifluoroethane
75-71-8	Dichlorodifluoromethane
75-34-3	Dichloroethane, 1,1- (ethylidene dichloride)
540-59-0	Dichloroethene
75-35-4	Dichloroethene, 1,1-
542-88-1	Dichloromethyl
60-57-1	Dieldrin
56-53-1	Diethyl stilbestrol
311-45-5	Diethyl-p-nitrophenyl phosphate
692-42-2	Diethylarsine
309-00-2	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa- chloro-1,4,4a,5,8,8a,-hexahydro-, (1α,4α,4aβ,5α,8α,8aβ)-
465-73-6	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa- chloro-1,4,4a,5,8,8a,-hexahydro-, (1α,4α,4aβ,5β,8β,8aβ)-
60-57-1	2,7:3,6-Dimethanonaphth [2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aα,2β,2aα,3β,6β, 6aα,7β,7aα)-
72-20-8	2,7:3,6-Dimethanonaphth [2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aα,2β,2aβ,3α,6α, 6aβ,7β,7aα)-, & metabolites
124-40-3	Dimethylamine

TABLE 1
Chemicals Eliminated from the Preliminary List[a]

CAS Number	Substance
119-93-7	Dimethylbenzidine, 3,3'-
105-67-9	Dimethylphenol (assumed 2,4-)
131-11-3	Dimethylphthalate
122-09-8	α,α-Dimethyphenethylamine
51-28-5	2,4-Dinitrophenol
121-14-2	Dinitrotoluene, 2,4-
606-20-2	Dinitrotoluene, 2,6-
145-73-3	Endothall
51-43-4	Epinephrine
460-19-5	Ethanedinitrile
107-12-0	Ethyl cyanide
141-78-6	Ethyl acetate
51-79-6	Ethyl carbamate
105-39-5	Ethylchloroacetate
52-85-7	Famphur
206-44-0	Fluoranthene
62-74-8	Fluoroacetic acid, sodium salt
64-18-6	Formic acid
28-86-4	Fulminic acid, mercury(2+) salt
98-01-1	Furfural
76-44-8	Heptachlor
110-43-0	Heptanone, 2-
57-58-4	Hexaethyl tetraphosphate
110-54-3	Hexane
142-92-7	Hexyl acetate
60-34-4	Hydrazine, methyl-
7803-51-2	Hydrogen phosphide
193-39-5	Indeno(1,2,3-cd)pyrene
78-59-1	Isophorone
67-63-0	Isopropanol

TABLE 1
Chemicals Eliminated from the Preliminary List[a]

CAS Number	Substance
108-21-4	Isopropyl acetate
120-58-1	Isosafrole
2763-96-4	3(2H)-Isoxazolone, 5-(aminomethyl)-
108-31-6	Maleic anhydride
628-86-4	Mercury fulminate
509-14-8	Methane, tetranitro-
542-88-1	Methane, oxybis[chloro-
75-70-7	Methanethiol, trichloro-
76-44-8	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-
115-29-7	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide
16752-77-5	Methomyl
80-62-6	Methyl methacrylate
504-60-9	Methylbutadiene, 1-
36-49-5	Methylcholanthrene, 3-
75-09-2	Methylene chloride
1116-54-7	N-nitrosodiethanolamine
55-18-5	N-nitrosodiethylamine
924-16-3	N-nitrosodi-n-butylamine
930-55-2	N-nitrosopyrolidine
4549-40-0	N-nitrosomethylvinylamine
134-32-7	Naphthylamine, 1-
91-59-8	Naphthylamine, 2-
557-19-7	Nickel cyanide
100-01-6	p-Nitroaniline
55-63-0	Nitroglycerine
100-02-7	Nitrophenol (para)
152-16-9	Octamethylpyrophosphoramide
145-73-3	7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid
109-66-0	Pentane
131-74-8	Phenol, 2,4,6-trinitro-, ammonium salt

TABLE 1
Chemicals Eliminated from the Preliminary List[a]

CAS Number	Substance
131-89-5	Phenol, 2-cyclohexyl-4,6-dinitro-
534-52-1	Phenol, 2-methyl-4,6-dinitro-, & salts
51-28-5	Phenol, 2,4-dinitro-
88-85-7	Phenol, 2-(1-methylpropyl)-4,6-dinitro-
311-45-5	Phosphoric acid, diethyl 4-nitrophenyl ester
298-02-2	Phosphorodithioic acid, O, O-diethyl S-[(ethylthio)methyl] ester
298-04-4	Phosphorodithioic acid, O, O-diethyl S-[2-(ethylthio)ethyl] ester
60-51-5	Phosphorodithioic acid, O, O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester
55-91-4	Phosphorofluoridic acid, bis(1-methylethyl) ester
297-97-2	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester
298-00-0	Phosphorothioic acid, O,O,-dimethyl O-(4-nitrophenyl) ester
52-85-7	Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl]phenyl] O,O-dimethyl ester
56-38-2	Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester
85-44-9	Phthalic anhydride
109-06-8	Picoline, 2-
116-06-3	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime
542-76-7	Propanenitrile, 3-chloro-
75-86-5	Propanenitrile, 2-hydroxy-2-methyl-
55-63-0	1,2,3-Propanetriol, trinitrate
71-23-8	Propanol, n-
598-31-2	2-Propanone, 1-bromo-
107-19-7	Propargyl alcohol
107-18-6	2-Propen-1-ol
107-02-8	2-Propenal
107-19-7	2-Propyn-1-ol
504-24-5	4-Pyridinamine
154-11-5	Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)-, & salts
108-46-3	Resorcinol
12039-52-0	Selenious acid, dithallium(1+) salt
630-10-4	Selenourea

TABLE 1
Chemicals Eliminated from the Preliminary List[a]

CAS Number	Substance
506-64-9	Silver cyanide
357-57-3	Strychnidin- 10-one, 2,3-dimethoxy-
630-20-6	Tetrachloroethane, 1,1,1,2-
79-34-5	Tetrachloroethane, 1,1,2,2-
107-49-3	Tetraethyl pyrophosphate
757-58-4	Tetraphosphoric acid, hexaethyl ester
12039-52-0	Thallium(l) selenite
7446-18-6	Thallium(l) sulfate
541-53-7	Thioimidodicarbonic diamide $[(H_2N)C(S)]_2NH$
103-85-5	Thiourea, phenyl-
86-88-4	Thiourea, 1-naphthalenyl-
823-40-5	Toluenediamine, 2,6-
95-80-7	Toluenediamine, 2,4-
76-13-1	Trichloro-1,2,2,-trifluoroethane, 1,1,2-
120-82-1	Trichlorobenzene (assumed 1,2,4-)
79-00-5	Trichloroethane, 1,1,2-
75-69-4	Trichlorofluoromethane
87-90-1	Trichloroisocyanuric acid (Symclosene)
75-70-7	Trichloromethanethiol
121-44-8	Triethylamine
7803-55-6	Vanadic acid, ammonium salt
4549-40-0	Vinylamine, N-methyl-N-nitroso-
557-21-1	Zinc cyanide

Note:

[a] 170 chemicals were eliminated from the preliminary list of 309 chemicals.

TABLE 2 Ranking of Chemicals of Potential Concern for Short-Term Exposures[a]					
CAS Number[1]	Substance	Basis[2]	R_1 Rank[3] (IDLH)	R_2 Rank[3] (IDLH, VP)	R_3 Rank[3] (IDLH, VP, C)
107-20-0	Acetaldehyde, chloro-	B	80	29	NS
640-19-7	Acetamide, 2-fluoro-	B	61	NS	NS
62-74-8	Acetic acid, fluoro-, sodium salt	B	4	NS	NS
67-64-1	Acetone	A	130	47	9
107-2-8	Acrolein	B, C, D	10	13	NS
107-13-1	Acrylonitrile	A, C, D	83	31	6
116-6-3	Aldicarb	B, D	6	93	NS
309-0-2	Aldrin	B, D	37	97	NS
107-18-6	Allyl alcohol	B, C, D	57	32	NS
20859-73-8	Aluminum phosphide	B, D	86	NS	NS
2763-96-4	Aminomethyl-3-isoxazolol, 5-	B	81	NS	NS
504-24-5	Aminopyridine, 4-	B	87	100	NS
7664-41-7	Ammonia	C	92	15	NS
62-53-3	Aniline	A, D	99	77	37
506-61-6	Argentate(1), bis(cyano-C)-, potassium	B	88	NS	NS
1327-53-3	Arsenic oxide	B	27	NS	NS
1303-28-2	Arsenic pentoxide	B, D	66	NS	NS
7784-34-1	Arsenous trichloride	C	24	28	NS
7784-42-1	Arsine	C	20	3	NS
71-43-2	Benzene	A	112	44	15
108-98-5	Benzenethiol	B	28	39	NS
100-44-7	Benzyl chloride	B, D	59	35	NS
71-36-3	Butanol	A	124	79	34
75-15-0	Carbon disulfide	A, B, C, D	111	36	5
56-23-5	Carbon tetrachloride	A	109	41	7
57-74-9	Chlordane	D	101	108	47
7782-50-5	Chlorine	C	40	6	NS

TABLE 2
Ranking of Chemicals of Potential Concern for Short-Term Exposures[a]

CAS Number[1]	Substance	Basis[2]	R_1 Rank[3] (IDLH)	R_2 Rank[3] (IDLH, VP)	R_3 Rank[3] (IDLH, VP, C)
10049-4-4	Chlorine dioxide	C	25	11	NS
67-66-3	Chloroform	A, C, D	117	42	10
542-88-1	bis-Chloromethyl ether	C	5	18	NS
5344-82-1	1-(o-Chlorophenyl)thiourea	B	55	NS	NS
542-76-7	Chloropropionitrile, 3-	B	68	43	NS
8001-58-9	Creosote (coal tar)	A	NS	NS	NS
95-48-7	Cresol, 2-	A, D	106	85	41
4170-30-3	Crotonaldehyde	A, C, D	79	40	13
98-82-8	Cumene	A	125	74	36
506-77-4	Cyanogen chloride	B, C	122	33	NS
110-82-7	Cyclohexane	A	126	51	20
108-94-1	Cyclohexanone	A	118	75	33
19287-45-7	Diborane	C	30	2	NS
95-50-1	Dichlorobenzene, 1,2-	A	107	81	35
541-73-1	Dichlorobenzene, 1,3-	A	NS	NS	NS
106-46-7	Dichlorobenzene, 1,4-	A	102	78	40
696-28-6	Dichlorophenylarsine	B	100	87	NS
84-66-2	Diethylphthalate	A	NS	NS	NS
297-97-2	Diethyl O-pyrazinyl phosphorothioate, O,O-	B	44	89	NS
55-91-4	Diisopropylfluorophosphate (DFP)	B	46	53	NS
60-51-5	Dimethoate	B, D	97	107	NS
540-73-8	Dimethylhydrazine	A, C, D	48	24	4
77-78-1	Dimethyl sulfate	A, D	47	57	29
534-52-1	Dinitro-o-cresol, 4,6- & salts (2)	B, D	11	90	NS
88-85-7	Dinoseb	B, D	54	76	NS
123-91-1	Dioxane, 1,4-	A	113	52	22
152-16-9	Diphosphoramide, octamethyl-	B, D	15	88	NS

TABLE 2 Ranking of Chemicals of Potential Concern for Short-Term Exposures[a]					
CAS Number[1]	Substance	Basis[2]	R_1 Rank[3] (IDLH)	R_2 Rank[3] (IDLH, VP)	R_3 Rank[3] (IDLH, VP, C)
107-49-3	Diphosphoric acid, tetraethyl ester	B	12	92	NS
298-4-4	Disulfoton	B, D	32	95	NS
541-53-7	Dithiobiuret	B, D	58	NS	NS
115-29-7	Endosulfan	B, D	16	102	NS
72-20-8	Endrin, & metabolites	B, D	3	101	46
106-89-8	Epichlorohydrin	A, C, D	96	45	17
16752-77-5	Ethanimidothioic acid, N-[[(methylamino)carbonyl]oxy]-, methyl ester (Methomyl)	B	72	104	NS
64-17-5	Ethanol	A	131	65	25
110-80-5	Ethoxyethanol, 2-	A	114	70	30
140-88-5	Ethyl acrylate	A	108	49	28
100-41-4	Ethylbenzene	A	121	71	31
151-56-4	Ethyleneimine	B, C, D	82	27	NS
82-41-4	Fluorine	B, C, D	52	23	NS
640-19-7	Fluoroacetamide	B, D	NS	NS	NS
50-0-0	Formaldehyde	A, C, D	35	7	2
142-82-5	Heptane	A	119	59	21
302-1-2	Hydrazine	A, C, D	62	37	11
79-19-6	Hydrazinecarbothioamide	B	69	NS	NS
74-90-8	Hydrocyanic acid	B, C, D	60	20	NS
7647-1-0	Hydrogen chloride	C	65	4	1
7664-39-3	Hydrogen fluoride	C	36	14	3
7783-7-5	Hydrogen selenide	C	8	1	NS
7783-6-4	Hydrogen sulfide	C	78	9	NS
13463-40-6	Iron, pentacarbonyl-	C	17	22	NS
78-83-1	Isobutanol	A	127	73	32
465-73-6	Isodrin	B, D	64	105	NS
62-38-4	Mercury, (acetato-O)phenyl-	B	93	103	NS

TABLE 2
Ranking of Chemicals of Potential Concern for Short-Term Exposures[a]

CAS Number[1]	Substance	Basis[2]	R_1 Rank[3] (IDLH)	R_2 Rank[3] (IDLH, VP)	R_3 Rank[3] (IDLH, VP, C)
62-75-9	Methanamine, N-methyl-N-nitroso-	B	84	55	NS
67-56-1	Methanol	A	132	60	19
78-93-3	Methyl ethyl ketone (2-Butanone)	A	133	63	16
60-34-4	Methyl hydrazine	B, C, D	50	25	NS
108-10-1	Methyl isobutyl ketone (2-Methyl-4-pentanone)	A	116	64	26
624-83-9	Methyl isocyanate	B, C, D	14	12	NS
75-86-5	Methylactronitrile, 2-	B	75	66	NS
298-0-0	Methyl parathion	B	9	98	NS
91-20-3	Naphthalene	A	110	91	45
86-88-4	Naphthylthiourea, alpha-	B	73	NS	NS
13463-39-3	Nickel carbonyl	B, C, D	26	16	NS
54-11-5	Nicotine, & salts (2)	B, D	13	54	NS
98-95-3	Nitrobenzene	A, D	104	86	39
10102-44-0	Nitrogen dioxide	B, D	51	17	NS
10102-43-9	Nitrogen oxide NO	B, C, D	77	5	NS
79-46-9	Nitropropane, 2-	A	98	46	8
62-75-9	N-nitrosodimethylamine	B, D	85	56	NS
20816-12-0	Osmium oxide OsO4, (T-4)-	B	1	21	NS
56-38-2	Parathion	B, D	21	96	NS
108-95-2	Phenol	A, D	103	84	42
62-38-4	Phenylmercury acetate	B, D	94	106	NS
103-85-5	Phenylthiourea	B, D	41	NS	NS
298-2-2	Phorate	B, D	2	82	NS
75-44-5	Phosgene	B, C, D	18	8	NS
7806-51-2	Phosphine	B, C, D	63	NS	NS
151-50-8	Potassium cyanide	B, D	38	NS	NS
506-61-6	Potassium silver cyanide	B, D	89	NS	NS

TABLE 2 Ranking of Chemicals of Potential Concern for Short-Term Exposures[a]					
CAS Number[1]	Substance	Basis[2]	R_1 Rank[3] (IDLH)	R_2 Rank[3] (IDLH, VP)	R_3 Rank[3] (IDLH, VP, C)
107-12-0	Propanenitrile	B, C	49	26	NS
75-55-8	Propylenimine, 1,2-	B, C, D	95	30	NS
110-86-1	Pyridine	A	120	68	27
26628-22-8	Sodium azide	B, D	90	NS	NS
143-33-9	Sodium cyanide	B; D	39	NS	NS
57-24-9	Strychnidin- 10-one, & salts (2)	B, D	7	NS	NS
7783-60-0	Sulfur tetrafluoride	C	70	10	NS
7446-11-9	Sulfur trioxide	C	42	19	NS
7446-18-6	Sulfuric acid, dithallium (1+) salt	B	33	NS	NS
95-94-3	Tetrachlorobenzene (assumed 1,2,4,5-)	A	NS	NS	NS
127-18-4	Tetrachloroethylene	A	105	58	24
3689-24-5	Tetraethyldithiopyrophosphate	B	22	94	NS
78-0-2	Tetraethyl lead	B, D	53	67	NS
109-99-9	Tetrahydrofuran	A	129	50	14
509-14-8	Tetranitromethane	B, C, D	43	34	NS
1314-32-5	Thallic oxide	B	34	NS	NS
39196-18-4	Thiofanox	B, D	67	99	NS
108-98-5	Thiophenol	B, D	29	38	NS
79-19-6	Thiosemicarbazide	B, D	71	NS	NS
5344-82-1	Thiourea, (2-chlorophenyl)-	B, D	56	NS	NS
7550-45-0	Titanium tetrachloride	C	23	NS	NS
108-88-3	Toluene	A	115	61	18
584-84-9	Toluene-2,4-diisocyanate	A, C, D	31	83	43
91-8-7	Toluene-2,6-diisocyanate	A, C, D	19	69	38
8001-35-2	Toxaphene	B	91	72	44
71-55-6	Trichloroethane, 1,1,1-	A	123	48	12
79-1-6	Trichloroethylene	A	128	62	23

TABLE 2
Ranking of Chemicals of Potential Concern for Short-Term Exposures[a]

CAS Number[1]	Substance	Basis[2]	R_1 Rank[3] (IDLH)	R_2 Rank[3] (IDLH, VP)	R_3 Rank[3] (IDLH, VP, C)
1314-62-1	Vanadium oxide	B, D	45	NS	NS
1330-20-7	Xylene	A	NS	NS	NS
81-81-2	Warfarin, & salts, when > 0.3% (2)	B, D	74	80	NS
1314-84-7	Zinc phosphide, when > 10%	B, D	76	NS	NS

Notes:

[a] 139 chemicals were selected for further analysis.

[1] CAS Number given for parent compound only.

[2] A — Wastes received by WTI during first year of operation
B — Constituents listed as "P" wastes (acutely hazardous according to RCRA)
C — Acutely toxic chemicals identified in CAA 112(r)
D — Extremely hazardous substances from EPCRA

[3] NS — IDLH, vapor pressure, or concentration data not available for this compound. Therefore, no score calculated.

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APPENDIX VII-3

Accidental Release Modeling

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ATTACHMENT

Attachment 1: ARCHIE Output for On-Site and Off-Site Fire Scenarios

I. RELEASE CHARACTERIZATION

A. Methodology

Atmospheric release rates for the chemicals of primary concern are estimated for each accident scenario selected for quantitative evaluation. The area and extent of on-site spills/releases are based on facility-specific parameters (e.g., tank volumes, dike sizes). Emission rates and durations are developed for specific constituents in the emissions based primarily on short-term modeling techniques. These models can take into account the physical/chemical properties of the chemicals (e.g., volatility, density, liquid or gas phase), the presence of passive mitigation devices (e.g., concrete dikes and berms), and active and redundant mitigation devices (e.g., nitrogen blankets and sprinkler systems).

Wastes consisting of a mixture of chemicals are modeled for all of the events in this Accident Analysis. Physical and chemical properties for these mixtures are estimated from the properties of the pure chemicals, weighted by the mass fraction of each chemical constituent. For example, the molecular weight of a mixture, MW_{mix}, containing N components is:

$$MW_{mix} = \left[\sum_{i=1}^{N} \frac{w_i}{MW_i} \right]^{-1} \quad (1)$$

where:

w_i = mass fraction of the ith component;
MW_i = molecular weight of the ith component.

The heat of vaporization of a mixture, λ_{mix}, is:

$$\lambda_{mix} = \sum_{i=1}^{N} w_i \lambda_i \quad (2)$$

where:

λ_i = heat of vaporization of the ith component.

Except for vapor pressure and boiling point, all mixture parameters with units proportional to the mass (e.g., density) are calculated in a manner similar to Equation (1), whereas parameters with units proportional to the inverse mass (e.g., heat capacity), are calculated in a manner similar to Equation (2). The vapor pressure of a mixture is the sum of the vapor pressures (in equilibrium with the liquid mixture) of the individual components. For a binary mixture, the liquid can be assumed to act as an ideal solution. Using Raoult's law, the vapor pressure of the mixture is:

$$p_v = x_A p_{vA}^* + x_B p_{vB}^* \quad (3)$$

where:

p_v = vapor pressure of the mixture (Pa);
x_A = liquid mole fraction of component A (unitless);
p_{vA}^* = vapor pressure of pure component A (Pa);
x_B = liquid mole fraction of component B (unitless);
p_{vB}^* = vapor pressure of pure component B (Pa).

The mass fraction, w_i, and mole fraction, x_i, are related by:

$$w_i(MW_{mix}) = x_i(MW_i) \quad (4)$$

and the vapor phase concentrations, y_i, are related to the liquid phase concentrations, x_i, by Raoult's law:

$$y_i = \frac{x_i p_{vi}^*}{p_v} \quad (5)$$

where:

y_i = vapor mole fraction of the ith component at equilibrium with liquid (unitless).

The vapor pressure of a pure component in a mixture depends on the boiling temperature of the mixture which, in turn, is determined by the bubble point of the mixture. The bubble point is the temperature at which the first bubble of vapor forms when a liquid is heated at constant pressure. The bubble point of a mixture is approximately its boiling point when the pressure is equal to atmospheric pressure (1 atm). For an ideal solution, Raoult's law is

used to determine the bubble point as follows. At the bubble point, and atmospheric pressure, Equation (3) becomes:

$$1\ atm = x_A p^*_{vA}(T_b) + x_B p^*_{vB}(T_b) \quad (6)$$

where:

T_b = boiling point temperature of the mixture;

$p_{vA}^*(T_b)$ = vapor pressure of pure component A at T_b (Pa);

$p_{vB}^*(T_b)$ = vapor pressure of pure component B at T_b (Pa).

The bubble point was calculated by solving Equation (6) iteratively. Antoine's equation was used to determine the vapor pressure of the pure component as a function of temperature:

$$\log_{10} p^*_{vi}(T) = A - \frac{B}{T+C} \quad (7)$$

where A, B and C are chemical-specific Antoine's constants, T is the boiling point in °C, and the vapor pressure p^*_{vi} is expressed in units of mm Hg. The Antoine equation's constants are obtained from a standard chemical engineering handbook (Dean 1973). If the constants were not readily available, they were estimated from vapor pressure-temperature data (Perry and Green 1984).

The estimates of the chemical emission rates for the accident scenarios discussed in this report are based on the following assumptions:

- Worst-case mixtures are represented as binary mixtures containing one chemical of potential concern;
- These binary mixtures behave as ideal solutions (i.e., Raoult's Law applies);
- All liquids are stored at ambient temperature (20°C) and atmospheric pressure;
- Worst-case releases are represented as the release of the largest stored quantity of a chemical of potential concern over a 10-minute period, under worst case meteorological conditions (F stability and 1.5 m/s wind speed), considering passive mitigation measures (U.S. EPA 1995);

- For spills in areas where no containment barriers are present, the liquid pool will reach its maximum size when the depth of the pool is 1 cm (U.S. EPA 1992);
- The temperature of the liquid after release is the same as the ambient temperature.

The procedures used to estimate chemical release rates for each accident scenario are described below.

B. Chemical-Specific Release Rate Calculations

1. On-Site Spill

The spills of two types of mixtures, formaldehyde/methanol and acetone/toluene mixtures, are examined in the Accident Analysis. The following parameters are used for the formaldehyde/methanol mixture:

	Formaldehyde	Methanol	Mixture
Mass Fraction	0.1	0.9	1.0
Molecular Weight	30.0	32.1	31.9
Boiling Point (K)	252	338	309
Density (kg/m^3)	815	791	794
Vapor Pressure at 20°C (Pa)	441,000	12,900	58,400

The following parameters are used for the acetone/toluene mixture:

	Acetone	Toluene	Mixture
Mass Fraction	0.1	0.9	1.0
Molecular Weight	58.1	92.1	87.0
Boiling Point (K)	329	384	367
Density (kg/m^3)	790	870	861
Vapor Pressure at 20°C (Pa)	24,500	2,930	6,170

The conservative on-site spill scenario selected for quantitative evaluation results from a spill of the contents of a 5,000-gallon tanker truck in the Organic Waste Tank Farm Truck Unloading Station. The tanker was assumed to be a horizontal cylindrical tank, 9.5 m long and 1.6 m in diameter. The typical on-site spill scenario selected results from the rupture of two drums, resulting in a 100-gallon release. The spilled drums were assumed to be horizontal cylinders, 1 m long and 0.515 m in diameter.

To model the single-phase release of a liquid waste and the subsequent evaporation of the resulting liquid pool, two emission rates must be determined and compared — the

liquid release rate, E, and the rate of evaporation from a liquid pool, E_{pool}. Comparing these two emission rates will determine the rate of release to the atmosphere.

For low volatility liquids, E will be greater than E_{pool}, and the pool's evaporation determines the rate at which material enters the atmosphere. The size of the pool being formed, A_p, depends on the release rate, duration, and the presence of containment barriers (e.g., dikes, speed bumps, building walls, etc.) in the spill vicinity. For the conservative case, the size of the pool resulting from the 5,000 gallon spill is limited by the containment barriers of the Truck Unloading Station, i.e., approximately 418 m^2 (75′×60′). This corresponds to a pool depth of approximately 4.5 cm. For the typical case, assuming the 100 gallon spill spreads to its maximum size and has a depth of 1 cm (U.S. EPA 1992), the area of the liquid pool would be approximately 38 m^2.

In accordance with U.S. EPA guidelines (U.S. EPA 1995), a worst case release is defined as the release over a 10-minute period of the largest quantity of a regulated substance resulting from a vessel or process piping failure. Therefore, the liquid release rate can be estimated by dividing the mass of the liquid in the tanker truck by ten minutes:

$$E = \frac{V_{tank}\rho_s}{(10\,\text{min})(60\,\text{sec/min})} \tag{8}$$

where:

E = emission rate of liquid from hole (kg/s);
V_{tank} = volume of storage tank (m^3);
ρ_s = storage density (kg/m^3).

The liquid release rate calculated by Equation (8) can be related to the dimensions of the tanker and the hole in the tanker using the following (U.S. EPA 1993):

$$E = A_o\, C_d \sqrt{\frac{2\rho_s\,(p_h - p_a)}{1 - (A_o / A_1)^2}} \tag{9}$$

where:

A_o = area of hole (m^2);
C_d = discharge coefficient = 0.62 (unitless);
A_1 = cross-sectional area of liquid container (m^2);

p_h = pressure at the hole (Pa):

$$p_h = \max(p_a, p_{vs}) + \rho_s g H_1; \tag{10}$$

p_a = ambient pressure (Pa);
g = acceleration due to gravity = 9.806 (m/s^2);
H_1 = vertical distance between hole and the top of liquid level (m);
p_{vs} = vapor pressure of the chemical at storage temperature, T_s (Pa).

Assuming the area of the hole is much smaller than the cross-sectional area of the liquid container, Equation (9) reduces to:

$$E = A_o C_d \sqrt{2\rho_s (p_h - p_a)} \tag{11}$$

This assumption will be verified when the hole area is calculated. Using the liquid release rate defined in Equation (8), the area of the hole in the tanker (A_o) can be back calculated from Equation (11).

The liquid release rate (E) is compared to the evaporation rate of a liquid pool:

$$E_{pool} = 6.94 \times 10^{-7} (1 + 0.0043(\Delta T_a)^2) U_r^{0.75} A_p (MW) \frac{p_v}{p_{vh}} \tag{12}$$

where:

E_{pool} = pool emission rate (kg/s);
U_r = ambient wind speed at 10 m altitude (m/s);
A_p = pool size (m^2);
T_a = ambient temperature (K);
ΔT_a = 0 if $[T_a - 273.15] < 0$
= $[T_a - 273.15]$ if $[T_a - 273.15] \geq 0$
p_v = vapor pressure of the liquid at T_a (Pa);
p_{vh} = vapor pressure of hydrazine at T_a (Pa):

$$p_{vh} = \exp\left[76.858 - \frac{7{,}245.2}{T_a} - 8.22 \ln(T_a) + 0.0061557 T_a\right]. \tag{13}$$

For binary mixtures, Equation (3) can be used to calculate p_v.

Equation (12) is an empirical formula for estimating source emissions from spills of toxic liquids (Clewell 1983). It was derived from limited data with specific

meteorological conditions. Although the ranges of meteorological conditions and chemical properties were not specified by U.S. EPA, it is understood that this equation should be used for estimating emission rates under typical meteorological conditions only. Emission estimates obtained from applying the equation to spills under extreme meteorological conditions (such as calm conditions, very low wind conditions, or extreme high wind conditions) represent only results extrapolated beyond the available data and should not be used without further evaluation. For example, Equation (12) will predict no emissions for a spill during the calm hours (hours with no winds). In the current assessment, the pool emission rates were estimated using Equation (12) and average meteorological conditions (namely, average wind speed and normal temperature).

If the value of $E_{pool} < E$, the pool's evaporation determines the rate at which material enters the atmosphere, and the atmospheric emission rate is E_{pool}. For high volatility liquids, the pool will begin to evaporate significantly as it is forming, thus reducing the size of the pool. In this case, $E_{pool} > E$ and the discharge rate from the tanker determines the atmospheric emission rate. As the chemical is released, a pool forms that is smaller than A_p, with an evaporation rate from the formed pool equal to E. The smaller pool size can be back calculated from Equation (12), setting E_{pool} equal to E.

To determine the evaporation rate of a chemical of concern, the total pool evaporation rate, E_{pool}, is multiplied by the chemical's mole fraction in the volatilizing mass. Because the vapor pressure of formaldehyde is much greater than that of methanol, formaldehyde will volatilize from the liquid pool more rapidly than methanol. Since the two chemicals are released into the atmosphere at different rates, the liquid pool composition will vary with time. Using Equations (4) and (5) (Raoult's Law), the vapor mass fractions of formaldehyde and methanol in equilibrium with a 10% formaldehyde, 90% methanol solution are 0.47 and 0.12, respectively; the balance of the vapor mass is air. Therefore, the volatilizing mass consists of 80% formaldehyde and 20% methanol.

Being much more volatile and initially present in a lower quantity, the liquid pool will be depleted of formaldehyde before the entire pool evaporates. As the composition of the pool changes, the vapor pressure, boiling point and equilibrium compositions will also change. Therefore, assuming the system remains in pseudo-steady state, the properties of the liquid pool and the emission rate are recalculated at discrete time intervals using Equations (3) through (10) until the pool is depleted of formaldehyde.

The calculated time required to deplete the pool of formaldehyde is used in the dispersion modeling as the duration of release. The average emission rate for the

mixture during the duration of release is calculated from the iterative steps discussed above. The average mole fraction of formaldehyde in vapor is calculated by averaging the mole fraction computed in each time step. The average mole fraction is used in the dispersion analysis to convert the formaldehyde concentrations from the mixture concentrations.

An algorithm is developed for estimating the average mole fraction of a chemical in vapor during an accident release. It first estimates the quantity of chemicals emitted from the liquid pool for a finite time increment. The vapor pressure and evaporation rate of the liquid pool are then recalculated for the next time increment using the remaining mass in the liquid pool. By iterating the calculations, the duration and quantity of emissions and the average mole fraction of the chemical of concern in the vapor phase can be estimated. The methodology is described as follows:

Step 1. Estimate the initial vapor emission rate

The initial emission rate for the mixture can be estimated using the steady-state emission model described in Equation (12). The evaporation duration is defined for the mixture, t_{mix}, based on the same equation and the total amount of mixture available for volatilization (U.S. EPA 1993, FEMA 1993):

$$t_{mix} = M_{mix}/E_{total},$$

where M_{mix} is the total quantity of mixture available for evaporation.

It is assumed that the emission rate E_{total} will remain constant during a release duration of t_{mix} (U.S. EPA 1993, FEMA 1993), which ignores the time-varying nature of the emission, and therefore overestimates the emission rates and durations for chemicals with high volatility while underestimated for the chemicals with low volatility.

Step 2. Estimate the initial chemical-specific vapor emission rate

The initial chemical-specific vapor emission rate is estimated using the following equation (U.S. EPA 1993):

$$E_{chem} = (M_{chem}/M_{mix})(P_{chem}/P_{mix})E_{total}$$

The product of M_{chem}/M_{mix} and P_{chem}/P_{mix} represents the initial mass fraction of one chemical in the vapor immediately after the volatilization.

As previously mentioned, chemicals with higher evaporation potential will escape from the pool faster than other chemicals and therefore the mass fraction of a chemical with higher volatility in the vapor phase will be greater than the chemical with low volatility. For example, the initial emissions for a 10% formaldehyde and 90% methanol mixture will consist of approximately 80% of formaldehyde in the vapor. As the time increases, the percentage of formaldehyde in the vapor will decrease because of less formaldehyde available for volatilization in the mixture.

Step 3. Estimate the amount of chemicals evaporated during the initial time step

The amount of chemical evaporated during the initial time step, dM_{chem}, can be calculated by the following equation:

$$dM_{chem} = E_{chem} \times dt,$$

where dt is the time increment used in defining the time step.

Step 4. Estimate the chemical properties of the liquid pool for the next time step

By calculating the mass volatilized from the mixture (Step 3) and subtracting it from the total mass, the mass fraction for the next time step is known. With the new mass fractions, the chemical properties of the residual liquid mixture can be determined. Subsequently, the vapor pressure for the new mixture can be computed for estimating the vapor emission rates for the next time step.

Step 5. Iterate the calculations in Steps 1 through 4 for the next time step

Steps 1 through 4 are repeated until the total mass of the liquid pool is completely depleted.

Step 6. Compute the average chemical-specific emission rate, emission duration, and mole fraction in the vapor phase

The chemical-specific emission duration can be easily determined during the iteration by identifying the time required for a chemical to be completely depleted from the mixture. The average chemical-specific emission rate can be calculated by summing the mass emitted for each time step and dividing by the total time. The average mole fraction in the vapor phase is calculated by the sum of the moles of the chemical of concern emitted divided by the total moles emitted for the duration of the release.

2. On-Site Fire

The on-site fire scenario selected for quantitative evaluation is a storage tank rupture in the Organic Waste Tank Farm in the presence of an ignition source, resulting in a pool fire. The contents of the storage tanks are a mixture of 15% tetrachloroethene (PCE) and 85% toluene. The following parameters were used for the tetrachloroethylene/toluene mixture:

	Tetrachloroethene	Toluene	Mixture
Mass Fraction	0.15	0.85	1.0
Molecular Weight	165.8	92.1	98.7
Boiling Point (K)	394	384	338.5
Density (kg/m^3)	1,630	870	935
Vapor Pressure (Pa)	1,870	2,930	2,840

The storage tank is assumed to be a vertical cylinder, 6.1 m high and 4 m in diameter.

The burning velocity for a liquid with a boiling point above ambient temperature is given by (FEMA 1993; Burgess et al. 1961):

$$BV = \frac{92.6e^{-0.0043(1.8T_b-459.7)}\ MW}{SpG}\ \frac{10^{-7}}{6} \qquad (14)$$

where:

BV = burning velocity (m/s);
MW = molecular weight (kg/kgmol);
SpG = liquid specific gravity (unitless);
T_b = normal boiling point, (K).

The rate of burning, mass burning rate per unit area, is defined as:

$$\frac{dm}{dt} = (BV)\rho_s \qquad (15)$$

where:

dm/dt = mass burning rate per unit area (kg/m^2-s);
ρ_s = liquid density or storage density (kg/m^3).

By substituting Equation (14) into (15), Equation (15) can be rewritten as:

$$\frac{dm}{dt} = 1.54\times10^{-3}(MW)e^{-0.0043\,(1.8T_s-459.7)} \qquad (16)$$

The total burning rate is estimated from the product of Equation (16) and the size of the burning pool. The pool size is defined by the size of the secondary containment area in the building.

The height of the flame is given by (FEMA 1993; World Bank 1988):

$$H = 42d_{pool}\left[\frac{(dm/dt)}{\rho_a\sqrt{d_{pool}g}}\right]^{0.61} \qquad (17)$$

where:

H = flame height (m);
d_{pool} = effective diameter of pool (m) (calculated from pool size) ;
ρ_a = density of air (kg/m^3).

As mentioned earlier, combustion products that may be emitted during a fire include NO_x, SO_2 or HCl. Phosgene emissions are also possible as a product of incomplete combustion. O'Mara et al. (1971) reported that the potential for phosgene formation during combustion of chlorinated hydrocarbons could be evaluated based on the following parameter:

$$a = \frac{\text{Number of Chlorine Atoms - Number of Hydrogen Atoms}}{\text{Number of Carbon Atoms}} \qquad (18)$$

Phosgene formation is likely when $a \geq 0.4$. Thus, for example, phosgene could be formed during the combustion of carbon tetrachloride ($a=4$), chloroform ($a=2$), tetrachloroethylene ($a=2$), and trichloroethylene ($a=1$), but would not be expected during the combustion of chlorobenzene ($a=-0.7$), dichlorobenzene ($a=-0.3$), or trichloroethane ($a=0$). The formation of HCl and phosgene from the combustion of several chlorinated hydrocarbons was estimated by Sjoberg (1952), as discussed in Chapter IV. According to Sjoberg (1952), combustion of tetrachloroethene is estimated to form 238 mg/g of HCl, and 7.0 mg/g of phosgene. These values are combined with Equation (16) for estimating HCl and phosgene emissions.

The resulting plume of hot gases from the fire will have the effect of increasing the release height as a result of buoyancy forces. To estimate the effective release height, the buoyancy flux is needed. For a thermal plume, the buoyancy flux is calculated by (Cooper and Alley 1990; Briggs 1975):

$$F_B = g\left[1 - \frac{MW_s}{28.9}\right]\left[\frac{T_a}{T_s}\right]\frac{V_s d_s^2}{4} + 0.0089\left[\frac{P_o}{P_a}\right]Q_H \qquad (19)$$

where:

F_B = buoyancy flux (m^4/s^3);
Q_H = heat emission rate (kW);
d_s = inner diameter of a stack (m);
P_a = atmospheric pressure (Pa);
MW_s = molecular weight of effluent gas (kg/kgmol);
P_o = standard sea level pressure (Pa);
T_s = gas temperature (K);
V_s = effluent velocity (m/s).

For most combustion sources, MW_s is approximately equal to 28.9, due to the rigorous entrainment of air into the fire, then the first term of Equation (19) becomes negligible, and F_B can be easily calculated:

$$F_B = 0.0089\left[\frac{P_0}{P_a}\right]Q_H \qquad (20)$$

The plume rise caused by a fire is analogous to that caused by heated gases released from a stack. The buoyancy flux for a fire can thus be expressed using Equation (20).

The heat emission rate can be obtained by multiplying the effective emission power, E_p, by the area of a heat flux (FEMA 1993). The heat emission rate can thus be expressed as:

$$Q_H = (-0.5634\ T_b + 260.87)A_H \qquad (21)$$

where:

A_H = area of heat emissions (m^2);
T_b = boiling temperature (K).

The flame temperature is calculated based on the heat transfer by way of thermal radiation. The Stefan-Boltzmann law states that the energy radiated by a hot body is proportional to the difference in the fourth powers of the absolute temperatures of the hot source and the more cool receiver of the radiation (Burgess 1978). By treating the fire as a hot source, the flame temperature can be correlated to the heat flux of the fire as:

$$Q_H = 5.67\times10^{-11} A_H \left[T_f^4 - T_a^4\right] e F_a \qquad (22)$$

where:

Q_H = heat emission rate (kW);
T_f = flame temperature (K);
e = effective absorptivity on emission factor ($e \approx 1$);
F_a = geometric configuration factor ($F_a \approx 1$).

Heat effects for the on-site fire scenario are calculated using the liquid pool fire option of the FEMA hazard assessment and consequence analysis model ARCHIE (FEMA 1993). ARCHIE calculates the radius of the circular zone around a liquid pool fire in which unprotected and/or unsheltered people may experience lethal burns due to thermal radiation exposures. The major assumptions of the pool fire model include the following:

- The wind velocity in the burning pool area is insufficient to tilt the flame in the direction of the wind to a significant degree;
- Individuals in direct view of the flame and in the open have exposed skin (i.e., their skin is not protected completely from the effects of thermal radiation by any clothing being worn);
- The base of the flame is fairly circular in shape;
- Neither carbon dioxide nor water vapor in the air absorbs any of the thermal radiation impinging on exposed individuals;
- The injury zone is defined by a radiation intensity of 5 kW/m^2, which has been reported to cause second degree burn injuries on bare skin within 45 seconds (Mudan 1984);
- The fatality zone is defined by a radiation intensity of 10 kW/m^2, which has been reported to quickly cause third degree burns leading to potential fatalities (Mudan 1984).

For the conservative on-site fire scenario evaluated here, the pool is assumed to ignite immediately upon initiation of the liquid discharge. Thus, the burning pool area may be smaller than the total spilled pool area.

In addition to the heat effects from a pool fire, ARCHIE can calculate the size of a fireball (diameter, height and duration) and associated thermal radiation zones resulting from the rupture of a tank engulfed in fire and the subsequent ignition of its contents. Thus, in the on-site fire scenario, the impact of an explosion of a tank adjacent to the ruptured tank can be evaluated. The major assumptions of the fireball thermal radiation model include the following:

- No thermal radiation is absorbed by water vapor or carbon dioxide gas present in the atmosphere;
- All flammable materials of interest are similar in characteristics (both physical and chemical properties) to liquefied compressed propane;
- Both the container and exposed individuals are on or near the ground;
- The burn severity depends upon the amount of energy absorbed by the skin after a surface temperature of 55°C is achieved.

3. On-Site Mixing of Incompatible Wastes

According to ASTM (1986), the mixing of certain classes of incompatible wastes could result in the generation of toxic gases such as hydrogen chloride, hydrogen cyanide and hydrogen sulfide, all of which have similar Levels of Concern (LOCs). Because of the relatively large amounts of chlorinated compounds expected to be processed at the WTI facility, the generation and release of HCl was selected for quantitative evaluation in this scenario. One of the chemicals with the highest chlorine content that is likely to be handled on-site is tetrachlorethene. A 15% tetrachlorethene/85% methanol waste is assumed to be accidentally added to a storage tank already containing mineral acids (70% nitric acid solution). According to ASTM (1986), the mixture of strong mineral acids with halogenated organic compounds may result in the generation of hydrogen halides. Therefore, the mixture of tetrachlorethene with 70% nitric acid is likely to result in the formation and release of gaseous hydrogen chloride.

The conservative on-site mixing of incompatible wastes scenario selected for quantitative evaluation results from the accidental pumping of waste from a 5,000-gallon tanker into the wrong vessel in the Organic Waste Tank Farm. Assuming the waste from the tanker is being pumped at its maximum rate of 250 gal/min, the tanker contents would be transferred into the storage tank over a 20 minute period. The typical case

involves a situation similar to the typical case for the on-site spill scenario, i.e., the rupture of four 55-gallon drums. Two of the drums in this typical scenario contain a 15% tetrachlorethene/85% methanol, and the other two drums contain a 70% nitric acid solution.

The following parameters were used for the tetrachlorethene/methanol mixture:

	Tetrachloroethene	Methanol	Mixture
Mass Fraction	0.15	0.85	1.0
Molecular Weight	165.8	32.1	36.5
Density (kg/m^3)	1,630	791	857

To model the release of HCl resulting from the mixing of incompatible wastes, it is assumed that as the two wastes mix, the reaction between the two wastes to produce HCl is instantaneous. For the conservative case, the duration of atmospheric release is estimated to be the 20 minute period required to pump all of the contents of the tanker into the storage tank. For the typical case, the release duration is estimated to be the amount of time required for the contents of the four drums to be spilled, forming a liquid pool. The total amount of HCl emitted in both cases is calculated from a mass balance.

4. Off-Site Tanker Truck Spill

The size of the off-site spill depends on the release rate, duration and the presence of containment barriers (e.g., street curbs, speed bumps, building walls, etc.) in the spill vicinity, if any. As was the case for the on-site spill, the evaporation of the off-site liquid pool is dominated primarily by the rate of mass transfer as air flows over the surface of the pool. Equations (8) through (13) are used for estimating the emission rate for this scenario.

Assuming the road on which the spill occurs has no curbs that are capable of acting as a containment barrier, the liquid pool resulting from the conservative 5,000-gallon spill is assumed to reach a maximum length of approximately 49 m, assuming pool depth of 1 cm. This assumes the pool spreads in all directions at an equal rate, with liquids reaching the edge of the road running off onto soil or into a ditch. Assuming the width of the road is 15 m, the area of the pool is approximately 735 m^2. In the typical 100-gallon spill case, the pool size is approximately 38 m^2.

5. Off-Site Tanker Truck Spill with Fire

The off-site fire scenario is similar to the off-site spill scenario, with the additional presence of an ignition source. To model the emissions from the resulting pool fire, Equations (14) through (22) are used. The pool is assumed to ignite immediately upon initiation of the liquid discharge. Thus, the burning pool area may be smaller than the total spilled pool area. ARCHIE is used to calculate the heat effects associated with the off-site fire (FEMA 1993).

C. Results of the Release Modeling

The average total emission rates calculated for each accident scenario are summarized below.

Scenario	Average Release Rate (g/s)	
	Conservative	Typical
On-Site Spill		
• Formaldehyde	1,040	94
• Acetone	465	42
On-Site Fire		
• HCl	360	150
• Phosgene	11	4.5
On-Site Mixing of Incompatible Wastes		
• HCl	1,790	71
Off-Site Spill		
• Formaldehyde	1,840	94
• Acetone	820	42
Off-Site Fire		
• HCl	1,470	76
• Phosgene	43	2.2

Tables 1 through 10 show the input parameters used in deriving the above summary table. Emission rates for both conservative and typical emission conditions for each accident scenario were estimated. Step-by-step calculations and relevant input parameters for the initial time step are presented below.

1. **On-Site Spill**

a) **Physical and chemical properties of 10% Formaldehyde/90% Methanol mixture**

$$w_F = 0.1$$
$$w_M = 0.9$$

(1) **Molecular weight**

By Equation (1):

$$MW_{mix} = \frac{1}{\frac{0.1}{30.03\,g/mol} + \frac{0.9}{32.1\,g/mol}} = 31.88\ g/mol$$

(2) **Liquid mole fractions:**

By Equation (4):

$$x_F = \left[\frac{0.1}{30.03\,g/mol}\right](31.88\,g/mol) = 0.1062$$

$$x_M = 1 - 0.1062 = 0.8938$$

(3) **Boiling point:**

Antoine's constants:

Formaldehyde	A=7.045; B=929.5; C=243.7
Methanol	A=7.879; B=1,473; C=230.0

Using these Antoine's constants, Equation (6) was solved iteratively for T_b.

By Equation (7):

$$p_{vf}^{\circ}\ (36.2°C) = 10^{\left(7.0447 - \frac{929.47}{36.2 + 243.7}\right)} = 5{,}296\ mmHg$$

$$p_{vm}^{\circ}\ (36.2°C) = 10^{\left(7.87863 - \frac{1473.11}{36.2 + 230.0}\right)} = 221.2\ mmHg$$

where T_b = 36.2°C satisfies Equation (6) as follows:

(0.1062)(5,296 mm Hg) + (0.8938)(221.2 mm Hg) = 760 mm Hg

(4) Density

ρ_F = 815 kg/m^3 at 20°C

ρ_M = 791.4 kg/m^3 at 20°C

According to Equation (1):

$$\rho_{mix} = \frac{1}{\frac{0.1}{815\,kg/m^3} + \frac{0.9}{791.4\,kg/m^3}} = 793.7\ kg/m^3$$

(5) Vapor pressure

By Equation (7):

$$p_{vf}^{\circ}\ (20°C) = 10^{\left(7.0447 - \frac{929.47}{20 + 243.7}\right)} = 3{,}311\ mm\ Hg$$

$$p_{vm}^{\circ}\ (20°C) = 10^{\left(7.87863 - \frac{1473.11}{20 + 230.0}\right)} = 96.87\ mm\ Hg$$

By Equation (3):

$$p_v(20°C) = (0.1062)(3{,}311\ mmHg) + (0.8938)(96.87\ mmHg)$$
$$= 438\ mmHg\,(133.322\,Pa/mmHg)$$
$$= 5.84e{+}04\,Pa$$

(6) Vapor composition

By incorporating Equation (5):

(a) Initial vapor mole fractions

$$y_F(20°C, 1\,atm) = \frac{(0.1062)(3{,}311\ mmHg)}{438\ mmHg} = 0.80$$

$$y_M(20°C, 1\,atm) = \frac{(0.8938)(96.87\ mmHg)}{438\ mmHg} = 0.20$$

(b) Initial vapor mass fraction per mole:

$$Y_F = \frac{(0.80)(30.03\,g/mol)}{(0.80)(30.03\,g/mol) + (0.20)(32.1\,g/mol)} = 0.792$$

$$Y_M = \frac{(0.20)(32.1\,g/mol)}{(0.80)(30.03\,g/mol) + (0.20)(32.1\,g/mol)} = 0.208$$

(7) Heat of vaporization

λ_P = 8.25e+05 J/kg

λ_M = 1.10e+06 J/kg

By Equation (2):

$$\lambda_{mix} = (0.10)(8.25e{+}05\,J/kg) + (0.90)(1.10e{+}06\,J/kg) = 1.07e{+}06\,J/kg$$

(8) Heat capacity

(a) Equilibrium vapor at 20°C, 1 atm

$C_{PF,g}$ = 789.3 J/kg K

$C_{pM,g}$ = 1,368 J/kg K

In a similar fashion as Equation (2):

$$C_{pmix} = (0.792)(789.3 J/kg K) + (0.208)(1{,}368 J/kg K)$$

$$= 909.8\ J/kg K$$

(b) Liquid mixture, 25°C

$C_{pF,l}$ = 4,295 J/kg K (estimated by Kopp's rule)

$C_{pM,l}$ = 2,542 J/kg K

In a similar fashion as Equation (2):

$$C_{pmix,l} = (0.10)(4{,}295 J/kg K) + (0.9)(2{,}542 J/kg K) = 2{,}716 J/kg K$$

b) Other Parameters

(1) Volume of spill

$$V_{spill}(m^3) = \frac{5{,}000\,gal}{264.17\,gal/m^3} = 18.93\,m^3$$

(2) Depth of pool

Containment area = 418.3 m^2 = A_p

$$depth = \frac{V_{spill}}{A_p} = \frac{18.93 m^3}{418.3 m^2} = 0.045 m$$

(3) **Effective diameter of pool**

$$d_{pool}(m) = 2\sqrt{\frac{418.3\ m^2}{\pi}} = 23.08\ m$$

(4) **Cross sectional area of liquid container**

H_1 = 1.6 m, vertical distance between hole and top of liquid level

$$A_1\ (m^2) = \frac{\left[\frac{5000\ gal}{264.17\ gal/m^3}\right]}{\pi\left[\frac{1.6\ m}{2}\right]^2}(1.6\ m) = 15.06\ m^2$$

c) **Calculations**

(1) **Pressure at the hole**

By Equation (10):

$$p_h = \max(101{,}325\,Pa, 58{,}408\ Pa) + (793.7\,kg/m^3)(9.806\,m/s^2)(1.6\,m) = 113{,}770\ Pa$$

(2) **Vapor pressure of hydrazine at T_s**

By Equation (13):

$$p_{vh} = \exp\left[76.858 - \frac{7{,}245.2}{293\ K} - 8.22\ln(293\ K) + 0.0061557(293K)\right] = 1{,}398\ Pa$$

(3) Liquid release rate from tanker

By Equation (8):

$$E = \frac{\left[\frac{5{,}000\,gal}{264.17\,gal/m^3}\right](794\,kg/m^3)}{(10\,\text{min})(60\,\text{sec/min})} = 25\ kg/\text{sec}$$

(4) Total initial evaporation rate

By Equation (12):

$$E_{pool} = 6.94\times10^{-7}(1+0.0043(20K)^2)(3.2\ m/s)^{0.75}(418\ m^2)(31.88\ g/mol)\frac{58{,}408\,Pa}{1{,}398\ Pa}$$

$$= 2.51\ kg/s$$

(5) Initial evaporation rate of formaldehyde

$$E_{pool,F} = (E_{pool})\,Y_f = (2.51\,kg/s)(0.792) = 1.99\,kg/s$$

(6) Evaporation time

Calculated iteratively as described in Steps 1 through 6 of Section B.1.

(7) Area of hole

Using Equation (11):

$$A_0(m^2) = \frac{E}{C_d\sqrt{2\rho_s(p_h - p_a)}} = \frac{25\,kg/\text{sec}}{0.62\sqrt{2(794\,kg/m^3)(113{,}770-101{,}325\,Pa)}} = 0.0091\,m^2$$

which confirms the assumption that $A_0 \ll A_1$.

2. On-Site Fire

The calculation of the mixture properties and storage tank parameters are the same as demonstrated in the previous section. The values of these parameters are summarized in Table 3.

(a) Mass burning rate

By Equation (16):

$$\frac{dm}{dt} = 1.54 \times 10^{-3} \ (98.68 \ g/mol) \ e^{-0.0043 \ (1.8(384.45K) - 459.7)}$$
$$= 5.60E\text{-}02 \ kg/m^2\text{-}s$$

(b) Flame height

By Equation (17):

$$H = 42(15.1 \ m) \left[\frac{0.0560 \ kg/m^2\text{-}s}{1.2 \ kg/m^3 \sqrt{(15.1 \ m)(9.8 \ m/s^2)}} \right]^{0.61} = 21.3 \ m$$

(c) HCl emission rate

$$m(HCl) = x_{CF} \frac{dm}{dt} A_P \left[238 \ g \ \frac{HCl}{kg \ PCE} \right]$$

$$m(HCl) = (0.15 \ kg \ PCE/kg) \ (0.0560 \ kg/m^2\text{-}s) \ (180 \ m^2) \left[238 \ g \ \frac{HCl}{kg \ PCE} \right] \left[\frac{1 \ kg}{1000 \ g} \right]$$
$$= 0.36 \ kg/s$$

(d) Phosgene emission rate

$$m(phos) = (0.15 \ kg \ PCE/kg) \ (0.0560 \ kg/m^2\text{-}s) \ (180 \ m^2) \ \frac{7 \ g \ phos}{kg \ PCE} \left[\frac{1 \ kg}{1000 \ g} \right]$$
$$= 1.06E\text{-}02 \ kg/s$$

(e) Heat emission rate

By Equation (21):

$$\frac{Q_H}{A_P} = -0.5634 \ (384.45 \ K) + 260.87 = 44.3 \ kW/m^2$$

(f) Buoyancy flux

By Equation (20):

$$F_B = (0.0089)(44.3\,kW/m^2)(180\,m^2) = 70.9\,m^4/s^3$$

(g) Average fire temperature

By Equation (22):

$$T_f = \left[293^4 + \frac{44.3}{5.67E\text{-}11}\right]^{1/4} = 942\,K$$

(h) Heat effects

The input parameters used in ARCHIE to compute the liquid pool fire heat effects and the fireball thermal radiation effects are summarized in Attachment 1.

3. On-Site Mixing of Incompatible Wastes

Calculations not included follow those in Section II.C.1 for the On-Site Spill Scenario. The values of these parameters are summarized in Tables 5 and 6.

(a) HCl release rate

The HCl release rate is based on a mass balance, assuming all Cl from the tetrachloroethylene (PCE) reacts to form HCl. The number of moles of PCE transferred from the tanker into the storage tank is:

$$Moles\ PCE\ transferred = \frac{\left[0.15\,\frac{kg\,PCE}{kg\,mixture}\right]\left[\frac{5{,}000\,gal}{264.17\,gal/m^3}\right](857\,kg/m^3)}{\left[165.8\,\frac{kg\,PCE}{kgmol\,PCE}\right]}$$

$$= 14.7\ kgmol\,PCE$$

Four moles of HCl are produced for every mole of PCE:

$$Mass\ HCl\ produced = (14.7\,kgmol\,PCE)\left[4\frac{kgmol\,HCl}{kgmol\,PCE}\right]\left[36.5\frac{kg\,HCl}{kgmol\,HCl}\right]$$

$$= 2{,}146\,kg\,HCl$$

The release rate is calculated by averaging the amount of HCl produced over the transfer time:

$$HCl\ release\ rate = \frac{2{,}146\,kg\,HCl}{(20\,min)(60\,sec/min)} = 1.79\,kg/sec$$

The exit velocity at which HCl is released from the vent (8 inch diameter) of the Organic Waste Tank Farm is:

$$HCl\ velocity = \frac{\dfrac{1.79\,kg/sec}{36.5\,kg/kgmol}\dfrac{(0.08206\,m^3\,atm/kgmol\,K)(293\,K)}{1\,atm}}{0.0324\,m^2} = 36.4\,m/sec$$

4. Off-Site Tanker Truck Spill

The majority of the emissions calculations for this off-site spill scenario follow those of the on-site spill scenario described in Section II.C.1. The major difference in the parameters used for the calculations is the size of the resulting pool. If the pool were allowed to reach its maximum diameter, at a depth of 1 cm, the resulting pool diameter would be:

$$d_{pool,max} = 2\sqrt{\frac{\left(\dfrac{5{,}000\,gal}{264.17\,gal/m^3}\right)}{(0.01\,m)\,\pi}} = 49\,m$$

The length of the pool is assumed to reach this maximum diameter. Because of the presence of ditches or soil along the side of the road, which restrict the flow of the pool in the direction perpendicular to the road, the width of the pool is assumed to be the width of the road (15 m). The spill is either collected by the ditches or adsorbed by the soil in the direction perpendicular to the road. Therefore the pool size for the off-site spill scenario is:

$$A_p = (49m)(15m) = 735m^2$$

The values of the parameters calculated for this off-site scenario are summarized in Tables 7 and 8.

5. Off-Site Tanker Truck Spill with Fire

The majority of the emissions calculations for this off-site spill with fire scenario follow those of the off-site spill scenario described in the previous section, and the on-site fire scenario described in Section II.C.2. The major differences in the parameters used for the calculations is the volume of the spilled wastes that are ignited. The volume of spill associated with the off-site fire is one quarter of the volume of spill associated with the on-site fire. The values of the parameters calculated for this scenario are summarized in Tables 9 and 10.

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TABLE 1				
Accident Analysis Calculations Scenario 1: On-Site Spill (conservative) (a) 5,000 gallon spill of 10% formaldehyde/90% methanol mixture				
Chemical/Physical Properties:	**Formaldehyde**	**Methanol**	**Mixture**	**Notes**
w_i	1.00e-01	9.00e-01	1.00e+00	liquid mass fraction
x_i	1.06e-01	8.94e-01	1.00e+00	liquid mole fraction
MW (kg/kgmol)	3.00e+01	3.21e+01	3.19e+01	molecular weight
T_{bp} (K)	2.52e+02	3.38e+02	3.09e+02	boiling temperature
ρ (kg/m^3)	8.15e+02	7.91e+02	7.94e+02	liquid density at Ta
p_v (Pa)	4.41e+05	1.29e+04	5.84e+04	vapor pressure at Ta
Y_i	7.92e-01	2.08e-01	1.00e+00	vapor mass fraction at Ta
λ_{vap} (J/kg-K)	8.25e+05	1.10e+06	1.07e+06	heat of vaporization at Tbp
$C_{p,g}$ (J/kg-K)	7.89e+02	1.37e+03	9.10e+02	gas heat capacity at 25C
$C_{p,l}$ (J/kg-K)	4.30e+03	2.54e+03	2.72e+03	liquid heat capacity at 25C
Truck parameters:				
A_0 (m^2)	9.09e-03	area of hole		
A_l (m^2)	1.51e+01	cross sectional area of liquid container		
H_l (m)	1.60e+00	vertical distance between hole and top of liquid level		
T_s (K)	2.93e+02	storage temperature		
Other parameters:				
T_a (K)	2.93e+02	ambient temperature		
p_a (Pa)	1.01e+05	ambient pressure		
V_{spill} (m^3)	1.89e+01	volume of spill (5,000 gal)		
t_{spill} (s)	6.00e+02	spill time		
A_p (m^2)	4.18e+02	pool area (75'×60')		
d_{pool} (m)	2.31e+01	effective pool diameter		
depth (m)	4.53e-02	pool depth		
U_r (m/s)	3.20e+00	wind speed at 10 m height		
Calculations:				
p_h (Pa)	1.14e+05	pressure at the hole		
p_{vh} (Pa)	1.40e+03	vapor pressure of hydrazine at Ta		
E (kg/s)	2.50e+01	liquid release rate from the truck		
E_{pool} (kg/s)	1.04e+00	average total evaporation rate until formaldehyde depleted[1]		
$E_{pool,600}$ (kg/s)	1.99e+00	average total evaporation rate over first 600 sec		
t_{evap} (s)	3.12e+03	time to evaporate (formaldehyde)		
f_i	4.78e-01	average formaldehyde vapor mole fraction until formaldehyde depleted[1]		
$f_{i,600}$	7.42e-01	average formaldehyde vapor mole fraction over the first 600 sec		

Note:
[1] Depletion defined when the liquid mass fraction of formaldehyde in the evaporating pool reaches 0.001

TABLE 1 (continued)				
Accident Analysis Calculations Scenario 1: On-Site Spill (conservative) (b) 5,000 gallon spill of 10% acetone/90% toluene mixture				
Chemical/Physical Properties:	**Acetone**	**Toluene**	**Mixture**	**Notes**
w_i	1.00e-01	9.00e-01	1.00e+00	liquid mass fraction
x_i	1.50e-01	8.50e-01	1.00e+00	liquid mole fraction
MW (kg/kgmol)	5.81e+01	9.21e+01	8.70e+01	molecular weight
T_{bp} (K)	3.29e+02	3.84e+02	3.67e+02	boiling temperature
ρ (kg/m^3)	7.90e+02	8.70e+02	8.61e+02	liquid density at Ta
p_v (Pa)	2.45e+04	2.93e+03	6.17e+03	vapor pressure at Ta
Y_i	5.96e-01	4.04e-01	1.00e+00	vapor mass fraction at Ta
λ_{vap} (J/kg-K)	5.08e+05	3.60e+05	3.75e+05	heat of vaporization at Tbp
$C_{p,g}$ (J/kg-K)	1.29e+03	1.13e+03	1.20e+03	gas heat capacity at 25C
$C_{p,l}$ (J/kg-K)	2.23e+03	1.73e+03	1.78e+03	liquid heat capacity at 25C
Truck parameters:				
A_0 (m^2)	9.09e-03	area of hole		
A_1 (m^2)	1.51e+01	cross sectional area of liquid container		
H_1 (m)	1.60e+00	vertical distance between hole and top of liquid level		
T_s (K)	2.93e+02	storage temperature		
Other parameters:				
T_a (K)	2.93e+02	ambient temperature		
p_a (Pa)	1.01e+05	ambient pressure		
V_{spill} (m^3)	1.89e+01	total volume of spill (5,000 gal)		
t_{spill} (s)	6.00e+02	spill time		
A_p (m^2)	4.18e+02	pool area (75'×60')		
d_{pool} (m)	2.31e+01	effective pool diameter		
depth (m)	4.53e-02	pool depth		
U_r (m/s)	3.20e+00	wind speed at 10 m height		
Calculations:				
p_h (Pa)	1.15e+05	pressure at the hole		
p_{vh} (Pa)	1.40e+03	vapor pressure of hydrazine at Ta		
E (kg/s)	2.72e+01	liquid release rate from the truck		
E_{pool} (kg/s)	4.65e-01	average total evaporation rate until acetone depleted[1]		
$E_{pool,600}$ (kg/s)	7.12e-01	average total evaporation rate for the first 600 sec		
t_{evap} (s)	1.82e+04	time to evaporate (acetone)		
f_i	2.73e-01	average acetone vapor mole fraction until acetone depleted[1]		
$f_{i,600}$	5.85e-01	average acetone vapor mole fraction over the first 600 sec		

Note:

[1] Depletion defined when the liquid mass fraction of acetone in the evaporating pool reaches 0.001.

TABLE 2				
Accident Analysis Calculations Scenario 1: On-Site Spill (typical) (a) 100 gallon spill of 10% formaldehyde/90% methanol mixture				
Chemical/Physical Properties:	**Formaldehyde**	**Methanol**	**Mixture**	**Notes**
w_i	1.00e-01	9.00e-01	1.00e+00	liquid mass fraction
x_i	1.06e-01	8.94e-01	1.00e+00	liquid mole fraction
MW (kg/kgmol)	3.00e+01	3.21e+01	3.19e+01	molecular weight
T_{bp} (K)	2.52e+02	3.38e+02	3.09e+02	boiling temperature
ρ (kg/m^3)	8.15e+02	7.91e+02	7.94e+02	liquid density at Ta
p_v (Pa)	4.41e+05	1.29e+04	5.84e+04	vapor pressure at Ta
Y_i	7.92e-01	2.08e-01	1.00e+00	vapor mass fraction at Ta
λ_{vap} (J/kg-K)	8.25e+05	1.10e+06	1.07e+06	heat of vaporization at Tbp
$C_{p,g}$ (J/kg-K)	7.89e+02	1.37e+03	9.10e+02	gas heat capacity at 25C
$C_{p,l}$ (J/kg-K)	4.30e+03	2.54e+03	2.72e+03	liquid heat capacity at 25C
Drum parameters:				
A_0 (m^2)	1.60e-04	area of hole		
A_1 (m^2)	2.06e+00	cross sectional area of liquid container		
H_1 (m)	5.15e-01	vertical distance between hole and top of liquid level		
T_s (K)	2.93e+02	storage temperature		
Other parameters:				
T_a (K)	2.93e+02	ambient temperature		
p_a (Pa)	1.01e+05	ambient pressure		
V_{spill} (m^3)	3.79e-01	total volume of spill (100 gal)		
t_{spill} (s)	6.00e+02	spill time		
A_p (m^2)	3.79e+01	pool area		
d_{pool} (m)	6.94e+00	effective pool diameter		
depth (m)	1.00e-02	pool depth		
U_r (m/s)	3.20e+00	wind speed at 10 m height		
Calculations:				
p_h (Pa)	1.05e+05	pressure at the hole		
p_{vh} (Pa)	1.40e+03	vapor pressure of hydrazine at Ta		
E (kg/s)	2.50e-01	liquid release rate from each drum		
E_{pool} (kg/s)	9.44e-02	average total evaporation rate until formaldehyde depleted[1]		
$E_{pool,600}$ (kg/s)	9.99e-02	average evaporation rate over the first 600 sec		
t_{evap} (s)	6.80e+02	time to evaporate (formaldehyde)		
f_1	4.82e-01	average formaldehyde vapor mole fraction until depleted[1]		
$f_{1,600}$	5.12e-01	average formaldehyde vapor mole fraction over the first 600 sec		

Note:

[1] Depletion defined when the liquid mass fraction in the evaporating pool reaches 0.001

TABLE 2 (continued)				
Accident Analysis Calculations Scenario 1: On-Site Spill (typical) (b) 100 gallon spill of 10% acetone/90% toluene mixture				
Chemical/Physical Properties:	**Acetone**	**Toluene**	**Mixture**	**Notes**
w_i	1.00e-01	9.00e-01	1.00e+00	liquid mass fraction
x_i	1.50e-01	8.50e-01	1.00e+00	liquid mole fraction
MW (kg/kgmol)	5.81e+01	9.21e+01	8.70e+01	molecular weight
T_{bp} (K)	3.29e+02	3.84e+02	3.67e+02	boiling temperature
ρ (kg/m^3)	7.90e+02	8.70e+02	8.61e+02	liquid density at Ta
p_v (Pa)	2.45e+04	2.93e+03	6.17e+03	vapor pressure at Ta
Y_i	5.96e-01	4.04e-01	1.00e+00	vapor mass fraction at Ta
λ_{vap} (J/kg-K)	5.08e+05	3.60e+05	3.75e+05	heat of vaporization at Tbp
$C_{p,g}$ (J/kg-K)	1.29e+03	1.13e+03	1.20e+03	gas heat capacity at 25C
$C_{p,l}$ (J/kg-K)	2.23e+03	1.73e+03	1.78e+03	liquid heat capacity at 25C
Drum parameters:				
A_0 (m^2)	1.60e-04	area of hole		
A_1 (m^2)	2.06e+00	cross sectional area of liquid container		
H_1 (m)	5.15e-01	vertical distance between hole and top of liquid level		
T_s (K)	2.93e+02	storage temperature		
Other parameters:				
T_a (K)	2.93e+02	ambient temperature		
p_a (Pa)	1.01e+05	ambient pressure		
V_{spill} (m^3)	3.79e-01	total volume of spill (100 gal)		
t_{spill} (s)	6.00e+02	spill time		
A_p (m^2)	3.79e+01	pool area		
d_{pool} (m)	6.94e+00	effective pool diameter		
depth (m)	1.00e-02	pool depth		
U_r (m/s)	3.20e+00	wind speed at 10 m height		
Calculations:				
p_h (Pa)	1.06e+05	pressure at the hole		
p_{vh} (Pa)	1.40e+03	vapor pressure of hydrazine at Ta		
E (kg/s)	2.72e-01	liquid release rate from each drum		
E_{pool} (kg/s)	4.22e-02	average total evaporation rate until acetone depleted[1]		
$E_{pool,600}$ (kg/s)	5.99e-02	average total evaporation rate for the first 600 sec		
t_{evap} (s)	3.96e+03	time to evaporate (acetone)		
f_i	2.76e-01	average acetone vapor mole fraction until depleted[1]		
$f_{i,600}$	5.38e-01	average acetone vapor mole fraction over the first 600 sec		

Note:

[1] Depletion defined when the liquid mass fraction in the evaporating pool reaches 0.001

TABLE 3				
Accident Analysis Calculations Scenario 2: On-Site Fire (conservative) PCE storage tank rupture in Organic Waste Tank Farm				
Chemical/Physical Properties:	**PCE**	**Toluene**	**Mixture**	**Notes**
w_i	1.50e-01	8.50e-01	1.00e+00	liquid mass fraction
x_i	8.93e-02	9.11e-01	1.00e+00	liquid mole fraction
MW (kg/kgmol)	1.66e+02	9.21e+01	9.87e+01	molecular weight
T_{bp} (K)	3.94e+02	3.84e+02	3.85e+02	boiling temperature
ρ (kg/m3)	1.63e+03	8.70e+02	9.35e+02	liquid density at Ta
p_v (Pa)	1.87e+03	2.93e+03	2.84e+03	vapor pressure at Ta
λ_{vap} (J/kg-K)	NU[1]	NU	NU	heat of vaporization at T_{bp}
Tank parameters:				
A_0 (m2)	1.86e-02	area of hole		
A_1 (m2)	1.24e+01	cross sectional area of liquid container		
H_1 (m)	6.10e+00	height of storage tank (20 ft)		
d_{tank} (m)	3.98e+00	tank diameter		
T_s (K)	2.93e+02	storage temperature		
Other parameters:				
T_a (K)	2.93e+02	ambient temperature		
p_a (Pa)	1.01e+05	ambient pressure		
V_{spill} (m^3)	7.57e+01	total volume of spill (20,000 gal)		
t_{spill} (s)	6.00e+02	spill time		
A_p (m^2)	1.80e+02	size of containment area		
d_{pool} (m)	1.51e+01	effective pool diameter		
depth (m)	4.21e-01	pool depth		
HCl (g/kg)	2.38e+02	HCl production from PCE		
PG (g/kg)	7.00e+00	phosgene production from PCE		
Calculations:				
dm/dt (kg/m^2-s)	5.60e-02	mass burning rate per unit area		
H (m)	2.13e+01	flame height		
m_{HCl} (kg/s)	3.60e-01	emission rate of HCl		
m_{PG} (kg/s)	1.06e-02	emission rate of phosgene		
Q_H (kW/m^2)	4.43e+01	heat emission rate		
F (m^4/s^3)	7.09e+01	buoyancy flux		
T (K)	9.42e+02	average fire temperature		
t_{burn} (s)	7.03e+03	time of burning		

Note:
[1] NU - Not used.

TABLE 4				
Accident Analysis Calculations Scenario 2: On-Site Fire (typical) Four PCE drum rupture indoors				
Chemical/Physical Properties:	**PCE**	**Toluene**	**Mixture**	**Notes**
w_i	1.50e-01	8.50e-01	1.00e+00	liquid mass fraction
x_i	8.93e-02	9.11e-01	1.00e+00	liquid mole fraction
MW (kg/kgmol)	1.66e+02	9.21e+01	9.87e+01	molecular weight
T_{bp} (K)	3.94e+02	3.84e+02	3.85e+02	boiling temperature
ρ (kg/m3)	1.63e+03	8.70e+02	9.35e+02	liquid density at Ta
p_v (Pa)	1.87e+03	2.93e+03	2.84e+03	vapor pressure at Ta
λ_{vap} (J/kg-K)	NU[1]	NU	NU	heat of vaporization at Tbp
Drum parameters (modeled as a 220-gallon horizontal cylindrical container):				
A_0 (m2)	1.60e-04	area of hole		
A_1 (m2)	2.06e+00	cross sectional area of liquid container		
H_1 (m)	5.15e-01	vertical distance between hole and top of liquid level		
T_s (K)	2.93e+02	storage temperature		
Other parameters:				
T_a (K)	2.93e+02	ambient temperature		
p_a (Pa)	1.01e+05	ambient pressure		
V_{spill} (m^3)	7.57e-01	total volume of spill (200 gal)		
t_{spill} (s)	6.00e+02	spill time		
A_p (m^2)	7.57e+01	size of containment area		
d_{pool} (m)	9.82e+00	effective pool diameter		
depth (m)	1.00e-02	pool depth		
HCl (g/kg)	2.38e+02	HCl production from PCE		
PG (g/kg)	7.00e+00	phosgene production from PCE		
Calculations:				
dm/dt (kg/m^2-s)	5.60e-02	mass burning rate per unit area		
H (m)	1.58e+01	flame height		
m_{HCl} (kg/s)	1.51e-01	emission rate of HCl		
m_{PG} (kg/s)	4.45e-03	emission rate of phosgene		
QH (kW/m^2)	4.43e+01	heat emission rate		
F (m^4/s^3)	2.98e+01	buoyancy flux		
T (K)	9.42e+02	average fire temperature		
t_{burn} (s)	1.67e+02	time of burn		

Note:

[1] NU = Not used.

TABLE 5				
Accident Analysis Calculations Scenario 3: On-Site Mixing of Incompatible Wastes (conservative) Pumping of tanker contents into wrong storage tank				
Chemical/Physical Properties:				
Truck:	**PCE**	**Methanol**	**Mixture**	**Notes**
w_i	1.50e-01	8.50e-01	1.00e+00	liquid mass fraction
x_i	3.30e-02	9.67e-01	1.00e+00	liquid mole fraction
MW (kg/kgmol)	1.66e+02	3.21e+01	3.65e-01	molecular weight
T_b (K)	3.94e+02	3.38e+02	3.39e+02	boiling temperature
ρ (kg/m^3)	1.63e+03	7.91e+02	8.57e+02	liquid density
p_v (Pa)	1.87e+03	1.29e+04	1.26+04	vapor pressure at Ta
Storage tank:	**Nitric acid**	**Water**	**Mixture**	
w_i	7.00e-01	3.00e-01	1.00e+00	liquid mass fraction
x_i	2.55e-01	3.82e-01	6.36e-01	liquid mole fraction
MW (kg/kgmol)	6.30e+01	1.80e+01	2.29e+01	molecular weight
T_b (K)	3.56e+02	3.73e+02	3.93e+02	boiling temperature
ρ (kg/m^3)	1.50e+03	1.00e+03	1.11e+03	liquid density
p_v (Pa)	6.40e+03	2.34e+03	3.37e+03	vapor pressure at Ta
Other parameters:				
T_a (K)	2.93e+02	ambient temperature		
p_a (Pa)	1.01e+05	ambient pressure		
$V_{transfer}$ (m^3)	3.79e+01	total volume transferred from truck to storage tank (5,000 gal)		
$r_{transfer}$ (m^3/s)	1.26e-02	maximum pumping rate from truck (250 gal/min)		
U_r (m/s)	3.20e+00	wind speed at 10 m height		
A_{disch} (m^2)	3.24e-02	area of vent discharge (8 inch diameter)		
H_{disch} (m)	8.40e+00	height of vent discharge[1]		
Calculations:				
M_{HCl} (kg/s)	1.79e+00	release rate of HCl		
t_{rel} (s)	1.20+03	duration of HCl release		
Note: [1] - Includes plume rise due to momentum.				

TABLE 6				
Accident Analysis Calculations Scenario 3: On-Site Mixing of Incompatible Wastes (typical) Four drum rupture outdoors				
Chemical/Physical Properties:				
Drums A:	**PCE**	**Methanol**	**Mixture**	**Notes**
w_i	1.50e-01	8.50e-01	1.00e+00	liquid mass fraction
x_i	3.30e-02	9.67e-01	1.00e+00	liquid mole fraction
MW (kg/kgmol)	1.66e+02	3.21e+01	3.65e-01	molecular weight
T_b (K)	3.94e+02	3.38e+02	3.39e+02	boiling temperature
ρ (kg/m^3)	1.63e+03	7.91e+02	8.57e+02	liquid density
p_v (Pa)	1.87e+03	1.29e+04	1.26+04	vapor pressure at Ta
Drums B:	**Nitric acid**	**Water**	**Mixture**	
w_i	7.00e-01	3.00e-01	1.00e+00	liquid mass fraction
x_i	2.55e-01	3.82e-01	6.36e-01	liquid mole fraction
MW (kg/kgmol)	6.30e+01	1.80e+01	2.29e+01	molecular weight
T_b (K)	3.56e+02	3.73e+02	3.93e+02	boiling temperature
ρ (kg/m^3)	1.50e+03	1.00e+03	1.11e+03	liquid density
p_v (Pa)	6.40e+03	2.34e+03	3.37e+03	vapor pressure at Ta
Drum parameters:				
A_0 (m^2)	1.60e-04	area of hole for Drums A		
A_0 (m^2)	1.60e-04	area of hole for Drums B		
A_1 (m^2)	2.06e+00	cross sectional area of liquid container		
H_1 (m)	5.15e-01	vertical distance between hole and top of liquid level		
T_s (K)	2.93e+02	storage temperature		
Other parameters:				
T_a (K)	2.93e+02	ambient temperature		
p_a (Pa)	1.01e+05	ambient pressure		
V_{spill} (m^3)	7.57e-01	total volume of spill (200 gal)		
A_p (m^2)	7.57e+01	pool area (low volatility)		
d_{pool} (m)	9.82e+00	effective pool diameter		
depth (m)	1.00e-02	pool depth (1 cm)		
U_r (m/s)	3.20e+00	wind speed at 10 m height		
Calculations:				
p_{h1} (Pa)	1.06e+05	pressure at the hole in Drums A		
p_{h2} (Pa)	1.07e+05	pressure at the hole in Drums B		
p_{vh} (Pa)	1.40e+03	vapor pressure of hydrazine at Ta		
E_1 (kg/s)	2.70e-01	liquid release rate from Drums A		
E_2 (kg/s)	3.51e-01	liquid release rate from Drums B		

TABLE 6		
Accident Analysis Calculations Scenario 3: On-Site Mixing of Incompatible Wastes (typical) Four drum rupture outdoors		
t_{spill1} (s)	6.00e+02	spill time from Drums A
t_{spill2} (s)	6.00e+02	spill time from Drums B
M_{HCl} (kg/s)	7.14e-02	release rate of HCl
t_{rel} (s)	6.00e+02	duration of HCl release

TABLE 7

Accident Analysis Calculations
Scenario 4: Off-Site Spill (conservative)
(a) One truck accident, containing 5,000 gallons of 10% formaldehyde/90% methanol mixture

Chemical/Physical Properties:	Formaldehyde	Methanol	Mixture	Notes
w_i	1.00e-01	9.00e-01	1.00e+00	liquid mass fraction
x_i	1.06e-01	8.94e-01	1.00e+00	liquid mole fraction
MW (kg/kgmol)	3.00e+01	3.21e+01	3.19e+01	molecular weight
T_b (K)	2.52e+02	3.38e+02	3.09e+02	boiling temperature
ρ (kg/m^3)	8.15e+02	7.91e+02	7.94e+02	liquid density at Ta
p_v (Pa)	4.41e+05	1.29e+04	5.84e+04	vapor pressure at Ta
Y_i	7.92e-01	2.08e-01	1.00e+00	vapor mass fraction at Ta
λ_{vap} (J/kg-K)	8.25e+05	1.10e+06	1.07e+06	heat of vaporization at Tbp
$C_{p,g}$ (J/kg-K)	7.89e+02	1.37e+03	9.10e+02	gas heat capacity at 25C
$C_{p,l}$ (J/kg-K)	4.30e+03	2.54e+03	2.72e+03	liquid heat capacity at 25C
Truck parameters:				
A_0 (m^2)	9.09e-03	area of hole		
A_1 (m^2)	1.51e+01	cross sectional area of liquid container		
H_1 (m)	1.60e+00	vertical distance between hole and top of liquid level		
T_s (K)	2.93e+02	storage temperature		
Other parameters:				
T_a (K)	2.93e+02	ambient temperature		
p_a (Pa)	1.01e+05	ambient pressure		
V_{spill} (m^3)	1.89e+01	total volume of spill (5,000 gal)		
t_{spill} (s)	6.00e+02	spill time		
A_p (m^2)	7.35e+02	pool area		
d_{pool} (m)	3.06e+01	effective pool diameter		
depth (m)	1.00e-02	pool depth		
U_r (m/s)	3.20e+00	wind speed at 10 m height		
Calculations:				
p_h (Pa)	1.14e+05	pressure at the hole		
p_{vh} (Pa)	1.40e+03	vapor pressure of hydrazine at Ta		
E (kg/s)	2.50e+01	liquid release rate from truck		
E_{pool} (kg/s)	1.84e+00	average total evaporation rate until formaldehyde depleted[1]		
t_{evap} (s)	1.74e+03	time to evaporate (formaldehyde)		
f_i	4.84e-01	average formaldehyde vapor mole fraction until depleted[1]		

Note:

[1] Depletion defined when the liquid mass fraction of formaldehyde in the evaporating pool reaches 0.001

TABLE 7 (continued)				
Accident Analysis Calculations Scenario 4: Off-Site Spill (conservative) (b) One truck accident, containing 5,000 gallons of 10% acetone/90% toluene mixture				
Chemical/Physical Properties:	**Acetone**	**Toluene**	**Mixture**	**Notes**
w_i	1.00e-01	9.00e-01	1.00e+00	liquid mass fraction
x_i	1.50e-01	8.50e-01	1.00e+00	liquid mole fraction
MW (kg/kgmol)	5.81e+01	9.21e+01	8.70e+01	molecular weight
T_b (K)	3.29e+02	3.84e+02	3.67e+02	boiling temperature
ρ (kg/m^3)	7.90e+02	8.70e+02	8.61e+02	liquid density at Ta
p_v (Pa)	2.45e+04	2.93e+03	6.17e+03	vapor pressure at Ta
Y_i	5.96e-01	4.04e-01	1.00e+00	vapor mass fraction at Ta
λ_{vap} (J/kg-K)	5.08e+05	3.60e+05	3.75e+05	heat of vaporization at Tbp
$C_{p,g}$ (J/kg-K)	1.29e+03	1.13e+03	1.20e+03	gas heat capacity at 25C
$C_{p,l}$ (J/kg-K)	2.23e+03	1.73e+03	1.78e+03	liquid heat capacity at 25C
Truck parameters:				
A_0 (m^2)	9.09e-03	area of hole		
A_1 (m^2)	1.51e+01	cross sectional area of liquid container		
H_1 (m)	1.60e+00	vertical distance between hole and top of liquid level		
T_s (K)	2.93e+02	storage temperature		
Other parameters:				
T_a (K)	2.93e+02	ambient temperature		
p_a (Pa)	1.01e+05	ambient pressure		
V_{spill} (m^3)	1.89e+01	total volume of spill (5,000 gal)		
t_{spill} (s)	6.00e+02	spill time		
A_p (m^2)	7.35e+02	pool area		
d_{pool} (m)	3.06e+01	effective pool diameter		
depth (m)	2.58e-02	pool depth		
U_r (m/s)	3.20e+00	wind speed at 10 m height		
Calculations:				
p_h (Pa)	1.15e+05	pressure at the hole		
p_{vh} (Pa)	1.40e+03	vapor pressure of hydrazine at Ta		
E (kg/s)	2.72e+01	liquid release rate from truck		
E_{pool} (kg/s)	8.18e-01	average total evaporation rate until acetone depleted[1]		
t_{evap} (s)	1.03e+04	time to evaporate (acetone)		
f_i	2.74e-01	average acetone vapor mole fraction until depleted[1]		

Note:

[1] Depletion defined when the liquid mass fraction of acetone in the evaporating pool reaches 0.001.

TABLE 8				
Accident Analysis Calculations Scenario 4: Off-Site Spill (typical) (a) One truck accident, containing 5,000 gallons of 10% formaldehyde/ 90% methanol mixture				
Chemical/Physical Properties:	**Formaldehyde**	**Methanol**	**Mixture**	**Notes**
w_i	1.00e-01	9.00e-01	1.00e+00	liquid mass fraction
x_i	1.06e-01	8.94e-01	1.00e+00	liquid mass fraction
MW (kg/kgmol)	3.00e+01	3.21e+01	3.19e+01	molecular weight
T_b (K)	2.52e+02	3.38e+02	3.09e+02	boiling temperature
ρ (kg/m^3)	8.15e+02	7.91e+02	7.94e+02	liquid density at Ta
p_v (Pa)	4.41e+05	1.29e+04	5.84e+04	vapor pressure at Ta
Y_i	7.92e-01	2.08e-01	1.00e+00	vapor mass fraction at Ta
λ_{vap} (J/kg-K)	8.25e+05	1.10e+06	1.07e+06	heat of vaporization at Tbp
$C_{p,g}$ (J/kg-K)	7.89e+02	1.37e+03	9.10e+02	gas heat capacity at 25C
$C_{p,l}$ (J/kg-K)	4.30e+03	2.54e+03	2.72e+03	liquid heat capacity at 25C
Truck parameters:				
A_0 (m^2)	1.82e-04	area of hole		
A_1 (m^2)	1.51e+01	cross sectional area of liquid container		
H_1 (m)	1.60e+00	vertical distance between hole and top of liquid level		
T_s (K)	2.93e+02	storage temperature		
Other parameters:				
T_a (K)	2.93e+02	ambient temperature		
p_a (Pa)	1.01e+05	ambient pressure		
V_{spill} (m^3)	3.79e-01	total volume of spill (100 gal)		
t_{spill} (s)	6.00e+02	spill time		
A_p (m^2)	3.79e+01	pool area (low volatility)		
d_{pool} (m)	6.94e+00	effective pool diameter		
depth (m)	1.00e-02	pool depth		
U_r (m/s)	3.2e+00	wind speed at 10 m height		
Calculations:				
p_h (Pa)	1.14e+05	pressure at the hole		
p_{vh} (Pa)	1.40e+03	vapor pressure of hydrazine at Ta		
E (kg/s)	2.50e-01	liquid release rate from each truck		
E_{pool} (kg/s)	9.44e-02	average total evaporation rate until formaldehyde depleted[1]		
t_{evap} (s)	6.80e+02	time to evaporate (formaldehyde)		
f_i	4.82e-01	average formaldehyde vapor mole fraction until depleted[1]		

Note:

[1] Depletion defined when the liquid mass fraction in the evaporating pool reaches 0.001

TABLE 8 (continued)

Accident Analysis Calculations
Scenario 4: Off-Site Spill (typical)
(b) One truck accident, containing 5,000 gallons of 10% acetone/90% toluene mixture

Chemical/Physical Properties:	Acetone	Toluene	Mixture	Notes
w_i	1.00e-01	9.00e-01	1.00e+00	liquid mass fraction
x_i	1.50e-01	8.50e-01	1.00e+00	liquid mass fraction
MW (kg/kgmol)	5.81e+01	9.21e+01	8.70e+01	molecular weight
T_b (K)	3.29e+02	3.84e+02	3.67e+02	boiling temperature
ρ (kg/m^3)	7.90e+02	8.70e+02	8.61e+02	liquid density at Ta
p_v (Pa)	2.45e+04	2.93e+03	6.17e+03	vapor pressure at Ta
Y_i	5.96e-01	4.04e-01	1.00e+00	vapor mass fraction at Ta
λ_{vap} (J/kg-K)	5.08e+05	3.60e+05	3.75e+05	heat of vaporization at Tbp
$C_{p,g}$ (J/kg-K)	1.29e+03	1.13e+03	1.20e+03	gas heat capacity at 25C
$C_{p,l}$ (J/kg-K)	2.23e+03	1.73e+03	1.78e+03	liquid heat capacity at 25C
Truck parameters:				
A_0 (m^2)	1.82e-04	area of hole		
A_1 (m^2)	1.51e+01	cross sectional area of liquid container		
H_1 (m)	1.60e+00	vertical distance between hole and top of liquid level		
T_s (K)	2.93e+02	storage temperature		
Other parameters:				
T_a (K)	2.93e+02	ambient temperature		
p_a (Pa)	1.01e+05	ambient pressure		
V_{spill} (m^3)	3.79e-01	total volume of spill (100 gal)		
t_{spill} (s)	6.00e+02	spill time		
A_p (m^2)	3.79e+01	pool area (low volatility)		
d_{pool} (m)	6.94e+00	effective pool diameter		
depth (m)	1.00e-02	pool depth		
U_r (m/s)	3.20e+00	wind speed at 10 m height		
Calculations:				
p_h (Pa)	1.15e+05	pressure at the hole		
p_{vh} (Pa)	1.40e+03	vapor pressure of hydrazine at Ta		
E (kg/s)	5.43e-01	liquid release rate from the truck		
E_{pool} (kg/s)	4.22e-02	average total evaporation rate until acetone depleted[1]		
t_{evap} (s)	3.96e+03	time to evaporate (acetone)		
f_i	2.76e-01	average acetone vapor mole fraction until depleted[1]		

Note:

[1] Depletion defined when the liquid mass fraction of formaldehyde in the evaporating pool reaches 0.001

TABLE 9				
Accident Analysis Calculations Scenario 5: Off-Site Spill with Fire (conservative) One truck accident, containing 5,000 gallons of 15% PCE/85% toluene mixture				
Chemical/Physical Properties:	**PCE**	**Toluene**	**Mixture**	**Notes**
w_i	1.50e-01	8.50e-01	1.00e+00	liquid mass fraction
x_i	8.93e-02	9.11e-01	1.00e+00	liquid mass fraction
MW (kg/kgmol)	1.66e+02	9.21e+01	9.87e+01	molecular weight
T_b (K)	3.94e+02	3.84e+02	3.85e+02	boiling temperature
ρ (kg/m3)	1.63e+03	8.70e+02	9.35e+02	liquid density at Ta
p_v (Pa)	1.87e+03	2.93e+03	2.84e+03	vapor pressure at Ta
λ_{vap} (J/kg-K)	NU[1]	NU	NU	heat of vaporization at Tbp
Tank parameters:				
A_0 (m2)	9.03e-03	area of hole		
A_1 (m2)	1.51e+01	cross sectional area of liquid container of the truck		
H_1 (m)	1.60e+00	vertical distance between hole and top of liquid level		
T_s (K)	2.93e+02	storage temperature		
Other parameters:				
T_a (K)	2.93e+02	ambient temperature		
p_a (Pa)	1.01e+05	ambient pressure		
V_{spill} (m^3)	1.89e+01	total volume of spill (5,000 gal)		
t_{spill} (s)	6.00e+02	spill time		
A_p (m^2)	7.35e+02	size of containment area		
d_{pool} (m)	3.06e+01	effective pool diameter		
depth (m)	1.00e-02	pool depth		
HCl (g/kg)	2.38e+02	HCl production from PCE		
PG (g/kg)	7.00e+00	phosgene production from PCE		
Calculations:				
dm/dt (kg/m^2-s)	5.60e-02	mass burning rate per unit area		
H (m)	3.48e+01	flame height		
m_{HCl} (kg/s)	1.47e+00	emission rate of HCl		
m_{PG} (kg/s)	4.32e-02	emission rate of phosgene		
QH (kW/m^2)	4.43e+01	heat emission rate		
F (m^4/s^3)	2.90e+02	buoyancy flux		
T (K)	9.42e+02	average fire temperature		
t_{burn} (s)	4.30e+02	time of burning		

TABLE 10

Accident Analysis Calculations
Scenario 5: Off-Site Spill with Fire (typical)
One truck accident, containing 5,000 gallons of 15% PCE/85% toluene mixture

Chemical/Physical Properties:	PCE	Toluene	Mixture	Notes
w_i	1.50e-01	8.50e-01	1.00e+00	liquid mass fraction
x_i	8.93e-02	9.11e-01	1.00e+00	liquid mass fraction
MW (kg/kgmol)	1.66e+02	9.21e+01	9.87e+01	molecular weight
T_b (K)	3.94e+02	3.84e+02	3.85e+02	boiling temperature
ρ (kg/m3)	1.63e+03	8.70e+02	9.35e+02	liquid density at Ta
p_v (Pa)	1.87e+03	2.93e+03	2.84e+03	vapor pressure at Ta
λ_{vap} (J/kg-K)	NU[1]	NU	NU	heat of vaporization at Tbp
Tank parameters:				
A_0 (m2)	1.82e-04	area of hole		
A_1 (m2)	1.51e+01	cross sectional area of liquid container		
H_1 (m)	1.60e+00	vertical distance between hole and top of liquid level		
T_s (K)	2.93e+02	storage temperature		
Other parameters:				
T_a (K)	2.93e+02	ambient temperature		
p_a (Pa)	1.01e+05	ambient pressure		
V_{spill} (m^3)	3.79e-01	total volume of spill (100 gal)		
t_{spill} (s)	6.00e+02	spill time		
A_p (m^2)	3.79e+01	size of containment area		
d_{pool} (m)	6.94e+00	effective pool diameter		
depth (m)	1.00e-02	pool depth		
HCl (g/kg)	2.38e+02	HCl production from PCE		
PG (g/kg)	7.00e+00	phosgene production from PCE		
Calculations:				
dm/dt (kg/m^2-s)	5.60e-02	mass burning rate per unit area		
H (m)	1.24e+01	flame height		
m_{HCl} (kg/s)	7.56e-02	emission rate of HCl		
m_{PG} (kg/s)	2.22e-03	emission rate of phosgene		
QH (kW/m^2)	4.43e+01	heat emission rate		
F (m^4/s^3)	1.49e+01	buoyancy flux		
T (K)	9.42e+02	average fire temperature		
t_{burn} (s)	1.67e+02	time of burning		

Note:

[1] Not used.

01-3999C:PCC00B85.W51

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ATTACHMENT 1

ARCHIE Output for On-Site and Off-site Fire Scenarios

1. Fire after the spill achieves maximum size

HAZARDOUS MATERIAL = PCE/toluene
ADDRESS \ LOCATION = WTI, East Liverpool, OH
DATE OF ASSESSMENT = June 5, 1995
NAME OF DISK FILE = SC2CON.ASF

*** SCENARIO DESCRIPTION

WTI Accident Analysis, Scenario 2 (conservative)
Storage tank rupture in organic waste tank farm
20,000 gallon spill and fire

******* DISCHARGE RATE/DURATION ESTIMATES

Liquid discharge from nonpressurized container

Average discharge rate	=	15352	lbs/min
Duration of discharge	=	10.2	minutes
Amount discharged	=	156095	lbs
State of material	=	Liquid	

******* LIQUID POOL SIZE ESTIMATES

Evaporating pool area	=	1940	ft2
Burning pool area	=	1940	ft2

Note: Pool is assumed to ignite after pool achieves maximum size.

******* POOL FIRE HAZARD ESTIMATION RESULTS

Burning pool radius	=	24.9	feet
Flame height	=	70	feet
Fatality zone radius	=	65	feet
Injury zone radius	=	93	feet

******* FIREBALL HAZARD RESULTS

Max fireball diameter	=	859	feet
Maximum fireball height	=	1411	feet
Fireball duration	=	16.5	seconds
Fatality zone radius	=	1199	feet
Injury zone radius	=	2274	feet

INPUT PARAMETER SUMMARY

PHYSIOCHEMICAL PROPERTIES OF MATERIAL

NORMAL BOILING POINT	=	233	degrees F
MOLECULAR WEIGHT	=	98.68	
LIQUID SPECIFIC GRAVITY	=	.94	
VAPOR PRES AT AMBIENT TEMP	=	.409	psia
	=	21.13	mm Hg

CONTAINER CHARACTERISTICS

CONTAINER TYPE	=	Vertical cylinder	
TANK DIAMETER	=	13.046	feet
TOTAL WEIGHT OF CONTENTS	=	156095	lbs
LIQUID HEIGHT IN CONTAINER	=	20	feet
DISCHARGE HOLE DIAMETER	=	8.5	inch(es)
DISCHARGE COEFFICIENT OF HOLE	=	.62	
TEMP OF CONTAINER CONTENTS	=	68	degrees F
TANK CONTENTS DURING FIREBALL	=	156095	lbs

ENVIRONMENTAL/LOCATION CHARACTERISTICS

AMBIENT TEMPERATURE	=	68	degrees F
WIND VELOCITY	=	3.4	mph
LIQUID CONFINEMENT AREA	=	NONE	

KEY RESULTS PROVIDED BY USER INSTEAD OF BY EVALUATION METHODS

NONE OBSERVED

KEY RESULTS OVERRIDDEN BY USER AT SOME POINT AFTER COMPUTATION

NONE OBSERVED

HAZARDOUS MATERIAL = PCE/toluene
ADDRESS \ LOCATION = WTI, East Liverpool, OH
DATE OF ASSESSMENT = June 5, 1995
NAME OF DISK FILE = SC2TYP.ASF

*** SCENARIO DESCRIPTION

WTI Accident Analysis, Scenario 2 (typical)
Four drums rupture indoors
200 gallon spill and fire

******* DISCHARGE RATE/DURATION ESTIMATES

Liquid discharge from nonpressurized container

Average discharge rate	=	156.5	lbs/min
Duration of discharge	=	9.99	minutes
Amount discharged	=	1561	lbs
State of material	=	Liquid	

******* LIQUID POOL SIZE ESTIMATES

Evaporating pool area	=	812	ft2
Burning pool area	=	811.2	ft2

Note: Pool is assumed to ignite immediately upon initiation of discharge.[1]

******* POOL FIRE HAZARD ESTIMATION RESULTS

Burning pool radius	=	16.1	feet
Flame height	=	52	feet
Fatality zone radius	=	42	feet
Injury zone radius	=	60	feet

******* FIREBALL HAZARD RESULTS

Max fireball diameter	=	186	feet
Maximum fireball height	=	305	feet
Fireball duration	=	7.7	seconds
Fatality zone radius	=	93	feet
Injury zone radius	=	208	feet

[1] Note should read "Pool is assumed to ignite after pool achieves maximum size." This is due to a scrambled flag in the program's reportable module. This was verifed by the company which wrote the program, Hazmat America Inc.

INPUT PARAMETER SUMMARY

PHYSIOCHEMICAL PROPERTIES OF MATERIAL

NORMAL BOILING POINT	=	233	degrees F
MOLECULAR WEIGHT	=	98.68	
LIQUID SPECIFIC GRAVITY	=	.94	
VAPOR PRES AT AMBIENT TEMP	=	.409	psia
	=	21.13	mm Hg

CONTAINER CHARACTERISTICS

CONTAINER TYPE	=	Vertical cylinder	
TANK DIAMETER	=	3.53	feet
TOTAL WEIGHT OF CONTENTS	=	1561	lbs
LIQUID HEIGHT IN CONTAINER	=	2.8	feet
DISCHARGE HOLE DIAMETER	=	1.42	inch(es)
DISCHARGE COEFFICIENT OF HOLE	=	.62	
TEMP OF CONTAINER CONTENTS	=	68	degrees F
TANK CONTENTS DURING FIREBALL	=	1561	lbs

ENVIRONMENTAL/LOCATION CHARACTERISTICS

AMBIENT TEMPERATURE	=	68	degrees F
WIND VELOCITY	=	3.4	mph
LIQUID CONFINEMENT AREA	=	NONE	

KEY RESULTS PROVIDED BY USER INSTEAD OF BY EVALUATION METHODS

NONE OBSERVED

KEY RESULTS OVERRIDDEN BY USER AT SOME POINT AFTER COMPUTATION

NONE OBSERVED

HAZARDOUS MATERIAL = PCE/toluene
ADDRESS \ LOCATION = WTI, East Liverpool, OH
DATE OF ASSESSMENT = June 5, 1995
NAME OF DISK FILE = SC5CON.ASF

*** SCENARIO DESCRIPTION

WTI Accident Analysis, Scenario #5 (conservative)
Off-site tanker truck accident
5,000 gallon spill and fire

******* DISCHARGE RATE/DURATION ESTIMATES

Liquid discharge from nonpressurized container

Average discharge rate	=	3854.3	lbs/min
Duration of discharge	=	10.2	minutes
Amount discharged	=	39024	lbs
State of material	=	Liquid	

******* LIQUID POOL SIZE ESTIMATES

Evaporating pool area	=	7907	ft2
Burning pool area	=	7907	ft2

Note: Pool is assumed to ignite after pool achieves maximum size.

******* POOL FIRE HAZARD ESTIMATION RESULTS

Burning pool radius	=	50.2	feet
Flame height	=	114	feet
Fatality zone radius	=	131	feet
Injury zone radius	=	187	feet

******* FIREBALL HAZARD RESULTS

Max fireball diameter	=	541	feet
Maximum fireball height	=	889	feet
Fireball duration	=	13.1	seconds
Fatality zone radius	=	552	feet
Injury zone radius	=	1106	feet

INPUT PARAMETER SUMMARY

PHYSIOCHEMICAL PROPERTIES OF MATERIAL

NORMAL BOILING POINT	=	233	degrees F
MOLECULAR WEIGHT	=	98.68	
LIQUID SPECIFIC GRAVITY	=	.94	
VAPOR PRES AT AMBIENT TEMP	=	.409	psia
	=	21.13	mm Hg

CONTAINER CHARACTERISTICS

CONTAINER TYPE	=	Horizontal cylinder	
TANK DIAMETER	=	4.2	feet
TANK LENGTH	=	48.3	feet
TOTAL WEIGHT OF CONTENTS	=	39024	lbs
LIQUID HEIGHT IN CONTAINER	=	4.2	feet
DISCHARGE HOLE DIAMETER	=	5.8	inch(es)
DISCHARGE COEFFICIENT OF HOLE	=	.62	
TEMP OF CONTAINER CONTENTS	=	68	degrees F
TANK CONTENTS DURING FIREBALL	=	39024	lbs

ENVIRONMENTAL/LOCATION CHARACTERISTICS

AMBIENT TEMPERATURE	=	68	degrees F
WIND VELOCITY	=	3.4	mph
LIQUID CONFINEMENT AREA	=	NONE	

KEY RESULTS PROVIDED BY USER INSTEAD OF BY EVALUATION METHODS

NONE OBSERVED

KEY RESULTS OVERRIDDEN BY USER AT SOME POINT AFTER COMPUTATION

NONE OBSERVED

HAZARDOUS MATERIAL = PCE/toluene
ADDRESS \ LOCATION = WTI, East Liverpool, OH
DATE OF ASSESSMENT = June 5, 1995
NAME OF DISK FILE = SC5TYP.ASF

*** SCENARIO DESCRIPTION

WTI Accident Analysis, Scenario 5 (typical)
Off-site tanker truck accident
100 gallon spill and fire

******* DISCHARGE RATE/DURATION ESTIMATES

Liquid discharge from nonpressurized container

Average discharge rate	=	78.4	lbs/min
Duration of discharge	=	10	minutes
Amount discharged	=	784	lbs
State of material	=	Liquid	

Note: Duration of discharge was intentionally shortened by user to account for response to spill. Computed duration was originally 498.1 minutes.

******* LIQUID POOL SIZE ESTIMATES

Evaporating pool area	=	408	ft2
Burning pool area	=	407.4	ft2

Note: Pool is assumed to ignite immediately upon initiation of discharge.[1]

******* POOL FIRE HAZARD ESTIMATION RESULTS

Burning pool radius	=	11.4	feet
Flame height	=	41	feet
Fatality zone radius	=	30	feet
Injury zone radius	=	43	feet

******* FIREBALL HAZARD RESULTS

Max fireball diameter	=	148	feet
Maximum fireball height	=	242	feet
Fireball duration	=	6.8	seconds
Fatality zone radius	=	74	feet
Injury zone radius	=	145	feet

[1] Note should read "Pool is assumed to ignite after pool achieves maximum size." This is due to a scrambled flag in the program's reportable module. This was verifed by the company which wrote the program, Hazmat America Inc.

INPUT PARAMETER SUMMARY

PHYSIOCHEMICAL PROPERTIES OF MATERIAL

NORMAL BOILING POINT	=	233	degrees F
MOLECULAR WEIGHT	=	98.68	
LIQUID SPECIFIC GRAVITY	=	.94	
VAPOR PRES AT AMBIENT TEMP	=	.409	psia
	=	21.13	mm Hg

CONTAINER CHARACTERISTICS

CONTAINER TYPE	=	Horizontal cylinder	
TANK DIAMETER	=	4.2	feet
TANK LENGTH	=	48.3	feet
TOTAL WEIGHT OF CONTENTS	=	39024	lbs
LIQUID HEIGHT IN CONTAINER	=	4.2	feet
DISCHARGE HOLE DIAMETER	=	.827	inch(es)
DISCHARGE COEFFICIENT OF HOLE	=	.62	
TEMP OF CONTAINER CONTENTS	=	68	degrees F
TANK CONTENTS DURING FIREBALL	=	784	lbs

ENVIRONMENTAL/LOCATION CHARACTERISTICS

AMBIENT TEMPERATURE	=	68	degrees F
WIND VELOCITY	=	3.4	mph
LIQUID CONFINEMENT AREA	=	NONE	

KEY RESULTS PROVIDED BY USER INSTEAD OF BY EVALUATION METHODS

NONE OBSERVED

KEY RESULTS OVERRIDDEN BY USER AT SOME POINT AFTER COMPUTATION

NONE OBSERVED

2. Fire immediately upon the spill

HAZARDOUS MATERIAL = PCE/toluene
ADDRESS \ LOCATION = WTI, East Liverpool, OH
DATE OF ASSESSMENT = June 5, 1995
NAME OF DISK FILE = SC2CONP.ASF

*** SCENARIO DESCRIPTION

WTI Accident Analysis, Scenario 2 (conservative)
Storage tank rupture in organic waste tank farm
20,000 gallon spill and fire

******* DISCHARGE RATE/DURATION ESTIMATES

Liquid discharge from nonpressurized container

Average discharge rate	=	15352	lbs/min
Duration of discharge	=	10.2	minutes
Amount discharged	=	156095	lbs
State of material	=	Liquid	

******* LIQUID POOL SIZE ESTIMATES

Evaporating pool area	=	1940	ft2
Burning pool area	=	1940	ft2

Note: Pool is assumed to ignite after pool achieves maximum size. [1]

******* POOL FIRE HAZARD ESTIMATION RESULTS

Burning pool radius	=	24.9	feet
Flame height	=	70	feet
Fatality zone radius	=	65	feet
Injury zone radius	=	93	feet

******* FIREBALL HAZARD RESULTS

Max fireball diameter	=	859	feet
Maximum fireball height	=	1411	feet
Fireball duration	=	16.5	seconds
Fatality zone radius	=	1199	feet
Injury zone radius	=	2274	feet

[1] Note should read "Pool is assumed to ignite immediately upon initiation of discharge." This is due to a scrambled flag in the program's reportable module. This was verifed by the company which wrote the program, Hazmat America Inc.

INPUT PARAMETER SUMMARY

PHYSIOCHEMICAL PROPERTIES OF MATERIAL

NORMAL BOILING POINT	=	233	degrees F
MOLECULAR WEIGHT	=	98.68	
LIQUID SPECIFIC GRAVITY	=	.94	
VAPOR PRES AT CONTAINER TEMP	=	.406	psia
	=	21.1	mm Hg
VAPOR PRES AT AMBIENT TEMP	=	.408	psia
	=	21.1	mm Hg

CONTAINER CHARACTERISTICS

CONTAINER TYPE	=	Vertical cylinder	
TANK DIAMETER	=	13.046	feet
TOTAL WEIGHT OF CONTENTS	=	156095	lbs
LIQUID HEIGHT IN CONTAINER	=	20	feet
DISCHARGE HOLE DIAMETER	=	8.5	inch(es)
DISCHARGE COEFFICIENT OF HOLE	=	.62	
TEMP OF CONTAINER CONTENTS	=	68	degrees F
TANK CONTENTS DURING FIREBALL	=	156095	lbs

ENVIRONMENTAL/LOCATION CHARACTERISTICS

AMBIENT TEMPERATURE	=	68	degrees F
WIND VELOCITY	=	3.4	mph
LIQUID CONFINEMENT AREA	=	NONE	

KEY RESULTS PROVIDED BY USER INSTEAD OF BY EVALUATION METHODS

NONE OBSERVED

KEY RESULTS OVERRIDDEN BY USER AT SOME POINT AFTER COMPUTATION

NONE OBSERVED

HAZARDOUS MATERIAL = PCE/toluene
ADDRESS \ LOCATION = WTI, East Liverpool, OH
DATE OF ASSESSMENT = June 5, 1995
NAME OF DISK FILE = SC2TYPP.ASF

*** SCENARIO DESCRIPTION

WTI Accident Analysis, Scenario 2 (typical)
Four drums rupture indoors
200 gallon spill and fire

******* DISCHARGE RATE/DURATION ESTIMATES

Liquid discharge from nonpressurized container

Average discharge rate	=	156.5	lbs/min
Duration of discharge	=	9.99	minutes
Amount discharged	=	1561	lbs
State of material	=	Liquid	

******* LIQUID POOL SIZE ESTIMATES

Evaporating pool area	=	812	ft2
Burning pool area	=	227.9	ft2

Note: Pool is assumed to ignite immediately upon initiation of discharge.

******* POOL FIRE HAZARD ESTIMATION RESULTS

Burning pool radius	=	8.6	feet
Flame height	=	34	feet
Fatality zone radius	=	23	feet
Injury zone radius	=	32	feet

******* FIREBALL HAZARD RESULTS

Max fireball diameter	=	186	feet
Maximum fireball height	=	305	feet
Fireball duration	=	7.7	seconds
Fatality zone radius	=	93	feet
Injury zone radius	=	208	feet

INPUT PARAMETER SUMMARY

PHYSIOCHEMICAL PROPERTIES OF MATERIAL

NORMAL BOILING POINT	=	233	degrees F
MOLECULAR WEIGHT	=	98.68	
LIQUID SPECIFIC GRAVITY	=	.94	
VAPOR PRES AT AMBIENT TEMP	=	.409	psia
	=	21.13	mm Hg

CONTAINER CHARACTERISTICS

CONTAINER TYPE	=	Vertical cylinder	
TANK DIAMETER	=	3.53	feet
TOTAL WEIGHT OF CONTENTS	=	1561	lbs
LIQUID HEIGHT IN CONTAINER	=	2.8	feet
DISCHARGE HOLE DIAMETER	=	1.42	inch(es)
DISCHARGE COEFFICIENT OF HOLE	=	.62	
TEMP OF CONTAINER CONTENTS	=	68	degrees F
TANK CONTENTS DURING FIREBALL	=	1561	lbs

ENVIRONMENTAL/LOCATION CHARACTERISTICS

AMBIENT TEMPERATURE	=	68	degrees F
WIND VELOCITY	=	3.4	mph
LIQUID CONFINEMENT AREA	=	NONE	

KEY RESULTS PROVIDED BY USER INSTEAD OF BY EVALUATION METHODS

NONE OBSERVED

KEY RESULTS OVERRIDDEN BY USER AT SOME POINT AFTER COMPUTATION

NONE OBSERVED

HAZARDOUS MATERIAL = PCE/toluene
ADDRESS \ LOCATION = WTI, East Liverpool, OH
DATE OF ASSESSMENT = June 5, 1995
NAME OF DISK FILE = SC5CONP.ASF

*** SCENARIO DESCRIPTION

WTI Accident Analysis, Scenario #5 (conservative)
Off-site tanker truck accident
5,000 gallon spill and fire

******* DISCHARGE RATE/DURATION ESTIMATES

Liquid discharge from nonpressurized container

Average discharge rate	=	3854.3	lbs/min
Duration of discharge	=	10.2	minutes
Amount discharged	=	39024	lbs
State of material	=	Liquid	

******* LIQUID POOL SIZE ESTIMATES

Evaporating pool area	=	7907	ft2
Burning pool area	=	5611	ft2

Note: Pool is assumed to ignite immediately upon initiation of discharge.

******* POOL FIRE HAZARD ESTIMATION RESULTS

Burning pool radius	=	42.3	feet
Flame height	=	102	feet
Fatality zone radius	=	110	feet
Injury zone radius	=	158	feet

******* FIREBALL HAZARD RESULTS

Max fireball diameter	=	541	feet
Maximum fireball height	=	889	feet
Fireball duration	=	13.1	seconds
Fatality zone radius	=	552	feet
Injury zone radius	=	1106	feet

INPUT PARAMETER SUMMARY

PHYSIOCHEMICAL PROPERTIES OF MATERIAL

NORMAL BOILING POINT	=	233	degrees F
MOLECULAR WEIGHT	=	98.68	
LIQUID SPECIFIC GRAVITY	=	.94	
VAPOR PRES AT AMBIENT TEMP	=	.409	psia
	=	21.13	mm Hg

CONTAINER CHARACTERISTICS

CONTAINER TYPE	=	Horizontal cylinder	
TANK DIAMETER	=	4.2	feet
TANK LENGTH	=	48.3	feet
TOTAL WEIGHT OF CONTENTS	=	39024	lbs
LIQUID HEIGHT IN CONTAINER	=	4.2	feet
DISCHARGE HOLE DIAMETER	=	5.8	inch(es)
DISCHARGE COEFFICIENT OF HOLE	=	.62	
TEMP OF CONTAINER CONTENTS	=	68	degrees F
TANK CONTENTS DURING FIREBALL	=	39024	lbs

ENVIRONMENTAL/LOCATION CHARACTERISTICS

AMBIENT TEMPERATURE	=	68	degrees F
WIND VELOCITY	=	3.4	mph
LIQUID CONFINEMENT AREA	=	NONE	

KEY RESULTS PROVIDED BY USER INSTEAD OF BY EVALUATION METHODS

NONE OBSERVED

KEY RESULTS OVERRIDDEN BY USER AT SOME POINT AFTER COMPUTATION

NONE OBSERVED

HAZARDOUS MATERIAL = PCE/toluene
ADDRESS \ LOCATION = WTI, East Liverpool, OH
DATE OF ASSESSMENT = June 5, 1995
NAME OF DISK FILE = SC5TYPP.ASF

*** SCENARIO DESCRIPTION

WTI Accident Analysis, Scenario 5 (typical)
Off-site tanker truck accident
100 gallon spill and fire

******* DISCHARGE RATE/DURATION ESTIMATES

Liquid discharge from nonpressurized container

Average discharge rate	=	78.4	lbs/min
Duration of discharge	=	10	minutes
Amount discharged	=	784	lbs
State of material	=	Liquid	

Note: Duration of discharge was intentionally shortened by user to account for response to spill. Computed duration was originally 498.1 minutes.

******* LIQUID POOL SIZE ESTIMATES

Evaporating pool area	=	408	ft2
Burning pool area	=	114.2	ft2

Note: Pool is assumed to ignite immediately upon initiation of discharge.

******* POOL FIRE HAZARD ESTIMATION RESULTS

Burning pool radius	=	6.1	feet
Flame height	=	27	feet
Fatality zone radius	=	16	feet
Injury zone radius	=	23	feet

******* FIREBALL HAZARD RESULTS

Max fireball diameter	=	148	feet
Maximum fireball height	=	242	feet
Fireball duration	=	6.8	seconds
Fatality zone radius	=	74	feet
Injury zone radius	=	145	feet

INPUT PARAMETER SUMMARY

PHYSIOCHEMICAL PROPERTIES OF MATERIAL

NORMAL BOILING POINT	=	233	degrees F
MOLECULAR WEIGHT	=	98.68	
LIQUID SPECIFIC GRAVITY	=	.94	
VAPOR PRES AT AMBIENT TEMP	=	.409	psia
	=	21.13	mm Hg

CONTAINER CHARACTERISTICS

CONTAINER TYPE	=	Horizontal cylinder	
TANK DIAMETER	=	4.2	feet
TANK LENGTH	=	48.3	feet
TOTAL WEIGHT OF CONTENTS	=	39024	lbs
LIQUID HEIGHT IN CONTAINER	=	4.2	feet
DISCHARGE HOLE DIAMETER	=	.827	inch(es)
DISCHARGE COEFFICIENT OF HOLE	=	.62	
TEMP OF CONTAINER CONTENTS	=	68	degrees F
TANK CONTENTS DURING FIREBALL	=	784	lbs

ENVIRONMENTAL/LOCATION CHARACTERISTICS

AMBIENT TEMPERATURE	=	68	degrees F
WIND VELOCITY	=	3.4	mph
LIQUID CONFINEMENT AREA	=	NONE	

KEY RESULTS PROVIDED BY USER INSTEAD OF BY EVALUATION METHODS

NONE OBSERVED

KEY RESULTS OVERRIDDEN BY USER AT SOME POINT AFTER COMPUTATION

NONE OBSERVED

APPENDIX VII-4

Atmospheric Dispersion Modeling

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I. ATMOSPHERIC DISPERSION MODELING

A. Model Selection

Atmospheric dispersion modeling of accidental releases is conducted using the following approaches:

1. SLAB Model

SLAB is a computer model that simulates the atmospheric dispersion of denser-than-air releases (Ermak 1990) and is one of the five refined models used in developing guidance on the application of refined dispersion models to hazardous/toxic air pollutant releases (U.S. EPA 1993). The model is capable of modeling continuous, finite duration, and instantaneous releases from four types of sources: 1) a ground level evaporating pool; 2) an elevated horizontal jet; 3) a stack or elevated vertical jet; and 4) a ground-based instantaneous release. The SLAB model is used to model the vapor releases for the WTI accident scenarios for the following reasons:

- SLAB is a fully-documented model released by Lawrence Livermore National Laboratory and listed by the U.S. EPA for use when modeling hazardous/toxic air pollutant releases.

- SLAB simulates both neutral and denser-than-air releases.

- SLAB allows for continuous, finite duration, and instantaneous releases as well as automatic transition of continuous plume into transient plume with various time-averaged concentrations at the receptor locations.

2. ISC-COMPDEP Model

The ISC-COMPDEP air dispersion model is used for modeling steady-state or quasi-steady-state buoyant emissions resulting from accidents involving fire. It was previously modified to allow the use of wind and temperature data at multiple levels derived from local meteorological observations at the WTI site (See Volume IV). Selection of ISC-COMPDEP for modeling the off-site air concentrations resulting from emissions from fire scenarios is based on the following considerations:

- The model is used in the WTI risk assessment report for modeling stack and fugitive emissions from the facility;
- The model is capable of estimating off-site air concentrations in simple and complex terrain; and
- The emissions associated with fire scenarios can be conservatively treated as continuous buoyant plumes due to high temperature and strong mixing with the entrained air.

B. Meteorological Data

For each identified accident scenario, off-site chemical concentrations in air are evaluated for three meteorological conditions: 1) typical; 2) conservative; and 3) calm/inversion. The modeling under each of these conditions is described below.

1. Typical Condition

Typical meteorological condition may be best represented by the real-time meteorological data observed at the site. A hybrid hourly surface meteorological data set, DEPBIN.MET, was developed mainly from wind data observed at the on-site meteorological towers and supplemented with the data observed at other off-site meteorological towers (the Beaver Valley Power Station meteorological tower and the National Weather Service Station at the Greater Pittsburgh International Airport) for ceiling height, cloud cover, and stability. The preprocessed data contains 8,760 hourly entries of wind direction, wind speed, ambient temperature, atmospheric stability, and mixing height (April 1992 through March 1993). It is used in the air quality modeling of stack and fugitive emissions from the WTI facility (See Volume IV).

The typical meteorological condition is defined based on the most frequent single type of stability conditions at the facility to provide a simplified approach to estimate the average zone of impact if an accidental release were to occur. The typical meteorological condition is defined as neutral atmosphere (Pasquill-Gifford Stability Category D) with average wind speed (3.2 m/sec). Selection of this condition to represent the typical meteorology for the accident analysis is based on the hourly surface meteorological data recorded between April 1, 1992, and March 31, 1993, at the WTI facility, which indicates the following:

- The most common prevailing atmospheric stability at the WTI facility is stability category D, which occurs approximately 57% of the time; the next most common stability category is F/G, which occurs approximately 21% of the time.

- The average wind speed for non-calm hours at the WTI facility is 3.2 m/s.

The approach of using a typical condition is relatively simple because it assumes a meteorology independent of wind direction and terrain elevation. While the average zone of impact for a receptor could be direction-specific and terrain-specific, it could alternatively be estimated using real-time meteorological conditions and site-specific terrain elevations, averaging only the concentrations directly downwind of the release. However, this would require advanced ISC-COMPDEP and SLAB air modeling involving modification of the source codes. The advanced modeling is not warranted given the range of meteorological conditions considered for each accident scenario.

It should be emphasized that the radius of the zone impacted by an accidental release is usually developed primarily for emergency planning purposes. During an accident, the wind may suddenly change direction, thus affecting different off-site populations. The use of a typical meteorological condition reflecting a combination of average stability and wind speed is considered adequate for a screening assessment to define an average zone of impact during an accident, independent of the wind direction. The average zone of impact is presented in additional to the maximum zone of impact, determined from the worst-case meteorological condition, to assist the emergency planner in defining the radius of the impacted zone under different meteorology regardless of the wind direction. This is consistent with the guidance for estimating vulnerable zones to actual releases recommended by U.S. EPA (1987) where it is suggested that emergency planners use a circle for fixed sites

or a corridor for transportation routes when estimating vulnerable zones because both wind speed and direction may change during the course of the release.

2. Conservative Condition

The screening meteorological conditions used in the SCREEN2 air dispersion model (U.S. EPA 1992) are used for identifying the conservative meteorological condition and for determining the maximum vapor concentration at each receptor. The 54 combinations of atmospheric stability and wind speed used in SCREEN2 for determining the conservative off-site vapor concentrations are summarized in Table 1. The conservative meteorological condition could be different for each downwind distance depending upon other parameters (such as plume rise, receptor downwind distance, source elevation, terrain elevation and receptor height) that characterize the dispersion. By examining all 54 combinations of wind speed and atmospheric stability, the maximum exposure concentration for each downwind distance can be determined. The 54 combinations of atmospheric conditions are considered to be more stringent than the conservative meteorological conditions defined by various regulatory agencies in quantifying the maximum exposure concentration for each downwind distance. For example, the screening meteorology covers the 1.5 m/sec, F-stability meteorology suggested in U.S. EPA's technical guidance for hazards analysis (U.S. EPA 1987), and the 2 m/sec, F-stability meteorology for ground-level and elevated releases affected by gravity or the 2 m/sec, A-stability meteorology for elevated, high flowrate, buoyant releases used in the Toxic Catastrophe Prevention Act (TCPA) program in New Jersey (NJDEP 1993).

3. Calm/Inversion Condition

Ground-level vapor concentrations could be significantly increased during certain meteorological conditions under which the plume is confined in the atmospheric boundary layer. Limited mixing occurs when the vertical mixing of the plume with the air is limited by a stable layer aloft. The worst meteorological condition during an inversion for off-site receptors is a stagnation period (calm condition with no winds) associated with a strong temperature inversion. During this period, air contaminants would accumulate over the source area before being dispersed downwind by light winds. In this Accident Analysis, the calm/inversion conditionis defined as a stable atmosphere with little winds (Stability F and wind speed of 1 m/s) immediately after a long period of calm condition.

The calm/inversion meteorological condition represents one of the most stable conditions that may occur at the WTI site. The hypothetical meteorology assumes that a temperature inversion with conservative meteorology would occur after calm hours. The limited mixing in the surface layer imposed by the temperature inversion is represented by a mixing height of 100 m in the SLAB model and the conservative meteorology is represented by the combination of low wind speed (1 m/sec) and stable atmosphere (Monin-Obukov length of 8.3 m, approximately equivalent to Pasquill-Gifford atmospheric stability of E or F based on the Liu-Durran regression equation, as referenced by Randerson 1984). It is similar to the calm meteorological condition previously evaluated in the routine stack and fugitive emissions study (See Volume IV) where emissions during the calm hours were accumulated and released at the end of the calm period.

It is assumed that vapor emissions due to a spill would accumulate over the spill area during the calm hours and disperse slowly downwind in a confined stable atmospheric boundary layer. The portion of emissions accumulated during the calm hours would transport downwind, as soon as the atmospheric winds resume, as a puff with the strength equal to the total emissions accumulated during the calm hours. The spill area would continue to emit toxic vapors at the same emission rate as previously calculated for the typical and conservative meteorology. The continuous emissions, if there is sufficient quantity for further volatilization after the calm hours, would travel downwind as a continuous plume. Based on a screening analysis, it was determined that the worst off-site air impact would occur due to short duration (up to 1 hour) of calm conditions. The screening analysis is provided in Section E.4.

Because ISC-COMPDEP does not simulate instantaneous or transient releases, this type of meteorological condition is not modeled by ISC-COMPDEP. However, the exposure concentrations under the calm/inversion condition may be qualitatively addressed using the results obtained under the conservative non-inversion condition.

C. Dispersion Categories

Five release scenarios were identified in Appendix VII-3 for atmospheric dispersion modeling in the accident analysis. Two emission conditions, conservative and typical, were identified for each release scenario. The five dispersion categories identified in the accident analysis are:

- **Category 1: On Site Spill**
  (Conservative Emissions) - Spill of 5,000 gallons of liquid organic waste from one tanker truck at the Organic Waste Tank Farm Truck Unloading Station area within the WTI facility (Figure 1). The liquid organic waste is assumed to be stored under atmospheric temperature and atmospheric pressure and contains either formaldehyde or acetone at 100,000 ppm (10% by weight).

  (Typical Emissions) - Spill of 100 gallons of the same waste at the same area.

- **Category 2: On-site Fire**
  (Conservative Emissions) - Storage tank rupture and release of 20,000 gallons of liquid organic waste over a finite time period in the Organic Waste Tank Farm, followed by ignition of the released waste and a fire. Phosgene and HCl are assumed to be released as combustion products.

  (Typical Emissions) - Spill of 200 gallons of the same waste ignites at the same area.

- **Category 3: On-site Mixing of Incompatible Wastes**
  (Conservative Emissions) - Release of hydrogen chloride gas from the storage vessel during an accident involving mixing of 10,000 gallons of incompatible wastes (chlorinated hydrocarbons and mineral acids) a storage vessel. The potential accident is assumed to occur at the tank storage area.

  (Typical Emissions) - Release of hydrogen chloride gas resulting from mixing of 200 gallons of incompatible wastes, as described in Appendix VII-3.

- **Category 4: Off-site Tanker Truck Spill**
  (Conservative Emissions) - Spill of 5,000 gallons of liquid organic waste over a finite time period from an inbound tanker truck involved in an incident on the local access route to the WTI facility (Figure 2). The liquid organic waste is assumed to be stored under atmospheric temperature and atmospheric pressure and contains either formaldehyde or acetone at 100,000 ppm (10% by weight).

  (Typical Emissions) - The same accident scenario as the conservative emission condition with a 100 gallon spill.

- **Category 5: Off-site Tanker Truck Spill With Fire**
  (Conservative Emissions) - Spill and subsequent ignition of 100 gallons of liquid organic waste over a finite time period from an inbound tanker truck involved in an incident on the local access route. Phosgene and HCl are assumed to be released as combustion products.

  (Typical Emissions) - Spill of 100 gallons of liquid waste and subsequent ignition of same at the same area.

Because it is anticipated that the on-site emergency team would be able to respond and mitigate a spill/fire accident on-site in 10 to 60 minutes, additional evaluation of all on-site accident scenarios is conducted assuming the fire/emission will be terminated in 10 or 60 minutes.

SLAB is used for modeling all release scenarios except the fire scenarios where strong buoyancy plumes may impinge on elevated terrains farther away from the source areas. Fire scenarios are modeled using the ISC-COMPDEP model.

D. Modeling Parameters

1. SLAB

The SLAB modeling analyses are conducted assuming dispersion would occur in a suburban environment (for modeling purposes, this is defined by the surface roughness). Tables 2 through 6 show the input parameters used in SLAB modeling. The definition of each model parameter is presented in Table 7. Detailed descriptions of these parameters can be found in the SLAB user's manual (Ermak 1990) and in U.S. EPA guidance on the application of refined models (U.S. EPA 1993). Specific modeling techniques requiring further discussions are provided below.

- **Source Area**
  The source area for the conservative on-site spill scenario (Dispersion Category 1) is calculated to be 418 m^2 for the conservative emission condition, based on an area of 60 ft by 75 ft at the truck unloading station. A spill volume of 5,000 gallons was determined to be the maximum release quantity. For the typical on-site spill volume of 100 gallons, the area was calculated to be 38 m^2. The source area was represented by a square and

positioned at the center of the area to the north of the Truck Unloading Station.

Phosgene and HCl emissions would result from the on-site fire scenario (Dispersion Category 2). The area of emissions is assumed to be 180 m^2 (1/4 of the Organic Waste Tank Farm area) for the conservative emission condition. The source area is therefore represented by a square of 13.5 m by 13.5 m, located at the Organic Waste Tank Farm area. For the typical on-site spill of 200 gallons, the area is calculated to be 76 m^2, assuming a spill depth of 1 cm.

Hydrogen chloride emissions due to mixing of incompatible wastes (Dispersion Category 3) are expected to be instantaneous as the chemical reactions occur. HCl emissions resulting from mixing of incompatibles are expected to be vented through the vapor recovery system of the storage vessel and the HCl generation rate depends on the waste pumping rate. The duration of release (20 minutes) is determined by the amount of time required for emptying all of the contents of the tanker truck (5,000 gallons). For a typical spill of 200 gallons of liquid waste, the duration is assumed to be 10 minutes and the source area is calculated to be 76 m^2.

The source area for the off-site spill (Dispersion Category 4) with conservatively high emissions is calculated to be less than 1,900 m^2, the area of an unconfined spill is calculated using a spill depth of 1 cm (U.S. EPA 1992; U.S. EPA 1987) and a spill volume of 5,000 gallons. It is assumed that the spill toward the two sides of the road will be either absorbed by soil or collected by the storm sewage system and therefore only the spill along the road will not be confined. The source is thus represented by a rectangular road segment of 15 m by 49 m (approximately 735 m^2 for the conservative scenario). The width of the road (15 m) is calculated based on a typical two-lane highway with shoulder on each side. The width of each lane or road shoulder is assumed to be 3.65 m (12 ft) based on the standard design of highway construction (Duttenhoeffer et al. 1983). The length of the source area is determined to be the same as the characteristic length of an unconfined spill of the same volume (the diameter of an unconfined spill). For the typical release scenario, the area was calculated to be 38 m^2.

Phosgene and hydrogen chloride gases would be generated due to a pool fire. The source area for the off-site fire scenario (Dispersion Category 5) is assumed to be the same as Dispersion Category 4. The source will be

represented by a rectangular road segment of 15 m by 49 m (approximately 735 m^2) for the conservative release scenario and 38 m^2 for the typical release scenario.

- **Source Temperature**
  For non-buoyant emissions (Dispersion Categories 1, 3, and 4), the source temperatures are set equal to the ambient temperature. For emissions associated with a fire (or potential heat release) scenarios (Dispersion Categories 2 and 5), the scenario-specific source temperature is estimated, as described in Appendix VII-3.

- **Source Height**
  The source height for mixing of incompatible wastes under the conservative emissions scenario is assumed to be the height of the building vent plus an additional height due to plume rise as the result of release gas momentum.

  The effective stack height, h_{eff}, is calculated using the Holland formula with the release temperature equal to the ambient temperature.

$$h_{eff} = h + \Delta h \quad (1)$$

$$\Delta h = \frac{v_s\, d}{u} \quad (2)$$

where:

Δh = plume rise (m);
v_s = stack gas exit velocity (m/s);
u = ambient wind speed (m/s);
d = stack diameter (m).

The stack gas exit velocity is calculated as the volumetric flow rate divided by the cross-sectional area of the stack to be 37 m/s. Therefore,

$$\Delta h = \frac{(37\ m/s)(0.20\ m)}{(3.2\ m/s)} = 2.3\ m \quad (3)$$

Thus the release height is:

$$h_{eff} = 6.1\ m + 2.3\ m = 8.4\ m \quad (4)$$

Sources for all spill scenarios are assumed to be at ground level.

- **Source Elevation**
  For all scenarios, it is assumed that there is no elevation difference between the source and the receptors. For a ground-level source release, the maximum exposure-point concentration will occur on the ground and within a short distance from the source. Treating elevated terrain as flat terrain would result in more conservative (or higher) exposure concentrations at the off-site receptors.

- **Receptor Locations**
  The SLAB model automatically computes volume concentrations at 61 downwind locations based on the maximum downwind distance specified by the user. It does not calculate concentrations at specific downwind locations because in the transient puff dispersion mode time is the independent variable rather than the downwind distance. A FORTRAN program, Program AIRCONC (Attachment A), is thus developed to linearly interpolate concentrations at specific receptor locations using the 61 values computed by SLAB. For the conservative release scenarios where the impacts of the emissions are expected to extend further downwind, the maximum downwind distance used in the SLAB model was assigned to 20,000 m such that concentrations at 24 hypothetical receptor locations (x = 25, 50, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1,000, 1,250, 1,500, 1,750, 2,000, 2,250, 2,500, 3,000, 4,000, 5,000, 10,000, 15,000, 20,000 m) can be interpolated. The maximum downwind distance is reduced to 5,000 m and the hypothetical receptor locations are reduced to 21, excluding the

receptors beyond 5,000 m, for the typical release scenarios to increase the resolution of the model predictions.

- **Receptor Height**
  All receptors are assumed to be at the ground level.

- **Receptor Elevation**
  All receptors are assumed to be at the same elevation as the source.

- **Surface Roughness Length**
  The surface roughness length is a measure of the roughness of a surface over which air is flowing. For a homogenous surface, its value is sometimes approximated as 1/10 of the average height of the surface irregularity. When the landscape contains any obstructions (i.e., is nonhomogeneous), an effective roughness length must be determined.

  The overall effects of increasing surface roughness are to retard the horizontal, buoyancy-induced spreading of the plume or cloud and to enhance the mixing between plume and environment as a result of the ambient and plume turbulence. Large surface roughness values could significantly decrease modeled concentrations. For low or ground-level releases, increasing the surface roughness value by a factor of 10 may result in concentration reductions by a factor of 2 (Britter and McQuaid 1988).

  The surface roughness length (z_o) for urban areas are reported to be between 100 cm and 600 cm, and was 60 cm and 80 cm for suburban medium buildings (U.S. EPA 1985). For suburban residential dwellings, z_o is found to be approximately 5 cm (U.S. EPA 1985). In the vicinity of grassy areas or agricultural crop field, z_o varies from 4 cm to 20 cm (U.S. EPA 1985, 1993). Based on the combined surface protrusions in the vicinity of WTI (suburban medium building, suburban residential dwellings, grassy with agricultural crops), z_o is estimated to be between 10 cm and 50 cm. Therefore, a median site-specific value of 30 cm, as used in the ISC-COMPDEP modeling for routine emissions (See Volume IV), is selected for the atmospheric dispersion modeling.

- **Concentration Averaging Time**

  The concentration averaging time is set to be one-half hour, which is consistent with the derivation of the Level of Concern (LOC) and Immediately Dangerous to Life or Health (IDLH) acute toxicity criteria used in the accident analysis.

  For instantaneous puff releases or releases with a duration of 5 minutes or less, the peak average concentrations over time periods of up to one hour depend not only on the averaging time but also on the ambient wind speed and the instantaneous horizontal puff dispersion coefficient (U.S. EPA 1988). For continuous plume releases or releases with a duration of more than 5 minutes, the concentration estimate follows a power relationship with the averaging time. Using a power exponent of 0.2 suggested by U.S. EPA (1988), a 15-minute average would be approximately 1.15 times greater than the 30-minute average. Thus, an averaging time of 30 minutes represents an averaging duration that is consistent with derivation of the health-based reference concentrations (IDLH or LOC) used in this assessment and does not significantly underestimate the concentrations when other short duration (less than 30 minutes) acute toxicity criteria are applied.

- **Time-Varying Releases**

  Vapor emissions associated with unconfined releases are expected to be time-varying and time-limited. The emission rates are expected to decrease from their initial large emission rates due to chemical adsorption and absorption onto soils or surfaces for unconfined releases and due to the decrease of chemical content in the spilled solution for confined releases.

  For unconfined spills, vapor emissions will be retarded because of the reduction of quantity available for diffusion and the increased diffusion pathways for chemical vapors to travel in the soil medium after the spills.

  Time-varying emission rates are governed by chemical-specific properties and site-specific conditions that are too complex to be incorporated in the air dispersion analysis. The steady-state emission model discussed in Appendix VII-3 is likely to underestimate the emission duration and overestimate the emission rates. A pseudo steady-state approach using the steady-state model for each time increment is developed for use in the current assessment. This approach is discussed in detail in Appendix VII-3.

- **Building Wake Effect**
  The presence of buildings or structures increases the intensity of atmospheric turbulence near an emission source. As a result, chemical vapors are rapidly mixed with large volume of air at the source, and the plume would travel downwind with wider vertical and horizontal spread but lower concentration at the plume centerline than that for the same release without nearby buildings. For a release that is confined within a building/warehouse, chemical vapors escaping from the building would be significantly less than the release. The current dispersion modeling conservatively assumes that the release is in an open area without considering the building wake effect (caused by the nearby structures) or building confinement effect on the plume dispersion and, consequently, overestimates the maximum downwind concentrations.

- **Relative Humidity**
  The mean relative humidity at the WTI site is obtained from the historical humidity data for Pittsburgh, Pennsylvania, complied by the U.S. Department of Commerce (U.S. DOC 1993). An annual averaged relative humidity of 68% is used in the SLAB modeling.

2. ISC-COMPDEP

The ISC-COMPDEP modeling analyses are conducted for the conservative on-site and off-site fire scenarios. Typical fire scenarios are addressed using the modeling results developed for the conservative scenarios, discussed in the following section. Common modeling parameters, such as source size, fire temperature, roughness length, are kept the same as used in SLAB modeling. Specific modeling parameters requiring further discussions are provided below:

- **Source Elevation**
  The elevation for the source area is obtained from the USGS topographical maps of the region.

- **Receptor Locations**

  A radial grid of receptors, the same as is used in the incinerator stack emission modeling, is used in ISC-COMPDEP modeling. Receptors are placed in rings at distances of 100, 200, 300, 400, 500, 600, 700, 800, 900, 1,000, 1,250, 1,500, 1,750, 2,000, 2,250, 2,500, 3,000, 4,000, 5,000, 7,500, 10,000, 15,000, 20,000, 30,000, 40,000, and 50,000 m from the source. Each receptor ring consists of 36 receptors located at 10° intervals.

- **Receptor Elevation**

  The terrain elevation for each receptor is determined from the USGS topographical maps as the maximum terrain height located with a sector defined as ± 5° on either side of the receptor including the area from the receptor ring out to the next distant receptor ring.

  For the analyses involving the hypothetical conservative and typical meteorological conditions, the highest elevation among receptors of a fixed-distance ring is selected to represent the receptor elevation of the receptor at that downwind distance since the most elevated receptor would yield the maximum concentrations for a given ring. This application implies that the worst receptor elevation is used in addition to the conservative meteorological condition in the ISC-COMPDEP dispersion analysis.

- **Concentration Averaging Time**

  The minimum concentration averaging time implied by ISC-COMPDEP is one hour because ISC-COMPDEP is a continuous plume model, which does not allow the use of various averaging time at receptors, and the duration for each meteorological observation is one hour. However, concentrations of shorter averaging time can be estimated from the 1-hour average using the peak to mean concentrations observed for sampling periods from 3 minutes to about half an hour. The concentration of shorter averaging time can be obtained as (Turner 1967, U.S. EPA 1988):

$$C_s = C_{1\text{-}hr}\,(60/t_s)^p \qquad (5)$$

where, C_s = Concentration averaged over t_s, (ppm);

t_s = the averaging time (minutes);
$C_{1\text{-hr}}$ = the 1-hr average concentration (ppm); and
p = 0.2 (U.S. EPA 1988).

One notices the above equation only accounts for the plume meandering due to wind direction and may not be applicable for puff or transient plume releases.

- **Building Wake Effect**
  The building wake effect is considered in the on-site fire scenario because there are large storage tanks located in the potential spill area. The building wake effect is studied using the U.S. EPA Building Profile Input Program. Detailed building information of the storage tanks is provided in Attachment 4. The building wake analysis is discussed in Volume IV.

E. Results and Discussions

Attachment 2 presents the SLAB model output for the conservative and typical on-site spill of formaldehyde and methanol. Complete SLAB model outputs are available on two 3 1/2-inch floppy diskettes or can be reproduced using the input parameters listed in Tables 2 through 6 and the public-accessible SLAB model. Attachment 3 shows the computer outputs from AIRCONC which display the 30-minute average exposure concentrations at specific receptor locations. Tables 8 through 12 summarize the impact distances associated with each chemical of concern and release scenario. Concentration estimates and associated modeling techniques are addressed below.

1. Initial Concentration

All release scenarios involving low volatility liquid spill are modeled in the SLAB modeling as releases of the mixtures. The SLAB outputs are summarized as volumetric concentrations of the initial mixtures. U.S. EPA's guidance on the application of refined dispersion models for hazardous/toxic air releases suggests that the SLAB results should be adjusted to account for the chemical-specific portion of the release by multiplying the concentration results by the fraction of the chemical in the initial vapor-phase concentration (U.S. EPA 1993). However, it should be noted that the real emission rate from a spill will not be constant in time. Effects such as cooling of the spill as a result of evaporation will suppress the emission rate. Chemicals with higher evaporation potential will escape from the pool faster than other chemicals but slow down as the residual concentration in the spill decreases.

For volatile chemicals such as formaldehyde, the initial mole fraction in the vapor phase is much greater than the mole fraction in the liquid. The mole fraction of formaldehyde in vapor phase will decrease in time because the vapor pressure of formaldehyde will decrease in the formaldehyde-depleted liquid as time increases. Therefore, adjusting the concentration results by multiplying the results by the mole fraction of chemical in the initial vapor-phase concentration would result in significant overestimation of the total mass available in the liquid for emissions. The algorithm developed in Appendix VII-3 is used to estimate the average mole fraction of a chemical in vapor during an accidental release. The methodology is developed from the principle of mass conservation and takes into consideration the fact that chemicals with higher volatility will evaporate from the spill pool faster than chemicals with lower volatility.

Figure 3 shows the mass evaporation rates of formaldehyde and methanol for a conservative on-site spill scenario. According to the steady-state approach, the liquid will emit the chemical mixture at a constant rate of 2.5 kg/sec for approximately 6,000 seconds (1 hour and 40 minutes) and the vapor contains approximately 80% of formaldehyde and 20% of methanol throughout the emissions. This would result in an overestimation of formaldehyde by approximately 8-fold since formaldehyde initially constitutes only 10% of the liquid waste. By using the chemical-specific time-varying emissions, the principle of mass conservation is preserved, as seen in Figure 3 where the area under the formaldehyde emission curve that represents the total mass of formaldehyde emitted is 10% of the total mass available in the liquid waste, and the emission duration is predicted to last for approximately 3,000 seconds (50 minutes). As shown in the figure, formaldehyde leaves the liquid much faster than methanol and the time for the rest of methanol to evaporate is actually much longer than the steady-state emission approach predicted due to the low volatility of methanol. Figure 4 shows the time-varying acetone and toluene emission rates for a conservative on-site spill scenario. Acetone leaves the liquid faster than toluene due to its higher volatility.

The average mole fraction obtained for each chemical for each accident scenario is used to convert the SLAB output of mixture concentrations to the desired chemical concentrations. Table 13 summarizes the average mole fractions used for estimating the chemical air concentrations.

2. Ambient Temperature

The ambient temperature may have significant effect on hazardous releases. The ambient temperature has a more significant effect on vapor emissions than air dispersion. If the ambient temperature is above the boiling point of the mixture, the liquid waste may flash rather than evaporate. In addition, increased ambient temperatures would increase the evaporation rate of the liquid waste. The boiling points for the liquid waste examined in this assessment are well above the room temperature or the extreme high temperature of summer time in the area. The maximum temperature for the Pittsburgh area is 103 °F (or 312 K) with a monthly normal maximum of 83 °F (or 307 K), based on the historical climatic data published by the U.S. DOC (1993). Hence, flashing, which can significantly increase the emission rate and alter the air dispersion characteristics, is not expected to occur during a spill accident. The monthly normal maximum is only approximately 5% higher than the average ambient temperature used in the analysis (307 K vs 293 K) and therefore the temperature effect on emission and air dispersion is not considered significant.

3. Relative Humidity

The relative humidity can affect the dynamics of elevated jet release and alter the plume height above the ground (U.S. EPA 1993). Higher humidity will increase the water vapor content in the initial vapor concentration and slightly increase the buoyancy effect of the plume. However, the increase in plume buoyancy is not expected to be significant because the mole fraction of water vapor in the ambient air could not exceed 0.7% based on the vapor pressure of H_2O. Two SLAB modeling runs are performed to examine the impact of relative humidity on plume dispersion using identical meteorology and modeling parameters. It is found that the off-site concentrations predicted by SLAB vary insignificantly (less than 1%) as the relative humidity increases from 0 to 100%. Hence, the effect of relative humidity on vapor emission and plume dispersion is considered negligible, particularly in the greater Pittsburgh area where the seasonal humidity average varies in a relatively narrow range of 56 to 77%, with an average of 68% (U.S. DOC 1993).

4. Modeling Emissions Under Calm/Inversion Conditions

As discussed in Section II.B.3, emissions during the calm/inversion conditions are modeled by superimposing the exposure concentration resulting from a puff release to that from a continuous or transient plume release. In the SLAB

modeling, only the puff model is conducted for releases that last for less than an hour. For releases lasting more than an hour, it is assumed that the release would accumulate for a maximum duration of one hour prior to the occurrence of conservative meteorology (1 m/sec wind in a stable limited mixing layer). However, releases resulting from fire scenarios under the calm/inversion conditions are not studied due to the unavailability of appropriate models.

a. The Vapor Accumulation Time

The duration for vapors to accumulate during the calm hours is assumed to be the actual emission time or a maximum of 1 hour. Although the calm meteorological condition may occur at the WTI site for several consecutive hours, one hour is selected to represent the duration that could possibly result in the worst impact to the off-site community (with largest impact zone) based on the following considerations:

- Although the mean motion of the atmospheric current ceases (or subsides to less than 1 m/sec) during the calm hours, both lateral and vertical velocity fluctuations (atmospheric turbulence) will continue to disperse the vapor cloud accumulated above the spill. The atmospheric turbulence will uniformly disperse the vapor cloud in all directions during the calm hours. The average concentration within this cloud is expected to be high, but not as high as the concentration at the center of an instantaneously released puff.

  The average concentration in the neutrally buoyant vapor cloud during a one hour stagnation period can be estimated using the following assumptions:

  - a turbulent intensity of 3% for both lateral and vertical velocity fluctuations;
  - a virtual wind speed of 1 m/sec in a moderately stable atmosphere for quantifying the atmospheric turbulence; and
  - homogeneous mixing of neutrally buoyant gases in all directions.

  The value of 3% for the atmospheric turbulent intensity has been referenced as a typical value (= 1/30) in the literature (Tennekes and Lumley 1972). A wind speed of 1 m/sec is selected to represent the wind

conditions below which wind measurements are generally considered "calm". The characteristic length scale (L) developed by the cloud in one hour can be calculated to be:

$$
\begin{aligned}
L_{lateral} &= 0.03 \times 1 \text{ m/sec} \times 3600 \text{ sec} \\
&= 108 \text{ m;} \\
L_{vertical} &= \text{minimum}(L_{lateral}, L_{mixing\ layer}) \\
&= \text{minimum (108 m, 100 m)} \\
&= 100 \text{ m.}
\end{aligned}
$$

Using these characteristic length scales, the average concentration of a stagnant vapor cloud for acetone/toluene mixture for the conservative on-site spill scenario can thus be estimated to be (acetone/toluene mixture is selected because of the low volatility and potentially longer emission duration if not mitigated):

$$
\begin{aligned}
C &= 1674 \text{ kg}/(108 \text{ m})^2 \ (100 \text{ m}) \\
&= 1.44 \times 10^{-3} \text{ kg/m}^3 \\
&= 594 \text{ ppm.}
\end{aligned}
$$

This value is approximately twice the concentration of 280 ppm a resident residing approximately 100 meters directly downwind of the spill would be exposed to in less than 2 minutes during the low wind stable condition. The size of the vapor cloud will continue to grow as time increases and the average concentration within the cloud will continue to decrease since the increase in volume outgrows the increase in emissions. Therefore, if the calm condition persists for another hour, the average concentration within the 200 meter radius area would be approximately 150 ppm, slightly more than the 120 ppm concentration 200 meters downwind of the source during the stable low wind condition.

- As indicated in Equation (11) of Appendix VII-3, emissions from a liquid spill during the calm condition could be significantly overestimated because without the atmospheric current the vapors accumulated above the liquid pool will significantly reduce the evaporation potential of the liquid. Indeed, Equation (11) of Appendix VII-3 is not applicable to the calm condition

since it predicts zero emissions from the pool. Nevertheless, Equation (11) of Appendix VII-3 is used in conjunction with an average wind speed at the WTI site to provide conservative emission estimates for the calm condition defined in this assessment. The emission rates during calm hours are obviously overestimated by applying this emission model with an average wind speed. The total emissions from the liquid pool during the calm condition could be unrealistically overestimated if the emissions are allowed to continue for a long period of time. A reasonable cut-off time is therefore assumed to be 1 hour.

- Due to the size of the vapor cloud developed by the spill during the calm hours, although much simplified without considering the density effect, the emissions will be rapidly dispersed when the atmospheric current resumes after a period of calm hours.

In addition, the initial dilution during the calm hour can not be simulated in the SLAB model and, therefore, the accumulated vapor is released in the model as a highly concentrated puff, which may result in unrealistic overestimation for the off-site exposure concentration estimates, particularly when the conservative meteorology is used to represent the resumed wind conditions. A long accumulation duration would result in misrepresentation of the source size in SLAB modeling.

While the conservative meteorology defines a very narrow area (an elliptic-shape area) along the prevailing wind direction that may be impacted by a release, the above calculation for calm condition does not necessarily define a smaller impact zone than the conservative meteorology. It simply indicates that an area of approximately 100 m in radius will be impacted by an average concentration of 594 ppm regardless of wind direction, which can actually be larger than the elliptic-shape impact zone defined by the conservative meteorology.

5. Distances to LOC and IDLH Concentrations

It is desirable to identify the region that could be exposed to concentrations greater than 1 x LOC or 1 x IDLH for the chemicals of concern. This is handled by Program AIRCONC such that the maximum distance from the source area to 1 x

LOC or 1 x IDLH is calculated. Tables 8 through 12 show the maximum distances from the source area to 1 x LOC and 1 x IDLH for the five release scenarios.

6. Modeling Emissions from Conservative Fires Using ISC-COMPDEP

The ISC-COMPDEP was used for modeling emissions from conservative fires based on two assumptions:

- The denser-than-air toxic vapors would rapidly mix in the fire with the entrained air such that the density of the gas mixture is approximately the same as air; and

- The plume would rise significantly and impact elevated receptors due to the buoyancy flux generated by the fire.

Emissions from a fire are simulated as emissions from a stack. The flame height is used to represent a virtual stack height of the emissions and the area of the fire is used to characterize the size of the virtual stack. An effective stack velocity is derived for the emissions using the buoyancy flux calculated in Appendix VII-3 and Brigg's equation (Briggs 1975). The modeling parameters are listed in Attachment 4. Complete ISC-COMPDEP model outputs are available on a 3.5" floppy diskette.

a) ISC-COMPDEP Modeling Results for Conservative Meteorological Condition

The one-hour average concentrations predicted by the ISC-COMPDEP model for each of the 54 screening meteorological conditions is presented in Table 14 for the on-site accidental release scenario. The concentrations are based on a unit emission rate (i.e., 1 g/s). The highest concentration of 63.4 $\mu g/m^3$ is predicted under low wind speed stable conditions (1.0 m/s, F stability). Low wind speed conditions result in lower plume dilution rates, and the stable atmospheric lapse rate assumed during F stability conditions reduces the plume rise associated with the buoyant source. The highest concentrations are predicted at a distance of 800 meters from origin of the receptor grid, which is centered at the WTI incinerator stack. The second highest concentrations are predicted under moderate wind-speed neutral conditions (5 m/s, D stability). In general, concentrations predicted during unstable (daytime) conditions are much lower than the peak values predicted under the stable and neutral conditions.

Table 15 shows the predicted concentrations for the off-site accidental fire scenario. The highest predicted concentrations are predicted during E and F stability conditions. The peak concentration of 218 $\mu g/m^3$ is predicted under 2.5 m/s winds with F stability. The concentrations under unstable conditions are typically an order of magnitude lower than those predicted during the conservative stable conditions.

b) ISC-COMPDEP Modeling Results for Typical Meteorological Condition

The one-hour average concentrations predicted by the ISC-COMPDEP model for conservative on-site fire scenario under the typical meteorological condition are contained in Table 14. The concentrations for the typical meteorological condition can be obtained by taking the average of the concentrations for the 3.0 m/sec D-stability condition and the 3.5 m/sec D-stability condition. The one-hour average concentrations predicted by the ISC-COMPDEP model need to be converted to 30-minutes averages for comparison with the health-related reference concentrations. The 30-minute average concentration can be obtained by multiplying the ISC-COMPDEP results by a factor of 1.15 using the equation presented in Section D.2 of this appendix:

$$(60/30)^{0.2} = 1.15$$

Tables 16 and 17 shows the 30-minute average concentration at each downwind distance for the on-site and off-site fire scenarios, respectively. The mass concentrations are converted to volumetric concentrations and compared to the respective LOC and IDLH concentrations. It is shown in Table 9 that the off-site air concentrations would not exceed any LOC concentrations with one exception - under the conservative meteorological condition, there will be areas impacted by the emissions exceeding the LOC concentrations. Tables 9 lists the zone that may contain pocket areas with concentrations exceeding the LOC. For example, the off-site concentrations at locations 675 to 1,125 m downwind of the WTI facility may exceed the LOC concentrations during an on-site fire scenario. However, because the ISC-COMPDEP model is used with the conservative receptor elevation, discussed in Section D.2, in conjunction with the conservative meteorology, a receptor which is within 675 to 11,25 m downwind of the spill but is located on a terrain with elevation less than the identified conservative terrain may not be

impacted by the LOC concentration or, if impacted, may have a very small impact radius.

For the off-site fire scenario, a few pocket areas located up to 2100 m downwind of the fire may be exposed to concentrations exceeding the LOC concentrations under the conservative meteorological condition. As discussed above, these pocket areas are the areas with high terrain elevations and may have small impact zones.

7. Interpreting ISC-COMPDEP Results to a 10-min Release Scenario

Emissions from an on-site fire are assumed to be terminated/controlled 10 minutes after the occurrence by either the emergency response team or any of the activated mitigation devices on-site. The 60-minute average concentration resulting from a 10-minute fire is estimated to be 1/6 of that resulting from a 1-hour fire. Therefore, the 30-minute average concentrations resulting from a 10-minute on-site fire can be estimated from the ISC-COMPDEP results by multiplying the results by a scaling factor of 1/6 to account for the shorter release time at the source and by a scaling factor of 1.15 to account for the shorter averaging time at the receptor. Table 18 summarizes the estimated 30-minute average off-site concentrations resulting from a 10-minute on-site fire. Due to the unpredictability in the location, time, and accessibility of an off-site fire accident and in the availability of a local emergency response team and in the effectiveness of the available mitigation reagents/devices, the off-site fire scenario is considered to be uncontrollable within an hour.

Based on the 30-minute average off-site concentrations estimated for the 10-minute on-site fire scenario, no residents will be impacted with concentrations exceeding either the LOC or IDLH concentrations.

8. Modeling Emissions from Typical Fires Using the ISC-COMPDEP Output for Large Fires

Because the ISC-COMPDEP results for the conservative fire scenarios are derived based on a unit emission rate and some physical characteristics of a large fire, the results can be applied to the typical fire scenarios to yield conservative concentration estimates.

As indicated in Appendix VII-3, the parameters used in characterizing emissions from a fire are the flame height, emission rate, buoyancy flux, flame temperature and time of burning. The exposure concentration can be easily adjusted based on the emission rate since the exposure concentration is proportional to the emission

rate. The effective stack exit velocity derived from the buoyancy flux, fire size, and Brigg's equation (Briggs 1975) for the typical fire is the same as the large fire. The plume rise caused by the small fire is somewhat less than the large fire due to lower buoyancy flux and flame height. However, the impact of this difference is not expected to be significant. The flame temperature is the same for both large and small fire while the time of burning (release) for a small fire is less than large fire.

The 30-minute average emission rates of HCl and phosgene for the typical fire scenarios are at least 20 times less than the 30-minute average emission rates for conservative fire scenarios, and the underestimation of using a slightly larger plume rise for the typical fire scenarios is not expected to cause order-of-magnitude underestimation of the off-site concentrations. Therefore, it is safe to say that the off-site impacts caused by typical fire scenarios are at least one order-of-magnitude (10 times) less than the off-site concentrations caused by conservative fire scenarios. It is thus concluded and shown in Tables 9 and 12, based on the low off-site concentrations predicted for the conservative fire scenarios and the low emission rates calculated for the typical fire scenarios, that the off-site impacts caused by typical fire scenarios will not exceed either the LOC or IDLH concentrations for HCl and phosgene.

9. ISC-COMPDEP Modeling Results Using 1-yr Real-time Meteorological Data

The ISC-COMPDEP model is used in conjunction with one-year of site-specific hourly surface meteorological data (DEPBIN.MET) to evaluate the results predicted by the same model using the screening meteorology. Both 1-hr and annual average concentrations are calculated and summarized in Attachment 5.

For the on-site fire scenario, the grid receptors indicate that the maximum 1-hr average concentration occurs at a distance approximately 300 m northeast of the incinerator with a concentration coefficient of 100.3 $\mu g/m^3/(g/sec)$, compared to 64.4 $\mu g/m^3/(g/sec)$ at a distance 800 m downwind of the facility predicted with the conservative meteorology. The difference is attributed to the receptor elevations used in the two analyses. For a buoyant plume release with significant plume rise, the concentration at a receptor close to the source is heavily affected by the terrain elevation. A polar grid system with previously determined terrain elevations centered at the incinerator stack, available from the routine and fugitive emission analysis (See Volume IV) is used in the ISC-COMPDEP modeling with real-time meteorological data. For the ISC-COMPDEP run with the screening meteorology,

however, the grid system is relocated to the center of the spill and the receptor elevations are redefined.

Based on the use of real-time meteorology, IDLH values are not predicted to be exceeded for the on-site fire scenario. Only pocketed areas located within 1000 m downwind of the facility are predicted by the ISC-COMPDEP run with real-time meteorology to exceed the LOC concentration for HCl, compared to an impact zone of approximately 1,100 m downwind of the facility predicted by the ISC-COMPDEP run with conservative meteorology. Off-site phosgene concentrations are found to be less than the LOC concentration with one exception at an elevated individual receptor where the concentration is approximately the same as the LOC concentration.

The annual average off-site air concentrations for the on-site fire scenario are also presented in Attachment 5. These concentrations should not be compared to the off-site concentrations predicted using the typical meteorological condition because the annual average concentration at a specific receptor is obtained by averaging the hourly air concentrations at the receptor regardless of the wind direction. Hence, the annual average concentration at a receptor could be significantly less than the hourly concentration obtained when the receptor is downwind of the source.

For the off-site fire scenario, the ISC-COMPDEP run with real-time meteorology indicates that the maximum 1-hr average concentration occurs 1000 m west of the facility (or approximately 100 m west of the fire) with a concentration coefficient of 102.8 $\mu g/m^3/(g/sec)$, compared to 218 $\mu g/m^3/(g/sec)$ at a distance 100 m off the fire predicted by the ISC-COMPDEP run with conservative meteorology. The difference is again attributed to the difference in terrain elevation used in the two analyses. The impacted zone that may exceed the LOC concentration for HCl extends from the fire to approximately 3,000 m, east of the facility, consistent with that predicted by the conservative meteorology.

10. Modeling Emissions from Mixing of Incompatible Waste

In the current SLAB modeling, HCl releases from mixing of incompatible waste are simulated as dense plume stack release which may have overestimated the initial slumping of the release and resulted in higher exposure concentration estimates.

11. Concentration Averaging Time at Receptors

The concentration averaging time should be the appropriate averaging time for the health and safety standard of interest. For comparison with the IDLH concentrations, the averaging time is selected to be 30 minutes. However, it is desirable to find out the averaging concentrations for periods less than 30 minutes.

For a continuous plume, the concentrations downwind of a source generally decrease with increasing averaging time due to the increased meandering of wind direction (Turner 1967). The decrease in concentration follows a one-fifth power law with the averaging time for averaging periods from about 3 minutes to about 30 minutes (Steward et al, as cited by Turner 1967). Studies also indicate the power law exponent could vary between 0.17 and 0.2 and the power law relationship could be applied to averaging times up to 24 hours (Turner 1967). Based on the one-fifth power law relationship, a 15-minute average concentration will be approximately 15% greater than a 30-minute average. This magnitude of concentration increase is considered relatively insignificant and does not transfer into any meaningful increase in the development of the zone/distance impacted by the release. Releases last for more than one hour are normally treated as continuous plume and the concentration averaging time does not have any significant impacts on the off-site air concentrations as well as the radius of impacted zone. It is shown in Table 19 that the releases due to acetone/toluene spills can be treated as continuous plume based on the emission duration, and therefore the difference between a 30-minute average and a 10-minute average is not considered significant.

For a continuous finite-duration release, the average concentration will be reduced from the peak concentration if the averaging time is greater than the source release time because the release is relatively short and the receptor is exposed to the material for only a fraction of the concentration averaging time. For receptors located within a short distance downwind of the source (e.g., 1 km downwind of the source), the exposure time is approximately the same as the source release time. Therefore, a 10-minute average concentration could be 3 times higher than a 30-minute average concentration if the release duration is only 10 minutes and the receptor is located close to the release. Accordingly, the distance, based on the 10-minute average concentration, to the IDLH concentration will be greater than that defined by the 30-minute average concentration. Table 20 shows the distances to IDLH and LOC concentrations for two emission scenarios. The averaging time is set to be the same as the release duration. It is observed from Table 20 that the maximum distance to the LOC concentration for formaldehyde increases by 2.5-fold

(from 100 m to 240 m downwind) when the averaging time decreases from 30 minutes (1800 seconds) to 11.5 minutes (680 seconds). However, the cloud duration increases as the cloud moves farther away from the spill. Therefore a receptor located 1,000 m downwind of a 10 minute release would be exposed to the cloud for approximately twice the duration of the release, longer than the release time. The difference in concentration caused by the averaging time for such a receptor becomes less significant than that for a receptor located nearby the release. Table 20 shows that the distance to either LOC or IDLH concentration increases by less than 50% for the receptors farther away from the spill.

If the release is instantaneous or very short, it is difficult to estimate the cloud length and cloud duration (Ermak 1990). A comparison of the concentration averaging time and the cloud duration can only be made by additional dispersion modeling. It is found from the SLAB modeling that the cloud duration for a puff release (under calm/inversion condition) is 305 seconds near the source. As the cloud moves farther downwind the cloud duration is expected to increase. A receptor located at least 1,000 m downwind of the release would be exposed to the elongated cloud for a period much greater than 305 seconds. Therefore, the maximum distance that already extends to 10 km from the release is not expected to increase much if the concentration averaging time is decreased from 30 minutes to 10 or less minutes.

12. Unconfined On-site Spill

The size of the on-site spill scenario dictates the zone that could be impacted by the release. The larger the source area is the higher the downwind concentration will be. This could happen if a spill occurs on site at areas outside the berms. The source area for such an unconfined release scenario would be approximately 4.5 times greater than the area confined by the berms, based on the assumption that the spill will form a liquid pool of 1 cm in depth. A sensitivity analysis is performed to examine the distance to the IDLH concentration for the on-site spill scenario.

For the formaldehyde/methanol spill, the distance to the IDLH concentration increases slightly for the unmitigated release. Under the typical meteorological condition, the distance to the LOC concentration increases from 1,000 m (for the confined release) to 1,500 m, and from 640 m to 980 m for the IDLH concentration. Under the conservative meteorological condition, the distance increases from 8,190 m to 8,400 m for LOC, and from 4,800 m to 5,000 m for IDLH. If the release were to be put out within 10 minutes after the spill under the typical meteorological

condition, the distance to the LOC concentration would be 1,500 m, or 980 m to the IDLH concentration. Under the conservative meteorological condition, the distance to the LOC concentration would be 8400 m, or 5000 m to the IDLH concentration. The slight increase is due to the following two facts:

- The off-site concentration increases as the source area increases; and
- For the same concentration averaging time at the receptor, the off-site concentration decreases as the emission duration decreases.

For the acetone/toluene spill, the distance to either the IDLH concentration or the LOC concentration is less than 25 m, measured from the source area, for both typical and conservative meteorological conditions.

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TABLE 1
Stability Wind Speed Combinations Used to Determine the Conservative Meteorological Conditions

Atmospheric Stability Categories	Wind Speed (m/s)												
	1	1.5	2	2.5	3	3.5	4	4.5	5	8	10	15	20
A	*	*	*	*	*								
B	*	*	*	*	*	*	*	*	*				
C	*	*	*	*	*	*	*	*	*	*	*		
D	*	*	*	*	*	*	*	*	*	*	*	*	*
E	*	*	*	*	*	*	*	*	*				
F	*	*	*	*	*	*	*						

Note:

* It is only necessary to consider the stability-wind speed conditions marked with an asterisk.

TABLE 2
Summary of Input Parameters for the On-Site Spill Scenario (Conservative Emissions)

Run No.:	1	2	3	4	5	6	7	8	9	10	11	12
Modeling Parameter[1]												
IDSPL	1	1	1	1	4	4	1	1	1	1	4	4
NCALC	1	1	1	1	1	1	1	1	1	1	1	1
WMS	0.03188	0.03188	0.03188	0.03188	0.03188	0.03188	0.08704	0.08704	0.08704	0.08704	0.08704	0.08704
CPS	909.8	909.8	909.8	909.8	909.8	909.8	1204	1204	1204	1204	1204	1204
TBP	309.35	309.35	309.35	309.35	309.35	309.35	367.5	367.5	367.5	367.5	367.5	367.5
CMEDO	0	0	0	0	0	0	0	0	0	0	0	0
DHE	1070000	1070000	1070000	1070000	1070000	1070000	375000	375000	375000	375000	375000	375000
CPSL	2716	2716	2716	2716	2716	2716	1781.5	1781.5	1781.5	1781.5	1781.5	1781.5
RHOSL	793.7	793.7	793.7	793.7	793.7	793.7	861.3	861.3	861.3	861.3	861.3	861.3
SPB	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
SPC	0	0	0	0	0	0	0	0	0	0	0	0
TS	293	293	293	293	293	293	293	293	293	293	293	293
QS	1.04	1.99	1.04	1.99	0	0	0.465	0.712	0.465	0.712	0	0
AS	418	418	418	418	418	418	418	418	418	418	418	418
TSD	3120	600	3120	600	0	0	18240	600	18240	600	0	0
QTIS	0	0	0	0	3244.8	1194	0	0	0	0	1674	427.2
HS	0	0	0	0	0	0	0	0	0	0	0	0
TAV	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
XFFM	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
Meteorology	**Typical**	**Typical**	**Conservative**	**Conservative**	**Calm/Inversion**	**Calm/Inversion**	**Typical**	**Typical**	**Conservative**	**Conservative**	**Calm/Inversion**	**Calm/Inversion**

Note:

[1] See TABLE 7 for definition.

TABLE 3
Summary of Input Parameters for
the On-Site Spill Scenario (Typical Emissions)

Run No.:	13	14	15	16	17	18	19	20	21	22	23	24
Modeling Parameter[1]												
IDSPL	1	1	1	1	4	4	1	1	1	1	4	4
NCALC	1	1	1	1	1	1	1	1	1	1	1	1
WMS	0.03188	0.03188	0.03188	0.03188	0.03188	0.03188	0.08704	0.08704	0.08704	0.08704	0.08704	0.08704
CPS	909.8	909.8	909.8	909.8	909.8	909.8	1204	1204	1204	1204	1204	1204
TBP	309.35	309.35	309.35	309.35	309.35	309.35	367.5	367.5	367.5	367.5	367.5	367.5
CMEDO	0	0	0	0	0	0	0	0	0	0	0	0
DHE	1070000	1070000	1070000	1070000	1070000	1070000	375000	375000	375000	375000	375000	375000
CPSL	2716	2716	2716	2716	2716	2716	1781.5	1781.5	1781.5	1781.5	1781.5	1781.5
RHOSL	793.7	793.7	793.7	793.7	793.7	793.7	861.3	861.3	861.3	861.3	861.3	861.3
SPB	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
SPC	0	0	0	0	0	0	0	0	0	0	0	0
TS	293	293	293	293	293	293	293	293	293	293	293	293
QS	0.094	0.10	0.094	0.10	0	0	0.042	0.06	0.042	0.06	0	0
AS	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9
TSD	680	600	680	600	0	0	3960	600	3960	600	0	0
QTIS	0	0	0	0	63.92	60.0	0	0	0	0	151.2	36
HS	0	0	0	0	0	0	0	0	0	0	0	0
TAV	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
XFFM	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
Meteorology	**Typical**	**Typical**	**Conservative**	**Conservative**	**Calm/Inversion**	**Calm/Inversion**	**Typical**	**Typical**	**Conservative**	**Conservative**	**Calm/Inversion**	**Calm/Inversion**

Note:
[1] See TABLE 7 for definition.

TABLE 4
Summary of Input Parameters for the Mixing of Incompatible Waste

Emissions	Conservative						Typical					
Run No.:	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
Modeling Parameter[1,2]												
IDSPL	3	3	3	3	4	4	1	1	1	1	4	4
NCALC	1	1	1	1	1	1	1	1	1	1	1	1
WMS	0.03647	0.03647	0.03647	0.03647	0.03647	0.03647	0.03647	0.03647	0.03647	0.03647	0.03647	0.03647
CPS	797.812	797.812	797.812	797.812	797.812	797.812	797.812	797.812	797.812	797.812	797.812	797.812
TBP	188.15	188.15	188.15	188.15	188.15	188.15	188.15	188.15	188.15	188.15	188.15	188.15
CMEDO	0	0	0	0	0	0	0	0	0	0	0	0
DHE	441459	441459	441459	441459	441459	441459	441459	441459	441459	441459	441459	441459
CPSL	1655.85	1655.85	1655.85	1655.85	1655.85	1655.85	1655.85	1655.85	1655.85	1655.85	1655.85	1655.85
RHOSL	1187	1187	1187	1187	1187	1187	1187	1187	1187	1187	1187	1187
SPB	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
SPC	0	0	0	0	0	0	0	0	0	0	0	0
TS	293	293	293	293	293	293	293	293	293	293	293	293
QS	1.79	1.79	1.79	1.79	0	0	0.0714	0.0714	0.0714	0.0714	0	0
AS	0.0324	0.0324	0.0324	0.0324	167.6	83.8	75.71	75.71	75.71	75.71	75.71	75.71
TSD	1200	600	1200	600	0	0	600	600	600	600	0	0
QTIS	0	0	0	0	2148	1074	0	0	0	0	42.84	42.84
HS	8.4	8.4	8.4	8.4	8.4	8.4	0	0	0	0	0	0
TAV	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
XFFM	20000	20000	20000	20000	20000	20000	5000	5000	5000	5000	5000	5000
Meteorology	**Typical**	**Typical**	**Conservative**	**Conservative**	**Calm/Inversion**	**Calm/Inversion**	**Typical**	**Typical**	**Conservative**	**Conservative**	**Inversion/ Calm**	**Inversion/ Calm**

Notes:
[1] Properties of HCl.
[2] See TABLE 7 for definition.

TABLE 5
Summary of Input Parameters for the Off-site Spill Scenario (Conservative Emissions)

Run No.:	61	62	63	64	65	66
Modeling Parameter[1]						
IDSPL	1	1	4	1	1	4
NCALC	1	1	1	1	1	1
WMS	0.03188	0.03188	0.03188	0.08704	0.08704	0.08704
CPS	909.8	909.8	909.8	1204	1204	1204
TBP	309.35	309.35	309.35	367.5	367.5	367.5
CMEDO	0	0	0	0	0	0
DHE	1070000	1070000	1070000	375000	375000	375000
CPSL	2716	2716	2716	1781.5	1781.5	1781.5
RHOSL	793.7	793.7	793.7	861.3	861.3	861.3
SPB	-1	-1	-1	-1	-1	-1
SPC	0	0	0	0	0	0
TS	293	293	293	293	293	293
QS	1.84	1.84	0	0.818	0.818	0
AS	735.0	735.0	735.0	735.0	735.0	735.0
TSD	1740.0	1740.0	0	10320	10320	0.0
QTIS	0	0	3201.6	0	0	2944.8
HS	0	0	0	0	0	0
TAV	1800	1800	1800	1800	1800	1800
XFFM	20000	20000	20000	20000	20000	20000
Meteorology	**Typical**	**Conservative**	**Calm/Inversion**	**Typical**	**Conservative**	**Calm/Inversion**

Note:

[1] See TABLE 7 for definition.

TABLE 6
Summary of Input Parameters for the Off-site Typical Spill Scenario (Typical Emissions)

Run No.:	67	68	69	70	71	72
Modeling Parameter[1]						
IDSPL	1	1	4	1	1	4
NCALC	1	1	1	1	1	1
WMS	0.03188	0.03188	0.03188	0.08704	0.08704	0.08704
CPS	909.8	909.8	909.8	1204	1204	1204
TBP	309.35	309.35	309.35	367.5	367.5	367.5
CMEDO	0	0	0	0	0	0
DHE	1070000	1070000	1070000	375000	375000	375000
CPSL	2716	2716	2716	1781.5	1781.5	1781.5
RHOSL	793.7	793.7	793.7	861.3	861.3	861.3
SPB	-1	-1	-1	-1	-1	-1
SPC	0	0	0	0	0	0
TS	293	293	293	293	293	293
QS	0.094	0.094	0	0.042	0.042	0
AS	37.9	37.9	37.9	37.9	37.9	37.9
TSD	680	680	0	3960	3960	0
QTIS	0	0	63.92	0	0	151.2
HS	0	0	0	0	0	0
TAV	1800	1800	1800	1800	1800	1800
XFFM	5000	5000	5000	5000	5000	5000
Meteorology	**Typical**	**Conservative**	**Calm/Inversion**	**Typical**	**Conservative**	**Calm/Inversion**

Note:

[1] See TABLE 7 for definition.

TABLE 7
Definition of Input Variables for SLAB Modeling

	Source Type and Numerical Substep Parameter
- IDSPL	Spill source type 1 - evaporating pool release 2 - horizontal jet release 3 - vertical jet or stack release 4 - instantaneous or short duration evaporating pool release
- NCALC	Numerical substep parameter
Source Properties	
- WMS	Molecular weight of source material (kg)
- CPS	Vapor heat capacity at constant pressure (J/kg-K)
- TBP	Boiling point temperature (K)
- CMEDO	Initial liquid mass fraction
- DHE	Heat of vaporization (J/kg)
- CPSL	Liquid heat capacity (J/kg-K)
- RHOSL	Liquid density of source material (kg/M^3)
- SPB	Saturation pressure constant (Default: SPB = -1.0)
- SPC	Saturation pressure constant (Default: SPC = 0.0)
Spill Parameters	
- TS	Temperature of source material (K)
- QS	Mass source rate (kg/S)
- AS	Source area (M^2)
- TSD	Continuous source duration (s)
- QTIS	Instantaneous source mass (kg)
- HS	Source height (M)
Field Parameters	
- TAV	Concentration averaging time (s)
- XFFM	Maximum downwind distance (M)
- ZP(I)	Heights of concentration calculation (M); I = 1, 4

TABLE 8
Summary of Air Dispersion Modeling Results (On-site Spill)

Run No.	Chemical of Concern	Emission Scenario	Meteorology	Spill Duration	LOC (ppm)	IDLH (ppm)	Max. Dist. to LOC (m)[1]	Max. Dist. to IDLH (m)[1]
1	Formaldehyde	Conservative	Typical	Unmitigated[3]	9.6	19.6	1000	640
2				10 minutes	9.6	19.6	1000[2]	640[2]
3			Conservative	Unmitigated	9.6	19.6	8190	4800
4				10 minutes	9.6	19.6	6470	3920
5			Calm/Inversion	Unmitigated	9.6	19.6	11400	8450
6				10 minutes	9.6	19.6	9360	6720
7	Acetone	Conservative	Typical	Unmitigated	1960	2442	<25	<25
8				10 minutes	1960	2442	<25	<25
9			Conservative	Unmitigated	1960	2442	<25	<25
10				10 minutes	1960	2442	<25	<25
11			Calm/Inversion	Unmitigated	1960	2442	<25	<25
12				10 minutes	1960	2442	<25	<25
13	Formaldehyde	Typical	Typical	Unmitigated	9.6	19.6	100	40
14				10 minutes	9.6	19.6	100[2]	40[2]
15			Conservative	Unmitigated	9.6	19.6	910	550
16				10 minutes	9.6	19.6	900	550[2]
17			Calm/Inversion	Unmitigated	9.6	19.6	1600	1000
18				10 minutes	9.6	19.6	1600[2]	1000[2]
19	Acetone	Typical	Typical	Unmitigated	1960	2442	<25	<25
20				10 minutes	1960	2442	<25	<25
21			Conservative	Unmitigated	1960	2442	<25	<25
22				10 minutes	1960	2442	<25	<25
23			Calm/Inversion	Unmitigated	1960	2442	<25	<25
24				10 minutes	1960	2442	<25	<25

Notes:

[1] All distances are measured from the property line to the east or west, across the Ohio river to the south, or from the existing railroad to the north, whichever is closer to the spill.
[2] Mitigation does not decrease maximum distance.
[3] Based on the preliminary calculations, the maximum distances to LOC and IDLH due to emissions from a spill mitigated in 1 hour (i.e., with an emission duration of 60 minutes) is approximately the same as an unmitigated spill.

TABLE 9
Summary of Air Dispersion Modeling Results (On-site Fire)

Run No.	Chemical of Concern	Emission Scenario	Meteorology	Emission Duration	LOC (ppm)	IDLH (ppm)	Max. Dist. to LOC (m)[1]	Max. Dist. to IDLH (m)[1]
25	HCl	Conservative	Typical	Unmitigated[4]	9.9	49.1	NO[2]	NO
26				10 minutes	9.9	49.1	NO[3]	NO
27			Conservative	Unmitigated	9.9	49.1	675-1125	NO
28				10 minutes	9.9	49.1	NO	NO
29			Calm/Inversion	Unmitigated	9.9	49.1	NA[3]	NA
30				10 minutes	9.9	49.1	NA	NA
31	Phosgene	Conservative	Typical	Unmitigated	0.2	2	NO	NO
32				10 minutes	0.2	2	NO	NO
33			Conservative	Unmitigated	0.2	2	NO	NO
34				10 minutes	0.2	2	NO	NO
35			Calm/Inversion	Unmitigated	0.2	2	NA	NA
36				10 minutes	0.2	2	NA	NA

Notes:

1 All distances are measured from the property line to the east or west, across the Ohio river to the south, or from the existing railroad to the north, whichever is closer to the spill.

2 NO = Do not occur.

3 NA = Not analyzed.

4 Based on the preliminary calculations, the maximum distances to LOC and IDLH due to emissions from a spill mitigated in 1 hour (i.e., with an emission duration of 60 minutes) is approximately the same as an unmitigated spill.

TABLE 9 (continued)
Summary of Air Dispersion Modeling Results (On-site Fire)

Run No.	Chemical of Concern	Emission Scenario	Meteorology	Emission Duration	LOC (ppm)	IDLH (ppm)	Max. Dist. to LOC (m)[1]	Max. Dist. to IDLH (m)[1]
37	HCl	Typical	Typical	Unmitigated[4]	9.9	49.1	NO[2]	NO
38				10 minutes	9.9	49.1	NO	NO
39			Conservative	Unmitigated	9.9	49.1	NO	NO
40				10 minutes	9.9	49.1	NO	NO
41			Calm/Inversion	Unmitigated	9.9	49.1	NA	NA
42				10 minutes	9.9	49.1	NA	NA
43	Phosgene	Typical	Typical	Unmitigated	0.2	2	NO	NO
44				10 minutes	0.2	2	NO	NO
45			Conservative	Unmitigated	0.2	2	NO	NO
46				10 minutes	0.2	2	NO	NO
47			Calm/Inversion	Unmitigated	0.2	2	NA	NA
48				10 minutes	0.2	2	NA	NA

Notes:

[1] All distances are measured from the property line to the east or west, across the Ohio river to the south, or from the existing railroad to the north, whichever is closer to the spill.

[2] NO = Do not occur.

[3] NA = Not analyzed.

[4] Based on the preliminary calculations, the maximum distances to LOC and IDLH due to emissions from a spill mitigated in 1 hour (i.e., with an emission duration of 60 minutes) is approximately the same as an unmitigated spill.

TABLE 10
Summary of Air Dispersion Modeling Results (On-site Mixing of Incompatible Wastes)

Run No.	Chemical of Concern	Emission Scenario	Meteorology	Emission Duration	LOC (ppm)	IDLH (ppm)	Max. Dist. to LOC (m)	Max. Dist. to IDLH (m)
49	HCl	Conservative	Typical	Unmitigated[2]	9.9	49.1	1780	680
50				10 minutes	9.9	49.1	1260	<25
51			Conservative	Unmitigated	9.9	49.1	8790	3190
52				10 minutes	9.9	49.1	6260	2170
53			Calm/Inversion	Unmitigated	9.9	49.1	12200	4620
54				10 minutes	9.9	49.1	9190	3380
55	HCl	Typical	Typical	Unmitigated	9.9	49.1	125	<25
56				10 minutes	9.9	49.1	125	<25
57			Conservative	Unmitigated	9.9	49.1	980	270
58				10 minutes	9.9	49.1	980	270
59			Calm/Inversion	Unmitigated	9.9	49.1	1700	520
60				10 minutes	9.9	49.1	1700	520

Notes:

[1] All distances are measured from the property line to the east or west, across the Ohio river to the south, or from the existing railroad to the north, whichever is closer to the spill.

[2] The unmitigated releases are assumed to last for 20 minutes.

TABLE 11 Summary of Air Dispersion Modeling Results (Off-site Spill)								
Run No.	**Chemical of Concern**	**Emission Scenario**	**Meteorology**	**Emission Duration**	**LOC (ppm)**	**IDLH (ppm)**	**Max. Dist. to LOC (m)**	**Max. Dist. to IDLH (m)**
61	Formaldehyde	Conservative	Typical	Unmitigated	9.6	19.6	1490	980
62			Conservative	Unmitigated	9.6	19.6	8490	5120
63			Calm/Inversion	Unmitigated	9.6	19.6	11540	8550
64	Acetone	Conservative	Typical	Unmitigated	1960	2442	<25	<25
65			Conservative	Unmitigated	1960	2442	<25	<25
66			Calm/Inversion	Unmitigated	1960	2442	57	47
67	Formaldehyde	Typical	Typical	Unmitigated	9.6	19.6	190	130
68			Conservative	Unmitigated	9.6	19.6	980	630
69			Calm/Inversion	Unmitigated	9.6	19.6	1670	1080
70	Acetone	Typical	Typical	Unmitigated	1960	2442	<25	<25
71			Conservative	Unmitigated	1960	2442	<25	<25
72			Calm/Inversion	Unmitigated	1960	2442	<25	<25

TABLE 12
Summary of Air Dispersion Modeling Results (Off-site Fire)

Run No.	Chemical of Concern	Emission Scenario	Meteorology	Emission Duration	LOC (ppm)	IDLH (ppm)	Max. Dist. to LOC (m)	Max. Dist. to IDLH (m)
73	HCl	Conservative	Typical	Unmitigated	9.9	49.1	NO[1]	NO[1]
74			Conservative	Unmitigated	9.9	49.1	2,100	275
75			Calm/Inversion	Unmitigated	9.9	49.1	NA[2]	NA
76	Phosgene	Conservative	Typical	Unmitigated	0.2	2	NO	NO
77			Conservative	Unmitigated	0.2	2	1,100	125
78			Calm/Inversion	Unmitigated	0.2	2	NA	NA
79	HCl	Typical	Typical	Unmitigated	9.9	49.1	NO	NO
80			Conservative	Unmitigated	9.9	49.1	NO	NO
81			Calm/Inversion	Unmitigated	9.9	49.1	NA	NA
82	Phosgene	Typical	Typical	Unmitigated	0.2	2	NO	NO
83			Conservative	Unmitigated	0.2	2	NO	NO
84			Calm/Inversion	Unmitigated	0.2	2	NA	NA

Notes:

[1] NO = Do not occur.
[2] NA = Not analyzed.

TABLE 13
Average Vapor Mole Fraction Used in SLAB Modeling

Scenario	Runs	Chemical of Concern	Time Required until Chemical of Concern Depleted[1] (sec)	Total Evaporation Time for the Spill (sec)	Average Vapor Mole Fraction Until Depleted[1]	Average Vapor Mole Fraction for 10 Minutes (with mitigation)
Conservative On-Site Spill	1-6	Formaldehyde	3120	24170	0.478	0.742
Conservative On-site Spill	7-12	Acetone	18240	39600	0.273	0.585
Typical On-Site Spill	13-18	Formaldehyde	680	5340	0.482	0.512
Typical On-site Spill	19-24	Acetone	3960	8760	0.276	0.538
Conservative Off-Site Spill	61-63	Formaldehyde	1740	13750	0.484	NC[2]
Conservative Off-Site Spill	64-66	Acetone	10320	22560	0.274	NC
Typical Off-Site Spill	67-69	Formaldehyde	680	5340	0.482	NC
Typical Off-Site Spill	70-72	Acetone	3960	8760	0.276	NC

Notes:

[1] = Depletion defined when the liquid mass fraction in the evaporating pool reaches 0.001.
[2] = Not calculated because mitigation is not considered.

TABLE 14
Summary of ISC-COMPDEP Screening Results for the On-Site Fire Scenario
One-hour Average Concentrations ($\mu g/m^3$)
Emission Rate (1 g/s)

X Downwind Distance (m)	Stability Class A Wind Speed (m/s)					Stability Class B Wind Speed (m/s)								
	1.000	1.500	2.000	2.500	3.000	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500	5.000
Mixing Height	320	480	640	800	960	320	480	640	800	960	1120	1280	1440	1600
100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
300	0.000	0.000	0.001	0.011	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001
400	0.000	0.001	0.071	0.495	1.257	0.000	0.000	0.000	0.005	0.050	0.164	0.329	0.496	0.636
500	0.000	0.023	0.453	1.535	2.700	0.000	0.000	0.002	0.057	0.324	0.834	1.436	1.979	2.393
600	0.000	0.157	1.037	2.186	3.021	0.000	0.000	0.009	0.155	0.625	1.330	2.048	2.635	3.052
700	0.000	1.037	2.145	2.693	2.839	0.000	0.000	0.023	0.246	0.802	1.516	2.175	2.679	0.000
800	0.000	3.763	4.735	4.938	4.766	0.000	0.912	1.951	3.285	4.587	5.620	6.306	6.273	6.060
900	0.000	3.500	3.615	3.502	3.239	0.000	0.716	1.518	2.512	3.450	4.170	4.634	4.875	4.709
1000	0.000	3.626	2.930	2.631	2.336	0.000	0.800	1.637	2.544	3.284	3.767	4.019	4.098	3.[illegible]
1250	0.000	3.115	1.814	1.336	1.108	0.000	1.076	1.886	2.486	2.801	2.902	2.872	2.743	2.[illegible]
1500	0.000	2.532	1.425	0.920	0.666	0.000	1.274	1.879	2.172	2.235	2.177	2.064	1.904	1.752
1750	0.000	2.129	1.198	0.766	0.533	0.000	1.338	1.693	1.789	1.739	1.634	1.513	1.381	1.262
2000	0.000	1.837	1.033	0.661	0.459	0.000	1.356	1.496	1.478	1.381	1.265	1.152	1.039	0.946
2250	0.000	1.615	0.908	0.581	0.404	0.000	1.340	1.308	1.230	1.116	1.004	0.897	0.807	0.733
2500	0.000	1.441	0.810	0.519	0.360	0.000	1.272	1.115	1.014	0.904	0.809	0.716	0.643	0.582
3000	0.000	1.185	0.667	0.427	0.296	0.000	1.172	0.852	0.746	0.656	0.548	0.484	0.433	0.391
4000	0.000	0.875	0.492	0.315	0.219	0.000	1.002	0.594	0.456	0.343	0.296	0.260	0.232	0.209
5000	0.000	0.693	0.390	0.249	0.173	0.000	0.830	0.470	0.322	0.216	0.184	0.161	0.143	0.129
7500	0.000	0.456	0.257	0.164	0.114	0.000	0.580	0.326	0.209	0.147	0.088	0.072	0.061	0.054
10000	0.000	0.344	0.193	0.124	0.085	0.000	0.451	0.254	0.162	0.085	0.063	0.048	0.039	0.033
15000	0.000	0.243	0.137	0.087	0.056	0.000	0.316	0.178	0.114	0.056	0.041	0.032	0.025	0.020
20000	0.000	0.190	0.107	0.068	0.042	0.000	0.247	0.139	0.089	0.042	0.031	0.024	0.019	0.015
30000	0.000	0.135	0.076	0.049	0.028	0.000	0.174	0.098	0.063	0.028	0.021	0.016	0.012	0.010
40000	0.000	0.107	0.060	0.038	0.021	0.000	0.137	0.077	0.049	0.021	0.015	0.012	0.009	0.008
50000	0.000	0.089	0.050	0.032	0.017	0.000	0.113	0.064	0.041	0.017	0.012	0.009	0.007	0.006

TABLE 14
Summary of ISC-COMPDEP Screening Results for the On-Site Fire Scenario
One-hour Average Concentrations ($\mu g/m^3$)
Emission Rate (1 g/s)

X Downwind Distance (m)	Stability Class C Wind Speed (m/s)										
	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500	5.000	8.000	10.000
Mixing Height	320	480	640	800	960	1120	1280	1440	1600	2560	3200
100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
300	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
400	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.004	0.006	0.009	0.008
500	0.000	0.000	0.000	0.001	0.014	0.055	0.123	0.200	0.271	0.406	0.000
600	0.000	0.000	0.000	0.003	0.039	0.158	0.362	0.604	0.833	0.000	0.000
700	0.000	0.000	0.000	0.005	0.060	0.239	0.543	0.906	0.000	0.000	0.000
800	0.000	0.498	1.035	1.902	3.068	4.394	5.697	5.824	5.879	5.515	5.030
900	0.000	0.355	0.733	1.341	2.159	3.092	4.015	4.735	4.765	4.389	3.969
1000	0.000	0.355	0.750	1.364	2.144	2.972	3.730	4.290	4.274	3.750	3.325
1250	0.000	0.414	0.891	1.543	2.230	2.822	3.253	3.358	3.267	2.604	2.232
1500	0.000	0.488	1.019	1.631	2.159	2.524	2.726	2.635	2.518	1.884	1.583
1750	0.000	0.538	1.061	1.567	1.930	2.130	2.204	2.093	1.975	1.417	1.176
2000	0.000	0.610	1.113	1.517	1.750	1.839	1.808	1.690	1.580	1.101	0.906
2250	0.000	0.694	1.162	1.466	1.595	1.729	1.497	1.387	1.287	0.878	0.719
2500	0.000	0.714	1.109	1.329	1.538	1.598	1.255	1.155	1.067	0.717	0.584
3000	0.000	0.796	1.062	1.286	1.351	1.008	0.914	0.833	0.764	0.503	0.408
4000	0.000	0.783	0.994	1.026	0.685	0.606	0.542	0.489	0.445	0.287	0.231
5000	0.000	0.856	0.831	0.786	0.459	0.402	0.357	0.320	0.291	0.185	0.149
7500	0.000	0.769	0.514	0.433	0.375	0.187	0.165	0.147	0.133	0.084	0.067
10000	0.000	0.623	0.366	0.275	0.126	0.108	0.095	0.085	0.076	0.048	0.038
15000	0.000	0.437	0.246	0.161	0.061	0.051	0.044	0.039	0.035	0.022	0.018
20000	0.000	0.339	0.190	0.122	0.042	0.032	0.026	0.023	0.020	0.013	0.010
30000	0.000	0.237	0.133	0.085	0.027	0.020	0.015	0.012	0.010	0.006	0.005
40000	0.000	0.184	0.104	0.066	0.020	0.015	0.012	0.009	0.007	0.003	0.003
50000	0.000	0.152	0.085	0.055	0.016	0.012	0.009	0.007	0.006	0.002	0.002

TABLE 14
Summary of ISC-COMPDEP Screening Results for the On-Site Fire Scenario
One-hour Average Concentrations ($\mu g/m^3$)
Emission Rate (1 g/s)

X Downwind Distance (m)	Stability Class D Wind Speed (m/s)												
	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500	5.000	8.000	10.000	15.000	20.000
Mixing Height	320	480	640	800	960	1120	1280	1440	1600	2560	3200	4800	6400
100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
300	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.002	0.000	0.000	0.000
600	0.000	0.000	0.000	0.000	0.000	0.002	0.006	0.015	0.027	0.000	0.000	0.000	0.000
700	0.000	0.000	0.000	0.000	0.000	0.004	0.018	0.049	0.000	0.000	0.000	0.000	0.000
800	0.000	0.359	0.673	1.196	1.987	3.072	3.998	4.066	4.141	4.503	4.566	4.288	3.815
900	0.000	0.244	0.445	0.778	1.281	1.976	2.851	3.383	3.456	3.772	3.809	3.535	3.116
1000	0.000	0.223	0.416	0.736	1.217	1.869	2.668	3.175	3.252	3.509	3.483	3.115	
1250	0.000	0.213	0.421	0.767	1.270	1.907	2.619	2.772	2.834	2.901	2.766	2.305	
1500	0.000	0.209	0.431	0.794	1.297	1.891	2.361	2.419	2.457	2.392	2.219	1.774	1.440
1750	0.000	0.196	0.411	0.757	1.214	1.721	2.099	2.136	2.152	2.001	1.817	1.410	1.128
2000	0.000	0.202	0.433	0.791	1.236	1.694	1.883	1.901	1.901	1.697	1.515	1.150	0.910
2250	0.000	0.225	0.491	0.882	1.330	1.676	1.701	1.704	1.691	1.458	1.284	0.957	0.752
2500	0.000	0.220	0.479	0.846	1.244	1.533	1.544	1.536	1.513	1.266	1.103	0.811	0.634
3000	0.000	0.274	0.591	0.981	1.288	1.300	1.291	1.266	1.232	0.982	0.842	0.607	0.470
4000	0.000	0.287	0.582	0.878	0.987	0.972	0.943	0.906	0.867	0.650	0.546	0.385	0.295
5000	0.000	0.262	0.501	0.707	0.785	0.758	0.722	0.685	0.647	0.467	0.388	0.270	0.206
7500	0.000	0.229	0.377	0.660	0.493	0.459	0.426	0.396	0.368	0.252	0.206	0.141	0.107
10000	0.000	0.227	0.440	0.627	0.342	0.312	0.286	0.262	0.241	0.161	0.131	0.089	0.067
15000	0.000	0.250	0.420	0.485	0.198	0.177	0.160	0.145	0.133	0.086	0.070	0.047	0.036
20000	0.000	0.272	0.359	0.374	0.132	0.117	0.105	0.094	0.086	0.055	0.045	0.030	0.023
30000	0.000	0.255	0.256	0.242	0.073	0.064	0.057	0.051	0.046	0.030	0.024	0.016	0.012
40000	0.000	0.224	0.192	0.174	0.048	0.042	0.037	0.033	0.030	0.019	0.015	0.010	0.008
50000	0.000	0.197	0.151	0.133	0.035	0.030	0.027	0.024	0.022	0.014	0.011	0.007	0.006

TABLE 14
Summary of ISC-COMPDEP Screening Results for the On-Site Fire Scenario
One-hour Average Concentrations ($\mu g/m^3$)
Emission Rate (1 g/s)

X Downwind Distance (m)	Stability Class E Wind Speed (m/s)								
	1.000	**1.500**	**2.000**	**2.500**	**3.000**	**3.500**	**4.000**	**4.500**	**5.000**
Mixing Height	10000	10000	10000	10000	10000	10000	10000	10000	10000
100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
300	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
600	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
700	0.000	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.000
800	62.572	44.669	34.963	28.866	24.654	21.557	19.178	17.288	15.749
900	53.023	37.699	29.415	24.223	20.644	18.017	16.002	14.405	13.105
1000	45.741	32.392	25.196	20.698	17.603	15.336	13.599	12.225	11.109
1250	33.155	23.132	17.863	14.589	12.348	10.715	9.469	8.486	7.690
1500	25.412	17.593	13.508	10.984	9.264	8.014	7.064	6.317	5.714
1750	20.536	14.127	10.797	8.749	7.358	6.351	5.587	4.988	4.505
2000	16.781	11.472	8.730	7.051	5.914	5.094	4.473	3.987	3.596
2250	13.783	9.364	7.096	5.713	4.780	4.109	3.602	3.206	2.888
2500	11.910	8.059	6.091	4.894	4.088	3.510	3.074	2.733	2.460
3000	8.623	5.779	4.339	3.469	2.888	2.471	2.159	1.916	1.721
4000	5.529	3.663	2.729	2.170	1.799	1.535	1.337	1.184	1.061
5000	4.102	2.702	2.007	1.592	1.317	1.122	0.976	0.864	0.774
7500	2.357	1.540	1.137	0.899	0.742	0.631	0.548	0.484	0.433
10000	1.476	0.957	0.704	0.554	0.456	0.387	0.336	0.296	0.265
15000	0.847	0.546	0.401	0.315	0.259	0.220	0.190	0.168	0.150
20000	0.561	0.361	0.264	0.208	0.170	0.144	0.125	0.110	0.098
30000	0.324	0.208	0.152	0.119	0.098	0.083	0.072	0.063	0.056
40000	0.219	0.140	0.102	0.080	0.066	0.056	0.048	0.043	0.038
50000	0.164	0.105	0.077	0.060	0.049	0.042	0.036	0.032	0.028

TABLE 14
Summary of ISC-COMPDEP Screening Results for the On-Site Fire Scenario
One-hour Average Concentrations ($\mu g/m^3$)
Emission Rate (1 g/s)

X Downwind Distance (m)	Stability Class F Wind Speed (m/s)						
	1.000	1.500	2.000	2.500	3.000	3.500	4.000
Mixing Height	10000	10000	10000	10000	10000	10000	10000
100	0.000	0.000	0.000	0.000	0.000	0.000	0.000
200	0.000	0.000	0.000	0.000	0.000	0.000	0.000
300	0.000	0.000	0.000	0.000	0.000	0.000	0.000
400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
500	0.000	0.000	0.000	0.000	0.000	0.000	0.000
600	0.000	0.000	0.000	0.000	0.000	0.000	0.000
700	0.000	0.000	0.000	0.000	0.000	0.000	0.000
800	63.414	45.284	35.560	29.422	25.166	22.028	19.610
900	54.020	38.467	30.142	24.897	21.265	18.591	16.534
1000	46.921	33.327	26.064	21.495	18.336	16.013	14.228
1250	34.352	24.236	18.860	15.493	13.174	11.474	10.172
1500	26.604	18.656	14.454	11.832	10.033	8.718	7.713
1750	21.724	15.156	11.698	9.549	8.078	7.006	6.188
2000	17.900	12.423	9.552	7.775	6.562	5.680	5.009
2250	14.796	10.213	7.824	6.350	5.347	4.620	4.068
2500	12.892	8.868	6.777	5.490	4.617	3.984	3.505
3000	9.424	6.426	4.882	3.937	3.299	2.839	2.492
4000	6.233	4.209	3.176	2.549	2.128	1.825	1.598
5000	4.733	3.179	2.390	1.913	1.594	1.365	1.194
7500	2.827	1.881	1.406	1.121	0.931	0.795	0.694
10000	1.826	1.205	0.896	0.712	0.590	0.503	0.438
15000	1.088	0.713	0.529	0.419	0.346	0.295	0.256
20000	0.753	0.492	0.364	0.288	0.238	0.202	0.176
30000	0.448	0.292	0.215	0.170	0.140	0.119	0.104
40000	0.313	0.204	0.150	0.118	0.098	0.083	0.072
50000	0.237	0.154	0.113	0.089	0.074	0.063	0.054

TABLE 15
Summary of ISC-COMPDEP Screening Results for the Off-Site Fire Scenario
One-hour Average Concentrations ($\mu g/m^3$)
Emission Rate (1 g/s)

X Downwind Distance (m)	Stability Class A Wind Speed (m/s)					Stability Class B Wind Speed (m/s)								
	1.000	1.500	2.000	2.500	3.000	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500	5.00
Mixing Height	320	480	640	800	960	320	480	640	800	960	1120	1280	1440	160
100	0.819	1.092	1.552	2.275	3.343	0.738	0.882	1.109	1.446	1.926	2.584	3.458	4.579	5.96
200	0.000	0.625	1.087	1.845	2.953	0.000	0.421	0.613	0.912	1.352	1.965	2.771	3.774	4.95
300	0.000	0.591	1.176	2.109	3.355	0.000	0.332	0.551	0.903	1.429	2.149	3.057	4.118	5.27
400	0.000	0.615	1.298	2.282	3.406	0.000	0.264	0.468	0.802	1.297	1.954	2.748	3.623	4.51
500	0.000	0.750	1.469	2.375	3.201	0.000	0.213	0.387	0.681	1.106	1.653	2.282	2.940	3.57
600	0.000	0.000	1.628	2.299	2.749	0.000	0.000	0.294	0.520	0.842	1.246	1.698	2.156	2.58
700	0.000	0.000	1.630	2.024	2.205	0.000	0.000	0.230	0.409	0.660	0.967	1.302	1.634	1.93
800	0.000	0.000	1.603	1.716	1.743	0.000	0.000	0.200	0.357	0.574	0.832	1.104	1.364	1.59
900	0.000	0.000	1.620	1.411	1.357	0.000	0.000	0.174	0.311	0.497	0.712	0.933	1.140	1.31
1000	0.000	0.000	1.647	1.196	1.070	0.000	0.000	0.169	0.303	0.479	0.676	0.871	1.046	1.19
1250	0.000	0.000	0.000	0.923	0.669	0.000	0.000	0.000	0.222	0.344	0.475	0.598	0.703	0.78
1500	0.000	0.000	0.000	0.773	0.538	0.000	0.000	0.000	0.271	0.395	0.507	0.596	0.661	0.70
1750	0.000	0.000	0.000	0.663	0.460	0.000	0.000	0.000	0.315	0.425	0.510	0.566	0.599	0.61
2000	0.000	0.000	0.000	0.580	0.403	0.000	0.000	0.000	0.349	0.437	0.494	0.523	0.534	0.53
2250	0.000	0.000	0.000	0.515	0.358	0.000	0.000	0.000	0.364	0.428	0.461	0.471	0.467	0.45
2500	0.000	0.000	0.000	0.464	0.322	0.000	0.000	0.000	0.389	0.429	0.441	0.436	0.421	0.40
3000	0.000	0.000	0.000	0.387	0.268	0.000	0.000	0.000	0.354	0.357	0.348	0.333	0.319	0.30
4000	0.000	0.000	0.000	0.290	0.201	0.000	0.000	0.000	0.306	0.260	0.241	0.223	0.207	0.19
5000	0.000	0.000	0.000	0.232	0.161	0.000	0.000	0.000	0.270	0.203	0.174	0.156	0.142	0.13
7500	0.000	0.000	0.000	0.155	0.107	0.000	0.000	0.000	0.196	0.137	0.103	0.083	0.071	0.06
10000	0.000	0.000	0.000	0.117	0.082	0.000	0.000	0.000	0.154	0.107	0.079	0.061	0.049	0.04
15000	0.000	0.000	0.000	0.083	0.058	0.000	0.000	0.000	0.109	0.076	0.056	0.043	0.034	0.02
20000	0.000	0.000	0.000	0.066	0.046	0.000	0.000	0.000	0.085	0.059	0.043	0.033	0.026	0.02
30000	0.000	0.000	0.000	0.047	0.032	0.000	0.000	0.000	0.060	0.042	0.031	0.024	0.019	0.0
40000	0.000	0.000	0.000	0.037	0.026	0.000	0.000	0.000	0.047	0.033	0.024	0.018	0.015	0.0
50000	0.000	0.000	0.000	0.031	0.021	0.000	0.000	0.000	0.039	0.027	0.020	0.015	0.012	0.0

TABLE 15
Summary of ISC-COMPDEP Screening Results for the Off-Site Fire Scenario
One-hour Average Concentrations ($\mu g/m^3$)
Emission Rate (1 g/s)

X Downwind Distance (m)	Stability Class C Wind Speed (m/s)										
	1.000	**1.500**	**2.000**	**2.500**	**3.000**	**3.500**	**4.000**	**4.500**	**5.000**	**8.000**	**10.000**
Mixing Height	320	480	640	800	960	1120	1280	1440	1600	2560	3200
100	0.689	0.762	0.871	1.023	1.229	1.500	1.850	2.293	2.843	2.089	1.590
200	0.000	0.349	0.456	0.609	0.823	1.115	1.501	1.996	2.612	5.665	5.595
300	0.000	0.267	0.395	0.588	0.868	1.260	1.781	2.444	3.245	5.495	5.585
400	0.000	0.205	0.323	0.507	0.779	1.160	1.663	2.289	3.024	4.605	4.671
500	0.000	0.153	0.246	0.394	0.614	0.922	1.326	1.819	2.388	3.773	3.795
600	0.000	0.000	0.168	0.268	0.416	0.624	0.894	1.224	1.602	3.108	3.096
700	0.000	0.000	0.119	0.188	0.291	0.434	0.621	0.848	1.109	2.591	2.558
800	0.000	0.000	0.096	0.152	0.236	0.353	0.504	0.687	0.894	2.132	2.143
900	0.000	0.000	0.077	0.122	0.190	0.284	0.405	0.550	0.715	1.681	1.819
1000	0.000	0.000	0.071	0.115	0.181	0.272	0.388	0.526	0.679	1.520	1.562
1250	0.000	0.000	0.045	0.070	0.110	0.164	0.233	0.315	0.405	0.903	1.05
1500	0.000	0.000	0.047	0.076	0.122	0.183	0.257	0.339	0.423	0.785	0.902
1750	0.000	0.000	0.052	0.087	0.140	0.208	0.283	0.361	0.436	0.747	0.823
2000	0.000	0.000	0.061	0.103	0.165	0.238	0.314	0.386	0.449	0.708	0.737
2250	0.000	0.000	0.071	0.120	0.187	0.262	0.333	0.398	0.466	0.657	0.503
2500	0.000	0.000	0.095	0.161	0.243	0.324	0.393	0.447	0.485	0.497	0.425
3000	0.000	0.000	0.113	0.178	0.253	0.316	0.378	0.429	0.466	0.373	0.314
4000	0.000	0.000	0.182	0.213	0.283	0.335	0.368	0.386	0.394	0.230	0.190
5000	0.000	0.000	0.248	0.239	0.285	0.311	0.322	0.322	0.317	0.156	0.127
7500	0.000	0.000	0.321	0.228	0.225	0.219	0.210	0.198	0.187	0.074	0.060
10000	0.000	0.000	0.304	0.196	0.167	0.153	0.141	0.130	0.120	0.043	0.035
15000	0.000	0.000	0.229	0.146	0.106	0.086	0.075	0.068	0.062	0.020	0.016
20000	0.000	0.000	0.179	0.115	0.080	0.061	0.049	0.043	0.038	0.012	0.009
30000	0.000	0.000	0.126	0.081	0.056	0.041	0.032	0.025	0.021	0.005	0.004
40000	0.000	0.000	0.098	0.063	0.044	0.032	0.025	0.019	0.016	0.003	0.002
50000	0.000	0.000	0.081	0.052	0.036	0.026	0.020	0.016	0.013	0.002	0.002

TABLE 15
Summary of ISC-COMPDEP Screening Results for the Off-Site Fire Scenario
One-hour Average Concentrations ($\mu g/m^3$)

X Downwind Distance (m)	Stability Class D Wind Speed (m/s)												
	1.000	**1.500**	**2.000**	**2.500**	**3.000**	**3.500**	**4.000**	**4.500**	**5.000**	**8.000**	**10.000**	**15.000**	**20.000**
Mixing Height	320	480	640	800	960	1120	1280	1440	1600	2560	3200	4800	6400
100	0.659	0.692	0.738	0.799	0.877	0.976	1.097	1.251	1.533	0.271	0.100	0.021	0.010
200	0.000	0.313	0.377	0.460	0.567	0.703	0.875	1.091	1.357	1.718	1.308	0.949	0.860
300	0.000	0.240	0.329	0.451	0.618	0.843	1.139	1.520	1.999	2.283	2.070	1.916	1.889
400	0.000	0.183	0.265	0.384	0.551	0.780	1.087	1.485	1.985	2.220	2.142	2.127	2.121
500	0.000	0.133	0.196	0.288	0.419	0.601	0.844	1.159	1.553	2.010	2.002	2.043	2.031
600	0.000	0.000	0.128	0.184	0.263	0.371	0.516	0.703	0.938	1.782	1.807	1.865	1.841
700	0.000	0.000	0.086	0.121	0.169	0.235	0.323	0.437	0.579	1.574	1.613	1.671	1.636
800	0.000	0.000	0.067	0.093	0.131	0.181	0.249	0.335	0.444	1.393	1.438	1.489	1.447
900	0.000	0.000	0.052	0.072	0.099	0.137	0.187	0.252	0.332	1.150	1.284	1.327	1.281
1000	0.000	0.000	0.047	0.067	0.094	0.132	0.182	0.246	0.327	1.109	1.152	1.186	1.137
1250	0.000	0.000	0.026	0.035	0.048	0.065	0.087	0.115	0.151	0.524	0.852	0.897	0.856
1500	0.000	0.000	0.022	0.031	0.043	0.059	0.081	0.108	0.143	0.480	0.745	0.783	0.725
1750	0.000	0.000	0.021	0.029	0.041	0.058	0.080	0.109	0.144	0.462	0.681	0.688	0.621
2000	0.000	0.000	0.020	0.030	0.043	0.062	0.088	0.120	0.159	0.478	0.648	0.607	0.537
2250	0.000	0.000	0.020	0.031	0.046	0.067	0.095	0.131	0.173	0.485	0.592	0.539	0.468
2500	0.000	0.000	0.027	0.044	0.069	0.103	0.148	0.203	0.266	0.546	0.541	0.481	0.412
3000	0.000	0.000	0.026	0.042	0.067	0.102	0.146	0.197	0.254	0.472	0.457	0.389	0.326
4000	0.000	0.000	0.026	0.045	0.074	0.112	0.156	0.204	0.252	0.362	0.338	0.272	0.222
5000	0.000	0.000	0.024	0.043	0.070	0.104	0.142	0.180	0.216	0.286	0.261	0.202	0.162
7500	0.000	0.000	0.028	0.049	0.080	0.116	0.155	0.193	0.228	0.178	0.155	0.114	0.089
10000	0.000	0.000	0.036	0.061	0.094	0.130	0.164	0.194	0.218	0.122	0.104	0.075	0.058
15000	0.000	0.000	0.048	0.073	0.104	0.132	0.153	0.168	0.178	0.070	0.059	0.041	0.031
20000	0.000	0.000	0.057	0.078	0.104	0.122	0.134	0.141	0.144	0.047	0.039	0.027	0.020
30000	0.000	0.000	0.070	0.077	0.091	0.098	0.101	0.100	0.098	0.026	0.021	0.014	0.011
40000	0.000	0.000	0.072	0.069	0.076	0.078	0.078	0.075	0.072	0.017	0.014	0.009	0.007
50000	0.000	0.000	0.072	0.061	0.064	0.064	0.062	0.059	0.056	0.012	0.010	0.007	0.005

TABLE 15
Summary of ISC-COMPDEP Screening Results for the Off-Site Fire Scenario
One-hour Average Concentrations ($\mu g/m^3$)
Emission Rate (1 g/s)

X Downwind Distance (m)	Stability Class E Wind Speed (m/s)								
	1.000	**1.500**	**2.000**	**2.500**	**3.000**	**3.500**	**4.000**	**4.500**	**5.000**
Mixing Height	10000	10000	10000	10000	10000	10000	10000	10000	10000
100	9.179	26.374	62.234	120.401	191.379	207.639	189.364	169.678	151.220
200	5.203	5.639	11.462	22.427	38.042	56.090	72.278	70.661	66.922
300	9.788	11.202	12.354	15.664	25.634	35.425	39.821	38.229	36.170
400	14.866	16.901	18.189	18.927	19.254	23.486	25.241	24.092	22.830
500	17.161	18.945	19.650	19.649	19.191	18.443	17.612	16.927	16.031
600	14.433	15.837	16.330	16.244	15.794	15.122	14.234	13.035	12.312
700	11.513	12.654	13.092	13.080	12.785	12.312	11.737	10.939	10.096
800	11.034	11.945	12.163	11.966	11.527	10.952	10.251	9.365	8.634
900	9.903	10.644	10.766	10.533	10.098	9.558	8.922	8.142	7.498
1000	11.801	12.066	11.603	10.813	9.825	8.722	7.800	7.031	6.405
1250	7.643	7.978	7.860	7.516	7.069	6.584	6.015	5.471	5.013
1500	6.218	6.424	6.282	5.976	5.603	5.210	4.803	4.360	3.996
1750	5.411	5.503	5.313	5.004	4.655	4.303	3.951	3.581	3.277
2000	5.394	5.293	4.953	4.543	4.131	3.719	3.324	2.998	2.714
2250	5.345	5.062	4.598	4.114	3.644	3.199	2.834	2.533	2.290
2500	7.214	5.655	4.360	3.525	2.960	2.552	2.242	2.000	1.805
3000	5.822	4.508	3.459	2.787	2.333	2.006	1.759	1.566	1.411
4000	4.325	3.059	2.300	1.841	1.533	1.313	1.147	1.018	0.915
5000	3.223	2.327	1.742	1.390	1.155	0.987	0.861	0.763	0.684
7500	1.877	1.369	1.029	0.817	0.675	0.575	0.500	0.442	0.396
10000	1.339	0.894	0.660	0.521	0.429	0.364	0.316	0.279	0.249
15000	0.776	0.524	0.384	0.302	0.248	0.211	0.182	0.161	0.144
20000	0.708	0.351	0.257	0.202	0.166	0.140	0.121	0.107	0.095
30000	0.563	0.205	0.150	0.117	0.096	0.081	0.070	0.062	0.055
40000	0.463	0.140	0.102	0.080	0.065	0.055	0.048	0.042	0.037
50000	0.390	0.105	0.077	0.060	0.049	0.041	0.036	0.031	0.028

TABLE 15
Summary of ISC-COMPDEP Screening Results for the Off-Site Fire Scenario
One-hour Average Concentrations ($\mu g/m^3$)
Emission Rate (1 g/s)

X Downwind Distance (m)	Stability Class F Wind Speed (m/s)						
	1.000	**1.500**	**2.000**	**2.500**	**3.000**	**3.500**	**4.000**
Mixing Height	10000	10000	10000	10000	10000	10000	10000
100	17.673	57.570	135.075	218.080	193.674	167.072	141.859
200	10.718	12.139	24.989	47.283	71.261	72.022	66.840
300	22.115	25.155	27.031	31.287	41.282	39.381	36.889
400	32.516	34.118	33.357	30.851	27.038	24.942	23.471
500	34.857	33.458	28.702	24.205	20.871	18.405	16.553
600	28.975	27.673	23.681	19.946	17.179	15.133	13.554
700	23.247	22.609	20.081	17.023	14.646	12.890	11.534
800	21.615	20.432	17.400	14.618	12.561	11.044	9.873
900	19.160	18.022	15.311	12.847	11.029	9.687	8.653
1000	20.693	16.874	13.365	11.078	9.495	8.329	7.431
1250	14.095	12.861	10.651	8.861	7.580	6.638	5.913
1500	11.294	10.328	8.663	7.221	6.164	5.387	4.791
1750	9.602	8.684	7.248	6.027	5.133	4.479	3.976
2000	9.110	7.755	6.162	5.057	4.298	3.743	3.318
2250	8.585	6.771	5.285	4.329	3.672	3.193	2.827
2500	7.888	5.487	4.230	3.451	2.919	2.531	2.236
3000	6.390	4.422	3.395	2.761	2.329	2.016	1.777
4000	4.437	3.042	2.320	1.877	1.577	1.360	1.195
5000	3.457	2.357	1.790	1.444	1.210	1.041	0.914
7500	2.156	1.454	1.097	0.880	0.734	0.629	0.551
10000	1.445	0.965	0.723	0.577	0.480	0.410	0.358
15000	0.886	0.586	0.437	0.347	0.288	0.245	0.214
20000	0.624	0.411	0.305	0.242	0.200	0.171	0.148
30000	0.378	0.248	0.183	0.145	0.120	0.102	0.088
40000	0.267	0.174	0.129	0.102	0.084	0.071	0.062
50000	0.204	0.133	0.098	0.077	0.064	0.054	0.047

TABLE 16
Maximum and Typical Phosgene and HCl Concentrations for the Conservative Unmitigated On-Site Fire Scenario

Meteorology Downwind (m)	Concentration Factors		Phosgene[1,3]		HCl[2,3]	
	Conservative Concentration $(ug/m^3)/(g/s)$	Typical Concentration $(ug/m^3)/(g/s)$	Conservative Concentration (ppm)	Typical Concentration (ppm)	Conservative Concentration (ppm)	Typical Concentration (ppm)
100	0	0	0.00	0.00	0.00	0.00
200	0	0	0.00	0.00	0.00	0.00
300	0.045	0	1.33e-04	0.00	1.23e-02	0.00
400	1.257	0	3.72e-03	0.00	3.43e-01	0.00
500	2.7	0	7.99e-03	0.00	7.24e-01	0.00
600	3.052	0.001	9.03e-03	2.96e-06	8.32e-01	2.73e-04
700	2.839	0.002	8.40e-03	5.92e-06	7.74e-01	5.45e-04
800	63.414	2.5295	1.88e-01	7.49e-03	1.73e+01	6.90e-01
900	54.02	1.6285	1.60e-01	4.82e-03	1.47e+01	4.44e-01
1000	46.921	1.543	1.39e-01	4.57e-03	1.28e+01	4.21e-01
1250	34.352	1.5885	1.02e-01	4.70e-03	9.37e+00	4.33e-01
1500	26.604	1.594	7.87e-02	4.72e-03	7.25e+00	4.35e-01
1750	21.724	1.4675	6.43e-02	4.34e-03	5.92e+00	4.00e-01
2000	17.9	1.465	5.30e-02	4.34e-03	4.88e+00	3.99e-01
2250	14.796	1.503	4.38e-02	4.45e-03	4.03e+00	4.10e-01
2500	12.892	1.3885	3.82e-02	4.11e-03	3.52e+00	3.79e-01
3000	9.424	1.294	2.79e-02	3.83e-03	2.57e+00	3.53e-01
4000	6.233	0.9795	1.84e-02	2.90e-03	1.70e+00	2.67e-01
5000	4.733	0.7715	1.40e-02	2.28e-03	1.29e+00	2.10e-01
7500	2.827	0.476	8.37e-03	1.41e-03	7.71e-01	1.30e-01
10000	1.826	0.327	5.40e-03	9.68e-04	4.98e-01	8.92e-02
15000	1.088	0.1875	3.22e-03	5.55e-04	2.97e-01	5.11e-02
20000	0.753	0.1245	2.23e-03	3.68e-04	2.05e-01	3.39e-02
30000	0.448	0.0685	1.33e-03	2.03e-04	1.22e-01	1.87e-02
40000	0.313	0.045	9.26e-04	1.33e-04	8.53e-02	1.23e-02
50000	0.237	0.0325	7.01e-04	9.62e-05	6.46e-02	8.86e-03

Notes:

1 Phosgene emission rate = 10.6 g/s.

2 HCl emission rate = 360 g/s.

3 Concentration = emission rate x concentration factor x 1.15 x $\frac{0.024}{MW}$.

TABLE 17
Maximum and Typical Phosgene and HCl Concentrations for the Conservative Off-Site Fire Scenario

Meteorology Downwind (m)	Concentration Factors		Phosgene[1,3]		HCl[2,3]	
	Conservative Concentration (ug/m^3)/(g/s)	Typical Concentration (ug/m^3)/(g/s)	Conservative Concentration (ppm)	Typical Concentration (ppm)	Conservative Concentration (ppm)	Typical Concentration (ppm)
100	218.080	0.927	2.63e+00	1.12e-02	2.43e+02	1.03e+00
200	72.278	0.635	8.71e-01	7.65e-03	8.04e+01	7.06e-01
300	41.282	0.731	4.98e-01	8.81e-03	4.59e+01	8.13e-01
400	34.118	0.666	4.11e-01	8.02e-03	3.80e+01	7.40e-01
500	34.857	0.510	4.20e-01	6.15e-03	3.88e+01	5.67e-01
600	28.975	0.317	3.49e-01	3.82e-03	3.22e+01	3.53e-01
700	23.247	0.202	2.80e-01	2.43e-03	2.59e+01	2.25e-01
800	21.615	0.156	2.61e-01	1.88e-03	2.40e+01	1.74e-01
900	19.160	0.118	2.31e-01	1.42e-03	2.13e+01	1.31e-01
1000	20.693	0.113	2.49e-01	1.36e-03	2.30e+01	1.26e-01
1250	14.095	0.057	1.70e-01	6.81e-04	1.57e+01	6.29e-02
1500	11.294	0.051	1.36e-01	6.15e-04	1.26e+01	5.67e-02
1750	9.602	0.050	1.16e-01	5.97e-04	1.07e+01	5.51e-02
2000	9.110	0.053	1.10e-01	6.33e-04	1.01e+01	5.84e-02
2250	8.585	0.057	1.03e-01	6.81e-04	9.55e+00	6.29e-02
2500	7.888	0.086	9.51e-02	1.04e-03	8.78+00	9.57e-02
3000	6.390	0.085	7.70e-02	1.02e-03	7.11e+00	9.40e-02
4000	4.437	0.093	5.35e-02	1.12e-03	4.94e+00	1.03e-01
5000	3.457	0.087	4.17e-02	1.05e-03	3.85e+00	9.68e-02
7500	2.156	0.098	2.60e-02	1.18e-03	2.40e+00	1.09e-01
10000	1.445	0.112	1.74e-02	1.35e-03	1.61e+00	1.25e-01
15000	0.886	0.118	1.07e-02	1.42e-03	9.86e-01	1.31e-01
20000	0.708	0.113	8.53e-03	1.36e-03	7.88e-01	1.26e-01
30000	0.563	0.095	6.79e-03	1.14e-03	6.26e-01	1.05e-01
40000	0.463	0.077	5.58e-03	9.28e-04	5.15e-01	8.57e-02
50000	0.390	0.064	4.70e-03	7.71e-04	4.34e-01	7.12e-02

Notes:

1 Phosgene emission rate = 43.2 g/s.

2 HCl emission rate = 1470 g/s.

3 Concentration = emission rate x concentration factor x 1.15 x $\frac{0.024}{MW}$.

TABLE 18
Maximum and Typical Phosgene and HCl Concentrations for the Conservative Mitigated On-Site Fire Scenario

Meteorology Downwind (m)	Concentration Factors		Phosgene[1,3]		HCl[2,3]	
	Conservative Concentration (ug/m^3)/(g/s)	Typical Concentration (ug/m^3)/(g/s)	Conservative Concentration (ppm)	Typical Concentration (ppm)	Conservative Concentration (ppm)	Typical Concentration (ppm)
100	0	0	0.00	0.00	0.00	0.00
200	0	0	0.00	0.00	0.00	0.00
300	0.045	0	2.22e-05	0.00	2.04e-03	0.00
400	1.257	0	6.20e-04	0.00	5.71e-02	0.00
500	2.7	0	1.33e-03	0.00	1.23e-01	0.00
600	3.052	0.001	1.51e-03	4.93e-07	1.39e-01	4.54e-05
700	2.839	0.002	1.40e-03	9.86e-07	1.29e-01	9.09e-05
800	63.414	2.5295	3.13e-02	1.25e-03	2.88e+00	1.15e-01
900	54.02	1.6285	2.66e-02	8.03e-04	2.45e+00	7.40e-02
1000	46.921	1.543	2.31e-02	7.61e-04	2.13e+00	7.01e-02
1250	34.352	1.5885	1.69e-02	7.84e-04	1.56e+00	7.22e-02
1500	26.604	1.594	1.31e-02	7.86e-04	1.21e+00	7.24e-02
1750	21.724	1.4675	1.07e-02	7.24e-04	9.87e-01	6.67e-02
2000	17.9	1.465	8.83e-03	7.23e-04	8.13e-01	6.66e-02
2250	14.796	1.503	7.30e-03	7.41e-04	6.72e-01	6.83e-02
2500	12.892	1.3885	6.36e-03	6.85e-04	5.86e-01	6.31e-02
3000	9.424	1.294	4.65e-03	6.38e-04	4.28e-01	5.88e-02
4000	6.233	0.9795	3.07e-03	4.83e-04	2.83e-01	4.45e-02
5000	4.733	0.7715	2.33e-03	3.81e-04	2.15e-01	3.51e-02
7500	2.827	0.476	1.39e-03	2.35e-04	1.28e-01	2.16e-02
10000	1.826	0.327	9.01e-04	1.61e-04	8.30e-02	1.49e-02
15000	1.088	0.1875	5.37e-04	9.25e-05	4.94e-02	8.52e-03
20000	0.753	0.1245	3.71e-04	6.14e-05	3.42e-02	5.66e-03
30000	0.448	0.0685	2.21e-04	3.38e-05	2.04e-02	3.11e-03
40000	0.313	0.045	1.54e-04	2.22e-05	1.42e-02	2.04e-03
50000	0.237	0.0325	1.17e-04	1.60e-05	1.08e-02	1.48e-03

Notes:

1 Phosgene emission rate = 10.6 g/s.

2 HCl emission rate = 360 g/s.

3 Concentration = emission rate x concentration factor x 1.15 x $\frac{0.024}{MW} x \frac{10}{60}$.

TABLE 19
Average Emission Rates and Emission Durations for the Release Scenarios

Scenario	Conservative		Typical	
	Emission Rate (g/s)	Emission Duration (sec)	Emission Rate (g/s)	Emission Duration (sec)
On-Site Spill				
• Formaldehyde/Methanol	1,040	3,120	94	680
• Acetone/Toluene	465	18,240	42	3,960
On-Site Fire				
• HCl	360	7,030	150	167
• Phosgene	11	7,030	4.5	167
On-Site Mixing of Incompatible Wastes				
• HCl	1,790	1,200	71	600
Off-Site Spill				
• Formaldehyde/Methanol	1,840	1,740	94	680
• Acetone/Toluene	820	10,320	42	3,960
Off-Site Fire				
• HCl	1,470	430	76	167
• Phosgene	43	430	2.2	167

TABLE 20
Air Dispersion Modeling Results Based on Various Concentration Averaging Time

Chemical of Concern	Emission Scenario	Meteorology	Release Duration (sec)	Concentration Averaging Time (sec)	LOC (ppm)	IDLH (ppm)	Max. Dist. to LOC (m)[1]	Max. Dist. to IDLH (m)[1]
Formaldehyde	Typical	Typical	680	680	9.6	19.6	240	140
				1800	9.6	19.6	100	40
		Conservative	680	680	9.6	19.6	1270	850
				1800	9.6	19.6	910	550
		Calm/Inversion	0	305	9.6	19.6	1950	1300
				1800	9.6	19.6	1600	1000
HCl	Conservative	Typical	1200	1200	9.9	49.1	2230	870
				1800	9.9	49.1	1780	680
		Conservative	1200	1200	9.9	49.1	9110	3480
				1800	9.9	49.1	8790	3190
		Calm/Inversion	0	759	9.9	49.1	12840	4800
				1800	9.9	49.1	12200	4620

Note:

[1] All distances are measured from the property line to the east or west, across the Ohio river to the south, or from the existing railroad to the north, whichever is closer to the spill.

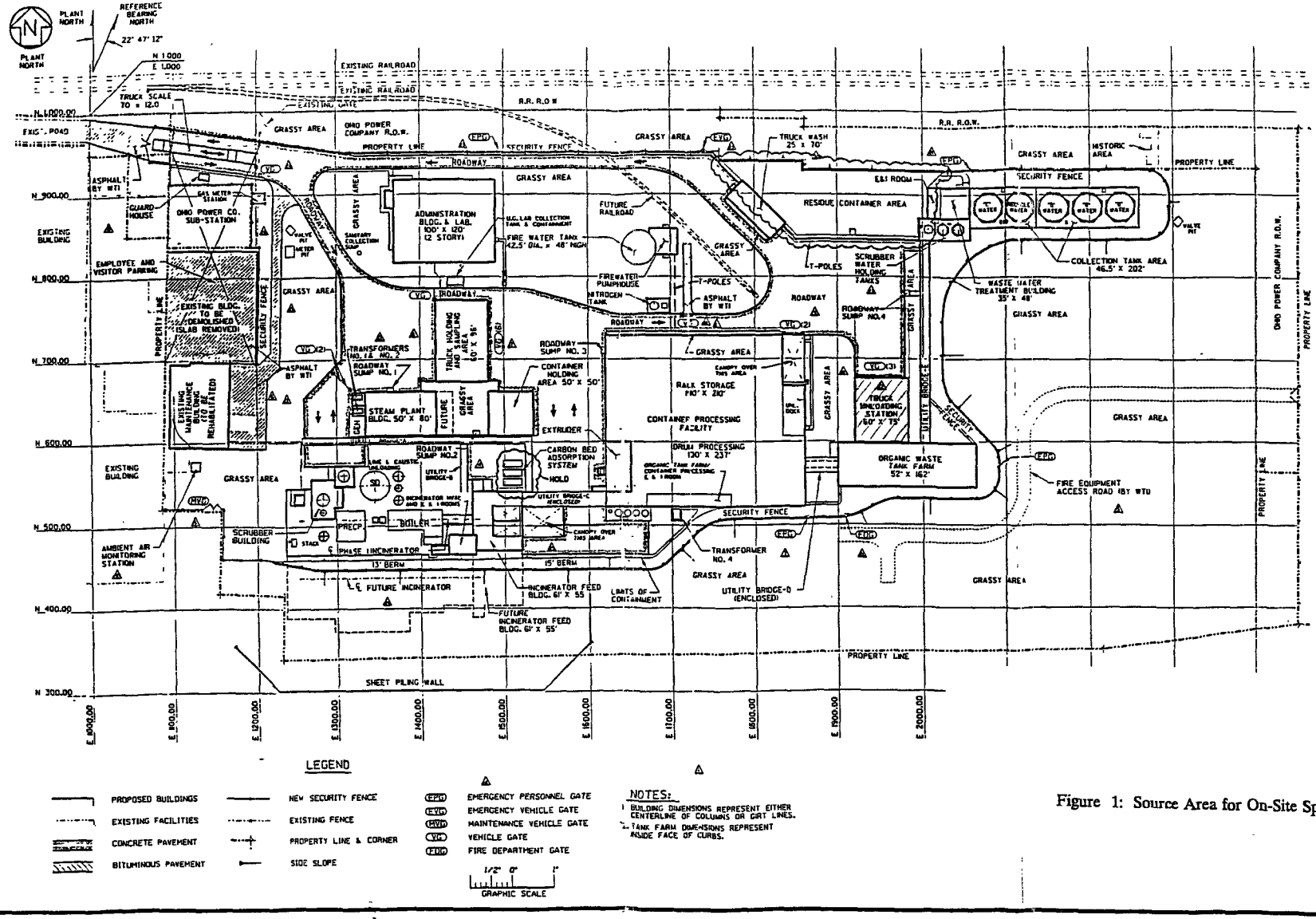

Figure 1: Source Area for On-Site Spill

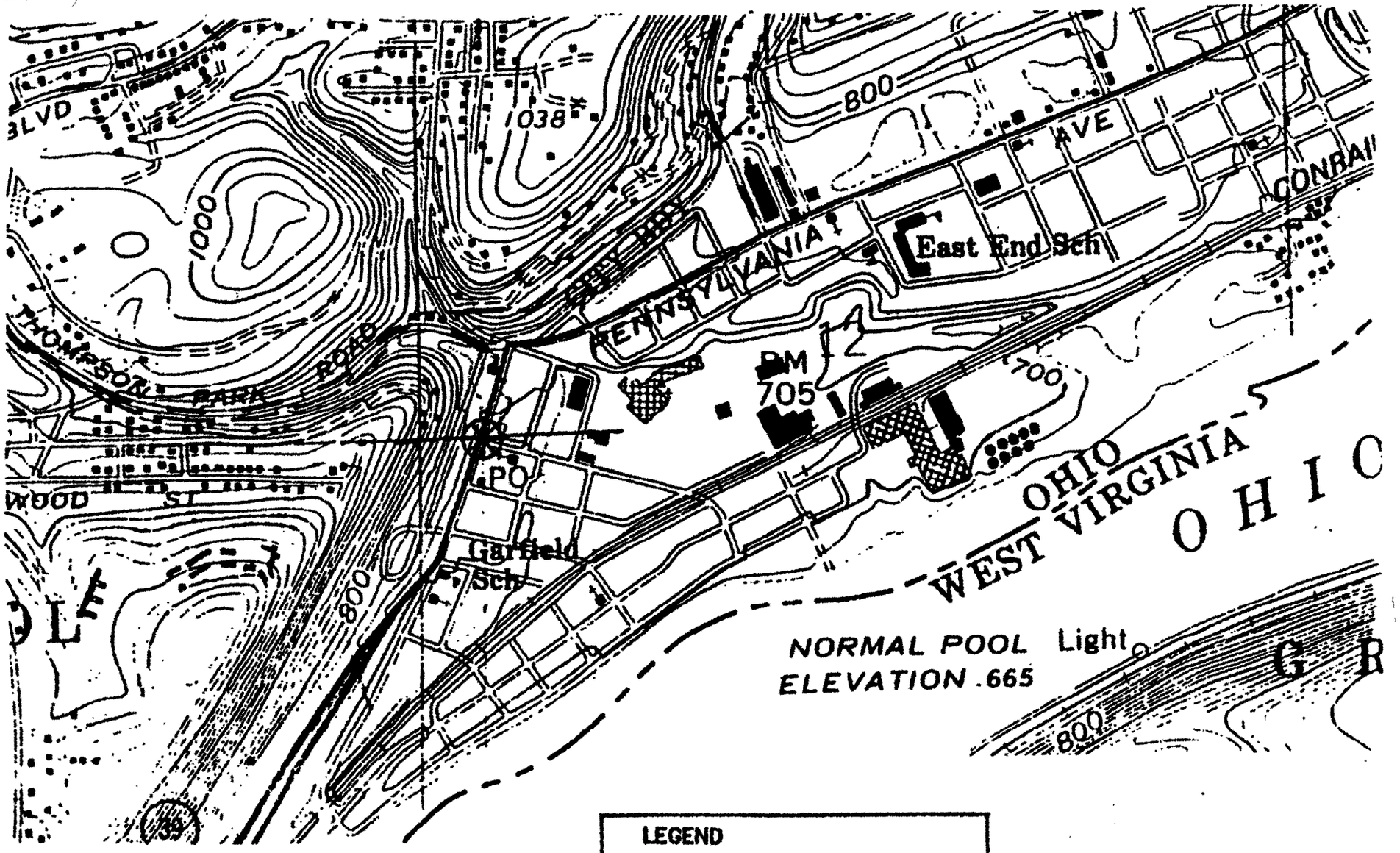

Figure 2
LOCATION FOR THE OFF-SITE SPILL

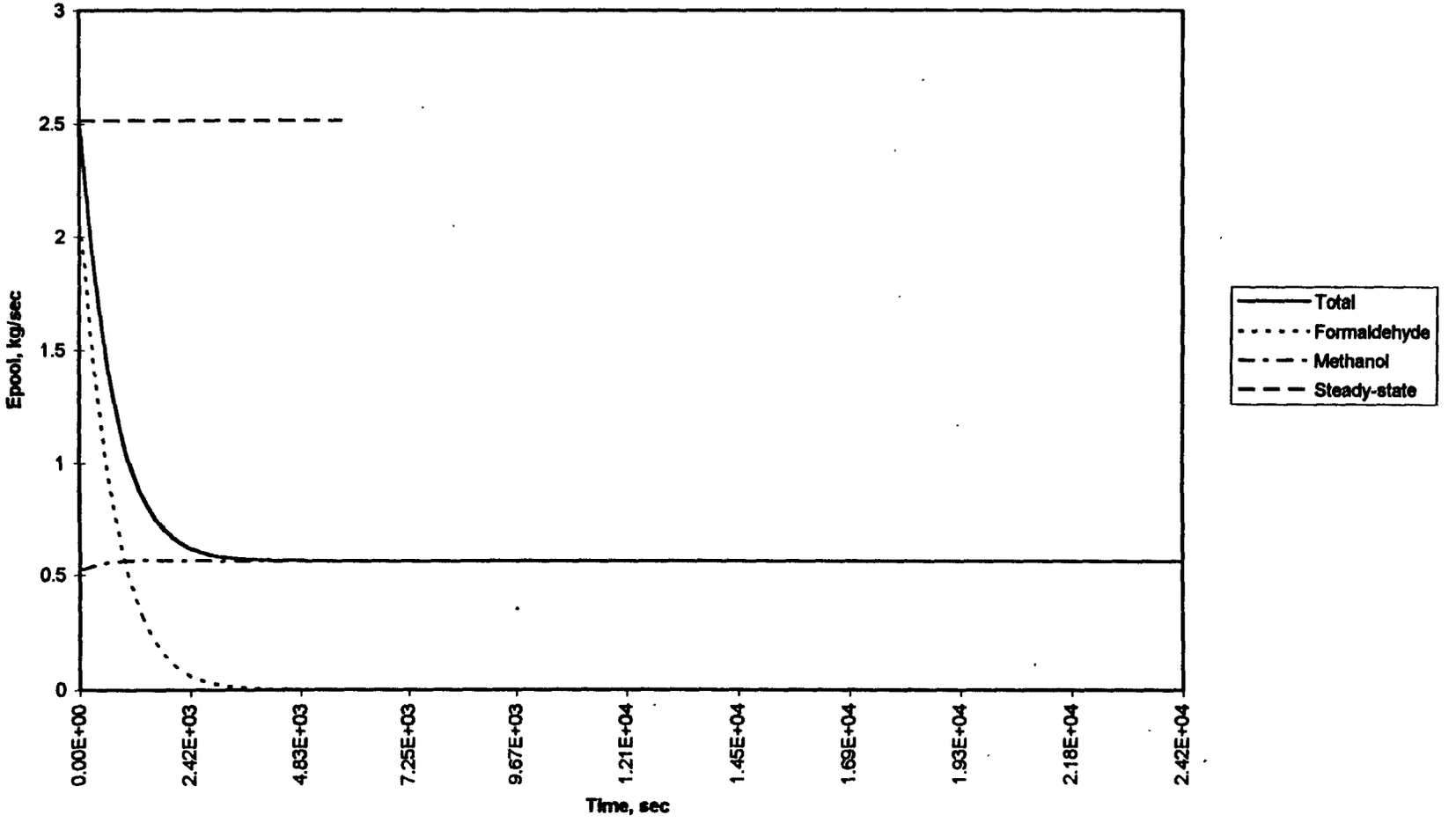

Figure 3: Rate of Evaporation of the 10% Formaldehyde/ 90% Methanol Liquid Pool for the On-Site Spill Scenario (Conservative Emissions)

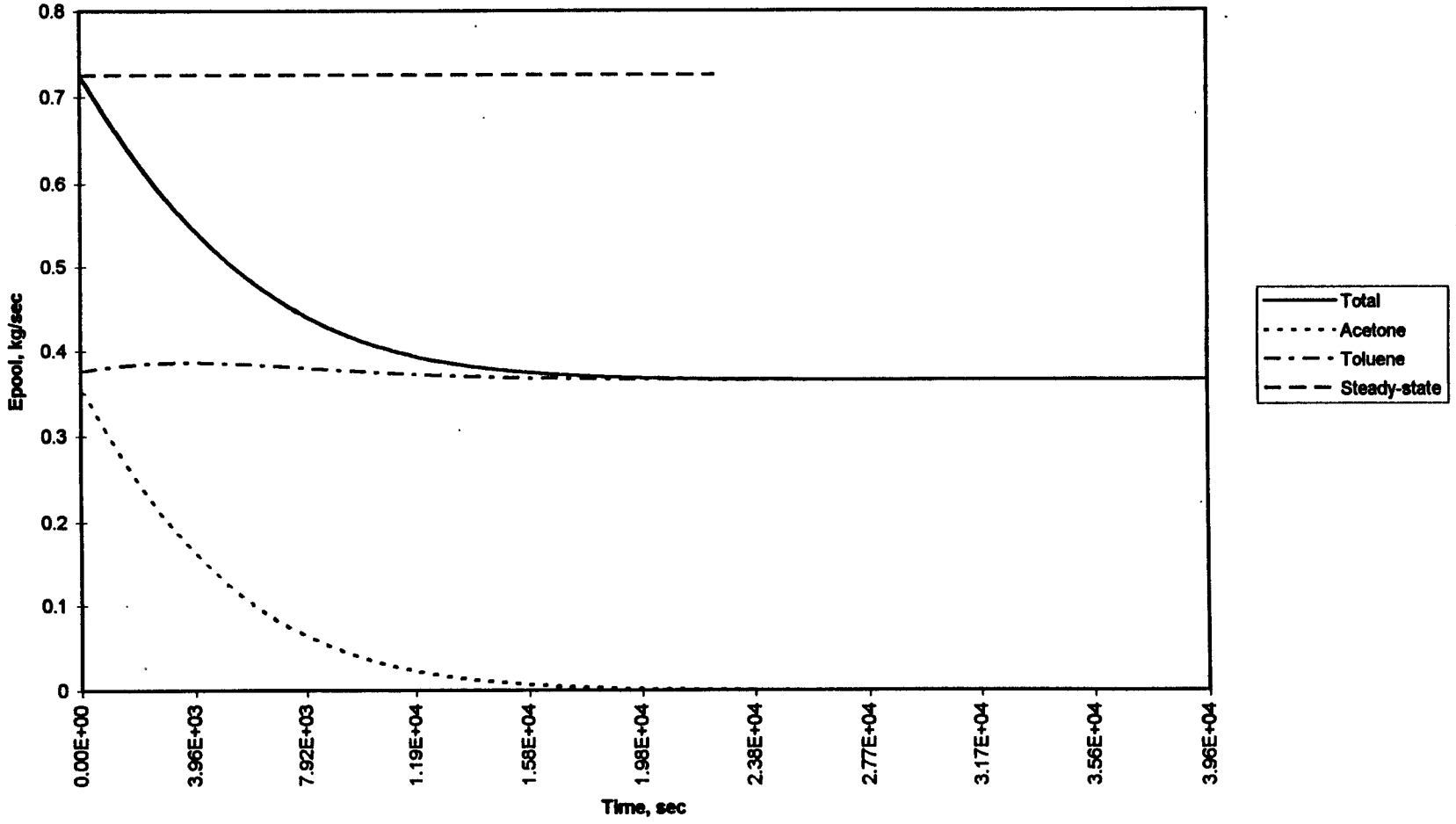

Figure 4: Rate of Evaporation of 10% Acetone/ 90% Toluene Liquid Pool for the On-Site Spill Scenario (Conservative Emissions)

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ATTACHMENT 1

Ohio Department of Public Safety Data

FACSIMILE MESSAGE

****

OHIO DEPARTMENT OF PUBLIC SAFETY
TRAFFIC CRASH RECORDS SECTION
1952 WEST BROAD STREET
COLUMBUS, OHIO 43223

PHONE: 614/752-1575
FAX: 614/752-1363

****

DATE: 8-24-95 TIME: 8:15 PAGES TO FOLLOW: 16

TO: Duane Arsnow FAX#: 609-452-0848

FROM: Kathy Nelson

REMARKS: Here are totals of crashes occurring on SR 39 by years. If you have any questions, please call.

NOTICE

THE INFORMATION CONTAINED IN THIS FACSIMILE MESSAGE IS CONFIDENTIAL BELONGING TO THE SENDER. THE INFORMATION IS INTENDED ONLY FOR USE OF THE INDIVIDUAL OR ENTITY NAMED ABOVE. IF ANY PAGES ARE UNCLEAR OR THERE IS ANY PROBLEM WITH THIS TRANSMISSION, PLEASE CALL IMMEDIATELY.

SR 39 in East Liverpool

Ohio Department of Highway Safety - Traffic Crash Records Section
Types of Motor Vehicles Involved in Ohio Accidents (MAC11)
Crashes From January, 1 1990 Thru December, 31 1990 Date of Run: 08/23/95 14:29

Type of Vehicle	Total Crashes	Vehicles In: Fatal Crashes	Vehicles In: Injury Crashes	Vehicles In: Property Crashes	Injury Severity: Fatal	Injury Severity: Injured	Injury Severity: No Injury
TYPE OF CAR							
COMPACT	6	0	4	2	0	2	3
FULL SIZE	4	0	0	4	0	0	6
MID SIZE	13	0	6	7	0	7	9
Sub-Totals	23	0	10	13	0	9	18
TYPE OF TRUCK							
PICKUP TRUCK	2	0	1	1	0	1	2
STR TRUCK TRLR	1	0	0	1	0	0	1
TRACT SEMI-TRLR	2	0	2	0	0	1	1
Sub-Totals	5	0	3	2	0	2	4
Total for Dates Specified	28	0	13	15	0	11	22

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Ohio Department of Highway Safety - Traffic Crash Records Section
Types of Motor Vehicles Involved in Ohio Accidents (HAC11)
Crashes From January, 1 1991 Thru December, 31 1991 Date of Run: 08/23/95 14:30

Type of Vehicle	Vehicles In				Injury Severity		
	Total Crashes	Fatal Crashes	Injury Crashes	Property Crashes	Fatal	Injured	No Injury
TYPE OF CAR							
COMPACT	8	0	4	4	0	8	4
FULL SIZE	3	0	1	2	0	2	2
MID SIZE	12	0	6	6	0	9	11
Sub-Totals	23	0	11	12	0	19	17
TYPE OF MOTORCYCLE							
MC351CC TO 750CC	1	0	1	0	0	2	0
Sub-Totals	1	0	1	0	0	2	0
TYPE OF OTHER VEHICLE							
CONSTRUCTION EQUIP	1	0	1	0	0	1	0
MOTOR HOME	1	0	0	1	0	0	4
Sub-Totals	2	0	1	1	0	1	4
TYPE OF TRUCK							
PANEL/VAN	1	0	1	0	0	1	0
PICKUP TRUCK	5	1	2	2	0	3	3
Sub-Totals	6	1	3	2	0	4	3
Total for Dates Specified	32	1	16	15	0	28	24

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Ohio Department of Highway Safety - Traffic Crash Records Section
Types of Motor Vehicles Involved in Ohio Accidents (HAC11)
Crashes From January, 1 1992 Thru December, 31 1992 Date of Run: 08/23/93 14:32

Type of Vehicle	Vehicles In				Injury Severity		
	Total Crashes	Fatal Crashes	Injury Crashes	Property Crashes	Fatal	Injured	No Injury
TYPE OF CAR							
COMPACT	5	0	5	2	0	4	1
FULL SIZE	9	0	5	4	0	4	3
MID SIZE	14	0	6	8	0	7	12
Sub-Totals	28	0	16	14	0	15	16
TYPE OF EMERGENCY VEHICLE							
POLICE VEHICLE	1	0	0	1	0	0	0
Sub-Totals	1	0	0	1	0	0	0
TYPE OF OTHER VEHICLE							
NOT STATED	1	0	0	1	0	0	1
Sub-Totals	1	0	0	1	0	0	1
TYPE OF TRUCK							
PANEL/VAN	2	0	1	1	0	1	1
PICKUP TRUCK	5	0	2	3	0	2	5
TRACT SEMI-TRLR	1	0	0	1	0	0	1
Sub-Totals	8	0	3	5	0	3	7
Total for Dates Specified	38	0	17	21	0	18	24

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Ohio Department of Highway Safety - Traffic Crash Records Section
Types of Motor Vehicles Involved in Ohio Accidents (HMC11)
Crashes From January, 1 1993 Thru December, 31 1993 Date of Run: 08/23/95 14:33

Type of Vehicle	Total Crashes	Vehicles In: Fatal Crashes	Vehicles In: Injury Crashes	Vehicles In: Property Crashes	Injury Severity: Fatal	Injury Severity: Injured	Injury Severity: No Injury
TYPE OF CAR							
COMPACT	5	0	3	2	0	3	2
FULL SIZE	3	0	2	1	0	1	2
MID SIZE	6	0	3	3	0	3	3
Sub-Totals	14	0	8	6	0	7	7
TYPE OF TRUCK							
PICKUP TRUCK	2	0	1	1	0	1	1
TRACT SEMI-TRLR	1	0	1	0	0	1	0
Sub-Totals	3	0	2	1	0	2	1
Total for Dates Specified	17	0	10	7	0	9	8

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Ohio Department of Highway Safety - Traffic Crash Records Section
Types of Motor Vehicles Involved in Ohio Accidents (NHAC11)
Crashes From January, 1 1994 Thru December, 31 1994 Date of Run: 08/23/95 14:34

Type of Vehicle	Total Crashes	Vehicles In: Fatal Crashes	Vehicles In: Injury Crashes	Vehicles In: Property Crashes	Injury Severity: Fatal	Injury Severity: Injured	Injury Severity: No Injury
TYPE OF CAR							
COMPACT	4	0	1	3	0	4	5
FULL SIZE	8	0	2	6	0	1	10
MID SIZE	8	0	2	6	0	1	10
Sub-Totals	20	0	5	15	0	6	25
TYPE OF TRUCK							
PANEL/VAN	3	0	0	3	0	0	3
PICKUP TRUCK	4	0	1	3	0	1	3
STRAIGHT TRUCK	1	0	0	1	0	0	1
TRACT SEMI-TRLR	2	0	1	1	0	0	1
Sub-Totals	10	0	2	8	0	1	8
Total for Dates Specified	30	0	7	23	0	7	31

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Ohio Department of Highway Safety - Traffic Crash Records Section
Types of Motor Vehicles Involved in Ohio Accidents (MAC11)
Crashes From January, 1 1995 Thru December, 31 1995 Date of Run: 08/23/95 14:35

Type of Vehicle	Total Crashes	Vehicles In Fatal Crashes	Vehicles In Injury Crashes	Vehicles In Property Crashes	Injury Severity Fatal	Injury Severity Injured	Injury Severity No Injury
TYPE OF CAR							
COMPACT	3	0	1	2	0	1	2
FULL SIZE	1	0	0	1	0	0	1
MID SIZE	7	0	3	4	0	4	4
Sub-Totals	11	0	4	7	0	5	7
TYPE OF TRUCK							
PANEL/VAN	1	0	1	0	0	0	1
PICKUP TRUCK	1	0	1	0	0	1	0
Sub-Totals	2	0	2	0	0	1	1
Total for Dates Specified	13	0	6	7	0	6	8

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Columbiana Co.

OHIO DEPARTMENT OF HIGHWAY SAFETY - INTEGRATED TRAFFIC RECORDS SYSTEM
CA001 - Motor Vehicle Traffic Crashes in Ohio (Cum) Date of Run: 08/23/95 14:44
Statewide Crashes From January, 1 1990 Thru December, 31 1990

Area	Jurisdiction	Yr	Total	Crash Severity Fatal	Injury	Property	Total Deaths	Pedest	Total Injury	Pedest
Columbiana	**County**									
Rural	County Road	90	518	1	179	338	1	0	270	2
Rural	Rur St Hwy	90	1,240	12	379	849	12	0	638	1
Rural	Township Rd	90	263	2	95	166	2	0	137	1
Rural	Village Road	90	62	0	22	40	0	0	34	0
Urban	Muni Street	90	1,192	2	404	786	3	0	704	28
County	Sub-Totals		3,275	17	1,079	2,179	18	0	1,783	32

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OHIO DEPARTMENT OF HIGHWAY SAFETY - INTEGRATED TRAFFIC RECORDS SYSTEM
CA061 - Motor Vehicle Traffic Crashes in Ohio (Cum) Date of Run: 08/23/95 14:44
Statewide Crashes From January, 1 1990 Thru December, 31 1990

Area	Jurisdiction	Yr	Total	Crash Severity Fatal	Injury	Property	Total Deaths	Pedest	Total Injury	Pedest
Rural										
Statewide	County Road	90	518	1	179	338	1	0	270	2
Statewide	Rur St Hwy	90	1,240	12	979	849	12	0	638	1
Statewide	Township Rd	90	263	2	95	166	2	0	137	1
Statewide	Village Road	90	62	0	22	40	0	0	34	0
Sub-Totals			2,083	15	675	1,393	15	0	1,079	4
Urban										
Statewide	Muni Street	90	1,192	2	404	786	3	0	704	28
Sub-Totals			1,192	2	404	786	3	0	704	28
Grand Totals			3,275	17	1,079	2,179	18	0	1,783	32

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OHIO DEPARTMENT OF HIGHWAY SAFETY - INTEGRATED TRAFFIC RECORDS SYSTEM
CA001 - Motor Vehicle Traffic Crashes in Ohio (Cum) Date of Run: 08/23/95 14:49
Statewide Crashes From January, 1 1991 Thru December, 31 1991

Area	Jurisdiction	Yr	Total	Crash Severity Fatal	Injury	Property	Total Deaths	Pedest	Total Injury	Pedest
Columbiana	County									
Rural	County Road	91	469	3	175	291	3	1	264	2
Rural	Rur St Hwy	91	1,138	5	350	783	6	0	558	6
Rural	Township Rd	91	273	1	118	154	1	0	182	1
Rural	Village Road	91	69	0	23	46	0	0	42	0
Urban	Muni Street	91	1,226	3	399	824	4	1	688	23
Urban	Unknown	91	1	0	0	1	0	0	0	0
County	Sub-Totals		3,176	12	1,065	2,099	14	2	1,734	32

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OHIO DEPARTMENT OF HIGHWAY SAFETY - INTEGRATED TRAFFIC RECORDS SYSTEM
CAC01 - Motor Vehicle Traffic Crashes in Ohio (Cum) Date of Run: 08/23/95 14:48
Statewide Crashes From January, 1 1991 Thru December, 31 1991

Area	Jurisdiction	Yr	Total	Crash Severity Fatal	Injury	Property	Total Deaths	Pedest	Total Injury	Pedest
Rural										
Statewide	County Road	91	469	3	175	291	3	1	264	2
Statewide	Rur St Hwy	91	1,138	5	350	783	6	0	558	6
Statewide	Township Rd	91	273	1	119	154	1	0	102	1
Statewide	Village Road	91	69	0	23	46	0	0	42	0
Sub-Totals			1,949	9	666	1,274	10	1	1,046	9
Urban										
Statewide	Muni Street	91	1,226	3	399	824	4	1	688	23
Statewide	Unknown	91	1	0	0	1	0	0	0	0
Sub-Totals			1,227	3	399	825	4	1	688	23
Grand Totals			3,176	12	1,065	2,099	14	2	1,734	32

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OHIO DEPARTMENT OF HIGHWAY SAFETY - INTEGRATED TRAFFIC RECORDS SYSTEM
CA001 - Motor Vehicle Traffic Crashes in Ohio (Cum) Date of Run: 08/23/95 14:50
Statewide Crashes From January, 1 1992 Thru December, 31 1992

Area	Jurisdiction	Yr	Total	Crash Severity Fatal	Injury	Property	Total Deaths	Pedest	Total Injury	Pedest
Columbiana	County									
Rural	County Road	92	483	1	167	315	1	1	250	1
Rural	Muni Street	92	6	0	1	5	0	0	2	0
Rural	Rur St Hwy	92	1,225	10	387	828	10	0	660	8
Rural	Township Rd	92	246	3	91	152	3	0	139	2
Rural	Village Road	92	71	0	24	47	0	0	50	0
Urban	Muni Street	92	1,032	1	318	713	1	0	508	15
Urban	Village Road	92	1	0	1	0	0	0	1	0
County Sub-Totals			3,064	15	989	2,060	15	1	1,680	26

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OHIO DEPARTMENT OF HIGHWAY SAFETY - INTEGRATED TRAFFIC RECORDS SYSTEM
CR001 - Motor Vehicle Traffic Crashes in Ohio (Cum) Date of Run: 08/23/95 14:50
Statewide Crashes From January, 1 1992 Thru December, 31 1992

Area	Jurisdiction	Yr	Total	Crash Severity Fatal	Injury	Property	Total Deaths	Pedest	Total Injury	Pedest
Rural										
Statewide	County Road	92	483	1	167	315	1	1	250	1
Statewide	Muni Street	92	6	0	1	5	0	0	2	0
Statewide	Rur St Hwy	92	1,225	10	387	828	10	0	660	8
Statewide	Township Rd	92	266	3	91	152	3	0	139	2
Statewide	Village Road	92	71	0	24	47	0	0	50	0
Sub-Totals			2,051	14	670	1,347	14	1	1,101	11
Urban										
Statewide	Muni Street	92	1,032	1	318	713	1	0	588	15
Statewide	Village Road	92	1	0	1	0	0	0	1	0
Sub-Totals			1,033	1	319	713	1	0	589	15
Grand Totals			3,084	15	989	2,060	15	1	1,690	26

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OHIO DEPARTMENT OF HIGHWAY SAFETY - INTEGRATED TRAFFIC RECORDS SYSTEM
CAD01 - Motor Vehicle Traffic Crashes in Ohio (Cum) Date of Run: 08/23/95 15:06
Statewide Crashes From January, 1 1993 Thru December, 31 1993

Area	Jurisdiction	Yr	Total	Crash Severity Fatal	Injury	Property	Total Deaths	Pedest	Total Injury	Pedest
Columbiana	**County**									
Rural	County Road	93	491	1	174	316	1	0	253	0
Rural	Rur St Hwy	93	1,032	6	345	681	7	0	569	3
Rural	Township Rd	93	273	4	109	160	5	0	173	0
Rural	Village Road	93	72	0	27	45	0	0	52	1
Urban	Muni Street	93	779	0	281	498	0	0	521	11
County Sub-Totals			2,647	11	936	1,700	13	0	1,568	15

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OHIO DEPARTMENT OF HIGHWAY SAFETY - INTEGRATED TRAFFIC RECORDS SYSTEM
CA001 - Motor Vehicle Traffic Crashes in Ohio (Cum) Date of Run: 08/23/95 15:06
Statewide Crashes From January, 1 1993 Thru December, 31 1993

Area	Jurisdiction	Yr	Total	Crash Severity Fatal	Injury	Property	Total Deaths	Pedest	Total Injury	Pedest
Rural										
Statewide	County Road	93	491	1	174	316	1	0	253	0
Statewide	Rur St Hwy	93	1,032	6	345	681	7	0	569	3
Statewide	Township Rd	93	273	4	109	160	5	0	173	0
Statewide	Village Road	93	72	0	27	45	0	0	52	1
Sub-Totals			1,868	11	655	1,202	13	0	1,047	4
Urban										
Statewide	Muni Street	93	779	0	281	498	0	0	521	11
Sub-Totals			779	0	281	498	0	0	521	11
Grand Totals			2,647	11	936	1,700	13	0	1,568	15

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OHIO DEPARTMENT OF HIGHWAY SAFETY - INTEGRATED TRAFFIC RECORDS SYSTEM
CA001 - Motor Vehicle Traffic Crashes in Ohio (Cum) Date of Run: 08/23/95 15:05
Statewide Crashes From January, 1 1994 Thru December, 31 1994

Area	Jurisdiction	Yr	Total	Crash Severity Fatal	Injury	Property	Total Deaths	Pedest	Total Injury	Pedest
Columbiana County										
Rural	County Road	94	484	2	177	305	3	0	268	4
Rural	Rur St Hwy	94	1,043	12	329	702	14	0	542	2
Rural	Township Rd	94	245	1	87	157	1	0	140	0
Rural	Village Road	94	62	0	26	36	0	0	44	0
Urban	Muni Street	94	777	1	214	562	1	0	348	12
County Sub-Totals			2,611	16	833	1,762	19	0	1,342	18

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OHIO DEPARTMENT OF HIGHWAY SAFETY - INTEGRATED TRAFFIC RECORDS SYSTEM
CR001 - Motor Vehicle Traffic Crashes in Ohio (Cum) Date of Run: 08/23/95 15:05
Statewide Crashes From January, 1 1994 Thru December, 31 1994

Area	Jurisdiction	Yr	Total	Crash Severity Fatal	Injury	Property	Total Deaths	Pedest	Total Injury	Pedest
Rural										
Statewide	County Road	94	486	2	177	305	3	0	268	4
Statewide	Rur St Hwy	94	1,043	12	329	702	14	0	542	2
Statewide	Township Rd	94	245	1	87	157	1	0	140	0
Statewide	Village Road	94	62	0	26	36	0	0	44	0
Sub-Totals			1,836	15	619	1,200	18	0	994	6
Urban										
Statewide	Muni Street	94	777	1	214	562	1	0	348	12
Sub-Totals			777	1	214	562	1	0	348	12
Grand Totals			2,611	16	833	1,762	19	0	1,342	18

External Review Draft
Do Not Cite or Quote

ATTACHMENT 2

Ohio Department of Transportation Data

George V. Voinovich
Governor

OHIO DEPARTMENT OF TRANSPORTATIC

25 South Front Street
P.O. Box 899
Columbus, Ohio 43216-0899

August 31, 1995

Ms. Daune Arnsow
ENVIRON
214 Carnegie Center
Princeton, New Jersey 08540-6284

Re: Travel Data for SR 39 in East Liverpool, Columbiana County

Dear Ms. Arnsow:

We have prepared the attached data sheet in response to the subject request. The information was extracted from our historic Highway Performance Monitoring System databases.

The traffic data was available for each section of SR 39 at the state, county and incorporated level. The HPMS truck information, however, was not available on a sufficient number of sections to be particularly meaningful except, possibly, at the State level. Furthermore, the HPMS sections with the additional truck data are selected for statistical adequacy upon a basis that is not necessarily sufficient for projecting a single route, even at the State-wide level.

The SR 39 data is only for those sections of SR 39 that are primary routes. In other words, those sections of SR 39 "overlapping" with other route(s) with a higher functional class, a higher jurisdictional level (interstate or US route), or a lower route number at the same jurisdictional level, are not included in this data. In Columbiana County, such sections would be where SR 39 follows SR 7 and US 30.

Some additional truck data was available in the current State "traffic book" database. The truck data from that file represents East Liverpool and Columbiana County for approximately 1992-94, and the State for about 1990-1994. The values computed from the traffic book's data are as follows:

East Liverpool	SR 39 traffic is 11.20% trucks
Columbiana County	SR 39 traffic is 7.00% trucks
State of Ohio	SR 39 traffic is 6.70% trucks

Please note that the HPMS truck data indicates that the proportions of SR 39 truck travel in Columbi County range from 8% (1990-91) to 5% (1992-94) of the total vehicle travel, and at the State wide leve., about 8%.

Please do not hesitate to call Ms. Andrea Goldberg of my staff (614)466-2697 if you have any questions or require additional information.

Respectfully,

James E McQuirt

James E. McQuirt, P.E.
Administrator
Office of Technical Services

JEM:db

Attachment

ATTACHMENT

1) Estimated Daily Vehicle Miles Traveled (DVMT) for Columbiana County

	DVMT	
1990	2,480,770	
1991	2,550,010	
1992	2,695,350	
1993	2,671,490	
1994	2,724,910	(projected from 1993)

2) SR 39 State-Wide Data

	All DVMT	Truck DVMT	Miles
1990	613,901	53,924	140.90
1991	624,036	56,251	140.90
1992	640,018	48,588	140.74
1993	694,641	56,085	140.74
1994	705,359	56,950	140.74

3) SR 39 Columbiana County Data

	All DVMT	Truck DVMT	Miles
1990	81,093	6,487	17.11
1991	82,074	6,566	17.11
1992	82,168	4,108	17.11
1993	84,292	4,215	17.08
1994	86,180	4,309	17.08

4) SR 39 East Liverpool Urban Area Data

	All DVMT	Truck DVMT	Miles
1990	35,178	———	3.39
1991	35,417	———	3.39
1992	31,830	———	3.39
1993	32,496	———	3.36
1994	33,877	———	3.36

a) New traffic counts taken for Columbiana County in 1992. 1990 and 1991 counts are projections of the previous (circa 1988) counts; 1993 and 1994 are projections of the 1992 counts.

b) Truck information is based upon a sample of approximately 11.5% of the statewide mileage and approximately 2% of the Columbiana County mileage. No truck breakdowns were available within East Liverpool.

ATTACHMENT 1

Program AIRCONC

```
      program airconc
      integer indexl, indexh,npts,nmet,nblank,iloc
      double precision mfrac,loc,idlh
      character*80 filenm,fileout,chem
      character*80 junk
      character*7 scen,locat,durat,meteo
      double precision xp(54,61), zm(54,61), cvpm(54,61), timp(54,61)
      double precision maxconc(24),maxdist
      double precision tcld(54,61),conc(54,24)
      double precision x(24), rmin, rmax, dist1, dist2,xloc(13)
      data x/25,50,100,200,300,400,500,600,700,800,900,1000,1250,1500,
     1           1750,2000,2250,2500,3000,4000,5000,10000,15000,20000/
      data xloc/0.0001,0.0005,0.001,0.005,0.01,0.05,0.1,0.5,1.0,5.0,
     1          10.0,50.0,100.0/
      open(unit=5,file='ppm.dat',status='old')
      read(5,130) filenm
      open(unit=3,file=filenm, status='old')
      fileout = 'ppm'// filenm(4:9)
      open(unit=7,file=fileout, status='new')
      read(5,132) mfrac
      read(5,132) loc
      read(5,132) idlh
      read(5,130) chem
      read(5,131) scen
      read(5,131) locat
      read(5,131) meteo
      read(5,131) durat
      if(meteo.eq.'WORST  ') then
      nmet = 54
          else
      nmet = 1
      endif
      npts = 24
      write(7,133)'From Slab output file:',filenm
      write(7,129)'Scenario:',scen
      write(7,129)'Accident Location:', locat
      write(7,129)'Duration:', durat
      write(7,129)'Meteorology:', meteo
      write(7,133)'Chemical:', chem
      write(7,134)'Vapor phase mole fraction:',mfrac
      write(7,134)'LOC:',loc
      write(7,134)'IDLH:',idlh
      if (nmet.eq.1) nblank = 323
      if (nmet.eq.54) nblank = 5
      do 10 j =1, nmet
      do 12 k = 1, nblank
      read(3,130) junk
   12 continue
      read (3,135) (xp(j,i),
     1           cvpm(j,i), i = 1,61)
   10 continue
c  find interpolation indeces
          if(locat.eq.'ON-SITE') then
          write(7,*)'*Output adjusted to be distance from fenceline.'
           do 29 i=1,61
              do 28 j = 1,nmet
                 xp(j,i) = xp(j,i) - (250./3.2808)
   28        continue
   29        continue
          endif
      do 30 j = 1, nmet
       do 35 k=1, npts
                    if(xp(j,61).ge.x(k)) then
         do 40 i = 1, 61
                    if(xp(j,i).le.x(k)) then
                       indexl = i
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                    indexh = i+1
                  endif
 40     continue
              dist1 = xp(j,indexh) - xp(j,indexl)
              dist2 = x(k) - xp(j,indexl)
              rmax = cvpm(j,indexh)
              rmin = cvpm(j,indexl)
          conc(j,k)=mfrac*1e+06*((dist2*(rmax-rmin)/dist1)+rmin)
                else
                npts = k-1
                goto 30
                endif
 35     continue
 30     continue
      if (nmet.ne.1) then
      write(7,145)'X,m',(i,i=1,27)
      write(7,140) (x(i),(conc(j,i), j=1,27), i=1,npts)
      write(7,145)'X,m',(i,i=28,nmet)
      write(7,140) (x(i),(conc(j,i), j=28,nmet), i=1,npts)
      endif
        do 45 k = 1, npts
           maxconc(k) = 0.0
 45     continue
        write(7,147) 'X,m', 'Max concentration, ppm'
           do 50 k=1,npts
              do 60 j = 1, nmet
                 maxconc(k) = max(maxconc(k),conc(j,k))
 60   continue
           write(7,150) x(k), maxconc(k)
 50   continue
c find distances to fractions of LOC
      write(7,*)
      write(7,*)
      write(7,155)'Concentration (ppm)', 'Distance to (m)'
c     do 80 iloc = 1,13
      do 80 iloc = 9,9
           maxdist = 0.0
           indexl=1
           indexh=1
           do 70 k=npts,1,-1
           if(maxconc(k).le.(xloc(iloc)*loc)) then
             indexl=k
             indexh=k-1
           endif
 70   continue
           if(maxconc(1).ge.(xloc(iloc)*loc).and.
     1          maxconc(npts).le.(xloc(iloc)*loc)) then
                dist1 = maxconc(indexh)-maxconc(indexl)
                dist2 = maxconc(indexh)-(xloc(iloc)*loc)
                rmax = x(indexh)
                rmin = x(indexl)
                maxdist=rmax - (dist2*(rmax-rmin)/dist1)
                   write(7,160) loc*xloc(iloc), maxdist
                   endif
                   if (maxconc(1).le.(loc*xloc(iloc))) then
                   write(7,165) loc*xloc(iloc),' less than', x(1)
                   endif
                   if (maxconc(npts).ge.(loc*xloc(iloc))) then
                   write(7,165) loc*xloc(iloc),' greater than', x(npts)
                   endif
 80   continue
c  find distance to the IDLH
           maxdist = 0.0
           indexl=1
           indexh=1
           do 95 k=npts,1,-1
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```
          if(maxconc(k).le.idlh) then
            indexl=k
            indexh=k-1
          endif
 5    continue
          if(maxconc(1).ge.idlh.and.
     1          maxconc(npts).le.idlh) then
               dist1 = maxconc(indexh)-maxconc(indexl)
               dist2 = maxconc(indexh)-idlh
               rmax = x(indexh)
               rmin = x(indexl)
               maxdist=rmax - (dist2*(rmax-rmin)/dist1)
                  write(7,161) idlh, maxdist
                  endif
                  if (maxconc(1).le.idlh) then
                  write(7,166) idlh,' less than', x(1)
                  endif
                  if (maxconc(npts).ge.idlh) then
                  write(7,166) idlh,' greater than', x(npts)
                  endif
 130 format (A80)
 131 format (A7)
 132 format (f12.3)
 129 format (A26,T40,A7)
 133 format (A26,T40,A80)
 134 format (A26,T40,f12.3)
 135 format (e12.2,42x,e11.2)
 136 format (2e12.2)
 140 format (28f12.2)
 145 format (A12,27I12)
 147 format(/,A12,3x,A22 /, 40('-'))
 150 format (F12.2,3x,F12.2)
 155 format (//,A19,8x,A15 /,40('='))
 156 format (2F12.2)
 160 format ('LOC',5x,F12.4,8x,F12.2)
 161 format ('IDLH',4x,F12.4,8x,F12.2)
 165 format ('LOC',3x,F12.4,A15, F12.2)
 166 format ('IDLH',2x,F12.4,A15, F12.2)
     end
```

ATTACHMENT 2

SLAB Output for the On-Site Spill Scenario

RUN01.OUT

problem input

idspl	=	1
ncalc	=	1
wms	=	.031880
cps	=	909.80
tbp	=	309.35
cmed0	=	.00
dhe	=	1070000.
cpsl	=	2716.00
rhosl	=	793.70
spb	=	-1.00
spc	=	.00
ts	=	293.00
qs	=	1.04
as	=	418.00
tsd	=	3120.
qtis	=	.00
hs	=	.00
tav	=	1800.00
xffm	=	20000.00
zp(1)	=	.00
zp(2)	=	.00
zp(3)	=	.00
zp(4)	=	.00
z0	=	.300000
za	=	10.00
ua	=	3.20
ta	=	293.00
rh	=	68.00
stab	=	4.00

release gas properties

molecular weight of source gas (kg)	- wms =	3.1880E-02
vapor heat capacity, const. p. (j/kg-k)	- cps =	9.0980E+02
temperature of source gas (k)	- ts =	3.0935E+02
density of source gas (kg/m3)	- rhos =	1.2559E+00
boiling point temperature	- tbp =	3.0935E+02
liquid mass fraction	- cmed0=	0.0000E+00
liquid heat capacity (j/kg-k)	- cpsl =	2.7160E+03
heat of vaporization (j/kg)	- dhe =	1.0700E+06
liquid source density (kg/m3)	- rhosl=	7.9370E+02
saturation pressure constant	- spa =	1.3263E+01
saturation pressure constant (k)	- spb =	4.1028E+03
saturation pressure constant (k)	- spc =	0.0000E+00

spill characteristics

spill type	- idspl=	1
mass source rate (kg/s)	- qs =	1.0400E+00
continuous source duration (s)	- tsd =	3.1200E+03
continuous source mass (kg)	- qtcs =	3.2448E+03
instantaneous source mass (kg)	- qtis =	0.0000E+00
source area (m2)	- as =	4.1800E+02
vertical vapor velocity (m/s)	- ws =	1.9811E-03
source half width (m)	- bs =	1.0223E+01
source height (m)	- hs =	0.0000E+00
horizontal vapor velocity (m/s)	- us =	0.0000E+00

field parameters

concentration averaging time (s)	- tav =	1.8000E+03
mixing layer height (m)	- hmx =	1.0400E+03
maximum downwind distrace (m)	- xffm =	2.0000E+04
concentration measurement height (m)	- zp(1)=	0.0000E+00
	- zp(2)=	0.0000E+00
	- zp(3)=	0.0000E+00
	- zp(4)=	0.0000E+00

ambient meteorological properties

molecular weight of ambient air (kg)	- wmae	=	2.8783E-02
heat capacity of ambient air at const p. (j/kg-k)	- cpaa	=	1.0144E+03
density of ambient air (kg/m3)	- rhoa	=	1.1972E+00
ambient measurement height (m)	- za	=	1.0000E+01
ambient atmospheric pressure (pa=n/m2=j/m3)	- pa	=	1.0133E+05
ambient wind speed (m/s)	- ua	=	3.2000E+00
ambient temperature (k)	- ta	=	2.9300E+02
relative humidity (percent)	- rh	=	6.8000E+01
ambient friction velocity (m/s)	- uastr	=	3.7515E-01
atmospheric stability class value	- stab	=	4.0000E+00
inverse monin-obukhov length (1/m)	- ala	=	0.0000E+00
surface roughness height (m)	- z0	=	3.0000E-01

additional parameters

sub-step multiplier	- ncalc	=	1
number of calculational sub-steps	- nssm	=	3
acceleration of gravity (m/s2)	- grav	=	9.8067E+00
gas constant (j/mol- k)	- rr	=	8.3143E+00
von karman constant	- xk	=	4.1000E-01

1

instantaneous spatially averaged cloud parameters

x	zc	h	bb	b	bbx	bx	cv	rho	t	u	ua
-1.02E+01	0.00E+00	0.00E+00	1.02E+01	9.20E+00	1.02E+01	1.02E+01	0.00E+00	1.20E+00	2.93E+02	0.00E+00	0.00E+00
-8.18E+00	0.00E+00	1.75E+00	1.04E+01	9.20E+00	1.13E+01	1.13E+01	2.39E-03	1.20E+00	2.93E+02	9.05E-01	9.08E-01
-6.13E+00	0.00E+00	2.37E+00	1.05E+01	9.20E+00	1.24E+01	1.24E+01	2.80E-03	1.20E+00	2.93E+02	1.13E+00	1.13E+00
-4.09E+00	0.00E+00	2.86E+00	1.06E+01	9.20E+00	1.35E+01	1.35E+01	3.05E-03	1.20E+00	2.93E+02	1.27E+00	1.28E+00
-2.04E+00	0.00E+00	3.29E+00	1.07E+01	9.20E+00	1.45E+01	1.45E+01	3.22E-03	1.20E+00	2.93E+02	1.38E+00	1.39E+00
-1.55E-06	0.00E+00	3.67E+00	1.08E+01	9.20E+00	1.56E+01	1.56E+01	3.35E-03	1.20E+00	2.93E+02	1.47E+00	1.48E+00
2.04E+00	0.00E+00	4.03E+00	1.09E+01	9.21E+00	1.67E+01	1.67E+01	3.46E-03	1.20E+00	2.93E+02	1.55E+00	1.55E+00
4.09E+00	0.00E+00	4.36E+00	1.10E+01	9.21E+00	1.78E+01	1.78E+01	3.54E-03	1.20E+00	2.93E+02	1.61E+00	1.62E+00
6.13E+00	0.00E+00	4.67E+00	1.12E+01	9.21E+00	1.89E+01	1.89E+01	3.61E-03	1.20E+00	2.93E+02	1.67E+00	1.67E+00
8.18E+00	0.00E+00	4.97E+00	1.13E+01	9.22E+00	2.00E+01	2.00E+01	3.67E-03	1.20E+00	2.93E+02	1.72E+00	1.73E+00
1.02E+01	0.00E+00	5.25E+00	1.14E+01	9.22E+00	2.10E+01	2.10E+01	3.71E-03	1.20E+00	2.93E+02	1.77E+00	1.77E+00
1.04E+01	0.00E+00	5.28E+00	1.14E+01	9.22E+00	2.13E+01	2.13E+01	3.68E-03	1.20E+00	2.93E+02	1.77E+00	1.78E+00
1.07E+01	0.00E+00	5.32E+00	1.14E+01	9.22E+00	2.16E+01	2.16E+01	3.64E-03	1.20E+00	2.93E+02	1.78E+00	1.78E+00
1.10E+01	0.00E+00	5.36E+00	1.14E+01	9.22E+00	2.19E+01	2.19E+01	3.59E-03	1.20E+00	2.93E+02	1.78E+00	1.79E+00
1.15E+01	0.00E+00	5.42E+00	1.15E+01	9.22E+00	2.23E+01	2.23E+01	3.53E-03	1.20E+00	2.93E+02	1.79E+00	1.80E+00
1.19E+01	0.00E+00	5.48E+00	1.15E+01	9.22E+00	2.29E+01	2.29E+01	3.46E-03	1.20E+00	2.93E+02	1.80E+00	1.81E+00
1.25E+01	0.00E+00	5.56E+00	1.15E+01	9.22E+00	2.35E+01	2.35E+01	3.38E-03	1.20E+00	2.93E+02	1.81E+00	1.82E+00
1.33E+01	0.00E+00	5.65E+00	1.16E+01	9.23E+00	2.43E+01	2.43E+01	3.28E-03	1.20E+00	2.93E+02	1.83E+00	1.83E+00
1.42E+01	0.00E+00	5.77E+00	1.16E+01	9.23E+00	2.52E+01	2.52E+01	3.17E-03	1.20E+00	2.93E+02	1.85E+00	1.85E+00
1.53E+01	0.00E+00	5.90E+00	1.17E+01	9.23E+00	2.64E+01	2.64E+01	3.05E-03	1.20E+00	2.93E+02	1.87E+00	1.87E+00
1.66E+01	0.00E+00	6.06E+00	1.18E+01	9.23E+00	2.78E+01	2.78E+01	2.91E-03	1.20E+00	2.93E+02	1.89E+00	1.89E+00
1.82E+01	0.00E+00	6.26E+00	1.18E+01	9.24E+00	2.95E+01	2.95E+01	2.76E-03	1.20E+00	2.93E+02	1.92E+00	1.92E+00
2.02E+01	0.00E+00	6.49E+00	1.20E+01	9.24E+00	3.15E+01	3.15E+01	2.59E-03	1.20E+00	2.93E+02	1.95E+00	1.95E+00
2.25E+01	0.00E+00	6.77E+00	1.21E+01	9.25E+00	3.41E+01	3.41E+01	2.42E-03	1.20E+00	2.93E+02	1.98E+00	1.99E+00
2.55E+01	0.00E+00	7.09E+00	1.23E+01	9.25E+00	3.72E+01	3.71E+01	2.23E-03	1.20E+00	2.93E+02	2.02E+00	2.03E+00
2.90E+01	0.00E+00	7.48E+00	1.25E+01	9.26E+00	4.09E+01	4.09E+01	2.03E-03	1.20E+00	2.93E+02	2.07E+00	2.07E+00
3.33E+01	0.00E+00	7.93E+00	1.27E+01	9.27E+00	4.55E+01	4.55E+01	1.83E-03	1.20E+00	2.93E+02	2.12E+00	2.12E+00
3.86E+01	0.00E+00	8.46E+00	1.30E+01	9.29E+00	5.11E+01	5.11E+01	1.64E-03	1.20E+00	2.93E+02	2.18E+00	2.18E+00
4.50E+01	0.00E+00	9.08E+00	1.34E+01	9.30E+00	5.79E+01	5.79E+01	1.44E-03	1.20E+00	2.93E+02	2.24E+00	2.24E+00
5.29E+01	0.00E+00	9.80E+00	1.38E+01	9.33E+00	6.61E+01	6.61E+01	1.26E-03	1.20E+00	2.93E+02	2.30E+00	2.31E+00
6.24E+01	0.00E+00	1.06E+01	1.44E+01	9.35E+00	7.62E+01	7.62E+01	1.08E-03	1.20E+00	2.93E+02	2.38E+00	2.38E+00
7.40E+01	0.00E+00	1.16E+01	1.51E+01	9.38E+00	8.85E+01	8.85E+01	9.15E-04	1.20E+00	2.93E+02	2.45E+00	2.46E+00
8.82E+01	0.00E+00	1.27E+01	1.59E+01	9.41E+00	1.04E+02	1.04E+02	7.66E-04	1.20E+00	2.93E+02	2.53E+00	2.54E+00
1.05E+02	0.00E+00	1.40E+01	1.69E+01	9.45E+00	1.22E+02	1.22E+02	6.33E-04	1.20E+00	2.93E+02	2.62E+00	2.62E+00
1.27E+02	0.00E+00	1.55E+01	1.81E+01	9.49E+00	1.44E+02	1.44E+02	5.17E-04	1.20E+00	2.93E+02	2.71E+00	2.71E+00
1.52E+02	0.00E+00	1.72E+01	1.95E+01	9.54E+00	1.71E+02	1.71E+02	4.16E-04	1.20E+00	2.93E+02	2.80E+00	2.81E+00
1.83E+02	0.00E+00	1.92E+01	2.12E+01	9.59E+00	2.04E+02	2.04E+02	3.31E-04	1.20E+00	2.93E+02	2.90E+00	2.90E+00
2.21E+02	0.00E+00	2.15E+01	2.34E+01	9.64E+00	2.44E+02	2.44E+02	2.60E-04	1.20E+00	2.93E+02	3.00E+00	3.00E+00
2.68E+02	0.00E+00	2.42E+01	2.59E+01	9.69E+00	2.93E+02	2.93E+02	2.02E-04	1.20E+00	2.93E+02	3.10E+00	3.11E+00
3.24E+02	0.00E+00	2.72E+01	2.90E+01	9.75E+00	3.53E+02	3.53E+02	1.55E-04	1.20E+00	2.93E+02	3.21E+00	3.21E+00
3.93E+02	0.00E+00	3.08E+01	3.26E+01	9.80E+00	4.26E+02	4.26E+02	1.18E-04	1.20E+00	2.93E+02	3.32E+00	3.32E+00
4.77E+02	0.00E+00	3.48E+01	3.70E+01	9.85E+00	5.15E+02	5.15E+02	8.87E-05	1.20E+00	2.93E+02	3.43E+00	3.43E+00
5.79E+02	0.00E+00	3.95E+01	4.23E+01	9.90E+00	6.23E+02	6.23E+02	6.63E-05	1.20E+00	2.93E+02	3.54E+00	3.54E+00
7.04E+02	0.00E+00	4.50E+01	4.85E+01	9.94E+00	7.55E+02	7.55E+02	4.91E-05	1.20E+00	2.93E+02	3.66E+00	3.66E+00

8.56E+02	0.00E+00	5.13E+01	5.59E+01	9.99E+00	9.15E+02	9.15E+02	3.62E-05	1.20E+00	2.93E+02	3.77E+00	3.77E+00
1.04E+03	0.00E+00	5.86E+01	6.47E+01	1.00E+01	1.11E+03	1.11E+03	2.66E-05	1.20E+00	2.93E+02	3.89E+00	3.89E+00
1.27E+03	0.00E+00	6.69E+01	7.52E+01	1.01E+01	1.35E+03	1.35E+03	1.94E-05	1.20E+00	2.93E+02	4.01E+00	4.01E+00
1.54E+03	0.00E+00	7.66E+01	8.74E+01	1.01E+01	1.64E+03	1.64E+03	1.42E-05	1.20E+00	2.93E+02	4.13E+00	4.13E+00
1.88E+03	0.00E+00	8.78E+01	1.02E+02	1.01E+01	1.99E+03	1.99E+03	1.03E-05	1.20E+00	2.93E+02	4.24E+00	4.25E+00
2.28E+03	0.00E+00	1.01E+02	1.19E+02	1.01E+01	2.42E+03	2.42E+03	7.53E-06	1.20E+00	2.93E+02	4.36E+00	4.37E+00
2.78E+03	0.00E+00	1.16E+02	1.38E+02	1.02E+01	2.95E+03	2.95E+03	5.48E-06	1.20E+00	2.93E+02	4.48E+00	4.49E+00
3.39E+03	0.00E+00	1.33E+02	1.61E+02	1.02E+01	3.59E+03	3.59E+03	4.00E-06	1.20E+00	2.93E+02	4.60E+00	4.60E+00
4.12E+03	0.00E+00	1.52E+02	1.87E+02	1.02E+01	4.37E+03	4.37E+03	2.93E-06	1.20E+00	2.93E+02	4.72E+00	4.72E+00
5.02E+03	0.00E+00	1.75E+02	2.16E+02	1.02E+01	5.32E+03	5.32E+03	2.15E-06	1.20E+00	2.93E+02	4.83E+00	4.84E+00
6.12E+03	0.00E+00	2.00E+02	2.50E+02	1.02E+01	6.48E+03	6.48E+03	1.58E-06	1.20E+00	2.93E+02	4.95E+00	4.95E+00
7.45E+03	0.00E+00	2.30E+02	2.89E+02	1.02E+01	7.89E+03	7.89E+03	1.17E-06	1.20E+00	2.93E+02	5.06E+00	5.06E+00
9.10E+03	0.00E+00	2.68E+02	3.34E+02	1.02E+01	8.18E+03	7.89E+03	8.36E-07	1.20E+00	2.93E+02	5.19E+00	5.19E+00
1.12E+04	0.00E+00	3.13E+02	3.85E+02	1.02E+01	8.52E+03	7.89E+03	5.98E-07	1.20E+00	2.93E+02	5.31E+00	5.31E+00
1.37E+04	0.00E+00	3.62E+02	4.43E+02	1.02E+01	8.93E+03	7.89E+03	4.27E-07	1.20E+00	2.93E+02	5.42E+00	5.42E+00
1.69E+04	0.00E+00	4.17E+02	5.10E+02	1.02E+01	9.42E+03	7.89E+03	3.05E-07	1.20E+00	2.93E+02	5.52E+00	5.53E+00
2.08E+04	0.00E+00	4.78E+02	5.86E+02	1.02E+01	1.00E+04	7.89E+03	2.18E-07	1.20E+00	2.93E+02	5.62E+00	5.62E+00

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x	cm	cmv	cmda	cmw	cmwv	wc	vg	ug	w	v	vx
-1.02E+01	0.00E+00	0.00E+00	9.90E-01	1.01E-02	1.01E-02	0.00E+00	0.00E+00	0.00E+00	4.12E-01	1.04E-01	0.00E+00
-8.18E+00	2.65E-03	2.65E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	1.84E-04	0.00E+00	3.37E-01	2.85E-02	3.45E-01
-6.13E+00	3.10E-03	3.10E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	4.71E-04	0.00E+00	2.87E-01	3.55E-02	3.83E-01
-4.09E+00	3.37E-03	3.37E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	8.16E-04	0.00E+00	2.62E-01	4.00E-02	4.05E-01
-2.04E+00	3.57E-03	3.57E-03	9.86E-01	1.01E-02	1.01E-02	0.00E+00	1.20E-03	0.00E+00	2.47E-01	4.35E-02	4.19E-01
-1.55E-06	3.71E-03	3.71E-03	9.86E-01	1.01E-02	1.01E-02	0.00E+00	1.62E-03	0.00E+00	2.36E-01	4.62E-02	4.30E-01
2.04E+00	3.83E-03	3.83E-03	9.86E-01	1.01E-02	1.01E-02	0.00E+00	2.07E-03	0.00E+00	2.27E-01	4.86E-02	4.39E-01
4.09E+00	3.92E-03	3.92E-03	9.86E-01	1.01E-02	1.01E-02	0.00E+00	2.54E-03	0.00E+00	2.20E-01	5.06E-02	4.46E-01
6.13E+00	4.00E-03	4.00E-03	9.86E-01	1.01E-02	1.01E-02	0.00E+00	3.02E-03	0.00E+00	2.14E-01	5.24E-02	4.52E-01
8.18E+00	4.06E-03	4.06E-03	9.86E-01	1.01E-02	1.01E-02	0.00E+00	3.53E-03	0.00E+00	2.09E-01	5.40E-02	4.57E-01
1.02E+01	4.11E-03	4.11E-03	9.86E-01	1.01E-02	1.01E-02	0.00E+00	4.04E-03	0.00E+00	2.05E-01	5.54E-02	4.61E-01
1.04E+01	4.07E-03	4.07E-03	9.86E-01	1.01E-02	1.01E-02	0.00E+00	4.10E-03	0.00E+00	2.05E-01	5.56E-02	4.62E-01
1.07E+01	4.03E-03	4.03E-03	9.86E-01	1.01E-02	1.01E-02	0.00E+00	4.17E-03	0.00E+00	2.04E-01	5.57E-02	4.62E-01
1.10E+01	3.97E-03	3.97E-03	9.86E-01	1.01E-02	1.01E-02	0.00E+00	4.25E-03	0.00E+00	2.04E-01	5.60E-02	4.63E-01
1.15E+01	3.90E-03	3.90E-03	9.86E-01	1.01E-02	1.01E-02	0.00E+00	4.35E-03	0.00E+00	2.03E-01	5.62E-02	4.64E-01
1.19E+01	3.83E-03	3.83E-03	9.86E-01	1.01E-02	1.01E-02	0.00E+00	4.46E-03	0.00E+00	2.02E-01	5.65E-02	4.65E-01
1.25E+01	3.74E-03	3.74E-03	9.86E-01	1.01E-02	1.01E-02	0.00E+00	4.60E-03	0.00E+00	2.01E-01	5.69E-02	4.66E-01
1.33E+01	3.63E-03	3.63E-03	9.86E-01	1.01E-02	1.01E-02	0.00E+00	4.76E-03	0.00E+00	2.00E-01	5.73E-02	4.67E-01
1.42E+01	3.51E-03	3.51E-03	9.86E-01	1.01E-02	1.01E-02	0.00E+00	4.95E-03	0.00E+00	1.99E-01	5.78E-02	4.68E-01
1.53E+01	3.38E-03	3.38E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	5.16E-03	0.00E+00	1.97E-01	5.84E-02	4.70E-01
1.66E+01	3.23E-03	3.23E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	5.41E-03	0.00E+00	1.95E-01	5.92E-02	4.72E-01
1.82E+01	3.06E-03	3.06E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	5.69E-03	0.00E+00	1.93E-01	6.00E-02	4.74E-01
2.02E+01	2.87E-03	2.87E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	6.00E-03	0.00E+00	1.91E-01	6.09E-02	4.77E-01
2.25E+01	2.68E-03	2.68E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	6.35E-03	0.00E+00	1.88E-01	6.20E-02	4.79E-01
2.55E+01	2.47E-03	2.47E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	6.73E-03	0.00E+00	1.86E-01	6.32E-02	4.82E-01
2.90E+01	2.25E-03	2.25E-03	9.88E-01	1.01E-02	1.01E-02	0.00E+00	7.13E-03	0.00E+00	1.83E-01	6.46E-02	4.86E-01
3.33E+01	2.03E-03	2.03E-03	9.88E-01	1.01E-02	1.01E-02	0.00E+00	7.56E-03	0.00E+00	1.79E-01	6.61E-02	4.89E-01
3.86E+01	1.81E-03	1.81E-03	9.88E-01	1.01E-02	1.01E-02	0.00E+00	7.99E-03	0.00E+00	1.76E-01	6.78E-02	4.93E-01
4.50E+01	1.60E-03	1.60E-03	9.88E-01	1.01E-02	1.01E-02	0.00E+00	8.42E-03	0.00E+00	1.72E-01	6.96E-02	4.97E-01
5.29E+01	1.39E-03	1.39E-03	9.89E-01	1.01E-02	1.01E-02	0.00E+00	8.83E-03	0.00E+00	1.69E-01	7.16E-02	5.01E-01
6.24E+01	1.19E-03	1.19E-03	9.89E-01	1.01E-02	1.01E-02	0.00E+00	9.20E-03	0.00E+00	1.65E-01	7.37E-02	5.05E-01
7.40E+01	1.01E-03	1.01E-03	9.89E-01	1.01E-02	1.01E-02	0.00E+00	9.52E-03	0.00E+00	1.61E-01	7.59E-02	5.09E-01
8.82E+01	8.49E-04	8.49E-04	9.89E-01	1.01E-02	1.01E-02	0.00E+00	9.75E-03	0.00E+00	1.57E-01	7.81E-02	5.12E-01
1.05E+02	7.02E-04	7.02E-04	9.89E-01	1.01E-02	1.01E-02	0.00E+00	9.88E-03	0.00E+00	1.53E-01	8.05E-02	5.16E-01
1.27E+02	5.72E-04	5.72E-04	9.89E-01	1.01E-02	1.01E-02	0.00E+00	9.91E-03	0.00E+00	1.49E-01	8.29E-02	5.20E-01
1.52E+02	4.61E-04	4.61E-04	9.89E-01	1.01E-02	1.01E-02	0.00E+00	9.80E-03	0.00E+00	1.45E-01	8.54E-02	5.23E-01
1.83E+02	3.67E-04	3.67E-04	9.90E-01	1.01E-02	1.01E-02	0.00E+00	9.57E-03	0.00E+00	1.41E-01	8.78E-02	5.27E-01
2.21E+02	2.88E-04	2.88E-04	9.90E-01	1.01E-02	1.01E-02	0.00E+00	9.22E-03	0.00E+00	1.37E-01	9.02E-02	5.30E-01
2.68E+02	2.24E-04	2.24E-04	9.90E-01	1.01E-02	1.01E-02	0.00E+00	8.75E-03	0.00E+00	1.33E-01	9.25E-02	5.33E-01
3.24E+02	1.72E-04	1.72E-04	9.90E-01	1.01E-02	1.01E-02	0.00E+00	8.19E-03	0.00E+00	1.29E-01	9.47E-02	5.35E-01
3.93E+02	1.30E-04	1.30E-04	9.90E-01	1.01E-02	1.01E-02	0.00E+00	7.57E-03	0.00E+00	1.26E-01	9.68E-02	5.37E-01
4.77E+02	9.82E-05	9.82E-05	9.90E-01	1.01E-02	1.01E-02	0.00E+00	6.91E-03	0.00E+00	1.22E-01	9.86E-02	5.40E-01
5.79E+02	7.34E-05	7.34E-05	9.90E-01	1.01E-02	1.01E-02	0.00E+00	6.24E-03	0.00E+00	1.18E-01	1.00E-01	5.41E-01
7.04E+02	5.44E-05	5.44E-05	9.90E-01	1.01E-02	1.01E-02	0.00E+00	5.57E-03	0.00E+00	1.15E-01	1.02E-01	5.43E-01
8.56E+02	4.01E-05	4.01E-05	9.90E-01	1.01E-02	1.01E-02	0.00E+00	4.92E-03	0.00E+00	1.11E-01	1.02E-01	5.44E-01
1.04E+03	2.95E-05	2.95E-05	9.90E-01	1.01E-02	1.01E-02	0.00E+00	4.31E-03	0.00E+00	1.08E-01	1.03E-01	5.46E-01
1.27E+03	2.15E-05	2.15E-05	9.90E-01	1.01E-02	1.01E-02	0.00E+00	3.72E-03	0.00E+00	1.04E-01	1.03E-01	5.46E-01
1.54E+03	1.57E-05	1.57E-05	9.90E-01	1.01E-02	1.01E-02	0.00E+00	3.19E-03	0.00E+00	1.01E-01	1.02E-01	5.47E-01
1.88E+03	1.14E-05	1.14E-05	9.90E-01	1.01E-02	1.01E-02	0.00E+00	2.72E-03	0.00E+00	9.75E-02	1.01E-01	5.47E-01
2.28E+03	8.34E-06	8.34E-06	9.90E-01	1.01E-02	1.01E-02	0.00E+00	2.33E-03	0.00E+00	9.41E-02	1.00E-01	5.47E-01
2.78E+03	6.07E-06	6.07E-06	9.90E-01	1.01E-02	1.01E-02	0.00E+00	2.03E-03	0.00E+00	9.07E-02	9.79E-02	5.46E-01
3.39E+03	4.43E-06	4.43E-06	9.90E-01	1.01E-02	1.01E-02	0.00E+00	1.79E-03	0.00E+00	8.72E-02	9.54E-02	5.46E-01
4.12E+03	3.24E-06	3.24E-06	9.90E-01	1.01E-02	1.01E-02	0.00E+00	1.58E-03	0.00E+00	8.37E-02	9.24E-02	5.44E-01
5.02E+03	2.38E-06	2.38E-06	9.90E-01	1.01E-02	1.01E-02	0.00E+00	1.35E-03	0.00E+00	8.00E-02	8.90E-02	5.43E-01
6.12E+03	1.75E-06	1.75E-06	9.90E-01	1.01E-02	1.01E-02	0.00E+00	1.17E-03	0.00E+00	7.63E-02	8.52E-02	5.40E-01

7.45E+03	1.29E-06	1.29E-06	9.90E-01	1.01E-02	1.01E-02	0.00E+00	9.85E-04	3.61E-05	7.23E-02	8.13E-02	5.38E-01
9.10E+03	9.26E-07	9.26E-07	9.90E-01	1.01E-02	1.01E-02	0.00E+00	8.52E-04	3.16E-05	6.77E-02	7.73E-02	5.06E-01
1.12E+04	6.62E-07	6.62E-07	9.90E-01	1.01E-02	1.01E-02	-1.03E-04	0.00E+00	0.00E+00	6.28E-02	7.30E-02	5.00E-01
1.37E+04	4.73E-07	4.73E-07	9.90E-01	1.01E-02	1.01E-02	-3.39E-04	0.00E+00	0.00E+00	5.76E-02	6.85E-02	4.92E-01
1.69E+04	3.38E-07	3.38E-07	9.90E-01	1.01E-02	1.01E-02	-1.53E-04	0.00E+00	0.00E+00	5.23E-02	6.40E-02	4.84E-01
2.08E+04	2.42E-07	2.42E-07	9.90E-01	1.01E-02	1.01E-02	0.00E+00	4.17E-04	2.39E-05	4.67E-02	5.94E-02	4.75E-01

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time averaged (tav = 1800. s) volume concentration: concentration contour parameters

c(x,y,z,t) = cc(x) * (erf(xa)-erf(xb)) * (erf(ya)-erf(yb)) * (exp(-za*za)+exp(-zb*zb))

c(x,y,z,t) = concentration (volume fraction) at (x,y,z,t)
x = downwind distance (m)
y = crosswind horizontal distance (m)
z = height (m)
t = time (s)

erf = error functon
xa = (x-xc+bx)/(sr2*betax)
xb = (x-xc-bx)/(sr2*betax)
ya = (y+b)/(sr2*betac)
yb = (y-b)/(sr2*betac)
exp = exponential function
za = (z-zc)/(sr2*sig)
zb = (z+zc)/(sr2*sig)
sr2 = sqrt(2.0)

x	cc(x)	b(x)	betac(x)	zc(x)	sig(x)
-1.02E+01	0.00E+00	9.20E+00	2.57E+00	0.00E+00	0.00E+00
-8.18E+00	4.66E-04	9.20E+00	2.76E+00	0.00E+00	1.01E+00
-6.13E+00	5.52E-04	9.20E+00	2.92E+00	0.00E+00	1.37E+00
-4.09E+00	6.08E-04	9.20E+00	3.07E+00	0.00E+00	1.65E+00
-2.04E+00	6.52E-04	9.20E+00	3.23E+00	0.00E+00	1.90E+00
-1.55E-06	6.88E-04	9.20E+00	3.40E+00	0.00E+00	2.12E+00
2.04E+00	7.19E-04	9.21E+00	3.56E+00	0.00E+00	2.32E+00
4.09E+00	7.47E-04	9.21E+00	3.73E+00	0.00E+00	2.52E+00
6.13E+00	7.73E-04	9.21E+00	3.90E+00	0.00E+00	2.70E+00
8.18E+00	7.97E-04	9.22E+00	4.07E+00	0.00E+00	2.87E+00
1.02E+01	8.20E-04	9.22E+00	4.24E+00	0.00E+00	3.03E+00
1.04E+01	8.14E-04	9.22E+00	4.26E+00	0.00E+00	3.05E+00
1.07E+01	8.06E-04	9.22E+00	4.28E+00	0.00E+00	3.07E+00
1.10E+01	7.97E-04	9.22E+00	4.31E+00	0.00E+00	3.10E+00
1.15E+01	7.86E-04	9.22E+00	4.35E+00	0.00E+00	3.13E+00
1.19E+01	7.74E-04	9.22E+00	4.39E+00	0.00E+00	3.16E+00
1.25E+01	7.59E-04	9.22E+00	4.44E+00	0.00E+00	3.21E+00
1.33E+01	7.42E-04	9.23E+00	4.50E+00	0.00E+00	3.26E+00
1.42E+01	7.23E-04	9.23E+00	4.58E+00	0.00E+00	3.33E+00
1.53E+01	7.01E-04	9.23E+00	4.67E+00	0.00E+00	3.41E+00
1.66E+01	6.76E-04	9.23E+00	4.79E+00	0.00E+00	3.50E+00
1.82E+01	6.49E-04	9.24E+00	4.93E+00	0.00E+00	3.61E+00
2.02E+01	6.20E-04	9.24E+00	5.10E+00	0.00E+00	3.75E+00
2.25E+01	5.89E-04	9.25E+00	5.30E+00	0.00E+00	3.91E+00
2.55E+01	5.56E-04	9.25E+00	5.56E+00	0.00E+00	4.09E+00
2.90E+01	5.22E-04	9.26E+00	5.87E+00	0.00E+00	4.32E+00
3.33E+01	4.87E-04	9.27E+00	6.25E+00	0.00E+00	4.58E+00
3.86E+01	4.53E-04	9.29E+00	6.72E+00	0.00E+00	4.88E+00
4.50E+01	4.20E-04	9.30E+00	7.29E+00	0.00E+00	5.24E+00
5.29E+01	3.88E-04	9.33E+00	7.99E+00	0.00E+00	5.66E+00
6.24E+01	3.58E-04	9.35E+00	8.85E+00	0.00E+00	6.14E+00
7.40E+01	3.29E-04	9.38E+00	9.89E+00	0.00E+00	6.70E+00
8.82E+01	3.03E-04	9.41E+00	1.12E+01	0.00E+00	7.35E+00
1.05E+02	2.78E-04	9.45E+00	1.27E+01	0.00E+00	8.09E+00
1.27E+02	2.54E-04	9.49E+00	1.46E+01	0.00E+00	8.96E+00
1.52E+02	2.32E-04	9.54E+00	1.69E+01	0.00E+00	9.95E+00
1.83E+02	2.11E-04	9.59E+00	1.97E+01	0.00E+00	1.11E+01
2.21E+02	1.91E-04	9.64E+00	2.30E+01	0.00E+00	1.24E+01
2.68E+02	1.72E-04	9.69E+00	2.71E+01	0.00E+00	1.40E+01
3.24E+02	1.55E-04	9.75E+00	3.20E+01	0.00E+00	1.57E+01
3.93E+02	1.38E-04	9.80E+00	3.79E+01	0.00E+00	1.78E+01
4.77E+02	1.22E-04	9.85E+00	4.50E+01	0.00E+00	2.01E+01
5.79E+02	1.08E-04	9.90E+00	5.35E+01	0.00E+00	2.28E+01
7.04E+02	9.46E-05	9.94E+00	6.37E+01	0.00E+00	2.60E+01
8.56E+02	8.26E-05	9.99E+00	7.59E+01	0.00E+00	2.96E+01
1.04E+03	7.19E-05	1.00E+01	9.03E+01	0.00E+00	3.38E+01

t	xc(t)	bx(t)	betax(t)
4.08E+00	0.00E+00	1.02E+01	8.35E-02
4.82E+00	1.02E+00	1.13E+01	9.23E-02
5.57E+00	2.04E+00	1.24E+01	1.01E-01
6.41E+00	3.07E+00	1.35E+01	1.10E-01
7.25E+00	4.09E+00	1.45E+01	1.19E-01
8.18E+00	5.11E+00	1.56E+01	1.28E-01
9.12E+00	6.13E+00	1.67E+01	1.36E-01
1.01E+01	7.16E+00	1.78E+01	1.45E-01
1.12E+01	8.18E+00	1.89E+01	1.54E-01
1.23E+01	9.20E+00	2.00E+01	1.63E-01
1.34E+01	1.02E+01	2.10E+01	1.72E-01
1.36E+01	1.04E+01	2.13E+01	1.74E-01
1.40E+01	1.07E+01	2.16E+01	1.76E-01
1.43E+01	1.10E+01	2.19E+01	1.79E-01
1.48E+01	1.15E+01	2.23E+01	1.82E-01
1.53E+01	1.19E+01	2.29E+01	1.87E-01
1.60E+01	1.25E+01	2.35E+01	1.92E-01
1.68E+01	1.33E+01	2.43E+01	1.98E-01
1.78E+01	1.42E+01	2.52E+01	2.06E-01
1.89E+01	1.53E+01	2.64E+01	2.15E-01
2.03E+01	1.66E+01	2.78E+01	2.27E-01
2.20E+01	1.82E+01	2.95E+01	2.41E-01
2.41E+01	2.02E+01	3.15E+01	2.58E-01
2.65E+01	2.25E+01	3.41E+01	2.78E-01
2.94E+01	2.55E+01	3.71E+01	3.03E-01
3.29E+01	2.90E+01	4.09E+01	3.34E-01
3.70E+01	3.33E+01	4.55E+01	3.71E-01
4.19E+01	3.86E+01	5.11E+01	4.17E-01
4.78E+01	4.50E+01	5.79E+01	4.72E-01
5.46E+01	5.29E+01	6.61E+01	5.40E-01
6.28E+01	6.24E+01	7.62E+01	6.22E-01
7.24E+01	7.40E+01	8.85E+01	7.23E-01
8.38E+01	8.82E+01	1.04E+02	8.45E-01
9.72E+01	1.05E+02	1.22E+02	9.95E-01
1.13E+02	1.27E+02	1.44E+02	1.18E+00
1.32E+02	1.52E+02	1.71E+02	1.40E+00
1.53E+02	1.83E+02	2.04E+02	1.67E+00
1.79E+02	2.21E+02	2.44E+02	2.00E+00
2.10E+02	2.68E+02	2.93E+02	2.40E+00
2.45E+02	3.24E+02	3.53E+02	2.88E+00
2.88E+02	3.93E+02	4.26E+02	3.48E+00
3.37E+02	4.77E+02	5.15E+02	4.20E+00
3.96E+02	5.79E+02	6.23E+02	5.09E+00
4.65E+02	7.04E+02	7.55E+02	6.16E+00
5.47E+02	8.56E+02	9.15E+02	7.47E+00
6.43E+02	1.04E+03	1.11E+03	9.07E+00

1.27E+03	6.23E-05	1.01E+01	1.07E+02	0.00E+00	3.87E+01	7.58E+02	1.27E+03	1.35E+03	1.10E+01
1.54E+03	5.38E-05	1.01E+01	1.28E+02	0.00E+00	4.43E+01	8.93E+02	1.54E+03	1.64E+03	1.34E+01
1.88E+03	4.63E-05	1.01E+01	1.51E+02	0.00E+00	5.07E+01	1.05E+03	1.88E+03	1.99E+03	1.63E+01
2.28E+03	3.98E-05	1.01E+01	1.79E+02	0.00E+00	5.82E+01	1.24E+03	2.28E+03	2.42E+03	1.98E+01
2.78E+03	3.41E-05	1.02E+01	2.11E+02	0.00E+00	6.67E+01	1.47E+03	2.78E+03	2.95E+03	2.41E+01
3.39E+03	2.92E-05	1.02E+01	2.48E+02	0.00E+00	7.66E+01	1.73E+03	3.39E+03	3.59E+03	2.93E+01
4.12E+03	2.50E-05	1.02E+01	2.91E+02	0.00E+00	8.79E+01	2.05E+03	4.12E+03	4.37E+03	3.57E+01
5.02E+03	2.14E-05	1.02E+01	3.40E+02	0.00E+00	1.01E+02	2.43E+03	5.02E+03	5.32E+03	4.35E+01
6.12E+03	1.83E-05	1.02E+01	3.96E+02	0.00E+00	1.16E+02	2.87E+03	6.12E+03	6.48E+03	5.29E+01
7.45E+03	1.57E-05	1.02E+01	4.59E+02	0.00E+00	1.33E+02	3.41E+03	7.45E+03	7.89E+03	6.44E+01
9.10E+03	1.35E-05	1.02E+01	5.32E+02	0.00E+00	1.55E+02	3.44E+03	9.10E+03	7.89E+03	1.24E+03
1.12E+04	1.16E-05	1.02E+01	6.16E+02	0.00E+00	1.80E+02	3.83E+03	1.12E+04	7.89E+03	1.85E+03
1.37E+04	1.01E-05	1.02E+01	7.13E+02	0.00E+00	2.09E+02	4.31E+03	1.37E+04	7.89E+03	2.41E+03
1.69E+04	8.75E-06	1.02E+01	8.22E+02	0.00E+00	2.41E+02	4.89E+03	1.69E+04	7.89E+03	2.97E+03
2.08E+04	7.66E-06	1.02E+01	9.46E+02	0.00E+00	2.76E+02	5.60E+03	2.08E+04	7.89E+03	3.55E+03

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time averaged (tav = 1800. s) volume concentration: concentration in the z = .00 plane.

downwind distance x (m)	time of max conc (s)	cloud duration (s)	effective half width bbc (m)	average concentration (volume fraction) at (x,y,z) y/bbc= 0.0	y/bbc= 0.5	y/bbc= 1.0	y/bbc= 1.5	y/bbc= 2.0	y/bbc= 2.5
-1.02E+01	1.56E+03	3.12E+03	1.02E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
-8.18E+00	1.56E+03	3.12E+03	1.04E+01	3.72E-03	3.45E-03	1.25E-03	4.00E-05	5.53E-08	0.00E+00
-6.13E+00	1.56E+03	3.12E+03	1.05E+01	4.40E-03	4.02E-03	1.45E-03	5.48E-05	1.16E-07	0.00E+00
-4.09E+00	1.56E+03	3.12E+03	1.06E+01	4.83E-03	4.35E-03	1.56E-03	6.84E-05	2.11E-07	0.00E+00
-2.04E+00	1.56E+03	3.12E+03	1.08E+01	5.16E-03	4.56E-03	1.62E-03	8.14E-05	3.49E-07	1.54E-10
-1.55E-06	1.56E+03	3.12E+03	1.09E+01	5.41E-03	4.71E-03	1.67E-03	9.39E-05	5.37E-07	3.25E-10
2.04E+00	1.56E+03	3.12E+03	1.11E+01	5.62E-03	4.81E-03	1.70E-03	1.06E-04	7.78E-07	5.07E-10
4.09E+00	1.56E+03	3.12E+03	1.12E+01	5.79E-03	4.88E-03	1.72E-03	1.17E-04	1.07E-06	1.22E-09
6.13E+00	1.56E+03	3.12E+03	1.14E+01	5.93E-03	4.93E-03	1.73E-03	1.27E-04	1.42E-06	2.16E-09
8.18E+00	1.56E+03	3.12E+03	1.16E+01	6.05E-03	4.95E-03	1.73E-03	1.37E-04	1.82E-06	3.51E-09
1.02E+01	1.56E+03	3.12E+03	1.18E+01	6.15E-03	4.97E-03	1.73E-03	1.46E-04	2.26E-06	5.67E-09
1.04E+01	1.56E+03	3.12E+03	1.18E+01	6.10E-03	4.91E-03	1.71E-03	1.45E-04	2.28E-06	6.00E-09
1.07E+01	1.56E+03	3.12E+03	1.18E+01	6.03E-03	4.85E-03	1.69E-03	1.44E-04	2.31E-06	6.12E-09
1.10E+01	1.56E+03	3.12E+03	1.19E+01	5.95E-03	4.78E-03	1.66E-03	1.43E-04	2.35E-06	6.59E-09
1.15E+01	1.56E+03	3.12E+03	1.19E+01	5.85E-03	4.69E-03	1.63E-03	1.42E-04	2.39E-06	7.04E-09
1.19E+01	1.56E+03	3.12E+03	1.20E+01	5.74E-03	4.58E-03	1.59E-03	1.41E-04	2.45E-06	7.45E-09
1.25E+01	1.56E+03	3.12E+03	1.20E+01	5.61E-03	4.46E-03	1.55E-03	1.39E-04	2.51E-06	8.16E-09
1.33E+01	1.56E+03	3.12E+03	1.21E+01	5.45E-03	4.32E-03	1.50E-03	1.37E-04	2.59E-06	8.98E-09
1.42E+01	1.56E+03	3.12E+03	1.22E+01	5.28E-03	4.16E-03	1.44E-03	1.35E-04	2.67E-06	1.02E-08
1.53E+01	1.56E+03	3.12E+03	1.23E+01	5.08E-03	3.98E-03	1.37E-03	1.32E-04	2.78E-06	1.16E-08
1.66E+01	1.56E+03	3.12E+03	1.24E+01	4.85E-03	3.77E-03	1.30E-03	1.28E-04	2.89E-06	1.36E-08
1.82E+01	1.56E+03	3.12E+03	1.26E+01	4.60E-03	3.55E-03	1.22E-03	1.24E-04	3.03E-06	1.60E-08
2.02E+01	1.56E+03	3.12E+03	1.28E+01	4.32E-03	3.30E-03	1.13E-03	1.19E-04	3.17E-06	1.94E-08
2.25E+01	1.56E+03	3.12E+03	1.30E+01	4.01E-03	3.04E-03	1.04E-03	1.14E-04	3.31E-06	2.36E-08
2.55E+01	1.57E+03	3.12E+03	1.34E+01	3.69E-03	2.76E-03	9.40E-04	1.07E-04	3.45E-06	2.89E-08
2.90E+01	1.57E+03	3.12E+03	1.38E+01	3.35E-03	2.48E-03	8.40E-04	9.98E-05	3.56E-06	3.54E-08
3.33E+01	1.57E+03	3.12E+03	1.43E+01	3.00E-03	2.19E-03	7.39E-04	9.16E-05	3.63E-06	4.30E-08
3.86E+01	1.57E+03	3.12E+03	1.49E+01	2.64E-03	1.91E-03	6.40E-04	8.27E-05	3.63E-06	5.10E-08
4.50E+01	1.57E+03	3.12E+03	1.57E+01	2.29E-03	1.63E-03	5.46E-04	7.32E-05	3.55E-06	5.87E-08
5.29E+01	1.57E+03	3.12E+03	1.67E+01	1.95E-03	1.38E-03	4.58E-04	6.35E-05	3.36E-06	6.48E-08
6.24E+01	1.57E+03	3.12E+03	1.80E+01	1.63E-03	1.14E-03	3.77E-04	5.38E-05	3.09E-06	6.80E-08
7.40E+01	1.58E+03	3.12E+03	1.95E+01	1.33E-03	9.30E-04	3.06E-04	4.46E-05	2.73E-06	6.76E-08
8.82E+01	1.58E+03	3.12E+03	2.15E+01	1.07E-03	7.44E-04	2.44E-04	3.62E-05	2.33E-06	6.35E-08
1.05E+02	1.58E+03	3.12E+03	2.40E+01	8.48E-04	5.86E-04	1.91E-04	2.87E-05	1.93E-06	5.64E-08
1.27E+02	1.59E+03	3.12E+03	2.70E+01	6.58E-04	4.54E-04	1.48E-04	2.24E-05	1.55E-06	4.77E-08
1.52E+02	1.59E+03	3.12E+03	3.08E+01	5.03E-04	3.46E-04	1.13E-04	1.72E-05	1.21E-06	3.87E-08
1.83E+02	1.60E+03	3.12E+03	3.54E+01	3.79E-04	2.61E-04	8.49E-05	1.30E-05	9.22E-07	3.04E-08
2.21E+02	1.61E+03	3.12E+03	4.10E+01	2.83E-04	1.94E-04	6.31E-05	9.66E-06	6.93E-07	2.32E-08
2.68E+02	1.62E+03	3.12E+03	4.79E+01	2.08E-04	1.43E-04	4.65E-05	7.13E-06	5.13E-07	1.73E-08
3.24E+02	1.63E+03	3.12E+03	5.63E+01	1.52E-04	1.05E-04	3.40E-05	5.21E-06	3.76E-07	1.28E-08
3.93E+02	1.64E+03	3.12E+03	6.64E+01	1.11E-04	7.60E-05	2.47E-05	3.78E-06	2.74E-07	9.33E-09
4.77E+02	1.66E+03	3.12E+03	7.86E+01	7.98E-05	5.48E-05	1.78E-05	2.73E-06	1.98E-07	6.74E-09
5.79E+02	1.68E+03	3.12E+03	9.32E+01	5.73E-05	3.94E-05	1.28E-05	1.96E-06	1.42E-07	4.85E-09
7.04E+02	1.71E+03	3.12E+03	1.11E+02	4.11E-05	2.82E-05	9.17E-06	1.41E-06	1.02E-07	3.49E-09
8.56E+02	1.74E+03	3.12E+03	1.32E+02	2.94E-05	2.02E-05	6.55E-06	1.01E-06	7.28E-08	2.49E-09
1.04E+03	1.78E+03	3.12E+03	1.57E+02	2.10E-05	1.44E-05	4.68E-06	7.18E-07	5.20E-08	1.78E-09
1.27E+03	1.83E+03	3.12E+03	1.86E+02	1.50E-05	1.03E-05	3.34E-06	5.13E-07	3.71E-08	1.27E-09
1.54E+03	1.88E+03	3.12E+03	2.21E+02	1.07E-05	7.36E-06	2.39E-06	3.66E-07	2.65E-08	9.12E-10
1.88E+03	1.95E+03	3.12E+03	2.62E+02	7.66E-06	5.27E-06	1.71E-06	2.62E-07	1.90E-08	6.51E-10
2.28E+03	2.04E+03	3.12E+03	3.10E+02	5.50E-06	3.78E-06	1.23E-06	1.88E-07	1.36E-08	4.68E-10
2.78E+03	2.14E+03	3.12E+03	3.65E+02	3.96E-06	2.72E-06	8.82E-07	1.35E-07	9.80E-09	3.35E-10
3.39E+03	2.27E+03	3.12E+03	4.30E+02	2.85E-06	1.96E-06	6.37E-07	9.77E-08	7.08E-09	2.42E-10

4.12E+03	2.42E+03	3.12E+03	5.04E+02	2.07E-06	1.42E-06	4.62E-07	7.08E-08	5.13E-09	1.77E-10
5.02E+03	2.61E+03	3.12E+03	5.89E+02	1.51E-06	1.03E-06	3.36E-07	5.15E-08	3.73E-09	1.29E-10
6.12E+03	2.84E+03	3.12E+03	6.86E+02	1.10E-06	7.57E-07	2.46E-07	3.77E-08	2.73E-09	9.25E-11
7.45E+03	3.12E+03	3.12E+03	7.96E+02	8.10E-07	5.57E-07	1.81E-07	2.77E-08	2.01E-09	6.80E-11
9.10E+03	3.44E+03	3.15E+03	9.22E+02	5.98E-07	4.11E-07	1.33E-07	2.05E-08	1.48E-09	5.00E-11
1.12E+04	3.83E+03	3.21E+03	1.07E+03	4.40E-07	3.03E-07	9.83E-08	1.51E-08	1.09E-09	3.67E-11
1.37E+04	4.31E+03	3.29E+03	1.23E+03	3.23E-07	2.22E-07	7.21E-08	1.11E-08	8.00E-10	2.77E-11
1.69E+04	4.89E+03	3.41E+03	1.42E+03	2.36E-07	1.62E-07	5.27E-08	8.09E-09	5.86E-10	1.98E-11
2.08E+04	5.60E+03	3.56E+03	1.64E+03	1.73E-07	1.19E-07	3.86E-08	5.92E-09	4.29E-10	1.43E-11

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time averaged (tav = 1800. s) volume concentration: maximum concentration (volume fraction) along centerline.

downwind distance x (m)	height z (m)	maximum concentration c(x,0,z)	time of max conc (s)	cloud duration (s)
-1.02E+01	0.00E+00	0.00E+00	1.56E+03	3.12E+03
-8.18E+00	0.00E+00	3.72E-03	1.56E+03	3.12E+03
-6.13E+00	0.00E+00	4.40E-03	1.56E+03	3.12E+03
-4.09E+00	0.00E+00	4.83E-03	1.56E+03	3.12E+03
-2.04E+00	0.00E+00	5.16E-03	1.56E+03	3.12E+03
-1.55E-06	0.00E+00	5.41E-03	1.56E+03	3.12E+03
2.04E+00	0.00E+00	5.62E-03	1.56E+03	3.12E+03
4.09E+00	0.00E+00	5.79E-03	1.56E+03	3.12E+03
6.13E+00	0.00E+00	5.93E-03	1.56E+03	3.12E+03
8.18E+00	0.00E+00	6.05E-03	1.56E+03	3.12E+03
1.02E+01	0.00E+00	6.15E-03	1.56E+03	3.12E+03
1.04E+01	0.00E+00	6.10E-03	1.56E+03	3.12E+03
1.07E+01	0.00E+00	6.03E-03	1.56E+03	3.12E+03
1.10E+01	0.00E+00	5.95E-03	1.56E+03	3.12E+03
1.15E+01	0.00E+00	5.85E-03	1.56E+03	3.12E+03
1.19E+01	0.00E+00	5.74E-03	1.56E+03	3.12E+03
1.25E+01	0.00E+00	5.61E-03	1.56E+03	3.12E+03
1.33E+01	0.00E+00	5.45E-03	1.56E+03	3.12E+03
1.42E+01	0.00E+00	5.28E-03	1.56E+03	3.12E+03
1.53E+01	0.00E+00	5.08E-03	1.56E+03	3.12E+03
1.66E+01	0.00E+00	4.85E-03	1.56E+03	3.12E+03
1.82E+01	0.00E+00	4.60E-03	1.56E+03	3.12E+03
2.02E+01	0.00E+00	4.32E-03	1.56E+03	3.12E+03
2.25E+01	0.00E+00	4.01E-03	1.56E+03	3.12E+03
2.55E+01	0.00E+00	3.69E-03	1.57E+03	3.12E+03
2.90E+01	0.00E+00	3.35E-03	1.57E+03	3.12E+03
3.33E+01	0.00E+00	3.00E-03	1.57E+03	3.12E+03
3.86E+01	0.00E+00	2.64E-03	1.57E+03	3.12E+03
4.50E+01	0.00E+00	2.29E-03	1.57E+03	3.12E+03
5.29E+01	0.00E+00	1.95E-03	1.57E+03	3.12E+03
6.24E+01	0.00E+00	1.63E-03	1.57E+03	3.12E+03
7.40E+01	0.00E+00	1.33E-03	1.58E+03	3.12E+03
8.82E+01	0.00E+00	1.07E-03	1.58E+03	3.12E+03
1.05E+02	0.00E+00	8.48E-04	1.58E+03	3.12E+03
1.27E+02	0.00E+00	6.58E-04	1.59E+03	3.12E+03
1.52E+02	0.00E+00	5.03E-04	1.59E+03	3.12E+03
1.83E+02	0.00E+00	3.79E-04	1.60E+03	3.12E+03
2.21E+02	0.00E+00	2.83E-04	1.61E+03	3.12E+03
2.68E+02	0.00E+00	2.08E-04	1.62E+03	3.12E+03
3.24E+02	0.00E+00	1.52E-04	1.63E+03	3.12E+03
3.93E+02	0.00E+00	1.11E-04	1.64E+03	3.12E+03
4.77E+02	0.00E+00	7.98E-05	1.66E+03	3.12E+03
5.79E+02	0.00E+00	5.73E-05	1.68E+03	3.12E+03
7.04E+02	0.00E+00	4.11E-05	1.71E+03	3.12E+03
8.56E+02	0.00E+00	2.94E-05	1.74E+03	3.12E+03
1.04E+03	0.00E+00	2.10E-05	1.78E+03	3.12E+03
1.27E+03	0.00E+00	1.50E-05	1.83E+03	3.12E+03
1.54E+03	0.00E+00	1.07E-05	1.88E+03	3.12E+03
1.88E+03	0.00E+00	7.66E-06	1.95E+03	3.12E+03
2.28E+03	0.00E+00	5.50E-06	2.04E+03	3.12E+03
2.78E+03	0.00E+00	3.96E-06	2.14E+03	3.12E+03
3.39E+03	0.00E+00	2.85E-06	2.27E+03	3.12E+03
4.12E+03	0.00E+00	2.07E-06	2.42E+03	3.12E+03
5.02E+03	0.00E+00	1.51E-06	2.61E+03	3.12E+03
6.12E+03	0.00E+00	1.10E-06	2.84E+03	3.12E+03
7.45E+03	0.00E+00	8.10E-07	3.12E+03	3.12E+03
9.10E+03	0.00E+00	5.98E-07	3.44E+03	3.15E+03
1.12E+04	0.00E+00	4.40E-07	3.83E+03	3.21E+03

1.37E+04	0.00E+00	3.23E-07	4.31E+03	3.29E+03
1.69E+04	0.00E+00	2.36E-07	4.89E+03	3.41E+03
2.08E+04	0.00E+00	1.73E-07	5.60E+03	3.56E+03

RUN13.OUT

problem input

idspl	=	1
ncalc	=	1
wms	=	.031880
cps	=	909.80
tbp	=	309.35
cmed0	=	.00
dhe	=	1070000.
cpsl	=	2716.00
rhosl	=	793.70
spb	=	-1.00
spc	=	.00
ts	=	293.00
qs	=	.09
as	=	37.85
tsd	=	680.
qtis	=	.00
hs	=	.00
tav	=	1800.00
xffm	=	5000.00
zp(1)	=	.00
zp(2)	=	.00
zp(3)	=	.00
zp(4)	=	.00
z0	=	.300000
za	=	10.00
ua	=	3.20
ta	=	293.00
rh	=	68.00
stab	=	4.00

release gas properties

molecular weight of source gas (kg)	- wms	=	3.1880E-02
vapor heat capacity, const. p. (j/kg-k)	- cps	=	9.0980E+02
temperature of source gas (k)	- ts	=	3.0935E+02
density of source gas (kg/m3)	- rhos	=	1.2559E+00
boiling point temperature	- tbp	=	3.0935E+02
liquid mass fraction	- cmed0	=	0.0000E+00
liquid heat capacity (j/kg-k)	- cpsl	=	2.7160E+03
heat of vaporization (j/kg)	- dhe	=	1.0700E+06
liquid source density (kg/m3)	- rhosl	=	7.9370E+02
saturation pressure constant	- spa	=	1.3263E+01
saturation pressure constant (k)	- spb	=	4.1028E+03
saturation pressure constant (k)	- spc	=	0.0000E+00

spill characteristics

spill type	- idspl	=	1
mass source rate (kg/s)	- qs	=	9.4000E-02
continuous source duration (s)	- tsd	=	6.8000E+02
continuous source mass (kg)	- qtcs	=	6.3920E+01
instantaneous source mass (kg)	- qtis	=	0.0000E+00
source area (m2)	- as	=	3.7854E+01
vertical vapor velocity (m/s)	- ws	=	1.9772E-03
source half width (m)	- bs	=	3.0763E+00
source height (m)	- hs	=	0.0000E+00
horizontal vapor velocity (m/s)	- us	=	0.0000E+00

field parameters

concentration averaging time (s)	- tav	=	1.8000E+03
mixing layer height (m)	- hmx	=	1.0400E+03
maximum downwind distrace (m)	- xffm	=	5.0000E+03
concentration measurement height (m)	- zp(1)	=	0.0000E+00
	- zp(2)	=	0.0000E+00
	- zp(3)	=	0.0000E+00
	- zp(4)	=	0.0000E+00

ambient meteorological properties

molecular weight of ambient air (kg)	- wmae	=	2.8783E-02
heat capacity of ambient air at const p. (j/kg-k)	- cpaa	=	1.0144E+03
density of ambient air (kg/m3)	- rhoa	=	1.1972E+00
ambient measurement height (m)	- za	=	1.0000E+01
ambient atmospheric pressure (pa=n/m2=j/m3)	- pa	=	1.0133E+05
ambient wind speed (m/s)	- ua	=	3.2000E+00
ambient temperature (k)	- ta	=	2.9300E+02
relative humidity (percent)	- rh	=	6.8000E+01
ambient friction velocity (m/s)	- uastr	=	3.7515E-01
atmospheric stability class value	- stab	=	4.0000E+00
inverse monin-obukhov length (1/m)	- ala	=	0.0000E+00
surface roughness height (m)	- z0	=	3.0000E-01

additional parameters

sub-step multiplier	- ncalc	=	1
number of calculational sub-steps	- nssm	=	3
acceleration of gravity (m/s2)	- grav	=	9.8067E+00
gas constant (j/mol- k)	- rr	=	8.3143E+00
von karman constant	- xk	=	4.1000E-01

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instantaneous spatially averaged cloud parameters

x	zc	h	bb	b	bbx	bx	cv	rho	t	u	ua
-3.08E+00	0.00E+00	0.00E+00	3.08E+00	2.77E+00	3.08E+00	3.08E+00	0.00E+00	1.20E+00	2.93E+02	0.00E+00	0.00E+00
-2.46E+00	0.00E+00	1.11E+00	3.13E+00	2.77E+00	3.40E+00	3.40E+00	1.66E-03	1.20E+00	2.93E+02	6.16E-01	6.18E-01
-1.85E+00	0.00E+00	1.44E+00	3.16E+00	2.77E+00	3.73E+00	3.73E+00	2.00E-03	1.20E+00	2.93E+02	7.78E-01	7.80E-01
-1.23E+00	0.00E+00	1.70E+00	3.20E+00	2.77E+00	4.05E+00	4.05E+00	2.21E-03	1.20E+00	2.93E+02	8.88E-01	8.90E-01
-6.15E-01	0.00E+00	1.91E+00	3.23E+00	2.77E+00	4.38E+00	4.38E+00	2.36E-03	1.20E+00	2.93E+02	9.72E-01	9.74E-01
3.87E-07	0.00E+00	2.10E+00	3.27E+00	2.77E+00	4.71E+00	4.71E+00	2.47E-03	1.20E+00	2.93E+02	1.04E+00	1.04E+00
6.15E-01	0.00E+00	2.28E+00	3.30E+00	2.77E+00	5.03E+00	5.03E+00	2.56E-03	1.20E+00	2.93E+02	1.10E+00	1.10E+00
1.23E+00	0.00E+00	2.44E+00	3.34E+00	2.77E+00	5.36E+00	5.36E+00	2.64E-03	1.20E+00	2.93E+02	1.15E+00	1.16E+00
1.85E+00	0.00E+00	2.60E+00	3.37E+00	2.77E+00	5.69E+00	5.68E+00	2.70E-03	1.20E+00	2.93E+02	1.20E+00	1.20E+00
2.46E+00	0.00E+00	2.74E+00	3.41E+00	2.77E+00	6.01E+00	6.01E+00	2.75E-03	1.20E+00	2.93E+02	1.24E+00	1.24E+00
3.08E+00	0.00E+00	2.88E+00	3.44E+00	2.77E+00	6.34E+00	6.34E+00	2.79E-03	1.20E+00	2.93E+02	1.28E+00	1.28E+00
3.14E+00	0.00E+00	2.90E+00	3.45E+00	2.77E+00	6.41E+00	6.41E+00	2.77E-03	1.20E+00	2.93E+02	1.28E+00	1.29E+00
3.22E+00	0.00E+00	2.91E+00	3.45E+00	2.77E+00	6.49E+00	6.49E+00	2.74E-03	1.20E+00	2.93E+02	1.29E+00	1.29E+00
3.32E+00	0.00E+00	2.93E+00	3.46E+00	2.77E+00	6.59E+00	6.59E+00	2.70E-03	1.20E+00	2.93E+02	1.29E+00	1.30E+00
3.44E+00	0.00E+00	2.96E+00	3.46E+00	2.77E+00	6.72E+00	6.72E+00	2.66E-03	1.20E+00	2.93E+02	1.30E+00	1.30E+00
3.58E+00	0.00E+00	2.99E+00	3.47E+00	2.77E+00	6.87E+00	6.87E+00	2.61E-03	1.20E+00	2.93E+02	1.31E+00	1.31E+00
3.75E+00	0.00E+00	3.03E+00	3.48E+00	2.77E+00	7.06E+00	7.05E+00	2.55E-03	1.20E+00	2.93E+02	1.32E+00	1.32E+00
3.96E+00	0.00E+00	3.07E+00	3.49E+00	2.77E+00	7.28E+00	7.28E+00	2.49E-03	1.20E+00	2.93E+02	1.33E+00	1.33E+00
4.22E+00	0.00E+00	3.12E+00	3.51E+00	2.78E+00	7.55E+00	7.55E+00	2.41E-03	1.20E+00	2.93E+02	1.34E+00	1.35E+00
4.53E+00	0.00E+00	3.18E+00	3.53E+00	2.78E+00	7.88E+00	7.88E+00	2.32E-03	1.20E+00	2.93E+02	1.36E+00	1.36E+00
4.91E+00	0.00E+00	3.26E+00	3.55E+00	2.78E+00	8.28E+00	8.28E+00	2.22E-03	1.20E+00	2.93E+02	1.38E+00	1.38E+00
5.37E+00	0.00E+00	3.35E+00	3.58E+00	2.78E+00	8.76E+00	8.76E+00	2.12E-03	1.20E+00	2.93E+02	1.40E+00	1.40E+00
5.92E+00	0.00E+00	3.45E+00	3.61E+00	2.78E+00	9.35E+00	9.35E+00	2.00E-03	1.20E+00	2.93E+02	1.42E+00	1.43E+00
6.60E+00	0.00E+00	3.58E+00	3.65E+00	2.78E+00	1.01E+01	1.01E+01	1.87E-03	1.20E+00	2.93E+02	1.45E+00	1.46E+00
7.41E+00	0.00E+00	3.72E+00	3.70E+00	2.78E+00	1.09E+01	1.09E+01	1.74E-03	1.20E+00	2.93E+02	1.49E+00	1.49E+00
8.41E+00	0.00E+00	3.89E+00	3.75E+00	2.78E+00	1.20E+01	1.20E+01	1.59E-03	1.20E+00	2.93E+02	1.52E+00	1.52E+00
9.62E+00	0.00E+00	4.09E+00	3.82E+00	2.79E+00	1.33E+01	1.33E+01	1.45E-03	1.20E+00	2.93E+02	1.56E+00	1.57E+00
1.11E+01	0.00E+00	4.33E+00	3.91E+00	2.79E+00	1.48E+01	1.48E+01	1.30E-03	1.20E+00	2.93E+02	1.61E+00	1.61E+00
1.29E+01	0.00E+00	4.60E+00	4.01E+00	2.79E+00	1.67E+01	1.67E+01	1.16E-03	1.20E+00	2.93E+02	1.66E+00	1.66E+00
1.50E+01	0.00E+00	4.91E+00	4.14E+00	2.80E+00	1.90E+01	1.90E+01	1.02E-03	1.20E+00	2.93E+02	1.71E+00	1.72E+00
1.76E+01	0.00E+00	5.27E+00	4.29E+00	2.80E+00	2.18E+01	2.18E+01	8.83E-04	1.20E+00	2.93E+02	1.77E+00	1.78E+00
2.08E+01	0.00E+00	5.69E+00	4.48E+00	2.81E+00	2.51E+01	2.51E+01	7.57E-04	1.20E+00	2.93E+02	1.84E+00	1.84E+00
2.47E+01	0.00E+00	6.16E+00	4.70E+00	2.81E+00	2.92E+01	2.92E+01	6.41E-04	1.20E+00	2.93E+02	1.91E+00	1.91E+00
2.94E+01	0.00E+00	6.71E+00	4.98E+00	2.82E+00	3.42E+01	3.42E+01	5.36E-04	1.20E+00	2.93E+02	1.98E+00	1.98E+00
3.51E+01	0.00E+00	7.34E+00	5.31E+00	2.83E+00	4.02E+01	4.02E+01	4.42E-04	1.20E+00	2.93E+02	2.06E+00	2.06E+00
4.20E+01	0.00E+00	8.06E+00	5.71E+00	2.84E+00	4.76E+01	4.76E+01	3.60E-04	1.20E+00	2.93E+02	2.14E+00	2.14E+00
5.04E+01	0.00E+00	8.89E+00	6.19E+00	2.85E+00	5.65E+01	5.65E+01	2.90E-04	1.20E+00	2.93E+02	2.22E+00	2.22E+00
6.06E+01	0.00E+00	9.83E+00	6.77E+00	2.86E+00	6.73E+01	6.73E+01	2.30E-04	1.20E+00	2.93E+02	2.31E+00	2.31E+00
7.29E+01	0.00E+00	1.09E+01	7.48E+00	2.87E+00	8.04E+01	8.04E+01	1.81E-04	1.20E+00	2.93E+02	2.40E+00	2.40E+00
8.79E+01	0.00E+00	1.21E+01	8.33E+00	2.88E+00	9.63E+01	9.63E+01	1.40E-04	1.20E+00	2.93E+02	2.50E+00	2.50E+00
1.06E+02	0.00E+00	1.36E+01	9.35E+00	2.89E+00	1.16E+02	1.16E+02	1.08E-04	1.20E+00	2.93E+02	2.59E+00	2.59E+00
1.28E+02	0.00E+00	1.52E+01	1.06E+01	2.90E+00	1.39E+02	1.39E+02	8.19E-05	1.20E+00	2.93E+02	2.69E+00	2.69E+00
1.55E+02	0.00E+00	1.70E+01	1.21E+01	2.90E+00	1.68E+02	1.68E+02	6.16E-05	1.20E+00	2.93E+02	2.80E+00	2.80E+00
1.88E+02	0.00E+00	1.92E+01	1.39E+01	2.91E+00	2.02E+02	2.02E+02	4.60E-05	1.20E+00	2.93E+02	2.90E+00	2.90E+00

2.27E+02	0.00E+00	2.16E+01	1.60E+01	2.92E+00	2.44E+02	2.44E+02	3.40E-05	1.20E+00	2.93E+02	3.01E+00	3.01E+00
2.75E+02	0.00E+00	2.44E+01	1.86E+01	2.93E+00	2.95E+02	2.95E+02	2.50E-05	1.20E+00	2.93E+02	3.11E+00	3.12E+00
3.34E+02	0.00E+00	2.77E+01	2.17E+01	2.93E+00	3.57E+02	3.57E+02	1.83E-05	1.20E+00	2.93E+02	3.22E+00	3.23E+00
4.05E+02	0.00E+00	3.14E+01	2.54E+01	2.94E+00	4.32E+02	4.32E+02	1.33E-05	1.20E+00	2.93E+02	3.34E+00	3.34E+00
4.90E+02	0.00E+00	3.56E+01	2.99E+01	2.94E+00	5.23E+02	5.23E+02	9.66E-06	1.20E+00	2.93E+02	3.45E+00	3.45E+00
5.95E+02	0.00E+00	4.05E+01	3.52E+01	2.94E+00	6.34E+02	6.34E+02	6.98E-06	1.20E+00	2.93E+02	3.56E+00	3.56E+00
7.22E+02	0.00E+00	4.61E+01	4.15E+01	2.95E+00	7.68E+02	7.68E+02	5.04E-06	1.20E+00	2.93E+02	3.68E+00	3.68E+00
8.75E+02	0.00E+00	5.25E+01	4.90E+01	2.95E+00	9.31E+02	9.31E+02	3.63E-06	1.20E+00	2.93E+02	3.79E+00	3.80E+00
1.06E+03	0.00E+00	6.00E+01	5.79E+01	2.95E+00	1.13E+03	1.13E+03	2.61E-06	1.20E+00	2.93E+02	3.91E+00	3.91E+00
1.29E+03	0.00E+00	6.85E+01	6.84E+01	2.95E+00	1.37E+03	1.37E+03	1.88E-06	1.20E+00	2.93E+02	4.03E+00	4.03E+00
1.57E+03	0.00E+00	8.05E+01	8.09E+01	2.95E+00	1.43E+03	1.37E+03	1.29E-06	1.20E+00	2.93E+02	4.17E+00	4.17E+00
1.92E+03	0.00E+00	9.45E+01	9.60E+01	2.95E+00	1.51E+03	1.37E+03	8.81E-07	1.20E+00	2.93E+02	4.31E+00	4.31E+00
2.36E+03	0.00E+00	1.11E+02	1.14E+02	2.95E+00	1.60E+03	1.37E+03	5.95E-07	1.20E+00	2.93E+02	4.45E+00	4.45E+00
2.91E+03	0.00E+00	1.30E+02	1.36E+02	2.95E+00	1.71E+03	1.37E+03	4.00E-07	1.20E+00	2.93E+02	4.58E+00	4.59E+00
3.61E+03	0.00E+00	1.52E+02	1.61E+02	2.95E+00	1.85E+03	1.37E+03	2.67E-07	1.20E+00	2.93E+02	4.72E+00	4.72E+00
4.47E+03	0.00E+00	1.77E+02	1.91E+02	2.95E+00	2.01E+03	1.37E+03	1.77E-07	1.20E+00	2.93E+02	4.85E+00	4.85E+00
5.54E+03	0.00E+00	2.07E+02	2.26E+02	2.95E+00	2.21E+03	1.37E+03	1.17E-07	1.20E+00	2.93E+02	4.98E+00	4.98E+00

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x	cm	cmv	cmda	cmw	cmwv	wc	vg	ug	w	v	vx
-3.08E+00	0.00E+00	0.00E+00	9.90E-01	1.01E-02	1.01E-02	0.00E+00	0.00E+00	0.00E+00	4.80E-01	1.04E-01	0.00E+00
-2.46E+00	1.84E-03	1.84E-03	9.88E-01	1.01E-02	1.01E-02	0.00E+00	1.21E-04	0.00E+00	4.55E-01	1.99E-02	2.84E-01
-1.85E+00	2.21E-03	2.21E-03	9.88E-01	1.01E-02	1.01E-02	0.00E+00	3.07E-04	0.00E+00	3.79E-01	2.51E-02	3.20E-01
-1.23E+00	2.45E-03	2.45E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	5.23E-04	0.00E+00	3.43E-01	2.86E-02	3.42E-01
-6.15E-01	2.61E-03	2.61E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	7.59E-04	0.00E+00	3.20E-01	3.13E-02	3.57E-01
3.87E-07	2.74E-03	2.74E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	1.01E-03	0.00E+00	3.05E-01	3.36E-02	3.69E-01
6.15E-01	2.84E-03	2.84E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	1.27E-03	0.00E+00	2.92E-01	3.55E-02	3.79E-01
1.23E+00	2.92E-03	2.92E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	1.55E-03	0.00E+00	2.83E-01	3.72E-02	3.87E-01
1.85E+00	2.99E-03	2.99E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	1.83E-03	0.00E+00	2.75E-01	3.87E-02	3.94E-01
2.46E+00	3.04E-03	3.04E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	2.12E-03	0.00E+00	2.68E-01	4.00E-02	4.00E-01
3.08E+00	3.09E-03	3.09E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	2.41E-03	0.00E+00	2.62E-01	4.12E-02	4.05E-01
3.14E+00	3.06E-03	3.06E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	2.44E-03	0.00E+00	2.61E-01	4.14E-02	4.06E-01
3.22E+00	3.03E-03	3.03E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	2.48E-03	0.00E+00	2.60E-01	4.15E-02	4.06E-01
3.32E+00	2.99E-03	2.99E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	2.52E-03	0.00E+00	2.60E-01	4.17E-02	4.07E-01
3.44E+00	2.94E-03	2.94E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	2.57E-03	0.00E+00	2.59E-01	4.19E-02	4.08E-01
3.58E+00	2.89E-03	2.89E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	2.64E-03	0.00E+00	2.57E-01	4.22E-02	4.09E-01
3.75E+00	2.83E-03	2.83E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	2.71E-03	0.00E+00	2.56E-01	4.25E-02	4.11E-01
3.96E+00	2.75E-03	2.75E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	2.80E-03	0.00E+00	2.55E-01	4.28E-02	4.12E-01
4.22E+00	2.67E-03	2.67E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	2.90E-03	0.00E+00	2.53E-01	4.33E-02	4.14E-01
4.53E+00	2.57E-03	2.57E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	3.01E-03	0.00E+00	2.51E-01	4.38E-02	4.16E-01
4.91E+00	2.46E-03	2.46E-03	9.87E-01	1.01E-02	1.01E-02	0.00E+00	3.14E-03	0.00E+00	2.48E-01	4.44E-02	4.18E-01
5.37E+00	2.34E-03	2.34E-03	9.88E-01	1.01E-02	1.01E-02	0.00E+00	3.29E-03	0.00E+00	2.45E-01	4.50E-02	4.21E-01
5.92E+00	2.21E-03	2.21E-03	9.88E-01	1.01E-02	1.01E-02	0.00E+00	3.45E-03	0.00E+00	2.42E-01	4.58E-02	4.24E-01
6.60E+00	2.07E-03	2.07E-03	9.88E-01	1.01E-02	1.01E-02	0.00E+00	3.63E-03	0.00E+00	2.39E-01	4.67E-02	4.28E-01
7.41E+00	1.92E-03	1.92E-03	9.88E-01	1.01E-02	1.01E-02	0.00E+00	3.83E-03	0.00E+00	2.35E-01	4.78E-02	4.31E-01
8.41E+00	1.77E-03	1.77E-03	9.88E-01	1.01E-02	1.01E-02	0.00E+00	4.03E-03	0.00E+00	2.31E-01	4.89E-02	4.36E-01
9.62E+00	1.60E-03	1.60E-03	9.88E-01	1.01E-02	1.01E-02	0.00E+00	4.25E-03	0.00E+00	2.27E-01	5.02E-02	4.40E-01
1.11E+01	1.44E-03	1.44E-03	9.88E-01	1.01E-02	1.01E-02	0.00E+00	4.46E-03	0.00E+00	2.22E-01	5.17E-02	4.45E-01
1.29E+01	1.28E-03	1.28E-03	9.89E-01	1.01E-02	1.01E-02	0.00E+00	4.67E-03	0.00E+00	2.17E-01	5.33E-02	4.50E-01
1.50E+01	1.13E-03	1.13E-03	9.89E-01	1.01E-02	1.01E-02	0.00E+00	4.86E-03	0.00E+00	2.12E-01	5.50E-02	4.56E-01
1.76E+01	9.78E-04	9.78E-04	9.89E-01	1.01E-02	1.01E-02	0.00E+00	5.04E-03	0.00E+00	2.07E-01	5.69E-02	4.62E-01
2.08E+01	8.38E-04	8.38E-04	9.89E-01	1.01E-02	1.01E-02	0.00E+00	5.18E-03	0.00E+00	2.01E-01	5.89E-02	4.67E-01
2.47E+01	7.10E-04	7.10E-04	9.89E-01	1.01E-02	1.01E-02	0.00E+00	5.27E-03	0.00E+00	1.96E-01	6.11E-02	4.73E-01
2.94E+01	5.93E-04	5.93E-04	9.89E-01	1.01E-02	1.01E-02	0.00E+00	5.32E-03	0.00E+00	1.91E-01	6.33E-02	4.79E-01
3.51E+01	4.90E-04	4.90E-04	9.89E-01	1.01E-02	1.01E-02	0.00E+00	5.30E-03	0.00E+00	1.85E-01	6.57E-02	4.85E-01
4.20E+01	3.99E-04	3.99E-04	9.89E-01	1.01E-02	1.01E-02	0.00E+00	5.22E-03	0.00E+00	1.80E-01	6.82E-02	4.90E-01
5.04E+01	3.21E-04	3.21E-04	9.90E-01	1.01E-02	1.01E-02	0.00E+00	5.07E-03	0.00E+00	1.75E-01	7.08E-02	4.96E-01
6.06E+01	2.55E-04	2.55E-04	9.90E-01	1.01E-02	1.01E-02	0.00E+00	4.86E-03	0.00E+00	1.69E-01	7.34E-02	5.01E-01
7.29E+01	2.00E-04	2.00E-04	9.90E-01	1.01E-02	1.01E-02	0.00E+00	4.59E-03	0.00E+00	1.64E-01	7.61E-02	5.06E-01
8.79E+01	1.56E-04	1.56E-04	9.90E-01	1.01E-02	1.01E-02	0.00E+00	4.27E-03	0.00E+00	1.60E-01	7.89E-02	5.11E-01
1.06E+02	1.19E-04	1.19E-04	9.90E-01	1.01E-02	1.01E-02	0.00E+00	3.92E-03	0.00E+00	1.55E-01	8.17E-02	5.15E-01
1.28E+02	9.07E-05	9.07E-05	9.90E-01	1.01E-02	1.01E-02	0.00E+00	3.55E-03	0.00E+00	1.50E-01	8.44E-02	5.19E-01
1.55E+02	6.82E-05	6.82E-05	9.90E-01	1.01E-02	1.01E-02	0.00E+00	3.18E-03	0.00E+00	1.46E-01	8.72E-02	5.23E-01
1.88E+02	5.09E-05	5.09E-05	9.90E-01	1.01E-02	1.01E-02	0.00E+00	2.81E-03	0.00E+00	1.41E-01	8.99E-02	5.27E-01
2.27E+02	3.77E-05	3.77E-05	9.90E-01	1.01E-02	1.01E-02	0.00E+00	2.45E-03	0.00E+00	1.37E-01	9.25E-02	5.30E-01
2.75E+02	2.77E-05	2.77E-05	9.90E-01	1.01E-02	1.01E-02	0.00E+00	2.13E-03	0.00E+00	1.33E-01	9.51E-02	5.33E-01
3.34E+02	2.03E-05	2.03E-05	9.90E-01	1.01E-02	1.01E-02	0.00E+00	1.84E-03	0.00E+00	1.29E-01	9.74E-02	5.35E-01
4.05E+02	1.48E-05	1.48E-05	9.90E-01	1.01E-02	1.01E-02	0.00E+00	1.58E-03	0.00E+00	1.25E-01	9.96E-02	5.38E-01
4.90E+02	1.07E-05	1.07E-05	9.90E-01	1.01E-02	1.01E-02	0.00E+00	1.34E-03	0.00E+00	1.21E-01	1.01E-01	5.40E-01
5.95E+02	7.73E-06	7.73E-06	9.90E-01	1.01E-02	1.01E-02	0.00E+00	1.13E-03	0.00E+00	1.18E-01	1.03E-01	5.42E-01
7.22E+02	5.58E-06	5.58E-06	9.90E-01	1.01E-02	1.01E-02	0.00E+00	9.43E-04	0.00E+00	1.14E-01	1.04E-01	5.43E-01
8.75E+02	4.02E-06	4.02E-06	9.90E-01	1.01E-02	1.01E-02	0.00E+00	7.92E-04	0.00E+00	1.11E-01	1.05E-01	5.45E-01
1.06E+03	2.89E-06	2.89E-06	9.90E-01	1.01E-02	1.01E-02	0.00E+00	6.63E-04	0.00E+00	1.07E-01	1.06E-01	5.46E-01
1.29E+03	2.08E-06	2.08E-06	9.90E-01	1.01E-02	1.01E-02	0.00E+00	5.50E-04	2.75E-05	1.04E-01	1.05E-01	5.46E-01
1.57E+03	1.43E-06	1.43E-06	9.90E-01	1.01E-02	1.01E-02	0.00E+00	4.30E-04	2.16E-05	9.98E-02	1.05E-01	5.30E-01

1.92E+03	9.75E-07	9.75E-07	9.90E-01	1.01E-02	1.01E-02	0.00E+00	3.34E-04	1.72E-05	9.58E-02	1.05E-01	5.29E-01
2.36E+03	6.59E-07	6.59E-07	9.90E-01	1.01E-02	1.01E-02	-2.69E-05	0.00E+00	0.00E+00	9.18E-02	1.03E-01	5.28E-01
2.91E+03	4.43E-07	4.43E-07	9.90E-01	1.01E-02	1.01E-02	-1.81E-05	0.00E+00	0.00E+00	8.78E-02	1.01E-01	5.25E-01
3.61E+03	2.95E-07	2.95E-07	9.90E-01	1.01E-02	1.01E-02	0.00E+00	8.65E-05	7.33E-06	8.38E-02	9.76E-02	5.23E-01
4.47E+03	1.96E-07	1.96E-07	9.90E-01	1.01E-02	1.01E-02	-9.08E-06	0.00E+00	0.00E+00	7.97E-02	9.40E-02	5.19E-01
5.54E+03	1.30E-07	1.30E-07	9.90E-01	1.01E-02	1.01E-02	-4.76E-05	0.00E+00	0.00E+00	7.55E-02	8.98E-02	5.15E-01

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time averaged (tav = 1800. s) volume concentration: concentration contour parameters

c(x,y,z,t) = cc(x) * (erf(xa)-erf(xb)) * (erf(ya)-erf(yb)) * (exp(-za*za)+exp(-zb*zb))

c(x,y,z,t) = concentration (volume fraction) at (x,y,z,t)
x = downwind distance (m)
y = crosswind horizontal distance (m)
z = height (m)
t = time (s)

erf = error functon
xa = (x-xc+bx)/(sr2*betax)
xb = (x-xc-bx)/(sr2*betax)
ya = (y+b)/(sr2*betac)
yb = (y-b)/(sr2*betac)
exp = exponential function
za = (z-zc)/(sr2*sig)
zb = (z+zc)/(sr2*sig)
sr2 = sqrt(2.0)

x	cc(x)	b(x)	betac(x)	zc(x)	sig(x)
-3.08E+00	0.00E+00	2.77E+00	7.74E-01	0.00E+00	0.00E+00
-2.46E+00	3.24E-04	2.77E+00	8.42E-01	0.00E+00	6.40E-01
-1.85E+00	3.95E-04	2.77E+00	8.87E-01	0.00E+00	8.33E-01
-1.23E+00	4.42E-04	2.77E+00	9.32E-01	0.00E+00	9.80E-01
-6.15E-01	4.78E-04	2.77E+00	9.77E-01	0.00E+00	1.10E+00
3.87E-07	5.07E-04	2.77E+00	1.02E+00	0.00E+00	1.22E+00
6.15E-01	5.33E-04	2.77E+00	1.07E+00	0.00E+00	1.32E+00
1.23E+00	5.55E-04	2.77E+00	1.11E+00	0.00E+00	1.41E+00
1.85E+00	5.76E-04	2.77E+00	1.16E+00	0.00E+00	1.50E+00
2.46E+00	5.95E-04	2.77E+00	1.20E+00	0.00E+00	1.58E+00
3.08E+00	6.12E-04	2.77E+00	1.25E+00	0.00E+00	1.66E+00
3.14E+00	6.08E-04	2.77E+00	1.26E+00	0.00E+00	1.67E+00
3.22E+00	6.02E-04	2.77E+00	1.26E+00	0.00E+00	1.68E+00
3.32E+00	5.95E-04	2.77E+00	1.27E+00	0.00E+00	1.69E+00
3.44E+00	5.88E-04	2.77E+00	1.28E+00	0.00E+00	1.71E+00
3.58E+00	5.79E-04	2.77E+00	1.29E+00	0.00E+00	1.73E+00
3.75E+00	5.68E-04	2.77E+00	1.30E+00	0.00E+00	1.75E+00
3.96E+00	5.56E-04	2.77E+00	1.32E+00	0.00E+00	1.77E+00
4.22E+00	5.42E-04	2.78E+00	1.34E+00	0.00E+00	1.80E+00
4.53E+00	5.26E-04	2.78E+00	1.36E+00	0.00E+00	1.84E+00
4.91E+00	5.08E-04	2.78E+00	1.39E+00	0.00E+00	1.88E+00
5.37E+00	4.89E-04	2.78E+00	1.42E+00	0.00E+00	1.93E+00
5.92E+00	4.67E-04	2.78E+00	1.46E+00	0.00E+00	1.99E+00
6.60E+00	4.44E-04	2.78E+00	1.51E+00	0.00E+00	2.06E+00
7.41E+00	4.20E-04	2.78E+00	1.58E+00	0.00E+00	2.15E+00
8.41E+00	3.95E-04	2.78E+00	1.65E+00	0.00E+00	2.25E+00
9.62E+00	3.69E-04	2.79E+00	1.74E+00	0.00E+00	2.36E+00
1.11E+01	3.43E-04	2.79E+00	1.85E+00	0.00E+00	2.50E+00
1.29E+01	3.18E-04	2.79E+00	1.99E+00	0.00E+00	2.65E+00
1.50E+01	2.93E-04	2.80E+00	2.15E+00	0.00E+00	2.83E+00
1.76E+01	2.69E-04	2.80E+00	2.35E+00	0.00E+00	3.04E+00
2.08E+01	2.47E-04	2.81E+00	2.59E+00	0.00E+00	3.28E+00
2.47E+01	2.26E-04	2.81E+00	2.88E+00	0.00E+00	3.56E+00
2.94E+01	2.06E-04	2.82E+00	3.24E+00	0.00E+00	3.88E+00
3.51E+01	1.88E-04	2.83E+00	3.67E+00	0.00E+00	4.24E+00
4.20E+01	1.71E-04	2.84E+00	4.19E+00	0.00E+00	4.66E+00
5.04E+01	1.55E-04	2.85E+00	4.82E+00	0.00E+00	5.13E+00
6.06E+01	1.41E-04	2.86E+00	5.59E+00	0.00E+00	5.68E+00
7.29E+01	1.27E-04	2.87E+00	6.51E+00	0.00E+00	6.30E+00
8.79E+01	1.14E-04	2.88E+00	7.63E+00	0.00E+00	7.01E+00
1.06E+02	1.02E-04	2.89E+00	8.99E+00	0.00E+00	7.83E+00
1.28E+02	9.10E-05	2.90E+00	1.06E+01	0.00E+00	8.77E+00
1.55E+02	8.07E-05	2.90E+00	1.26E+01	0.00E+00	9.84E+00
1.88E+02	7.13E-05	2.91E+00	1.50E+01	0.00E+00	1.11E+01
2.27E+02	6.26E-05	2.92E+00	1.79E+01	0.00E+00	1.25E+01
2.75E+02	5.48E-05	2.93E+00	2.13E+01	0.00E+00	1.41E+01

t	xc(t)	bx(t)	betax(t)
1.76E+00	0.00E+00	3.08E+00	2.51E-02
2.08E+00	3.08E-01	3.40E+00	2.78E-02
2.39E+00	6.15E-01	3.73E+00	3.04E-02
2.75E+00	9.23E-01	4.05E+00	3.31E-02
3.10E+00	1.23E+00	4.38E+00	3.58E-02
3.49E+00	1.54E+00	4.71E+00	3.84E-02
3.88E+00	1.85E+00	5.03E+00	4.11E-02
4.31E+00	2.15E+00	5.36E+00	4.38E-02
4.74E+00	2.46E+00	5.68E+00	4.64E-02
5.20E+00	2.77E+00	6.01E+00	4.91E-02
5.67E+00	3.08E+00	6.34E+00	5.17E-02
5.77E+00	3.14E+00	6.41E+00	5.23E-02
5.89E+00	3.22E+00	6.49E+00	5.30E-02
6.05E+00	3.32E+00	6.59E+00	5.38E-02
6.23E+00	3.44E+00	6.72E+00	5.49E-02
6.45E+00	3.58E+00	6.87E+00	5.61E-02
6.71E+00	3.75E+00	7.05E+00	5.76E-02
7.03E+00	3.96E+00	7.28E+00	5.94E-02
7.41E+00	4.22E+00	7.55E+00	6.17E-02
7.87E+00	4.53E+00	7.88E+00	6.43E-02
8.42E+00	4.91E+00	8.28E+00	6.76E-02
9.08E+00	5.37E+00	8.76E+00	7.16E-02
9.87E+00	5.92E+00	9.35E+00	7.64E-02
1.08E+01	6.60E+00	1.01E+01	8.22E-02
1.19E+01	7.41E+00	1.09E+01	8.93E-02
1.32E+01	8.41E+00	1.20E+01	9.79E-02
1.48E+01	9.62E+00	1.33E+01	1.08E-01
1.67E+01	1.11E+01	1.48E+01	1.21E-01
1.88E+01	1.29E+01	1.67E+01	1.36E-01
2.14E+01	1.50E+01	1.90E+01	1.55E-01
2.44E+01	1.76E+01	2.18E+01	1.78E-01
2.79E+01	2.08E+01	2.51E+01	2.05E-01
3.20E+01	2.47E+01	2.92E+01	2.39E-01
3.69E+01	2.94E+01	3.42E+01	2.79E-01
4.25E+01	3.51E+01	4.02E+01	3.29E-01
4.91E+01	4.20E+01	4.76E+01	3.88E-01
5.68E+01	5.04E+01	5.65E+01	4.61E-01
6.58E+01	6.06E+01	6.73E+01	5.49E-01
7.63E+01	7.29E+01	8.04E+01	6.56E-01
8.85E+01	8.79E+01	9.63E+01	7.86E-01
1.03E+02	1.06E+02	1.16E+02	9.44E-01
1.20E+02	1.28E+02	1.39E+02	1.14E+00
1.39E+02	1.55E+02	1.68E+02	1.37E+00
1.62E+02	1.88E+02	2.02E+02	1.65E+00
1.89E+02	2.27E+02	2.44E+02	1.99E+00
2.20E+02	2.75E+02	2.95E+02	2.41E+00

3.34E+02	4.78E-05	2.93E+00	2.55E+01	0.00E+00	1.60E+01	2.57E+02	3.34E+02	3.57E+02	2.91E+00
4.05E+02	4.15E-05	2.94E+00	3.05E+01	0.00E+00	1.81E+01	3.00E+02	4.05E+02	4.32E+02	3.53E+00
4.90E+02	3.59E-05	2.94E+00	3.65E+01	0.00E+00	2.06E+01	3.51E+02	4.90E+02	5.23E+02	4.27E+00
5.95E+02	3.10E-05	2.94E+00	4.36E+01	0.00E+00	2.34E+01	4.10E+02	5.95E+02	6.34E+02	5.17E+00
7.22E+02	2.67E-05	2.95E+00	5.21E+01	0.00E+00	2.66E+01	4.80E+02	7.22E+02	7.68E+02	6.27E+00
8.75E+02	2.29E-05	2.95E+00	6.23E+01	0.00E+00	3.03E+01	5.63E+02	8.75E+02	9.31E+02	7.60E+00
1.06E+03	1.97E-05	2.95E+00	7.42E+01	0.00E+00	3.46E+01	6.60E+02	1.06E+03	1.13E+03	9.22E+00
1.29E+03	1.68E-05	2.95E+00	8.84E+01	0.00E+00	3.95E+01	7.74E+02	1.29E+03	1.37E+03	1.12E+01
1.57E+03	1.45E-05	2.95E+00	1.05E+02	0.00E+00	4.65E+01	7.48E+02	1.57E+03	1.37E+03	2.43E+02
1.92E+03	1.24E-05	2.95E+00	1.26E+02	0.00E+00	5.46E+01	8.31E+02	1.92E+03	1.37E+03	3.65E+02
2.36E+03	1.07E-05	2.95E+00	1.52E+02	0.00E+00	6.40E+01	9.32E+02	2.36E+03	1.37E+03	4.79E+02
2.91E+03	9.24E-06	2.95E+00	1.83E+02	0.00E+00	7.50E+01	1.05E+03	2.91E+03	1.37E+03	5.93E+02
3.61E+03	8.00E-06	2.95E+00	2.20E+02	0.00E+00	8.77E+01	1.20E+03	3.61E+03	1.37E+03	7.15E+02
4.47E+03	6.95E-06	2.95E+00	2.64E+02	0.00E+00	1.02E+02	1.38E+03	4.47E+03	1.37E+03	8.49E+02
5.54E+03	6.05E-06	2.95E+00	3.17E+02	0.00E+00	1.19E+02	1.60E+03	5.54E+03	1.37E+03	9.98E+02

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time averaged (tav = 1800. s) volume concentration: concentration in the z = .00 plane.

downwind distance x (m)	time of max conc (s)	cloud duration (s)	effective half width bbc (m)	average concentration (volume fraction) at (x,y,z) y/bbc= 0.0	y/bbc= 0.5	y/bbc= 1.0	y/bbc= 1.5	y/bbc= 2.0	y/bbc= 2.5
-3.08E+00	3.41E+02	6.80E+02	3.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
-2.46E+00	3.41E+02	6.80E+02	3.13E+00	9.77E-04	9.03E-04	3.27E-04	1.09E-05	1.67E-08	0.00E+00
-1.85E+00	3.40E+02	6.80E+02	3.17E+00	1.19E-03	1.08E-03	3.89E-04	1.52E-05	3.49E-08	0.00E+00
-1.23E+00	3.40E+02	6.80E+02	3.21E+00	1.33E-03	1.19E-03	4.26E-04	1.91E-05	6.22E-08	0.00E+00
-6.15E-01	3.40E+02	6.80E+02	3.25E+00	1.43E-03	1.26E-03	4.50E-04	2.28E-05	1.00E-07	4.28E-11
3.87E-07	3.40E+02	6.80E+02	3.29E+00	1.51E-03	1.32E-03	4.67E-04	2.63E-05	1.51E-07	9.08E-11
6.15E-01	3.40E+02	6.80E+02	3.33E+00	1.58E-03	1.36E-03	4.78E-04	2.96E-05	2.14E-07	1.43E-10
1.23E+00	3.40E+02	6.80E+02	3.38E+00	1.64E-03	1.38E-03	4.87E-04	3.27E-05	2.90E-07	2.97E-10
1.85E+00	3.40E+02	6.80E+02	3.42E+00	1.69E-03	1.41E-03	4.93E-04	3.56E-05	3.78E-07	5.11E-10
2.46E+00	3.41E+02	6.80E+02	3.47E+00	1.73E-03	1.42E-03	4.96E-04	3.84E-05	4.78E-07	8.41E-10
3.08E+00	3.41E+02	6.80E+02	3.52E+00	1.76E-03	1.43E-03	4.99E-04	4.09E-05	5.88E-07	1.29E-09
3.14E+00	3.41E+02	6.80E+02	3.52E+00	1.75E-03	1.42E-03	4.94E-04	4.07E-05	5.94E-07	1.39E-09
3.22E+00	3.41E+02	6.80E+02	3.53E+00	1.73E-03	1.40E-03	4.87E-04	4.05E-05	6.01E-07	1.43E-09
3.32E+00	3.41E+02	6.80E+02	3.54E+00	1.71E-03	1.38E-03	4.80E-04	4.02E-05	6.10E-07	1.47E-09
3.44E+00	3.41E+02	6.80E+02	3.55E+00	1.68E-03	1.36E-03	4.72E-04	3.99E-05	6.20E-07	1.60E-09
3.58E+00	3.41E+02	6.80E+02	3.56E+00	1.65E-03	1.33E-03	4.62E-04	3.96E-05	6.33E-07	1.68E-09
3.75E+00	3.41E+02	6.80E+02	3.57E+00	1.62E-03	1.30E-03	4.50E-04	3.91E-05	6.48E-07	1.84E-09
3.96E+00	3.41E+02	6.80E+02	3.59E+00	1.58E-03	1.26E-03	4.37E-04	3.86E-05	6.66E-07	2.00E-09
4.22E+00	3.41E+02	6.80E+02	3.61E+00	1.53E-03	1.22E-03	4.22E-04	3.80E-05	6.86E-07	2.23E-09
4.53E+00	3.41E+02	6.80E+02	3.64E+00	1.48E-03	1.17E-03	4.04E-04	3.72E-05	7.11E-07	2.53E-09
4.91E+00	3.41E+02	6.80E+02	3.67E+00	1.42E-03	1.11E-03	3.85E-04	3.64E-05	7.39E-07	2.92E-09
5.37E+00	3.41E+02	6.80E+02	3.71E+00	1.35E-03	1.05E-03	3.63E-04	3.54E-05	7.71E-07	3.43E-09
5.92E+00	3.42E+02	6.80E+02	3.76E+00	1.28E-03	9.88E-04	3.40E-04	3.42E-05	8.07E-07	4.08E-09
6.60E+00	3.42E+02	6.80E+02	3.82E+00	1.20E-03	9.17E-04	3.15E-04	3.28E-05	8.46E-07	4.93E-09
7.41E+00	3.42E+02	6.80E+02	3.90E+00	1.11E-03	8.42E-04	2.88E-04	3.12E-05	8.85E-07	6.03E-09
8.41E+00	3.42E+02	6.80E+02	3.99E+00	1.02E-03	7.65E-04	2.61E-04	2.94E-05	9.22E-07	7.42E-09
9.62E+00	3.43E+02	6.80E+02	4.11E+00	9.24E-04	6.85E-04	2.33E-04	2.74E-05	9.54E-07	9.10E-09
1.11E+01	3.43E+02	6.80E+02	4.25E+00	8.27E-04	6.06E-04	2.05E-04	2.52E-05	9.74E-07	1.11E-08
1.29E+01	3.43E+02	6.80E+02	4.43E+00	7.30E-04	5.28E-04	1.78E-04	2.27E-05	9.76E-07	1.32E-08
1.50E+01	3.44E+02	6.80E+02	4.66E+00	6.34E-04	4.54E-04	1.52E-04	2.02E-05	9.57E-07	1.53E-08
1.76E+01	3.45E+02	6.80E+02	4.94E+00	5.42E-04	3.84E-04	1.28E-04	1.76E-05	9.13E-07	1.70E-08
2.08E+01	3.45E+02	6.80E+02	5.29E+00	4.55E-04	3.20E-04	1.06E-04	1.50E-05	8.44E-07	1.80E-08
2.47E+01	3.47E+02	6.80E+02	5.73E+00	3.75E-04	2.62E-04	8.63E-05	1.25E-05	7.54E-07	1.82E-08
2.94E+01	3.48E+02	6.80E+02	6.28E+00	3.04E-04	2.11E-04	6.93E-05	1.02E-05	6.52E-07	1.73E-08
3.51E+01	3.49E+02	6.80E+02	6.95E+00	2.42E-04	1.68E-04	5.48E-05	8.21E-06	5.45E-07	1.56E-08
4.20E+01	3.51E+02	6.80E+02	7.79E+00	1.90E-04	1.31E-04	4.27E-05	6.46E-06	4.42E-07	1.34E-08
5.04E+01	3.53E+02	6.80E+02	8.82E+00	1.46E-04	1.01E-04	3.29E-05	4.99E-06	3.49E-07	1.11E-08
6.06E+01	3.56E+02	6.80E+02	1.01E+01	1.11E-04	7.67E-05	2.50E-05	3.81E-06	2.70E-07	8.83E-09
7.29E+01	3.59E+02	6.80E+02	1.16E+01	8.38E-05	5.76E-05	1.87E-05	2.86E-06	2.05E-07	6.83E-09
8.79E+01	3.63E+02	6.80E+02	1.35E+01	6.23E-05	4.28E-05	1.39E-05	2.13E-06	1.53E-07	5.17E-09
1.06E+02	3.68E+02	6.80E+02	1.58E+01	4.59E-05	3.16E-05	1.02E-05	1.57E-06	1.13E-07	3.85E-09
1.28E+02	3.74E+02	6.80E+02	1.86E+01	3.36E-05	2.31E-05	7.49E-06	1.15E-06	8.30E-08	2.83E-09
1.55E+02	3.81E+02	6.80E+02	2.20E+01	2.44E-05	1.67E-05	5.44E-06	8.34E-07	6.03E-08	2.06E-09
1.88E+02	3.90E+02	6.80E+02	2.61E+01	1.76E-05	1.21E-05	3.93E-06	6.02E-07	4.36E-08	1.49E-09
2.27E+02	4.00E+02	6.80E+02	3.11E+01	1.27E-05	8.70E-06	2.82E-06	4.33E-07	3.14E-08	1.07E-0
2.75E+02	4.13E+02	6.80E+02	3.71E+01	9.07E-06	6.23E-06	2.02E-06	3.10E-07	2.25E-08	7.68E-10
3.34E+02	4.28E+02	6.80E+02	4.43E+01	6.48E-06	4.45E-06	1.45E-06	2.22E-07	1.61E-08	5.49E-10
4.05E+02	4.47E+02	6.80E+02	5.29E+01	4.62E-06	3.18E-06	1.03E-06	1.58E-07	1.15E-08	3.92E-10
4.90E+02	4.69E+02	6.80E+02	6.33E+01	3.29E-06	2.26E-06	7.35E-07	1.13E-07	8.16E-09	2.80E-10
5.95E+02	4.97E+02	6.80E+02	7.56E+01	2.34E-06	1.61E-06	5.23E-07	8.02E-08	5.81E-09	1.99E-10
7.22E+02	5.30E+02	6.80E+02	9.04E+01	1.67E-06	1.15E-06	3.72E-07	5.71E-08	4.14E-09	1.41E-10
8.75E+02	5.71E+02	6.80E+02	1.08E+02	1.19E-06	8.17E-07	2.65E-07	4.07E-08	2.95E-09	1.00E-10

1.06E+03	6.20E+02	6.80E+02	1.29E+02	8.48E-07	5.83E-07	1.89E-07	2.90E-08	2.10E-09	7.18E-11
1.29E+03	6.80E+02	6.80E+02	1.53E+02	6.06E-07	4.17E-07	1.35E-07	2.07E-08	1.50E-09	5.15E-11
1.57E+03	7.48E+02	6.87E+02	1.83E+02	4.17E-07	2.87E-07	9.31E-08	1.43E-08	1.03E-09	3.51E-11
1.92E+03	8.31E+02	7.00E+02	2.19E+02	2.87E-07	1.97E-07	6.40E-08	9.82E-09	7.11E-10	2.43E-11
2.36E+03	9.32E+02	7.20E+02	2.63E+02	1.97E-07	1.36E-07	4.40E-08	6.75E-09	4.89E-10	1.67E-11
2.91E+03	1.05E+03	7.47E+02	3.16E+02	1.36E-07	9.34E-08	3.03E-08	4.65E-09	3.37E-10	1.16E-11
3.61E+03	1.20E+03	7.83E+02	3.80E+02	9.38E-08	6.45E-08	2.09E-08	3.21E-09	2.33E-10	8.08E-12
4.47E+03	1.38E+03	8.29E+02	4.57E+02	6.50E-08	4.47E-08	1.45E-08	2.22E-09	1.61E-10	5.43E-12
5.54E+03	1.60E+03	8.86E+02	5.49E+02	4.53E-08	3.11E-08	1.01E-08	1.55E-09	1.12E-10	3.81E-12

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time averaged (tav = 1800. s) volume concentration: maximum concentration (volume fraction) along centerline.

downwind distance x (m)	height z (m)	maximum concentration c(x,0,z)	time of max conc (s)	cloud duration (s)
-3.08E+00	0.00E+00	0.00E+00	3.41E+02	6.80E+02
-2.46E+00	0.00E+00	9.77E-04	3.41E+02	6.80E+02
-1.85E+00	0.00E+00	1.19E-03	3.40E+02	6.80E+02
-1.23E+00	0.00E+00	1.33E-03	3.40E+02	6.80E+02
-6.15E-01	0.00E+00	1.43E-03	3.40E+02	6.80E+02
3.87E-07	0.00E+00	1.51E-03	3.40E+02	6.80E+02
6.15E-01	0.00E+00	1.58E-03	3.40E+02	6.80E+02
1.23E+00	0.00E+00	1.64E-03	3.40E+02	6.80E+02
1.85E+00	0.00E+00	1.69E-03	3.40E+02	6.80E+02
2.46E+00	0.00E+00	1.73E-03	3.41E+02	6.80E+02
3.08E+00	0.00E+00	1.76E-03	3.41E+02	6.80E+02
3.14E+00	0.00E+00	1.75E-03	3.41E+02	6.80E+02
3.22E+00	0.00E+00	1.73E-03	3.41E+02	6.80E+02
3.32E+00	0.00E+00	1.71E-03	3.41E+02	6.80E+02
3.44E+00	0.00E+00	1.68E-03	3.41E+02	6.80E+02
3.58E+00	0.00E+00	1.65E-03	3.41E+02	6.80E+02
3.75E+00	0.00E+00	1.62E-03	3.41E+02	6.80E+02
3.96E+00	0.00E+00	1.58E-03	3.41E+02	6.80E+02
4.22E+00	0.00E+00	1.53E-03	3.41E+02	6.80E+02
4.53E+00	0.00E+00	1.48E-03	3.41E+02	6.80E+02
4.91E+00	0.00E+00	1.42E-03	3.41E+02	6.80E+02
5.37E+00	0.00E+00	1.35E-03	3.41E+02	6.80E+02
5.92E+00	0.00E+00	1.28E-03	3.42E+02	6.80E+02
6.60E+00	0.00E+00	1.20E-03	3.42E+02	6.80E+02
7.41E+00	0.00E+00	1.11E-03	3.42E+02	6.80E+02
8.41E+00	0.00E+00	1.02E-03	3.42E+02	6.80E+02
9.62E+00	0.00E+00	9.24E-04	3.43E+02	6.80E+02
1.11E+01	0.00E+00	8.27E-04	3.43E+02	6.80E+02
1.29E+01	0.00E+00	7.30E-04	3.43E+02	6.80E+02
1.50E+01	0.00E+00	6.34E-04	3.44E+02	6.80E+02
1.76E+01	0.00E+00	5.42E-04	3.45E+02	6.80E+02
2.08E+01	0.00E+00	4.55E-04	3.45E+02	6.80E+02
2.47E+01	0.00E+00	3.75E-04	3.47E+02	6.80E+02
2.94E+01	0.00E+00	3.04E-04	3.48E+02	6.80E+02
3.51E+01	0.00E+00	2.42E-04	3.49E+02	6.80E+02
4.20E+01	0.00E+00	1.90E-04	3.51E+02	6.80E+02
5.04E+01	0.00E+00	1.46E-04	3.53E+02	6.80E+02
6.06E+01	0.00E+00	1.11E-04	3.56E+02	6.80E+02
7.29E+01	0.00E+00	8.38E-05	3.59E+02	6.80E+02
8.79E+01	0.00E+00	6.23E-05	3.63E+02	6.80E+02
1.06E+02	0.00E+00	4.59E-05	3.68E+02	6.80E+02
1.28E+02	0.00E+00	3.36E-05	3.74E+02	6.80E+02
1.55E+02	0.00E+00	2.44E-05	3.81E+02	6.80E+02
1.88E+02	0.00E+00	1.76E-05	3.90E+02	6.80E+02
2.27E+02	0.00E+00	1.27E-05	4.00E+02	6.80E+02
2.75E+02	0.00E+00	9.07E-06	4.13E+02	6.80E+02
3.34E+02	0.00E+00	6.48E-06	4.28E+02	6.80E+02
4.05E+02	0.00E+00	4.62E-06	4.47E+02	6.80E+02
4.90E+02	0.00E+00	3.29E-06	4.69E+02	6.80E+02
5.95E+02	0.00E+00	2.34E-06	4.97E+02	6.80E+02
7.22E+02	0.00E+00	1.67E-06	5.30E+02	6.80E+02
8.75E+02	0.00E+00	1.19E-06	5.71E+02	6.80E+02
1.06E+03	0.00E+00	8.48E-07	6.20E+02	6.80E+02
1.29E+03	0.00E+00	6.06E-07	6.80E+02	6.80E+02
1.57E+03	0.00E+00	4.17E-07	7.48E+02	6.87E+02
1.92E+03	0.00E+00	2.87E-07	8.31E+02	7.00E+02
2.36E+03	0.00E+00	1.97E-07	9.32E+02	7.20E+02
2.91E+03	0.00E+00	1.36E-07	1.05E+03	7.47E+02

3.61E+03	0.00E+00	9.38E-08	1.20E+03	7.83E+02
4.47E+03	0.00E+00	6.50E-08	1.38E+03	8.29E+02
5.54E+03	0.00E+00	4.53E-08	1.60E+03	8.86E+02

ATTACHMENT 3

Summary of Exposure Concentrations at Specific Receptor Locations

From Slab output file:	RUN01.OUT
Scenario:	CONSERV
Accident Location:	ON-SITE
Duration:	UNMITIG
Meteorology:	TYPICAL
Chemical:	FORMALDEHYDE
Vapor phase mole fraction:	0.478
LOC:	9.600
IDLH:	19.600

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	429.34
50.00	317.82
100.00	194.16
200.00	95.50
300.00	57.83
400.00	38.29
500.00	27.68
600.00	21.37
700.00	16.99
800.00	13.61
900.00	11.43
1000.00	9.59
1250.00	6.74
1500.00	4.96
1750.00	3.89
2000.00	3.16
2250.00	2.56
2500.00	2.19
3000.00	1.64
4000.00	1.01
5000.00	0.71
10000.00	0.25
15000.00	0.14
20000.00	0.09

Concentration (ppm)		Distance to (m)
LOC	9.6000	999.27
IDLH	19.6000	640.38

From Slab output file:	RUN02.OUT
Scenario:	CONSERV
Accident Location:	ON-SITE
Duration:	MITIGAT
Meteorology:	TYPICAL
Chemical:	FORMALDEHYDE
Vapor phase mole fraction:	0.742
LOC:	9.600
IDLH:	19.600

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	476.47
50.00	358.89
100.00	224.89
200.00	113.41
300.00	69.36
400.00	46.47
500.00	33.82
600.00	26.14
700.00	20.83
800.00	16.75
900.00	14.09
1000.00	11.77
1250.00	7.95
1500.00	5.73
1750.00	4.48
2000.00	3.56
2250.00	2.88
2500.00	2.43
3000.00	1.76
4000.00	1.10
5000.00	0.76
10000.00	0.25
15000.00	0.13
20000.00	0.08

Concentration (ppm)		Distance to (m)
LOC	9.6000	1141.92
IDLH	19.6000	730.21

From Slab output file: RUN03.OUT
Scenario: CONSERV
Accident Location: ON-SITE
Duration: UNMITIG
Meteorology: WORST
Chemical: FORMALDEHYDE
r phase mole fraction: 0.478
LOC: 9.600
IDLH: 19.600
put adjusted to be distance from fenceline.

X,m	1	2	3	4	5
25.00	69.02	166.11	466.75	971.81	1914.76
50.00	48.11	117.10	339.75	724.29	1457.10
100.00	27.25	67.17	203.44	446.33	926.57
200.00	12.26	30.91	98.16	222.32	483.21
300.00	7.01	17.98	58.18	134.61	300.86
400.00	4.48	11.61	38.24	89.71	204.33
500.00	3.16	8.27	27.45	64.75	150.63
600.00	2.39	6.28	21.02	49.93	117.54
700.00	1.87	4.93	16.61	39.64	94.20
800.00	1.47	3.92	13.23	31.71	76.03
900.00	1.23	3.26	11.05	26.59	64.34
1000.00	1.02	2.72	9.21	22.27	54.36
1250.00	0.70	1.89	6.43	15.59	38.49
1500.00	0.50	1.38	4.72	11.45	28.57
1750.00	0.39	1.07	3.67	8.95	22.52
2000.00	0.32	0.86	2.96	7.24	18.32
2250.00	0.25	0.69	2.39	5.86	14.91
2500.00	0.22	0.59	2.04	5.01	12.80
3000.00	0.16	0.44	1.51	3.73	9.58
4000.00	0.10	0.27	0.93	2.31	5.94
5000.00	0.07	0.19	0.64	1.59	4.07
10000.00	0.02	0.06	0.21	0.51	1.24
15000.00	0.01	0.03	0.11	0.25	0.61

X,m	28	29	30	31	32
25.00	796.32	2262.62	61.47	169.07	342.11
50.00	603.23	1792.22	43.13	122.31	253.09
100.00	381.34	1211.15	24.71	72.54	154.26
200.00	195.52	674.08	11.31	34.63	75.79
300.00	120.67	438.08	6.57	20.53	45.76
400.00	81.54	306.88	4.25	13.43	30.32
500.00	59.88	230.61	3.03	9.66	21.93
600.00	46.52	182.77	2.30	7.40	16.91
700.00	37.22	148.57	1.81	5.86	13.45
800.00	30.02	121.61	1.44	4.67	10.79
900.00	25.32	103.69	1.20	3.91	9.05
1000.00	21.34	88.34	1.00	3.27	7.58
1250.00	15.17	63.72	0.70	2.28	5.35
1500.00	11.27	48.28	0.51	1.67	3.94
1750.00	8.88	38.37	0.40	1.31	3.09
2000.00	7.24	31.47	0.32	1.06	2.51
2250.00	5.91	25.87	0.26	0.86	2.03
2500.00	5.07	22.31	0.22	0.73	1.74
3000.00	3.80	16.90	0.16	0.54	1.30
4000.00	2.37	10.69	0.10	0.33	0.81
5000.00	1.67	7.64	0.07	0.23	0.57
10000.00	0.59	2.59	0.02	0.08	0.20
15000.00	0.32	1.30	0.01	0.04	0.11

6	7	8	9	10	11
3951.19	51.95	123.63	343.03	704.41	1429.94
3038.31	36.12	87.10	248.93	521.62	1090.35
2016.25	20.42	49.81	148.63	321.94	696.79
1147.64	9.19	22.89	71.08	159.83	361.30
771.82	5.27	13.29	42.22	96.58	224.78
560.81	3.36	8.59	27.73	64.28	152.05
432.81	2.37	6.09	19.91	46.48	111.55
350.82	1.79	4.65	15.27	35.84	87.00
291.38	1.40	3.66	12.08	28.46	69.63
243.81	1.10	2.90	9.62	22.78	56.07
210.81	0.92	2.42	8.04	19.11	47.31
182.39	0.76	2.01	6.70	16.02	39.89
135.56	0.52	1.40	4.67	11.23	28.27
104.68	0.38	1.02	3.43	8.25	20.96
84.88	0.29	0.79	2.68	6.46	16.50
70.33	0.24	0.64	2.17	5.23	13.40
57.59	0.19	0.52	1.75	4.24	10.90
49.66	0.16	0.44	1.49	3.63	9.34
36.53	0.12	0.33	1.11	2.70	6.99
22.78	0.07	0.20	0.68	1.66	4.37
15.41	0.05	0.14	0.47	1.17	3.04
4.32	0.02	0.05	0.16	0.39	0.98
1.99	0.01	0.03	0.09	0.20	0.49
33	34	35	36	37	38
695.31	1983.05	54.45	150.20	303.62	615.59
526.05	1570.61	38.32	108.77	224.60	466.16
331.94	1055.63	21.93	64.36	136.85	293.78
169.73	586.27	10.07	30.72	67.06	150.36
104.94	379.75	5.84	18.22	40.51	92.53
70.52	265.64	3.78	11.95	26.87	62.36
51.67	199.26	2.69	8.56	19.42	45.73
40.26	157.64	2.05	6.56	14.98	35.57
32.24	128.10	1.61	5.19	11.90	28.48
26.00	104.88	1.28	4.14	9.54	22.98
21.94	89.29	1.07	3.47	8.00	19.40
18.51	76.04	0.89	2.90	6.71	16.36
13.15	55.06	0.62	2.03	4.72	11.62
9.79	41.46	0.45	1.49	3.49	8.63
7.71	33.03	0.35	1.16	2.74	6.80
6.28	27.11	0.28	0.94	2.22	5.54
5.12	22.29	0.23	0.76	1.80	4.52
4.40	19.25	0.19	0.65	1.54	3.89
3.30	14.60	0.14	0.48	1.15	2.92
2.06	9.23	0.09	0.30	0.71	1.82
1.46	6.60	0.06	0.21	0.50	1.29
0.52	2.33	0.02	0.07	0.18	0.46
0.29	1.19	0.01	0.04	0.10	0.26

12	13	14	15	16	17
3608.06	41.53	98.48	272.38	557.15	1129.09
2819.74	28.90	69.20	197.23	411.56	858.83
1884.63	16.36	39.67	117.64	252.32	545.01
1053.44	7.37	18.23	55.97	124.50	282.50
693.01	4.22	10.57	33.30	75.23	175.05
493.80	2.69	6.81	21.83	49.89	118.48
375.65	1.90	4.88	15.66	36.18	86.92
300.62	1.44	3.71	11.99	27.89	67.46
246.73	1.12	2.91	9.50	22.15	54.01
203.96	0.88	2.31	7.59	17.74	43.65
174.87	0.73	1.93	6.34	14.90	36.82
149.99	0.61	1.61	5.29	12.50	31.03
109.89	0.42	1.12	3.70	8.76	22.01
83.65	0.30	0.82	2.71	6.44	16.32
67.13	0.24	0.64	2.12	5.06	12.84
55.44	0.19	0.51	1.71	4.10	10.45
45.87	0.15	0.41	1.38	3.32	8.52
39.80	0.13	0.35	1.18	2.84	7.30
30.11	0.10	0.26	0.88	2.12	5.47
18.74	0.06	0.16	0.54	1.31	3.40
12.91	0.04	0.11	0.38	0.92	2.40
3.83	0.01	0.04	0.13	0.32	0.82
1.82	0.01	0.02	0.07	0.17	0.42
39	40	41	42	43	44
49.09	134.99	272.73	553.90	84.06	170.23
34.46	97.65	201.89	418.93	60.91	125.60
19.75	58.10	123.00	263.69	36.21	76.84
9.07	27.65	60.58	134.73	17.24	37.60
5.26	16.38	36.39	83.11	10.22	22.65
3.40	10.75	24.13	56.12	6.67	15.02
2.42	7.69	17.44	40.96	4.80	10.87
1.84	5.89	13.46	31.87	3.68	8.38
1.45	4.66	10.70	25.51	2.91	6.65
1.15	3.73	8.56	20.57	2.32	5.33
0.96	3.12	7.19	17.35	1.94	4.48
0.80	2.61	6.03	14.63	1.62	3.76
0.56	1.82	4.25	10.41	1.14	2.65
0.41	1.34	3.13	7.74	0.83	1.95
0.32	1.05	2.46	6.09	0.65	1.53
0.25	0.85	2.00	4.96	0.53	1.24
0.21	0.68	1.62	4.06	0.43	1.01
0.18	0.58	1.39	3.49	0.36	0.86
0.13	0.43	1.03	2.62	0.27	0.65
0.08	0.27	0.64	1.64	0.17	0.40
0.06	0.19	0.45	1.16	0.12	0.28
0.02	0.07	0.16	0.41	0.04	0.10
0.01	0.04	0.09	0.23	0.02	0.06

18	19	20	21	22	23
3084.38	34.54	81.99	226.07	459.44	932.94
2437.95	24.11	57.59	163.86	340.02	709.26
1641.56	13.63	32.99	97.26	207.91	449.32
919.02	6.13	15.12	46.33	102.39	230.93
601.16	3.51	8.79	27.54	61.64	142.85
422.91	2.24	5.66	18.04	41.02	96.41
319.32	1.58	4.04	12.95	29.67	70.97
253.99	1.20	3.08	9.95	22.88	55.03
207.30	0.93	2.42	7.86	18.19	44.02
170.39	0.73	1.92	6.25	14.58	35.54
145.45	0.61	1.60	5.24	12.25	29.98
124.20	0.51	1.34	4.38	10.27	25.27
90.33	0.35	0.93	3.06	7.20	17.96
68.28	0.25	0.68	2.24	5.33	13.31
54.57	0.20	0.53	1.75	4.17	10.50
44.89	0.16	0.43	1.42	3.38	8.53
36.97	0.13	0.34	1.14	2.74	6.94
31.93	0.11	0.29	0.98	2.34	5.96
24.25	0.08	0.22	0.73	1.75	4.48
15.45	0.05	0.13	0.45	1.08	2.79
10.76	0.03	0.09	0.31	0.76	1.97
3.28	0.01	0.03	0.11	0.27	0.69
1.64	0.01	0.02	0.06	0.15	0.37
45	46	47	48	49	50
67.20	135.89	90.64	67.84	105.19	256.66
48.82	100.47	66.68	50.23	72.18	181.44
28.96	61.45	40.82	30.58	40.62	104.79
13.80	30.07	20.01	15.01	18.34	48.11
8.17	18.11	12.05	9.04	10.49	28.07
5.37	11.99	8.01	6.00	6.72	18.14
3.84	8.70	5.80	4.33	4.73	12.86
2.95	6.71	4.46	3.34	3.58	9.78
2.33	5.33	3.55	2.66	2.80	7.69
1.86	4.26	2.84	2.13	2.21	6.10
1.55	3.58	2.39	1.79	1.84	5.08
1.30	3.00	2.00	1.50	1.52	4.22
0.91	2.12	1.41	1.06	1.05	2.92
0.67	1.56	1.04	0.78	0.76	2.13
0.52	1.22	0.82	0.61	0.59	1.65
0.42	0.99	0.66	0.50	0.47	1.33
0.34	0.81	0.54	0.40	0.38	1.07
0.29	0.69	0.46	0.35	0.32	0.91
0.22	0.52	0.34	0.26	0.24	0.68
0.13	0.32	0.21	0.16	0.14	0.41
0.09	0.22	0.15	0.11	0.10	0.28
0.03	0.08	0.05	0.04	0.03	0.09
0.02	0.04	0.03	0.02	0.02	0.04

24	25	26	27
2626.70	70.24	193.42	391.76
2081.28	49.36	140.18	289.80
1407.01	28.24	83.31	177.23
785.30	12.96	39.67	87.25
511.91	7.52	23.51	52.70
359.14	4.85	15.40	34.83
270.62	3.46	11.07	25.22
214.63	2.63	8.49	19.45
174.58	2.07	6.70	15.45
142.97	1.65	5.32	12.36
121.93	1.37	4.47	10.39
103.99	1.14	3.74	8.72
75.35	0.79	2.61	6.12
56.67	0.58	1.92	4.52
45.28	0.45	1.50	3.55
37.20	0.36	1.21	2.87
30.58	0.29	0.98	2.33
26.40	0.25	0.84	2.00
20.02	0.19	0.62	1.49
12.69	0.11	0.38	0.92
9.02	0.08	0.27	0.65
2.90	0.03	0.09	0.23
1.45	0.02	0.05	0.13

51	52	53	54
737.42	1506.13	2522.04	3842.79
536.48	1111.03	1882.95	2965.40
322.04	680.82	1190.86	2004.13
155.05	338.09	626.98	1187.28
92.16	205.32	399.04	826.85
60.46	136.73	276.22	618.17
43.45	99.50	206.53	491.10
33.27	76.91	162.95	405.04
26.27	61.21	131.98	341.94
20.91	49.07	107.64	291.15
17.45	41.14	91.54	255.92
14.55	34.46	77.80	223.56
10.15	24.23	56.04	165.38
7.41	17.84	42.25	128.80
5.76	13.98	33.52	103.52
4.64	11.34	27.19	82.37
3.75	9.18	22.07	70.21
3.21	7.87	18.82	58.04
2.37	5.81	13.69	43.68
1.45	3.54	8.42	26.34
0.99	2.41	5.67	17.85
0.29	0.70	1.61	4.90
0.14	0.33	0.74	2.16

X,m	Max concentration, ppm
25.00	3951.19
50.00	3038.31
100.00	2016.25
200.00	1187.28
300.00	826.85
400.00	618.17
500.00	491.10
600.00	405.04
700.00	341.94
800.00	291.15
900.00	255.92
1000.00	223.56
1250.00	165.38
1500.00	128.80
1750.00	103.52
2000.00	82.37
2250.00	70.21
2500.00	58.04
3000.00	43.68
4000.00	26.34
5000.00	17.85
10000.00	4.90
15000.00	2.16

Concentration (ppm)	Distance to (m)
[illegible] 9.6000	8185.01
[illegible]H 19.6000	4793.62

From Slab output file: RUN04.OUT
Scenario: CONSERV
Accident Location: ON-SITE
Duration: MITIGAT
Meteorology: WORST
Chemical: FORMALDEHYDE
Vapor phase mole fraction: 0.742
LOC: 9.600
IDLH: 19.600

*Output adjusted to be distance from fenceline.

X,m	1	2	3	4	5
25.00	81.56	192.89	524.21	1058.75	1894.64
50.00	56.95	137.40	387.63	794.34	1438.12
100.00	32.47	80.06	236.90	499.03	921.84
200.00	14.77	37.55	116.91	254.05	486.75
300.00	8.49	21.99	70.29	155.85	290.03
400.00	5.44	14.30	46.47	100.85	195.90
500.00	3.84	10.21	32.50	71.89	144.13
600.00	2.86	7.63	24.55	54.58	110.24
700.00	2.20	5.90	19.09	42.37	85.97
800.00	1.70	4.59	14.88	33.91	71.78
900.00	1.41	3.82	12.54	28.15	58.93
1000.00	1.15	3.11	10.26	23.55	50.73
1250.00	0.78	2.12	6.99	16.35	35.31
1500.00	0.56	1.55	5.19	12.04	26.04
1750.00	0.44	1.21	3.98	9.03	20.77
2000.00	0.34	0.94	3.10	7.31	16.26
2250.00	0.28	0.78	2.59	5.90	13.74
2500.00	0.23	0.64	2.11	5.00	11.22
3000.00	0.16	0.46	1.56	3.65	8.42
4000.00	0.10	0.28	0.92	2.22	5.06
5000.00	0.07	0.19	0.63	1.51	3.43
10000.00	0.02	0.06	0.19	0.44	0.99
15000.00	0.01	0.03	0.10	0.22	0.47
20000.00	0.01	0.02	0.06	0.13	0.27

X,m	28	29	30	31	32
25.00	871.31	2329.06	70.97	189.90	379.26
50.00	670.87	1861.59	50.46	139.49	285.48
100.00	435.13	1280.35	29.32	84.51	178.34
200.00	230.12	732.06	13.65	41.18	89.88
300.00	144.02	484.38	7.97	24.67	54.82
400.00	98.28	344.57	5.18	16.24	36.64
500.00	72.61	262.00	3.69	11.70	26.69
600.00	56.73	200.89	2.82	9.04	20.65
700.00	45.58	158.62	2.22	7.16	16.46
800.00	36.91	125.26	1.76	5.70	13.22
900.00	31.18	107.26	1.47	4.78	11.08
1000.00	26.16	89.55	1.22	4.00	9.29
1250.00	17.72	62.73	0.85	2.80	6.55
1500.00	12.77	47.28	0.62	2.05	4.70
1750.00	10.01	36.37	0.49	1.57	3.62
2000.00	7.95	29.82	0.39	1.26	2.89
2250.00	6.47	24.33	0.31	1.00	2.30
2500.00	5.42	20.86	0.26	0.85	1.97
3000.00	3.91	15.35	0.19	0.62	1.43
4000.00	2.47	9.62	0.12	0.38	0.89
5000.00	1.70	6.63	0.08	0.26	0.62
10000.00	0.55	2.00	0.03	0.09	0.20
15000.00	0.28	1.01	0.01	0.05	0.11
20000.00	0.18	0.60	0.01	0.03	0.07

6	7	8	9	10	11
3112.56	61.16	142.96	386.47	783.37	1514.99
2402.57	42.82	102.10	284.95	591.10	1167.76
1549.78	24.41	59.36	174.05	371.43	756.84
825.48	11.09	27.67	85.49	189.13	402.64
556.15	6.38	16.21	51.25	116.24	254.54
412.97	4.08	10.50	33.89	78.19	174.95
323.93	2.88	7.49	24.38	56.69	123.90
266.98	2.19	5.71	18.75	42.80	94.73
218.98	1.71	4.50	14.67	33.29	74.17
189.30	1.35	3.57	11.44	25.92	58.82
159.62	1.10	2.93	9.47	21.74	49.28
142.68	0.90	2.41	7.75	17.67	40.84
105.15	0.61	1.64	5.32	12.10	28.64
81.08	0.43	1.17	3.90	9.09	21.31
65.18	0.34	0.92	3.02	7.01	16.19
52.08	0.27	0.73	2.36	5.40	13.15
44.01	0.21	0.58	1.94	4.56	10.66
37.00	0.18	0.49	1.60	3.72	9.06
27.41	0.13	0.36	1.16	2.77	6.63
16.72	0.08	0.22	0.72	1.66	4.09
11.17	0.05	0.15	0.50	1.14	2.80
2.89	0.02	0.05	0.16	0.35	0.83
1.32	0.01	0.03	0.08	0.18	0.40
0.73	0.01	0.02	0.05	0.11	0.25
33	34	35	36	37	38
758.38	2072.46	63.04	168.52	336.27	673.40
585.39	1659.64	44.83	123.75	253.25	518.79
378.46	1140.28	26.04	75.13	157.75	335.20
199.41	653.79	12.09	36.54	79.22	176.54
124.77	431.97	7.08	21.89	48.51	110.33
85.61	306.62	4.60	14.45	32.39	75.20
62.89	232.82	3.28	10.43	23.55	55.46
49.10	185.76	2.50	8.00	18.22	43.31
39.41	148.32	1.97	6.33	14.51	34.78
31.88	116.71	1.57	5.06	11.65	28.13
26.96	98.60	1.31	4.24	9.79	23.78
22.64	81.00	1.09	3.55	8.23	20.09
15.36	55.81	0.76	2.48	5.81	14.26
11.14	42.64	0.55	1.83	4.28	10.22
8.74	33.22	0.43	1.43	3.27	7.92
6.94	26.34	0.35	1.14	2.62	6.31
5.65	22.05	0.28	0.91	2.09	5.05
4.74	18.46	0.23	0.77	1.79	4.30
3.43	13.79	0.17	0.56	1.30	3.13
2.16	8.59	0.10	0.34	0.80	1.96
1.50	5.98	0.07	0.23	0.55	1.36
0.49	1.88	0.02	0.08	0.18	0.45
0.26	0.91	0.01	0.04	0.10	0.24
0.16	0.57	0.01	0.03	0.06	0.15

12	13	14	15	16	17
3146.31	48.93	114.23	306.26	617.25	1223.67
2439.67	34.26	81.11	225.71	465.28	943.27
1629.61	19.53	47.19	136.90	292.19	614.56
927.88	8.88	21.97	67.11	148.36	326.82
578.29	5.10	12.86	40.24	90.51	205.85
407.86	3.26	8.34	26.59	60.84	141.45
310.63	2.30	5.94	19.13	44.24	104.18
244.48	1.75	4.54	14.71	34.26	78.91
200.38	1.37	3.57	11.67	26.94	61.77
168.14	1.08	2.84	9.31	21.08	48.36
143.40	0.89	2.37	7.66	17.64	40.79
122.70	0.74	1.97	6.29	14.45	33.23
88.69	0.50	1.33	4.29	9.75	23.13
69.43	0.35	0.95	3.10	7.24	17.30
54.65	0.27	0.74	2.42	5.63	13.32
44.78	0.22	0.59	1.91	4.40	10.54
36.86	0.17	0.47	1.56	3.65	8.79
31.59	0.15	0.40	1.30	3.00	7.31
23.22	0.11	0.29	0.94	2.21	5.43
14.30	0.06	0.18	0.59	1.36	3.32
9.59	0.04	0.12	0.40	0.94	2.30
2.64	0.01	0.04	0.13	0.30	0.72
1.26	0.01	0.02	0.07	0.15	0.36
0.71	0.00	0.01	0.04	0.10	0.22
39	40	41	42	43	44
56.78	151.36	302.52	604.99	94.58	188.15
40.33	111.72	227.06	466.39	69.52	141.61
23.47	67.51	141.93	301.18	42.12	88.06
10.89	32.85	71.34	158.01	20.45	44.37
6.38	19.65	43.51	99.03	12.25	27.02
4.13	12.96	29.12	67.31	8.04	18.02
2.95	9.37	21.15	49.61	5.82	13.12
2.25	7.19	16.37	38.73	4.48	10.16
1.77	5.69	13.05	31.11	3.55	8.09
1.41	4.55	10.49	25.18	2.83	6.49
1.17	3.81	8.80	21.27	2.38	5.46
0.98	3.19	7.37	17.96	1.99	4.59
0.68	2.23	5.22	12.79	1.39	3.24
0.50	1.64	3.85	9.47	1.02	2.39
0.39	1.29	3.03	7.24	0.80	1.88
0.31	1.03	2.43	5.82	0.65	1.52
0.25	0.82	1.93	4.63	0.52	1.24
0.21	0.70	1.64	3.96	0.45	1.06
0.16	0.51	1.19	2.89	0.33	0.80
0.09	0.31	0.73	1.79	0.20	0.48
0.06	0.21	0.50	1.24	0.14	0.33
0.02	0.07	0.16	0.41	0.05	0.11
0.01	0.04	0.09	0.22	0.02	0.06
0.01	0.02	0.06	0.14	0.02	0.04

18	19	20	21	22	23
2944.74	40.78	94.67	254.26	510.06	1020.68
2311.65	28.55	67.49	186.75	383.65	786.11
1559.58	16.30	39.24	113.75	240.12	510.60
890.09	7.39	18.28	55.42	121.99	271.00
568.43	4.25	10.68	33.18	74.41	170.49
386.74	2.72	6.92	21.90	49.82	116.15
290.27	1.92	4.94	15.83	36.22	86.16
227.37	1.46	3.77	12.14	28.05	67.21
179.24	1.14	2.97	9.61	22.33	53.07
152.39	0.90	2.36	7.69	17.91	41.57
125.53	0.75	1.97	6.44	15.08	34.78
110.13	0.62	1.64	5.37	12.63	28.48
78.63	0.43	1.14	3.64	8.56	19.42
58.91	0.30	0.81	2.62	6.13	14.53
47.42	0.23	0.62	2.04	4.79	11.29
37.34	0.18	0.50	1.62	3.81	8.76
32.02	0.14	0.39	1.30	3.07	7.40
26.70	0.12	0.34	1.10	2.59	6.03
20.17	0.09	0.25	0.80	1.88	4.53
12.44	0.05	0.15	0.50	1.17	2.75
8.50	0.04	0.10	0.34	0.81	1.91
2.48	0.01	0.03	0.11	0.26	0.62
1.15	0.01	0.02	0.06	0.14	0.32
0.67	0.00	0.01	0.04	0.09	0.20
45	46	47	48	49	50
75.54	150.52	100.35	75.09	125.22	295.73
55.57	113.15	74.95	56.42	87.18	211.70
33.68	70.54	46.94	35.19	49.07	123.96
16.38	35.45	23.60	17.70	22.09	58.26
9.81	21.60	14.38	10.77	12.68	33.56
6.46	14.45	9.61	7.20	7.94	21.18
4.65	10.50	6.98	5.23	5.52	14.95
3.58	8.14	5.40	4.05	4.11	11.22
2.84	6.48	4.31	3.22	3.16	8.62
2.26	5.19	3.46	2.59	2.45	6.84
1.90	4.36	2.91	2.18	2.05	5.63
1.59	3.67	2.45	1.83	1.67	4.66
1.12	2.59	1.72	1.29	1.13	3.17
0.82	1.91	1.27	0.96	0.83	2.32
0.64	1.51	1.00	0.75	0.63	1.75
0.52	1.22	0.81	0.61	0.49	1.39
0.42	0.99	0.66	0.50	0.40	1.14
0.36	0.85	0.57	0.42	0.33	0.94
0.27	0.63	0.42	0.32	0.24	0.69
0.16	0.39	0.26	0.20	0.14	0.41
0.11	0.27	0.18	0.14	0.10	0.28
0.04	0.09	0.06	0.05	0.03	0.08
0.02	0.05	0.03	0.03	0.01	0.04
0.01	0.03	0.02	0.02	0.01	0.02

24	25	26	27
2633.54	81.05	217.38	434.80
2093.77	57.74	159.74	327.43
1423.67	33.56	97.03	204.46
811.51	15.58	47.24	103.46
540.49	9.12	28.32	63.11
386.23	5.92	18.69	42.22
278.16	4.22	13.43	30.67
215.61	3.23	10.34	23.77
171.01	2.54	8.20	18.93
138.80	2.02	6.55	15.17
117.14	1.68	5.48	12.75
99.53	1.40	4.59	10.70
71.01	0.98	3.20	7.51
53.26	0.71	2.28	5.40
40.88	0.54	1.75	4.16
33.77	0.43	1.40	3.31
27.23	0.35	1.12	2.63
23.44	0.29	0.96	2.25
17.04	0.21	0.70	1.64
10.75	0.13	0.43	1.02
7.28	0.09	0.30	0.70
2.22	0.03	0.10	0.23
1.10	0.02	0.05	0.12
0.65	0.01	0.03	0.08
51	52	53	54
798.08	1467.37	2098.59	3067.89
584.24	1079.80	1573.56	2255.16
353.53	665.01	979.43	1473.71
172.65	321.70	491.31	856.81
99.61	194.14	316.19	604.88
64.70	130.91	224.55	460.12
46.37	95.52	167.55	364.07
34.98	72.34	134.74	303.81
26.78	56.96	109.27	255.79
21.99	46.65	90.81	219.90
17.83	38.29	76.44	189.51
15.29	32.57	66.13	168.39
10.44	22.59	47.34	124.50
7.54	16.75	35.23	93.07
5.73	13.17	27.90	76.18
4.64	10.22	22.39	60.68
3.66	8.58	18.40	51.38
3.14	6.95	15.14	42.07
2.26	5.17	10.94	31.53
1.37	3.00	6.47	18.62
0.92	2.01	4.32	12.29
0.26	0.56	1.16	3.11
0.12	0.26	0.52	1.32
0.07	0.14	0.29	0.75

X,m	Max concentration, ppm
25.00	3146.31
50.00	2439.67
100.00	1629.61
200.00	927.88
300.00	604.88
400.00	460.12
500.00	364.07
600.00	303.81
700.00	255.79
800.00	219.90
900.00	189.51
1000.00	168.39
1250.00	124.50
1500.00	93.07
1750.00	76.18
2000.00	60.68
2250.00	51.38
2500.00	42.07
3000.00	31.53
4000.00	18.62
5000.00	12.29
10000.00	3.11
15000.00	1.32
20000.00	0.75

centration (ppm)		Distance to (m)
LOC	9.6000	6464.52
IDLH	19.6000	3924.27

From Slab output file:	RUN05.OUT
Scenario:	CONSERV
Accident Location:	ON-SITE
Duration:	UNMITIG
Meteorology:	INVERSN
Chemical:	FORMALDEHYDE
Vapor phase mole fraction:	0.478
LOC:	9.600
IDLH:	19.600

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	6494.06
50.00	5038.76
100.00	3464.59
200.00	2068.94
300.00	1454.11
400.00	1101.68
500.00	867.51
600.00	720.65
700.00	607.79
800.00	522.51
900.00	452.54
1000.00	403.52
1250.00	304.94
1500.00	235.86
1750.00	194.85
2000.00	159.25
2250.00	135.99
2500.00	113.41
3000.00	87.83
4000.00	54.79
5000.00	38.15
10000.00	11.23
15000.00	5.33
20000.00	3.08

Concentration (ppm)		Distance to (m)
LOC	9.6000	11380.26
IDLH	19.6000	8445.13

From Slab output file:	RUN06.OUT
Scenario:	CONSERV
Accident Location:	ON-SITE
Duration:	MITIGAT
Meteorology:	INVERSN
Chemical:	FORMALDEHYDE
Vapor phase mole fraction:	0.742
LOC:	9.600
IDLH:	19.600

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	4450.17
50.00	3473.82
100.00	2427.27
200.00	1473.06
300.00	1060.50
400.00	813.60
500.00	646.51
600.00	544.01
700.00	454.30
800.00	396.47
900.00	338.65
1000.00	303.76
1250.00	227.17
1500.00	177.19
1750.00	144.82
2000.00	116.19
2250.00	99.41
2500.00	82.81
3000.00	62.75
4000.00	38.46
5000.00	26.09
10000.00	7.18
15000.00	3.27
20000.00	1.86

Concentration (ppm)		Distance to (m)
LOC	9.6000	9360.84
IDLH	19.6000	6716.09

From Slab output file:	RUN07.OUT
Scenario:	CONSERV
Accident Location:	ON-SITE
Duration:	UNMITIG
Meteorology:	TYPICAL
Chemical:	ACETONE
Vapor phase mole fraction:	0.273
LOC:	1960.000
IDLH:	2442.000

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	41.05
50.00	30.35
100.00	18.68
200.00	9.26
300.00	5.60
400.00	3.73
500.00	2.69
600.00	2.07
700.00	1.65
800.00	1.32
900.00	1.11
1000.00	0.93
1250.00	0.65
1500.00	0.48
1750.00	0.37
2000.00	0.30
2250.00	0.25
2500.00	0.21
3000.00	0.16
4000.00	0.10
5000.00	0.07
10000.00	0.02
15000.00	0.01

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:	RUN08.OUT
Scenario:	CONSERV
Accident Location:	ON-SITE
Duration:	MITIGAT
Meteorology:	TYPICAL
Chemical:	ACETONE
Vapor phase mole fraction:	0.585
LOC:	1960.000
IDLH:	2442.000

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	50.03
50.00	37.74
100.00	23.72
200.00	12.04
300.00	7.38
400.00	4.94
500.00	3.60
600.00	2.78
700.00	2.22
800.00	1.78
900.00	1.50
1000.00	1.25
1250.00	0.85
1500.00	0.61
1750.00	0.47
2000.00	0.38
2250.00	0.30
2500.00	0.26
3000.00	0.19
4000.00	0.12
5000.00	0.08
10000.00	0.03
15000.00	0.01
20000.00	0.01

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file: RUN09.OUT
Scenario: CONSERV
Accident Location: ON-SITE
Duration: UNMITIG
Meteorology: WORST
Chemical: ACETONE
Vapor phase mole fraction: 0.273
LOC: 1960.000
IDLH: 2442.000
*Output adjusted to be distance from fenceline.

X,m	1	2	3	4	5
25.00	6.56	16.01	45.91	93.55	157.28
50.00	4.51	11.33	33.40	69.24	117.73
100.00	2.53	6.52	20.06	42.40	74.44
200.00	1.14	3.01	9.67	21.04	39.24
300.00	0.66	1.75	5.74	12.78	24.98
400.00	0.42	1.13	3.78	8.52	17.28
500.00	0.30	0.80	2.71	6.18	12.90
600.00	0.22	0.61	2.07	4.78	10.19
700.00	0.17	0.48	1.63	3.80	8.25
800.00	0.14	0.38	1.30	3.04	6.73
900.00	0.11	0.32	1.09	2.56	5.72
1000.00	0.09	0.26	0.91	2.15	4.86
1250.00	0.07	0.18	0.63	1.51	3.50
1500.00	0.05	0.13	0.46	1.11	2.63
1750.00	0.04	0.10	0.36	0.87	2.08
2000.00	0.03	0.08	0.29	0.70	1.71
2250.00	0.02	0.07	0.23	0.57	1.40
2500.00	0.02	0.06	0.20	0.49	1.20
3000.00	0.01	0.04	0.15	0.36	0.91
4000.00	0.01	0.03	0.09	0.22	0.57
5000.00	0.01	0.02	0.06	0.16	0.40
10000.00	0.00	0.01	0.02	0.05	0.14
15000.00	0.00	0.00	0.01	0.03	0.08

X,m	28	29	30	31	32
25.00	75.63	202.78	5.75	15.88	32.37
50.00	57.59	159.89	4.04	11.51	23.95
100.00	36.61	107.58	2.32	6.85	14.65
200.00	18.97	60.17	1.06	3.27	7.24
300.00	11.78	39.37	0.62	1.94	4.38
400.00	7.97	27.93	0.40	1.27	2.90
500.00	5.85	21.08	0.28	0.91	2.10
600.00	4.56	16.77	0.22	0.70	1.62
700.00	3.65	13.70	0.17	0.55	1.29
800.00	2.94	11.27	0.13	0.44	1.03
900.00	2.48	9.64	0.11	0.37	0.86
1000.00	2.09	8.24	0.09	0.31	0.72
1250.00	1.48	5.99	0.07	0.22	0.51
1500.00	1.10	4.54	0.05	0.16	0.38
1750.00	0.86	3.63	0.04	0.12	0.29
2000.00	0.70	2.99	0.03	0.10	0.24
2250.00	0.57	2.47	0.02	0.08	0.19
2500.00	0.49	2.13	0.02	0.07	0.17
3000.00	0.37	1.62	0.02	0.05	0.12
4000.00	0.23	1.03	0.01	0.03	0.08
5000.00	0.16	0.74	0.01	0.02	0.05
10000.00	0.06	0.27	0.00	0.01	0.02
15000.00	0.03	0.15	0.00	0.00	0.01

6	7	8	9	10	11
237.90	4.86	11.74	33.10	69.07	132.22
184.48	3.37	8.26	24.15	51.30	100.05
125.59	1.91	4.75	14.49	31.79	63.68
74.71	0.86	2.19	6.97	15.79	33.13
51.92	0.49	1.27	4.15	9.56	20.70
38.86	0.32	0.82	2.72	6.36	14.13
30.80	0.22	0.58	1.95	4.61	10.42
25.54	0.17	0.44	1.50	3.54	8.13
21.59	0.13	0.35	1.18	2.81	6.53
18.35	0.10	0.28	0.94	2.25	5.30
16.08	0.09	0.23	0.79	1.89	4.48
14.11	0.07	0.19	0.66	1.58	3.79
10.76	0.05	0.13	0.46	1.11	2.70
8.46	0.04	0.10	0.33	0.81	2.00
6.96	0.03	0.08	0.26	0.64	1.58
5.87	0.02	0.06	0.21	0.51	1.29
4.96	0.02	0.05	0.17	0.41	1.05
4.35	0.02	0.04	0.14	0.35	0.90
3.40	0.01	0.03	0.11	0.26	0.67
2.25	0.01	0.02	0.07	0.16	0.42
1.65	0.00	0.01	0.05	0.11	0.30
0.63	0.00	0.00	0.02	0.04	0.10
0.36	0.00	0.00	0.01	0.02	0.06
33	34	35	36	37	38
65.64	181.74	5.10	14.08	28.59	58.11
49.88	143.91	3.59	10.21	21.18	44.10
31.73	97.15	2.06	6.08	12.96	27.97
16.37	54.36	0.94	2.91	6.37	14.37
10.14	35.56	0.55	1.72	3.85	8.90
6.85	24.97	0.35	1.12	2.55	6.00
5.02	18.82	0.25	0.81	1.85	4.41
3.91	14.95	0.19	0.62	1.43	3.43
3.13	12.18	0.15	0.49	1.13	2.75
2.52	10.00	0.12	0.39	0.91	2.21
2.13	8.53	0.10	0.33	0.76	1.87
1.80	7.28	0.08	0.27	0.64	1.57
1.27	5.28	0.06	0.19	0.45	1.12
0.94	3.98	0.04	0.14	0.33	0.83
0.74	3.18	0.03	0.11	0.26	0.65
0.61	2.61	0.03	0.09	0.21	0.53
0.49	2.15	0.02	0.07	0.17	0.43
0.42	1.86	0.02	0.06	0.15	0.37
0.32	1.41	0.01	0.05	0.11	0.28
0.20	0.90	0.01	0.03	0.07	0.17
0.14	0.64	0.01	0.02	0.05	0.12
0.05	0.23	0.00	0.01	0.02	0.04
0.03	0.13	0.00	0.00	0.01	0.02

12	13	14	15	16	17
246.28	3.88	9.28	25.97	53.74	107.32
189.49	2.70	6.55	18.88	39.99	81.83
126.77	1.53	3.75	11.29	24.61	52.31
73.03	0.69	1.72	5.42	12.25	27.09
49.81	0.39	1.00	3.23	7.42	16.92
36.41	0.25	0.65	2.11	4.93	11.48
28.34	0.18	0.46	1.52	3.56	8.44
23.15	0.13	0.35	1.16	2.75	6.57
19.33	0.10	0.27	0.92	2.18	5.27
16.25	0.08	0.22	0.73	1.75	4.26
14.09	0.07	0.18	0.61	1.47	3.59
12.24	0.06	0.15	0.51	1.23	3.03
9.18	0.04	0.11	0.36	0.86	2.14
7.12	0.03	0.08	0.26	0.63	1.59
5.80	0.02	0.06	0.20	0.49	1.25
4.83	0.02	0.05	0.16	0.40	1.02
4.03	0.01	0.04	0.13	0.32	0.83
3.52	0.01	0.03	0.11	0.28	0.71
2.73	0.01	0.02	0.08	0.21	0.53
1.77	0.01	0.01	0.05	0.13	0.33
1.28	0.00	0.01	0.04	0.09	0.23
0.48	0.00	0.00	0.01	0.03	0.08
0.27	0.00	0.00	0.01	0.02	0.05
39	40	41	42	43	44
4.60	12.65	25.65	52.13	7.88	15.92
3.23	9.17	18.98	39.42	5.71	11.78
1.85	5.46	11.61	25.01	3.38	7.17
0.85	2.60	5.72	12.82	1.62	3.52
0.49	1.54	3.45	7.93	0.96	2.12
0.32	1.01	2.29	5.34	0.63	1.41
0.23	0.72	1.65	3.92	0.45	1.02
0.17	0.56	1.27	3.05	0.35	0.79
0.14	0.44	1.01	2.44	0.27	0.62
0.11	0.35	0.81	1.97	0.22	0.50
0.09	0.29	0.68	1.66	0.18	0.42
0.07	0.24	0.57	1.40	0.15	0.35
0.05	0.17	0.40	1.00	0.11	0.25
0.04	0.13	0.30	0.74	0.08	0.18
0.03	0.10	0.23	0.58	0.06	0.14
0.02	0.08	0.19	0.47	0.05	0.12
0.02	0.06	0.15	0.39	0.04	0.09
0.02	0.05	0.13	0.33	0.03	0.08
0.01	0.04	0.10	0.25	0.03	0.06
0.01	0.03	0.06	0.16	0.02	0.04
0.01	0.02	0.04	0.11	0.01	0.03
0.00	0.01	0.01	0.04	0.00	0.01
0.00	0.00	0.01	0.02	0.00	0.01

18	19	20	21	22	23
241.47	3.23	7.70	21.40	43.97	88.86
186.98	2.25	5.42	15.54	32.55	67.78
124.64	1.27	3.10	9.27	20.05	43.31
70.26	0.57	1.43	4.43	9.94	22.47
46.80	0.33	0.83	2.64	6.02	13.97
33.68	0.21	0.53	1.73	4.00	9.48
25.93	0.15	0.38	1.24	2.90	6.95
20.92	0.11	0.29	0.95	2.23	5.41
17.28	0.09	0.23	0.75	1.77	4.33
14.37	0.07	0.18	0.60	1.42	3.49
12.38	0.06	0.15	0.50	1.19	2.94
10.67	0.05	0.13	0.42	1.00	2.48
7.89	0.03	0.09	0.29	0.70	1.76
6.06	0.02	0.06	0.21	0.51	1.30
4.89	0.02	0.05	0.17	0.40	1.03
4.05	0.01	0.04	0.13	0.33	0.83
3.36	0.01	0.03	0.11	0.26	0.68
2.92	0.01	0.03	0.09	0.23	0.58
2.24	0.01	0.02	0.07	0.17	0.43
1.44	0.00	0.01	0.04	0.10	0.27
1.03	0.00	0.01	0.03	0.07	0.19
0.38	0.00	0.00	0.01	0.03	0.07
0.21	0.00	0.00	0.01	0.01	0.04
45	46	47	48	49	50
6.31	12.73	8.46	6.34	10.24	25.10
4.56	9.41	6.26	4.69	7.05	17.77
2.71	5.73	3.81	2.86	3.94	10.27
1.29	2.81	1.87	1.40	1.76	4.73
0.77	1.70	1.13	0.85	1.00	2.75
0.50	1.12	0.75	0.56	0.64	1.78
0.36	0.81	0.54	0.41	0.45	1.26
0.28	0.63	0.42	0.31	0.34	0.96
0.22	0.50	0.33	0.25	0.26	0.75
0.17	0.40	0.27	0.20	0.21	0.60
0.15	0.34	0.22	0.17	0.17	0.50
0.12	0.28	0.19	0.14	0.14	0.41
0.09	0.20	0.13	0.10	0.10	0.28
0.06	0.15	0.10	0.07	0.07	0.21
0.05	0.11	0.08	0.06	0.06	0.16
0.04	0.09	0.06	0.05	0.04	0.13
0.03	0.08	0.05	0.04	0.04	0.10
0.03	0.06	0.04	0.03	0.03	0.09
0.02	0.05	0.03	0.02	0.02	0.07
0.01	0.03	0.02	0.01	0.01	0.04
0.01	0.02	0.01	0.01	0.01	0.03
0.00	0.01	0.00	0.00	0.00	0.01
0.00	0.00	0.00	0.00	0.00	0.01

24	25	26	27
224.61	6.59	18.23	37.32
175.63	4.64	13.22	27.59
117.46	2.65	7.87	16.93
65.97	1.22	3.77	8.37
43.39	0.71	2.23	5.07
30.94	0.46	1.46	3.37
23.47	0.33	1.05	2.43
18.78	0.25	0.81	1.87
15.41	0.19	0.64	1.49
12.74	0.15	0.51	1.19
10.91	0.13	0.42	1.00
9.35	0.11	0.35	0.84
6.85	0.07	0.25	0.59
5.23	0.05	0.18	0.43
4.18	0.04	0.14	0.34
3.45	0.03	0.11	0.28
2.85	0.03	0.09	0.22
2.47	0.02	0.08	0.19
1.89	0.02	0.06	0.14
1.20	0.01	0.04	0.09
0.86	0.01	0.03	0.06
0.32	0.00	0.01	0.02
0.18	0.00	0.00	0.01
51	52	53	54
70.82	120.70	166.17	278.61
50.28	88.04	125.14	212.12
29.67	54.04	81.11	140.44
14.18	27.59	44.85	82.88
8.48	17.12	29.57	57.52
5.59	11.67	21.16	43.49
4.03	8.60	16.16	34.75
3.12	6.73	12.99	28.81
2.47	5.42	10.69	24.42
1.97	4.39	8.87	20.94
1.65	3.71	7.62	18.52
1.38	3.13	6.55	16.39
0.97	2.23	4.81	12.72
0.71	1.66	3.66	10.21
0.56	1.31	2.94	8.42
0.45	1.07	2.43	7.20
0.36	0.87	2.01	6.23
0.31	0.74	1.74	5.40
0.23	0.56	1.33	4.29
0.14	0.35	0.85	2.99
0.10	0.24	0.61	2.22
0.03	0.08	0.22	0.89
0.02	0.05	0.12	0.52

X,m	Max concentration, ppm
25.00	278.61
50.00	212.12
100.00	140.44
200.00	82.88
300.00	57.52
400.00	43.49
500.00	34.75
600.00	28.81
700.00	24.42
800.00	20.94
900.00	18.52
1000.00	16.39
1250.00	12.72
1500.00	10.21
1750.00	8.42
2000.00	7.20
2250.00	6.23
2500.00	5.40
3000.00	4.29
4000.00	2.99
5000.00	2.22
10000.00	0.89
15000.00	0.52

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file: RUN10.OUT
Scenario: CONSERV
Accident Location: ON-SITE
Duration: MITIGAT
Meteorology: WORST
Chemical: ACETONE
Vapor phase mole fraction: 0.585
LOC: 1960.000
IDLH: 2442.000
*Output adjusted to be distance from fenceline.

X,m	1	2	3	4	5
25.00	8.56	20.32	55.10	104.37	156.74
50.00	5.98	14.56	40.45	76.86	117.56
100.00	3.36	8.51	24.59	47.63	75.28
200.00	1.51	3.99	12.08	24.21	40.73
300.00	0.88	2.34	7.28	15.00	24.82
400.00	0.56	1.52	4.82	9.79	17.14
500.00	0.40	1.08	3.38	7.02	12.86
600.00	0.30	0.81	2.56	5.38	10.02
700.00	0.23	0.63	1.99	4.21	7.98
800.00	0.18	0.49	1.56	3.40	6.71
900.00	0.15	0.41	1.31	2.84	5.57
1000.00	0.12	0.33	1.07	2.40	4.83
1250.00	0.08	0.22	0.74	1.68	3.44
1500.00	0.06	0.16	0.55	1.24	2.60
1750.00	0.05	0.13	0.42	0.93	2.08
2000.00	0.04	0.10	0.33	0.76	1.63
2250.00	0.03	0.08	0.27	0.62	1.39
2500.00	0.02	0.07	0.22	0.52	1.14
3000.00	0.02	0.05	0.17	0.38	0.87
4000.00	0.01	0.03	0.10	0.23	0.53
5000.00	0.01	0.02	0.07	0.16	0.36
10000.00	0.00	0.01	0.02	0.05	0.10
15000.00	0.00	0.00	0.01	0.02	0.05
20000.00	0.00	0.00	0.01	0.01	0.03

X,m	28	29	30	31	32
25.00	90.23	217.33	7.33	19.70	39.53
50.00	69.65	171.03	5.23	14.49	29.77
100.00	45.28	116.01	3.04	8.79	18.67
200.00	24.07	66.22	1.41	4.30	9.45
300.00	15.19	44.12	0.83	2.58	5.78
400.00	10.39	31.74	0.54	1.70	3.87
500.00	7.68	24.42	0.38	1.22	2.81
600.00	6.01	18.84	0.29	0.94	2.18
700.00	4.83	14.99	0.23	0.75	1.74
800.00	3.90	11.96	0.18	0.59	1.39
900.00	3.25	10.28	0.15	0.50	1.17
1000.00	2.67	8.64	0.13	0.42	0.98
1250.00	1.81	6.21	0.09	0.29	0.69
1500.00	1.33	4.72	0.06	0.21	0.49
1750.00	1.04	3.65	0.05	0.16	0.38
2000.00	0.82	3.01	0.04	0.13	0.30
2250.00	0.68	2.47	0.03	0.10	0.24
2500.00	0.56	2.13	0.03	0.09	0.21
3000.00	0.41	1.58	0.02	0.06	0.15
4000.00	0.26	1.00	0.01	0.04	0.09
5000.00	0.18	0.69	0.01	0.03	0.06
10000.00	0.06	0.21	0.00	0.01	0.02
15000.00	0.03	0.11	0.00	0.00	0.01
20000.00	0.02	0.06	0.00	0.00	0.01

6	7	8	9	10	11
234.74	6.36	15.01	40.76	82.17	143.85
182.75	4.41	10.71	30.09	61.46	109.24
115.60	2.51	6.25	18.42	38.53	69.75
64.10	1.14	2.92	9.05	19.58	37.24
44.42	0.66	1.71	5.46	12.03	23.81
33.63	0.42	1.11	3.61	8.10	15.79
26.77	0.30	0.79	2.60	5.91	11.48
21.79	0.23	0.60	2.00	4.46	8.87
18.79	0.18	0.47	1.57	3.47	6.98
15.88	0.14	0.38	1.22	2.71	5.71
14.12	0.11	0.31	1.01	2.30	4.76
12.35	0.09	0.25	0.83	1.88	4.07
9.43	0.06	0.17	0.57	1.29	2.86
7.44	0.04	0.12	0.41	0.96	2.13
5.95	0.03	0.10	0.32	0.74	1.63
5.00	0.03	0.08	0.25	0.58	1.34
4.13	0.02	0.06	0.21	0.48	1.08
3.54	0.02	0.05	0.17	0.39	0.93
2.59	0.01	0.04	0.12	0.29	0.67
1.62	0.01	0.02	0.08	0.18	0.42
1.08	0.01	0.02	0.05	0.12	0.29
0.30	0.00	0.01	0.02	0.04	0.09
0.14	0.00	0.00	0.01	0.02	0.04
0.08	0.00	0.00	0.01	0.01	0.03
33	34	35	36	37	38
78.72	200.48	6.52	17.46	34.98	70.00
60.79	159.18	4.64	12.89	26.35	53.89
39.52	108.61	2.70	7.79	16.50	34.99
20.97	62.23	1.26	3.80	8.32	18.54
13.19	41.27	0.73	2.28	5.09	11.66
9.04	29.51	0.48	1.50	3.41	7.92
6.68	22.54	0.34	1.08	2.48	5.87
5.21	18.12	0.26	0.83	1.92	4.59
4.19	14.55	0.20	0.66	1.53	3.68
3.39	11.51	0.16	0.53	1.22	2.98
2.86	9.77	0.14	0.44	1.03	2.52
2.40	8.07	0.11	0.37	0.87	2.13
1.63	5.69	0.08	0.26	0.61	1.51
1.18	4.35	0.06	0.19	0.45	1.08
0.92	3.39	0.04	0.15	0.34	0.84
0.73	2.71	0.04	0.12	0.27	0.67
0.59	2.26	0.03	0.09	0.22	0.53
0.50	1.90	0.02	0.08	0.19	0.45
0.36	1.43	0.02	0.06	0.14	0.33
0.23	0.90	0.01	0.04	0.08	0.21
0.16	0.63	0.01	0.02	0.06	0.14
0.05	0.20	0.00	0.01	0.02	0.05
0.03	0.10	0.00	0.00	0.01	0.02
0.02	0.06	0.00	0.00	0.01	0.02

12	13	14	15	16	17
230.43	5.05	11.88	32.14	64.86	123.22
178.20	3.54	8.47	23.71	49.08	94.45
120.69	2.02	4.93	14.49	30.89	61.15
66.17	0.91	2.30	7.13	15.70	32.54
43.87	0.53	1.35	4.28	9.68	20.62
32.26	0.34	0.88	2.82	6.46	14.20
25.18	0.24	0.62	2.04	4.72	10.57
20.09	0.18	0.47	1.57	3.65	8.05
17.15	0.14	0.37	1.24	2.87	6.31
14.38	0.11	0.30	0.99	2.24	4.94
12.69	0.09	0.25	0.81	1.88	4.17
10.99	0.08	0.21	0.67	1.54	3.40
8.25	0.05	0.14	0.46	1.05	2.41
6.47	0.04	0.10	0.33	0.77	1.81
5.13	0.03	0.08	0.26	0.60	1.39
4.33	0.02	0.06	0.20	0.47	1.10
3.56	0.02	0.05	0.16	0.39	0.92
3.08	0.02	0.04	0.14	0.32	0.77
2.26	0.01	0.03	0.10	0.23	0.57
1.41	0.01	0.02	0.06	0.14	0.35
0.96	0.00	0.01	0.04	0.10	0.24
0.29	0.00	0.00	0.01	0.03	0.08
0.13	0.00	0.00	0.01	0.02	0.04
0.07	0.00	0.00	0.00	0.01	0.02
39	40	41	42	43	44
5.87	15.71	31.38	62.71	9.75	19.47
4.17	11.53	23.63	48.39	7.21	14.65
2.42	7.03	14.76	31.38	4.36	9.13
1.13	3.41	7.43	16.57	2.12	4.60
0.66	2.05	4.55	10.41	1.27	2.80
0.43	1.35	3.05	7.10	0.83	1.87
0.31	0.97	2.22	5.23	0.60	1.36
0.23	0.75	1.71	4.09	0.46	1.05
0.18	0.59	1.36	3.28	0.37	0.84
0.15	0.47	1.09	2.65	0.29	0.67
0.12	0.40	0.92	2.24	0.25	0.57
0.10	0.33	0.77	1.90	0.21	0.48
0.07	0.23	0.55	1.35	0.14	0.34
0.05	0.17	0.40	1.00	0.11	0.25
0.04	0.13	0.32	0.76	0.08	0.20
0.03	0.11	0.25	0.61	0.07	0.16
0.03	0.09	0.20	0.49	0.05	0.13
0.02	0.07	0.17	0.42	0.05	0.11
0.02	0.05	0.12	0.30	0.03	0.08
0.01	0.03	0.08	0.19	0.02	0.05
0.01	0.02	0.05	0.13	0.01	0.03
0.00	0.01	0.02	0.04	0.00	0.01
0.00	0.00	0.01	0.02	0.00	0.01
0.00	0.00	0.01	0.01	0.00	0.00

18	19	20	21	22	23
235.70	4.21	9.83	26.51	53.54	104.61
182.34	2.95	6.99	19.57	40.40	80.85
122.25	1.68	4.08	11.91	25.41	52.49
70.85	0.76	1.90	5.84	12.94	27.97
46.26	0.44	1.11	3.50	7.91	17.67
32.22	0.28	0.72	2.31	5.31	12.09
24.63	0.20	0.51	1.67	3.87	8.98
19.63	0.15	0.39	1.28	2.99	7.03
15.77	0.12	0.31	1.01	2.39	5.55
13.59	0.09	0.25	0.81	1.92	4.35
11.43	0.08	0.20	0.68	1.61	3.64
10.07	0.06	0.17	0.57	1.35	2.99
7.34	0.04	0.12	0.38	0.91	2.05
5.66	0.03	0.08	0.28	0.65	1.53
4.60	0.02	0.06	0.21	0.51	1.19
3.66	0.02	0.05	0.17	0.40	0.93
3.16	0.01	0.04	0.14	0.33	0.78
2.66	0.01	0.04	0.12	0.27	0.64
2.03	0.01	0.03	0.08	0.20	0.48
1.27	0.01	0.02	0.05	0.12	0.29
0.87	0.00	0.01	0.04	0.08	0.20
0.26	0.00	0.00	0.01	0.03	0.06
0.12	0.00	0.00	0.01	0.01	0.03
0.07	0.00	0.00	0.00	0.01	0.02
45	46	47	48	49	50
7.82	15.56	10.33	7.74	13.27	30.47
5.75	11.70	7.80	5.83	9.24	21.78
3.48	7.31	4.85	3.64	5.22	12.74
1.69	3.67	2.44	1.83	2.35	6.00
1.01	2.23	1.49	1.11	1.35	3.47
0.67	1.49	0.99	0.75	0.84	2.21
0.48	1.09	0.72	0.54	0.59	1.56
0.37	0.84	0.56	0.42	0.44	1.17
0.29	0.67	0.44	0.33	0.34	0.90
0.23	0.54	0.36	0.27	0.26	0.72
0.20	0.45	0.30	0.23	0.22	0.59
0.16	0.38	0.25	0.19	0.18	0.50
0.11	0.27	0.18	0.13	0.12	0.34
0.08	0.20	0.13	0.10	0.09	0.25
0.07	0.16	0.10	0.08	0.07	0.19
0.05	0.13	0.08	0.06	0.05	0.15
0.04	0.10	0.07	0.05	0.04	0.12
0.04	0.09	0.06	0.04	0.03	0.10
0.03	0.07	0.04	0.03	0.03	0.07
0.02	0.04	0.03	0.02	0.02	0.04
0.01	0.03	0.02	0.01	0.01	0.03
0.00	0.01	0.01	0.01	0.00	0.01
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00

24	25	26	27
230.94	8.39	22.60	45.46
179.93	5.98	16.67	34.26
120.95	3.48	10.11	21.54
69.11	1.62	4.95	10.91
46.54	0.95	2.97	6.68
33.79	0.62	1.96	4.48
24.75	0.44	1.41	3.26
19.39	0.33	1.08	2.52
15.56	0.26	0.86	2.01
12.81	0.21	0.69	1.62
10.89	0.17	0.57	1.36
9.31	0.15	0.48	1.14
6.76	0.10	0.34	0.80
5.16	0.07	0.24	0.57
4.05	0.06	0.19	0.44
3.37	0.05	0.15	0.35
2.76	0.04	0.12	0.28
2.37	0.03	0.10	0.24
1.74	0.02	0.07	0.17
1.11	0.01	0.05	0.11
0.75	0.01	0.03	0.07
0.23	0.00	0.01	0.02
0.11	0.00	0.01	0.01
0.07	0.00	0.00	0.01
51	52	53	54
77.25	119.46	169.69	282.55
54.65	88.08	128.01	205.93
32.37	55.08	77.24	130.71
15.86	26.48	40.78	73.27
9.26	16.70	26.67	49.88
6.13	11.62	19.35	37.77
4.44	8.62	14.99	30.36
3.39	6.61	11.90	25.32
2.62	5.42	9.81	21.15
2.18	4.39	8.25	18.48
1.77	3.74	7.10	15.84
1.53	3.10	6.08	14.18
1.06	2.23	4.42	10.64
0.78	1.70	3.44	8.26
0.59	1.31	2.70	6.78
0.48	1.06	2.19	5.46
0.39	0.87	1.81	4.64
0.33	0.73	1.52	3.83
0.24	0.54	1.12	2.90
0.15	0.32	0.68	1.74
0.10	0.22	0.45	1.17
0.03	0.06	0.12	0.31
0.01	0.03	0.05	0.14
0.01	0.02	0.03	0.08

X,m	Max concentration, ppm
25.00	282.55
50.00	205.93
100.00	130.71
200.00	73.27
300.00	49.88
400.00	37.77
500.00	30.36
600.00	25.32
700.00	21.15
800.00	18.48
900.00	15.84
1000.00	14.18
1250.00	10.64
1500.00	8.26
1750.00	6.78
2000.00	5.46
2250.00	4.64
2500.00	3.83
3000.00	2.90
4000.00	1.74
5000.00	1.17
10000.00	0.31
15000.00	0.14
20000.00	0.08

ncentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:	RUN11.OUT
Scenario:	CONSERV
Accident Location:	ON-SITE
Duration:	UNMITIG
Meteorology:	INVERSN
Chemical:	ACETONE
Vapor phase mole fraction:	0.273
LOC:	1960.000
IDLH:	2442.000

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	526.75
50.00	407.31
100.00	270.25
200.00	158.44
300.00	107.11
400.00	80.44
500.00	63.86
600.00	51.43
700.00	43.67
800.00	36.79
900.00	32.37
1000.00	27.94
1250.00	21.45
1500.00	16.97
1750.00	13.59
2000.00	11.58
2250.00	9.70
2500.00	8.44
3000.00	6.35
4000.00	4.20
5000.00	2.95
10000.00	0.96
15000.00	0.48
20000.00	0.29

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:	RUNA1.OUT
Scenario:	CONSERV
Accident Location:	ON-SITE
Duration:	UNMITIG
Meteorology:	INVERSN
Chemical:	ACETONE
Vapor phase mole fraction:	0.273
LOC:	1960.000
IDLH:	2442.000

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	163.47
50.00	136.60
100.00	103.94
200.00	72.23
300.00	56.22
400.00	46.50
500.00	39.85
600.00	34.91
700.00	30.98
800.00	28.03
900.00	25.66
1000.00	23.48
1250.00	19.54
1500.00	16.73
1750.00	14.62
2000.00	13.01
2250.00	11.64
2500.00	10.52
3000.00	8.85
4000.00	6.65
5000.00	5.35
10000.00	2.36
15000.00	1.31
20000.00	0.83

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:	RUN12.OUT
Scenario:	CONSERV
Accident Location:	ON-SITE
Duration:	MITIGAT
Meteorology:	INVERSN
Chemical:	ACETONE
Vapor phase mole fraction:	0.585
LOC:	1960.000
IDLH:	2442.000

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	1206.67
50.00	951.72
100.00	678.83
200.00	423.89
300.00	305.44
400.00	236.16
500.00	192.42
600.00	160.65
700.00	135.25
800.00	117.15
900.00	101.72
1000.00	89.64
1250.00	67.85
1500.00	53.05
1750.00	42.01
2000.00	34.52
2250.00	28.84
2500.00	24.25
3000.00	17.97
4000.00	10.75
5000.00	7.21

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:	RUN13.OUT
Scenario:	TYPICAL
Accident Location:	ON-SITE
Duration:	UNMITIG
Meteorology:	TYPICAL
Chemical:	FORMALDEHYDE
Vapor phase mole fraction:	0.482
LOC:	9.600
IDLH:	19.600

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	24.22
50.00	16.68
100.00	9.66
200.00	4.35
300.00	2.59
400.00	1.69
500.00	1.21
600.00	0.92
700.00	0.72
800.00	0.57
900.00	0.48
1000.00	0.40
1250.00	0.28
1500.00	0.20
1750.00	0.16
2000.00	0.12
2250.00	0.10
2500.00	0.08
3000.00	0.06
4000.00	0.04
5000.00	0.03

Concentration (ppm)		Distance to (m)
LOC	9.6000	101.04
IDLH	19.6000	40.32

From Slab output file:	RUN14.OUT
Scenario:	TYPICAL
Accident Location:	ON-SITE
Duration:	MITIG
Meteorology:	TYPICAL
Chemical:	FORMALDEHYDE
Vapor phase mole fraction:	0.512
LOC:	9.600
IDLH:	19.600

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	24.65
50.00	16.98
100.00	9.84
200.00	4.43
300.00	2.65
400.00	1.73
500.00	1.24
600.00	0.94
700.00	0.74
800.00	0.58
900.00	0.49
1000.00	0.41
1250.00	0.28
1500.00	0.20
1750.00	0.16
2000.00	0.12
2250.00	0.10
2500.00	0.08
3000.00	0.06
4000.00	0.04
5000.00	0.03

Concentration (ppm)		Distance to (m)
LOC	9.6000	104.49
IDLH	19.6000	41.46

From Slab output file: RUN15.OUT
Scenario: TYPICAL
Accident Location: ON-SITE
Duration: UNMITIG
Meteorology: WORST
Chemical: FORMALDEHYDE
Vapor phase mole fraction: 0.482
LOC: 9.600
IDLH: 19.600

*Output adjusted to be distance from fenceline.

X,m	1	2	3	4	5
25.00	3.78	9.11	25.48	53.76	109.91
50.00	2.47	6.03	17.25	37.21	77.76
100.00	1.34	3.34	9.82	21.64	46.56
200.00	0.56	1.41	4.31	9.73	21.90
300.00	0.32	0.82	2.53	5.79	13.00
400.00	0.20	0.52	1.64	3.77	8.22
500.00	0.14	0.36	1.16	2.62	5.77
600.00	0.10	0.27	0.86	1.94	4.28
700.00	0.08	0.20	0.66	1.48	3.23
800.00	0.06	0.16	0.51	1.17	2.67
900.00	0.05	0.13	0.43	0.96	2.12
1000.00	0.04	0.11	0.35	0.80	1.83
1250.00	0.03	0.07	0.23	0.54	1.25
1500.00	0.02	0.05	0.17	0.40	0.90
1750.00	0.02	0.04	0.13	0.30	0.71
2000.00	0.01	0.03	0.10	0.24	0.56
2250.00	0.01	0.03	0.09	0.20	0.46
2500.00	0.01	0.02	0.07	0.16	0.38
3000.00	0.01	0.02	0.05	0.12	0.27
4000.00	0.00	0.01	0.03	0.07	0.17

X,m	28	29	30	31	32
25.00	46.43	143.87	3.41	9.33	19.30
50.00	32.57	104.75	2.26	6.31	13.26
100.00	19.30	65.22	1.25	3.58	7.68
200.00	8.96	32.22	0.53	1.57	3.46
300.00	5.44	20.17	0.31	0.92	2.06
400.00	3.60	13.68	0.19	0.60	1.35
500.00	2.61	10.07	0.14	0.43	0.97
600.00	2.00	7.81	0.10	0.32	0.73
700.00	1.58	6.14	0.08	0.25	0.58
800.00	1.26	4.74	0.06	0.20	0.46
900.00	1.07	3.97	0.05	0.17	0.39
1000.00	0.89	3.24	0.04	0.14	0.32
1250.00	0.60	2.20	0.03	0.10	0.22
1500.00	0.43	1.65	0.02	0.07	0.16
1750.00	0.34	1.27	0.02	0.06	0.13
2000.00	0.27	1.00	0.01	0.04	0.10
2250.00	0.22	0.83	0.01	0.03	0.08
2500.00	0.18	0.70	0.01	0.03	0.07
3000.00	0.13	0.52	0.01	0.02	0.05
4000.00	0.08	0.32	0.00	0.01	0.03

6	7	8	9	10	11
245.18	2.83	6.82	18.81	39.64	83.41
183.81	1.85	4.53	12.73	27.30	58.93
119.82	1.01	2.51	7.23	15.84	35.06
57.32	0.42	1.06	3.18	7.14	16.34
35.12	0.24	0.61	1.87	4.24	9.88
24.01	0.15	0.39	1.21	2.76	6.55
17.36	0.11	0.27	0.86	1.98	4.57
13.62	0.08	0.20	0.65	1.50	3.39
10.82	0.06	0.16	0.50	1.17	2.59
8.81	0.05	0.12	0.39	0.90	2.06
7.33	0.04	0.10	0.32	0.75	1.69
6.31	0.03	0.08	0.26	0.61	1.41
4.41	0.02	0.06	0.18	0.41	0.97
3.19	0.02	0.04	0.13	0.30	0.72
2.51	0.01	0.03	0.10	0.23	0.54
1.98	0.01	0.02	0.08	0.18	0.44
1.63	0.01	0.02	0.07	0.15	0.35
1.31	0.01	0.02	0.05	0.12	0.30
0.96	0.00	0.01	0.04	0.09	0.22
0.56	0.00	0.01	0.02	0.06	0.13
33	34	35	36	37	38
40.47	125.85	3.03	8.31	17.11	35.86
28.35	91.42	2.01	5.62	11.77	25.13
16.79	56.64	1.11	3.18	6.80	14.88
7.81	27.95	0.47	1.39	3.07	6.90
4.74	17.51	0.27	0.82	1.83	4.19
3.14	11.85	0.17	0.53	1.20	2.78
2.27	8.73	0.12	0.38	0.86	2.01
1.74	6.78	0.09	0.29	0.65	1.54
1.38	5.40	0.07	0.22	0.51	1.22
1.10	4.35	0.05	0.18	0.41	0.97
0.93	3.64	0.05	0.15	0.34	0.82
0.77	2.94	0.04	0.12	0.28	0.69
0.55	1.99	0.03	0.09	0.20	0.49
0.39	1.48	0.02	0.06	0.15	0.36
0.30	1.15	0.01	0.05	0.12	0.28
0.24	0.89	0.01	0.04	0.09	0.22
0.19	0.75	0.01	0.03	0.07	0.18
0.16	0.61	0.01	0.03	0.06	0.15
0.12	0.46	0.01	0.02	0.05	0.11
0.07	0.28	0.00	0.01	0.03	0.07

12	13	14	15	16	17
223.21	2.27	5.44	14.93	31.28	66.10
164.37	1.48	3.62	10.10	21.55	46.44
104.81	0.80	2.00	5.74	12.49	27.63
53.70	0.33	0.85	2.53	5.61	12.84
32.95	0.19	0.49	1.49	3.35	7.80
21.29	0.12	0.31	0.96	2.18	5.13
15.24	0.08	0.22	0.68	1.56	3.72
11.43	0.06	0.16	0.52	1.19	2.85
8.82	0.05	0.13	0.40	0.93	2.22
7.30	0.04	0.10	0.32	0.74	1.71
5.99	0.03	0.08	0.27	0.62	1.43
5.08	0.03	0.07	0.22	0.50	1.16
3.48	0.02	0.05	0.15	0.34	0.80
2.58	0.01	0.03	0.11	0.25	0.59
2.03	0.01	0.03	0.08	0.19	0.45
1.57	0.01	0.02	0.07	0.15	0.35
1.33	0.01	0.02	0.05	0.12	0.30
1.10	0.01	0.01	0.04	0.10	0.24
0.81	0.00	0.01	0.03	0.07	0.18
0.49	0.00	0.01	0.02	0.05	0.11
39	40	41	42	43	44
2.73	7.47	15.40	32.23	4.66	9.60
1.81	5.07	10.58	22.56	3.15	6.60
1.00	2.86	6.14	13.36	1.79	3.82
0.42	1.26	2.76	6.23	0.79	1.72
0.24	0.74	1.65	3.77	0.46	1.03
0.16	0.48	1.07	2.50	0.30	0.67
0.11	0.34	0.77	1.81	0.21	0.48
0.08	0.26	0.59	1.39	0.16	0.37
0.06	0.20	0.46	1.10	0.13	0.29
0.05	0.16	0.36	0.88	0.10	0.23
0.04	0.13	0.31	0.74	0.08	0.19
0.03	0.11	0.26	0.62	0.07	0.16
0.02	0.08	0.18	0.44	0.05	0.11
0.02	0.06	0.13	0.32	0.04	0.08
0.01	0.04	0.10	0.26	0.03	0.06
0.01	0.04	0.08	0.21	0.02	0.05
0.01	0.03	0.07	0.16	0.02	0.04
0.01	0.02	0.06	0.14	0.02	0.04
0.01	0.02	0.04	0.10	0.01	0.03
0.00	0.01	0.02	0.06	0.01	0.02

18	19	20	21	22	23
194.07	1.89	4.54	12.45	25.90	54.60
142.21	1.23	3.02	8.41	17.82	38.27
89.63	0.67	1.67	4.77	10.30	22.72
44.83	0.28	0.71	2.10	4.64	10.54
28.27	0.16	0.41	1.23	2.77	6.40
18.40	0.10	0.26	0.80	1.81	4.24
12.96	0.07	0.18	0.57	1.29	3.06
9.71	0.05	0.14	0.43	0.98	2.35
7.40	0.04	0.11	0.34	0.77	1.85
6.10	0.03	0.08	0.26	0.61	1.48
4.90	0.03	0.07	0.22	0.52	1.23
4.22	0.02	0.06	0.18	0.43	1.00
2.91	0.01	0.04	0.13	0.29	0.67
2.12	0.01	0.03	0.09	0.21	0.50
1.68	0.01	0.02	0.07	0.16	0.39
1.33	0.01	0.02	0.06	0.13	0.30
1.10	0.01	0.01	0.04	0.10	0.25
0.90	0.00	0.01	0.04	0.09	0.21
0.67	0.00	0.01	0.03	0.06	0.15
0.40	0.00	0.01	0.02	0.04	0.09
45	46	47	48	49	50
3.75	7.67	5.12	3.84	5.67	13.63
2.54	5.26	3.52	2.64	3.70	9.06
1.43	3.05	2.03	1.53	2.01	5.00
0.63	1.38	0.92	0.69	0.83	2.12
0.37	0.82	0.55	0.41	0.48	1.22
0.24	0.53	0.36	0.27	0.29	0.76
0.17	0.38	0.26	0.19	0.20	0.52
0.13	0.29	0.20	0.15	0.15	0.39
0.10	0.23	0.15	0.11	0.11	0.29
0.08	0.18	0.12	0.09	0.09	0.23
0.07	0.15	0.10	0.08	0.07	0.19
0.06	0.13	0.09	0.06	0.06	0.16
0.04	0.09	0.06	0.04	0.04	0.11
0.03	0.07	0.04	0.03	0.03	0.08
0.02	0.05	0.03	0.03	0.02	0.06
0.02	0.04	0.03	0.02	0.02	0.05
0.01	0.03	0.02	0.02	0.01	0.04
0.01	0.03	0.02	0.01	0.01	0.03
0.01	0.02	0.01	0.01	0.01	0.02
0.01	0.01	0.01	0.01	0.00	0.01

24	25	26	27
166.96	3.89	10.66	22.11
122.01	2.59	7.21	15.19
76.06	1.43	4.09	8.78
37.73	0.61	1.80	3.96
23.67	0.35	1.06	2.36
16.08	0.22	0.68	1.54
11.82	0.16	0.49	1.11
8.88	0.12	0.37	0.84
6.80	0.09	0.29	0.66
5.36	0.07	0.23	0.52
4.46	0.06	0.19	0.44
3.70	0.05	0.16	0.37
2.56	0.03	0.11	0.26
1.89	0.02	0.08	0.18
1.43	0.02	0.06	0.14
1.16	0.01	0.05	0.11
0.94	0.01	0.04	0.09
0.81	0.01	0.03	0.08
0.59	0.01	0.02	0.06
0.37	0.00	0.01	0.03
51	52	53	54
39.32	80.04	142.45	252.35
26.69	55.56	102.38	182.53
15.20	32.49	62.81	115.80
6.66	14.75	28.18	62.96
3.85	8.30	16.50	41.16
2.40	5.29	10.95	29.51
1.67	3.71	7.75	22.23
1.23	2.73	5.81	16.96
0.93	2.08	4.63	14.09
0.75	1.70	3.62	11.29
0.61	1.35	3.08	9.71
0.51	1.16	2.57	8.12
0.35	0.78	1.76	5.74
0.25	0.56	1.29	4.21
0.19	0.44	0.97	3.17
0.15	0.34	0.79	2.56
0.12	0.28	0.62	2.04
0.10	0.23	0.53	1.69
0.07	0.16	0.38	1.17
0.04	0.10	0.22	0.68

X,m	Max concentration, ppm
25.00	252.35
50.00	183.81
100.00	119.82
200.00	62.96
300.00	41.16
400.00	29.51
500.00	22.23
600.00	16.96
700.00	14.09
800.00	11.29
900.00	9.71
1000.00	8.12
1250.00	5.74
1500.00	4.21
1750.00	3.17
2000.00	2.56
2250.00	2.04
2500.00	1.69
3000.00	1.17
4000.00	0.68

Concentration (ppm)		Distance to (m)
LOC	9.6000	906.64
IDLH	19.6000	549.87

From Slab output file: RUN16.OUT
Scenario: TYPICAL
Accident Location: ON-SITE
Duration: MITIGAT
Meteorology: WORST
Chemical: FORMALDEHYDE
Vapor phase mole fraction: 0.512
LOC: 9.600
IDLH: 19.600
*Output adjusted to be distance from fenceline.

X,m	1	2	3	4	5
25.00	3.85	9.23	25.94	54.75	110.58
50.00	2.51	6.14	17.59	37.85	78.38
100.00	1.37	3.40	10.02	22.01	47.19
200.00	0.57	1.45	4.40	9.93	22.18
300.00	0.32	0.83	2.59	5.91	12.61
400.00	0.20	0.53	1.67	3.74	8.10
500.00	0.14	0.37	1.16	2.59	5.72
600.00	0.10	0.27	0.86	1.92	4.22
700.00	0.08	0.21	0.65	1.46	3.27
800.00	0.06	0.16	0.51	1.17	2.65
900.00	0.05	0.13	0.43	0.96	2.15
1000.00	0.04	0.11	0.35	0.80	1.81
1250.00	0.03	0.07	0.24	0.55	1.23
1500.00	0.02	0.05	0.17	0.40	0.90
1750.00	0.02	0.04	0.13	0.30	0.71
2000.00	0.01	0.03	0.10	0.24	0.55
2250.00	0.01	0.03	0.09	0.19	0.46
2500.00	0.01	0.02	0.07	0.16	0.37
3000.00	0.01	0.02	0.05	0.12	0.28
4000.00	0.00	0.01	0.03	0.07	0.16

X,m	28	29	30	31	32
25.00	47.21	145.62	3.47	9.51	19.62
50.00	33.12	106.02	2.30	6.44	13.50
100.00	19.68	66.35	1.28	3.65	7.81
200.00	9.16	32.80	0.54	1.60	3.53
300.00	5.56	20.54	0.31	0.94	2.11
400.00	3.68	13.93	0.20	0.61	1.38
500.00	2.67	10.26	0.14	0.43	0.99
600.00	2.04	7.69	0.10	0.33	0.75
700.00	1.61	5.88	0.08	0.26	0.59
800.00	1.28	4.65	0.06	0.20	0.47
900.00	1.08	3.87	0.05	0.17	0.39
1000.00	0.87	3.22	0.04	0.14	0.33
1250.00	0.59	2.21	0.03	0.10	0.23
1500.00	0.43	1.64	0.02	0.07	0.16
1750.00	0.34	1.24	0.02	0.06	0.13
2000.00	0.26	1.01	0.01	0.04	0.10
2250.00	0.22	0.82	0.01	0.04	0.08
2500.00	0.18	0.70	0.01	0.03	0.07
3000.00	0.13	0.52	0.01	0.02	0.05
4000.00	0.08	0.32	0.00	0.01	0.03

6	7	8	9	10	11
241.68	2.88	6.95	19.13	40.31	84.61
181.60	1.89	4.61	12.99	27.79	59.49
114.17	1.02	2.56	7.38	16.14	35.62
55.57	0.43	1.08	3.25	7.28	16.65
33.92	0.24	0.63	1.91	4.33	10.07
23.32	0.15	0.40	1.24	2.83	6.69
17.32	0.11	0.28	0.88	2.02	4.66
13.54	0.08	0.21	0.67	1.50	3.45
10.51	0.06	0.16	0.51	1.15	2.63
8.84	0.05	0.12	0.40	0.90	2.09
7.16	0.04	0.10	0.33	0.74	1.72
6.23	0.03	0.08	0.27	0.60	1.43
4.32	0.02	0.06	0.18	0.41	0.99
3.22	0.02	0.04	0.13	0.31	0.73
2.52	0.01	0.03	0.10	0.24	0.54
1.94	0.01	0.02	0.08	0.18	0.44
1.63	0.01	0.02	0.07	0.15	0.36
1.34	0.01	0.02	0.05	0.12	0.30
0.98	0.00	0.01	0.04	0.09	0.22
0.58	0.00	0.01	0.02	0.06	0.14
33	34	35	36	37	38
41.13	127.50	3.08	8.44	17.43	36.46
28.85	92.88	2.05	5.71	11.97	25.59
17.13	57.75	1.14	3.24	6.93	15.17
7.99	28.47	0.48	1.43	3.13	7.08
4.84	17.83	0.28	0.84	1.87	4.28
3.21	12.09	0.18	0.54	1.22	2.84
2.32	8.90	0.12	0.39	0.87	2.06
1.78	6.91	0.09	0.29	0.67	1.58
1.41	5.43	0.07	0.23	0.52	1.24
1.12	4.20	0.06	0.18	0.41	0.99
0.95	3.53	0.05	0.15	0.35	0.84
0.79	2.88	0.04	0.13	0.29	0.70
0.53	1.96	0.03	0.09	0.20	0.50
0.39	1.47	0.02	0.06	0.15	0.35
0.30	1.13	0.02	0.05	0.12	0.28
0.24	0.90	0.01	0.04	0.09	0.22
0.19	0.74	0.01	0.03	0.07	0.18
0.16	0.62	0.01	0.03	0.06	0.15
0.12	0.46	0.01	0.02	0.05	0.11
0.07	0.29	0.00	0.01	0.03	0.07

12	13	14	15	16	17
221.68	2.31	5.55	15.20	31.82	67.25
164.02	1.51	3.69	10.30	21.94	47.24
104.64	0.82	2.04	5.85	12.73	28.12
53.44	0.34	0.87	2.58	5.75	13.08
31.41	0.19	0.50	1.52	3.42	7.94
20.78	0.12	0.32	0.98	2.23	5.25
14.92	0.09	0.22	0.70	1.60	3.80
11.10	0.06	0.17	0.53	1.21	2.84
8.89	0.05	0.13	0.41	0.94	2.17
7.16	0.04	0.10	0.32	0.73	1.70
6.00	0.03	0.08	0.27	0.61	1.41
4.94	0.03	0.07	0.22	0.50	1.16
3.44	0.02	0.05	0.15	0.34	0.80
2.61	0.01	0.03	0.11	0.25	0.59
2.00	0.01	0.03	0.08	0.19	0.45
1.61	0.01	0.02	0.07	0.15	0.36
1.31	0.01	0.02	0.05	0.12	0.29
1.11	0.01	0.01	0.04	0.10	0.24
0.81	0.00	0.01	0.03	0.08	0.18
0.49	0.00	0.01	0.02	0.05	0.11
39	40	41	42	43	44
2.77	7.60	15.64	32.73	4.75	9.75
1.84	5.14	10.76	22.96	3.21	6.70
1.02	2.92	6.23	13.61	1.82	3.89
0.43	1.28	2.81	6.36	0.80	1.76
0.25	0.75	1.68	3.85	0.47	1.05
0.16	0.49	1.10	2.55	0.30	0.69
0.11	0.35	0.79	1.85	0.22	0.49
0.08	0.26	0.60	1.42	0.16	0.37
0.06	0.21	0.47	1.12	0.13	0.29
0.05	0.16	0.37	0.89	0.10	0.23
0.04	0.14	0.31	0.76	0.09	0.20
0.03	0.11	0.26	0.63	0.07	0.16
0.02	0.08	0.18	0.45	0.05	0.11
0.02	0.06	0.13	0.33	0.04	0.08
0.01	0.05	0.11	0.26	0.03	0.07
0.01	0.04	0.09	0.20	0.02	0.05
0.01	0.03	0.07	0.16	0.02	0.04
0.01	0.02	0.06	0.14	0.02	0.04
0.01	0.02	0.04	0.10	0.01	0.03
0.00	0.01	0.03	0.06	0.01	0.02

18	19	20	21	22	23
194.45	1.92	4.62	12.66	26.33	55.49
142.66	1.26	3.07	8.56	18.14	38.96
90.05	0.68	1.70	4.86	10.53	23.15
45.28	0.28	0.72	2.14	4.74	10.79
27.66	0.16	0.42	1.26	2.83	6.53
17.81	0.10	0.26	0.81	1.84	4.32
12.68	0.07	0.19	0.58	1.32	3.13
9.47	0.05	0.14	0.44	1.01	2.40
7.31	0.04	0.11	0.34	0.79	1.87
6.00	0.03	0.08	0.27	0.62	1.45
4.86	0.03	0.07	0.23	0.52	1.21
4.16	0.02	0.06	0.19	0.43	0.98
2.88	0.02	0.04	0.13	0.29	0.67
2.14	0.01	0.03	0.09	0.21	0.50
1.68	0.01	0.02	0.07	0.16	0.39
1.30	0.01	0.02	0.06	0.13	0.30
1.10	0.01	0.01	0.05	0.11	0.25
0.91	0.00	0.01	0.04	0.09	0.20
0.68	0.00	0.01	0.03	0.06	0.15
0.42	0.00	0.01	0.02	0.04	0.09
45	46	47	48	49	50
3.82	7.80	5.20	3.90	5.75	13.86
2.58	5.38	3.58	2.68	3.77	9.21
1.46	3.11	2.07	1.56	2.05	5.10
0.64	1.40	0.94	0.70	0.85	2.16
0.38	0.84	0.56	0.42	0.49	1.23
0.24	0.55	0.36	0.27	0.30	0.76
0.17	0.39	0.26	0.20	0.20	0.53
0.13	0.30	0.20	0.15	0.15	0.39
0.10	0.23	0.16	0.12	0.11	0.29
0.08	0.19	0.12	0.09	0.09	0.24
0.07	0.16	0.10	0.08	0.07	0.19
0.06	0.13	0.09	0.07	0.06	0.16
0.04	0.09	0.06	0.05	0.04	0.11
0.03	0.07	0.04	0.03	0.03	0.08
0.02	0.05	0.04	0.03	0.02	0.06
0.02	0.04	0.03	0.02	0.02	0.05
0.01	0.03	0.02	0.02	0.01	0.04
0.01	0.03	0.02	0.01	0.01	0.03
0.01	0.02	0.01	0.01	0.01	0.02
0.01	0.01	0.01	0.01	0.00	0.01

24	25	26	27
167.97	3.96	10.86	22.47
123.25	2.63	7.34	15.50
77.17	1.46	4.17	8.96
38.30	0.62	1.83	4.05
24.08	0.36	1.08	2.41
16.37	0.23	0.70	1.58
11.49	0.16	0.50	1.13
8.57	0.12	0.38	0.86
6.55	0.09	0.29	0.67
5.28	0.07	0.23	0.53
4.33	0.06	0.19	0.45
3.67	0.05	0.16	0.37
2.54	0.03	0.11	0.25
1.86	0.03	0.08	0.18
1.42	0.02	0.06	0.14
1.16	0.02	0.05	0.11
0.94	0.01	0.04	0.09
0.80	0.01	0.03	0.08
0.58	0.01	0.02	0.06
0.36	0.00	0.01	0.03
51	52	53	54
39.86	80.52	141.28	236.20
27.13	55.86	101.88	171.82
15.49	32.81	60.70	110.32
6.82	14.39	27.53	60.81
3.80	8.19	16.10	40.61
2.40	5.27	10.73	29.13
1.68	3.69	7.57	21.75
1.23	2.70	5.88	17.33
0.92	2.11	4.57	13.96
0.76	1.69	3.70	11.52
0.60	1.38	3.04	9.56
0.52	1.15	2.59	8.22
0.35	0.78	1.78	5.69
0.25	0.57	1.29	4.07
0.19	0.44	0.99	3.24
0.15	0.34	0.79	2.51
0.12	0.28	0.64	2.08
0.10	0.23	0.53	1.66
0.07	0.17	0.37	1.22
0.05	0.10	0.22	0.69

From Slab output file:	RUN17.OUT
Scenario:	TYPICAL
Accident Location:	ON-SITE
Duration:	UNMITIG
Meteorology:	INVERSN
Chemical:	FORMALDEHYDE
Vapor phase mole fraction:	0.482
LOC:	9.600
IDLH:	19.600

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	273.13
50.00	220.21
100.00	158.21
200.00	101.73
300.00	74.44
400.00	57.70
500.00	46.12
600.00	37.38
700.00	31.36
800.00	26.38
900.00	22.52
1000.00	19.47
1250.00	14.04
1500.00	10.41
1750.00	8.07
2000.00	6.43
2250.00	5.08
2500.00	4.29
3000.00	3.03
4000.00	1.72
5000.00	1.09

Concentration (ppm)		Distance to (m)
LOC	9.6000	1586.16
IDLH	19.6000	995.67

From Slab output file:	RUN18.OUT
Scenario:	TYPICAL
Accident Location:	ON-SITE
Duration:	MITIGAT
Meteorology:	INVERSN
Chemical:	FORMALDEHYDE
Vapor phase mole fraction:	0.512
LOC:	9.600
IDLH:	19.600

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	275.80
50.00	221.92
100.00	160.37
200.00	102.75
300.00	75.45
400.00	58.47
500.00	46.49
600.00	37.68
700.00	31.62
800.00	26.55
900.00	22.61
1000.00	19.52
1250.00	14.05
1500.00	10.40
1750.00	8.06
2000.00	6.42
2250.00	5.08
2500.00	4.29
3000.00	3.03
4000.00	1.72
5000.00	1.09

Concentration (ppm)		Distance to (m)
LOC	9.6000	1585.91
IDLH	19.6000	997.50

From Slab output file:	RUN19.OUT
Scenario:	TYPICAL
Accident Location:	ON-SITE
Duration:	UNMITIG
Meteorology:	TYPICAL
Chemical:	ACETONE
Vapor phase mole fraction:	0.276
LOC:	1960.000
IDLH:	2442.000

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	5.24
50.00	3.58
100.00	2.06
200.00	0.92
300.00	0.55
400.00	0.35
500.00	0.25
600.00	0.19
700.00	0.15
800.00	0.12
900.00	0.10
1000.00	0.08
1250.00	0.06
1500.00	0.04
1750.00	0.03
2000.00	0.03
2250.00	0.02
2500.00	0.02
3000.00	0.01
4000.00	0.01

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:	RUN20.OUT
Scenario:	TYPICAL
Accident Location:	ON-SITE
Duration:	MITIGAT
Meteorology:	TYPICAL
Chemical:	ACETONE
Vapor phase mole fraction:	0.538
LOC:	1960.000
IDLH:	2442.000

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	5.82
50.00	4.02
100.00	2.33
200.00	1.05
300.00	0.63
400.00	0.41
500.00	0.29
600.00	0.22
700.00	0.17
800.00	0.14
900.00	0.12
1000.00	0.10
1250.00	0.06
1500.00	0.05
1750.00	0.04
2000.00	0.03
2250.00	0.02
2500.00	0.02
3000.00	0.01
4000.00	0.01
5000.00	0.01

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file: RUN21.OUT
Scenario: TYPICAL
Accident Location: ON-SITE
Duration: UNMITIG
Meteorology: WORST
Chemical: ACETONE
Vapor phase mole fraction: 0.276
LOC: 1960.000
IDLH: 2442.000
*Output adjusted to be distance from fenceline.

X,m	1	2	3	4	5
25.00	0.80	1.91	5.65	11.83	22.00
50.00	0.52	1.26	3.79	8.13	15.62
100.00	0.28	0.70	2.15	4.68	9.46
200.00	0.12	0.29	0.93	2.10	4.50
300.00	0.07	0.17	0.54	1.25	2.77
400.00	0.04	0.11	0.35	0.81	1.85
500.00	0.03	0.07	0.25	0.58	1.34
600.00	0.02	0.06	0.19	0.44	1.03
700.00	0.02	0.04	0.14	0.34	0.81
800.00	0.01	0.03	0.11	0.27	0.64
900.00	0.01	0.03	0.10	0.23	0.55
1000.00	0.01	0.02	0.08	0.19	0.45
1250.00	0.01	0.02	0.05	0.13	0.32
1500.00	0.00	0.01	0.04	0.10	0.24
1750.00	0.00	0.01	0.03	0.07	0.19
2000.00	0.00	0.01	0.03	0.06	0.15
2250.00	0.00	0.01	0.02	0.05	0.12
2500.00	0.00	0.01	0.02	0.04	0.11
3000.00	0.00	0.00	0.01	0.03	0.08
4000.00	0.00	0.00	0.01	0.02	0.05

X,m	28	29	30	31	32
25.00	10.18	30.99	0.72	1.96	4.12
50.00	7.10	22.49	0.47	1.32	2.82
100.00	4.19	14.00	0.26	0.75	1.62
200.00	1.93	6.89	0.11	0.32	0.72
300.00	1.16	4.30	0.06	0.19	0.43
400.00	0.77	2.93	0.04	0.12	0.28
500.00	0.55	2.15	0.03	0.09	0.20
600.00	0.42	1.66	0.02	0.07	0.15
700.00	0.33	1.33	0.02	0.05	0.12
800.00	0.26	1.07	0.01	0.04	0.09
900.00	0.22	0.91	0.01	0.03	0.08
1000.00	0.19	0.76	0.01	0.03	0.07
1250.00	0.13	0.55	0.01	0.02	0.05
1500.00	0.10	0.41	0.00	0.01	0.03
1750.00	0.08	0.33	0.00	0.01	0.03
2000.00	0.06	0.27	0.00	0.01	0.02
2250.00	0.05	0.22	0.00	0.01	0.02
2500.00	0.04	0.19	0.00	0.01	0.02
3000.00	0.03	0.14	0.00	0.00	0.01
4000.00	0.02	0.09	0.00	0.00	0.01

6	7	8	9	10	11
41.49	0.60	1.44	4.10	8.80	18.06
31.82	0.39	0.95	2.76	6.03	12.66
21.35	0.21	0.52	1.56	3.47	7.52
11.87	0.09	0.22	0.68	1.54	3.49
7.94	0.05	0.13	0.40	0.91	2.12
5.67	0.03	0.08	0.26	0.59	1.40
4.32	0.02	0.06	0.18	0.42	1.01
3.45	0.02	0.04	0.14	0.32	0.77
2.82	0.01	0.03	0.11	0.25	0.61
2.31	0.01	0.03	0.08	0.20	0.48
1.99	0.01	0.02	0.07	0.17	0.41
1.70	0.01	0.02	0.06	0.14	0.34
1.24	0.00	0.01	0.04	0.10	0.24
0.94	0.00	0.01	0.03	0.07	0.18
0.76	0.00	0.01	0.02	0.06	0.14
0.63	0.00	0.01	0.02	0.04	0.11
0.52	0.00	0.00	0.01	0.04	0.09
0.45	0.00	0.00	0.01	0.03	0.08
0.34	0.00	0.00	0.01	0.02	0.06
0.22	0.00	0.00	0.01	0.01	0.04
33	34	35	36	37	38
8.82	27.69	0.64	1.74	3.66	7.77
6.14	20.04	0.42	1.17	2.49	5.40
3.62	12.39	0.23	0.66	1.43	3.18
1.66	6.07	0.10	0.29	0.64	1.46
1.00	3.78	0.06	0.17	0.38	0.88
0.66	2.56	0.04	0.11	0.25	0.58
0.48	1.87	0.02	0.08	0.18	0.42
0.36	1.45	0.02	0.06	0.13	0.32
0.29	1.15	0.01	0.05	0.11	0.25
0.23	0.93	0.01	0.04	0.08	0.20
0.19	0.79	0.01	0.03	0.07	0.17
0.16	0.66	0.01	0.03	0.06	0.14
0.11	0.48	0.01	0.02	0.04	0.10
0.08	0.35	0.00	0.01	0.03	0.07
0.07	0.28	0.00	0.01	0.02	0.06
0.05	0.23	0.00	0.01	0.02	0.05
0.04	0.19	0.00	0.01	0.02	0.04
0.04	0.16	0.00	0.01	0.01	0.03
0.03	0.12	0.00	0.00	0.01	0.03
0.02	0.08	0.00	0.00	0.01	0.02

12	13	14	15	16	17
40.19	0.48	1.15	3.20	6.88	14.63
29.93	0.31	0.76	2.16	4.69	10.22
19.56	0.17	0.42	1.22	2.71	6.04
10.35	0.07	0.18	0.53	1.20	2.77
6.73	0.04	0.10	0.31	0.71	1.68
4.70	0.02	0.06	0.20	0.46	1.11
3.52	0.02	0.04	0.14	0.33	0.80
2.77	0.01	0.03	0.11	0.25	0.61
2.24	0.01	0.03	0.08	0.20	0.48
1.82	0.01	0.02	0.07	0.15	0.38
1.56	0.01	0.02	0.06	0.13	0.32
1.32	0.01	0.01	0.05	0.11	0.27
0.96	0.00	0.01	0.03	0.08	0.19
0.72	0.00	0.01	0.02	0.06	0.14
0.58	0.00	0.01	0.02	0.04	0.11
0.47	0.00	0.00	0.01	0.04	0.09
0.39	0.00	0.00	0.01	0.03	0.07
0.34	0.00	0.00	0.01	0.02	0.06
0.25	0.00	0.00	0.01	0.02	0.05
0.16	0.00	0.00	0.00	0.01	0.03
39	40	41	42	43	44
0.58	1.57	3.28	6.94	0.99	2.03
0.38	1.05	2.24	4.83	0.66	1.39
0.21	0.59	1.29	2.84	0.37	0.80
0.09	0.26	0.57	1.31	0.16	0.36
0.05	0.15	0.34	0.79	0.10	0.21
0.03	0.10	0.22	0.52	0.06	0.14
0.02	0.07	0.16	0.38	0.04	0.10
0.02	0.05	0.12	0.29	0.03	0.08
0.01	0.04	0.09	0.23	0.03	0.06
0.01	0.03	0.07	0.18	0.02	0.05
0.01	0.03	0.06	0.15	0.02	0.04
0.01	0.02	0.05	0.13	0.01	0.03
0.00	0.02	0.04	0.09	0.01	0.02
0.00	0.01	0.03	0.07	0.01	0.02
0.00	0.01	0.02	0.05	0.01	0.01
0.00	0.01	0.02	0.04	0.00	0.01
0.00	0.01	0.01	0.03	0.00	0.01
0.00	0.01	0.01	0.03	0.00	0.01
0.00	0.00	0.01	0.02	0.00	0.01
0.00	0.00	0.01	0.01	0.00	0.00

18	19	20	21	22	23
37.77	0.40	0.96	2.64	5.63	12.07
27.83	0.26	0.63	1.78	3.84	8.41
17.67	0.14	0.35	1.00	2.21	4.97
9.03	0.06	0.15	0.44	0.99	2.28
5.76	0.03	0.08	0.26	0.59	1.38
3.98	0.02	0.05	0.17	0.38	0.91
2.94	0.01	0.04	0.12	0.27	0.65
2.29	0.01	0.03	0.09	0.21	0.50
1.84	0.01	0.02	0.07	0.16	0.39
1.49	0.01	0.02	0.05	0.13	0.31
1.27	0.01	0.01	0.05	0.11	0.26
1.07	0.00	0.01	0.04	0.09	0.22
0.77	0.00	0.01	0.03	0.06	0.15
0.58	0.00	0.01	0.02	0.05	0.11
0.46	0.00	0.00	0.02	0.04	0.09
0.38	0.00	0.00	0.01	0.03	0.07
0.31	0.00	0.00	0.01	0.02	0.06
0.27	0.00	0.00	0.01	0.02	0.05
0.20	0.00	0.00	0.01	0.01	0.04
0.13	0.00	0.00	0.00	0.01	0.02
45	46	47	48	49	50
0.79	1.62	1.08	0.81	1.19	2.89
0.53	1.11	0.74	0.55	0.77	1.91
0.30	0.64	0.42	0.32	0.42	1.05
0.13	0.29	0.19	0.14	0.17	0.44
0.08	0.17	0.11	0.08	0.10	0.26
0.05	0.11	0.07	0.06	0.06	0.16
0.04	0.08	0.05	0.04	0.04	0.11
0.03	0.06	0.04	0.03	0.03	0.09
0.02	0.05	0.03	0.02	0.02	0.07
0.02	0.04	0.02	0.02	0.02	0.05
0.01	0.03	0.02	0.02	0.02	0.04
0.01	0.03	0.02	0.01	0.01	0.04
0.01	0.02	0.01	0.01	0.01	0.02
0.01	0.01	0.01	0.01	0.01	0.02
0.00	0.01	0.01	0.01	0.01	0.01
0.00	0.01	0.01	0.00	0.00	0.01
0.00	0.01	0.00	0.00	0.00	0.01
0.00	0.01	0.00	0.00	0.00	0.01
0.00	0.00	0.00	0.00	0.00	0.01
0.00	0.00	0.00	0.00	0.00	0.00

24	25	26	27
34.52	0.82	2.25	4.75
25.17	0.54	1.51	3.24
15.76	0.30	0.85	1.87
7.88	0.13	0.37	0.83
4.96	0.07	0.22	0.50
3.40	0.05	0.14	0.32
2.49	0.03	0.10	0.23
1.94	0.02	0.08	0.18
1.55	0.02	0.06	0.14
1.25	0.01	0.05	0.11
1.06	0.01	0.04	0.09
0.89	0.01	0.03	0.08
0.64	0.01	0.02	0.05
0.48	0.01	0.02	0.04
0.38	0.00	0.01	0.03
0.31	0.00	0.01	0.02
0.26	0.00	0.01	0.02
0.22	0.00	0.01	0.02
0.17	0.00	0.01	0.01
0.11	0.00	0.00	0.01
51	52	53	54
8.41	15.89	25.56	18.28
5.69	11.10	18.72	15.42
3.25	6.58	11.85	11.94
1.42	3.05	5.99	8.22
0.84	1.84	3.79	6.21
0.54	1.21	2.60	4.95
0.38	0.87	1.91	4.06
0.29	0.66	1.49	3.40
0.22	0.52	1.18	2.91
0.18	0.41	0.95	2.53
0.15	0.35	0.81	2.20
0.12	0.29	0.68	1.96
0.08	0.20	0.48	1.51
0.06	0.15	0.36	1.20
0.05	0.12	0.29	0.98
0.04	0.09	0.23	0.81
0.03	0.08	0.19	0.69
0.03	0.06	0.16	0.58
0.02	0.05	0.12	0.43
0.01	0.03	0.08	0.27

X,m	Max concentration, ppm
25.00	41.49
50.00	31.82
100.00	21.35
200.00	11.87
300.00	7.94
400.00	5.67
500.00	4.32
600.00	3.45
700.00	2.91
800.00	2.53
900.00	2.20
1000.00	1.96
1250.00	1.51
1500.00	1.20
1750.00	0.98
2000.00	0.81
2250.00	0.69
2500.00	0.58
3000.00	0.43
4000.00	0.27

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:	RUN22.OUT
Scenario:	TYPICAL
Accident Location:	ON-SITE
Duration:	MITIGAT
Meteorology:	WORST
Chemical:	ACETONE
Vapor phase mole fraction:	0.538
LOC:	1960.000
IDLH:	2442.000

*Output adjusted to be distance from fenceline.

X,m	1	2	3	4	5
25.00	0.89	2.13	6.14	12.09	20.51
50.00	0.58	1.41	4.17	8.42	14.84
100.00	0.32	0.79	2.38	4.97	9.25
200.00	0.13	0.33	1.05	2.28	4.59
300.00	0.07	0.19	0.62	1.37	2.68
400.00	0.05	0.12	0.40	0.87	1.76
500.00	0.03	0.09	0.28	0.61	1.26
600.00	0.02	0.06	0.20	0.45	0.95
700.00	0.02	0.05	0.16	0.34	0.74
800.00	0.01	0.04	0.12	0.28	0.60
900.00	0.01	0.03	0.10	0.23	0.49
1000.00	0.01	0.03	0.08	0.19	0.42
1250.00	0.01	0.02	0.06	0.13	0.29
1500.00	0.00	0.01	0.04	0.09	0.21
1750.00	0.00	0.01	0.03	0.07	0.17
2000.00	0.00	0.01	0.02	0.06	0.13
2250.00	0.00	0.01	0.02	0.05	0.11
2500.00	0.00	0.01	0.02	0.04	0.09
3000.00	0.00	0.00	0.01	0.03	0.07
4000.00	0.00	0.00	0.01	0.02	0.04

X,m	28	29	30	31	32
25.00	11.13	30.42	0.80	2.20	4.60
50.00	7.85	22.42	0.53	1.49	3.17
100.00	4.68	14.23	0.29	0.85	1.84
200.00	2.18	7.23	0.13	0.37	0.83
300.00	1.32	4.61	0.07	0.22	0.49
400.00	0.88	3.18	0.05	0.14	0.32
500.00	0.63	2.35	0.03	0.10	0.23
600.00	0.48	1.78	0.02	0.08	0.18
700.00	0.38	1.37	0.02	0.06	0.14
800.00	0.30	1.08	0.01	0.05	0.11
900.00	0.25	0.90	0.01	0.04	0.09
1000.00	0.21	0.75	0.01	0.03	0.08
1250.00	0.14	0.52	0.01	0.02	0.05
1500.00	0.10	0.39	0.01	0.02	0.04
1750.00	0.08	0.29	0.00	0.01	0.03
2000.00	0.06	0.24	0.00	0.01	0.02
2250.00	0.05	0.19	0.00	0.01	0.02
2500.00	0.04	0.16	0.00	0.01	0.02
3000.00	0.03	0.12	0.00	0.01	0.01
4000.00	0.02	0.08	0.00	0.00	0.01

6	7	8	9	10	11
35.34	0.66	1.60	4.56	9.52	18.03
27.32	0.43	1.06	3.10	6.59	12.87
18.00	0.24	0.59	1.76	3.84	7.81
9.44	0.10	0.25	0.78	1.73	3.74
6.11	0.06	0.14	0.45	1.03	2.30
4.40	0.04	0.09	0.29	0.68	1.48
3.38	0.02	0.06	0.21	0.48	1.04
2.71	0.02	0.05	0.16	0.36	0.78
2.16	0.01	0.04	0.12	0.27	0.59
1.84	0.01	0.03	0.09	0.21	0.48
1.52	0.01	0.02	0.08	0.18	0.39
1.34	0.01	0.02	0.06	0.15	0.33
0.95	0.00	0.01	0.04	0.10	0.23
0.72	0.00	0.01	0.03	0.07	0.17
0.57	0.00	0.01	0.02	0.06	0.13
0.44	0.00	0.01	0.02	0.04	0.10
0.37	0.00	0.00	0.02	0.04	0.08
0.31	0.00	0.00	0.01	0.03	0.07
0.23	0.00	0.00	0.01	0.02	0.05
0.14	0.00	0.00	0.01	0.01	0.03
33	34	35	36	37	38
9.71	28.02	0.71	1.95	4.07	8.56
6.81	20.56	0.47	1.32	2.80	6.03
4.06	13.00	0.26	0.75	1.62	3.58
1.89	6.53	0.11	0.33	0.73	1.67
1.15	4.12	0.06	0.19	0.44	1.01
0.76	2.83	0.04	0.13	0.29	0.67
0.55	2.09	0.03	0.09	0.20	0.48
0.42	1.62	0.02	0.07	0.16	0.37
0.33	1.28	0.02	0.05	0.12	0.29
0.26	0.99	0.01	0.04	0.10	0.23
0.22	0.83	0.01	0.04	0.08	0.20
0.19	0.68	0.01	0.03	0.07	0.16
0.12	0.47	0.01	0.02	0.05	0.12
0.09	0.35	0.00	0.01	0.03	0.08
0.07	0.27	0.00	0.01	0.03	0.06
0.06	0.21	0.00	0.01	0.02	0.05
0.05	0.17	0.00	0.01	0.02	0.04
0.04	0.15	0.00	0.01	0.01	0.03
0.03	0.11	0.00	0.00	0.01	0.03
0.02	0.07	0.00	0.00	0.01	0.02

12	13	14	15	16	17
34.61	0.53	1.28	3.59	7.59	15.37
26.37	0.35	0.85	2.44	5.24	10.89
17.70	0.19	0.47	1.38	3.04	6.54
9.15	0.08	0.20	0.61	1.37	3.08
5.77	0.04	0.12	0.36	0.82	1.88
4.01	0.03	0.07	0.23	0.53	1.25
2.96	0.02	0.05	0.16	0.38	0.90
2.28	0.01	0.04	0.12	0.29	0.67
1.87	0.01	0.03	0.10	0.22	0.51
1.50	0.01	0.02	0.08	0.17	0.40
1.30	0.01	0.02	0.06	0.14	0.33
1.10	0.01	0.02	0.05	0.12	0.27
0.79	0.00	0.01	0.03	0.08	0.19
0.59	0.00	0.01	0.03	0.06	0.14
0.45	0.00	0.01	0.02	0.05	0.11
0.37	0.00	0.00	0.02	0.04	0.08
0.30	0.00	0.00	0.01	0.03	0.07
0.26	0.00	0.00	0.01	0.02	0.06
0.18	0.00	0.00	0.01	0.02	0.04
0.11	0.00	0.00	0.00	0.01	0.03
39	40	41	42	43	44
0.64	1.75	3.65	7.66	1.10	2.26
0.43	1.19	2.51	5.39	0.74	1.55
0.24	0.67	1.46	3.20	0.42	0.90
0.10	0.30	0.66	1.49	0.19	0.41
0.06	0.17	0.39	0.90	0.11	0.24
0.04	0.11	0.26	0.60	0.07	0.16
0.03	0.08	0.18	0.43	0.05	0.11
0.02	0.06	0.14	0.33	0.04	0.09
0.01	0.05	0.11	0.26	0.03	0.07
0.01	0.04	0.09	0.21	0.02	0.05
0.01	0.03	0.07	0.18	0.02	0.05
0.01	0.03	0.06	0.15	0.02	0.04
0.01	0.02	0.04	0.10	0.01	0.03
0.00	0.01	0.03	0.08	0.01	0.02
0.00	0.01	0.02	0.06	0.01	0.02
0.00	0.01	0.02	0.05	0.01	0.01
0.00	0.01	0.02	0.04	0.00	0.01
0.00	0.01	0.01	0.03	0.00	0.01
0.00	0.00	0.01	0.02	0.00	0.01
0.00	0.00	0.01	0.01	0.00	0.00

18	19	20	21	22	23
34.10	0.44	1.07	2.96	6.23	12.99
25.58	0.29	0.71	2.00	4.30	9.18
16.73	0.16	0.39	1.14	2.50	5.49
8.89	0.07	0.17	0.50	1.13	2.57
5.64	0.04	0.10	0.30	0.67	1.56
3.72	0.02	0.06	0.19	0.44	1.03
2.71	0.02	0.04	0.14	0.31	0.75
2.06	0.01	0.03	0.10	0.24	0.57
1.61	0.01	0.02	0.08	0.19	0.45
1.34	0.01	0.02	0.06	0.15	0.34
1.11	0.01	0.02	0.05	0.12	0.29
0.95	0.01	0.01	0.04	0.10	0.23
0.66	0.00	0.01	0.03	0.07	0.16
0.49	0.00	0.01	0.02	0.05	0.12
0.39	0.00	0.01	0.02	0.04	0.09
0.30	0.00	0.00	0.01	0.03	0.07
0.26	0.00	0.00	0.01	0.02	0.06
0.21	0.00	0.00	0.01	0.02	0.05
0.16	0.00	0.00	0.01	0.01	0.04
0.10	0.00	0.00	0.00	0.01	0.02
45	46	47	48	49	50
0.89	1.80	1.20	0.90	1.33	3.20
0.60	1.24	0.83	0.62	0.87	2.13
0.34	0.72	0.48	0.36	0.47	1.18
0.15	0.32	0.22	0.16	0.20	0.50
0.09	0.19	0.13	0.10	0.11	0.29
0.06	0.13	0.08	0.06	0.07	0.18
0.04	0.09	0.06	0.05	0.05	0.12
0.03	0.07	0.05	0.03	0.03	0.09
0.02	0.05	0.04	0.03	0.03	0.07
0.02	0.04	0.03	0.02	0.02	0.06
0.02	0.04	0.02	0.02	0.02	0.04
0.01	0.03	0.02	0.02	0.01	0.04
0.01	0.02	0.01	0.01	0.01	0.03
0.01	0.02	0.01	0.01	0.01	0.02
0.01	0.01	0.01	0.01	0.01	0.01
0.00	0.01	0.01	0.00	0.00	0.01
0.00	0.01	0.01	0.00	0.00	0.01
0.00	0.01	0.00	0.00	0.00	0.01
0.00	0.01	0.00	0.00	0.00	0.01
0.00	0.00	0.00	0.00	0.00	0.00

24	25	26	27
32.51	0.92	2.52	5.30
24.11	0.61	1.71	3.65
15.51	0.34	0.97	2.12
8.03	0.14	0.43	0.95
5.18	0.08	0.25	0.57
3.43	0.05	0.16	0.37
2.44	0.04	0.12	0.27
1.85	0.03	0.09	0.20
1.42	0.02	0.07	0.16
1.18	0.02	0.05	0.13
0.95	0.01	0.05	0.11
0.83	0.01	0.04	0.09
0.58	0.01	0.03	0.06
0.42	0.01	0.02	0.04
0.33	0.00	0.01	0.03
0.26	0.00	0.01	0.03
0.22	0.00	0.01	0.02
0.18	0.00	0.01	0.02
0.14	0.00	0.01	0.01
0.08	0.00	0.00	0.01
51	52	53	54
8.42	14.76	22.67	13.65
5.82	10.55	16.90	10.91
3.39	6.45	10.69	7.99
1.53	2.98	5.18	5.36
0.87	1.75	3.16	4.08
0.55	1.16	2.19	3.28
0.39	0.82	1.60	2.71
0.29	0.61	1.26	2.30
0.22	0.48	0.99	1.99
0.18	0.39	0.82	1.71
0.14	0.32	0.68	1.52
0.12	0.27	0.58	1.33
0.08	0.18	0.41	1.00
0.06	0.13	0.30	0.77
0.05	0.10	0.23	0.61
0.04	0.08	0.18	0.50
0.03	0.07	0.15	0.41
0.02	0.05	0.12	0.35
0.02	0.04	0.09	0.25
0.01	0.02	0.05	0.15

X,m	Max concentration, ppm
25.00	35.34
50.00	27.32
100.00	18.00
200.00	9.44
300.00	6.11
400.00	4.40
500.00	3.38
600.00	2.71
700.00	2.16
800.00	1.84
900.00	1.52
1000.00	1.34
1250.00	1.00
1500.00	0.77
1750.00	0.61
2000.00	0.50
2250.00	0.41
2500.00	0.35
3000.00	0.25
4000.00	0.15

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:	RUN23.OUT
Scenario:	TYPICAL
Accident Location:	ON-SITE
Duration:	UNMITIG
Meteorology:	INVERSN
Chemical:	ACETONE
Vapor phase mole fraction:	0.276
LOC:	1960.000
IDLH:	2442.000

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	75.76
50.00	59.28
100.00	41.52
200.00	25.61
300.00	18.16
400.00	14.02
500.00	11.33
600.00	9.49
700.00	8.04
800.00	6.91
900.00	6.04
1000.00	5.30
1250.00	4.00
1500.00	3.15
1750.00	2.53
2000.00	2.06
2250.00	1.74
2500.00	1.45
3000.00	1.09
4000.00	0.67
5000.00	0.45

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:	RUNA3.OUT
Scenario:	TYPICAL
Accident Location:	ON-SITE
Duration:	UNMITIG
Meteorology:	INVERSN
Chemical:	ACETONE
Vapor phase mole fraction:	0.276
LOC:	1960.000
IDLH:	2442.000

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	4.90
50.00	4.13
100.00	3.23
200.00	2.30
300.00	1.82
400.00	1.51
500.00	1.29
600.00	1.11
700.00	0.97
800.00	0.86
900.00	0.76
1000.00	0.67
1250.00	0.51
1500.00	0.40
1750.00	0.32
2000.00	0.26
2250.00	0.22
2500.00	0.18
3000.00	0.13
4000.00	0.08
5000.00	0.05
10000.00	0.01
15000.00	0.01
20000.00	0.00

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:	RUN24.OUT
Scenario:	TYPICAL
Accident Location:	ON-SITE
Duration:	MITIGAT
Meteorology:	INVERSN
Chemical:	ACETONE
Vapor phase mole fraction:	0.538
LOC:	1960.000
IDLH:	2442.000

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	44.91
50.00	35.94
100.00	25.49
200.00	16.38
300.00	12.12
400.00	9.45
500.00	7.67
600.00	6.36
700.00	5.35
800.00	4.62
900.00	3.95
1000.00	3.51
1250.00	2.60
1500.00	1.98
1750.00	1.54
2000.00	1.27
2250.00	1.03
2500.00	0.87
3000.00	0.63
4000.00	0.36
5000.00	0.24

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:	RUN49.OUT
Scenario:	CONSERV
Accident Location:	ON-SITE
Duration:	UNMITIG
Meteorology:	TYPICAL
Chemical:	HCL
Vapor phase mole fraction:	1.000
LOC:	9.900
IDLH:	49.100

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	59.01
50.00	167.55
100.00	263.91
200.00	222.38
300.00	153.10
400.00	106.62
500.00	77.62
600.00	59.15
700.00	46.24
800.00	36.82
900.00	30.95
1000.00	25.51
1250.00	17.60
1500.00	12.96
1750.00	10.11
2000.00	8.05
2250.00	6.47
2500.00	5.52
3000.00	4.02
4000.00	2.39
5000.00	1.61
10000.00	0.50
15000.00	0.25
20000.00	0.16

Concentration (ppm)		Distance to (m)
LOC	9.9000	1775.30
IDLH	49.1000	677.85

From Slab output file:	RUN50.OUT
Scenario:	CONSERV
Accident Location:	ON-SITE
Duration:	MITIGAT
Meteorology:	TYPICAL
Chemical:	HCL
Vapor phase mole fraction:	1.000
LOC:	9.900
IDLH:	49.100

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	33.45
50.00	94.94
100.00	149.15
200.00	125.49
300.00	86.42
400.00	60.21
500.00	43.98
600.00	33.52
700.00	26.20
800.00	20.87
900.00	17.57
1000.00	14.52
1250.00	10.01
1500.00	7.12
1750.00	5.47
2000.00	4.29
2250.00	3.45
2500.00	2.89
3000.00	2.07
4000.00	1.27
5000.00	0.87
10000.00	0.27
15000.00	0.14
20000.00	0.09

Concentration (ppm)		Distance to (m)	
LOC	9.9000		1259.72
IDLH	49.1000	less than	25.00

From Slab output file: RUN51.OUT
Scenario: CONSERV
Accident Location: ON-SITE
Duration: UNMITIG
Meteorology: WORST
Chemical: HCL
Vapor phase mole fraction: 1.000
LOC: 9.900
IDLH: 49.100
*Output adjusted to be distance from fenceline.

X,m	1	2	3	4	5
25.00	211.86	424.91	2069.98	3969.77	5654.50
50.00	146.49	351.70	1499.70	2569.52	3413.61
100.00	79.62	213.55	767.54	1266.58	1728.28
200.00	33.78	93.58	296.31	527.85	809.76
300.00	18.35	52.32	166.02	306.72	496.06
400.00	11.54	32.61	105.06	203.43	350.67
500.00	7.96	22.67	73.32	146.94	263.84
600.00	5.90	16.99	54.82	112.11	207.52
700.00	4.59	13.15	42.39	87.93	166.60
800.00	3.61	10.26	33.17	71.07	140.51
900.00	2.97	8.48	28.01	59.99	118.39
1000.00	2.46	6.99	23.00	50.24	100.51
1250.00	1.66	4.77	15.34	33.58	70.02
1500.00	1.20	3.37	10.94	24.83	52.47
1750.00	0.90	2.56	8.46	19.18	40.65
2000.00	0.72	2.03	6.65	14.98	32.02
2250.00	0.57	1.60	5.37	12.32	26.90
2500.00	0.48	1.35	4.48	10.21	22.14
3000.00	0.35	0.97	3.20	7.30	16.55
4000.00	0.20	0.59	1.95	4.49	9.83
5000.00	0.14	0.40	1.32	3.02	6.70
10000.00	0.04	0.12	0.39	0.90	1.97
15000.00	0.02	0.06	0.19	0.43	0.94

X,m	28	29	30	31	32
25.00	0.19	0.00	159.42	123.07	43.50
50.00	9.45	0.03	125.72	158.30	104.96
100.00	185.57	1393.75	74.80	158.58	169.22
200.00	317.92	1893.05	32.73	92.18	151.26
300.00	274.10	1113.48	18.19	54.76	108.22
400.00	209.95	734.35	11.66	36.63	76.83
500.00	160.67	528.11	8.10	25.96	56.85
600.00	124.98	404.80	5.93	19.19	44.09
700.00	98.44	322.17	4.54	15.27	35.11
800.00	81.72	261.48	3.68	12.19	28.12
900.00	67.50	223.73	2.94	9.88	23.53
1000.00	57.55	189.89	2.51	8.40	19.66
1250.00	40.03	137.83	1.71	5.78	13.70
1500.00	29.58	105.85	1.25	4.19	9.98
1750.00	22.99	83.11	0.95	3.18	7.80
2000.00	18.28	67.32	0.76	2.60	6.32
2250.00	15.20	54.83	0.62	2.11	5.10
2500.00	12.77	45.57	0.51	1.78	4.33
3000.00	9.36	33.57	0.38	1.32	3.20
4000.00	5.64	20.13	0.23	0.80	1.92
5000.00	3.80	13.80	0.16	0.54	1.29
10000.00	1.13	4.25	0.05	0.17	0.41
15000.00	0.58	2.08	0.03	0.09	0.21

6	7	8	9	10	11
8087.54	160.13	275.56	487.33	1052.67	2724.16
5029.25	112.70	235.56	595.85	1406.00	3633.70
2774.64	60.75	146.82	479.75	1146.94	2145.70
1422.03	25.63	66.10	233.80	529.50	895.39
950.41	13.88	37.41	132.85	294.82	504.97
708.22	8.73	23.44	84.43	188.48	341.83
561.12	6.02	16.40	58.67	131.47	248.46
459.07	4.45	12.31	43.51	97.69	189.28
379.64	3.46	9.54	33.36	75.02	150.02
320.12	2.72	7.46	26.14	60.21	124.26
271.24	2.21	6.16	21.65	49.71	102.70
238.70	1.84	5.08	17.56	41.22	88.49
176.96	1.26	3.49	12.05	27.89	61.51
137.03	0.91	2.53	8.74	20.91	44.85
110.72	0.69	1.95	6.75	16.05	34.21
92.00	0.55	1.55	5.29	12.45	26.71
75.88	0.44	1.22	4.20	9.98	22.35
65.70	0.37	1.03	3.53	8.31	18.16
49.06	0.26	0.75	2.53	5.96	13.54
31.16	0.16	0.45	1.53	3.62	8.17
21.22	0.11	0.30	1.03	2.44	5.54
5.93	0.03	0.09	0.30	0.73	1.68
2.65	0.02	0.05	0.16	0.37	0.82
33	34	35	36	37	38
0.06	0.00	146.70	115.86	39.11	0.13
5.57	0.00	113.42	147.67	88.73	3.76
87.02	70.67	66.75	141.92	146.41	55.20
208.35	1419.08	28.89	81.20	129.24	150.74
193.31	1063.05	16.24	48.71	92.17	145.75
157.53	719.95	10.33	32.46	66.24	123.45
125.15	516.66	7.21	22.99	49.23	101.02
100.29	393.46	5.30	17.02	37.92	82.46
80.89	310.84	4.00	13.30	30.52	67.67
67.46	250.00	3.26	10.77	24.67	56.53
56.59	211.54	2.63	8.69	20.52	48.12
48.18	178.73	2.22	7.46	17.29	40.91
34.02	128.45	1.51	5.10	11.98	28.87
25.35	97.26	1.11	3.73	8.83	21.75
19.84	76.15	0.84	2.83	6.75	17.28
15.86	62.97	0.67	2.29	5.53	13.94
13.12	52.07	0.55	1.88	4.50	11.44
11.10	42.80	0.45	1.56	3.80	9.73
8.16	31.16	0.34	1.16	2.82	7.23
4.92	18.87	0.21	0.71	1.72	4.44
3.32	12.89	0.14	0.48	1.17	2.99
1.01	3.94	0.05	0.16	0.37	0.93
0.51	1.97	0.02	0.08	0.20	0.48

12	13	14	15	16	17
6279.70	133.14	224.16	214.24	142.89	96.19
6763.27	92.18	188.93	304.18	391.73	910.76
3306.22	48.59	115.88	293.89	531.14	1515.31
1487.99	20.75	51.86	165.02	370.75	891.63
946.98	10.96	29.11	98.65	230.16	505.59
678.83	7.05	18.37	63.97	152.36	332.65
526.62	4.85	12.83	45.13	107.75	235.97
428.58	3.53	9.58	33.74	80.23	175.55
359.38	2.77	7.47	26.02	61.61	138.05
303.33	2.19	5.88	20.30	49.34	112.63
256.51	1.78	4.84	17.08	40.83	91.65
221.09	1.49	4.02	13.98	33.86	78.56
162.21	1.01	2.76	9.49	22.86	54.58
123.43	0.73	1.99	6.88	16.81	40.54
98.71	0.55	1.52	5.38	13.10	31.11
81.63	0.44	1.23	4.29	10.33	23.96
67.18	0.36	0.99	3.43	8.26	19.80
58.12	0.30	0.83	2.90	6.91	16.18
43.26	0.22	0.60	2.08	4.95	11.52
27.42	0.13	0.36	1.24	2.98	7.13
18.97	0.09	0.24	0.84	2.01	4.83
5.53	0.03	0.08	0.26	0.60	1.46
2.56	0.01	0.04	0.13	0.31	0.73
39	40	41	42	43	44
137.71	112.50	37.08	0.13	100.85	37.27
103.52	141.45	80.70	2.77	113.65	66.35
60.24	130.04	128.86	41.62	88.27	89.20
25.98	72.78	113.97	119.55	46.53	72.80
14.68	43.91	81.29	117.04	27.26	50.29
9.24	29.18	58.88	100.58	18.06	35.92
6.45	20.71	43.80	83.57	12.71	26.41
4.78	15.41	33.43	69.25	9.33	20.58
3.64	11.84	26.90	57.61	7.45	16.45
2.91	9.69	21.95	48.12	5.93	13.14
2.39	7.81	18.04	41.53	4.90	11.16
2.00	6.66	15.37	35.34	4.08	9.24
1.35	4.56	10.68	25.40	2.79	6.46
1.00	3.34	7.92	19.24	2.02	4.82
0.76	2.55	6.05	15.29	1.59	3.79
0.59	2.04	4.94	12.36	1.27	3.01
0.50	1.68	4.04	10.07	1.03	2.50
0.41	1.39	3.40	8.65	0.87	2.09
0.30	1.04	2.53	6.44	0.64	1.53
0.19	0.64	1.55	4.04	0.40	0.97
0.13	0.44	1.06	2.73	0.28	0.68
0.04	0.14	0.34	0.86	0.09	0.22
0.02	0.07	0.18	0.44	0.05	0.12

18	19	20	21	22	23
78.93	113.59	196.26	153.22	67.49	1.94
4889.99	77.77	159.57	219.72	197.00	62.36
4110.25	41.23	96.00	217.66	310.40	533.42
1681.69	17.33	43.53	127.82	252.64	583.34
990.89	9.29	23.84	77.68	170.33	406.39
688.97	5.93	15.33	50.49	117.57	283.54
519.15	4.08	10.64	35.84	85.07	205.62
414.02	2.96	7.83	27.07	64.47	154.78
340.55	2.30	6.17	21.07	50.13	120.70
283.95	1.83	4.89	16.54	40.00	98.65
246.74	1.46	3.98	13.81	33.27	80.33
214.38	1.24	3.33	11.40	27.23	68.29
159.23	0.84	2.28	7.85	18.78	46.99
119.04	0.61	1.66	5.67	13.78	34.80
92.75	0.46	1.25	4.40	10.83	26.95
76.26	0.37	1.02	3.54	8.62	21.28
62.45	0.30	0.83	2.84	6.94	17.38
53.44	0.25	0.70	2.42	5.85	14.31
39.91	0.18	0.51	1.76	4.19	10.27
24.65	0.11	0.30	1.04	2.52	6.25
16.98	0.07	0.21	0.70	1.70	4.23
5.10	0.02	0.07	0.22	0.52	1.27
2.44	0.01	0.03	0.11	0.27	0.65
45	46	47	48	49	50
92.23	36.88	34.01	30.41	349.00	1105.73
96.74	61.38	51.05	43.25	241.29	694.13
73.24	78.32	59.31	47.27	127.00	339.34
37.52	59.89	42.21	32.54	53.44	139.34
22.14	41.13	28.23	21.67	28.32	74.70
14.46	29.14	19.77	15.07	18.06	48.21
10.28	21.57	14.41	11.01	12.42	33.56
7.66	16.45	11.00	8.32	9.00	24.55
5.81	13.10	8.86	6.61	7.04	19.37
4.79	10.76	7.03	5.38	5.56	15.32
3.85	8.78	5.96	4.39	4.42	12.32
3.30	7.52	4.89	3.75	3.69	10.23
2.27	5.22	3.43	2.61	2.45	6.85
1.66	3.83	2.58	1.92	1.74	4.87
1.25	2.99	2.01	1.50	1.31	3.71
1.02	2.43	1.59	1.21	1.05	2.94
0.82	1.96	1.33	0.98	0.82	2.31
0.70	1.68	1.11	0.84	0.69	1.97
0.52	1.24	0.83	0.62	0.50	1.41
0.32	0.78	0.51	0.39	0.29	0.84
0.22	0.54	0.36	0.27	0.20	0.57
0.07	0.18	0.12	0.09	0.06	0.16
0.04	0.10	0.07	0.05	0.03	0.08

24	25	26	27
0.00	175.51	133.60	51.41
77.85	139.67	179.50	133.36
3564.67	84.30	180.96	217.24
1889.01	37.55	106.12	188.45
1051.39	20.53	64.20	132.40
707.83	13.23	42.22	93.00
520.24	9.19	29.92	68.30
406.11	6.73	22.52	52.49
328.39	5.25	17.72	41.35
270.46	4.20	14.04	32.79
233.30	3.38	11.61	27.57
199.89	2.87	9.66	22.72
147.58	1.95	6.62	15.78
113.91	1.42	4.81	11.54
86.81	1.08	3.71	9.08
70.81	0.87	2.99	7.28
57.86	0.71	2.41	5.84
48.81	0.59	2.05	5.00
36.31	0.44	1.51	3.65
21.98	0.26	0.90	2.17
15.05	0.18	0.61	1.47
4.55	0.06	0.19	0.46
2.24	0.03	0.10	0.23
51	52	53	54
1825.46	2856.08	3801.56	5314.38
1153.39	1826.44	2573.77	3891.35
608.51	1051.41	1547.47	2532.95
287.20	519.04	807.94	1477.99
172.10	326.88	539.34	1034.23
117.01	226.75	390.98	774.63
85.60	169.92	293.63	604.16
66.09	132.13	232.27	488.84
52.44	105.63	188.04	401.77
41.72	84.48	155.67	346.16
34.87	72.00	133.46	295.76
29.07	59.86	114.95	261.73
20.00	42.07	83.42	195.76
14.60	32.10	63.77	151.82
11.46	25.07	49.56	121.69
9.03	19.52	40.51	101.26
7.39	16.45	33.21	84.15
6.13	13.37	28.30	72.16
4.39	9.96	20.95	52.93
2.69	5.88	12.85	33.10
1.80	3.97	8.66	22.17
0.52	1.12	2.37	6.00
0.24	0.53	1.06	2.81

X,m	Max concentration, ppm
25.00	8087.54
50.00	6763.27
100.00	4110.25
200.00	1893.05
300.00	1113.48
400.00	774.63
500.00	604.16
600.00	488.84
700.00	401.77
800.00	346.16
900.00	295.76
1000.00	261.73
1250.00	195.76
1500.00	151.82
1750.00	121.69
2000.00	101.26
2250.00	84.15
2500.00	72.16
3000.00	52.93
4000.00	33.10
5000.00	22.17
10000.00	6.00
15000.00	2.81

Concentration (ppm)		Distance to (m)
LOC	9.9000	8793.28
IDLH	49.1000	3193.13

From Slab output file: RUN52.OUT
Scenario: CONSERV
Accident Location: ON-SITE
Duration: MITIGAT
Meteorology: WORST
Chemical: HCL
Vapor phase mole fraction: 1.000
LOC: 9.900
IDLH: 49.100
*Output adjusted to be distance from fenceline.

X,m	1	2	3	4	5
25.00	118.24	235.73	1109.99	2052.56	2872.74
50.00	82.50	195.48	799.39	1324.15	1725.89
100.00	44.84	118.75	409.30	654.07	875.08
200.00	19.15	52.40	159.22	274.88	413.12
300.00	10.44	29.42	90.33	161.19	254.83
400.00	6.56	18.38	57.33	107.96	178.53
500.00	4.54	12.81	40.23	76.75	130.11
600.00	3.37	9.44	29.74	57.35	99.78
700.00	2.60	7.20	22.61	44.14	79.85
800.00	2.00	5.52	17.55	35.81	66.73
900.00	1.62	4.57	14.58	29.49	55.20
1000.00	1.32	3.69	11.87	24.86	48.05
1250.00	0.89	2.48	8.05	17.14	34.36
1500.00	0.62	1.81	5.92	12.72	25.83
1750.00	0.48	1.39	4.52	9.70	20.57
2000.00	0.38	1.07	3.47	7.83	16.71
2250.00	0.31	0.88	2.90	6.38	13.69
2500.00	0.26	0.72	2.34	5.35	11.65
3000.00	0.18	0.51	1.73	3.93	8.55
4000.00	0.11	0.32	1.04	2.38	5.35
5000.00	0.08	0.22	0.70	1.62	3.62
10000.00	0.02	0.07	0.21	0.47	1.06
15000.00	0.01	0.03	0.10	0.23	0.49
20000.00	0.01	0.02	0.06	0.14	0.29

X,m	28	29	30	31	32
25.00	0.11	0.00	88.97	68.82	24.68
50.00	5.35	0.01	70.38	88.87	59.25
100.00	105.22	775.35	42.18	89.36	96.26
200.00	178.75	992.64	18.58	52.20	86.13
300.00	154.22	582.63	10.33	31.07	61.55
400.00	117.95	384.54	6.64	20.85	43.70
500.00	90.39	277.28	4.62	14.78	32.33
600.00	70.30	213.59	3.38	10.90	25.13
700.00	55.42	170.98	2.60	8.69	20.01
800.00	46.06	139.25	2.11	6.95	16.01
900.00	38.08	117.75	1.68	5.64	13.44
1000.00	32.48	97.71	1.44	4.80	11.26
1250.00	22.62	68.00	0.98	3.31	7.83
1500.00	16.54	50.13	0.71	2.40	5.71
1750.00	12.55	39.86	0.54	1.82	4.34
2000.00	9.69	32.37	0.43	1.47	3.47
2250.00	8.01	26.55	0.35	1.17	2.74
2500.00	6.58	22.68	0.29	0.98	2.33
3000.00	4.71	16.75	0.21	0.71	1.68
4000.00	2.92	10.58	0.12	0.42	1.02
5000.00	1.99	7.31	0.08	0.29	0.70
10000.00	0.62	2.25	0.03	0.09	0.22
15000.00	0.32	1.11	0.01	0.05	0.12
20000.00	0.20	0.67	0.01	0.03	0.07

6	7	8	9	10	11
4070.16	89.59	154.00	273.09	586.08	1470.49
2527.86	63.13	131.88	332.75	768.00	1910.00
1397.32	34.26	82.54	266.55	618.73	1111.16
717.40	14.53	37.33	129.90	286.01	465.04
470.09	7.89	21.16	74.16	159.70	264.91
338.22	4.97	13.29	47.19	102.93	180.35
261.44	3.43	9.33	32.89	72.34	130.77
214.77	2.54	7.00	24.42	53.93	96.96
180.42	1.98	5.43	18.63	41.32	75.92
152.35	1.55	4.24	14.36	32.63	61.86
134.48	1.26	3.50	11.80	26.49	50.10
117.13	1.03	2.84	9.44	21.71	43.14
89.81	0.68	1.89	6.34	14.69	30.05
71.87	0.48	1.34	4.65	10.68	22.18
58.13	0.37	1.05	3.55	8.12	17.18
48.35	0.29	0.82	2.73	6.26	13.97
40.73	0.23	0.66	2.25	5.24	11.14
34.91	0.20	0.55	1.84	4.23	9.61
26.33	0.14	0.40	1.32	3.13	7.05
16.49	0.09	0.24	0.81	1.88	4.39
11.30	0.06	0.17	0.55	1.28	3.01
3.13	0.02	0.05	0.17	0.40	0.90
1.39	0.01	0.03	0.09	0.20	0.44
0.79	0.01	0.02	0.05	0.12	0.26
33	34	35	36	37	38
0.03	0.00	81.90	64.86	22.13	0.07
3.16	0.00	63.35	82.84	50.32	2.13
49.50	40.05	37.63	79.96	83.06	31.41
118.18	767.08	16.37	46.06	73.39	85.98
109.65	565.99	9.22	27.68	52.47	82.99
89.17	382.34	5.90	18.45	37.77	70.05
71.02	274.82	4.11	13.12	28.07	57.30
56.86	209.97	3.03	9.72	21.60	46.86
45.85	166.73	2.29	7.61	17.39	38.48
38.29	134.92	1.86	6.17	14.08	32.15
32.16	114.21	1.51	4.97	11.73	27.37
27.39	96.20	1.27	4.26	9.90	23.27
19.29	66.68	0.86	2.92	6.86	16.40
14.44	48.86	0.63	2.14	5.05	12.43
11.14	37.83	0.48	1.62	3.87	9.68
8.68	30.60	0.38	1.29	3.11	7.64
7.07	24.59	0.32	1.04	2.49	6.20
5.88	21.07	0.26	0.86	2.10	5.20
4.24	15.58	0.19	0.63	1.52	3.75
2.60	9.70	0.11	0.37	0.91	2.31
1.78	6.69	0.08	0.25	0.62	1.58
0.56	2.08	0.03	0.08	0.20	0.51
0.29	1.03	0.01	0.04	0.11	0.26
0.18	0.63	0.01	0.03	0.07	0.16

12	13	14	15	16	17
3253.49	74.33	125.00	120.21	80.78	54.04
3429.95	51.77	105.86	170.30	221.13	507.66
1663.11	27.39	65.13	165.10	296.65	821.77
752.57	11.75	29.35	92.74	206.21	477.49
479.74	6.24	16.54	55.69	128.44	271.98
335.18	4.01	10.47	36.09	84.83	179.11
252.45	2.76	7.30	25.48	60.20	127.86
202.13	2.01	5.46	19.07	44.99	95.61
165.96	1.58	4.26	14.74	34.60	75.32
139.34	1.25	3.35	11.56	27.77	60.75
121.29	1.01	2.77	9.72	22.81	48.36
105.93	0.85	2.29	7.95	18.60	41.00
79.27	0.57	1.53	5.27	12.23	27.91
62.57	0.40	1.08	3.76	8.90	20.35
50.34	0.30	0.84	2.90	6.81	15.30
41.76	0.24	0.66	2.27	5.27	12.19
35.28	0.19	0.53	1.82	4.36	9.95
30.28	0.16	0.45	1.52	3.56	8.33
23.02	0.12	0.32	1.09	2.54	6.12
14.43	0.07	0.20	0.67	1.58	3.70
9.95	0.05	0.13	0.46	1.07	2.52
2.91	0.01	0.04	0.14	0.34	0.77
1.34	0.01	0.02	0.07	0.17	0.39
0.77	0.01	0.01	0.05	0.11	0.24
39	40	41	42	43	44
76.64	62.90	21.01	0.08	56.24	21.14
57.84	79.50	45.71	1.57	63.60	37.64
33.95	73.20	73.22	23.75	49.98	50.67
14.78	41.32	64.81	68.43	26.43	41.53
8.33	24.98	46.34	66.72	15.54	28.74
5.27	16.62	33.61	57.36	10.26	20.54
3.68	11.83	25.05	47.58	7.27	15.09
2.74	8.80	19.13	39.43	5.34	11.76
2.08	6.76	15.39	32.82	4.27	9.42
1.67	5.54	12.55	27.44	3.40	7.54
1.37	4.47	10.31	23.68	2.81	6.40
1.15	3.81	8.80	20.13	2.34	5.30
0.78	2.61	6.13	14.47	1.60	3.70
0.57	1.91	4.54	10.99	1.15	2.76
0.44	1.46	3.47	8.74	0.91	2.17
0.34	1.17	2.82	7.01	0.73	1.72
0.29	0.96	2.30	5.60	0.59	1.44
0.23	0.78	1.92	4.75	0.50	1.20
0.17	0.57	1.39	3.44	0.37	0.88
0.10	0.34	0.82	2.10	0.23	0.55
0.07	0.23	0.56	1.44	0.16	0.38
0.02	0.08	0.18	0.46	0.05	0.12
0.01	0.04	0.10	0.24	0.03	0.06
0.01	0.03	0.06	0.15	0.02	0.04

18	19	20	21	22	23
43.93	63.76	110.01	85.73	38.12	1.09
2622.17	43.74	89.34	123.56	111.76	35.20
2101.31	23.25	54.10	122.29	175.40	300.31
857.95	9.80	24.67	71.94	142.22	322.80
504.94	5.28	13.55	43.93	96.41	225.10
352.66	3.37	8.75	28.68	66.29	156.67
267.22	2.32	6.08	20.31	48.04	113.86
208.85	1.68	4.47	15.40	36.44	85.84
167.18	1.31	3.53	12.01	28.36	67.18
137.05	1.04	2.80	9.43	22.66	55.03
118.02	0.84	2.28	7.88	18.85	44.92
99.79	0.71	1.91	6.51	15.43	38.23
72.90	0.48	1.30	4.47	10.43	25.74
57.11	0.35	0.93	3.16	7.51	18.68
45.98	0.25	0.69	2.43	5.79	14.14
37.13	0.20	0.56	1.91	4.51	10.85
31.74	0.16	0.44	1.50	3.65	9.03
26.50	0.14	0.38	1.28	3.02	7.32
20.25	0.10	0.27	0.92	2.16	5.37
12.67	0.06	0.17	0.56	1.34	3.27
8.70	0.04	0.11	0.38	0.91	2.23
2.60	0.01	0.04	0.12	0.29	0.70
1.25	0.01	0.02	0.06	0.15	0.35
0.72	0.00	0.01	0.04	0.09	0.22
45	46	47	48	49	50
51.53	20.92	19.27	17.23	193.53	590.72
54.32	34.80	28.94	24.58	134.17	371.11
41.42	44.54	33.73	26.90	70.95	182.43
21.33	34.21	24.04	18.55	29.98	75.85
12.58	23.53	16.16	12.40	15.93	41.02
8.23	16.70	11.34	8.62	10.19	25.79
5.86	12.36	8.27	6.30	6.85	17.59
4.38	9.42	6.30	4.76	4.86	12.93
3.33	7.48	5.07	3.79	3.80	10.07
2.74	6.14	4.03	3.08	2.96	7.80
2.20	5.03	3.42	2.51	2.41	6.46
1.89	4.31	2.80	2.15	1.97	5.23
1.30	3.00	1.97	1.50	1.30	3.52
0.95	2.20	1.48	1.10	0.93	2.59
0.72	1.71	1.15	0.86	0.72	1.99
0.59	1.39	0.91	0.69	0.56	1.53
0.47	1.12	0.76	0.56	0.45	1.27
0.40	0.96	0.63	0.48	0.37	1.03
0.30	0.71	0.48	0.35	0.26	0.76
0.18	0.45	0.29	0.22	0.16	0.45
0.13	0.31	0.21	0.16	0.11	0.30
0.04	0.10	0.07	0.05	0.03	0.09
0.02	0.05	0.04	0.03	0.02	0.04
0.01	0.03	0.02	0.02	0.01	0.03

24	25	26	27
0.00	97.89	74.59	29.08
43.60	78.29	100.70	75.55
1877.08	47.54	102.10	123.12
970.06	21.28	60.11	106.27
542.38	11.67	36.40	74.86
365.74	7.55	23.96	52.73
270.14	5.25	16.98	38.82
211.75	3.84	12.84	29.88
170.17	3.00	10.11	23.53
136.61	2.40	8.01	18.59
116.31	1.93	6.64	15.66
97.20	1.65	5.53	12.93
69.72	1.12	3.78	8.99
53.05	0.81	2.75	6.38
42.49	0.60	2.06	4.97
34.28	0.48	1.65	3.92
28.71	0.39	1.30	3.13
24.18	0.33	1.10	2.63
17.95	0.24	0.80	1.90
11.50	0.14	0.48	1.16
7.97	0.10	0.33	0.79
2.43	0.03	0.10	0.25
1.16	0.02	0.06	0.13
0.70	0.01	0.04	0.08
51	52	53	54
922.02	1435.20	1905.78	2662.19
585.44	922.18	1295.98	1950.68
310.32	531.67	780.35	1266.48
148.33	263.28	407.12	757.34
87.31	158.96	262.09	520.49
57.55	109.30	186.00	389.23
41.88	81.59	141.95	306.74
32.54	63.78	112.93	249.22
25.73	50.57	92.05	212.16
20.82	42.59	78.78	180.98
17.47	35.34	66.34	158.55
14.76	30.81	58.44	138.35
10.34	21.98	42.80	103.53
7.72	16.37	32.45	83.24
5.90	12.84	26.44	67.18
4.79	10.43	21.33	55.06
3.89	8.49	17.93	46.35
3.28	7.22	14.86	39.36
2.41	5.23	10.98	29.50
1.46	3.22	6.60	18.11
0.98	2.14	4.44	12.14
0.28	0.60	1.21	3.21
0.13	0.27	0.55	1.38
0.08	0.16	0.30	0.79

X,m	Max concentration, ppm
25.00	4070.16
50.00	3429.95
100.00	2101.31
200.00	992.64
300.00	582.63
400.00	389.23
500.00	306.74
600.00	249.22
700.00	212.16
800.00	180.98
900.00	158.55
1000.00	138.35
1250.00	103.53
1500.00	83.24
1750.00	67.18
2000.00	55.06
2250.00	46.35
2500.00	39.36
3000.00	29.50
4000.00	18.11
5000.00	12.14
10000.00	3.21
15000.00	1.39
20000.00	0.79

Concentration (ppm)		Distance to (m)
LOC	9.9000	6254.60
IDLH	49.1000	2171.13

From Slab output file:	RUN53.OUT
Scenario:	CONSERV
Accident Location:	ON-SITE
Duration:	UNMITIG
Meteorology:	INVERSN
Chemical:	HCL
Vapor phase mole fraction:	1.000
LOC:	9.900
IDLH:	49.100

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	6922.40
50.00	5380.31
100.00	3699.98
200.00	2196.71
300.00	1539.06
400.00	1166.96
500.00	917.96
600.00	759.06
700.00	641.81
800.00	549.87
900.00	477.37
1000.00	423.41
1250.00	321.14
1500.00	250.66
1750.00	206.91
2000.00	170.55
2250.00	146.00
2500.00	122.98
3000.00	95.13
4000.00	60.26
5000.00	42.33
10000.00	12.83
15000.00	6.18
20000.00	3.60

Concentration (ppm)		Distance to (m)
LOC	9.9000	12204.31
IDLH	49.1000	4622.65

From Slab output file:	RUN54.OUT
Scenario:	CONSERV
Accident Location:	ON-SITE
Duration:	MITIGAT
Meteorology:	INVERSN
Chemical:	HCL
Vapor phase mole fraction:	1.000
LOC:	9.900
IDLH:	49.100

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	3914.84
50.00	3051.54
100.00	2133.12
200.00	1277.65
300.00	915.36
400.00	698.19
500.00	553.50
600.00	465.95
700.00	389.78
800.00	339.32
900.00	290.62
1000.00	261.54
1250.00	197.50
1500.00	153.22
1750.00	126.38
2000.00	102.52
2250.00	88.40
2500.00	74.27
3000.00	57.16
4000.00	35.67
5000.00	24.63
10000.00	7.06
15000.00	3.31
20000.00	1.91

Concentration (ppm)		Distance to (m)
LOC	9.9000	9191.12
IDLH	49.1000	3375.25

From Slab output file:	RUN55.OUT
Scenario:	TYPICAL
Accident Location:	ON-SITE
Duration:	UNMITIG
Meteorology:	TYPICAL
Chemical:	HCL
Vapor phase mole fraction:	1.000
LOC:	9.900
IDLH:	49.100

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	27.52
50.00	19.71
100.00	11.40
200.00	5.39
300.00	3.13
400.00	2.10
500.00	1.51
600.00	1.13
700.00	0.88
800.00	0.72
900.00	0.60
1000.00	0.50
1250.00	0.34
1500.00	0.25
1750.00	0.19
2000.00	0.15
2250.00	0.12
2500.00	0.10
3000.00	0.07
4000.00	0.05
5000.00	0.03

Concentration (ppm)		Distance to (m)	
LOC	9.9000		125.02
IDLH	49.1000	less than	25.00

From Slab output file:	RUN56.OUT
Scenario:	TYPICAL
Accident Location:	ON-SITE
Duration:	MITIGAT
Meteorology:	TYPICAL
Chemical:	HCL
Vapor phase mole fraction:	1.000
LOC:	9.900
IDLH:	49.100

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	27.52
50.00	19.71
100.00	11.40
200.00	5.39
300.00	3.13
400.00	2.10
500.00	1.51
600.00	1.13
700.00	0.88
800.00	0.72
900.00	0.60
1000.00	0.50
1250.00	0.34
1500.00	0.25
1750.00	0.19
2000.00	0.15
2250.00	0.12
2500.00	0.10
3000.00	0.07
4000.00	0.05
5000.00	0.03

Concentration (ppm)		Distance to (m)	
LOC	9.9000		125.02
IDLH	49.1000	less than	25.00

From Slab output file: RUN57.OUT
Scenario: TYPICAL
Accident Location: ON-SITE
Duration: UNMITIG
Meteorology: WORST
Chemical: HCL
Vapor phase mole fraction: 1.000
LOC: 9.900
IDLH: 49.100
*Output adjusted to be distance from fenceline.

X,m	1	2	3	4	5
25.00	4.36	10.38	29.27	60.80	117.61
50.00	2.96	7.16	20.65	43.78	86.89
100.00	1.59	3.92	11.71	25.43	52.44
200.00	0.69	1.75	5.41	12.07	26.18
300.00	0.38	0.98	3.09	7.01	14.84
400.00	0.25	0.64	2.03	4.48	9.72
500.00	0.17	0.45	1.40	3.11	6.81
600.00	0.13	0.32	1.02	2.27	5.07
700.00	0.09	0.24	0.78	1.78	4.03
800.00	0.08	0.20	0.63	1.42	3.17
900.00	0.06	0.16	0.50	1.15	2.68
1000.00	0.05	0.13	0.43	0.97	2.19
1250.00	0.03	0.09	0.29	0.66	1.49
1500.00	0.02	0.07	0.21	0.48	1.13
1750.00	0.02	0.05	0.16	0.37	0.87
2000.00	0.01	0.04	0.13	0.30	0.67
2250.00	0.01	0.03	0.10	0.24	0.57
2500.00	0.01	0.03	0.09	0.20	0.46
3000.00	0.01	0.02	0.06	0.15	0.34
4000.00	0.00	0.01	0.04	0.09	0.20

X,m	28	29	30	31	32
25.00	52.24	154.85	3.89	10.58	21.93
50.00	38.13	117.55	2.69	7.48	15.74
100.00	22.70	74.27	1.47	4.21	9.05
200.00	11.07	38.84	0.66	1.95	4.29
300.00	6.58	24.00	0.37	1.12	2.49
400.00	4.46	16.72	0.24	0.74	1.66
500.00	3.24	12.20	0.17	0.53	1.20
600.00	2.46	8.92	0.13	0.39	0.90
700.00	1.92	6.86	0.10	0.30	0.70
800.00	1.59	5.59	0.08	0.25	0.58
900.00	1.31	4.48	0.06	0.20	0.47
1000.00	1.09	3.87	0.05	0.17	0.40
1250.00	0.73	2.67	0.04	0.12	0.28
1500.00	0.54	1.94	0.03	0.09	0.20
1750.00	0.41	1.51	0.02	0.07	0.16
2000.00	0.32	1.22	0.02	0.05	0.12
2250.00	0.27	1.00	0.01	0.04	0.10
2500.00	0.22	0.84	0.01	0.04	0.08
3000.00	0.16	0.61	0.01	0.03	0.06
4000.00	0.10	0.39	0.00	0.02	0.04

6	7	8	9	10	11
235.68	3.27	7.77	21.64	45.07	92.36
183.07	2.22	5.38	15.24	32.37	67.87
121.80	1.19	2.95	8.60	18.77	40.65
60.68	0.52	1.31	3.98	8.88	20.05
38.36	0.29	0.73	2.28	5.16	11.89
26.76	0.19	0.48	1.51	3.45	7.98
20.08	0.13	0.34	1.08	2.45	5.54
15.53	0.10	0.25	0.80	1.79	4.05
12.49	0.07	0.19	0.60	1.36	3.14
10.32	0.06	0.15	0.49	1.10	2.53
8.63	0.05	0.12	0.39	0.88	2.04
7.30	0.04	0.10	0.33	0.75	1.74
5.09	0.03	0.07	0.22	0.51	1.19
3.88	0.02	0.05	0.16	0.37	0.86
3.02	0.01	0.04	0.12	0.28	0.67
2.37	0.01	0.03	0.10	0.23	0.54
1.97	0.01	0.02	0.08	0.18	0.43
1.63	0.01	0.02	0.07	0.15	0.37
1.19	0.01	0.01	0.05	0.11	0.27
0.71	0.00	0.01	0.03	0.07	0.17
33	34	35	36	37	38
45.54	136.66	3.46	9.43	19.49	40.37
33.28	103.87	2.39	6.64	13.91	29.43
19.77	65.20	1.31	3.75	8.03	17.45
9.63	33.98	0.58	1.73	3.80	8.54
5.72	20.97	0.33	0.99	2.21	5.06
3.89	14.60	0.21	0.66	1.48	3.44
2.82	10.80	0.15	0.47	1.06	2.50
2.14	8.23	0.11	0.35	0.80	1.90
1.67	6.21	0.08	0.27	0.62	1.48
1.38	5.08	0.07	0.22	0.51	1.22
1.14	4.09	0.06	0.18	0.42	1.01
0.97	3.50	0.05	0.15	0.35	0.86
0.66	2.40	0.03	0.11	0.25	0.60
0.48	1.76	0.02	0.08	0.18	0.44
0.37	1.34	0.02	0.06	0.14	0.34
0.29	1.10	0.01	0.05	0.11	0.26
0.24	0.88	0.01	0.04	0.09	0.22
0.20	0.76	0.01	0.03	0.08	0.18
0.14	0.56	0.01	0.02	0.06	0.13
0.09	0.35	0.00	0.01	0.03	0.08

12	13	14	15	16	17
223.63	2.62	6.22	17.17	35.64	73.93
171.20	1.78	4.30	12.06	25.51	54.20
110.80	0.95	2.35	6.82	14.74	32.28
58.96	0.42	1.05	3.15	6.99	15.85
33.96	0.23	0.59	1.80	4.06	9.42
22.99	0.15	0.38	1.19	2.71	6.39
16.78	0.10	0.27	0.85	1.95	4.64
13.08	0.08	0.20	0.64	1.47	3.49
10.30	0.06	0.15	0.49	1.14	2.63
8.44	0.05	0.12	0.40	0.92	2.14
7.01	0.04	0.10	0.33	0.74	1.71
6.01	0.03	0.08	0.28	0.62	1.45
4.24	0.02	0.06	0.18	0.42	0.98
3.13	0.02	0.04	0.13	0.31	0.72
2.42	0.01	0.03	0.10	0.23	0.55
1.96	0.01	0.02	0.08	0.18	0.44
1.59	0.01	0.02	0.07	0.15	0.36
1.34	0.01	0.02	0.05	0.12	0.30
0.96	0.00	0.01	0.04	0.09	0.22
0.59	0.00	0.01	0.02	0.06	0.14
39	40	41	42	43	44
3.11	8.47	17.47	36.31	5.32	10.97
2.15	5.97	12.55	26.42	3.73	7.84
1.18	3.36	7.22	15.64	2.10	4.51
0.53	1.56	3.42	7.66	0.97	2.13
0.29	0.89	1.99	4.55	0.56	1.24
0.19	0.59	1.33	3.08	0.37	0.83
0.13	0.42	0.96	2.24	0.26	0.60
0.10	0.32	0.72	1.70	0.20	0.45
0.08	0.24	0.56	1.33	0.15	0.35
0.06	0.20	0.46	1.10	0.12	0.29
0.05	0.16	0.38	0.91	0.10	0.24
0.04	0.14	0.32	0.77	0.09	0.20
0.03	0.09	0.22	0.54	0.06	0.14
0.02	0.07	0.17	0.40	0.04	0.10
0.02	0.06	0.13	0.30	0.03	0.08
0.01	0.04	0.10	0.24	0.03	0.06
0.01	0.04	0.08	0.20	0.02	0.05
0.01	0.03	0.07	0.16	0.02	0.05
0.01	0.02	0.05	0.12	0.01	0.03
0.00	0.01	0.03	0.07	0.01	0.02

18	19	20	21	22	23
201.39	2.18	5.18	14.23	29.44	61.26
153.60	1.48	3.58	10.03	21.07	44.81
97.94	0.79	1.96	5.64	12.21	26.63
52.10	0.35	0.88	2.61	5.77	13.08
32.56	0.19	0.49	1.49	3.35	7.75
21.25	0.12	0.32	0.99	2.24	5.26
15.05	0.09	0.23	0.71	1.61	3.81
11.13	0.06	0.17	0.53	1.21	2.90
8.99	0.05	0.13	0.41	0.94	2.26
7.18	0.04	0.10	0.33	0.77	1.83
6.04	0.03	0.09	0.27	0.63	1.47
4.99	0.03	0.07	0.23	0.53	1.23
3.43	0.02	0.05	0.16	0.35	0.84
2.64	0.01	0.04	0.11	0.26	0.61
2.04	0.01	0.03	0.09	0.20	0.47
1.61	0.01	0.02	0.07	0.16	0.37
1.34	0.01	0.02	0.06	0.13	0.31
1.12	0.01	0.01	0.05	0.11	0.25
0.84	0.00	0.01	0.03	0.08	0.19
0.51	0.00	0.01	0.02	0.05	0.11
45	46	47	48	49	50
4.26	8.77	5.86	4.39	6.54	15.47
2.99	6.27	4.18	3.13	4.45	10.69
1.69	3.60	2.40	1.81	2.39	5.87
0.78	1.70	1.14	0.85	1.04	2.63
0.44	0.99	0.66	0.49	0.57	1.47
0.30	0.66	0.44	0.33	0.36	0.93
0.21	0.48	0.32	0.24	0.24	0.64
0.16	0.36	0.24	0.18	0.18	0.47
0.12	0.28	0.19	0.14	0.13	0.36
0.10	0.23	0.15	0.11	0.11	0.29
0.08	0.19	0.13	0.09	0.08	0.23
0.07	0.16	0.11	0.08	0.07	0.20
0.05	0.11	0.07	0.06	0.05	0.13
0.04	0.08	0.06	0.04	0.03	0.10
0.03	0.06	0.04	0.03	0.03	0.07
0.02	0.05	0.03	0.03	0.02	0.06
0.02	0.04	0.03	0.02	0.02	0.05
0.02	0.04	0.02	0.02	0.01	0.04
0.01	0.03	0.02	0.01	0.01	0.03
0.01	0.02	0.01	0.01	0.01	0.02

24	25	26	27
177.10	4.45	12.19	25.18
135.00	3.07	8.56	17.97
85.35	1.69	4.83	10.40
44.91	0.75	2.23	4.92
27.91	0.42	1.27	2.85
19.17	0.27	0.85	1.91
13.41	0.19	0.60	1.37
9.91	0.14	0.45	1.03
7.79	0.11	0.35	0.80
6.27	0.09	0.29	0.66
5.12	0.07	0.23	0.54
4.34	0.06	0.20	0.46
3.01	0.04	0.14	0.31
2.22	0.03	0.10	0.23
1.76	0.02	0.08	0.17
1.38	0.02	0.06	0.14
1.16	0.02	0.05	0.11
0.95	0.01	0.04	0.09
0.71	0.01	0.03	0.07
0.43	0.01	0.02	0.04
51	52	53	54
44.40	86.17	142.85	206.49
31.47	62.28	106.75	155.77
17.87	36.62	66.62	107.65
8.30	16.77	31.20	63.55
4.56	9.38	18.64	42.95
2.93	6.08	12.50	31.57
2.04	4.30	9.12	24.58
1.48	3.28	6.94	19.60
1.17	2.54	5.33	15.75
0.93	2.01	4.45	13.30
0.76	1.68	3.57	11.04
0.63	1.40	3.11	9.54
0.43	0.96	2.14	6.67
0.31	0.70	1.54	4.93
0.24	0.53	1.20	3.85
0.19	0.42	0.95	2.96
0.15	0.34	0.77	2.49
0.13	0.29	0.64	2.02
0.09	0.21	0.45	1.47
0.06	0.12	0.27	0.84

X,m	Max concentration, ppm
25.00	235.68
50.00	183.07
100.00	121.80
200.00	63.55
300.00	42.95
400.00	31.57
500.00	24.58
600.00	19.60
700.00	15.75
800.00	13.30
900.00	11.04
1000.00	9.54
1250.00	6.67
1500.00	4.93
1750.00	3.85
2000.00	2.96
2250.00	2.49
2500.00	2.02
3000.00	1.47
4000.00	0.84

Concentration (ppm)		Distance to (m)
LOC	9.9000	976.22
IDLH	49.1000	270.14

From Slab output file: RUN58.OUT
Scenario: TYPICAL
Accident Location: ON-SITE
Duration: MITIGAT
Meteorology: WORST
Chemical: HCL
Vapor phase mole fraction: 1.000
LOC: 9.900
IDLH: 49.100
*Output adjusted to be distance from fenceline.

X,m	1	2	3	4	5
25.00	4.36	10.38	29.27	60.80	117.61
50.00	2.96	7.16	20.65	43.78	86.89
100.00	1.59	3.92	11.71	25.43	52.44
200.00	0.69	1.75	5.41	12.07	26.18
300.00	0.38	0.98	3.09	7.01	14.84
400.00	0.25	0.64	2.03	4.48	9.72
500.00	0.17	0.45	1.40	3.11	6.81
600.00	0.13	0.32	1.02	2.27	5.07
700.00	0.09	0.24	0.78	1.78	4.03
800.00	0.08	0.20	0.63	1.42	3.17
900.00	0.06	0.16	0.50	1.15	2.68
1000.00	0.05	0.13	0.43	0.97	2.19
1250.00	0.03	0.09	0.29	0.66	1.49
1500.00	0.02	0.07	0.21	0.48	1.13
1750.00	0.02	0.05	0.16	0.37	0.87
2000.00	0.01	0.04	0.13	0.30	0.67
2250.00	0.01	0.03	0.10	0.24	0.57
2500.00	0.01	0.03	0.09	0.20	0.46
3000.00	0.01	0.02	0.06	0.15	0.34
4000.00	0.00	0.01	0.04	0.09	0.20

X,m	28	29	30	31	32
25.00	52.24	154.85	3.89	10.58	21.93
50.00	38.13	117.55	2.69	7.48	15.74
100.00	22.70	74.27	1.47	4.21	9.05
200.00	11.07	38.84	0.66	1.95	4.29
300.00	6.58	24.00	0.37	1.12	2.49
400.00	4.46	16.72	0.24	0.74	1.66
500.00	3.24	12.20	0.17	0.53	1.20
600.00	2.46	8.92	0.13	0.39	0.90
700.00	1.92	6.86	0.10	0.30	0.70
800.00	1.59	5.59	0.08	0.25	0.58
900.00	1.31	4.48	0.06	0.20	0.47
1000.00	1.09	3.87	0.05	0.17	0.40
1250.00	0.73	2.67	0.04	0.12	0.28
1500.00	0.54	1.94	0.03	0.09	0.20
1750.00	0.41	1.51	0.02	0.07	0.16
2000.00	0.32	1.22	0.02	0.05	0.12
2250.00	0.27	1.00	0.01	0.04	0.10
2500.00	0.22	0.84	0.01	0.04	0.08
3000.00	0.16	0.61	0.01	0.03	0.06
4000.00	0.10	0.39	0.00	0.02	0.04

6	7	8	9	10	11
235.68	3.27	7.77	21.64	45.07	92.36
183.07	2.22	5.38	15.24	32.37	67.87
121.80	1.19	2.95	8.60	18.77	40.65
60.68	0.52	1.31	3.98	8.88	20.05
38.36	0.29	0.73	2.28	5.16	11.89
26.76	0.19	0.48	1.51	3.45	7.98
20.08	0.13	0.34	1.08	2.45	5.54
15.53	0.10	0.25	0.80	1.79	4.05
12.49	0.07	0.19	0.60	1.36	3.14
10.32	0.06	0.15	0.49	1.10	2.53
8.63	0.05	0.12	0.39	0.88	2.04
7.30	0.04	0.10	0.33	0.75	1.74
5.09	0.03	0.07	0.22	0.51	1.19
3.88	0.02	0.05	0.16	0.37	0.86
3.02	0.01	0.04	0.12	0.28	0.67
2.37	0.01	0.03	0.10	0.23	0.54
1.97	0.01	0.02	0.08	0.18	0.43
1.63	0.01	0.02	0.07	0.15	0.37
1.19	0.01	0.01	0.05	0.11	0.27
0.71	0.00	0.01	0.03	0.07	0.17
33	34	35	36	37	38
45.54	136.66	3.46	9.43	19.49	40.37
33.28	103.87	2.39	6.64	13.91	29.43
19.77	65.20	1.31	3.75	8.03	17.45
9.63	33.98	0.58	1.73	3.80	8.54
5.72	20.97	0.33	0.99	2.21	5.06
3.89	14.60	0.21	0.66	1.48	3.44
2.82	10.80	0.15	0.47	1.06	2.50
2.14	8.23	0.11	0.35	0.80	1.90
1.67	6.21	0.08	0.27	0.62	1.48
1.38	5.08	0.07	0.22	0.51	1.22
1.14	4.09	0.06	0.18	0.42	1.01
0.97	3.50	0.05	0.15	0.35	0.86
0.66	2.40	0.03	0.11	0.25	0.60
0.48	1.76	0.02	0.08	0.18	0.44
0.37	1.34	0.02	0.06	0.14	0.34
0.29	1.10	0.01	0.05	0.11	0.26
0.24	0.88	0.01	0.04	0.09	0.22
0.20	0.76	0.01	0.03	0.08	0.18
0.14	0.56	0.01	0.02	0.06	0.13
0.09	0.35	0.00	0.01	0.03	0.08

12	13	14	15	16	17
223.63	2.62	6.22	17.17	35.64	73.93
171.20	1.78	4.30	12.06	25.51	54.20
110.80	0.95	2.35	6.82	14.74	32.28
58.96	0.42	1.05	3.15	6.99	15.85
33.96	0.23	0.59	1.80	4.06	9.42
22.99	0.15	0.38	1.19	2.71	6.39
16.78	0.10	0.27	0.85	1.95	4.64
13.08	0.08	0.20	0.64	1.47	3.49
10.30	0.06	0.15	0.49	1.14	2.63
8.44	0.05	0.12	0.40	0.92	2.14
7.01	0.04	0.10	0.33	0.74	1.71
6.01	0.03	0.08	0.28	0.62	1.45
4.24	0.02	0.06	0.18	0.42	0.98
3.13	0.02	0.04	0.13	0.31	0.72
2.42	0.01	0.03	0.10	0.23	0.55
1.96	0.01	0.02	0.08	0.18	0.44
1.59	0.01	0.02	0.07	0.15	0.36
1.34	0.01	0.02	0.05	0.12	0.30
0.96	0.00	0.01	0.04	0.09	0.22
0.59	0.00	0.01	0.02	0.06	0.14
39	40	41	42	43	44
3.11	8.47	17.47	36.31	5.32	10.97
2.15	5.97	12.55	26.42	3.73	7.84
1.18	3.36	7.22	15.64	2.10	4.51
0.53	1.56	3.42	7.66	0.97	2.13
0.29	0.89	1.99	4.55	0.56	1.24
0.19	0.59	1.33	3.08	0.37	0.83
0.13	0.42	0.96	2.24	0.26	0.60
0.10	0.32	0.72	1.70	0.20	0.45
0.08	0.24	0.56	1.33	0.15	0.35
0.06	0.20	0.46	1.10	0.12	0.29
0.05	0.16	0.38	0.91	0.10	0.24
0.04	0.14	0.32	0.77	0.09	0.20
0.03	0.09	0.22	0.54	0.06	0.14
0.02	0.07	0.17	0.40	0.04	0.10
0.02	0.06	0.13	0.30	0.03	0.08
0.01	0.04	0.10	0.24	0.03	0.06
0.01	0.04	0.08	0.20	0.02	0.05
0.01	0.03	0.07	0.16	0.02	0.05
0.01	0.02	0.05	0.12	0.01	0.03
0.00	0.01	0.03	0.07	0.01	0.02

18	19	20	21	22	23
201.39	2.18	5.18	14.23	29.44	61.26
153.60	1.48	3.58	10.03	21.07	44.81
97.94	0.79	1.96	5.64	12.21	26.63
52.10	0.35	0.88	2.61	5.77	13.08
32.56	0.19	0.49	1.49	3.35	7.75
21.25	0.12	0.32	0.99	2.24	5.26
15.05	0.09	0.23	0.71	1.61	3.81
11.13	0.06	0.17	0.53	1.21	2.90
8.99	0.05	0.13	0.41	0.94	2.26
7.18	0.04	0.10	0.33	0.77	1.83
6.04	0.03	0.09	0.27	0.63	1.47
4.99	0.03	0.07	0.23	0.53	1.23
3.43	0.02	0.05	0.16	0.35	0.84
2.64	0.01	0.04	0.11	0.26	0.61
2.04	0.01	0.03	0.09	0.20	0.47
1.61	0.01	0.02	0.07	0.16	0.37
1.34	0.01	0.02	0.06	0.13	0.31
1.12	0.01	0.01	0.05	0.11	0.25
0.84	0.00	0.01	0.03	0.08	0.19
0.51	0.00	0.01	0.02	0.05	0.11
45	46	47	48	49	50
4.26	8.77	5.86	4.39	6.54	15.47
2.99	6.27	4.18	3.13	4.45	10.69
1.69	3.60	2.40	1.81	2.39	5.87
0.78	1.70	1.14	0.85	1.04	2.63
0.44	0.99	0.66	0.49	0.57	1.47
0.30	0.66	0.44	0.33	0.36	0.93
0.21	0.48	0.32	0.24	0.24	0.64
0.16	0.36	0.24	0.18	0.18	0.47
0.12	0.28	0.19	0.14	0.13	0.36
0.10	0.23	0.15	0.11	0.11	0.29
0.08	0.19	0.13	0.09	0.08	0.23
0.07	0.16	0.11	0.08	0.07	0.20
0.05	0.11	0.07	0.06	0.05	0.13
0.04	0.08	0.06	0.04	0.03	0.10
0.03	0.06	0.04	0.03	0.03	0.07
0.02	0.05	0.03	0.03	0.02	0.06
0.02	0.04	0.03	0.02	0.02	0.05
0.02	0.04	0.02	0.02	0.01	0.04
0.01	0.03	0.02	0.01	0.01	0.03
0.01	0.02	0.01	0.01	0.01	0.02

24	25	26	27
177.10	4.45	12.19	25.18
135.00	3.07	8.56	17.97
85.35	1.69	4.83	10.40
44.91	0.75	2.23	4.92
27.91	0.42	1.27	2.85
19.17	0.27	0.85	1.91
13.41	0.19	0.60	1.37
9.91	0.14	0.45	1.03
7.79	0.11	0.35	0.80
6.27	0.09	0.29	0.66
5.12	0.07	0.23	0.54
4.34	0.06	0.20	0.46
3.01	0.04	0.14	0.31
2.22	0.03	0.10	0.23
1.76	0.02	0.08	0.17
1.38	0.02	0.06	0.14
1.16	0.02	0.05	0.11
0.95	0.01	0.04	0.09
0.71	0.01	0.03	0.07
0.43	0.01	0.02	0.04
51	52	53	54
44.40	86.17	142.85	206.49
31.47	62.28	106.75	155.77
17.87	36.62	66.62	107.65
8.30	16.77	31.20	63.55
4.56	9.38	18.64	42.95
2.93	6.08	12.50	31.57
2.04	4.30	9.12	24.58
1.48	3.28	6.94	19.60
1.17	2.54	5.33	15.75
0.93	2.01	4.45	13.30
0.76	1.68	3.57	11.04
0.63	1.40	3.11	9.54
0.43	0.96	2.14	6.67
0.31	0.70	1.54	4.93
0.24	0.53	1.20	3.85
0.19	0.42	0.95	2.96
0.15	0.34	0.77	2.49
0.13	0.29	0.64	2.02
0.09	0.21	0.45	1.47
0.06	0.12	0.27	0.84

X,m	Max concentration, ppm
25.00	235.68
50.00	183.07
100.00	121.80
200.00	63.55
300.00	42.95
400.00	31.57
500.00	24.58
600.00	19.60
700.00	15.75
800.00	13.30
900.00	11.04
1000.00	9.54
1250.00	6.67
1500.00	4.93
1750.00	3.85
2000.00	2.96
2250.00	2.49
2500.00	2.02
3000.00	1.47
4000.00	0.84

Concentration (ppm)		Distance to (m)
LOC	9.9000	976.22
IDLH	49.1000	270.14

From Slab output file:	RUN59.OUT
Scenario:	TYPICAL
Accident Location:	ON-SITE
Duration:	UNMITIG
Meteorology:	INVERSN
Chemical:	HCL
Vapor phase mole fraction:	1.000
LOC:	9.900
IDLH:	49.100

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	295.17
50.00	237.54
100.00	170.19
200.00	110.30
300.00	81.48
400.00	63.57
500.00	51.14
600.00	41.76
700.00	35.16
800.00	29.88
900.00	25.56
1000.00	22.23
1250.00	16.08
1500.00	12.01
1750.00	9.36
2000.00	7.52
2250.00	5.97
2500.00	5.04
3000.00	3.60
4000.00	2.06
5000.00	1.30

Concentration (ppm)		Distance to (m)
LOC	9.9000	1699.08
IDLH	49.1000	521.79

From Slab output file:	RUN60.OUT
Scenario:	TYPICAL
Accident Location:	ON-SITE
Duration:	MITIGAT
Meteorology:	INVERSN
Chemical:	HCL
Vapor phase mole fraction:	1.000
LOC:	9.900
IDLH:	49.100

*Output adjusted to be distance from fenceline.

X,m	Max concentration, ppm
25.00	295.17
50.00	237.54
100.00	170.19
200.00	110.30
300.00	81.48
400.00	63.57
500.00	51.14
600.00	41.76
700.00	35.16
800.00	29.88
900.00	25.56
1000.00	22.23
1250.00	16.08
1500.00	12.01
1750.00	9.36
2000.00	7.52
2250.00	5.97
2500.00	5.04
3000.00	3.60
4000.00	2.06
5000.00	1.30

Concentration (ppm)		Distance to (m)
LOC	9.9000	1699.08
IDLH	49.1000	521.79

From Slab output file:	RUN61.OUT
Scenario:	CONSERV
Accident Location:	OFFSITE
Duration:	UNMITIG
Meteorology:	TYPICAL
Chemical:	FORMALDEHYDE
Vapor phase mole fraction:	0.484
LOC:	9.600
IDLH:	19.600

X,m	Max concentration, ppm
25.00	2252.21
50.00	1352.68
100.00	660.84
200.00	259.13
300.00	137.95
400.00	87.72
500.00	60.74
600.00	44.88
700.00	34.65
800.00	27.39
900.00	22.55
1000.00	18.84
1250.00	12.90
1500.00	9.50
1750.00	7.28
2000.00	5.73
2250.00	4.78
2500.00	3.97
3000.00	2.92
4000.00	1.80
5000.00	1.18
10000.00	0.36
15000.00	0.19
20000.00	0.12

Concentration (ppm)		Distance to (m)
LOC	9.6000	1492.39
IDLH	19.6000	979.60

From Slab output file:			RUN62.OUT		
Scenario:			CONSERV		
Accident Location:			OFFSITE		
Duration:			UNMITIG		
Meteorology:			WORST		
Chemical:			FORMALDEHYDE		
Vapor phase mole fraction:			0.484		
LOC:			9.600		
IDLH:			19.600		
X,m	1	2	3	4	5
25.00	709.87	1337.45	2820.11	5082.00	9002.40
50.00	313.46	666.18	1592.17	3046.30	5639.57
100.00	113.17	267.16	726.30	1491.72	2907.66
200.00	35.62	90.29	271.94	596.84	1233.92
300.00	17.42	44.91	141.62	322.19	692.69
400.00	10.59	27.56	89.23	206.18	453.26
500.00	7.06	18.58	61.10	143.00	321.63
600.00	5.07	13.46	44.73	105.69	241.42
700.00	3.84	10.24	34.33	81.74	189.01
800.00	2.98	7.99	26.96	64.60	151.39
900.00	2.42	6.52	22.12	52.94	125.70
1000.00	2.00	5.41	18.41	44.16	105.78
1250.00	1.34	3.64	12.46	30.25	70.99
1500.00	0.97	2.65	9.10	21.71	49.16
1750.00	0.73	2.01	6.87	15.74	36.20
2000.00	0.57	1.57	5.10	11.97	28.32
2250.00	0.46	1.28	4.18	9.77	22.97
2500.00	0.37	1.02	3.36	7.79	18.80
3000.00	0.26	0.72	2.36	5.63	13.70
4000.00	0.15	0.43	1.44	3.39	7.94
5000.00	0.10	0.29	0.97	2.28	5.31
10000.00	0.03	0.09	0.29	0.68	1.53
15000.00	0.02	0.04	0.14	0.33	0.73
20000.00	0.01	0.03	0.09	0.20	0.43
X,m	28	29	30	31	32
25.00	3600.96	8147.33	496.91	1034.15	1797.25
50.00	2287.96	5589.23	247.89	583.51	1077.96
100.00	1200.44	3294.62	98.81	263.54	526.14
200.00	509.44	1600.52	33.11	96.74	205.76
300.00	281.81	958.79	16.41	49.97	109.46
400.00	183.88	658.43	10.07	31.26	69.73
500.00	129.28	480.52	6.80	21.36	48.15
600.00	96.43	368.35	4.92	15.62	35.51
700.00	75.23	293.49	3.74	11.99	27.42
800.00	60.07	238.53	2.92	9.43	21.67
900.00	49.79	200.29	2.38	7.73	17.85
1000.00	41.84	170.38	1.98	6.43	14.91
1250.00	28.94	120.76	1.33	4.37	10.19
1500.00	21.49	91.16	0.97	3.20	7.50
1750.00	16.62	71.37	0.74	2.44	5.76
2000.00	13.16	57.19	0.58	1.92	4.54
2250.00	11.03	48.30	0.48	1.60	3.79
2500.00	9.18	40.17	0.40	1.32	3.15
3000.00	6.79	27.25	0.29	0.97	2.32
4000.00	4.18	16.27	0.18	0.61	1.47
5000.00	2.72	10.95	0.13	0.42	1.02
10000.00	0.82	3.30	0.04	0.13	0.30
15000.00	0.42	1.61	0.02	0.07	0.16
20000.00	0.27	0.97	0.01	0.04	0.10

6	7	8	9	10	11
20795.87	530.79	1000.27	2087.65	3676.79	6453.33
12574.32	234.53	496.55	1176.70	2209.17	4099.29
6080.10	84.67	198.93	535.41	1079.44	2155.28
2635.45	26.73	66.67	198.50	430.91	926.65
1578.03	13.10	33.15	103.07	230.82	518.54
1101.97	7.92	20.35	64.57	147.81	341.37
825.67	5.30	13.72	44.28	102.44	241.40
649.97	3.82	9.94	32.37	75.77	180.99
511.21	2.88	7.57	24.83	58.57	141.32
392.23	2.24	5.90	19.52	46.23	112.66
326.09	1.82	4.82	15.99	38.04	93.24
271.55	1.50	3.99	13.30	31.77	78.40
190.21	1.00	2.69	9.03	21.71	54.38
139.39	0.73	1.96	6.60	15.94	40.26
111.47	0.55	1.49	5.03	12.23	30.60
89.02	0.43	1.16	3.95	9.64	22.84
73.53	0.35	0.97	3.29	7.78	18.55
61.14	0.29	0.80	2.70	6.17	14.80
44.24	0.21	0.58	1.87	4.34	10.60
26.93	0.12	0.34	1.12	2.63	6.38
17.85	0.08	0.23	0.75	1.77	4.32
4.77	0.02	0.07	0.22	0.53	1.29
2.22	0.01	0.04	0.11	0.27	0.63
1.25	0.01	0.02	0.07	0.16	0.38
33	34	35	36	37	38
3142.77	7114.80	442.21	919.60	1593.97	2787.84
1998.73	4889.56	220.39	518.23	956.77	1770.86
1047.86	2884.88	87.76	234.03	465.45	929.16
443.14	1401.66	29.39	86.07	182.62	392.51
244.90	839.31	14.60	44.37	96.98	216.51
159.27	570.15	8.93	27.76	61.60	140.81
112.17	416.04	6.03	18.98	42.60	99.15
83.78	319.49	4.36	13.87	31.43	73.94
65.33	254.26	3.32	10.63	24.25	57.55
52.13	206.30	2.59	8.36	19.16	45.87
43.11	173.14	2.12	6.84	15.79	38.01
36.19	147.22	1.75	5.69	13.20	31.95
25.05	104.30	1.18	3.87	9.05	22.12
18.59	78.64	0.86	2.83	6.67	16.43
14.37	61.47	0.66	2.17	5.12	12.70
11.40	49.37	0.51	1.70	4.03	10.08
9.56	41.69	0.43	1.42	3.36	8.45
7.97	35.01	0.35	1.17	2.79	7.04
5.89	26.06	0.26	0.86	2.05	5.19
3.77	14.89	0.16	0.54	1.30	3.33
2.50	9.92	0.11	0.38	0.91	2.33
0.74	2.98	0.03	0.11	0.27	0.68
0.38	1.50	0.02	0.06	0.14	0.35
0.25	0.90	0.01	0.04	0.09	0.23

12	13	14	15	16	17
14745.87	423.66	796.99	1661.73	2904.00	5082.00
9790.35	187.46	397.62	935.86	1743.76	3236.41
5362.37	67.71	158.56	423.57	851.72	1702.79
2475.31	21.39	53.11	156.76	336.77	729.32
1474.97	10.45	26.38	81.07	179.89	407.00
1016.98	6.34	16.18	50.78	114.80	266.32
749.56	4.24	10.90	34.77	79.48	187.87
583.26	3.05	7.88	25.43	58.68	140.74
469.60	2.31	6.00	19.50	45.35	109.90
384.31	1.79	4.69	15.33	35.86	87.56
325.45	1.46	3.83	12.55	29.53	72.62
279.00	1.20	3.18	10.45	24.66	61.07
192.23	0.80	2.14	7.11	16.87	42.25
134.31	0.58	1.56	5.20	12.42	31.30
100.05	0.44	1.19	3.97	9.53	24.17
79.98	0.34	0.93	3.11	7.49	19.13
65.05	0.28	0.77	2.59	6.24	16.02
54.16	0.23	0.63	2.14	5.17	13.22
39.68	0.17	0.46	1.56	3.79	9.02
23.76	0.10	0.28	0.92	2.20	5.37
16.02	0.07	0.19	0.61	1.47	3.62
4.51	0.02	0.06	0.19	0.44	1.09
2.08	0.01	0.03	0.10	0.22	0.55
1.19	0.01	0.02	0.06	0.14	0.33
39	40	41	42	43	44
397.85	826.03	1432.64	2507.12	514.65	893.79
198.25	467.00	859.78	1593.13	290.30	534.92
78.80	210.48	418.60	836.14	131.45	260.95
26.44	77.33	164.02	352.41	48.31	102.07
13.10	39.87	87.02	194.07	24.88	54.03
8.04	24.95	55.26	126.05	15.56	34.45
5.43	17.06	38.26	88.72	10.62	23.80
3.92	12.47	28.21	66.22	7.78	17.56
2.99	9.57	21.77	51.53	5.97	13.55
2.33	7.52	17.21	41.07	4.69	10.70
1.90	6.15	14.16	34.02	3.84	8.82
1.58	5.12	11.83	28.59	3.20	7.37
1.07	3.48	8.11	19.80	2.17	5.05
0.78	2.55	5.98	14.68	1.59	3.71
0.59	1.95	4.59	11.35	1.22	2.85
0.46	1.53	3.62	9.00	0.95	2.25
0.38	1.27	3.02	7.55	0.79	1.88
0.32	1.05	2.50	6.29	0.66	1.56
0.23	0.77	1.84	4.67	0.48	1.15
0.15	0.49	1.17	2.99	0.30	0.73
0.10	0.34	0.81	2.09	0.21	0.51
0.03	0.11	0.25	0.62	0.07	0.17
0.02	0.06	0.13	0.32	0.04	0.09
0.01	0.04	0.08	0.21	0.02	0.06

18	19	20	21	22	23
11535.33	352.67	666.31	1381.01	2408.71	4215.64
7850.48	155.93	331.00	777.50	1446.39	2675.75
4525.58	56.17	131.81	352.50	702.51	1405.84
2166.38	17.82	44.21	129.91	277.25	598.36
1296.46	8.73	21.92	67.09	147.91	333.09
889.40	5.29	13.45	41.96	94.13	217.37
653.67	3.54	9.06	28.70	65.14	153.03
504.40	2.54	6.55	20.99	48.10	114.48
402.83	1.92	4.98	16.09	37.13	89.35
328.36	1.49	3.90	12.64	29.35	71.23
276.68	1.21	3.18	10.37	24.18	58.99
236.12	1.00	2.64	8.64	20.20	49.57
168.43	0.67	1.78	5.86	13.82	34.34
123.26	0.48	1.30	4.28	10.16	25.48
89.31	0.37	0.99	3.28	7.79	19.68
68.93	0.29	0.77	2.57	6.16	15.60
56.49	0.24	0.64	2.14	5.14	13.06
46.04	0.19	0.53	1.77	4.25	10.87
33.91	0.14	0.39	1.30	3.13	8.02
19.94	0.09	0.24	0.79	1.92	4.64
13.52	0.06	0.16	0.52	1.26	3.08
3.95	0.02	0.05	0.16	0.38	0.92
1.91	0.01	0.03	0.08	0.20	0.48
1.09	0.01	0.02	0.05	0.13	0.30
45	46	47	48	49	50
411.24	711.48	474.32	354.45	1066.41	2024.73
231.95	428.26	284.59	213.00	474.55	1015.43
105.00	208.33	138.90	103.92	172.39	411.37
38.60	81.69	54.51	40.76	54.25	140.61
19.88	43.31	28.84	21.64	26.17	70.23
12.45	27.52	18.33	13.75	15.82	43.28
8.49	19.02	12.67	9.50	10.55	29.14
6.22	14.02	9.35	6.99	7.60	21.11
4.77	10.82	7.21	5.39	5.76	16.07
3.74	8.56	5.68	4.27	4.46	12.53
3.07	7.03	4.68	3.52	3.63	10.20
2.56	5.87	3.92	2.94	3.00	8.44
1.74	4.03	2.68	2.01	2.00	5.59
1.27	2.97	1.98	1.48	1.42	3.86
0.97	2.28	1.52	1.14	1.03	2.83
0.76	1.80	1.20	0.90	0.78	2.19
0.64	1.50	1.00	0.75	0.64	1.78
0.53	1.24	0.83	0.62	0.51	1.43
0.39	0.92	0.61	0.46	0.36	1.02
0.24	0.58	0.39	0.29	0.22	0.62
0.17	0.41	0.27	0.20	0.15	0.41
0.06	0.14	0.09	0.07	0.04	0.12
0.03	0.08	0.05	0.04	0.02	0.06
0.02	0.05	0.03	0.03	0.01	0.03

24	25	26	27
9534.80	567.89	1182.57	2058.61
6526.26	283.45	665.98	1233.04
3824.54	112.91	301.53	599.81
1855.93	37.83	110.82	236.16
1117.00	18.76	57.07	125.47
766.66	11.50	35.82	80.07
559.53	7.74	24.49	55.38
429.95	5.63	17.91	40.84
343.11	4.29	13.73	31.51
279.19	3.34	10.78	24.88
234.68	2.73	8.84	20.49
199.85	2.26	7.36	17.13
141.81	1.52	5.00	11.71
107.11	1.11	3.66	8.61
84.05	0.84	2.80	6.62
67.46	0.66	2.20	5.23
54.38	0.55	1.83	4.36
42.76	0.45	1.51	3.61
29.97	0.33	1.11	2.66
18.22	0.21	0.70	1.69
12.27	0.14	0.47	1.12
3.63	0.04	0.14	0.34
1.73	0.02	0.07	0.17
1.04	0.01	0.05	0.11
51	52	53	54
4517.33	8582.93	15407.33	30604.93
2545.84	5055.67	8793.31	13987.60
1154.16	2373.13	3964.85	5998.06
432.25	913.93	1572.03	2607.79
225.15	488.19	881.83	1605.17
141.73	312.10	587.96	1107.62
96.94	217.07	422.02	766.18
71.03	160.60	321.89	585.28
54.54	124.30	247.58	464.84
42.75	97.89	187.12	389.46
35.01	77.35	153.02	328.25
28.79	62.56	125.56	284.37
18.40	40.84	84.95	206.13
12.87	28.90	61.23	156.48
9.46	21.39	47.15	120.18
7.42	17.17	37.49	99.76
5.98	13.67	29.91	80.46
4.89	11.43	25.25	69.34
3.52	8.20	18.03	50.31
2.04	4.81	10.83	30.30
1.37	3.19	7.16	19.95
0.39	0.86	1.91	5.12
0.18	0.40	0.85	2.32
0.11	0.23	0.48	1.26

X,m	Max concentration, ppm
25.00	30604.93
50.00	13987.60
100.00	6080.10
200.00	2635.45
300.00	1605.17
400.00	1107.62
500.00	825.67
600.00	649.97
700.00	511.21
800.00	392.23
900.00	328.25
1000.00	284.37
1250.00	206.13
1500.00	156.48
1750.00	120.18
2000.00	99.76
2250.00	80.46
2500.00	69.34
3000.00	50.31
4000.00	30.30
5000.00	19.95
10000.00	5.12
15000.00	2.32
20000.00	1.26

ncentration (ppm)		Distance to (m)
LOC	9.6000	8489.07
IDLH	19.6000	5119.39

From Slab output file:	RUN63.OUT
Scenario:	CONSERV
Accident Location:	OFFSITE
Duration:	UNMITIG
Meteorology:	INVERSN
Chemical:	FORMALDEHYDE
Vapor phase mole fraction:	0.484
LOC:	9.600
IDLH:	19.600

X,m	Max concentration, ppm
25.00	29537.00
50.00	14459.07
100.00	6685.56
200.00	2995.96
300.00	1884.70
400.00	1342.85
500.00	1041.36
600.00	836.73
700.00	683.27
800.00	588.78
900.00	500.84
1000.00	440.83
1250.00	325.33
1500.00	253.08
1750.00	206.40
2000.00	166.11
2250.00	143.19
2500.00	120.26
3000.00	92.06
4000.00	57.32
5000.00	39.52
10000.00	11.47
15000.00	5.40
20000.00	3.10

Concentration (ppm)		Distance to (m)
LOC	9.6000	11542.35
IDLH	19.6000	8551.02

From Slab output file:	RUNA6.OUT
Scenario:	CONSERV
Accident Location:	OFFSITE
Duration:	UNMITIG
Meteorology:	INVERSN
Chemical:	ACETONE
Vapor phase mole fraction:	0.274
LOC:	1960.000
IDLH:	2442.000

X,m	Max concentration, ppm
25.00	1313.34
50.00	442.38
100.00	232.92
200.00	130.86
300.00	93.98
400.00	74.48
500.00	62.07
600.00	53.59
700.00	47.28
800.00	42.38
900.00	38.33
1000.00	34.91
1250.00	28.95
1500.00	24.72
1750.00	21.55
2000.00	19.28
2250.00	17.35
2500.00	15.60
3000.00	12.77
4000.00	8.95
5000.00	6.57

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:	RUN64.OUT
Scenario:	CONSERV
Accident Location:	OFFSITE
Duration:	UNMITIG
Meteorology:	TYPICAL
Chemical:	ACETONE
Vapor phase mole fraction:	0.274
LOC:	1960.000
IDLH:	2442.000

X,m	Max concentration, ppm
25.00	218.20
50.00	130.83
100.00	63.74
200.00	25.33
300.00	13.55
400.00	8.66
500.00	6.01
600.00	4.43
700.00	3.42
800.00	2.71
900.00	2.23
1000.00	1.86
1250.00	1.27
1500.00	0.93
1750.00	0.71
2000.00	0.56
2250.00	0.47
2500.00	0.39
3000.00	0.29
4000.00	0.18
5000.00	0.13
10000.00	0.04
15000.00	0.02
20000.00	0.02

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:			RUN65.OUT		
Scenario:			CONSERV		
Accident Location:			OFFSITE		
Duration:			UNMITIG		
Meteorology:			WORST		
Chemical:			ACETONE		
Vapor phase mole fraction:			0.274		
LOC:			1960.000		
IDLH:			2442.000		
X,m	1	2	3	4	5
25.00	67.68	128.78	288.61	545.26	980.92
50.00	30.00	64.44	161.69	320.25	555.45
100.00	10.92	26.08	73.24	150.15	251.78
200.00	3.43	8.89	27.38	58.06	100.35
300.00	1.66	4.45	14.22	30.83	56.14
400.00	1.00	2.74	8.94	19.75	37.46
500.00	0.67	1.84	6.13	13.72	26.89
600.00	0.48	1.33	4.48	10.15	20.49
700.00	0.36	1.01	3.44	7.85	16.23
800.00	0.28	0.79	2.71	6.22	13.13
900.00	0.23	0.64	2.21	5.13	11.00
1000.00	0.19	0.53	1.84	4.30	9.33
1250.00	0.13	0.36	1.24	2.95	6.59
1500.00	0.09	0.26	0.91	2.17	4.97
1750.00	0.07	0.20	0.69	1.66	3.88
2000.00	0.05	0.15	0.54	1.31	3.10
2250.00	0.04	0.13	0.45	1.09	2.61
2500.00	0.04	0.11	0.37	0.90	2.19
3000.00	0.03	0.08	0.27	0.66	1.63
4000.00	0.02	0.05	0.17	0.42	1.05
5000.00	0.01	0.03	0.12	0.29	0.74
10000.00	0.00	0.01	0.04	0.10	0.26
15000.00	0.00	0.01	0.02	0.05	0.14
20000.00	0.00	0.00	0.01	0.04	0.10
X,m	28	29	30	31	32
25.00	348.89	795.51	47.40	98.91	172.71
50.00	220.72	534.08	23.60	55.55	103.47
100.00	115.84	302.74	9.39	25.14	50.30
200.00	49.71	144.24	3.15	9.28	19.86
300.00	27.71	86.32	1.56	4.79	10.58
400.00	18.16	59.25	0.96	2.99	6.76
500.00	12.82	43.45	0.64	2.05	4.68
600.00	9.60	33.51	0.47	1.50	3.45
700.00	7.50	26.85	0.36	1.15	2.66
800.00	5.98	21.98	0.28	0.90	2.11
900.00	4.95	18.55	0.23	0.74	1.73
1000.00	4.15	15.84	0.19	0.62	1.45
1250.00	2.87	11.32	0.13	0.42	0.99
1500.00	2.13	8.59	0.09	0.31	0.73
1750.00	1.65	6.76	0.07	0.23	0.56
2000.00	1.30	5.45	0.05	0.18	0.44
2250.00	1.09	4.61	0.05	0.15	0.37
2500.00	0.91	3.89	0.04	0.13	0.30
3000.00	0.67	2.94	0.03	0.09	0.22
4000.00	0.43	1.91	0.02	0.06	0.14
5000.00	0.30	1.36	0.01	0.04	0.10
10000.00	0.10	0.48	0.00	0.01	0.03
15000.00	0.06	0.27	0.00	0.01	0.02
20000.00	0.04	0.18	0.00	0.00	0.01

6	7	8	9	10	11
1861.83	50.69	95.72	204.22	371.73	663.99
862.09	22.39	47.60	115.03	222.32	408.92
377.44	8.08	19.13	52.36	108.42	206.00
167.70	2.53	6.47	19.67	43.22	86.15
103.67	1.24	3.23	10.25	23.24	47.98
74.41	0.75	1.98	6.45	14.87	31.55
57.29	0.50	1.34	4.42	10.32	22.44
46.02	0.36	0.97	3.24	7.62	16.88
38.16	0.27	0.73	2.49	5.88	13.23
32.25	0.21	0.57	1.95	4.64	10.61
27.96	0.17	0.47	1.60	3.82	8.83
24.55	0.14	0.39	1.33	3.19	7.45
18.59	0.10	0.26	0.90	2.18	5.18
14.65	0.07	0.19	0.66	1.60	3.86
11.91	0.05	0.14	0.50	1.22	2.99
9.89	0.04	0.11	0.39	0.96	2.38
8.57	0.03	0.09	0.33	0.80	1.99
7.39	0.03	0.08	0.27	0.66	1.66
5.76	0.02	0.06	0.20	0.49	1.23
3.92	0.01	0.04	0.12	0.31	0.79
2.87	0.01	0.02	0.08	0.21	0.55
1.11	0.00	0.01	0.03	0.07	0.19
0.63	0.00	0.00	0.02	0.04	0.10
0.41	0.00	0.00	0.01	0.03	0.07
33	34	35	36	37	38
303.23	689.57	42.20	87.68	152.89	267.79
191.91	467.33	20.95	49.32	91.58	169.96
100.76	270.74	8.35	22.31	44.49	89.13
42.94	130.24	2.80	8.22	17.54	37.81
23.91	78.16	1.39	4.25	9.34	21.03
15.63	53.70	0.85	2.65	5.94	13.73
11.03	39.22	0.57	1.81	4.12	9.68
8.26	30.24	0.41	1.33	3.04	7.24
6.45	24.18	0.32	1.02	2.34	5.63
5.14	19.69	0.25	0.80	1.85	4.48
4.26	16.56	0.20	0.66	1.53	3.72
3.58	14.12	0.17	0.55	1.27	3.13
2.47	10.06	0.11	0.37	0.87	2.17
1.83	7.62	0.08	0.27	0.64	1.61
1.42	5.99	0.06	0.21	0.49	1.24
1.12	4.81	0.05	0.16	0.39	0.98
0.94	4.06	0.04	0.14	0.32	0.82
0.78	3.41	0.03	0.11	0.27	0.68
0.58	2.56	0.02	0.08	0.20	0.51
0.37	1.67	0.02	0.05	0.12	0.32
0.26	1.18	0.01	0.04	0.09	0.23
0.09	0.42	0.00	0.01	0.03	0.08
0.05	0.23	0.00	0.01	0.02	0.04
0.03	0.15	0.00	0.00	0.01	0.03

12	13	14	15	16	17
1536.23	40.28	76.26	160.47	284.96	505.07
844.69	17.84	37.99	90.41	171.36	317.40
385.91	6.43	15.16	41.12	83.82	165.35
168.05	2.03	5.09	15.31	33.51	70.77
101.91	0.99	2.53	7.96	18.01	39.76
71.95	0.60	1.56	5.00	11.52	26.09
54.36	0.40	1.05	3.42	7.99	18.43
43.09	0.29	0.76	2.50	5.90	13.83
35.29	0.22	0.58	1.92	4.56	10.80
29.46	0.17	0.45	1.51	3.61	8.62
25.34	0.14	0.37	1.24	2.97	7.15
22.02	0.11	0.31	1.03	2.47	6.02
16.29	0.08	0.21	0.70	1.69	4.16
12.72	0.06	0.15	0.51	1.24	3.09
10.25	0.04	0.11	0.39	0.95	2.39
8.43	0.03	0.09	0.30	0.75	1.89
7.21	0.03	0.07	0.25	0.62	1.58
6.15	0.02	0.06	0.21	0.51	1.32
4.74	0.02	0.04	0.15	0.38	0.97
3.18	0.01	0.03	0.10	0.24	0.62
2.30	0.01	0.02	0.07	0.16	0.43
0.85	0.00	0.01	0.02	0.06	0.15
0.49	0.00	0.00	0.01	0.03	0.08
0.33	0.00	0.00	0.01	0.02	0.05
39	40	41	42	43	44
37.99	78.73	137.27	240.39	49.05	85.21
18.85	44.29	82.16	152.49	27.74	51.05
7.50	20.05	40.04	79.94	12.49	24.86
2.51	7.37	15.70	33.87	4.59	9.72
1.24	3.80	8.35	18.75	2.36	5.15
0.76	2.38	5.31	12.24	1.48	3.27
0.51	1.63	3.69	8.61	1.01	2.26
0.37	1.19	2.72	6.43	0.74	1.67
0.28	0.91	2.10	5.02	0.57	1.29
0.22	0.72	1.66	4.01	0.44	1.02
0.18	0.59	1.36	3.31	0.37	0.84
0.15	0.49	1.14	2.78	0.30	0.70
0.10	0.33	0.78	1.93	0.21	0.48
0.07	0.24	0.57	1.43	0.15	0.35
0.06	0.19	0.44	1.10	0.12	0.27
0.04	0.15	0.35	0.87	0.09	0.21
0.04	0.12	0.29	0.73	0.08	0.18
0.03	0.10	0.24	0.61	0.06	0.15
0.02	0.07	0.18	0.45	0.05	0.11
0.01	0.05	0.11	0.29	0.03	0.07
0.01	0.03	0.08	0.20	0.02	0.05
0.00	0.01	0.03	0.07	0.01	0.02
0.00	0.01	0.01	0.04	0.00	0.01
0.00	0.00	0.01	0.03	0.00	0.01

18	19	20	21	22	23
1179.11	33.70	63.39	132.80	233.63	411.91
733.66	14.84	31.49	74.67	140.07	260.06
372.44	5.34	12.58	33.85	68.46	136.47
166.13	1.69	4.23	12.56	27.21	58.68
99.22	0.83	2.10	6.49	14.59	32.75
68.94	0.50	1.29	4.08	9.32	21.54
51.35	0.34	0.87	2.79	6.47	15.21
40.24	0.24	0.63	2.04	4.78	11.40
32.67	0.18	0.48	1.57	3.69	8.91
27.02	0.14	0.37	1.23	2.92	7.12
22.98	0.11	0.30	1.01	2.40	5.90
19.79	0.09	0.25	0.84	2.00	4.95
14.40	0.06	0.17	0.57	1.37	3.41
11.10	0.05	0.12	0.42	1.01	2.53
8.86	0.03	0.09	0.32	0.77	1.96
7.22	0.03	0.07	0.25	0.61	1.55
6.15	0.02	0.06	0.21	0.51	1.30
5.21	0.02	0.05	0.17	0.42	1.08
3.96	0.01	0.04	0.13	0.31	0.80
2.63	0.01	0.02	0.08	0.19	0.51
1.88	0.01	0.02	0.05	0.13	0.35
0.68	0.00	0.01	0.02	0.05	0.12
0.38	0.00	0.00	0.01	0.02	0.07
0.26	0.00	0.00	0.01	0.02	0.04
45	46	47	48	49	50
39.18	67.95	45.21	33.79	103.30	200.75
22.09	40.80	27.12	20.30	46.33	100.42
9.98	19.84	13.19	9.89	17.02	40.90
3.65	7.76	5.17	3.87	5.40	13.99
1.89	4.10	2.74	2.05	2.60	6.98
1.18	2.62	1.74	1.30	1.57	4.30
0.81	1.81	1.20	0.90	1.04	2.90
0.59	1.33	0.89	0.66	0.75	2.10
0.45	1.03	0.68	0.51	0.57	1.60
0.36	0.81	0.54	0.41	0.44	1.24
0.29	0.67	0.45	0.33	0.36	1.01
0.24	0.56	0.37	0.28	0.29	0.84
0.16	0.38	0.25	0.19	0.20	0.56
0.12	0.28	0.19	0.14	0.14	0.41
0.09	0.22	0.14	0.11	0.11	0.31
0.07	0.17	0.11	0.09	0.08	0.24
0.06	0.14	0.09	0.07	0.07	0.20
0.05	0.12	0.08	0.06	0.06	0.16
0.04	0.09	0.06	0.04	0.04	0.12
0.02	0.06	0.04	0.03	0.03	0.07
0.02	0.04	0.03	0.02	0.02	0.05
0.01	0.01	0.01	0.01	0.01	0.02
0.00	0.01	0.00	0.00	0.00	0.01
0.00	0.00	0.00	0.00	0.00	0.01

24	25	26	27
946.21	54.34	113.25	198.38
621.98	27.02	63.69	118.94
340.86	10.76	28.86	57.93
157.34	3.62	10.65	22.94
93.91	1.79	5.50	12.25
64.80	1.10	3.45	7.83
47.69	0.74	2.36	5.42
37.01	0.53	1.73	4.01
29.81	0.41	1.33	3.10
24.43	0.32	1.04	2.44
20.69	0.26	0.85	2.01
17.74	0.22	0.71	1.68
12.75	0.15	0.48	1.15
9.74	0.11	0.35	0.84
7.72	0.08	0.27	0.65
6.25	0.06	0.21	0.51
5.30	0.05	0.18	0.42
4.47	0.04	0.15	0.35
3.39	0.03	0.11	0.26
2.22	0.02	0.07	0.16
1.58	0.01	0.05	0.11
0.57	0.00	0.02	0.04
0.32	0.00	0.01	0.02
0.21	0.00	0.01	0.01
51	52	53	54
616.50	1037.55	1491.47	1687.29
322.22	505.37	662.86	1018.47
122.36	199.71	271.48	450.46
40.94	73.44	109.40	191.01
20.81	39.82	63.34	116.47
13.06	25.90	43.52	82.00
8.98	18.36	32.12	63.19
6.60	13.82	24.96	50.94
5.09	10.85	20.12	42.39
4.02	8.70	16.55	36.06
3.30	7.23	14.05	31.48
2.75	6.10	12.06	27.63
1.88	4.26	8.71	21.22
1.38	3.18	6.68	16.93
1.06	2.46	5.31	13.98
0.83	1.95	4.29	11.79
0.69	1.64	3.65	10.21
0.57	1.36	3.09	8.95
0.42	1.01	2.34	7.10
0.27	0.64	1.53	4.85
0.18	0.45	1.09	3.68
0.06	0.15	0.40	1.46
0.03	0.09	0.22	0.77
0.02	0.06	0.14	0.47

X,m	Max concentration, ppm
25.00	1861.83
50.00	1018.47
100.00	450.46
200.00	191.01
300.00	116.47
400.00	82.00
500.00	63.19
600.00	50.94
700.00	42.39
800.00	36.06
900.00	31.48
1000.00	27.63
1250.00	21.22
1500.00	16.93
1750.00	13.98
2000.00	11.79
2250.00	10.21
2500.00	8.95
3000.00	7.10
4000.00	4.85
5000.00	3.68
10000.00	1.46
15000.00	0.77
20000.00	0.47

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:	RUN66.OUT
Scenario:	CONSERV
Accident Location:	OFFSITE
Duration:	UNMITIG
Meteorology:	INVERSN
Chemical:	ACETONE
Vapor phase mole fraction:	0.274
LOC:	1960.000
IDLH:	2442.000

X,m	Max concentration, ppm
25.00	3188.68
50.00	1676.45
100.00	802.96
200.00	351.70
300.00	213.25
400.00	149.28
500.00	112.46
600.00	88.30
700.00	73.32
800.00	61.56
900.00	52.43
1000.00	45.80
1250.00	33.98
1500.00	26.29
1750.00	21.31
2000.00	17.80
2250.00	14.77
2500.00	12.96
3000.00	9.92
4000.00	6.46
5000.00	4.59

Concentration (ppm)		Distance to (m)
LOC	1960.0000	45.31
IDLH	2442.0000	37.34

From Slab output file:	RUN67.OUT
Scenario:	TYPICAL
Accident Location:	OFFSITE
Duration:	UNMITIG
Meteorology:	TYPICAL
Chemical:	FORMALDEHYDE
Vapor phase mole fraction:	0.482
LOC:	9.600
IDLH:	19.600

X,m	Max concentration, ppm
25.00	178.57
50.00	71.38
100.00	24.74
200.00	7.76
300.00	3.84
400.00	2.29
500.00	1.54
600.00	1.12
700.00	0.86
800.00	0.69
900.00	0.55
1000.00	0.46
1250.00	0.31
1500.00	0.22
1750.00	0.17
2000.00	0.13
2250.00	0.11
2500.00	0.09
3000.00	0.06
4000.00	0.04
5000.00	0.03

Concentration (ppm)		Distance to (m)
LOC	9.6000	189.15
IDLH	19.6000	130.28

From Slab output file:			RUN68.OUT		
Scenario:			TYPICAL		
Accident Location:			OFFSITE		
Duration:			UNMITIG		
Meteorology:			WORST		
Chemical:			FORMALDEHYDE		
Vapor phase mole fraction:			0.482		
LOC:			9.600		
IDLH:			19.600		
X,m	1	2	3	4	5
25.00	43.32	89.32	210.76	385.74	681.57
50.00	13.49	30.43	79.25	156.86	296.27
100.00	3.87	9.33	26.06	54.92	112.08
200.00	1.05	2.64	7.82	17.39	37.94
300.00	0.49	1.24	3.80	8.60	19.45
400.00	0.28	0.72	2.23	5.11	11.33
500.00	0.18	0.47	1.49	3.43	7.32
600.00	0.13	0.33	1.07	2.38	5.29
700.00	0.10	0.25	0.80	1.80	4.03
800.00	0.08	0.19	0.62	1.40	3.09
900.00	0.06	0.15	0.49	1.09	2.54
1000.00	0.05	0.13	0.41	0.93	2.06
1250.00	0.03	0.08	0.27	0.61	1.37
1500.00	0.02	0.06	0.19	0.43	0.99
1750.00	0.02	0.04	0.14	0.32	0.77
2000.00	0.01	0.03	0.11	0.26	0.59
2250.00	0.01	0.03	0.09	0.21	0.49
2500.00	0.01	0.02	0.07	0.17	0.40
3000.00	0.01	0.02	0.05	0.12	0.29
4000.00	0.00	0.01	0.03	0.07	0.17
5000.00	0.00	0.01	0.02	0.05	0.11
X,m	28	29	30	31	32
25.00	296.96	711.41	33.45	78.03	142.85
50.00	128.40	349.84	11.42	29.07	57.20
100.00	47.37	146.46	3.49	9.54	19.72
200.00	15.64	53.81	0.99	2.85	6.17
300.00	7.95	28.82	0.47	1.38	3.06
400.00	4.84	18.04	0.27	0.81	1.82
500.00	3.30	12.59	0.18	0.54	1.23
600.00	2.41	9.35	0.12	0.39	0.89
700.00	1.87	7.34	0.10	0.30	0.69
800.00	1.50	5.80	0.08	0.24	0.55
900.00	1.21	4.53	0.06	0.19	0.44
1000.00	1.02	3.80	0.05	0.16	0.37
1250.00	0.67	2.50	0.03	0.11	0.25
1500.00	0.48	1.81	0.02	0.08	0.18
1750.00	0.37	1.35	0.02	0.06	0.14
2000.00	0.28	1.09	0.01	0.05	0.11
2250.00	0.23	0.88	0.01	0.04	0.09
2500.00	0.19	0.74	0.01	0.03	0.07
3000.00	0.14	0.54	0.01	0.02	0.05
4000.00	0.09	0.33	0.00	0.01	0.03
5000.00	0.06	0.23	0.00	0.01	0.02

6	7	8	9	10	11
1277.30	32.46	66.98	157.00	287.62	519.57
580.01	10.11	22.83	58.71	116.30	226.95
249.24	2.90	6.98	19.24	40.50	85.11
99.28	0.79	1.98	5.76	12.73	28.45
50.52	0.37	0.93	2.80	6.30	14.50
32.05	0.21	0.54	1.65	3.75	8.77
22.35	0.14	0.35	1.10	2.52	5.98
16.47	0.10	0.25	0.79	1.82	4.14
12.73	0.07	0.19	0.60	1.40	3.15
10.34	0.06	0.15	0.48	1.10	2.46
8.34	0.05	0.12	0.37	0.86	1.93
7.09	0.04	0.10	0.31	0.72	1.62
4.83	0.02	0.06	0.20	0.47	1.08
3.45	0.02	0.05	0.15	0.34	0.78
2.72	0.01	0.03	0.11	0.25	0.58
2.09	0.01	0.03	0.08	0.19	0.47
1.74	0.01	0.02	0.07	0.16	0.37
1.38	0.01	0.02	0.06	0.13	0.31
1.02	0.00	0.01	0.04	0.10	0.23
0.59	0.00	0.01	0.03	0.06	0.14
0.39	0.00	0.01	0.02	0.04	0.09
33	34	35	36	37	38
259.32	625.57	29.74	69.45	126.67	230.70
112.28	306.99	10.14	25.79	50.84	99.59
41.30	128.15	3.10	8.49	17.49	36.60
13.61	46.71	0.88	2.53	5.46	12.06
6.94	25.00	0.41	1.23	2.71	6.12
4.21	15.67	0.24	0.72	1.62	3.73
2.87	10.90	0.16	0.48	1.09	2.55
2.10	8.11	0.11	0.35	0.79	1.86
1.63	6.36	0.08	0.27	0.61	1.45
1.31	5.15	0.07	0.21	0.49	1.16
1.06	4.18	0.05	0.17	0.39	0.94
0.89	3.47	0.04	0.14	0.33	0.79
0.61	2.27	0.03	0.09	0.22	0.54
0.44	1.63	0.02	0.07	0.16	0.40
0.33	1.23	0.02	0.05	0.13	0.30
0.26	0.96	0.01	0.04	0.10	0.24
0.21	0.80	0.01	0.03	0.08	0.19
0.17	0.66	0.01	0.03	0.07	0.16
0.12	0.49	0.01	0.02	0.05	0.11
0.08	0.30	0.00	0.01	0.03	0.07
0.05	0.20	0.00	0.01	0.02	0.05

12	13	14	15	16	17
1135.47	25.96	53.68	125.59	229.52	415.69
536.17	8.10	18.27	46.69	92.36	181.09
227.08	2.32	5.57	15.27	31.95	67.44
87.35	0.63	1.58	4.57	10.04	22.39
48.16	0.29	0.74	2.23	4.96	11.41
28.83	0.17	0.43	1.31	2.96	6.93
19.12	0.11	0.28	0.88	1.99	4.69
14.09	0.08	0.20	0.63	1.44	3.44
10.81	0.06	0.15	0.48	1.11	2.67
8.30	0.05	0.12	0.38	0.88	2.10
6.98	0.04	0.10	0.31	0.71	1.64
5.67	0.03	0.08	0.26	0.59	1.37
3.85	0.02	0.05	0.17	0.38	0.90
2.85	0.01	0.04	0.12	0.28	0.65
2.16	0.01	0.03	0.09	0.21	0.48
1.71	0.01	0.02	0.07	0.16	0.38
1.40	0.01	0.02	0.06	0.13	0.31
1.17	0.01	0.01	0.05	0.11	0.26
0.85	0.00	0.01	0.03	0.08	0.19
0.50	0.00	0.01	0.02	0.05	0.11
0.34	0.00	0.00	0.01	0.03	0.08
39	40	41	42	43	44
26.75	62.31	114.26	207.36	39.00	70.96
9.11	23.20	45.61	89.35	14.49	28.45
2.79	7.64	15.74	32.89	4.77	9.81
0.79	2.28	4.93	10.83	1.42	3.07
0.37	1.11	2.44	5.53	0.69	1.52
0.21	0.65	1.46	3.35	0.41	0.91
0.14	0.44	0.98	2.28	0.27	0.61
0.10	0.31	0.71	1.67	0.20	0.44
0.08	0.24	0.55	1.30	0.15	0.34
0.06	0.19	0.44	1.04	0.12	0.27
0.05	0.15	0.35	0.84	0.10	0.22
0.04	0.13	0.29	0.71	0.08	0.18
0.03	0.09	0.20	0.48	0.05	0.12
0.02	0.06	0.15	0.36	0.04	0.09
0.01	0.05	0.11	0.28	0.03	0.07
0.01	0.04	0.09	0.22	0.02	0.06
0.01	0.03	0.07	0.18	0.02	0.05
0.01	0.03	0.06	0.15	0.02	0.04
0.01	0.02	0.04	0.11	0.01	0.03
0.00	0.01	0.03	0.06	0.01	0.02
0.00	0.01	0.02	0.04	0.00	0.01

18	19	20	21	22	23
964.41	21.64	44.61	104.17	190.94	346.54
469.61	6.72	15.24	38.81	76.27	150.36
197.52	1.94	4.65	12.73	26.46	55.72
74.27	0.52	1.32	3.81	8.28	18.42
40.14	0.24	0.62	1.85	4.10	9.36
25.34	0.14	0.36	1.09	2.45	5.69
16.54	0.09	0.23	0.73	1.65	3.88
11.84	0.06	0.17	0.52	1.19	2.83
9.13	0.05	0.13	0.40	0.92	2.20
7.09	0.04	0.10	0.32	0.73	1.76
5.79	0.03	0.08	0.25	0.59	1.42
4.74	0.03	0.07	0.21	0.49	1.18
3.17	0.02	0.04	0.14	0.32	0.77
2.32	0.01	0.03	0.10	0.23	0.55
1.81	0.01	0.02	0.08	0.18	0.42
1.40	0.01	0.02	0.06	0.14	0.32
1.17	0.01	0.01	0.05	0.11	0.27
0.94	0.00	0.01	0.04	0.09	0.21
0.71	0.00	0.01	0.03	0.07	0.16
0.42	0.00	0.01	0.02	0.04	0.10
0.29	0.00	0.00	0.01	0.03	0.07
45	46	47	48	49	50
31.58	56.67	37.85	28.62	64.99	133.02
11.69	22.73	15.15	11.39	20.21	45.47
3.84	7.84	5.23	3.93	5.81	13.95
1.14	2.45	1.63	1.23	1.58	3.95
0.55	1.22	0.81	0.61	0.73	1.86
0.33	0.72	0.48	0.36	0.42	1.07
0.22	0.49	0.33	0.24	0.26	0.69
0.16	0.35	0.24	0.18	0.18	0.47
0.12	0.27	0.18	0.14	0.14	0.36
0.10	0.22	0.15	0.11	0.10	0.28
0.08	0.18	0.12	0.09	0.08	0.22
0.06	0.15	0.10	0.07	0.07	0.18
0.04	0.10	0.07	0.05	0.04	0.12
0.03	0.07	0.05	0.04	0.03	0.09
0.02	0.06	0.04	0.03	0.02	0.06
0.02	0.04	0.03	0.02	0.02	0.05
0.02	0.04	0.02	0.02	0.01	0.04
0.01	0.03	0.02	0.02	0.01	0.03
0.01	0.02	0.02	0.01	0.01	0.02
0.01	0.01	0.01	0.01	0.01	0.01
0.00	0.01	0.01	0.00	0.00	0.01

24	25	26	27
825.86	38.24	89.42	163.33
403.50	13.03	33.23	65.48
169.90	3.99	10.90	22.59
62.77	1.13	3.26	7.04
33.75	0.53	1.58	3.50
21.20	0.31	0.93	2.09
14.79	0.20	0.62	1.41
10.95	0.14	0.45	1.02
8.23	0.11	0.34	0.78
6.46	0.09	0.27	0.63
5.04	0.07	0.22	0.50
4.28	0.06	0.18	0.42
2.86	0.04	0.12	0.29
2.05	0.03	0.09	0.20
1.53	0.02	0.07	0.15
1.24	0.02	0.05	0.12
0.98	0.01	0.04	0.10
0.85	0.01	0.04	0.08
0.61	0.01	0.03	0.06
0.38	0.00	0.02	0.04
0.26	0.00	0.01	0.02
51	52	53	54
319.24	571.39	895.39	1233.92
120.82	230.17	375.41	560.27
40.21	81.73	145.17	256.16
12.13	26.18	50.96	95.44
5.87	12.86	24.58	56.14
3.34	7.27	14.90	37.29
2.14	4.74	10.09	27.29
1.52	3.41	7.29	20.97
1.15	2.57	5.40	16.28
0.89	1.96	4.39	13.41
0.71	1.62	3.48	10.91
0.59	1.30	2.96	9.33
0.38	0.85	1.98	6.36
0.27	0.62	1.40	4.52
0.20	0.47	1.05	3.48
0.16	0.36	0.84	2.71
0.13	0.30	0.66	2.20
0.11	0.24	0.56	1.77
0.08	0.17	0.39	1.25
0.05	0.10	0.23	0.70
0.03	0.07	0.15	0.45

X,m	Max concentration, ppm
25.00	1277.30
50.00	580.01
100.00	256.16
200.00	99.28
300.00	56.14
400.00	37.29
500.00	27.29
600.00	20.97
700.00	16.28
800.00	13.41
900.00	10.91
1000.00	9.33
1250.00	6.36
1500.00	4.52
1750.00	3.48
2000.00	2.71
2250.00	2.20
2500.00	1.77
3000.00	1.25
4000.00	0.70
5000.00	0.45

Concentration (ppm)		Distance to (m)
LOC	9.6000	982.84
IDLH	19.6000	629.22

From Slab output file:	RUN69.OUT
Scenario:	TYPICAL
Accident Location:	OFFSITE
Duration:	UNMITIG
Meteorology:	INVERSN
Chemical:	FORMALDEHYDE
Vapor phase mole fraction:	0.482
LOC:	9.600
IDLH:	19.600

X,m	Max concentration, ppm
25.00	1130.37
50.00	552.61
100.00	276.05
200.00	140.62
300.00	93.94
400.00	69.90
500.00	54.61
600.00	44.01
700.00	35.95
800.00	29.93
900.00	25.46
1000.00	21.60
1250.00	15.28
1500.00	11.41
1750.00	8.78
2000.00	6.84
2250.00	5.49
2500.00	4.53
3000.00	3.16
4000.00	1.79
5000.00	1.13

Concentration (ppm)		Distance to (m)
LOC	9.6000	1671.96
IDLH	19.6000	1078.99

From Slab output file:	RUN70.OUT
Scenario:	TYPICAL
Accident Location:	OFFSITE
Duration:	UNMITIG
Meteorology:	TYPICAL
Chemical:	ACETONE
Vapor phase mole fraction:	0.276
LOC:	1960.000
IDLH:	2442.000

X,m	Max concentration, ppm
25.00	41.15
50.00	15.85
100.00	5.35
200.00	1.65
300.00	0.81
400.00	0.48
500.00	0.32
600.00	0.23
700.00	0.18
800.00	0.14
900.00	0.11
1000.00	0.10
1250.00	0.06
1500.00	0.05
1750.00	0.04
2000.00	0.03
2250.00	0.02
2500.00	0.02
3000.00	0.01
4000.00	0.01
5000.00	0.01

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:			RUN71.OUT		
Scenario:			TYPICAL		
Accident Location:			OFFSITE		
Duration:			UNMITIG		
Meteorology:			WORST		
Chemical:			ACETONE		
Vapor phase mole fraction:			0.276		
LOC:			1960.000		
IDLH:			2442.000		
X,m	1	2	3	4	5
25.00	9.34	19.47	48.75	89.68	144.78
50.00	2.87	6.51	17.85	35.26	59.56
100.00	0.82	1.96	5.78	12.09	22.43
200.00	0.22	0.55	1.71	3.76	7.73
300.00	0.10	0.26	0.82	1.86	4.01
400.00	0.06	0.15	0.48	1.10	2.46
500.00	0.04	0.10	0.32	0.74	1.69
600.00	0.03	0.07	0.23	0.53	1.24
700.00	0.02	0.05	0.17	0.41	0.96
800.00	0.02	0.04	0.14	0.32	0.77
900.00	0.01	0.03	0.11	0.26	0.62
1000.00	0.01	0.03	0.09	0.22	0.52
1250.00	0.01	0.02	0.06	0.15	0.36
1500.00	0.00	0.01	0.04	0.11	0.26
1750.00	0.00	0.01	0.03	0.08	0.20
2000.00	0.00	0.01	0.03	0.06	0.16
2250.00	0.00	0.01	0.02	0.05	0.13
2500.00	0.00	0.01	0.02	0.04	0.11
3000.00	0.00	0.00	0.01	0.03	0.08
4000.00	0.00	0.00	0.01	0.02	0.05
5000.00	0.00	0.00	0.01	0.01	0.04
X,m	28	29	30	31	32
25.00	68.76	163.37	7.34	17.59	32.70
50.00	28.81	77.04	2.45	6.28	12.55
100.00	10.40	31.56	0.74	2.00	4.21
200.00	3.39	11.55	0.21	0.59	1.30
300.00	1.71	6.16	0.10	0.29	0.64
400.00	1.03	3.85	0.06	0.17	0.38
500.00	0.70	2.69	0.04	0.11	0.26
600.00	0.51	1.99	0.03	0.08	0.18
700.00	0.40	1.56	0.02	0.06	0.14
800.00	0.32	1.26	0.02	0.05	0.11
900.00	0.25	1.03	0.01	0.04	0.09
1000.00	0.21	0.87	0.01	0.03	0.08
1250.00	0.15	0.61	0.01	0.02	0.05
1500.00	0.11	0.45	0.00	0.02	0.04
1750.00	0.08	0.35	0.00	0.01	0.03
2000.00	0.07	0.28	0.00	0.01	0.02
2250.00	0.05	0.23	0.00	0.01	0.02
2500.00	0.05	0.20	0.00	0.01	0.02
3000.00	0.03	0.15	0.00	0.00	0.01
4000.00	0.02	0.09	0.00	0.00	0.01
5000.00	0.01	0.07	0.00	0.00	0.00

6	7	8	9	10	11
202.45	7.01	14.69	35.94	67.05	118.93
92.62	2.15	4.88	13.03	26.31	50.05
42.14	0.61	1.47	4.20	9.00	18.43
18.19	0.16	0.41	1.24	2.77	6.10
10.78	0.08	0.19	0.60	1.36	3.10
7.22	0.04	0.11	0.35	0.81	1.88
5.27	0.03	0.07	0.23	0.54	1.28
4.05	0.02	0.05	0.17	0.39	0.93
3.26	0.01	0.04	0.13	0.30	0.72
2.69	0.01	0.03	0.10	0.24	0.58
2.23	0.01	0.02	0.08	0.19	0.46
1.92	0.01	0.02	0.07	0.16	0.39
1.36	0.01	0.01	0.04	0.11	0.26
1.03	0.00	0.01	0.03	0.08	0.19
0.82	0.00	0.01	0.02	0.06	0.15
0.66	0.00	0.01	0.02	0.05	0.12
0.55	0.00	0.00	0.02	0.04	0.10
0.47	0.00	0.00	0.01	0.03	0.08
0.36	0.00	0.00	0.01	0.02	0.06
0.22	0.00	0.00	0.01	0.01	0.04
0.15	0.00	0.00	0.00	0.01	0.03
33	34	35	36	37	38
60.02	145.65	6.58	15.63	28.89	53.20
25.01	68.95	2.18	5.58	11.12	22.13
9.01	28.21	0.66	1.78	3.74	7.93
2.93	10.20	0.18	0.53	1.15	2.58
1.47	5.42	0.09	0.25	0.56	1.30
0.89	3.37	0.05	0.15	0.34	0.78
0.61	2.35	0.03	0.10	0.23	0.53
0.44	1.74	0.02	0.07	0.16	0.39
0.34	1.36	0.02	0.05	0.13	0.30
0.27	1.10	0.01	0.04	0.10	0.24
0.22	0.90	0.01	0.03	0.08	0.19
0.19	0.76	0.01	0.03	0.07	0.16
0.13	0.53	0.01	0.02	0.05	0.11
0.09	0.39	0.00	0.01	0.03	0.08
0.07	0.30	0.00	0.01	0.03	0.06
0.06	0.24	0.00	0.01	0.02	0.05
0.05	0.20	0.00	0.01	0.02	0.04
0.04	0.17	0.00	0.01	0.01	0.04
0.03	0.13	0.00	0.00	0.01	0.03
0.02	0.08	0.00	0.00	0.01	0.02
0.01	0.06	0.00	0.00	0.00	0.01

12	13	14	15	16	17
211.19	5.62	11.75	28.32	53.13	96.58
94.63	1.72	3.93	10.23	20.66	40.82
40.85	0.49	1.18	3.28	7.03	14.93
16.45	0.13	0.33	0.97	2.17	4.88
9.34	0.06	0.15	0.47	1.06	2.46
6.07	0.03	0.09	0.27	0.63	1.49
4.35	0.02	0.06	0.18	0.42	1.01
3.28	0.02	0.04	0.13	0.31	0.73
2.61	0.01	0.03	0.10	0.23	0.57
2.14	0.01	0.02	0.08	0.19	0.45
1.76	0.01	0.02	0.06	0.15	0.37
1.50	0.01	0.02	0.05	0.12	0.31
1.05	0.00	0.01	0.04	0.08	0.21
0.79	0.00	0.01	0.03	0.06	0.15
0.62	0.00	0.01	0.02	0.05	0.12
0.50	0.00	0.00	0.02	0.04	0.09
0.41	0.00	0.00	0.01	0.03	0.08
0.35	0.00	0.00	0.01	0.03	0.06
0.26	0.00	0.00	0.01	0.02	0.05
0.17	0.00	0.00	0.00	0.01	0.03
0.12	0.00	0.00	0.00	0.01	0.02
39	40	41	42	43	44
6.04	14.05	26.02	48.01	8.90	16.21
1.99	5.02	9.97	19.83	3.17	6.19
0.59	1.61	3.35	7.08	1.01	2.08
0.17	0.47	1.03	2.29	0.30	0.64
0.08	0.23	0.51	1.16	0.14	0.31
0.04	0.13	0.30	0.70	0.08	0.19
0.03	0.09	0.20	0.48	0.06	0.13
0.02	0.06	0.15	0.35	0.04	0.09
0.02	0.05	0.11	0.27	0.03	0.07
0.01	0.04	0.09	0.22	0.02	0.06
0.01	0.03	0.07	0.17	0.02	0.04
0.01	0.03	0.06	0.15	0.02	0.04
0.01	0.02	0.04	0.10	0.01	0.03
0.00	0.01	0.03	0.07	0.01	0.02
0.00	0.01	0.02	0.06	0.01	0.01
0.00	0.01	0.02	0.05	0.00	0.01
0.00	0.01	0.01	0.04	0.00	0.01
0.00	0.01	0.01	0.03	0.00	0.01
0.00	0.00	0.01	0.02	0.00	0.01
0.00	0.00	0.01	0.01	0.00	0.00
0.00	0.00	0.00	0.01	0.00	0.00

18	19	20	21	22	23
202.02	4.67	9.79	23.58	43.87	80.49
92.13	1.43	3.26	8.47	16.97	33.84
38.46	0.41	0.98	2.70	5.75	12.32
14.72	0.11	0.28	0.80	1.77	4.01
8.11	0.05	0.13	0.39	0.87	2.02
5.17	0.03	0.07	0.23	0.52	1.22
3.67	0.02	0.05	0.15	0.35	0.83
2.73	0.01	0.03	0.11	0.25	0.60
2.16	0.01	0.03	0.08	0.19	0.47
1.76	0.01	0.02	0.07	0.15	0.37
1.44	0.01	0.02	0.05	0.12	0.30
1.22	0.01	0.01	0.04	0.10	0.25
0.85	0.00	0.01	0.03	0.07	0.17
0.63	0.00	0.01	0.02	0.05	0.13
0.50	0.00	0.00	0.02	0.04	0.10
0.40	0.00	0.00	0.01	0.03	0.08
0.33	0.00	0.00	0.01	0.02	0.06
0.28	0.00	0.00	0.01	0.02	0.05
0.21	0.00	0.00	0.01	0.02	0.04
0.13	0.00	0.00	0.00	0.01	0.02
0.09	0.00	0.00	0.00	0.01	0.02
45	46	47	48	49	50
7.10	12.97	8.69	6.51	13.94	30.18
2.53	4.96	3.31	2.48	4.30	9.91
0.81	1.66	1.11	0.83	1.22	2.96
0.24	0.51	0.34	0.25	0.33	0.83
0.11	0.25	0.17	0.13	0.15	0.39
0.07	0.15	0.10	0.07	0.09	0.22
0.04	0.10	0.07	0.05	0.06	0.15
0.03	0.07	0.05	0.04	0.04	0.10
0.02	0.06	0.04	0.03	0.03	0.08
0.02	0.04	0.03	0.02	0.02	0.06
0.02	0.04	0.02	0.02	0.02	0.05
0.01	0.03	0.02	0.02	0.02	0.04
0.01	0.02	0.01	0.01	0.01	0.03
0.01	0.01	0.01	0.01	0.01	0.02
0.00	0.01	0.01	0.01	0.01	0.02
0.00	0.01	0.01	0.00	0.00	0.01
0.00	0.01	0.00	0.00	0.00	0.01
0.00	0.01	0.00	0.00	0.00	0.01
0.00	0.00	0.00	0.00	0.00	0.01
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00

24	25	26	27
183.28	8.40	20.15	37.34
85.42	2.80	7.20	14.42
35.14	0.84	2.30	4.86
13.05	0.24	0.68	1.50
7.06	0.11	0.33	0.74
4.44	0.06	0.19	0.44
3.13	0.04	0.13	0.29
2.31	0.03	0.09	0.21
1.82	0.02	0.07	0.16
1.48	0.02	0.06	0.13
1.20	0.01	0.04	0.10
1.02	0.01	0.04	0.09
0.71	0.01	0.03	0.06
0.53	0.01	0.02	0.04
0.41	0.00	0.01	0.03
0.33	0.00	0.01	0.03
0.27	0.00	0.01	0.02
0.23	0.00	0.01	0.02
0.17	0.00	0.01	0.01
0.11	0.00	0.00	0.01
0.08	0.00	0.00	0.01
51	52	53	54
73.22	118.75	151.02	54.32
26.40	45.36	63.43	31.24
8.60	16.22	26.02	18.45
2.59	5.33	9.85	10.80
1.25	2.70	5.37	7.66
0.74	1.63	3.40	5.87
0.49	1.11	2.39	4.73
0.35	0.80	1.78	3.90
0.27	0.62	1.40	3.29
0.21	0.49	1.13	2.79
0.17	0.40	0.92	2.45
0.14	0.33	0.78	2.15
0.09	0.22	0.54	1.63
0.07	0.16	0.39	1.28
0.05	0.13	0.31	1.04
0.04	0.10	0.25	0.86
0.03	0.08	0.20	0.73
0.03	0.07	0.17	0.60
0.02	0.05	0.13	0.45
0.01	0.03	0.08	0.28
0.01	0.02	0.05	0.19

X,m	Max concentration, ppm
25.00	211.19
50.00	94.63
100.00	42.14
200.00	18.19
300.00	10.78
400.00	7.22
500.00	5.27
600.00	4.05
700.00	3.29
800.00	2.79
900.00	2.45
1000.00	2.15
1250.00	1.63
1500.00	1.28
1750.00	1.04
2000.00	0.86
2250.00	0.73
2500.00	0.60
3000.00	0.45
4000.00	0.28
5000.00	0.19

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:	RUN72.OUT
Scenario:	TYPICAL
Accident Location:	OFFSITE
Duration:	UNMITIG
Meteorology:	INVERSN
Chemical:	ACETONE
Vapor phase mole fraction:	0.276
LOC:	1960.000
IDLH:	2442.000

X,m	Max concentration, ppm
25.00	364.49
50.00	166.35
100.00	76.63
200.00	36.12
300.00	23.15
400.00	17.15
500.00	13.38
600.00	10.83
700.00	9.08
800.00	7.77
900.00	6.64
1000.00	5.87
1250.00	4.36
1500.00	3.37
1750.00	2.67
2000.00	2.20
2250.00	1.83
2500.00	1.54
3000.00	1.15
4000.00	0.69
5000.00	0.46

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

From Slab output file:	RUNA7.OUT
Scenario:	TYPICAL
Accident Location:	OFFSITE
Duration:	UNMITIG
Meteorology:	INVERSN
Chemical:	ACETONE
Vapor phase mole fraction:	0.276
LOC:	1960.000
IDLH:	2442.000

X,m	Max concentration, ppm
25.00	18.00
50.00	8.87
100.00	4.94
200.00	2.91
300.00	2.16
400.00	1.72
500.00	1.45
600.00	1.24
700.00	1.08
800.00	0.94
900.00	0.83
1000.00	0.74
1250.00	0.56
1500.00	0.44
1750.00	0.34
2000.00	0.28
2250.00	0.23
2500.00	0.19
3000.00	0.14
4000.00	0.08
5000.00	0.05
10000.00	0.01
15000.00	0.01
20000.00	0.00

Concentration (ppm)		Distance to (m)	
LOC	1960.0000	less than	25.00
IDLH	2442.0000	less than	25.00

ATTACHMENT 4

ISC-COMPDEP Outputs Using Screening Meteorology

A. On-Site Fire Scenario

```
CO STARTING
   TITLEONE  WTI Storage Tank Rupture,  Screen Modeling -- ONSITE ORG. TANK
   TITLETWO  1 Point source; 26 receptors up to 50KM away; Vapor.
   MODELOPT  NOSTD  GRDRIS  RURAL  CONC
   AVERTIME  1
   POLLUTID  Fugitive
   TERRHGTS  ELEV
   ELEVUNIT  METERS
   RUNORNOT  RUN
   ERRORFIL  ONSITE.ERR
CO FINISHED

SO STARTING
   LOCATION  ONSITE POINT    186.385 105.445 212.1
** Point Source          QS    HS    TS    VS     DS
** Parameters:          ----  ----  ----  ----   ---
SO SRCPARAM  ONSITE   1.0   23.0  997.  0.225   15.14
** SO SRCPARAM  ONSITE   1.0   23.0  997.  0.075   26.22

SO BUILDHGT ONSITE     17.37   17.37   17.37   17.37   17.37   17.37
SO BUILDHGT ONSITE     17.37   17.37   17.37   17.37   17.37   17.37
SO BUILDHGT ONSITE     17.37   17.37   17.37   17.37   17.37   17.37
SO BUILDHGT ONSITE     17.37   17.37   17.37   17.37   17.37   17.37
SO BUILDHGT ONSITE     17.37   17.37   17.37   17.37   17.37   17.37
SO BUILDHGT ONSITE     17.37   17.37   17.37   17.37   17.37   17.37
SO BUILDWID ONSITE     18.23   18.23   18.23   18.23   18.23   18.23
SO BUILDWID ONSITE     18.23   18.23   18.23   18.23   18.23   18.23
SO BUILDWID ONSITE     18.23   18.23   18.23   18.23   18.23   18.23
SO BUILDWID ONSITE     18.23   18.23   18.23   18.23   18.23   18.23
SO BUILDWID ONSITE     18.23   18.23   18.23   18.23   18.23   18.23
SO BUILDWID ONSITE     18.23   18.23   18.23   18.23   18.23   18.23

SO SRCGROUP ALL
SO FINISHED

RE STARTING
RE DISCCART     100.00000      0.00000   213.4
RE DISCCART     200.00000      0.00000   225.6
RE DISCCART     300.00000      0.00000   231.6
RE DISCCART     400.00000      0.00000   231.6
RE DISCCART     500.00000      0.00000   268.2
RE DISCCART     600.00000      0.00000   304.8
RE DISCCART     700.00000      0.00000   323.1
RE DISCCART     800.00000      0.00000   353.6
RE DISCCART     900.00000      0.00000   353.6
RE DISCCART    1000.00000      0.00000   353.6
RE DISCCART    1250.00000      0.00000   359.7
RE DISCCART    1500.00000      0.00000   365.8
RE DISCCART    1750.00000      0.00000   365.8
RE DISCCART    2000.00000      0.00000   371.9
RE DISCCART    2250.00000      0.00000   384.0
RE DISCCART    2500.00000      0.00000   384.0
RE DISCCART    3000.00000      0.00000   408.4
RE DISCCART    4000.00000      0.00000   420.6
RE DISCCART    5000.00000      0.00000   415.4
RE DISCCART    7500.00000      0.00000   408.4
RE DISCCART   10000.00000      0.00000   426.7
RE DISCCART   15000.00000      0.00000   420.0
RE DISCCART   20000.00000      0.00000   420.0
RE DISCCART   30000.00000      0.00000   420.0
RE DISCCART   40000.00000      0.00000   420.0
RE DISCCART   50000.00000      0.00000   420.0
```

```
RE FINISHED

ME STARTING
ME INPUTFIL  SCREEN.MET
ME ANEMHGHT  10.0 METERS
ME SURFDATA  94823  1993
ME UAIRDATA  94823  1993
** ME PROFFILE TEMPS ISC_TEMP.STK
** ME PROFFILE WINDS ISC_WIND.STK
** DAYRANGE  1/3
ME FINISHED

TG STARTING
**   INPUTFIL  wti100k.out
**   LOCATION  538.4 4497.8 km
TG FINISHED

OU STARTING
   RECTABLE  ALLAVE  FIRST-SECOND
   DAYTABLE ALLAVE
   MAXTABLE  ALLAVE  50
**   MAXIFILE   3  ALL  30.0   MAXIALL.FIL   25
**   MAXIFILE  24  ALL  10.0   MAXIALL.FIL   25
**   POSTFILE  1  ALL  INDIV POST2C.BIN    20
**   POSTFILE  PERIOD ALL PLOT PSTANALL.FIL  21
** Note that the following two input cards generate PLOTFILEs with the file
** unit dynamically allocated by the ISCST2 program.  When porting the model
** to another computer system, the user may need to specify the file units
** as is done on the previous four input cards.
**   PLOTFILE   3  ALL  2ND    PLT03ALL.FIL
**   PLOTFILE  24  ALL  2ND    PLT24ALL.FIL
** OU PLOTFILE 1 ALL 1ST ONSITE.PL1
OU PLOTFILE 1 ALL 1ST ONSITE.PLT
OU FINISHED

************************************
*** SETUP Finishes Successfully ***
************************************
```

```
*** ISCOMDEP VERSION 94227 ***     *** WTI Storage Tank Rupture,  Screen Modeling -- ONSITE ORG. TANK      ***
                                  *** 1 Point source; 26 receptors up to 50KM away; Vapor.               ***

*** MODELING OPTIONS USED:  CONC   RURAL  ELEV                GRDRIS NOSTD

                                        ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Intermediate Terrain Processing is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  --  SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses RURAL Dispersion.

**Model Uses User-Specified Options:
          1. Gradual Plume Rise.
          2. Not Use Stack-tip Downwash.
          3. Buoyancy-induced Dispersion.
          4. Calms Processing Routine.
          5. Not Use Missing Data Processing Routine.
          6. Default Wind Profile Exponents.
          7. Default Vertical Potential Temperature Gradients.

**Model Accepts Receptors on ELEV Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:   1-HR

**This Run Includes:    1 Source(s);      1 Source Group(s); and     26 Receptor(s)

**The Model Assumes A Pollutant Type of:  FUGITIVE

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
        Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
        Model Outputs Tables of Overall Maximum Short Term Values (MAXTABLE Keyword)
        Model Outputs Tables of Concurrent Short Term Values by Receptor for Each Day Processed (DAYTABLE Keyword)
        Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Anem. Hgt. (m) =    10.00 ;    Decay Coef. =   0.0000     ;    Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+0
                 Output Units   = MICROGRAMS/M**3

**Input Runstream File: ONSITE.INC                                ;  **Output Print File: ONSITE.OUT
**Detailed Error/Message File:   ONSITE.ERR
```

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
ONSITE	0	0.10000E+01	186.4	105.4	212.1	23.00	997.00	0.22	15.14	YES	

```
*** ISCOMDEP VERSION 94227 ***    *** WTI Storage Tank Rupture,  Screen Modeling -- ONSITE ORG. TANK    ***
                                  *** 1 Point source; 26 receptors up to 50KM away; Vapor.            ***

*** MODELING OPTIONS USED:  CONC  RURAL  ELEV                GRDRIS NOSTD


                                  *** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID                                        SOURCE IDs


ALL    .  ONSITE  ,
```

```
*** ISCOMDEP VERSION 94227 ***     *** WTI Storage Tank Rupture,  Screen Modeling -- ONSITE ORG. TANK      ***
                                  *** 1 Point source; 26 receptors up to 50KM away; Vapor.               ***

*** MODELING OPTIONS USED:  CONC   RURAL  ELEV                GRDRIS NOSTD

                                          *** SOURCE PARTICULATE/GAS DATA ***


      *** SOURCE ID = ONSITE  ; SOURCE TYPE =   POINT  ***

      SCAV COEF [LIQ] 1/(S-MM/HR)=
      0.00E+00,

      SCAV COEF [ICE] 1/(S-MM/HR)=
      0.00E+00,
```

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: ONSITE

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV
1	17.4,	18.2,	0	2	17.4,	18.2,	0	3	17.4,	18.2,	0	4	17.4,	18.2,	0	5	17.4,	18.2,	0	6
7	17.4,	18.2,	0	8	17.4,	18.2,	0	9	17.4,	18.2,	0	10	17.4,	18.2,	0	11	17.4,	18.2,	0	12
13	17.4,	18.2,	0	14	17.4,	18.2,	0	15	17.4,	18.2,	0	16	17.4,	18.2,	0	17	17.4,	18.2,	0	18
19	17.4,	18.2,	0	20	17.4,	18.2,	0	21	17.4,	18.2,	0	22	17.4,	18.2,	0	23	17.4,	18.2,	0	24
25	17.4,	18.2,	0	26	17.4,	18.2,	0	27	17.4,	18.2,	0	28	17.4,	18.2,	0	29	17.4,	18.2,	0	30
31	17.4,	18.2,	0	32	17.4,	18.2,	0	33	17.4,	18.2,	0	34	17.4,	18.2,	0	35	17.4,	18.2,	0	36

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZFLAG)
(METERS)

(100.0,	0.0,	213.4,	0.0);	(200.0,	0.0,	225.6,	0.0);
(300.0,	0.0,	231.6,	0.0);	(400.0,	0.0,	231.6,	0.0);
(500.0,	0.0,	268.2,	0.0);	(600.0,	0.0,	304.8,	0.0);
(700.0,	0.0,	323.1,	0.0);	(800.0,	0.0,	353.6,	0.0);
(900.0,	0.0,	353.6,	0.0);	(1000.0,	0.0,	353.6,	0.0);
(1250.0,	0.0,	359.7,	0.0);	(1500.0,	0.0,	365.8,	0.0);
(1750.0,	0.0,	365.8,	0.0);	(2000.0,	0.0,	371.9,	0.0);
(2250.0,	0.0,	384.0,	0.0);	(2500.0,	0.0,	384.0,	0.0);
(3000.0,	0.0,	408.4,	0.0);	(4000.0,	0.0,	420.6,	0.0);
(5000.0,	0.0,	415.4,	0.0);	(7500.0,	0.0,	408.4,	0.0);
(10000.0,	0.0,	426.7,	0.0);	(15000.0,	0.0,	420.0,	0.0);
(20000.0,	0.0,	420.0,	0.0);	(30000.0,	0.0,	420.0,	0.0);
(40000.0,	0.0,	420.0,	0.0);	(50000.0,	0.0,	420.0,	0.0);

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

1 1 1

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: SCREEN.MET FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,f5.1,i4,f7.2)
SURFACE STATION NO.: 94823 UPPER AIR STATION NO.: 94823
NAME: UNKNOWN NAME: UNKNOWN
YEAR: 1993 YEAR: 1993

YEAR	MONTH	DAY	HOUR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	MIXING HEIGHT (M) URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-O (M)	Zd (M)
93	1	1	1	90.0	1.00	293.1	1	320.0	320.0	0.0000	0.0	0.0000	0.0
93	1	1	2	90.0	1.50	293.1	1	480.0	480.0	0.0000	0.0	0.0000	0.0
93	1	1	3	90.0	2.00	293.1	1	640.0	640.0	0.0000	0.0	0.0000	0.0
93	1	1	4	90.0	2.50	293.1	1	800.0	800.0	0.0000	0.0	0.0000	0.0
93	1	1	5	90.0	3.00	293.1	1	960.0	960.0	0.0000	0.0	0.0000	0.0
93	1	1	6	90.0	1.00	293.1	2	320.0	320.0	0.0000	0.0	0.0000	0.0
93	1	1	7	90.0	1.50	293.1	2	480.0	480.0	0.0000	0.0	0.0000	0.0
93	1	1	8	90.0	2.00	293.1	2	640.0	640.0	0.0000	0.0	0.0000	0.0
93	1	1	9	90.0	2.50	293.1	2	800.0	800.0	0.0000	0.0	0.0000	0.0
93	1	1	10	90.0	3.00	293.1	2	960.0	960.0	0.0000	0.0	0.0000	0.0
93	1	1	11	90.0	3.50	293.1	2	1120.0	1120.0	0.0000	0.0	0.0000	0.0
93	1	1	12	90.0	4.00	293.1	2	1280.0	1280.0	0.0000	0.0	0.0000	0.0
93	1	1	13	90.0	4.50	293.1	2	1440.0	1440.0	0.0000	0.0	0.0000	
93	1	1	14	90.0	5.00	293.1	2	1600.0	1600.0	0.0000	0.0	0.000	
93	1	1	15	90.0	1.00	293.1	3	320.0	320.0	0.0000	0.0	0.0000	
93	1	1	16	90.0	1.50	293.1	3	480.0	480.0	0.0000	0.0	0.0000	0.0
93	1	1	17	90.0	2.00	293.1	3	640.0	640.0	0.0000	0.0	0.0000	0.0
93	1	1	18	90.0	2.50	293.1	3	800.0	800.0	0.0000	0.0	0.0000	0.0
93	1	1	19	90.0	3.00	293.1	3	960.0	960.0	0.0000	0.0	0.0000	0.0
93	1	1	20	90.0	3.50	293.1	3	1120.0	1120.0	0.0000	0.0	0.0000	0.0
93	1	1	21	90.0	4.00	293.1	3	1280.0	1280.0	0.0000	0.0	0.0000	0.0
93	1	1	22	90.0	4.50	293.1	3	1440.0	1440.0	0.0000	0.0	0.0000	0.0
93	1	1	23	90.0	5.00	293.1	3	1600.0	1600.0	0.0000	0.0	0.0000	0.0
93	1	1	24	90.0	8.00	293.1	3	2560.0	2560.0	0.0000	0.0	0.0000	0.0

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 1 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	0.00000
900.00	0.00	0.00000	1000.00	0.00	0.00000
1250.00	0.00	0.00000	1500.00	0.00	0.00000
1750.00	0.00	0.00000	2000.00	0.00	0.00000
2250.00	0.00	0.00000	2500.00	0.00	0.00000
3000.00	0.00	0.00000	4000.00	0.00	0.00000
5000.00	0.00	0.00000	7500.00	0.00	0.00000
10000.00	0.00	0.00000	15000.00	0.00	0.00000
20000.00	0.00	0.00000	30000.00	0.00	0.00000
40000.00	0.00	0.00000	50000.00	0.00	0.00000

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK *** C
*** 1 Point source; 26 receptors up to 50KM away; Vapor. *** 1

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 2 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00067
500.00	0.00	0.02293	600.00	0.00	0.15725
700.00	0.00	1.03664	800.00	0.00	3.76290
900.00	0.00	3.49966	1000.00	0.00	3.62576
1250.00	0.00	3.11532	1500.00	0.00	2.53176
1750.00	0.00	2.12897	2000.00	0.00	1.83657
2250.00	0.00	1.61470	2500.00	0.00	1.44060
3000.00	0.00	1.18499	4000.00	0.00	0.87455
5000.00	0.00	0.69296	7500.00	0.00	0.45615
10000.00	0.00	0.34380	15000.00	0.00	0.24271
20000.00	0.00	0.19011	30000.00	0.00	0.13527
40000.00	0.00	0.10656	50000.00	0.00	0.08872

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 3 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00055	400.00	0.00	0.07051
500.00	0.00	0.45269	600.00	0.00	1.03694
700.00	0.00	2.14537	800.00	0.00	4.73459
900.00	0.00	3.61482	1000.00	0.00	2.93018
1250.00	0.00	1.81360	1500.00	0.00	1.42457
1750.00	0.00	1.19755	2000.00	0.00	1.03307
2250.00	0.00	0.90827	2500.00	0.00	0.81034
3000.00	0.00	0.66656	4000.00	0.00	0.49193
5000.00	0.00	0.38979	7500.00	0.00	0.25658
10000.00	0.00	0.19339	15000.00	0.00	0.13653
20000.00	0.00	0.10694	30000.00	0.00	0.07609
40000.00	0.00	0.05994	50000.00	0.00	0.04990

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 4 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.01101	400.00	0.00	0.49471
500.00	0.00	1.53512	600.00	0.00	2.18574
700.00	0.00	2.69253	800.00	0.00	4.93815
900.00	0.00	3.50190	1000.00	0.00	2.63131
1250.00	0.00	1.33560	1500.00	0.00	0.92004
1750.00	0.00	0.76647	2000.00	0.00	0.66117
2250.00	0.00	0.58129	2500.00	0.00	0.51862
3000.00	0.00	0.42660	4000.00	0.00	0.31484
5000.00	0.00	0.24947	7500.00	0.00	0.16421
10000.00	0.00	0.12377	15000.00	0.00	0.08738
20000.00	0.00	0.06844	30000.00	0.00	0.04870
40000.00	0.00	0.03836	50000.00	0.00	0.03194

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 5 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.04468	400.00	0.00	1.25708
500.00	0.00	2.70007	600.00	0.00	3.02139
700.00	0.00	2.83874	800.00	0.00	4.76561
900.00	0.00	3.23863	1000.00	0.00	2.33644
1250.00	0.00	1.10840	1500.00	0.00	0.66585
1750.00	0.00	0.53284	2000.00	0.00	0.45914
2250.00	0.00	0.40367	2500.00	0.00	0.36015
3000.00	0.00	0.29625	4000.00	0.00	0.21864
5000.00	0.00	0.17324	7500.00	0.00	0.11404
10000.00	0.00	0.08499	15000.00	0.00	0.05631
20000.00	0.00	0.04210	30000.00	0.00	0.02798
40000.00	0.00	0.02095	50000.00	0.00	0.01674

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK *** (
*** 1 Point source; 26 receptors up to 50KM away; Vapor. *** 1

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 6 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	0.00000
900.00	0.00	0.00000	1000.00	0.00	0.00000
1250.00	0.00	0.00000	1500.00	0.00	0.00000
1750.00	0.00	0.00000	2000.00	0.00	0.00000
2250.00	0.00	0.00000	2500.00	0.00	0.00000
3000.00	0.00	0.00000	4000.00	0.00	0.00000
5000.00	0.00	0.00000	7500.00	0.00	0.00000
10000.00	0.00	0.00000	15000.00	0.00	0.00000
20000.00	0.00	0.00000	30000.00	0.00	0.00000
40000.00	0.00	0.00000	50000.00	0.00	0.00000

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 7 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00001
700.00	0.00	0.00009	800.00	0.00	0.91164
900.00	0.00	0.71572	1000.00	0.00	0.80047
1250.00	0.00	1.07642	1500.00	0.00	1.27402
1750.00	0.00	1.33757	2000.00	0.00	1.35620
2250.00	0.00	1.33976	2500.00	0.00	1.27164
3000.00	0.00	1.17236	4000.00	0.00	1.00197
5000.00	0.00	0.83007	7500.00	0.00	0.58033
10000.00	0.00	0.45067	15000.00	0.00	0.31644
20000.00	0.00	0.24677	30000.00	0.00	0.17439
40000.00	0.00	0.13666	50000.00	0.00	0.11328

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK *** 0
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 8 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00007
500.00	0.00	0.00173	600.00	0.00	0.00922
700.00	0.00	0.02279	800.00	0.00	1.95133
900.00	0.00	1.51803	1000.00	0.00	1.63705
1250.00	0.00	1.88640	1500.00	0.00	1.87892
1750.00	0.00	1.69324	2000.00	0.00	1.49577
2250.00	0.00	1.30812	2500.00	0.00	1.11492
3000.00	0.00	0.85239	4000.00	0.00	0.59448
5000.00	0.00	0.47050	7500.00	0.00	0.32644
10000.00	0.00	0.25350	15000.00	0.00	0.17800
20000.00	0.00	0.13881	30000.00	0.00	0.09810
40000.00	0.00	0.07687	50000.00	0.00	0.06372

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 9 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00001	400.00	0.00	0.00548
500.00	0.00	0.05687	600.00	0.00	0.15452
700.00	0.00	0.24646	800.00	0.00	3.28459
900.00	0.00	2.51236	1000.00	0.00	2.54448
1250.00	0.00	2.48588	1500.00	0.00	2.17235
1750.00	0.00	1.78864	2000.00	0.00	1.47789
2250.00	0.00	1.22950	2500.00	0.00	1.01387
3000.00	0.00	0.74597	4000.00	0.00	0.45586
5000.00	0.00	0.32248	7500.00	0.00	0.20913
10000.00	0.00	0.16224	15000.00	0.00	0.11392
20000.00	0.00	0.08884	30000.00	0.00	0.06278
40000.00	0.00	0.04920	50000.00	0.00	0.04078

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 10 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00009	400.00	0.00	0.04954
500.00	0.00	0.32378	600.00	0.00	0.62452
700.00	0.00	0.80167	800.00	0.00	4.58698
900.00	0.00	3.44999	1000.00	0.00	3.28362
1250.00	0.00	2.80136	1500.00	0.00	2.23532
1750.00	0.00	1.73919	2000.00	0.00	1.38067
2250.00	0.00	1.11581	2500.00	0.00	0.90402
3000.00	0.00	0.65630	4000.00	0.00	0.34305
5000.00	0.00	0.21649	7500.00	0.00	0.14669
10000.00	0.00	0.08500	15000.00	0.00	0.05631
20000.00	0.00	0.04210	30000.00	0.00	0.02798
40000.00	0.00	0.02095	50000.00	0.00	0.01674

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 11 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00027	400.00	0.00	0.16448
500.00	0.00	0.83423	600.00	0.00	1.33047
700.00	0.00	1.51564	800.00	0.00	5.61981
900.00	0.00	4.17008	1000.00	0.00	3.76749
1250.00	0.00	2.90179	1500.00	0.00	2.17656
1750.00	0.00	1.63359	2000.00	0.00	1.26494
2250.00	0.00	1.00419	2500.00	0.00	0.80930
3000.00	0.00	0.54820	4000.00	0.00	0.29583
5000.00	0.00	0.18369	7500.00	0.00	0.08777
10000.00	0.00	0.06255	15000.00	0.00	0.04137
20000.00	0.00	0.03093	30000.00	0.00	0.02055
40000.00	0.00	0.01539	50000.00	0.00	0.01230

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 12 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00047	400.00	0.00	0.32855
500.00	0.00	1.43619	600.00	0.00	2.04795
700.00	0.00	2.17457	800.00	0.00	6.30585
900.00	0.00	4.63402	1000.00	0.00	4.01892
1250.00	0.00	2.87154	1500.00	0.00	2.06444
1750.00	0.00	1.51347	2000.00	0.00	1.15155
2250.00	0.00	0.89720	2500.00	0.00	0.71627
3000.00	0.00	0.48388	4000.00	0.00	0.26002
5000.00	0.00	0.16075	7500.00	0.00	0.07152
10000.00	0.00	0.04823	15000.00	0.00	0.03167
20000.00	0.00	0.02368	30000.00	0.00	0.01574
40000.00	0.00	0.01178	50000.00	0.00	0.00942

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 13 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00064	400.00	0.00	0.49603
500.00	0.00	1.97899	600.00	0.00	2.63484
700.00	0.00	2.67886	800.00	0.00	6.27253
900.00	0.00	4.87513	1000.00	0.00	4.09815
1250.00	0.00	2.74288	1500.00	0.00	1.90441
1750.00	0.00	1.38101	2000.00	0.00	1.03949
2250.00	0.00	0.80696	2500.00	0.00	0.64261
3000.00	0.00	0.43274	4000.00	0.00	0.23186
5000.00	0.00	0.14312	7500.00	0.00	0.06134
10000.00	0.00	0.03882	15000.00	0.00	0.02503
20000.00	0.00	0.01871	30000.00	0.00	0.01243
40000.00	0.00	0.00931	50000.00	0.00	0.00744

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 14 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00075	400.00	0.00	0.63576
500.00	0.00	2.39320	600.00	0.00	3.05156
700.00	0.00	0.00000	800.00	0.00	6.05986
900.00	0.00	4.70917	1000.00	0.00	3.91382
1250.00	0.00	2.55091	1500.00	0.00	1.75178
1750.00	0.00	1.26213	2000.00	0.00	0.94617
2250.00	0.00	0.73255	2500.00	0.00	0.58227
3000.00	0.00	0.39120	4000.00	0.00	0.20915
5000.00	0.00	0.12898	7500.00	0.00	0.05437
10000.00	0.00	0.03251	15000.00	0.00	0.02028
20000.00	0.00	0.01516	30000.00	0.00	0.01007
40000.00	0.00	0.00754	50000.00	0.00	0.00603

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 15 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	0.00000
900.00	0.00	0.00000	1000.00	0.00	0.00000
1250.00	0.00	0.00000	1500.00	0.00	0.00000
1750.00	0.00	0.00000	2000.00	0.00	0.00000
2250.00	0.00	0.00000	2500.00	0.00	0.00000
3000.00	0.00	0.00000	4000.00	0.00	0.00000
5000.00	0.00	0.00000	7500.00	0.00	0.00000
10000.00	0.00	0.00000	15000.00	0.00	0.00000
20000.00	0.00	0.00000	30000.00	0.00	0.00000
40000.00	0.00	0.00000	50000.00	0.00	0.00000

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 16 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	0.49781
900.00	0.00	0.35516	1000.00	0.00	0.35542
1250.00	0.00	0.41352	1500.00	0.00	0.48755
1750.00	0.00	0.53806	2000.00	0.00	0.60959
2250.00	0.00	0.69374	2500.00	0.00	0.71369
3000.00	0.00	0.79637	4000.00	0.00	0.78297
5000.00	0.00	0.85563	7500.00	0.00	0.76923
10000.00	0.00	0.62321	15000.00	0.00	0.43689
20000.00	0.00	0.33855	30000.00	0.00	0.23681
40000.00	0.00	0.18407	50000.00	0.00	0.15156

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 17 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00001	600.00	0.00	0.00002
700.00	0.00	0.00004	800.00	0.00	1.03478
900.00	0.00	0.73275	1000.00	0.00	0.74956
1250.00	0.00	0.89115	1500.00	0.00	1.01917
1750.00	0.00	1.06070	2000.00	0.00	1.11316
2250.00	0.00	1.16173	2500.00	0.00	1.10945
3000.00	0.00	1.06167	4000.00	0.00	0.99398
5000.00	0.00	0.83088	7500.00	0.00	0.51434
10000.00	0.00	0.36598	15000.00	0.00	0.24610
20000.00	0.00	0.19044	30000.00	0.00	0.13321
40000.00	0.00	0.10354	50000.00	0.00	0.08525

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 18 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00003
500.00	0.00	0.00109	600.00	0.00	0.00315
700.00	0.00	0.00519	800.00	0.00	1.90220
900.00	0.00	1.34148	1000.00	0.00	1.36445
1250.00	0.00	1.54328	1500.00	0.00	1.63103
1750.00	0.00	1.56730	2000.00	0.00	1.51727
2250.00	0.00	1.46576	2500.00	0.00	1.32860
3000.00	0.00	1.28568	4000.00	0.00	1.02595
5000.00	0.00	0.78552	7500.00	0.00	0.43262
10000.00	0.00	0.27513	15000.00	0.00	0.16141
20000.00	0.00	0.12207	30000.00	0.00	0.08525
40000.00	0.00	0.06627	50000.00	0.00	0.05456

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 19 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00032
500.00	0.00	0.01364	600.00	0.00	0.03899
700.00	0.00	0.06040	800.00	0.00	3.06808
900.00	0.00	2.15941	1000.00	0.00	2.14426
1250.00	0.00	2.23041	1500.00	0.00	2.15893
1750.00	0.00	1.92986	2000.00	0.00	1.74974
2250.00	0.00	1.59504	2500.00	0.00	1.53797
3000.00	0.00	1.35129	4000.00	0.00	0.68513
5000.00	0.00	0.45928	7500.00	0.00	0.37539
10000.00	0.00	0.12558	15000.00	0.00	0.06134
20000.00	0.00	0.04174	30000.00	0.00	0.02729
40000.00	0.00	0.02043	50000.00	0.00	0.01633

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 20 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00127
500.00	0.00	0.05467	600.00	0.00	0.15805
700.00	0.00	0.23898	800.00	0.00	4.39351
900.00	0.00	3.09171	1000.00	0.00	2.97184
1250.00	0.00	2.82183	1500.00	0.00	2.52382
1750.00	0.00	2.13019	2000.00	0.00	1.83901
2250.00	0.00	1.72940	2500.00	0.00	1.59844
3000.00	0.00	1.00826	4000.00	0.00	0.60614
5000.00	0.00	0.40216	7500.00	0.00	0.18731
10000.00	0.00	0.10814	15000.00	0.00	0.05051
20000.00	0.00	0.03198	30000.00	0.00	0.02007
40000.00	0.00	0.01501	50000.00	0.00	0.01200

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 21 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00281
500.00	0.00	0.12281	600.00	0.00	0.36200
700.00	0.00	0.54328	800.00	0.00	5.69707
900.00	0.00	4.01496	1000.00	0.00	3.73007
1250.00	0.00	3.25340	1500.00	0.00	2.72637
1750.00	0.00	2.20377	2000.00	0.00	1.80828
2250.00	0.00	1.49681	2500.00	0.00	1.25509
3000.00	0.00	0.91395	4000.00	0.00	0.54180
5000.00	0.00	0.35694	7500.00	0.00	0.16501
10000.00	0.00	0.09500	15000.00	0.00	0.04370
20000.00	0.00	0.02627	30000.00	0.00	0.01546
40000.00	0.00	0.01150	50000.00	0.00	0.00919

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK *** 0
*** 1 Point source; 26 receptors up to 50KM away; Vapor. *** 1

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 22 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00450
500.00	0.00	0.20044	600.00	0.00	0.60350
700.00	0.00	0.90601	800.00	0.00	5.82435
900.00	0.00	4.73503	1000.00	0.00	4.29039
1250.00	0.00	3.35772	1500.00	0.00	2.63454
1750.00	0.00	2.09344	2000.00	0.00	1.69019
2250.00	0.00	1.38672	2500.00	0.00	1.15494
3000.00	0.00	0.83313	4000.00	0.00	0.48890
5000.00	0.00	0.32048	7500.00	0.00	0.14738
10000.00	0.00	0.08468	15000.00	0.00	0.03877
20000.00	0.00	0.02267	30000.00	0.00	0.01241
40000.00	0.00	0.00909	50000.00	0.00	0.00726

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK *** *** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 23 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00600
500.00	0.00	0.27120	600.00	0.00	0.83344
700.00	0.00	0.00000	800.00	0.00	5.87911
900.00	0.00	4.76468	1000.00	0.00	4.27394
1250.00	0.00	3.26694	1500.00	0.00	2.51800
1750.00	0.00	1.97521	2000.00	0.00	1.57989
2250.00	0.00	1.28731	2500.00	0.00	1.06657
3000.00	0.00	0.76391	4000.00	0.00	0.44490
5000.00	0.00	0.29055	7500.00	0.00	0.13310
10000.00	0.00	0.07636	15000.00	0.00	0.03491
20000.00	0.00	0.02017	30000.00	0.00	0.01036
40000.00	0.00	0.00739	50000.00	0.00	0.00588

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK *** 0
*** 1 Point source; 26 receptors up to 50KM away; Vapor. *** 1

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 24 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00851
500.00	0.00	0.40590	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	5.51516
900.00	0.00	4.38890	1000.00	0.00	3.74987
1250.00	0.00	2.60410	1500.00	0.00	1.88435
1750.00	0.00	1.41706	2000.00	0.00	1.10085
2250.00	0.00	0.87845	2500.00	0.00	0.71670
3000.00	0.00	0.50281	4000.00	0.00	0.28662
5000.00	0.00	0.18527	7500.00	0.00	0.08397
10000.00	0.00	0.04799	15000.00	0.00	0.02187
20000.00	0.00	0.01255	30000.00	0.00	0.00575
40000.00	0.00	0.00341	50000.00	0.00	0.00242

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 1 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00767
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	5.02992
900.00	0.00	3.96872	1000.00	0.00	3.32493
1250.00	0.00	2.23194	1500.00	0.00	1.58334
1750.00	0.00	1.17603	2000.00	0.00	0.90612
2250.00	0.00	0.71894	2500.00	0.00	0.58414
3000.00	0.00	0.40758	4000.00	0.00	0.23105
5000.00	0.00	0.14896	7500.00	0.00	0.06734
10000.00	0.00	0.03845	15000.00	0.00	0.01751
20000.00	0.00	0.01004	30000.00	0.00	0.00459
40000.00	0.00	0.00265	50000.00	0.00	0.00177

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK *** 0
*** 1 Point source; 26 receptors up to 50KM away; Vapor. *** 1

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 2 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	0.00000
900.00	0.00	0.00000	1000.00	0.00	0.00000
1250.00	0.00	0.00000	1500.00	0.00	0.00000
1750.00	0.00	0.00000	2000.00	0.00	0.00000
2250.00	0.00	0.00000	2500.00	0.00	0.00000
3000.00	0.00	0.00000	4000.00	0.00	0.00000
5000.00	0.00	0.00000	7500.00	0.00	0.00000
10000.00	0.00	0.00000	15000.00	0.00	0.00000
20000.00	0.00	0.00000	30000.00	0.00	0.00000
40000.00	0.00	0.00000	50000.00	0.00	0.00000

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 3 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	0.35852
900.00	0.00	0.24351	1000.00	0.00	0.22329
1250.00	0.00	0.21284	1500.00	0.00	0.20912
1750.00	0.00	0.19563	2000.00	0.00	0.20175
2250.00	0.00	0.22522	2500.00	0.00	0.21971
3000.00	0.00	0.27371	4000.00	0.00	0.28663
5000.00	0.00	0.26191	7500.00	0.00	0.22854
10000.00	0.00	0.22724	15000.00	0.00	0.24962
20000.00	0.00	0.27180	30000.00	0.00	0.25534
40000.00	0.00	0.22390	50000.00	0.00	0.19725

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 4 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	0.67296
900.00	0.00	0.44539	1000.00	0.00	0.41629
1250.00	0.00	0.42104	1500.00	0.00	0.43064
1750.00	0.00	0.41134	2000.00	0.00	0.43323
2250.00	0.00	0.49127	2500.00	0.00	0.47949
3000.00	0.00	0.59055	4000.00	0.00	0.58230
5000.00	0.00	0.50098	7500.00	0.00	0.37728
10000.00	0.00	0.44014	15000.00	0.00	0.42043
20000.00	0.00	0.35949	30000.00	0.00	0.25632
40000.00	0.00	0.19203	50000.00	0.00	0.15120

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 5 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	1.19561
900.00	0.00	0.77806	1000.00	0.00	0.73619
1250.00	0.00	0.76749	1500.00	0.00	0.79396
1750.00	0.00	0.75712	2000.00	0.00	0.79138
2250.00	0.00	0.88218	2500.00	0.00	0.84609
3000.00	0.00	0.98070	4000.00	0.00	0.87820
5000.00	0.00	0.70690	7500.00	0.00	0.65976
10000.00	0.00	0.62717	15000.00	0.00	0.48507
20000.00	0.00	0.37444	30000.00	0.00	0.24213
40000.00	0.00	0.17358	50000.00	0.00	0.13257

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK *** 05
*** 1 Point source; 26 receptors up to 50KM away; Vapor. *** 11

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 6 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00002	600.00	0.00	0.00016
700.00	0.00	0.00028	800.00	0.00	1.98682
900.00	0.00	1.28131	1000.00	0.00	1.21696
1250.00	0.00	1.27019	1500.00	0.00	1.29693
1750.00	0.00	1.21409	2000.00	0.00	1.23642
2250.00	0.00	1.33047	2500.00	0.00	1.24433
3000.00	0.00	1.28757	4000.00	0.00	0.98699
5000.00	0.00	0.78507	7500.00	0.00	0.49276
10000.00	0.00	0.34188	15000.00	0.00	0.19830
20000.00	0.00	0.13225	30000.00	0.00	0.07330
40000.00	0.00	0.04838	50000.00	0.00	0.03495

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 7 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00013	600.00	0.00	0.00162
700.00	0.00	0.00374	800.00	0.00	3.07187
900.00	0.00	1.97610	1000.00	0.00	1.86886
1250.00	0.00	1.90724	1500.00	0.00	1.89053
1750.00	0.00	1.72141	2000.00	0.00	1.69353
2250.00	0.00	1.67589	2500.00	0.00	1.53326
3000.00	0.00	1.30014	4000.00	0.00	0.97189
5000.00	0.00	0.75753	7500.00	0.00	0.45942
10000.00	0.00	0.31235	15000.00	0.00	0.17744
20000.00	0.00	0.11705	30000.00	0.00	0.06415
40000.00	0.00	0.04213	50000.00	0.00	0.03033

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 8 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00040	600.00	0.00	0.00646
700.00	0.00	0.01807	800.00	0.00	3.99830
900.00	0.00	2.85100	1000.00	0.00	2.66761
1250.00	0.00	2.61905	1500.00	0.00	2.36116
1750.00	0.00	2.09878	2000.00	0.00	1.88289
2250.00	0.00	1.70063	2500.00	0.00	1.54437
3000.00	0.00	1.29080	4000.00	0.00	0.94286
5000.00	0.00	0.72241	7500.00	0.00	0.42647
10000.00	0.00	0.28562	15000.00	0.00	0.15986
20000.00	0.00	0.10465	30000.00	0.00	0.05692
40000.00	0.00	0.03725	50000.00	0.00	0.02677

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 9 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00079	600.00	0.00	0.01543
700.00	0.00	0.04941	800.00	0.00	4.06616
900.00	0.00	3.38335	1000.00	0.00	3.17512
1250.00	0.00	2.77191	1500.00	0.00	2.41854
1750.00	0.00	2.13556	2000.00	0.00	1.90135
2250.00	0.00	1.70400	2500.00	0.00	1.53582
3000.00	0.00	1.26625	4000.00	0.00	0.90637
5000.00	0.00	0.68469	7500.00	0.00	0.39574
10000.00	0.00	0.26206	15000.00	0.00	0.14508
20000.00	0.00	0.09446	30000.00	0.00	0.05110
40000.00	0.00	0.03336	50000.00	0.00	0.02393

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK *** 0
*** 1 Point source; 26 receptors up to 50KM away; Vapor. *** 1

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 10 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00121	600.00	0.00	0.02717
700.00	0.00	0.00000	800.00	0.00	4.14078
900.00	0.00	3.45579	1000.00	0.00	3.25192
1250.00	0.00	2.83389	1500.00	0.00	2.45693
1750.00	0.00	2.15250	2000.00	0.00	1.90102
2250.00	0.00	1.69061	2500.00	0.00	1.51291
3000.00	0.00	1.23202	4000.00	0.00	0.86669
5000.00	0.00	0.64716	7500.00	0.00	0.36784
10000.00	0.00	0.24147	15000.00	0.00	0.13259
20000.00	0.00	0.08597	30000.00	0.00	0.04632
40000.00	0.00	0.03019	50000.00	0.00	0.02163

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 11 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00235	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	4.50307
900.00	0.00	3.77197	1000.00	0.00	3.50857
1250.00	0.00	2.90088	1500.00	0.00	2.39218
1750.00	0.00	2.00120	2000.00	0.00	1.69724
2250.00	0.00	1.45757	2500.00	0.00	1.26581
3000.00	0.00	0.98236	4000.00	0.00	0.64977
5000.00	0.00	0.46698	7500.00	0.00	0.25199
10000.00	0.00	0.16122	15000.00	0.00	0.08645
20000.00	0.00	0.05541	30000.00	0.00	0.02952
40000.00	0.00	0.01914	50000.00	0.00	0.01368

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 12 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	4.56569
900.00	0.00	3.80947	1000.00	0.00	3.48282
1250.00	0.00	2.76574	1500.00	0.00	2.21922
1750.00	0.00	1.81722	2000.00	0.00	1.51549
2250.00	0.00	1.28412	2500.00	0.00	1.10311
3000.00	0.00	0.84217	4000.00	0.00	0.54633
5000.00	0.00	0.38823	7500.00	0.00	0.20646
10000.00	0.00	0.13118	15000.00	0.00	0.06991
20000.00	0.00	0.04468	30000.00	0.00	0.02373
40000.00	0.00	0.01537	50000.00	0.00	0.01098

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 13 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	4.28782
900.00	0.00	3.53466	1000.00	0.00	3.11489
1250.00	0.00	2.30460	1500.00	0.00	1.77414
1750.00	0.00	1.40978	2000.00	0.00	1.14957
2250.00	0.00	0.95736	2500.00	0.00	0.81127
3000.00	0.00	0.60710	4000.00	0.00	0.38493
5000.00	0.00	0.27001	7500.00	0.00	0.14126
10000.00	0.00	0.08907	15000.00	0.00	0.04715
20000.00	0.00	0.03003	30000.00	0.00	0.01591
40000.00	0.00	0.01029	50000.00	0.00	0.00734

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 14 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	3.81524
900.00	0.00	3.11636	1000.00	0.00	2.68416
1250.00	0.00	1.90977	1500.00	0.00	1.43998
1750.00	0.00	1.12801	2000.00	0.00	0.91036
2250.00	0.00	0.75230	2500.00	0.00	0.63368
3000.00	0.00	0.47013	4000.00	0.00	0.29522
5000.00	0.00	0.20598	7500.00	0.00	0.10705
10000.00	0.00	0.06729	15000.00	0.00	0.03552
20000.00	0.00	0.02260	30000.00	0.00	0.01195
40000.00	0.00	0.00773	50000.00	0.00	0.00551

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 15 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00002	800.00	0.00	62.57232
900.00	0.00	53.02272	1000.00	0.00	45.74073
1250.00	0.00	33.15455	1500.00	0.00	25.41248
1750.00	0.00	20.53589	2000.00	0.00	16.78118
2250.00	0.00	13.78308	2500.00	0.00	11.90994
3000.00	0.00	8.62315	4000.00	0.00	5.52872
5000.00	0.00	4.10184	7500.00	0.00	2.35653
10000.00	0.00	1.47648	15000.00	0.00	0.84673
20000.00	0.00	0.56104	30000.00	0.00	0.32372
40000.00	0.00	0.21901	50000.00	0.00	0.16437

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK *** C
*** 1 Point source; 26 receptors up to 50KM away; Vapor. *** 1

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 16 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00001
700.00	0.00	0.00024	800.00	0.00	44.66874
900.00	0.00	37.69915	1000.00	0.00	32.39180
1250.00	0.00	23.13220	1500.00	0.00	17.59253
1750.00	0.00	14.12651	2000.00	0.00	11.47166
2250.00	0.00	9.36406	2500.00	0.00	8.05933
3000.00	0.00	5.77875	4000.00	0.00	3.66254
5000.00	0.00	2.70237	7500.00	0.00	1.53952
10000.00	0.00	0.95701	15000.00	0.00	0.54635
20000.00	0.00	0.36093	30000.00	0.00	0.20770
40000.00	0.00	0.14030	50000.00	0.00	0.10522

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 17 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00002
700.00	0.00	0.00081	800.00	0.00	34.96268
900.00	0.00	29.41492	1000.00	0.00	25.19619
1250.00	0.00	17.86273	1500.00	0.00	13.50803
1750.00	0.00	10.79750	2000.00	0.00	8.73002
2250.00	0.00	7.09592	2500.00	0.00	6.09073
3000.00	0.00	4.33881	4000.00	0.00	2.72924
5000.00	0.00	2.00681	7500.00	0.00	1.13742
10000.00	0.00	0.70355	15000.00	0.00	0.40062
20000.00	0.00	0.26419	30000.00	0.00	0.15179
40000.00	0.00	0.10245	50000.00	0.00	0.07680

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 18 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00004
700.00	0.00	0.00168	800.00	0.00	28.86622
900.00	0.00	24.22348	1000.00	0.00	20.69772
1250.00	0.00	14.58888	1500.00	0.00	10.98368
1750.00	0.00	8.74911	2000.00	0.00	7.05054
2250.00	0.00	5.71267	2500.00	0.00	4.89363
3000.00	0.00	3.46935	4000.00	0.00	2.17046
5000.00	0.00	1.59211	7500.00	0.00	0.89920
10000.00	0.00	0.55426	15000.00	0.00	0.31507
20000.00	0.00	0.20753	30000.00	0.00	0.11912
40000.00	0.00	0.08035	50000.00	0.00	0.06021

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 19 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00008
700.00	0.00	0.00000	800.00	0.00	24.65439
900.00	0.00	20.64429	1000.00	0.00	17.60280
1250.00	0.00	12.34844	1500.00	0.00	9.26369
1750.00	0.00	7.35844	2000.00	0.00	5.91436
2250.00	0.00	4.78015	2500.00	0.00	4.08844
3000.00	0.00	2.88771	4000.00	0.00	1.79905
5000.00	0.00	1.31730	7500.00	0.00	0.74207
10000.00	0.00	0.45619	15000.00	0.00	0.25902
20000.00	0.00	0.17047	30000.00	0.00	0.09777
40000.00	0.00	0.06592	50000.00	0.00	0.04939

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 20 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00011
700.00	0.00	0.00000	800.00	0.00	21.55747
900.00	0.00	18.01745	1000.00	0.00	15.33563
1250.00	0.00	10.71480	1500.00	0.00	8.01418
1750.00	0.00	6.35123	2000.00	0.00	5.09389
2250.00	0.00	4.10867	2500.00	0.00	3.50971
3000.00	0.00	2.47146	4000.00	0.00	1.53460
5000.00	0.00	1.12210	7500.00	0.00	0.63085
10000.00	0.00	0.38700	15000.00	0.00	0.21953
20000.00	0.00	0.14439	30000.00	0.00	0.08276
40000.00	0.00	0.05579	50000.00	0.00	0.04179

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 21 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00014
700.00	0.00	0.00000	800.00	0.00	19.17776
900.00	0.00	16.00237	1000.00	0.00	13.59941
1250.00	0.00	9.46883	1500.00	0.00	7.06426
1750.00	0.00	5.58749	2000.00	0.00	4.47329
2250.00	0.00	3.60198	2500.00	0.00	3.07368
3000.00	0.00	2.15899	4000.00	0.00	1.33690
5000.00	0.00	0.97645	7500.00	0.00	0.54809
10000.00	0.00	0.33565	15000.00	0.00	0.19027
20000.00	0.00	0.12508	30000.00	0.00	0.07166
40000.00	0.00	0.04829	50000.00	0.00	0.03617

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 22 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	17.28809
900.00	0.00	14.40475	1000.00	0.00	12.22498
1250.00	0.00	8.48609	1500.00	0.00	6.31715
1750.00	0.00	4.98817	2000.00	0.00	3.98734
2250.00	0.00	3.20603	2500.00	0.00	2.73339
3000.00	0.00	1.91587	4000.00	0.00	1.18362
5000.00	0.00	0.86369	7500.00	0.00	0.48416
10000.00	0.00	0.29608	15000.00	0.00	0.16774
20000.00	0.00	0.11022	30000.00	0.00	0.06313
40000.00	0.00	0.04253	50000.00	0.00	0.03185

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 23 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	15.74889
900.00	0.00	13.10529	1000.00	0.00	11.10862
1250.00	0.00	7.69050	1500.00	0.00	5.71383
1750.00	0.00	4.50517	2000.00	0.00	3.59643
2250.00	0.00	2.88809	2500.00	0.00	2.46045
3000.00	0.00	1.72138	4000.00	0.00	1.06137
5000.00	0.00	0.77388	7500.00	0.00	0.43334
10000.00	0.00	0.26467	15000.00	0.00	0.14988
20000.00	0.00	0.09845	30000.00	0.00	0.05637
40000.00	0.00	0.03797	50000.00	0.00	0.02844

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK *** (
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 24 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	63.41436
900.00	0.00	54.02040	1000.00	0.00	46.92068
1250.00	0.00	34.35207	1500.00	0.00	26.60357
1750.00	0.00	21.72369	2000.00	0.00	17.90035
2250.00	0.00	14.79566	2500.00	0.00	12.89174
3000.00	0.00	9.42373	4000.00	0.00	6.23338
5000.00	0.00	4.73324	7500.00	0.00	2.82689
10000.00	0.00	1.82605	15000.00	0.00	1.08768
20000.00	0.00	0.75322	30000.00	0.00	0.44796
40000.00	0.00	0.31324	50000.00	0.00	0.23723

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 1 FOR DAY 3 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	45.28408
900.00	0.00	38.46748	1000.00	0.00	33.32661
1250.00	0.00	24.23649	1500.00	0.00	18.65625
1750.00	0.00	15.15639	2000.00	0.00	12.42282
2250.00	0.00	10.21285	2500.00	0.00	8.86820
3000.00	0.00	6.42609	4000.00	0.00	4.20866
5000.00	0.00	3.17854	7500.00	0.00	1.88087
10000.00	0.00	1.20517	15000.00	0.00	0.71349
20000.00	0.00	0.49244	30000.00	0.00	0.29169
40000.00	0.00	0.20355	50000.00	0.00	0.15394

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 2 FOR DAY 3 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	35.56019
900.00	0.00	30.14240	1000.00	0.00	26.06351
1250.00	0.00	18.86021	1500.00	0.00	14.45353
1750.00	0.00	11.69847	2000.00	0.00	9.55245
2250.00	0.00	7.82353	2500.00	0.00	6.77720
3000.00	0.00	4.88164	4000.00	0.00	3.17590
5000.00	0.00	2.39006	7500.00	0.00	1.40597
10000.00	0.00	0.89624	15000.00	0.00	0.52865
20000.00	0.00	0.36412	30000.00	0.00	0.21517
40000.00	0.00	0.14997	50000.00	0.00	0.11332

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 3 FOR DAY 3 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	29.42244
900.00	0.00	24.89685	1000.00	0.00	21.49452
1250.00	0.00	15.49300	1500.00	0.00	11.83207
1750.00	0.00	9.54912	2000.00	0.00	7.77493
2250.00	0.00	6.34959	2500.00	0.00	5.49047
3000.00	0.00	3.93725	4000.00	0.00	2.54896
5000.00	0.00	1.91335	7500.00	0.00	1.12086
10000.00	0.00	0.71187	15000.00	0.00	0.41885
20000.00	0.00	0.28810	30000.00	0.00	0.16997
40000.00	0.00	0.11837	50000.00	0.00	0.08939

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 4 FOR DAY 3 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	25.16628
900.00	0.00	21.26514	1000.00	0.00	18.33578
1250.00	0.00	13.17389	1500.00	0.00	10.03277
1750.00	0.00	8.07817	2000.00	0.00	6.56213
2250.00	0.00	5.34702	2500.00	0.00	4.61697
3000.00	0.00	3.29930	4000.00	0.00	2.12784
5000.00	0.00	1.59413	7500.00	0.00	0.93093
10000.00	0.00	0.58959	15000.00	0.00	0.34627
20000.00	0.00	0.23793	30000.00	0.00	0.14021
40000.00	0.00	0.09758	50000.00	0.00	0.07367

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 5 FOR DAY 3 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	22.02755
900.00	0.00	18.59078	1000.00	0.00	16.01270
1250.00	0.00	11.47395	1500.00	0.00	8.71776
1750.00	0.00	7.00580	2000.00	0.00	5.68021
2250.00	0.00	4.61983	2500.00	0.00	3.98441
3000.00	0.00	2.83919	4000.00	0.00	1.82547
5000.00	0.00	1.36549	7500.00	0.00	0.79545
10000.00	0.00	0.50267	15000.00	0.00	0.29480
20000.00	0.00	0.20241	30000.00	0.00	0.11917
40000.00	0.00	0.08290	50000.00	0.00	0.06256

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 6 FOR DAY 3 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00000	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	19.60995
900.00	0.00	16.53356	1000.00	0.00	14.22777
1250.00	0.00	10.17163	1500.00	0.00	7.71292
1750.00	0.00	6.18814	2000.00	0.00	5.00922
2250.00	0.00	4.06775	2500.00	0.00	3.50485
3000.00	0.00	2.49154	4000.00	0.00	1.59786
5000.00	0.00	1.19372	7500.00	0.00	0.69400
10000.00	0.00	0.43776	15000.00	0.00	0.25645
20000.00	0.00	0.17597	30000.00	0.00	0.10352
40000.00	0.00	0.07199	50000.00	0.00	0.05432

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL **
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDI
100.00	0.00	0.00000	(0)	200.00	0.00	0.00000	(
300.00	0.00	0.04468	(93010105)	400.00	0.00	1.25708	(93010
500.00	0.00	2.70007	(93010105)	600.00	0.00	3.05156	(93010
700.00	0.00	2.83874	(93010105)	800.00	0.00	63.41436	(93010
900.00	0.00	54.02040	(93010224)	1000.00	0.00	46.92068	(93010
1250.00	0.00	34.35207	(93010224)	1500.00	0.00	26.60357	(93010
1750.00	0.00	21.72369	(93010224)	2000.00	0.00	17.90035	(93010
2250.00	0.00	14.79566	(93010224)	2500.00	0.00	12.89174	(93010
3000.00	0.00	9.42373	(93010224)	4000.00	0.00	6.23338	(93010
5000.00	0.00	4.73324	(93010224)	7500.00	0.00	2.82689	(93010
10000.00	0.00	1.82605	(93010224)	15000.00	0.00	1.08768	(93010
20000.00	0.00	0.75322	(93010224)	30000.00	0.00	0.44796	(93010
40000.00	0.00	0.31324	(93010224)	50000.00	0.00	0.23723	(93010

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** THE 2ND HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): ONSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDH
100.00	0.00	0.00000	(0)	200.00	0.00	0.00000	(
300.00	0.00	0.01101	(93010104)	400.00	0.00	0.63576	(9301011
500.00	0.00	2.39320	(93010114)	600.00	0.00	3.02139	(9301010
700.00	0.00	2.69253	(93010104)	800.00	0.00	62.57232	(9301021
900.00	0.00	53.02272	(93010215)	1000.00	0.00	45.74073	(9301021
1250.00	0.00	33.15455	(93010215)	1500.00	0.00	25.41248	(9301021
1750.00	0.00	20.53589	(93010215)	2000.00	0.00	16.78118	(9301021
2250.00	0.00	13.78308	(93010215)	2500.00	0.00	11.90994	(9301021
3000.00	0.00	8.62315	(93010215)	4000.00	0.00	5.52872	(9301021
5000.00	0.00	4.10184	(93010215)	7500.00	0.00	2.35653	(9301021
10000.00	0.00	1.47648	(93010215)	15000.00	0.00	0.84673	(930102'
20000.00	0.00	0.56104	(93010215)	30000.00	0.00	0.32372	(930102'
40000.00	0.00	0.22390	(93010203)	50000.00	0.00	0.19725	(9301020

*** ISCOMDEP VERSION 94227 *** *** WTI Storage Tank Rupture, Screen Modeling -- ONSITE ORG. TANK ***
*** 1 Point source; 26 receptors up to 50KM away; Vapor. ***

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** THE MAXIMUM 50 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): ONSITE ,

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

RANK	CONC	(YYMMDDHH) AT	RECEPTOR (XR,YR) OF TYPE			RANK	CONC	(YYMMDDHH) AT	RECEPTOR (XR
1.	63.41436	(93010224) AT (	800.00,	0.00)	DC	26.	24.89685	(93010303) AT (	900.00,
2.	62.57232	(93010215) AT (	800.00,	0.00)	DC	27.	24.65439	(93010219) AT (	800.00,
3.	54.02040	(93010224) AT (	900.00,	0.00)	DC	28.	24.23649	(93010301) AT (	1250.00,
4.	53.02272	(93010215) AT (	900.00,	0.00)	DC	29.	24.22348	(93010218) AT (	900.00,
5.	46.92068	(93010224) AT (	1000.00,	0.00)	DC	30.	23.13220	(93010216) AT (	1250.00,
6.	45.74073	(93010215) AT (	1000.00,	0.00)	DC	31.	22.02755	(93010305) AT (	800.00,
7.	45.28408	(93010301) AT (	800.00,	0.00)	DC	32.	21.72369	(93010224) AT (	1750.00,
8.	44.66874	(93010216) AT (	800.00,	0.00)	DC	33.	21.55747	(93010220) AT (	800.00,
9.	38.46748	(93010301) AT (	900.00,	0.00)	DC	34.	21.49452	(93010303) AT (	1000.00,
10.	37.69915	(93010216) AT (	900.00,	0.00)	DC	35.	21.26514	(93010304) AT (	900.00,
11.	35.56019	(93010302) AT (	800.00,	0.00)	DC	36.	20.69772	(93010218) AT (	1000.00,
12.	34.96268	(93010217) AT (	800.00,	0.00)	DC	37.	20.64429	(93010219) AT (	900.00,
13.	34.35207	(93010224) AT (	1250.00,	0.00)	DC	38.	20.53589	(93010215) AT (	1750.00,
14.	33.32661	(93010301) AT (	1000.00,	0.00)	DC	39.	19.60995	(93010306) AT (	800.00,
15.	33.15455	(93010215) AT (	1250.00,	0.00)	DC	40.	19.17776	(93010221) AT (	800.00,
16.	32.39180	(93010216) AT (	1000.00,	0.00)	DC	41.	18.86021	(93010302) AT (	1250.00,
17.	30.14240	(93010302) AT (	900.00,	0.00)	DC	42.	18.65625	(93010301) AT (	1500.00,
18.	29.42244	(93010303) AT (	800.00,	0.00)	DC	43.	18.59078	(93010305) AT (	900.00,
19.	29.41492	(93010217) AT (	900.00,	0.00)	DC	44.	18.33578	(93010304) AT (	1000.00,
20.	28.86622	(93010218) AT (	800.00,	0.00)	DC	45.	18.01745	(93010220) AT (	900.00,
21.	26.60357	(93010224) AT (	1500.00,	0.00)	DC	46.	17.90035	(93010224) AT (	2000.00,
22.	26.06351	(93010302) AT (	1000.00,	0.00)	DC	47.	17.86273	(93010217) AT (	1250.00,
23.	25.41248	(93010215) AT (	1500.00,	0.00)	DC	48.	17.60280	(93010219) AT (	1000.00,
24.	25.19619	(93010217) AT (	1000.00,	0.00)	DC	49.	17.59253	(93010216) AT (	1500.00,
25.	25.16628	(93010304) AT (	800.00,	0.00)	DC	50.	17.28809	(93010222) AT (	800.00,

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

```
*** ISCOMDEP VERSION 94227 ***     *** WTI Storage Tank Rupture,  Screen Modeling -- ONSITE ORG. TANK      ***
                                  *** 1 Point source; 26 receptors up to 50KM away; Vapor.              ***

*** MODELING OPTIONS USED:  CONC   RURAL  ELEV                GRDRIS NOSTD


                                        *** THE SUMMARY OF HIGHEST  1-HR RESULTS ***


                                     ** CONC OF FUGITIVE IN MICROGRAMS/M**3                          **

                                                    DATE
GROUP ID                          AVERAGE CONC     (YYMMDDHH)          RECEPTOR  (XR, YR, ZELEV, ZFLAG)     OF TYPE
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL      HIGH  1ST HIGH VALUE IS      63.41436  ON 93010224: AT (     800.00,       0.00,     353.60,       0.00) DC
         HIGH  2ND HIGH VALUE IS      62.57232  ON 93010215: AT (     800.00,       0.00,     353.60,       0.00) DC

*** RECEPTOR TYPES:  GC = GRIDCART
                     GP = GRIDPOLR
                     DC = DISCCART
                     DP = DISCPOLR
                     BD = BOUNDARY
```

```
 *** ISCOMDEP VERSION 94227 ***    *** WTI Storage Tank Rupture,  Screen Modeling -- ONSITE ORG. TANK      ***
                                  *** 1 Point source; 26 receptors up to 50KM away; Vapor.               ***

 *** MODELING OPTIONS USED:  CONC   RURAL  ELEV                GRDRIS NOSTD


*** Message Summary : ISCOMDEP Model Execution ***

 --------- Summary of Total Messages --------

A Total of           0 Fatal Error Message(s)
A Total of           0 Warning Message(s)
A Total of           0 Informational Message(s)


   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***


   ********   WARNING MESSAGES   ********
              ***  NONE  ***


   ****************************************
   *** ISCOMDEP Finishes Successfully ***
   ****************************************
```

B. Off-Site Fire Scenario

```
CO STARTING
   TITLEONE  WTI Truck Accident Off-Site, Screen Modeling -- OFFSITE
   TITLETWO  1 Point source; 26 receptors up to 50 KM away; Vapor.
   MODELOPT  GRDRIS NOSTD  RURAL  CONC
   AVERTIME  1
   POLLUTID  Fugitive
   TERRHGTS  ELEV
   ELEVUNIT  METERS
   RUNORNOT  RUN
   ERRORFIL  OFFSITE.ERR
CO FINISHED

SO STARTING
   LOCATION  OFFSITE POINT     0.0  0.0  216.4
** Point Source          QS    HS    TS    VS     DS
** Parameters:          ----  ----  ----  ----   ---
SO SRCPARAM  OFFSITE   1.0   38.0  997.  0.225   30.59
** SO SRCPARAM  OFFSITE   1.0   38.0  997.  0.075   52.98

SO SRCGROUP ALL
SO FINISHED

RE STARTING
RE DISCCART     100.00000      0.00000   292.6
RE DISCCART     200.00000      0.00000   304.8
RE DISCCART     300.00000      0.00000   328.0
RE DISCCART     400.00000      0.00000   347.5
RE DISCCART     500.00000      0.00000   359.7
RE DISCCART     600.00000      0.00000   359.7
RE DISCCART     700.00000      0.00000   356.6
RE DISCCART     800.00000      0.00000   359.7
RE DISCCART     900.00000      0.00000   359.7
RE DISCCART    1000.00000      0.00000   371.9
RE DISCCART    1250.00000      0.00000   361.5
RE DISCCART    1500.00000      0.00000   359.7
RE DISCCART    1750.00000      0.00000   359.7
RE DISCCART    2000.00000      0.00000   365.8
RE DISCCART    2250.00000      0.00000   371.9
RE DISCCART    2500.00000      0.00000   408.4
RE DISCCART    3000.00000      0.00000   408.4
RE DISCCART    4000.00000      0.00000   420.6
RE DISCCART    5000.00000      0.00000   415.4
RE DISCCART    7500.00000      0.00000   408.4
RE DISCCART   10000.00000      0.00000   426.7
RE DISCCART   15000.00000      0.00000   420.0
RE DISCCART   20000.00000      0.00000   420.0
RE DISCCART   30000.00000      0.00000   420.0
RE DISCCART   40000.00000      0.00000   420.0
RE DISCCART   50000.00000      0.00000   420.0
RE FINISHED

ME STARTING
ME INPUTFIL  screen.met
ME ANEMHGHT  10.0 METERS
ME SURFDATA  94823  1993
ME UAIRDATA  94823  1993
** ME PROFFILE TEMPS ISC_TEMP.STK
** ME PROFFILE WINDS ISC_WIND.STK
** DAYRANGE  1/3
ME FINISHED

TG STARTING
```

```
**   INPUTFIL  wti100k.out
**   LOCATION  538.4 4497.8 km
TG FINISHED

OU STARTING
   RECTABLE  ALLAVE  FIRST
   DAYTABLE ALLAVE
   MAXTABLE  ALLAVE  50
**   MAXIFILE   3  ALL  30.0   MAXIALL.FIL   25
**   MAXIFILE  24  ALL  10.0   MAXIALL.FIL   25
**   POSTFILE  1  ALL  INDIV POST2C.BIN    20
**   POSTFILE  PERIOD ALL PLOT PSTAALL.FIL  21
** Note that the following two input cards generate PLOTFILEs with the file
** unit dynamically allocated by the ISCST2 program.  When porting the model
** to another computer system, the user may need to specify the file units
** as is done on the previous four input cards.
**   PLOTFILE   3  ALL  2ND    PLT03ALL.FIL
**   PLOTFILE  24  ALL  2ND    PLT24ALL.FIL
OU PLOTFILE 1 ALL FIRST OFFSITE.PLT
** OU PLOTFILE 1 ALL FIRST OFFSITE.PLT
OU FINISHED


 *** Message Summary For ISC2 Model Setup ***

 --------- Summary of Total Messages --------

A Total of            0 Fatal Error Message(s)
A Total of            1 Warning Message(s)
A Total of            0 Informational Message(s)


   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***


   ********   WARNING MESSAGES   ********
SO W320   17 PPARM : Source Parameter May Be Out-of-Range for Parameter      DS

**************************************
*** SETUP Finishes Successfully ***
**************************************
```

```
 *** ISCOMDEP VERSION 94227 ***    ***  WTI Truck Accident Off-Site, Screen Modeling -- OFFSITE          ***    09/14/9
                                  ***  1 Point source; 26 receptors up to 50 KM away; Vapor.            ***    12:59:4
                                                                                                                 PAGE
 *** MODELING OPTIONS USED:  CONC   RURAL  ELEV          GRDRIS NOSTD

                                        ***     MODEL SETUP OPTIONS SUMMARY      ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 **Intermediate Terrain Processing is Selected

 **Model Is Setup For Calculation of Average CONCentration Values.

   --  SCAVENGING/DEPOSITION LOGIC --
 **Model Uses NO DRY DEPLETION.  DDPLETE =  F
 **Model Uses NO WET DEPLETION.  WDPLETE =  F
 **NO WET SCAVENGING Data Provided.
 **Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

 **Model Uses RURAL Dispersion.

 **Model Uses User-Specified Options:
           1. Gradual Plume Rise.
           2. Not Use Stack-tip Downwash.
           3. Buoyancy-induced Dispersion.
           4. Calms Processing Routine.
           5. Not Use Missing Data Processing Routine.
           6. Default Wind Profile Exponents.
           7. Default Vertical Potential Temperature Gradients.

 **Model Accepts Receptors on ELEV Terrain.

 **Model Assumes No FLAGPOLE Receptor Heights.

 **Model Calculates  1 Short Term Average(s) of:   1-HR

 **This Run Includes:     1 Source(s);      1 Source Group(s); and     26 Receptor(s)

 **The Model Assumes A Pollutant Type of:  FUGITIVE

 **Model Set To Continue RUNning After the Setup Testing.

 **Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs Tables of Overall Maximum Short Term Values (MAXTABLE Keyword)
         Model Outputs Tables of Concurrent Short Term Values by Receptor for Each Day Processed (DAYTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                 m for Missing Hours
                                                                 b for Both Calm and Missing Hours

 **Misc. Inputs:  Anem. Hgt. (m) =    10.00 ;    Decay Coef. =   0.0000     ;    Rot. Angle =     0.0
                  Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                  Output Units   = MICROGRAMS/M**3

 **Input Runstream File: offsite.inp                              ;  **Output Print File: offsite.lst
 **Detailed Error/Message File:   OFFSITE.ERR
```

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
OFFSITE	0	0.10000E+01	0.0	0.0	216.4	38.00	997.00	0.22	30.59	NO	

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	OFFSITE ,

*** MODELING OPTIONS USED: CONC RURAL ELEV[illegible] GRDRIS NOSTD

*** SOURCE PARTICULATE/GAS DATA ***

*** SOURCE ID = OFFSITE ; SOURCE TYPE = POINT ***

SCAV COEF [LIQ] 1/(S-MM/HR)=
0.00E+00,

SCAV COEF [ICE] 1/(S-MM/HR)=
0.00E+00,

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZFLAG)
(METERS)

(100.0,	0.0,	292.6,	0.0);	(200.0,	0.0,	304.8,	0.0);
(300.0,	0.0,	328.0,	0.0);	(400.0,	0.0,	347.5,	0.0);
(500.0,	0.0,	359.7,	0.0);	(600.0,	0.0,	359.7,	0.0);
(700.0,	0.0,	356.6,	0.0);	(800.0,	0.0,	359.7,	0.0);
(900.0,	0.0,	359.7,	0.0);	(1000.0,	0.0,	371.9,	0.0);
(1250.0,	0.0,	361.5,	0.0);	(1500.0,	0.0,	359.7,	0.0);
(1750.0,	0.0,	359.7,	0.0);	(2000.0,	0.0,	365.8,	0.0);
(2250.0,	0.0,	371.9,	0.0);	(2500.0,	0.0,	408.4,	0.0);
(3000.0,	0.0,	408.4,	0.0);	(4000.0,	0.0,	420.6,	0.0);
(5000.0,	0.0,	415.4,	0.0);	(7500.0,	0.0,	408.4,	0.0);
(10000.0,	0.0,	426.7,	0.0);	(15000.0,	0.0,	420.0,	0.0);
(20000.0,	0.0,	420.0,	0.0);	(30000.0,	0.0,	420.0,	0.0);
(40000.0,	0.0,	420.0,	0.0);	(50000.0,	0.0,	420.0,	0.0);

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

1 1 1

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: screen.met FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,f5.1,i4,f7.2)
SURFACE STATION NO.: 94823 UPPER AIR STATION NO.: 94823
NAME: UNKNOWN NAME: UNKNOWN
YEAR: 1993 YEAR: 1993

YEAR	MONTH	DAY	HOUR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	MIXING HEIGHT (M) URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-O (M)	Zd (M)	IPCOD
93	1	1	1	90.0	1.00	293.1	1	320.0	320.0	0.0000	0.0	0.0000	0.0	0
93	1	1	2	90.0	1.50	293.1	1	480.0	480.0	0.0000	0.0	0.0000	0.0	0
93	1	1	3	90.0	2.00	293.1	1	640.0	640.0	0.0000	0.0	0.0000	0.0	0
93	1	1	4	90.0	2.50	293.1	1	800.0	800.0	0.0000	0.0	0.0000	0.0	0
93	1	1	5	90.0	3.00	293.1	1	960.0	960.0	0.0000	0.0	0.0000	0.0	0
93	1	1	6	90.0	1.00	293.1	2	320.0	320.0	0.0000	0.0	0.0000	0.0	0
93	1	1	7	90.0	1.50	293.1	2	480.0	480.0	0.0000	0.0	0.0000	0.0	0
93	1	1	8	90.0	2.00	293.1	2	640.0	640.0	0.0000	0.0	0.0000	0.0	0
93	1	1	9	90.0	2.50	293.1	2	800.0	800.0	0.0000	0.0	0.0000	0.0	0
93	1	1	10	90.0	3.00	293.1	2	960.0	960.0	0.0000	0.0	0.0000	0.0	0
93	1	1	11	90.0	3.50	293.1	2	1120.0	1120.0	0.0000	0.0	0.0000	0.0	0
93	1	1	12	90.0	4.00	293.1	2	1280.0	1280.0	0.0000	0.0	0.0000	0.0	0
93	1	1	13	90.0	4.50	293.1	2	1440.0	1440.0	0.0000	0.0	0.0000	0.0	0
93	1	1	14	90.0	5.00	293.1	2	1600.0	1600.0	0.0000	0.0	0.0000	0.0	0
93	1	1	15	90.0	1.00	293.1	3	320.0	320.0	0.0000	0.0	0.0000	0.0	0
93	1	1	16	90.0	1.50	293.1	3	480.0	480.0	0.0000	0.0	0.0000	0.0	0
93	1	1	17	90.0	2.00	293.1	3	640.0	640.0	0.0000	0.0	0.0000	0.0	0
93	1	1	18	90.0	2.50	293.1	3	800.0	800.0	0.0000	0.0	0.0000	0.0	0
93	1	1	19	90.0	3.00	293.1	3	960.0	960.0	0.0000	0.0	0.0000	0.0	0
93	1	1	20	90.0	3.50	293.1	3	1120.0	1120.0	0.0000	0.0	0.0000	0.0	0
93	1	1	21	90.0	4.00	293.1	3	1280.0	1280.0	0.0000	0.0	0.0000	0.0	0
93	1	1	22	90.0	4.50	293.1	3	1440.0	1440.0	0.0000	0.0	0.0000	0.0	0
93	1	1	23	90.0	5.00	293.1	3	1600.0	1600.0	0.0000	0.0	0.0000	0.0	0
93	1	1	24	90.0	8.00	293.1	3	2560.0	2560.0	0.0000	0.0	0.0000	0.0	0

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

*** ISCOMDEP VERSION 94227 *** *** WTI Truck Accident Off-Site, Screen Modeling -- OFFSITE *** 09/14/95
*** 1 Point source; 26 receptors up to 50 KM away; Vapor. *** 12:5[illegible]8
PA

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 1 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.81890	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	0.00000
900.00	0.00	0.00000	1000.00	0.00	0.00000
1250.00	0.00	0.00000	1500.00	0.00	0.00000
1750.00	0.00	0.00000	2000.00	0.00	0.00000
2250.00	0.00	0.00000	2500.00	0.00	0.00000
3000.00	0.00	0.00000	4000.00	0.00	0.00000
5000.00	0.00	0.00000	7500.00	0.00	0.00000
10000.00	0.00	0.00000	15000.00	0.00	0.00000
20000.00	0.00	0.00000	30000.00	0.00	0.00000
40000.00	0.00	0.00000	50000.00	0.00	0.00000

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 2 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	1.09211	200.00	0.00	0.62507
300.00	0.00	0.59055	400.00	0.00	0.61457
500.00	0.00	0.75027	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	0.00000
900.00	0.00	0.00000	1000.00	0.00	0.00000
1250.00	0.00	0.00000	1500.00	0.00	0.00000
1750.00	0.00	0.00000	2000.00	0.00	0.00000
2250.00	0.00	0.00000	2500.00	0.00	0.00000
3000.00	0.00	0.00000	4000.00	0.00	0.00000
5000.00	0.00	0.00000	7500.00	0.00	0.00000
10000.00	0.00	0.00000	15000.00	0.00	0.00000
20000.00	0.00	0.00000	30000.00	0.00	0.00000
40000.00	0.00	0.00000	50000.00	0.00	0.00000

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 3 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	1.55244	200.00	0.00	1.08747
300.00	0.00	1.17569	400.00	0.00	1.29777
500.00	0.00	1.46886	600.00	0.00	1.62803
700.00	0.00	1.62981	800.00	0.00	1.60347
900.00	0.00	1.62013	1000.00	0.00	1.64727
1250.00	0.00	0.00000	1500.00	0.00	0.00000
1750.00	0.00	0.00000	2000.00	0.00	0.00000
2250.00	0.00	0.00000	2500.00	0.00	0.00000
3000.00	0.00	0.00000	4000.00	0.00	0.00000
5000.00	0.00	0.00000	7500.00	0.00	0.00000
10000.00	0.00	0.00000	15000.00	0.00	0.00000
20000.00	0.00	0.00000	30000.00	0.00	0.00000
40000.00	0.00	0.00000	50000.00	0.00	0.00000

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 4 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	2.27503	200.00	0.00	1.84501
300.00	0.00	2.10901	400.00	0.00	2.28176
500.00	0.00	2.37484	600.00	0.00	2.29886
700.00	0.00	2.02377	800.00	0.00	1.71558
900.00	0.00	1.41099	1000.00	0.00	1.19607
1250.00	0.00	0.92261	1500.00	0.00	0.77306
1750.00	0.00	0.66265	2000.00	0.00	0.57982
2250.00	0.00	0.51540	2500.00	0.00	0.46386
3000.00	0.00	0.38655	4000.00	0.00	0.28991
5000.00	0.00	0.23193	7500.00	0.00	0.15462
10000.00	0.00	0.11740	15000.00	0.00	0.08340
20000.00	0.00	0.06552	30000.00	0.00	0.04676
40000.00	0.00	0.03689	50000.00	0.00	0.03074

*** ISCOMDEP VERSION 94227 *** *** WTI Truck Accident Off-Site, Screen Modeling -- OFFSITE *** 09/14/95
*** 1 Point source; 26 receptors up to 50 KM away; Vapor. *** 12:50:48
PA

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 5 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	3.34302	200.00	0.00	2.95250
300.00	0.00	3.35501	400.00	0.00	3.40608
500.00	0.00	3.20150	600.00	0.00	2.74879
700.00	0.00	2.20528	800.00	0.00	1.74341
900.00	0.00	1.35652	1000.00	0.00	1.07026
1250.00	0.00	0.66945	1500.00	0.00	0.53763
1750.00	0.00	0.46018	2000.00	0.00	0.40265
2250.00	0.00	0.35791	2500.00	0.00	0.32212
3000.00	0.00	0.26844	4000.00	0.00	0.20133
5000.00	0.00	0.16106	7500.00	0.00	0.10737
10000.00	0.00	0.08163	15000.00	0.00	0.05796
20000.00	0.00	0.04552	30000.00	0.00	0.03248
40000.00	0.00	0.02562	50000.00	0.00	0.02135

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 6 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.73782	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	0.00000
900.00	0.00	0.00000	1000.00	0.00	0.00000
1250.00	0.00	0.00000	1500.00	0.00	0.00000
1750.00	0.00	0.00000	2000.00	0.00	0.00000
2250.00	0.00	0.00000	2500.00	0.00	0.00000
3000.00	0.00	0.00000	4000.00	0.00	0.00000
5000.00	0.00	0.00000	7500.00	0.00	0.00000
10000.00	0.00	0.00000	15000.00	0.00	0.00000
20000.00	0.00	0.00000	30000.00	0.00	0.00000
40000.00	0.00	0.00000	50000.00	0.00	0.00000

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 7 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.88183	200.00	0.00	0.42052
300.00	0.00	0.33234	400.00	0.00	0.26377
500.00	0.00	0.21296	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	0.00000
900.00	0.00	0.00000	1000.00	0.00	0.00000
1250.00	0.00	0.00000	1500.00	0.00	0.00000
1750.00	0.00	0.00000	2000.00	0.00	0.00000
2250.00	0.00	0.00000	2500.00	0.00	0.00000
3000.00	0.00	0.00000	4000.00	0.00	0.00000
5000.00	0.00	0.00000	7500.00	0.00	0.00000
10000.00	0.00	0.00000	15000.00	0.00	0.00000
20000.00	0.00	0.00000	30000.00	0.00	0.00000
40000.00	0.00	0.00000	50000.00	0.00	0.00000

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 8 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	1.10912	200.00	0.00	0.61332
300.00	0.00	0.55083	400.00	0.00	0.46774
500.00	0.00	0.38747	600.00	0.00	0.29377
700.00	0.00	0.23023	800.00	0.00	0.20016
900.00	0.00	0.17402	1000.00	0.00	0.16905
1250.00	0.00	0.00000	1500.00	0.00	0.00000
1750.00	0.00	0.00000	2000.00	0.00	0.00000
2250.00	0.00	0.00000	2500.00	0.00	0.00000
3000.00	0.00	0.00000	4000.00	0.00	0.00000
5000.00	0.00	0.00000	7500.00	0.00	0.00000
10000.00	0.00	0.00000	15000.00	0.00	0.00000
20000.00	0.00	0.00000	30000.00	0.00	0.00000
40000.00	0.00	0.00000	50000.00	0.00	0.00000

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 9 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	1.44608	200.00	0.00	0.91202
300.00	0.00	0.90330	400.00	0.00	0.80214
500.00	0.00	0.68065	600.00	0.00	0.51961
700.00	0.00	0.40882	800.00	0.00	0.35741
900.00	0.00	0.31138	1000.00	0.00	0.30266
1250.00	0.00	0.22177	1500.00	0.00	0.27135
1750.00	0.00	0.31509	2000.00	0.00	0.34855
2250.00	0.00	0.36427	2500.00	0.00	0.38863
3000.00	0.00	0.35387	4000.00	0.00	0.30555
5000.00	0.00	0.27006	7500.00	0.00	0.19640
10000.00	0.00	0.15368	15000.00	0.00	0.10865
20000.00	0.00	0.08501	30000.00	0.00	0.06027
40000.00	0.00	0.04730	50000.00	0.00	0.03924

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 10 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	1.92557	200.00	0.00	1.35182
300.00	0.00	1.42867	400.00	0.00	1.29651
500.00	0.00	1.10621	600.00	0.00	0.84213
700.00	0.00	0.65979	800.00	0.00	0.57385
900.00	0.00	0.49681	1000.00	0.00	0.47862
1250.00	0.00	0.34430	1500.00	0.00	0.39451
1750.00	0.00	0.42503	2000.00	0.00	0.43721
2250.00	0.00	0.42845	2500.00	0.00	0.42889
3000.00	0.00	0.35660	4000.00	0.00	0.26007
5000.00	0.00	0.20341	7500.00	0.00	0.13720
10000.00	0.00	0.10695	15000.00	0.00	0.07553
20000.00	0.00	0.05907	30000.00	0.00	0.04187
40000.00	0.00	0.03285	50000.00	0.00	0.02726

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 11 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	2.58426	200.00	0.00	1.96470
300.00	0.00	2.14864	400.00	0.00	1.95449
500.00	0.00	1.65292	600.00	0.00	1.24624
700.00	0.00	0.96723	800.00	0.00	0.83159
900.00	0.00	0.71214	1000.00	0.00	0.67593
1250.00	0.00	0.47503	1500.00	0.00	0.50657
1750.00	0.00	0.50958	2000.00	0.00	0.49384
2250.00	0.00	0.46113	2500.00	0.00	0.44104
3000.00	0.00	0.34819	4000.00	0.00	0.24054
5000.00	0.00	0.17370	7500.00	0.00	0.10298
10000.00	0.00	0.07873	15000.00	0.00	0.05553
20000.00	0.00	0.04342	30000.00	0.00	0.03076
40000.00	0.00	0.02414	50000.00	0.00	0.02003

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 12 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	3.45842	200.00	0.00	2.77124
300.00	0.00	3.05698	400.00	0.00	2.74778
500.00	0.00	2.28199	600.00	0.00	1.69778
700.00	0.00	1.30217	800.00	0.00	1.10362
900.00	0.00	0.93335	1000.00	0.00	0.87100
1250.00	0.00	0.59801	1500.00	0.00	0.59625
1750.00	0.00	0.56611	2000.00	0.00	0.52340
2250.00	0.00	0.47128	2500.00	0.00	0.43575
3000.00	0.00	0.33303	4000.00	0.00	0.22346
5000.00	0.00	0.15583	7500.00	0.00	0.08284
10000.00	0.00	0.06060	15000.00	0.00	0.04253
20000.00	0.00	0.03325	30000.00	0.00	0.02356
40000.00	0.00	0.01848	50000.00	0.00	0.01533

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 13 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	4.57867	200.00	0.00	3.77421
300.00	0.00	4.11814	400.00	0.00	3.62343
500.00	0.00	2.94028	600.00	0.00	2.15603
700.00	0.00	1.63354	800.00	0.00	1.36412
900.00	0.00	1.13951	1000.00	0.00	1.04568
1250.00	0.00	0.70301	1500.00	0.00	0.66094
1750.00	0.00	0.59867	2000.00	0.00	0.53355
2250.00	0.00	0.46740	2500.00	0.00	0.42131
3000.00	0.00	0.31939	4000.00	0.00	0.20724
5000.00	0.00	0.14195	7500.00	0.00	0.07053
10000.00	0.00	0.04858	15000.00	0.00	0.03362
20000.00	0.00	0.02628	30000.00	0.00	0.01861
40000.00	0.00	0.01461	50000.00	0.00	0.01212

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 14 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	5.96480	200.00	0.00	4.95626
300.00	0.00	5.27547	400.00	0.00	4.51893
500.00	0.00	3.57619	600.00	0.00	2.58555
700.00	0.00	1.93669	800.00	0.00	1.59475
900.00	0.00	1.31723	1000.00	0.00	1.19007
1250.00	0.00	0.78588	1500.00	0.00	0.70301
1750.00	0.00	0.61309	2000.00	0.00	0.53095
2250.00	0.00	0.45548	2500.00	0.00	0.40264
3000.00	0.00	0.30380	4000.00	0.00	0.19232
5000.00	0.00	0.13020	7500.00	0.00	0.06240
10000.00	0.00	0.04047	15000.00	0.00	0.02724
20000.00	0.00	0.02129	30000.00	0.00	0.01508
40000.00	0.00	0.01183	50000.00	0.00	0.00981

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 15 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.68894	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	0.00000
900.00	0.00	0.00000	1000.00	0.00	0.00000
1250.00	0.00	0.00000	1500.00	0.00	0.00000
1750.00	0.00	0.00000	2000.00	0.00	0.00000
2250.00	0.00	0.00000	2500.00	0.00	0.00000
3000.00	0.00	0.00000	4000.00	0.00	0.00000
5000.00	0.00	0.00000	7500.00	0.00	0.00000
10000.00	0.00	0.00000	15000.00	0.00	0.00000
20000.00	0.00	0.00000	30000.00	0.00	0.00000
40000.00	0.00	0.00000	50000.00	0.00	0.00000

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 16 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.76179	200.00	0.00	0.34938
300.00	0.00	0.26741	400.00	0.00	0.20527
500.00	0.00	0.15277	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	0.00000
900.00	0.00	0.00000	1000.00	0.00	0.00000
1250.00	0.00	0.00000	1500.00	0.00	0.00000
1750.00	0.00	0.00000	2000.00	0.00	0.00000
2250.00	0.00	0.00000	2500.00	0.00	0.00000
3000.00	0.00	0.00000	4000.00	0.00	0.00000
5000.00	0.00	0.00000	7500.00	0.00	0.00000
10000.00	0.00	0.00000	15000.00	0.00	0.00000
20000.00	0.00	0.00000	30000.00	0.00	0.00000
40000.00	0.00	0.00000	50000.00	0.00	0.00000

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 17 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.87063	200.00	0.00	0.45629
300.00	0.00	0.39519	400.00	0.00	0.32323
500.00	0.00	0.24606	600.00	0.00	0.16816
700.00	0.00	0.11893	800.00	0.00	0.09554
900.00	0.00	0.07669	1000.00	0.00	0.07120
1250.00	0.00	0.04468	1500.00	0.00	0.04701
1750.00	0.00	0.05217	2000.00	0.00	0.06086
2250.00	0.00	0.07082	2500.00	0.00	0.09477
3000.00	0.00	0.11294	4000.00	0.00	0.18240
5000.00	0.00	0.24819	7500.00	0.00	0.32083
10000.00	0.00	0.30443	15000.00	0.00	0.22927
20000.00	0.00	0.17898	30000.00	0.00	0.12577
40000.00	0.00	0.09797	50000.00	0.00	0.08075

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 18 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	1.02308	200.00	0.00	0.60938
300.00	0.00	0.58794	400.00	0.00	0.50678
500.00	0.00	0.39393	600.00	0.00	0.26789
700.00	0.00	0.18814	800.00	0.00	0.15194
900.00	0.00	0.12210	1000.00	0.00	0.11529
1250.00	0.00	0.07006	1500.00	0.00	0.07642
1750.00	0.00	0.08705	2000.00	0.00	0.10303
2250.00	0.00	0.11957	2500.00	0.00	0.16053
3000.00	0.00	0.17840	4000.00	0.00	0.21262
5000.00	0.00	0.23852	7500.00	0.00	0.22802
10000.00	0.00	0.19646	15000.00	0.00	0.14648
20000.00	0.00	0.11475	30000.00	0.00	0.08058
40000.00	0.00	0.06274	50000.00	0.00	0.05171

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 19 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	1.22892	200.00	0.00	0.82335
300.00	0.00	0.86845	400.00	0.00	0.77877
500.00	0.00	0.61432	600.00	0.00	0.41638
700.00	0.00	0.29106	800.00	0.00	0.23590
900.00	0.00	0.18973	1000.00	0.00	0.18104
1250.00	0.00	0.10954	1500.00	0.00	0.12236
1750.00	0.00	0.14038	2000.00	0.00	0.16482
2250.00	0.00	0.18745	2500.00	0.00	0.24269
3000.00	0.00	0.25285	4000.00	0.00	0.28284
5000.00	0.00	0.28522	7500.00	0.00	0.22481
10000.00	0.00	0.16651	15000.00	0.00	0.10601
20000.00	0.00	0.08018	30000.00	0.00	0.05599
40000.00	0.00	0.04358	50000.00	0.00	0.03592

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 20 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	1.49998	200.00	0.00	1.11479
300.00	0.00	1.25983	400.00	0.00	1.15989
500.00	0.00	0.92247	600.00	0.00	0.62356
700.00	0.00	0.43443	800.00	0.00	0.35259
900.00	0.00	0.28352	1000.00	0.00	0.27185
1250.00	0.00	0.16389	1500.00	0.00	0.18340
1750.00	0.00	0.20759	2000.00	0.00	0.23761
2250.00	0.00	0.26172	2500.00	0.00	0.32364
3000.00	0.00	0.31608	4000.00	0.00	0.33463
5000.00	0.00	0.31119	7500.00	0.00	0.21949
10000.00	0.00	0.15263	15000.00	0.00	0.08631
20000.00	0.00	0.06066	30000.00	0.00	0.04118
40000.00	0.00	0.03203	50000.00	0.00	0.02639

*** ISCOMDEP VERSION 94227 *** *** WTI Truck Accident Off-Site, Screen Modeling -- OFFSITE *** 09/14/95
*** 1 Point source; 26 receptors up to 50 KM away; Vapor. *** 12:[illegible]
P/

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 21 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	1.84974	200.00	0.00	1.50061
300.00	0.00	1.78126	400.00	0.00	1.66318
500.00	0.00	1.32556	600.00	0.00	0.89375
700.00	0.00	0.62105	800.00	0.00	0.50371
900.00	0.00	0.40456	1000.00	0.00	0.38794
1250.00	0.00	0.23305	1500.00	0.00	0.25704
1750.00	0.00	0.28341	2000.00	0.00	0.31363
2250.00	0.00	0.33334	2500.00	0.00	0.39338
3000.00	0.00	0.37818	4000.00	0.00	0.36796
5000.00	0.00	0.32169	7500.00	0.00	0.20971
10000.00	0.00	0.14082	15000.00	0.00	0.07525
20000.00	0.00	0.04941	30000.00	0.00	0.03167
40000.00	0.00	0.02453	50000.00	0.00	0.02021

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 22 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	2.29270	200.00	0.00	1.99603
300.00	0.00	2.44350	400.00	0.00	2.28925
500.00	0.00	1.81930	600.00	0.00	1.22355
700.00	0.00	0.84845	800.00	0.00	0.68656
900.00	0.00	0.55031	1000.00	0.00	0.52589
1250.00	0.00	0.31487	1500.00	0.00	0.33865
1750.00	0.00	0.36142	2000.00	0.00	0.38574
2250.00	0.00	0.39771	2500.00	0.00	0.44738
3000.00	0.00	0.42908	4000.00	0.00	0.38636
5000.00	0.00	0.32217	7500.00	0.00	0.19825
10000.00	0.00	0.12995	15000.00	0.00	0.06761
20000.00	0.00	0.04254	30000.00	0.00	0.02537
40000.00	0.00	0.01940	50000.00	0.00	0.01597

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 23 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	2.84345	200.00	0.00	2.61234
300.00	0.00	3.24546	400.00	0.00	3.02450
500.00	0.00	2.38751	600.00	0.00	1.60183
700.00	0.00	1.10895	800.00	0.00	0.89428
900.00	0.00	0.71502	1000.00	0.00	0.67926
1250.00	0.00	0.40548	1500.00	0.00	0.42278
1750.00	0.00	0.43587	2000.00	0.00	0.44908
2250.00	0.00	0.46577	2500.00	0.00	0.48530
3000.00	0.00	0.46562	4000.00	0.00	0.39383
5000.00	0.00	0.31662	7500.00	0.00	0.18659
10000.00	0.00	0.12017	15000.00	0.00	0.06156
20000.00	0.00	0.03791	30000.00	0.00	0.02113
40000.00	0.00	0.01576	50000.00	0.00	0.01294

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 24 FOR DAY 1 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	2.08867	200.00	0.00	5.66463
300.00	0.00	5.49504	400.00	0.00	4.60496
500.00	0.00	3.77290	600.00	0.00	3.10751
700.00	0.00	2.59060	800.00	0.00	2.13215
900.00	0.00	1.68105	1000.00	0.00	1.52042
1250.00	0.00	0.90328	1500.00	0.00	0.78533
1750.00	0.00	0.74650	2000.00	0.00	0.70761
2250.00	0.00	0.65674	2500.00	0.00	0.49665
3000.00	0.00	0.37322	4000.00	0.00	0.23038
5000.00	0.00	0.15551	7500.00	0.00	0.07420
10000.00	0.00	0.04336	15000.00	0.00	0.02016
20000.00	0.00	0.01167	30000.00	0.00	0.00540
40000.00	0.00	0.00321	50000.00	0.00	0.00229

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 1 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	1.59015	200.00	0.00	5.59481
300.00	0.00	5.58536	400.00	0.00	4.67075
500.00	0.00	3.79475	600.00	0.00	3.09618
700.00	0.00	2.55791	800.00	0.00	2.14266
900.00	0.00	1.81858	1000.00	0.00	1.56203
1250.00	0.00	1.05858	1500.00	0.00	0.90184
1750.00	0.00	0.82346	2000.00	0.00	0.73736
2250.00	0.00	0.50270	2500.00	0.00	0.42498
3000.00	0.00	0.31392	4000.00	0.00	0.19008
5000.00	0.00	0.12703	7500.00	0.00	0.05996
10000.00	0.00	0.03490	15000.00	0.00	0.01618
20000.00	0.00	0.00935	30000.00	0.00	0.00431
40000.00	0.00	0.00250	50000.00	0.00	0.00167

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 2 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.65923	200.00	0.00	0.00000
300.00	0.00	0.00000	400.00	0.00	0.00000
500.00	0.00	0.00000	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	0.00000
900.00	0.00	0.00000	1000.00	0.00	0.00000
1250.00	0.00	0.00000	1500.00	0.00	0.00000
1750.00	0.00	0.00000	2000.00	0.00	0.00000
2250.00	0.00	0.00000	2500.00	0.00	0.00000
3000.00	0.00	0.00000	4000.00	0.00	0.00000
5000.00	0.00	0.00000	7500.00	0.00	0.00000
10000.00	0.00	0.00000	15000.00	0.00	0.00000
20000.00	0.00	0.00000	30000.00	0.00	0.00000
40000.00	0.00	0.00000	50000.00	0.00	0.00000

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 3 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.69152	200.00	0.00	0.31257
300.00	0.00	0.24032	400.00	0.00	0.18268
500.00	0.00	0.13296	600.00	0.00	0.00000
700.00	0.00	0.00000	800.00	0.00	0.00000
900.00	0.00	0.00000	1000.00	0.00	0.00000
1250.00	0.00	0.00000	1500.00	0.00	0.00000
1750.00	0.00	0.00000	2000.00	0.00	0.00000
2250.00	0.00	0.00000	2500.00	0.00	0.00000
3000.00	0.00	0.00000	4000.00	0.00	0.00000
5000.00	0.00	0.00000	7500.00	0.00	0.00000
10000.00	0.00	0.00000	15000.00	0.00	0.00000
20000.00	0.00	0.00000	30000.00	0.00	0.00000
40000.00	0.00	0.00000	50000.00	0.00	0.00000

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 4 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.73755	200.00	0.00	0.37658
300.00	0.00	0.32853	400.00	0.00	0.26505
500.00	0.00	0.19618	600.00	0.00	0.12761
700.00	0.00	0.08585	800.00	0.00	0.06672
900.00	0.00	0.05166	1000.00	0.00	0.04744
1250.00	0.00	0.02599	1500.00	0.00	0.02245
1750.00	0.00	0.02054	2000.00	0.00	0.02035
2250.00	0.00	0.02044	2500.00	0.00	0.02721
3000.00	0.00	0.02552	4000.00	0.00	0.02610
5000.00	0.00	0.02434	7500.00	0.00	0.02849
10000.00	0.00	0.03564	15000.00	0.00	0.04756
20000.00	0.00	0.05732	30000.00	0.00	0.06956
40000.00	0.00	0.07235	50000.00	0.00	0.07179

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 5 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.79885	200.00	0.00	0.45966
300.00	0.00	0.45085	400.00	0.00	0.38360
500.00	0.00	0.28827	600.00	0.00	0.18363
700.00	0.00	0.12062	800.00	0.00	0.09339
900.00	0.00	0.07162	1000.00	0.00	0.06699
1250.00	0.00	0.03507	1500.00	0.00	0.03091
1750.00	0.00	0.02900	2000.00	0.00	0.02971
2250.00	0.00	0.03078	2500.00	0.00	0.04382
3000.00	0.00	0.04230	4000.00	0.00	0.04546
5000.00	0.00	0.04323	7500.00	0.00	0.04929
10000.00	0.00	0.06051	15000.00	0.00	0.07323
20000.00	0.00	0.07844	30000.00	0.00	0.07692
40000.00	0.00	0.06906	50000.00	0.00	0.06145

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 6 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.87742	200.00	0.00	0.56660
300.00	0.00	0.61811	400.00	0.00	0.55069
500.00	0.00	0.41929	600.00	0.00	0.26259
700.00	0.00	0.16910	800.00	0.00	0.13057
900.00	0.00	0.09937	1000.00	0.00	0.09441
1250.00	0.00	0.04760	1500.00	0.00	0.04282
1750.00	0.00	0.04111	2000.00	0.00	0.04332
2250.00	0.00	0.04600	2500.00	0.00	0.06864
3000.00	0.00	0.06743	4000.00	0.00	0.07401
5000.00	0.00	0.07031	7500.00	0.00	0.07954
10000.00	0.00	0.09418	15000.00	0.00	0.10449
20000.00	0.00	0.10357	30000.00	0.00	0.09075
40000.00	0.00	0.07610	50000.00	0.00	0.06436

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 7 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.97568	200.00	0.00	0.70307
300.00	0.00	0.84288	400.00	0.00	0.78041
500.00	0.00	0.60055	600.00	0.00	0.37108
700.00	0.00	0.23522	800.00	0.00	0.18123
900.00	0.00	0.13708	1000.00	0.00	0.13194
1250.00	0.00	0.06452	1500.00	0.00	0.05909
1750.00	0.00	0.05782	2000.00	0.00	0.06227
2250.00	0.00	0.06726	2500.00	0.00	0.10328
3000.00	0.00	0.10203	4000.00	0.00	0.11155
5000.00	0.00	0.10425	7500.00	0.00	0.11595
10000.00	0.00	0.13022	15000.00	0.00	0.13193
20000.00	0.00	0.12217	30000.00	0.00	0.09804
40000.00	0.00	0.07838	50000.00	0.00	0.06421

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 8 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	1.09653	200.00	0.00	0.87549
300.00	0.00	1.13892	400.00	0.00	1.08743
500.00	0.00	0.84357	600.00	0.00	0.51595
700.00	0.00	0.32307	800.00	0.00	0.24852
900.00	0.00	0.18708	1000.00	0.00	0.18188
1250.00	0.00	0.08681	1500.00	0.00	0.08069
1750.00	0.00	0.08009	2000.00	0.00	0.08751
2250.00	0.00	0.09544	2500.00	0.00	0.14837
3000.00	0.00	0.14590	4000.00	0.00	0.15600
5000.00	0.00	0.14210	7500.00	0.00	0.15503
10000.00	0.00	0.16442	15000.00	0.00	0.15328
20000.00	0.00	0.13420	30000.00	0.00	0.10067
40000.00	0.00	0.07772	50000.00	0.00	0.06226

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 9 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	1.25098	200.00	0.00	1.09092
300.00	0.00	1.52013	400.00	0.00	1.48541
500.00	0.00	1.15857	600.00	0.00	0.70343
700.00	0.00	0.43650	800.00	0.00	0.33535
900.00	0.00	0.25154	1000.00	0.00	0.24636
1250.00	0.00	0.11549	1500.00	0.00	0.10849
1750.00	0.00	0.10864	2000.00	0.00	0.11962
2250.00	0.00	0.13086	2500.00	0.00	0.20319
3000.00	0.00	0.19736	4000.00	0.00	0.20398
5000.00	0.00	0.18034	7500.00	0.00	0.19337
10000.00	0.00	0.19409	15000.00	0.00	0.16836
20000.00	0.00	0.14088	30000.00	0.00	0.10034
40000.00	0.00	0.07549	50000.00	0.00	0.05948

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 10 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	1.53251	200.00	0.00	1.35679
300.00	0.00	1.99924	400.00	0.00	1.98495
500.00	0.00	1.55276	600.00	0.00	0.93823
700.00	0.00	0.57864	800.00	0.00	0.44408
900.00	0.00	0.33223	1000.00	0.00	0.32693
1250.00	0.00	0.15138	1500.00	0.00	0.14310
1750.00	0.00	0.14388	2000.00	0.00	0.15864
2250.00	0.00	0.17309	2500.00	0.00	0.26570
3000.00	0.00	0.25361	4000.00	0.00	0.25176
5000.00	0.00	0.21590	7500.00	0.00	0.22843
10000.00	0.00	0.21807	15000.00	0.00	0.17798
20000.00	0.00	0.14363	30000.00	0.00	0.09826
40000.00	0.00	0.07250	50000.00	0.00	0.05643

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 11 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.27107	200.00	0.00	1.71777
300.00	0.00	2.28344	400.00	0.00	2.21965
500.00	0.00	2.00967	600.00	0.00	1.78189
700.00	0.00	1.57371	800.00	0.00	1.39321
900.00	0.00	1.14996	1000.00	0.00	1.10872
1250.00	0.00	0.52386	1500.00	0.00	0.48024
1750.00	0.00	0.46164	2000.00	0.00	0.47766
2250.00	0.00	0.48491	2500.00	0.00	0.54602
3000.00	0.00	0.47196	4000.00	0.00	0.36155
5000.00	0.00	0.28626	7500.00	0.00	0.17751
10000.00	0.00	0.12210	15000.00	0.00	0.07023
20000.00	0.00	0.04661	30000.00	0.00	0.02571
40000.00	0.00	0.01694	50000.00	0.00	0.01222

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 12 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.10018	200.00	0.00	1.30773
300.00	0.00	2.06962	400.00	0.00	2.14212
500.00	0.00	2.00171	600.00	0.00	1.80676
700.00	0.00	1.61295	800.00	0.00	1.43766
900.00	0.00	1.28449	1000.00	0.00	1.15230
1250.00	0.00	0.85233	1500.00	0.00	0.74482
1750.00	0.00	0.68052	2000.00	0.00	0.64832
2250.00	0.00	0.59155	2500.00	0.00	0.54123
3000.00	0.00	0.45701	4000.00	0.00	0.33781
5000.00	0.00	0.26054	7500.00	0.00	0.15511
10000.00	0.00	0.10432	15000.00	0.00	0.05869
20000.00	0.00	0.03851	30000.00	0.00	0.02100
40000.00	0.00	0.01376	50000.00	0.00	0.00990

*** ISCOMDEP VERSION 94227 *** *** WTI Truck Accident Off-Site, Screen Modeling -- OFFSITE *** 09/14/95
*** 1 Point source; 26 receptors up to 50 KM away; Vapor. *** 12:
PA

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 13 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.02068	200.00	0.00	0.94900
300.00	0.00	1.91570	400.00	0.00	2.12697
500.00	0.00	2.04348	600.00	0.00	1.86491
700.00	0.00	1.67058	800.00	0.00	1.48853
900.00	0.00	1.32693	1000.00	0.00	1.18646
1250.00	0.00	0.89734	1500.00	0.00	0.78286
1750.00	0.00	0.68782	2000.00	0.00	0.60707
2250.00	0.00	0.53873	2500.00	0.00	0.48084
3000.00	0.00	0.38948	4000.00	0.00	0.27228
5000.00	0.00	0.20237	7500.00	0.00	0.11431
10000.00	0.00	0.07482	15000.00	0.00	0.04103
20000.00	0.00	0.02658	30000.00	0.00	0.01431
40000.00	0.00	0.00933	50000.00	0.00	0.00669

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 14 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	0.00974	200.00	0.00	0.86040
300.00	0.00	1.88919	400.00	0.00	2.12054
500.00	0.00	2.03106	600.00	0.00	1.84082
700.00	0.00	1.63626	800.00	0.00	1.44688
900.00	0.00	1.28060	1000.00	0.00	1.13748
1250.00	0.00	0.85626	1500.00	0.00	0.72546
1750.00	0.00	0.62138	2000.00	0.00	0.53698
2250.00	0.00	0.46826	2500.00	0.00	0.41185
3000.00	0.00	0.32603	4000.00	0.00	0.22158
5000.00	0.00	0.16184	7500.00	0.00	0.08930
10000.00	0.00	0.05779	15000.00	0.00	0.03136
20000.00	0.00	0.02021	30000.00	0.00	0.01083
40000.00	0.00	0.00704	50000.00	0.00	0.00504

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 15 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	9.17914	200.00	0.00	5.20311
300.00	0.00	9.78828	400.00	0.00	14.86587
500.00	0.00	17.16070	600.00	0.00	14.43324
700.00	0.00	11.51297	800.00	0.00	11.03429
900.00	0.00	9.90330	1000.00	0.00	11.80137
1250.00	0.00	7.64272	1500.00	0.00	6.21791
1750.00	0.00	5.41060	2000.00	0.00	5.39378
2250.00	0.00	5.34495	2500.00	0.00	7.21376
3000.00	0.00	5.82222	4000.00	0.00	4.32489
5000.00	0.00	3.22312	7500.00	0.00	1.87735
10000.00	0.00	1.33870	15000.00	0.00	0.77559
20000.00	0.00	0.70805	30000.00	0.00	0.56321
40000.00	0.00	0.46332	50000.00	0.00	0.38992

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 16 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	26.37437	200.00	0.00	5.63871
300.00	0.00	11.20241	400.00	0.00	16.90074
500.00	0.00	18.94490	600.00	0.00	15.83704
700.00	0.00	12.65435	800.00	0.00	11.94546
900.00	0.00	10.64366	1000.00	0.00	12.06563
1250.00	0.00	7.97805	1500.00	0.00	6.42436
1750.00	0.00	5.50312	2000.00	0.00	5.29277
2250.00	0.00	5.06163	2500.00	0.00	5.65509
3000.00	0.00	4.50767	4000.00	0.00	3.05915
5000.00	0.00	2.32745	7500.00	0.00	1.36933
10000.00	0.00	0.89431	15000.00	0.00	0.52351
20000.00	0.00	0.35126	30000.00	0.00	0.20522
40000.00	0.00	0.13974	50000.00	0.00	0.10528

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 17 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	62.23378	200.00	0.00	11.46214
300.00	0.00	12.35422	400.00	0.00	18.18891
500.00	0.00	19.64951	600.00	0.00	16.33002
700.00	0.00	13.09169	800.00	0.00	12.16302
900.00	0.00	10.76628	1000.00	0.00	11.60286
1250.00	0.00	7.85987	1500.00	0.00	6.28158
1750.00	0.00	5.31279	2000.00	0.00	4.95312
2250.00	0.00	4.59804	2500.00	0.00	4.36019
3000.00	0.00	3.45930	4000.00	0.00	2.30037
5000.00	0.00	1.74236	7500.00	0.00	1.02928
10000.00	0.00	0.65978	15000.00	0.00	0.38430
20000.00	0.00	0.25701	30000.00	0.00	0.14970
40000.00	0.00	0.10176	50000.00	0.00	0.07659

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 18 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	120.40126	200.00	0.00	22.42717
300.00	0.00	15.66378	400.00	0.00	18.92721
500.00	0.00	19.64915	600.00	0.00	16.24436
700.00	0.00	13.08050	800.00	0.00	11.96645
900.00	0.00	10.53259	1000.00	0.00	10.81345
1250.00	0.00	7.51630	1500.00	0.00	5.97614
1750.00	0.00	5.00416	2000.00	0.00	4.54292
2250.00	0.00	4.11389	2500.00	0.00	3.52548
3000.00	0.00	2.78693	4000.00	0.00	1.84120
5000.00	0.00	1.38996	7500.00	0.00	0.81654
10000.00	0.00	0.52080	15000.00	0.00	0.30231
20000.00	0.00	0.20173	30000.00	0.00	0.11726
40000.00	0.00	0.07961	50000.00	0.00	0.05989

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 19 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	191.37901	200.00	0.00	38.04164
300.00	0.00	25.63425	400.00	0.00	19.25438
500.00	0.00	19.19101	600.00	0.00	15.79421
700.00	0.00	12.78461	800.00	0.00	11.52680
900.00	0.00	10.09808	1000.00	0.00	9.82507
1250.00	0.00	7.06886	1500.00	0.00	5.60258
1750.00	0.00	4.65516	2000.00	0.00	4.13088
2250.00	0.00	3.64354	2500.00	0.00	2.96026
3000.00	0.00	2.33326	4000.00	0.00	1.53348
5000.00	0.00	1.15467	7500.00	0.00	0.67544
10000.00	0.00	0.42914	15000.00	0.00	0.24847
20000.00	0.00	0.16553	30000.00	0.00	0.09607
40000.00	0.00	0.06517	50000.00	0.00	0.04900

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 20 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	207.63899	200.00	0.00	56.09013
300.00	0.00	35.42534	400.00	0.00	23.48624
500.00	0.00	18.44327	600.00	0.00	15.12176
700.00	0.00	12.31243	800.00	0.00	10.95165
900.00	0.00	9.55779	1000.00	0.00	8.72180
1250.00	0.00	6.58382	1500.00	0.00	5.20999
1750.00	0.00	4.30342	2000.00	0.00	3.71879
2250.00	0.00	3.19940	2500.00	0.00	2.55168
3000.00	0.00	2.00631	4000.00	0.00	1.31298
5000.00	0.00	0.98657	7500.00	0.00	0.57515
10000.00	0.00	0.36430	15000.00	0.00	0.21052
20000.00	0.00	0.14006	30000.00	0.00	0.08120
40000.00	0.00	0.05505	50000.00	0.00	0.04137

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 21 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	189.36391	200.00	0.00	72.27760
300.00	0.00	39.82120	400.00	0.00	25.24093
500.00	0.00	17.61203	600.00	0.00	14.23355
700.00	0.00	11.73672	800.00	0.00	10.25074
900.00	0.00	8.92155	1000.00	0.00	7.79965
1250.00	0.00	6.01535	1500.00	0.00	4.80297
1750.00	0.00	3.95109	2000.00	0.00	3.32376
2250.00	0.00	2.83397	2500.00	0.00	2.24233
3000.00	0.00	1.75942	4000.00	0.00	1.14726
5000.00	0.00	0.86056	7500.00	0.00	0.50029
10000.00	0.00	0.31608	15000.00	0.00	0.18237
20000.00	0.00	0.12121	30000.00	0.00	0.07020
40000.00	0.00	0.04757	50000.00	0.00	0.03574

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 22 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	169.67842	200.00	0.00	70.66110
300.00	0.00	38.22855	400.00	0.00	24.09174
500.00	0.00	16.92746	600.00	0.00	13.03526
700.00	0.00	10.93935	800.00	0.00	9.36549
900.00	0.00	8.14166	1000.00	0.00	7.03090
1250.00	0.00	5.47144	1500.00	0.00	4.36030
1750.00	0.00	3.58087	2000.00	0.00	2.99774
2250.00	0.00	2.53310	2500.00	0.00	1.99987
3000.00	0.00	1.56636	4000.00	0.00	1.01821
5000.00	0.00	0.76265	7500.00	0.00	0.44233
10000.00	0.00	0.27886	15000.00	0.00	0.16069
20000.00	0.00	0.10671	30000.00	0.00	0.06176
40000.00	0.00	0.04183	50000.00	0.00	0.03142

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 23 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	151.22041	200.00	0.00	66.92157
300.00	0.00	36.17004	400.00	0.00	22.82990
500.00	0.00	16.03088	600.00	0.00	12.31160
700.00	0.00	10.09557	800.00	0.00	8.63371
900.00	0.00	7.49753	1000.00	0.00	6.40542
1250.00	0.00	5.01292	1500.00	0.00	3.99640
1750.00	0.00	3.27706	2000.00	0.00	2.71366
2250.00	0.00	2.29028	2500.00	0.00	1.80466
3000.00	0.00	1.41124	4000.00	0.00	0.91491
5000.00	0.00	0.68441	7500.00	0.00	0.39617
10000.00	0.00	0.24930	15000.00	0.00	0.14350
20000.00	0.00	0.09523	30000.00	0.00	0.05508
40000.00	0.00	0.03729	50000.00	0.00	0.02801

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 24 FOR DAY 2 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	17.67307	200.00	0.00	10.71785
300.00	0.00	22.11532	400.00	0.00	32.51575
500.00	0.00	34.85668	600.00	0.00	28.97512
700.00	0.00	23.24654	800.00	0.00	21.61471
900.00	0.00	19.16001	1000.00	0.00	20.69304
1250.00	0.00	14.09468	1500.00	0.00	11.29400
1750.00	0.00	9.60246	2000.00	0.00	9.10952
2250.00	0.00	8.58492	2500.00	0.00	7.88782
3000.00	0.00	6.38994	4000.00	0.00	4.43724
5000.00	0.00	3.45708	7500.00	0.00	2.15608
10000.00	0.00	1.44461	15000.00	0.00	0.88569
20000.00	0.00	0.62392	30000.00	0.00	0.37837
40000.00	0.00	0.26734	50000.00	0.00	0.20389

*** ISCOMDEP VERSION 94227 *** *** WTI Truck Accident Off-Site, Screen Modeling -- OFFSITE *** 09/14/95
*** 1 Point source; 26 receptors up to 50 KM away; Vapor. *** 12:[illegible]
PM

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 1 FOR DAY 3 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	57.56957	200.00	0.00	12.13928
300.00	0.00	25.15523	400.00	0.00	34.11783
500.00	0.00	33.45829	600.00	0.00	27.67290
700.00	0.00	22.60911	800.00	0.00	20.43232
900.00	0.00	18.02194	1000.00	0.00	16.87412
1250.00	0.00	12.86062	1500.00	0.00	10.32840
1750.00	0.00	8.68409	2000.00	0.00	7.75508
2250.00	0.00	6.77120	2500.00	0.00	5.48719
3000.00	0.00	4.42163	4000.00	0.00	3.04205
5000.00	0.00	2.35676	7500.00	0.00	1.45425
10000.00	0.00	0.96494	15000.00	0.00	0.58639
20000.00	0.00	0.41102	30000.00	0.00	0.24767
40000.00	0.00	0.17439	50000.00	0.00	0.13268

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 2 FOR DAY 3 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	135.07504	200.00	0.00	24.98931
300.00	0.00	27.03052	400.00	0.00	33.35661
500.00	0.00	28.70184	600.00	0.00	23.68114
700.00	0.00	20.08150	800.00	0.00	17.39954
900.00	0.00	15.31101	1000.00	0.00	13.36535
1250.00	0.00	10.65054	1500.00	0.00	8.66254
1750.00	0.00	7.24759	2000.00	0.00	6.16188
2250.00	0.00	5.28539	2500.00	0.00	4.23010
3000.00	0.00	3.39516	4000.00	0.00	2.32025
5000.00	0.00	1.79032	7500.00	0.00	1.09660
10000.00	0.00	0.72288	15000.00	0.00	0.43677
20000.00	0.00	0.30517	30000.00	0.00	0.18315
40000.00	0.00	0.12870	50000.00	0.00	0.09777

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 3 FOR DAY 3 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	218.07961	200.00	0.00	47.28311
300.00	0.00	31.28687	400.00	0.00	30.85106
500.00	0.00	24.20550	600.00	0.00	19.94574
700.00	0.00	17.02319	800.00	0.00	14.61751
900.00	0.00	12.84729	1000.00	0.00	11.07833
1250.00	0.00	8.86100	1500.00	0.00	7.22098
1750.00	0.00	6.02657	2000.00	0.00	5.05741
2250.00	0.00	4.32855	2500.00	0.00	3.45101
3000.00	0.00	2.76117	4000.00	0.00	1.87722
5000.00	0.00	1.44400	7500.00	0.00	0.87960
10000.00	0.00	0.57704	15000.00	0.00	0.34723
20000.00	0.00	0.24206	30000.00	0.00	0.14487
40000.00	0.00	0.10165	50000.00	0.00	0.07714

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 4 FOR DAY 3 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	193.67424	200.00	0.00	71.26071
300.00	0.00	41.28204	400.00	0.00	27.03833
500.00	0.00	20.87127	600.00	0.00	17.17882
700.00	0.00	14.64603	800.00	0.00	12.56148
900.00	0.00	11.02856	1000.00	0.00	9.49537
1250.00	0.00	7.58009	1500.00	0.00	6.16377
1750.00	0.00	5.13345	2000.00	0.00	4.29847
2250.00	0.00	3.67234	2500.00	0.00	2.91874
3000.00	0.00	2.32929	4000.00	0.00	1.57697
5000.00	0.00	1.21004	7500.00	0.00	0.73389
10000.00	0.00	0.47965	15000.00	0.00	0.28773
20000.00	0.00	0.20024	30000.00	0.00	0.11959
40000.00	0.00	0.08382	50000.00	0.00	0.06356

*** ISCOMDEP VERSION 94227 *** *** WTI Truck Accident Off-Site, Screen Modeling -- OFFSITE *** 09/14/95
*** 1 Point source; 26 receptors up to 50 KM away; Vapor. *** 12:
PA

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 5 FOR DAY 3 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	167.07159	200.00	0.00	72.02185
300.00	0.00	39.38115	400.00	0.00	24.94218
500.00	0.00	18.40491	600.00	0.00	15.13344
700.00	0.00	12.88981	800.00	0.00	11.04373
900.00	0.00	9.68692	1000.00	0.00	8.32914
1250.00	0.00	6.63757	1500.00	0.00	5.38715
1750.00	0.00	4.47852	2000.00	0.00	3.74304
2250.00	0.00	3.19289	2500.00	0.00	2.53110
3000.00	0.00	2.01554	4000.00	0.00	1.35980
5000.00	0.00	1.04128	7500.00	0.00	0.62931
10000.00	0.00	0.41005	15000.00	0.00	0.24537
20000.00	0.00	0.17054	30000.00	0.00	0.10169
40000.00	0.00	0.07121	50000.00	0.00	0.05397

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** CONCURRENT 1-HR AVERAGE CONCENTRATION VALUES ENDING WITH HOUR 6 FOR DAY 3 ***
FOR SOURCE GROUP: ALL
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
100.00	0.00	141.85909	200.00	0.00	66.84029
300.00	0.00	36.88860	400.00	0.00	23.47149
500.00	0.00	16.55301	600.00	0.00	13.55362
700.00	0.00	11.53413	800.00	0.00	9.87302
900.00	0.00	8.65274	1000.00	0.00	7.43120
1250.00	0.00	5.91276	1500.00	0.00	4.79085
1750.00	0.00	3.97645	2000.00	0.00	3.31799
2250.00	0.00	2.82656	2500.00	0.00	2.23572
3000.00	0.00	1.77700	4000.00	0.00	1.19531
5000.00	0.00	0.91374	7500.00	0.00	0.55061
10000.00	0.00	0.35786	15000.00	0.00	0.21371
20000.00	0.00	0.14837	30000.00	0.00	0.08836
40000.00	0.00	0.06183	50000.00	0.00	0.04684

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): OFFSITE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)
100.00	0.00	218.07961	(93010303)	200.00	0.00	72.27760	(93010221)
300.00	0.00	41.28204	(93010304)	400.00	0.00	34.11783	(93010301)
500.00	0.00	34.85668	(93010224)	600.00	0.00	28.97512	(93010224)
700.00	0.00	23.24654	(93010224)	800.00	0.00	21.61471	(93010224)
900.00	0.00	19.16001	(93010224)	1000.00	0.00	20.69304	(93010224)
1250.00	0.00	14.09468	(93010224)	1500.00	0.00	11.29400	(93010224)
1750.00	0.00	9.60246	(93010224)	2000.00	0.00	9.10952	(93010224)
2250.00	0.00	8.58492	(93010224)	2500.00	0.00	7.88782	(93010224)
3000.00	0.00	6.38994	(93010224)	4000.00	0.00	4.43724	(93010224)
5000.00	0.00	3.45708	(93010224)	7500.00	0.00	2.15608	(93010224)
10000.00	0.00	1.44461	(93010224)	15000.00	0.00	0.88569	(93010224)
20000.00	0.00	0.70805	(93010215)	30000.00	0.00	0.56321	(93010215)
40000.00	0.00	0.46332	(93010215)	50000.00	0.00	0.38992	(93010215)

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** THE MAXIMUM 50 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): OFFSITE ,

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

RANK	CONC	(YYMMDDHH) AT	RECEPTOR (XR,YR) OF TYPE	RANK	CONC	(YYMMDDHH) AT	RECEPTOR (XR,YR) OF
1.	218.07961	(93010303) AT (	100.00, 0.00) DC	26.	38.04164	(93010219) AT (	200.00, 0.00)
2.	207.63899	(93010220) AT (	100.00, 0.00) DC	27.	36.88860	(93010306) AT (	300.00, 0.00)
3.	193.67424	(93010304) AT (	100.00, 0.00) DC	28.	36.17004	(93010223) AT (	300.00, 0.00)
4.	191.37901	(93010219) AT (	100.00, 0.00) DC	29.	35.42534	(93010220) AT (	300.00, 0.00)
5.	189.36391	(93010221) AT (	100.00, 0.00) DC	30.	34.85668	(93010224) AT (	500.00, 0.00)
6.	169.67842	(93010222) AT (	100.00, 0.00) DC	31.	34.11783	(93010301) AT (	400.00, 0.00)
7.	167.07159	(93010305) AT (	100.00, 0.00) DC	32.	33.45829	(93010301) AT (	500.00, 0.00)
8.	151.22041	(93010223) AT (	100.00, 0.00) DC	33.	33.35661	(93010302) AT (	400.00, 0.00)
9.	141.85909	(93010306) AT (	100.00, 0.00) DC	34.	32.51575	(93010224) AT (	400.00, 0.00)
10.	135.07504	(93010302) AT (	100.00, 0.00) DC	35.	31.28687	(93010303) AT (	300.00, 0.00)
11.	120.40126	(93010218) AT (	100.00, 0.00) DC	36.	30.85106	(93010303) AT (	400.00, 0.00)
12.	72.27760	(93010221) AT (	200.00, 0.00) DC	37.	28.97512	(93010224) AT (	600.00, 0.00)
13.	72.02185	(93010305) AT (	200.00, 0.00) DC	38.	28.70184	(93010302) AT (	500.00, 0.00)
14.	71.26071	(93010304) AT (	200.00, 0.00) DC	39.	27.67290	(93010301) AT (	600.00, 0.00)
15.	70.66110	(93010222) AT (	200.00, 0.00) DC	40.	27.03833	(93010304) AT (	400.00, 0.00)
16.	66.92157	(93010223) AT (	200.00, 0.00) DC	41.	27.03052	(93010302) AT (	300.00, 0.00)
17.	66.84029	(93010306) AT (	200.00, 0.00) DC	42.	26.37437	(93010216) AT (	100.00, 0.00)
18.	62.23378	(93010217) AT (	100.00, 0.00) DC	43.	25.63425	(93010219) AT (	300.00, 0.00)
19.	57.56957	(93010301) AT (	100.00, 0.00) DC	44.	25.24093	(93010221) AT (	400.00, 0.00)
20.	56.09013	(93010220) AT (	200.00, 0.00) DC	45.	25.15523	(93010301) AT (	300.00, 0.00)
21.	47.28311	(93010303) AT (	200.00, 0.00) DC	46.	24.98931	(93010302) AT (	200.00, 0.00)
22.	41.28204	(93010304) AT (	300.00, 0.00) DC	47.	24.94218	(93010305) AT (	400.00, 0.00)
23.	39.82120	(93010221) AT (	300.00, 0.00) DC	48.	24.20550	(93010303) AT (	500.00, 0.00)
24.	39.38115	(93010305) AT (	300.00, 0.00) DC	49.	24.09174	(93010222) AT (	400.00, 0.00)
25.	38.22855	(93010222) AT (	300.00, 0.00) DC	50.	23.68114	(93010302) AT (	600.00, 0.00)

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

*** MODELING OPTIONS USED: CONC RURAL ELEV GRDRIS NOSTD

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF FUGITIVE IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL HIGH 1ST HIGH VALUE IS	218.07961	ON 93010303:	AT (100.00, 0.00, 292.60, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

```
*** ISCOMDEP VERSION 94227 ***     *** WTI Truck Accident Off-Site, Screen Modeling -- OFFSITE          ***     09/14/
                                   *** 1 Point source; 26 receptors up to 50 KM away; Vapor.           ***     12:59:
                                                                                                               PAGE

*** MODELING OPTIONS USED:  CONC   RURAL  ELEV                GRDRIS NOSTD


*** Message Summary : ISCOMDEP Model Execution ***

 --------- Summary of Total Messages --------

A Total of            0 Fatal Error Message(s)
A Total of            1 Warning Message(s)
A Total of            0 Informational Message(s)


   ******** FATAL ERROR MESSAGES ********
              *** NONE ***


   ********   WARNING MESSAGES   ********
SO W320   17 PPARM : Source Parameter May Be Out-of-Range for Parameter      DS

   ****************************************
   *** ISCOMDEP Finishes Successfully ***
   ****************************************
```

ATTACHMENT 5

ISC-COMPDEP Outputs Using Real-Times Meteorology Data

A. On-Site Fire Scenario

```
CO STARTING
   TITLEONE  WTI Storage Tank Rupture,  ISCOMDEP -- ONSITE ORGANIC TANK FARM
   TITLETWO  1 Point source; 936 receptors up to 50KM away; Vapor.
   MODELOPT  NOSTD  GRDRIS  RURAL  CONC
   AVERTIME  1 3 24 PERIOD
   POLLUTID  Chemical
   TERRHGTS  ELEV
   ELEVUNIT  METERS
   RUNORNOT  RUN
   ERRORFIL  ONSITE.ERR
CO FINISHED

SO STARTING
   LOCATION  ONSITE POINT    186.385 105.445 212.1
** Point Source          QS     HS     TS     VS     DS
** Parameters:          ----   ----   ----   ----   ---
SO SRCPARAM  ONSITE   1.0   23.0  997.  0.225   15.14
** SO SRCPARAM  ONSITE   1.0   23.0  997.  0.075   26.22

SO BUILDHGT ONSITE    17.37   17.37   17.37   17.37   17.37   17.37
SO BUILDHGT ONSITE    17.37   17.37   17.37   17.37   17.37   17.37
SO BUILDHGT ONSITE    17.37   17.37   17.37   17.37   17.37   17.37
SO BUILDHGT ONSITE    17.37   17.37   17.37   17.37   17.37   17.37
SO BUILDHGT ONSITE    17.37   17.37   17.37   17.37   17.37   17.37
SO BUILDHGT ONSITE    17.37   17.37   17.37   17.37   17.37   17.37
SO BUILDWID ONSITE    50.09   47.00   42.49   36.68   29.75   21.92
SO BUILDWID ONSITE    18.23   26.39   33.74   40.06   45.17   48.91
SO BUILDWID ONSITE    51.16   51.86   50.98   50.09   51.66   51.66
SO BUILDWID ONSITE    50.09   47.00   42.49   36.68   29.75   21.92
SO BUILDWID ONSITE    18.23   26.39   33.74   40.06   45.17   48.91
SO BUILDWID ONSITE    51.16   51.86   50.98   50.09   51.66   51.66


SO SRCGROUP ALL
SO FINISHED

RE STARTING
RE DISCCART      17.36482     98.48077   213.4
RE DISCCART      34.72963    196.96155   225.6
RE DISCCART      52.09445    295.44232   225.6
RE DISCCART      69.45927    393.92310   225.6
RE DISCCART      86.82409    492.40387   225.6
RE DISCCART     104.18890    590.88464   225.6
RE DISCCART     121.55372    689.36542   243.8
RE DISCCART     138.91853    787.84619   256.0
RE DISCCART     156.28336    886.32697   280.4
RE DISCCART     173.64818    984.80774   286.5
RE DISCCART     217.06021   1231.00964   353.6
RE DISCCART     260.47226   1477.21167   353.6
RE DISCCART     303.88431   1723.41357   310.9
RE DISCCART     347.29636   1969.61548   347.5
RE DISCCART     390.70837   2215.81738   353.6
RE DISCCART     434.12042   2462.01929   359.7
RE DISCCART     520.94452   2954.42334   347.5
RE DISCCART     694.59271   3939.23096   341.4
RE DISCCART     868.24084   4924.03857   341.4
RE DISCCART    1302.36133   7386.05811   365.8
RE DISCCART    1736.48169   9848.07715   360.0
RE DISCCART    2604.72266  14772.11620   340.0
RE DISCCART    3472.96338  19696.15430   340.0
RE DISCCART    5209.44531  29544.23240   360.0
RE DISCCART    6945.92676  39392.30860   350.0
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RE DISCCART	8682.40820	49240.38670	360.0
RE DISCCART	34.20201	93.96926	213.4
RE DISCCART	68.40403	187.93852	225.6
RE DISCCART	102.60604	281.90778	225.6
RE DISCCART	136.80806	375.87704	225.6
RE DISCCART	171.01007	469.84631	225.6
RE DISCCART	205.21208	563.81555	225.6
RE DISCCART	239.41409	657.78485	237.7
RE DISCCART	273.61612	751.75409	243.8
RE DISCCART	307.81812	845.72339	256.0
RE DISCCART	342.02014	939.69263	286.5
RE DISCCART	427.52518	1174.61572	329.2
RE DISCCART	513.03021	1409.53894	347.5
RE DISCCART	598.53522	1644.46204	335.3
RE DISCCART	684.04028	1879.38525	347.5
RE DISCCART	769.54529	2114.30835	353.6
RE DISCCART	855.05035	2349.23145	359.7
RE DISCCART	1026.06042	2819.07788	362.4
RE DISCCART	1368.08057	3758.77051	329.2
RE DISCCART	1710.10071	4698.46289	359.7
RE DISCCART	2565.15112	7047.69482	369.7
RE DISCCART	3420.20142	9396.92578	385.9
RE DISCCART	5130.30225	14095.38960	340.0
RE DISCCART	6840.40283	18793.85160	340.0
RE DISCCART	10260.60450	28190.77930	360.0
RE DISCCART	13680.80570	37587.70310	380.0
RE DISCCART	17101.00590	46984.63280	390.0
RE DISCCART	50.00000	86.60254	213.4
RE DISCCART	100.00000	173.20508	219.5
RE DISCCART	150.00000	259.80762	225.6
RE DISCCART	200.00000	346.41016	225.6
RE DISCCART	250.00000	433.01270	225.6
RE DISCCART	300.00000	519.61523	225.6
RE DISCCART	350.00000	606.21777	225.6
RE DISCCART	400.00000	692.82031	231.6
RE DISCCART	450.00000	779.42285	243.8
RE DISCCART	500.00000	866.02539	262.1
RE DISCCART	625.00000	1082.53174	225.6
RE DISCCART	750.00000	1299.03809	347.5
RE DISCCART	875.00000	1515.54443	359.7
RE DISCCART	1000.00000	1732.05078	353.6
RE DISCCART	1125.00000	1948.55713	353.6
RE DISCCART	1250.00000	2165.06348	329.2
RE DISCCART	1500.00000	2598.07617	323.1
RE DISCCART	2000.00000	3464.10156	361.2
RE DISCCART	2500.00000	4330.12695	366.7
RE DISCCART	3750.00000	6495.19043	378.0
RE DISCCART	5000.00000	8660.25391	396.2
RE DISCCART	7500.00000	12990.38090	320.0
RE DISCCART	10000.00000	17320.50780	360.0
RE DISCCART	15000.00000	25980.76170	380.0
RE DISCCART	20000.00000	34641.01560	370.0
RE DISCCART	25000.00000	43301.26950	400.0
RE DISCCART	64.27876	76.60445	213.4
RE DISCCART	128.55753	153.20889	213.4
RE DISCCART	192.83627	229.81334	225.6
RE DISCCART	257.11505	306.41779	225.6
RE DISCCART	321.39380	383.02222	225.6
RE DISCCART	385.67255	459.62668	225.6
RE DISCCART	449.95132	536.23114	225.6
RE DISCCART	514.23010	612.83557	225.6
RE DISCCART	578.50885	689.44000	225.6
RE DISCCART	642.78760	766.04443	243.8

RE DISCCART	803.48450	957.55554	280.4
RE DISCCART	964.18140	1149.06665	353.6
RE DISCCART	1124.87830	1340.57776	361.5
RE DISCCART	1285.57520	1532.08887	353.6
RE DISCCART	1446.27209	1723.59998	353.6
RE DISCCART	1606.96899	1915.11108	353.6
RE DISCCART	1928.36279	2298.13330	335.3
RE DISCCART	2571.15039	3064.17773	353.9
RE DISCCART	3213.93799	3830.22217	353.0
RE DISCCART	4820.90674	5745.33350	378.0
RE DISCCART	6427.87598	7660.44434	398.4
RE DISCCART	9641.81348	11490.66700	376.0
RE DISCCART	12855.75200	15320.88870	380.0
RE DISCCART	19283.62700	22981.33400	360.0
RE DISCCART	25711.50390	30641.77730	420.0
RE DISCCART	32139.37890	38302.22270	420.0
RE DISCCART	76.60445	64.27876	213.4
RE DISCCART	153.20889	128.55753	207.3
RE DISCCART	229.81334	192.83629	213.4
RE DISCCART	306.41779	257.11505	219.5
RE DISCCART	383.02222	321.39380	219.5
RE DISCCART	459.62668	385.67258	219.5
RE DISCCART	536.23114	449.95132	219.5
RE DISCCART	612.83557	514.23010	219.5
RE DISCCART	689.44000	578.50885	225.6
RE DISCCART	766.04443	642.78760	219.5
RE DISCCART	957.55554	803.48450	219.5
RE DISCCART	1149.06665	964.18140	323.1
RE DISCCART	1340.57776	1124.87830	353.6
RE DISCCART	1532.08887	1285.57520	353.6
RE DISCCART	1723.59998	1446.27209	335.3
RE DISCCART	1915.11108	1606.96899	347.5
RE DISCCART	2298.13330	1928.36279	347.5
RE DISCCART	3064.17773	2571.15039	341.4
RE DISCCART	3830.22217	3213.93799	335.3
RE DISCCART	5745.33350	4820.90723	373.1
RE DISCCART	7660.44434	6427.87598	396.2
RE DISCCART	11490.66700	9641.81445	360.0
RE DISCCART	15320.88870	12855.75200	380.0
RE DISCCART	22981.33400	19283.62890	380.0
RE DISCCART	30641.77730	25711.50390	420.0
RE DISCCART	38302.22270	32139.38090	420.0
RE DISCCART	86.60254	50.00000	213.4
RE DISCCART	173.20508	99.99999	207.3
RE DISCCART	259.80762	150.00000	207.3
RE DISCCART	346.41016	199.99998	201.2
RE DISCCART	433.01270	249.99998	207.3
RE DISCCART	519.61523	300.00000	213.4
RE DISCCART	606.21777	349.99997	213.4
RE DISCCART	692.82031	399.99997	213.4
RE DISCCART	779.42285	449.99997	213.4
RE DISCCART	866.02539	499.99997	219.5
RE DISCCART	1082.53174	624.99994	225.6
RE DISCCART	1299.03809	749.99994	219.5
RE DISCCART	1515.54443	874.99994	243.8
RE DISCCART	1732.05078	999.99994	292.6
RE DISCCART	1948.55725	1125.00000	310.9
RE DISCCART	2165.06348	1249.99988	323.1
RE DISCCART	2598.07617	1499.99988	317.0
RE DISCCART	3464.10156	1999.99988	323.1
RE DISCCART	4330.12695	2499.99976	359.7
RE DISCCART	6495.19043	3749.99976	378.9
RE DISCCART	8660.25391	4999.99951	408.7

RE DISCCART	12990.38090	7499.99951	380.0
RE DISCCART	17320.50780	9999.99902	360.0
RE DISCCART	25980.76170	14999.99900	380.0
RE DISCCART	34641.01560	19999.99800	380.0
RE DISCCART	43301.26950	24999.99800	420.0
RE DISCCART	93.96926	34.20201	207.3
RE DISCCART	187.93852	68.40403	201.2
RE DISCCART	281.90778	102.60604	202.7
RE DISCCART	375.87704	136.80806	202.7
RE DISCCART	469.84631	171.01007	207.3
RE DISCCART	563.81555	205.21208	207.3
RE DISCCART	657.78485	239.41411	207.3
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RE DISCCART	845.72333	307.81815	213.4
RE DISCCART	939.69263	342.02014	213.4
RE DISCCART	1174.61572	427.52518	213.4
RE DISCCART	1409.53894	513.03021	213.4
RE DISCCART	1644.46204	598.53528	213.4
RE DISCCART	1879.38525	684.04028	213.4
RE DISCCART	2114.30835	769.54535	213.4
RE DISCCART	2349.23145	855.05035	231.6
RE DISCCART	2819.07788	1026.06042	231.6
RE DISCCART	3758.77051	1368.08057	310.9
RE DISCCART	4698.46289	1710.10071	384.0
RE DISCCART	7047.69482	2565.15112	384.0
RE DISCCART	9396.92578	3420.20142	370.3
RE DISCCART	14095.38960	5130.30225	360.0
RE DISCCART	18793.85160	6840.40283	380.0
RE DISCCART	28190.77930	10260.60450	400.0
RE DISCCART	37587.70310	13680.80570	360.0
RE DISCCART	46984.63280	17101.00780	400.0
RE DISCCART	98.48077	17.36482	207.3
RE DISCCART	196.96155	34.72964	202.7
RE DISCCART	295.44232	52.09447	202.7
RE DISCCART	393.92310	69.45929	202.7
RE DISCCART	492.40387	86.82411	202.7
RE DISCCART	590.88464	104.18893	202.7
RE DISCCART	689.36542	121.55375	202.7
RE DISCCART	787.84619	138.91858	202.7
RE DISCCART	886.32697	156.28340	202.7
RE DISCCART	984.80774	173.64822	202.7
RE DISCCART	1231.00964	217.06027	202.7
RE DISCCART	1477.21167	260.47232	202.7
RE DISCCART	1723.41357	303.88437	213.4
RE DISCCART	1969.61548	347.29645	207.3
RE DISCCART	2215.81738	390.70850	207.3
RE DISCCART	2462.01929	434.12054	231.6
RE DISCCART	2954.42334	520.94464	304.8
RE DISCCART	3939.23096	694.59290	346.6
RE DISCCART	4924.03857	868.24109	365.8
RE DISCCART	7386.05811	1302.36157	384.0
RE DISCCART	9848.07715	1736.48218	371.9
RE DISCCART	14772.11620	2604.72314	320.0
RE DISCCART	19696.15430	3472.96436	360.0
RE DISCCART	29544.23240	5209.44629	380.0
RE DISCCART	39392.30860	6945.92871	380.0
RE DISCCART	49240.38670	8682.41113	400.0
RE DISCCART	100.00000	0.00001	207.3
RE DISCCART	200.00000	0.00002	202.7
RE DISCCART	300.00000	0.00002	202.7
RE DISCCART	400.00000	0.00003	202.7
RE DISCCART	500.00000	0.00004	202.7
RE DISCCART	600.00000	0.00005	202.7

RE DISCCART	700.00000	0.00005	202.7
RE DISCCART	800.00000	0.00006	202.7
RE DISCCART	900.00000	0.00007	202.7
RE DISCCART	1000.00000	0.00008	202.7
RE DISCCART	1250.00000	0.00009	243.8
RE DISCCART	1500.00000	0.00011	341.4
RE DISCCART	1750.00000	0.00013	323.1
RE DISCCART	2000.00000	0.00015	341.4
RE DISCCART	2250.00000	0.00017	304.8
RE DISCCART	2500.00000	0.00019	292.6
RE DISCCART	3000.00000	0.00023	310.9
RE DISCCART	4000.00000	0.00030	359.7
RE DISCCART	5000.00000	0.00038	402.3
RE DISCCART	7500.00000	0.00057	347.5
RE DISCCART	10000.00000	0.00075	380.1
RE DISCCART	15000.00000	0.00113	360.0
RE DISCCART	20000.00000	0.00151	360.0
RE DISCCART	30000.00000	0.00226	380.0
RE DISCCART	40000.00000	0.00302	400.0
RE DISCCART	50000.00000	0.00377	360.0
RE DISCCART	98.48077	-17.36482	207.3
RE DISCCART	196.96155	-34.72964	202.7
RE DISCCART	295.44232	-52.09446	202.7
RE DISCCART	393.92310	-69.45927	202.7
RE DISCCART	492.40387	-86.82410	202.7
RE DISCCART	590.88464	-104.18891	202.7
RE DISCCART	689.36542	-121.55373	202.7
RE DISCCART	787.84619	-138.91855	219.5
RE DISCCART	886.32697	-156.28337	225.6
RE DISCCART	984.80774	-173.64819	329.2
RE DISCCART	1231.00964	-217.06023	347.5
RE DISCCART	1477.21167	-260.47229	353.6
RE DISCCART	1723.41357	-303.88434	323.1
RE DISCCART	1969.61548	-347.29639	341.4
RE DISCCART	2215.81738	-390.70840	341.4
RE DISCCART	2462.01929	-434.12045	323.1
RE DISCCART	2954.42334	-520.94458	347.5
RE DISCCART	3939.23096	-694.59277	353.6
RE DISCCART	4924.03857	-868.24091	386.5
RE DISCCART	7386.05811	-1302.36145	353.6
RE DISCCART	9848.07715	-1736.48181	360.0
RE DISCCART	14772.11620	-2604.72290	340.0
RE DISCCART	19696.15430	-3472.96362	380.0
RE DISCCART	29544.23240	-5209.44580	380.0
RE DISCCART	39392.30860	-6945.92725	380.0
RE DISCCART	49240.38670	-8682.40918	400.0
RE DISCCART	93.96926	-34.20201	207.3
RE DISCCART	187.93852	-68.40402	202.7
RE DISCCART	281.90778	-102.60603	202.7
RE DISCCART	375.87704	-136.80804	202.7
RE DISCCART	469.84631	-171.01006	202.7
RE DISCCART	563.81555	-205.21207	213.4
RE DISCCART	657.78485	-239.41408	256.0
RE DISCCART	751.75409	-273.61609	298.7
RE DISCCART	845.72339	-307.81812	286.5
RE DISCCART	939.69263	-342.02011	323.1
RE DISCCART	1174.61584	-427.52515	347.5
RE DISCCART	1409.53894	-513.03015	347.5
RE DISCCART	1644.46216	-598.53522	310.9
RE DISCCART	1879.38525	-684.04022	353.6
RE DISCCART	2114.30835	-769.54529	350.2
RE DISCCART	2349.23169	-855.05029	347.5
RE DISCCART	2819.07788	-1026.06030	347.5

RE	DISCCART	3758.77051	-1368.08044	345.9
RE	DISCCART	4698.46338	-1710.10059	371.9
RE	DISCCART	7047.69482	-2565.15088	365.8
RE	DISCCART	9396.92676	-3420.20117	408.4
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RE	DISCCART	18793.85350	-6840.40234	360.0
RE	DISCCART	28190.77930	-10260.60350	360.0
RE	DISCCART	37587.70700	-13680.80470	360.0
RE	DISCCART	46984.63280	-17101.00590	360.0
RE	DISCCART	86.60254	-50.00000	207.3
RE	DISCCART	173.20508	-100.00001	202.7
RE	DISCCART	259.80762	-150.00002	202.7
RE	DISCCART	346.41016	-200.00002	202.7
RE	DISCCART	433.01270	-250.00003	213.4
RE	DISCCART	519.61523	-300.00003	268.2
RE	DISCCART	606.21777	-350.00003	317.0
RE	DISCCART	692.82031	-400.00003	347.5
RE	DISCCART	779.42285	-450.00003	353.6
RE	DISCCART	866.02539	-500.00006	347.5
RE	DISCCART	1082.53174	-625.00006	310.9
RE	DISCCART	1299.03809	-750.00006	359.7
RE	DISCCART	1515.54443	-875.00006	335.3
RE	DISCCART	1732.05078	-1000.00012	359.7
RE	DISCCART	1948.55713	-1125.00012	359.7
RE	DISCCART	2165.06348	-1250.00012	347.5
RE	DISCCART	2598.07617	-1500.00012	365.8
RE	DISCCART	3464.10156	-2000.00024	359.7
RE	DISCCART	4330.12695	-2500.00024	353.6
RE	DISCCART	6495.19043	-3750.00049	402.3
RE	DISCCART	8660.25391	-5000.00049	396.2
RE	DISCCART	12990.38090	-7500.00098	380.0
RE	DISCCART	17320.50780	-10000.00100	380.0
RE	DISCCART	25980.76170	-15000.00200	360.0
RE	DISCCART	34641.01560	-20000.00200	360.0
RE	DISCCART	43301.26950	-25000.00200	360.0
RE	DISCCART	76.60445	-64.27876	207.3
RE	DISCCART	153.20889	-128.55753	202.7
RE	DISCCART	229.81332	-192.83629	202.7
RE	DISCCART	306.41779	-257.11505	202.7
RE	DISCCART	383.02222	-321.39380	243.8
RE	DISCCART	459.62665	-385.67258	298.7
RE	DISCCART	536.23108	-449.95132	323.1
RE	DISCCART	612.83557	-514.23010	353.6
RE	DISCCART	689.44000	-578.50885	353.6
RE	DISCCART	766.04443	-642.78760	353.6
RE	DISCCART	957.55554	-803.48456	353.6
RE	DISCCART	1149.06665	-964.18146	359.7
RE	DISCCART	1340.57776	-1124.87830	341.4
RE	DISCCART	1532.08887	-1285.57520	353.6
RE	DISCCART	1723.59998	-1446.27222	353.6
RE	DISCCART	1915.11108	-1606.96912	341.4
RE	DISCCART	2298.13330	-1928.36292	359.7
RE	DISCCART	3064.17773	-2571.15039	359.7
RE	DISCCART	3830.22217	-3213.93823	359.7
RE	DISCCART	5745.33301	-4820.90723	408.4
RE	DISCCART	7660.44434	-6427.87646	408.4
RE	DISCCART	11490.66600	-9641.81445	380.0
RE	DISCCART	15320.88870	-12855.75290	360.0
RE	DISCCART	22981.33200	-19283.62890	360.0
RE	DISCCART	30641.77730	-25711.50590	360.0
RE	DISCCART	38302.22270	-32139.38090	360.0
RE	DISCCART	64.27876	-76.60445	207.3
RE	DISCCART	128.55753	-153.20889	202.7

RE DISCCART	192.83629	-229.81332	202.7
RE DISCCART	257.11505	-306.41779	202.7
RE DISCCART	321.39380	-383.02222	268.2
RE DISCCART	385.67258	-459.62665	304.8
RE DISCCART	449.95132	-536.23108	310.9
RE DISCCART	514.23010	-612.83557	323.1
RE DISCCART	578.50885	-689.44000	329.2
RE DISCCART	642.78760	-766.04443	323.1
RE DISCCART	803.48450	-957.55554	347.5
RE DISCCART	964.18146	-1149.06665	359.7
RE DISCCART	1124.87830	-1340.57776	329.2
RE DISCCART	1285.57520	-1532.08887	359.7
RE DISCCART	1446.27209	-1723.59998	353.6
RE DISCCART	1606.96899	-1915.11108	359.7
RE DISCCART	1928.36292	-2298.13330	408.4
RE DISCCART	2571.15039	-3064.17773	420.6
RE DISCCART	3213.93799	-3830.22217	371.9
RE DISCCART	4820.90723	-5745.33350	392.0
RE DISCCART	6427.87598	-7660.44434	390.1
RE DISCCART	9641.81445	-11490.66700	340.0
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RE DISCCART	-39392.30860	6945.92627	380.0
RE DISCCART	-49240.38670	8682.40820	400.0
RE DISCCART	-93.96926	34.20201	213.4
RE DISCCART	-187.93852	68.40401	213.4
RE DISCCART	-281.90781	102.60603	213.4
RE DISCCART	-375.87704	136.80803	219.5
RE DISCCART	-469.84631	171.01004	225.6
RE DISCCART	-563.81561	205.21205	225.6
RE DISCCART	-657.78485	239.41406	243.8
RE DISCCART	-751.75409	273.61606	274.3
RE DISCCART	-845.72339	307.81808	286.5
RE DISCCART	-939.69263	342.02008	298.7
RE DISCCART	-1174.61584	427.52512	317.0
RE DISCCART	-1409.53894	513.03015	298.7
RE DISCCART	-1644.46216	598.53516	298.7
RE DISCCART	-1879.38525	684.04016	359.7
RE DISCCART	-2114.30835	769.54523	384.0
RE DISCCART	-2349.23169	855.05023	378.0
RE DISCCART	-2819.07788	1026.06030	378.0
RE DISCCART	-3758.77051	1368.08032	378.0
RE DISCCART	-4698.46338	1710.10046	378.0
RE DISCCART	-7047.69482	2565.15063	371.9
RE DISCCART	-9396.92676	3420.20093	424.9
RE DISCCART	-14095.38960	5130.30127	420.0
RE DISCCART	-18793.85350	6840.40186	360.0
RE DISCCART	-28190.77930	10260.60250	400.0
RE DISCCART	-37587.70700	13680.80370	380.0
RE DISCCART	-46984.63280	17101.00390	400.0
RE DISCCART	-86.60255	49.99999	213.4
RE DISCCART	-173.20509	99.99998	213.4
RE DISCCART	-259.80765	149.99997	219.5
RE DISCCART	-346.41019	199.99997	231.6
RE DISCCART	-433.01273	249.99995	225.6
RE DISCCART	-519.61530	299.99994	231.6
RE DISCCART	-606.21783	349.99994	268.2
RE DISCCART	-692.82037	399.99994	304.8
RE DISCCART	-779.42291	449.99994	310.9
RE DISCCART	-866.02545	499.99991	304.8
RE DISCCART	-1082.53186	624.99988	292.6
RE DISCCART	-1299.03821	749.99988	323.1
RE DISCCART	-1515.54456	874.99988	359.7
RE DISCCART	-1732.05090	999.99982	371.9
RE DISCCART	-1948.55725	1124.99988	371.9
RE DISCCART	-2165.06372	1249.99976	378.0
RE DISCCART	-2598.07642	1499.99976	378.0
RE DISCCART	-3464.10181	1999.99963	378.0
RE DISCCART	-4330.12744	2499.99951	384.0
RE DISCCART	-6495.19092	3749.99951	384.0
RE DISCCART	-8660.25488	4999.99902	426.7
RE DISCCART	-12990.38180	7499.99902	400.0
RE DISCCART	-17320.50980	9999.99805	400.0
RE DISCCART	-25980.76370	14999.99800	420.0
RE DISCCART	-34641.01950	19999.99610	400.0
RE DISCCART	-43301.27340	24999.99610	350.0
RE DISCCART	-76.60445	64.27875	213.4

RE DISCCART	-153.20891	128.55750	213.4
RE DISCCART	-229.81335	192.83626	225.6
RE DISCCART	-306.41782	257.11499	231.6
RE DISCCART	-383.02225	321.39377	225.6
RE DISCCART	-459.62671	385.67252	231.6
RE DISCCART	-536.23114	449.95126	268.2
RE DISCCART	-612.83563	514.22998	304.8
RE DISCCART	-689.44006	578.50879	316.4
RE DISCCART	-766.04449	642.78754	317.0
RE DISCCART	-957.55566	803.48438	304.8
RE DISCCART	-1149.06677	964.18127	341.4
RE DISCCART	-1340.57788	1124.87817	353.6
RE DISCCART	-1532.08899	1285.57507	365.8
RE DISCCART	-1723.60022	1446.27185	371.9
RE DISCCART	-1915.11133	1606.96875	378.0
RE DISCCART	-2298.13354	1928.36255	384.0
RE DISCCART	-3064.17798	2571.15015	359.7
RE DISCCART	-3830.22266	3213.93750	384.0
RE DISCCART	-5745.33398	4820.90625	378.0
RE DISCCART	-7660.44531	6427.87500	379.2
RE DISCCART	-11490.66800	9641.81250	360.0
RE DISCCART	-15320.89060	12855.75000	400.0
RE DISCCART	-22981.33590	19283.62500	400.0
RE DISCCART	-30641.78130	25711.50000	400.0
RE DISCCART	-38302.22660	32139.37500	370.0
RE DISCCART	-64.27877	76.60443	213.4
RE DISCCART	-128.55754	153.20886	225.6
RE DISCCART	-192.83632	229.81331	231.6
RE DISCCART	-257.11508	306.41772	231.6
RE DISCCART	-321.39386	383.02216	225.6
RE DISCCART	-385.67264	459.62662	231.6
RE DISCCART	-449.95142	536.23102	274.3
RE DISCCART	-514.23016	612.83545	304.8
RE DISCCART	-578.50897	689.43988	310.9
RE DISCCART	-642.78772	766.04431	310.9
RE DISCCART	-803.48468	957.55542	317.0
RE DISCCART	-964.18158	1149.06653	347.5
RE DISCCART	-1124.87854	1340.57764	353.6
RE DISCCART	-1285.57544	1532.08862	353.6
RE DISCCART	-1446.27246	1723.59973	359.7
RE DISCCART	-1606.96936	1915.11084	365.8
RE DISCCART	-1928.36316	2298.13306	384.0
RE DISCCART	-2571.15088	3064.17725	384.0
RE DISCCART	-3213.93872	3830.22168	378.0
RE DISCCART	-4820.90820	5745.33252	378.0
RE DISCCART	-6427.87744	7660.44336	378.0
RE DISCCART	-9641.81641	11490.66500	380.0
RE DISCCART	-12855.75490	15320.88670	400.0
RE DISCCART	-19283.63280	22981.33010	400.0
RE DISCCART	-25711.50980	30641.77340	360.0
RE DISCCART	-32139.38670	38302.21880	360.0
RE DISCCART	-50.00002	86.60253	213.4
RE DISCCART	-100.00003	173.20506	225.6
RE DISCCART	-150.00005	259.80759	231.6
RE DISCCART	-200.00006	346.41013	231.6
RE DISCCART	-250.00009	433.01266	225.6
RE DISCCART	-300.00009	519.61517	243.8
RE DISCCART	-350.00012	606.21771	249.9
RE DISCCART	-400.00012	692.82025	243.8
RE DISCCART	-450.00015	779.42279	304.8
RE DISCCART	-500.00018	866.02533	304.8
RE DISCCART	-625.00024	1082.53162	286.5
RE DISCCART	-750.00024	1299.03796	329.2

RE DISCCART	-875.00031	1515.54431	347.5
RE DISCCART	-1000.00037	1732.05066	353.6
RE DISCCART	-1125.00037	1948.55688	353.6
RE DISCCART	-1250.00049	2165.06323	384.0
RE DISCCART	-1500.00049	2598.07593	384.0
RE DISCCART	-2000.00073	3464.10132	384.0
RE DISCCART	-2500.00098	4330.12646	378.0
RE DISCCART	-3750.00122	6495.18994	365.8
RE DISCCART	-5000.00195	8660.25293	371.9
RE DISCCART	-7500.00244	12990.37990	360.0
RE DISCCART	-10000.00390	17320.50590	360.0
RE DISCCART	-15000.00490	25980.75980	340.0
RE DISCCART	-20000.00780	34641.01170	380.0
RE DISCCART	-25000.00780	43301.26560	350.0
RE DISCCART	-34.20204	93.96925	213.4
RE DISCCART	-68.40408	187.93851	225.6
RE DISCCART	-102.60611	281.90778	225.6
RE DISCCART	-136.80815	375.87701	225.6
RE DISCCART	-171.01018	469.84628	225.6
RE DISCCART	-205.21222	563.81555	243.8
RE DISCCART	-239.41425	657.78479	262.1
RE DISCCART	-273.61630	751.75403	286.5
RE DISCCART	-307.81833	845.72327	280.4
RE DISCCART	-342.02036	939.69257	292.6
RE DISCCART	-427.52545	1174.61572	323.1
RE DISCCART	-513.03052	1409.53882	353.6
RE DISCCART	-598.53564	1644.46191	359.7
RE DISCCART	-684.04071	1879.38513	359.7
RE DISCCART	-769.54584	2114.30811	329.2
RE DISCCART	-855.05090	2349.23145	347.5
RE DISCCART	-1026.06104	2819.07764	378.0
RE DISCCART	-1368.08142	3758.77026	385.0
RE DISCCART	-1710.10181	4698.46289	371.9
RE DISCCART	-2565.15283	7047.69385	329.2
RE DISCCART	-3420.20361	9396.92578	349.0
RE DISCCART	-5130.30566	14095.38770	360.0
RE DISCCART	-6840.40723	18793.85160	360.0
RE DISCCART	-10260.61130	28190.77540	340.0
RE DISCCART	-13680.81450	37587.70310	370.0
RE DISCCART	-17101.01760	46984.62890	350.0
RE DISCCART	-17.36484	98.48077	213.4
RE DISCCART	-34.72969	196.96155	225.6
RE DISCCART	-52.09453	295.44232	225.6
RE DISCCART	-69.45937	393.92310	225.6
RE DISCCART	-86.82422	492.40384	225.6
RE DISCCART	-104.18906	590.88464	243.8
RE DISCCART	-121.55391	689.36542	262.1
RE DISCCART	-138.91875	787.84619	292.6
RE DISCCART	-156.28360	886.32697	298.7
RE DISCCART	-173.64844	984.80768	298.7
RE DISCCART	-217.06055	1231.00964	335.3
RE DISCCART	-260.47266	1477.21155	365.8
RE DISCCART	-303.88477	1723.41345	359.7
RE DISCCART	-347.29688	1969.61536	359.7
RE DISCCART	-390.70898	2215.81738	341.4
RE DISCCART	-434.12109	2462.01929	378.0
RE DISCCART	-520.94531	2954.42310	384.0
RE DISCCART	-694.59375	3939.23071	378.0
RE DISCCART	-868.24219	4924.03857	365.8
RE DISCCART	-1302.36328	7386.05762	341.4
RE DISCCART	-1736.48438	9848.07715	339.9
RE DISCCART	-2604.72656	14772.11520	340.0
RE DISCCART	-3472.96875	19696.15430	360.0

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RE DISCCART   -5209.45313  29544.23050   340.0
RE DISCCART   -6945.93750  39392.30860   330.0
RE DISCCART   -8682.42188  49240.38670   320.0
RE DISCCART      -0.00003    100.00000   213.4
RE DISCCART      -0.00006    200.00000   225.6
RE DISCCART      -0.00009    300.00000   225.6
RE DISCCART      -0.00012    400.00000   225.6
RE DISCCART      -0.00015    500.00000   225.6
RE DISCCART      -0.00018    600.00000   237.7
RE DISCCART      -0.00021    700.00000   256.0
RE DISCCART      -0.00024    800.00000   280.4
RE DISCCART      -0.00027    900.00000   298.7
RE DISCCART      -0.00030   1000.00000   292.6
RE DISCCART      -0.00038   1250.00000   353.6
RE DISCCART      -0.00045   1500.00000   323.1
RE DISCCART      -0.00053   1750.00000   341.4
RE DISCCART      -0.00060   2000.00000   317.0
RE DISCCART      -0.00068   2250.00000   359.7
RE DISCCART      -0.00075   2500.00000   359.7
RE DISCCART      -0.00091   3000.00000   378.0
RE DISCCART      -0.00121   4000.00000   383.4
RE DISCCART      -0.00151   5000.00000   359.7
RE DISCCART      -0.00226   7500.00000   371.9
RE DISCCART      -0.00302  10000.00000   380.1
RE DISCCART      -0.00453  15000.00000   360.0
RE DISCCART      -0.00604  20000.00000   340.0
RE DISCCART      -0.00906  30000.00000   380.0
RE DISCCART      -0.01208  40000.00000   350.0
RE DISCCART      -0.01510  50000.00000   350.0
RE FINISHED

ME STARTING
ME INPUTFIL  DEPBIN.MET
ME ANEMHGHT  30.0 METERS
ME SURFDATA  94823  1993
ME UAIRDATA  94823  1993
ME PROFFILE TEMPS ISC_TEMP.STK
ME PROFFILE WINDS ISC_WIND.STK
** DAYRANGE  1/3
ME FINISHED

TG STARTING
   INPUTFIL  wti100k.out
   LOCATION  538.4 4497.8 km
TG FINISHED

OU STARTING
   RECTABLE  ALLAVE  FIRST-SECOND
**   DAYTABLE ALLAVE
   MAXTABLE  ALLAVE  50
**   MAXIFILE   3  ALL  30.0   MAXIALL.FIL   25
**   MAXIFILE  24  ALL  10.0   MAXIALL.FIL   25
**   POSTFILE  1  ALL  INDIV POST2C.BIN    20
**   POSTFILE  PERIOD ALL PLOT PSTAMALL.FIL  21
** Note that the following two input cards generate PLOTFILEs with the file
** unit dynamically allocated by the ISCST2 program.  When porting the model
** to another computer system, the user may need to specify the file units
** as is done on the previous four input cards.
**   PLOTFILE   3  ALL  2ND    PLT03ALL.FIL
**   PLOTFILE  24  ALL  2ND    PLT24ALL.FIL
OU PLOTFILE 1 ALL 1ST ONSITE.1
OU PLOTFILE 3 ALL 1ST ONSITE.3
OU PLOTFILE 24 ALL 1ST ONSITE.24
```

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OU PLOTFILE PERIOD ALL ONSITE.ANN
** OU PLOTFILE 1 ALL 1ST ONSITE.PL2
OU FINISHED

************************************
*** SETUP Finishes Successfully ***
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* ISCST2 (94227):  WTI Storage Tank Rupture,  ISCOMDEP -- ONSITE ORGANIC TANK FARM
* MODELING OPTIONS USED:
*  CONC   RURAL  ELEV                 GRDRIS NOSTD

*         PLOT FILE OF  HIGH 1ST  HIGH  1-HR VALUES FOR SOURCE GROUP: ALL
*         FOR A TOTAL OF   936 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4)
*        X             Y             CONC        ZELEV     AVE     GRP       HIVAL
*
 ----------  ----------  ----------  ----------  ------  --------  ------
   17.36482    98.48077   16.79521   213.40    1-HR    ALL       1ST
   34.72963   196.96155   16.61840   225.60    1-HR    ALL       1ST
   52.09445   295.44235    5.53868   225.60    1-HR    ALL       1ST
   69.45927   393.92307    5.30869   225.60    1-HR    ALL       1ST
   86.82409   492.40384    3.10193   225.60    1-HR    ALL       1ST
  104.18890   590.88470    3.69308   225.60    1-HR    ALL       1ST
  121.55373   689.36542   10.97034   243.80    1-HR    ALL       1ST
  138.91852   787.84613   13.74630   256.00    1-HR    ALL       1ST
  156.28337   886.32697   12.91760   280.40    1-HR    ALL       1ST
  173.64818   984.80774   16.09260   286.50    1-HR    ALL       1ST
  217.06021  1231.00964   36.37793   353.60    1-HR    ALL       1ST
  260.47229  1477.21167   29.38692   353.60    1-HR    ALL       1ST
  303.88428  1723.41370   18.73467   310.90    1-HR    ALL       1ST
  347.29639  1969.61548   19.57441   347.50    1-HR    ALL       1ST
  390.70837  2215.81738   18.22014   353.60    1-HR    ALL       1ST
  434.12042  2462.01929   16.84233   359.70    1-HR    ALL       1ST
  520.94452  2954.42310    9.75648   347.50    1-HR    ALL       1ST
  694.59271  3939.23096    6.88101   341.40    1-HR    ALL       1ST
  868.24084  4924.03809    5.18808   341.40    1-HR    ALL       1ST
 1302.36133  7386.05762    3.01776   365.80    1-HR    ALL       1ST
 1736.48169  9848.07715    2.12708   360.00    1-HR    ALL       1ST
 2604.72241 14772.11520    1.25943   340.00    1-HR    ALL       1ST
 3472.96313 19696.15430    0.88135   340.00    1-HR    ALL       1ST
 5209.44531 29544.23050    0.57982   360.00    1-HR    ALL       1ST
 6945.92627 39392.30860    0.43556   350.00    1-HR    ALL       1ST
 8682.40820 49240.38670    0.34810   360.00    1-HR    ALL       1ST
   34.20201    93.96926   20.09486   213.40    1-HR    ALL       1ST
   68.40403   187.93851   62.92639   225.60    1-HR    ALL       1ST
  102.60603   281.90778    9.69793   225.60    1-HR    ALL       1ST
  136.80806   375.87701    9.42351   225.60    1-HR    ALL       1ST
  171.01007   469.84631    7.11029   225.60    1-HR    ALL       1ST
  205.21207   563.81555    5.43599   225.60    1-HR    ALL       1ST
  239.41408   657.78491    5.06535   237.70    1-HR    ALL       1ST
  273.61615   751.75409    4.94948   243.80    1-HR    ALL       1ST
  307.81812   845.72339    5.26656   256.00    1-HR    ALL       1ST
  342.02011   939.69263   15.08930   286.50    1-HR    ALL       1ST
  427.52518  1174.61572   29.01570   329.20    1-HR    ALL       1ST
  513.03021  1409.53894   23.78149   347.50    1-HR    ALL       1ST
  598.53522  1644.46204   19.79313   335.30    1-HR    ALL       1ST
  684.04022  1879.38525   16.52250   347.50    1-HR    ALL       1ST
  769.54523  2114.30835   14.10990   353.60    1-HR    ALL       1ST
  855.05035  2349.23145   12.23069   359.70    1-HR    ALL       1ST
 1026.06042  2819.07788    9.67375   362.40    1-HR    ALL       1ST
 1368.08057  3758.77051    6.04362   329.20    1-HR    ALL       1ST
 1710.10071  4698.46289    5.15676   359.70    1-HR    ALL       1ST
 2565.15112  7047.69482    3.00116   369.70    1-HR    ALL       1ST
 3420.20142  9396.92578    1.99441   385.90    1-HR    ALL       1ST
 5130.30176 14095.38960    1.73969   340.00    1-HR    ALL       1ST
 6840.40283 18793.85350    1.57623   340.00    1-HR    ALL       1ST
10260.60450 28190.77930    0.73020   360.00    1-HR    ALL       1ST
13680.80570 37587.70310    0.36371   380.00    1-HR    ALL       1ST
17101.00590 46984.63670    0.26962   390.00    1-HR    ALL       1ST
   50.00000    86.60254   26.97623   213.40    1-HR    ALL       1ST
  100.00000   173.20508   59.04914   219.50    1-HR    ALL       1ST
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External Review Draft
Do Not Cite or Quote

150.00000	259.80762	27.20872	225.60	1-HR	ALL	1ST
200.00000	346.41016	15.02902	225.60	1-HR	ALL	1ST
250.00000	433.01273	14.53630	225.60	1-HR	ALL	1ST
300.00000	519.61517	8.97993	225.60	1-HR	ALL	1ST
350.00000	606.21777	6.45860	225.60	1-HR	ALL	1ST
400.00000	692.82031	8.83360	231.60	1-HR	ALL	1ST
450.00000	779.42291	14.90733	243.80	1-HR	ALL	1ST
500.00000	866.02539	15.70679	262.10	1-HR	ALL	1ST
625.00000	1082.53174	7.27158	225.60	1-HR	ALL	1ST
750.00000	1299.03821	27.62148	347.50	1-HR	ALL	1ST
875.00000	1515.54443	21.64511	359.70	1-HR	ALL	1ST
1000.00000	1732.05090	18.32998	353.60	1-HR	ALL	1ST
1125.00000	1948.55713	15.58878	353.60	1-HR	ALL	1ST
1250.00000	2165.06348	14.43524	329.20	1-HR	ALL	1ST
1500.00000	2598.07617	11.43595	323.10	1-HR	ALL	1ST
2000.00000	3464.10156	7.01111	361.20	1-HR	ALL	1ST
2500.00000	4330.12695	5.10995	366.70	1-HR	ALL	1ST
3750.00000	6495.19043	2.97486	378.00	1-HR	ALL	1ST
5000.00000	8660.25391	1.97396	396.20	1-HR	ALL	1ST
7500.00000	12990.38090	2.82748	320.00	1-HR	ALL	1ST
10000.00000	17320.50780	0.96089	360.00	1-HR	ALL	1ST
15000.00000	25980.76170	0.51697	380.00	1-HR	ALL	1ST
20000.00000	34641.01560	0.37340	370.00	1-HR	ALL	1ST
25000.00000	43301.26560	0.26257	400.00	1-HR	ALL	1ST
64.27876	76.60445	33.78500	213.40	1-HR	ALL	1ST
128.55754	153.20888	34.00709	213.40	1-HR	ALL	1ST
192.83627	229.81335	100.29875	225.60	1-HR	ALL	1ST
257.11508	306.41779	57.44691	225.60	1-HR	ALL	1ST
321.39377	383.02225	33.55591	225.60	1-HR	ALL	1ST
385.67258	459.62671	13.53698	225.60	1-HR	ALL	1ST
449.95132	536.23120	7.75491	225.60	1-HR	ALL	1ST
514.23016	612.83557	5.32684	225.60	1-HR	ALL	1ST
578.50885	689.44000	5.06455	225.60	1-HR	ALL	1ST
642.78766	766.04443	15.17323	243.80	1-HR	ALL	1ST
803.48456	957.55554	22.78652	280.40	1-HR	ALL	1ST
964.18140	1149.06665	27.62006	353.60	1-HR	ALL	1ST
1124.87830	1340.57764	21.84241	361.50	1-HR	ALL	1ST
1285.57520	1532.08899	18.55730	353.60	1-HR	ALL	1ST
1446.27197	1723.59998	15.75471	353.60	1-HR	ALL	1ST
1606.96912	1915.11108	13.64595	353.60	1-HR	ALL	1ST
1928.36292	2298.13330	11.16552	335.30	1-HR	ALL	1ST
2571.15039	3064.17798	7.19737	353.90	1-HR	ALL	1ST
3213.93799	3830.22192	5.33632	353.00	1-HR	ALL	1ST
4820.90625	5745.33301	2.98305	378.00	1-HR	ALL	1ST
6427.87549	7660.44434	1.96627	398.40	1-HR	ALL	1ST
9641.81250	11490.66600	1.24070	376.00	1-HR	ALL	1ST
12855.75200	15320.88870	0.86084	380.00	1-HR	ALL	1ST
19283.62700	22981.33400	0.67867	360.00	1-HR	ALL	1ST
25711.50390	30641.77730	0.32632	420.00	1-HR	ALL	1ST
32139.37890	38302.22270	0.24829	420.00	1-HR	ALL	1ST
76.60445	64.27876	20.86079	213.40	1-HR	ALL	1ST
153.20888	128.55754	0.00000	207.30	1-HR	ALL	1ST
229.81335	192.83629	55.07706	213.40	1-HR	ALL	1ST
306.41779	257.11508	45.54440	219.50	1-HR	ALL	1ST
383.02225	321.39377	21.33775	219.50	1-HR	ALL	1ST
459.62671	385.67261	17.94308	219.50	1-HR	ALL	1ST
536.23120	449.95132	13.29508	219.50	1-HR	ALL	1ST
612.83557	514.23016	9.78028	219.50	1-HR	ALL	1ST
689.44000	578.50885	9.54597	225.60	1-HR	ALL	1ST
766.04443	642.78766	6.58953	219.50	1-HR	ALL	1ST
957.55554	803.48456	4.85307	219.50	1-HR	ALL	1ST
1149.06665	964.18140	29.78035	323.10	1-HR	ALL	1ST
1340.57764	1124.87830	22.22086	353.60	1-HR	ALL	1ST

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1532.08899	1285.57520	18.47447	353.60	1-HR	ALL	1ST
1723.59998	1446.27197	16.48253	335.30	1-HR	ALL	1ST
1915.11108	1606.96912	13.82754	347.50	1-HR	ALL	1ST
2298.13330	1928.36292	10.77820	347.50	1-HR	ALL	1ST
3064.17798	2571.15039	7.44035	341.40	1-HR	ALL	1ST
3830.22192	3213.93799	5.59988	335.30	1-HR	ALL	1ST
5745.33301	4820.90674	3.05963	373.10	1-HR	ALL	1ST
7660.44434	6427.87549	1.99478	396.20	1-HR	ALL	1ST
11490.66600	9641.81348	1.29926	360.00	1-HR	ALL	1ST
15320.88870	12855.75200	0.86138	380.00	1-HR	ALL	1ST
22981.33400	19283.62700	0.51739	380.00	1-HR	ALL	1ST
30641.77730	25711.50390	0.32525	420.00	1-HR	ALL	1ST
38302.22270	32139.38090	0.24724	420.00	1-HR	ALL	1ST
86.60254	50.00000	27.17797	213.40	1-HR	ALL	1ST
173.20508	99.99999	0.00000	207.30	1-HR	ALL	1ST
259.80762	150.00000	18.20800	207.30	1-HR	ALL	1ST
346.41016	199.99997	9.06094	201.20	1-HR	ALL	1ST
433.01273	249.99997	16.68992	207.30	1-HR	ALL	1ST
519.61517	300.00000	29.36513	213.40	1-HR	ALL	1ST
606.21777	349.99994	25.16099	213.40	1-HR	ALL	1ST
692.82031	399.99994	22.83578	213.40	1-HR	ALL	1ST
779.42291	449.99994	20.88769	213.40	1-HR	ALL	1ST
866.02539	499.99994	27.52405	219.50	1-HR	ALL	1ST
1082.53174	625.00000	28.21201	225.60	1-HR	ALL	1ST
1299.03821	750.00000	17.26831	219.50	1-HR	ALL	1ST
1515.54443	875.00000	25.65752	243.80	1-HR	ALL	1ST
1732.05090	1000.00000	21.83312	292.60	1-HR	ALL	1ST
1948.55725	1125.00000	21.23749	310.90	1-HR	ALL	1ST
2165.06348	1250.00000	17.81623	323.10	1-HR	ALL	1ST
2598.07617	1500.00000	14.05590	317.00	1-HR	ALL	1ST
3464.10156	2000.00000	9.35248	323.10	1-HR	ALL	1ST
4330.12695	2499.99976	6.25248	359.70	1-HR	ALL	1ST
6495.19043	3749.99976	3.38971	378.90	1-HR	ALL	1ST
8660.25391	4999.99902	2.09213	408.70	1-HR	ALL	1ST
12990.38090	7499.99902	1.31895	380.00	1-HR	ALL	1ST
17320.50780	9999.99902	1.12988	360.00	1-HR	ALL	1ST
25980.76170	14999.99900	0.53638	380.00	1-HR	ALL	1ST
34641.01560	19999.99800	0.37378	380.00	1-HR	ALL	1ST
43301.26560	24999.99800	0.25133	420.00	1-HR	ALL	1ST
93.96926	34.20201	12.33390	207.30	1-HR	ALL	1ST
187.93851	68.40403	0.00000	201.20	1-HR	ALL	1ST
281.90778	102.60603	7.39211	202.70	1-HR	ALL	1ST
375.87701	136.80806	8.37012	202.70	1-HR	ALL	1ST
469.84631	171.01007	10.97494	207.30	1-HR	ALL	1ST
563.81555	205.21207	7.23640	207.30	1-HR	ALL	1ST
657.78491	239.41411	4.84703	207.30	1-HR	ALL	1ST
751.75409	273.61615	9.17665	213.40	1-HR	ALL	1ST
845.72333	307.81815	9.66306	213.40	1-HR	ALL	1ST
939.69263	342.02011	9.78090	213.40	1-HR	ALL	1ST
1174.61572	427.52518	9.29955	213.40	1-HR	ALL	1ST
1409.53894	513.03021	8.43639	213.40	1-HR	ALL	1ST
1644.46204	598.53528	7.42095	213.40	1-HR	ALL	1ST
1879.38525	684.04022	7.03921	213.40	1-HR	ALL	1ST
2114.30835	769.54535	6.56121	213.40	1-HR	ALL	1ST
2349.23145	855.05035	24.12316	231.60	1-HR	ALL	1ST
2819.07788	1026.06042	20.86826	231.60	1-HR	ALL	1ST
3758.77051	1368.08057	9.63144	310.90	1-HR	ALL	1ST
4698.46289	1710.10071	5.81526	384.00	1-HR	ALL	1ST
7047.69482	2565.15112	3.33586	384.00	1-HR	ALL	1ST
9396.92578	3420.20142	2.35683	370.30	1-HR	ALL	1ST
14095.38960	5130.30176	1.39824	360.00	1-HR	ALL	1ST
18793.85350	6840.40283	0.90783	380.00	1-HR	ALL	1ST
28190.77930	10260.60450	0.50488	400.00	1-HR	ALL	1ST

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37587.70310	13680.80570	0.62891	360.00	1-HR	ALL	1ST
46984.63670	17101.00780	0.26623	400.00	1-HR	ALL	1ST
98.48077	17.36482	2.59753	207.30	1-HR	ALL	1ST
196.96155	34.72964	4.69783	202.70	1-HR	ALL	1ST
295.44235	52.09447	8.48135	202.70	1-HR	ALL	1ST
393.92307	69.45930	4.77423	202.70	1-HR	ALL	1ST
492.40384	86.82410	5.68795	202.70	1-HR	ALL	1ST
590.88470	104.18893	4.62604	202.70	1-HR	ALL	1ST
689.36542	121.55376	3.23299	202.70	1-HR	ALL	1ST
787.84613	138.91856	3.10778	202.70	1-HR	ALL	1ST
886.32697	156.28340	2.97928	202.70	1-HR	ALL	1ST
984.80774	173.64821	2.75755	202.70	1-HR	ALL	1ST
1231.00964	217.06027	2.63681	202.70	1-HR	ALL	1ST
1477.21167	260.47235	2.60276	202.70	1-HR	ALL	1ST
1723.41370	303.88434	3.90019	213.40	1-HR	ALL	1ST
1969.61548	347.29648	3.02954	207.30	1-HR	ALL	1ST
2215.81738	390.70850	3.33715	207.30	1-HR	ALL	1ST
2462.01929	434.12051	10.95022	231.60	1-HR	ALL	1ST
2954.42310	520.94470	17.00310	304.80	1-HR	ALL	1ST
3939.23096	694.59296	10.19148	346.60	1-HR	ALL	1ST
4924.03809	868.24103	7.07213	365.80	1-HR	ALL	1ST
7386.05762	1302.36169	3.61724	384.00	1-HR	ALL	1ST
9848.07715	1736.48218	2.53417	371.90	1-HR	ALL	1ST
14772.11520	2604.72290	4.01392	320.00	1-HR	ALL	1ST
19696.15430	3472.96411	1.03218	360.00	1-HR	ALL	1ST
29544.23050	5209.44580	0.57193	380.00	1-HR	ALL	1ST
39392.30860	6945.92822	0.39790	380.00	1-HR	ALL	1ST
49240.38670	8682.41113	0.28149	400.00	1-HR	ALL	1ST
100.00000	0.00001	1.92787	207.30	1-HR	ALL	1ST
200.00000	0.00002	5.61738	202.70	1-HR	ALL	1ST
300.00000	0.00002	5.52209	202.70	1-HR	ALL	1ST
400.00000	0.00003	7.13858	202.70	1-HR	ALL	1ST
500.00000	0.00004	4.49742	202.70	1-HR	ALL	1ST
600.00000	0.00005	2.27909	202.70	1-HR	ALL	1ST
700.00000	0.00005	1.83655	202.70	1-HR	ALL	1ST
800.00000	0.00006	1.56700	202.70	1-HR	ALL	1ST
900.00000	0.00007	1.53429	202.70	1-HR	ALL	1ST
1000.00000	0.00008	1.81226	202.70	1-HR	ALL	1ST
1250.00000	0.00009	15.36937	243.80	1-HR	ALL	1ST
1500.00000	0.00011	40.81028	341.40	1-HR	ALL	1ST
1750.00000	0.00013	34.50356	323.10	1-HR	ALL	1ST
2000.00000	0.00015	27.13080	341.40	1-HR	ALL	1ST
2250.00000	0.00017	25.28048	304.80	1-HR	ALL	1ST
2500.00000	0.00019	40.27191	292.60	1-HR	ALL	1ST
3000.00000	0.00023	16.60923	310.90	1-HR	ALL	1ST
4000.00000	0.00030	9.75752	359.70	1-HR	ALL	1ST
5000.00000	0.00038	6.26888	402.30	1-HR	ALL	1ST
7500.00000	0.00057	4.22683	347.50	1-HR	ALL	1ST
10000.00000	0.00075	2.58858	380.10	1-HR	ALL	1ST
15000.00000	0.00113	1.57603	360.00	1-HR	ALL	1ST
20000.00000	0.00151	1.20421	360.00	1-HR	ALL	1ST
30000.00000	0.00226	0.59988	380.00	1-HR	ALL	1ST
40000.00000	0.00302	0.39122	400.00	1-HR	ALL	1ST
50000.00000	0.00377	0.80650	360.00	1-HR	ALL	1ST
98.48077	-17.36482	5.56092	207.30	1-HR	ALL	1ST
196.96155	-34.72964	3.58844	202.70	1-HR	ALL	1ST
295.44235	-52.09446	1.14107	202.70	1-HR	ALL	1ST
393.92307	-69.45927	1.82645	202.70	1-HR	ALL	1ST
492.40384	-86.82410	3.62259	202.70	1-HR	ALL	1ST
590.88470	-104.18891	2.75895	202.70	1-HR	ALL	1ST
689.36542	-121.55373	2.71497	202.70	1-HR	ALL	1ST
787.84613	-138.91853	16.38509	219.50	1-HR	ALL	1ST
886.32697	-156.28339	29.87196	225.60	1-HR	ALL	1ST

984.80774	-173.64819	47.39488	329.20	1-HR	ALL	1ST
1231.00964	-217.06023	35.12508	347.50	1-HR	ALL	1ST
1477.21167	-260.47232	30.09088	353.60	1-HR	ALL	1ST
1723.41370	-303.88431	23.13125	323.10	1-HR	ALL	1ST
1969.61548	-347.29642	18.63275	341.40	1-HR	ALL	1ST
2215.81738	-390.70840	16.09868	341.40	1-HR	ALL	1ST
2462.01929	-434.12045	14.47428	323.10	1-HR	ALL	1ST
2954.42310	-520.94458	14.88407	347.50	1-HR	ALL	1ST
3939.23096	-694.59277	9.85795	353.60	1-HR	ALL	1ST
4924.03809	-868.24091	6.85141	386.50	1-HR	ALL	1ST
7386.05762	-1302.36145	4.23198	353.60	1-HR	ALL	1ST
9848.07715	-1736.48181	3.01603	360.00	1-HR	ALL	1ST
14772.11520	-2604.72290	1.66579	340.00	1-HR	ALL	1ST
19696.15430	-3472.96338	1.22616	380.00	1-HR	ALL	1ST
29544.23050	-5209.44580	0.73998	380.00	1-HR	ALL	1ST
39392.30860	-6945.92676	0.52144	380.00	1-HR	ALL	1ST
49240.38670	-8682.40918	0.37662	400.00	1-HR	ALL	1ST
93.96926	-34.20201	7.23791	207.30	1-HR	ALL	1ST
187.93851	-68.40402	2.85747	202.70	1-HR	ALL	1ST
281.90778	-102.60603	2.54463	202.70	1-HR	ALL	1ST
375.87701	-136.80804	1.01166	202.70	1-HR	ALL	1ST
469.84631	-171.01006	1.63203	202.70	1-HR	ALL	1ST
563.81555	-205.21207	6.18410	213.40	1-HR	ALL	1ST
657.78491	-239.41406	60.31136	256.00	1-HR	ALL	1ST
751.75409	-273.61612	64.43974	298.70	1-HR	ALL	1ST
845.72339	-307.81812	56.14117	286.50	1-HR	ALL	1ST
939.69263	-342.02008	45.98010	323.10	1-HR	ALL	1ST
1174.61584	-427.52515	34.14631	347.50	1-HR	ALL	1ST
1409.53894	-513.03021	27.58699	347.50	1-HR	ALL	1ST
1644.46216	-598.53522	21.40200	310.90	1-HR	ALL	1ST
1879.38525	-684.04016	20.86284	353.60	1-HR	ALL	1ST
2114.30835	-769.54523	17.59651	350.20	1-HR	ALL	1ST
2349.23145	-855.05023	15.12554	347.50	1-HR	ALL	1ST
2819.07788	-1026.06030	12.18979	347.50	1-HR	ALL	1ST
3758.77051	-1368.08032	8.55346	345.90	1-HR	ALL	1ST
4698.46338	-1710.10059	7.06592	371.90	1-HR	ALL	1ST
7047.69482	-2565.15088	4.30253	365.80	1-HR	ALL	1ST
9396.92676	-3420.20093	2.70832	408.40	1-HR	ALL	1ST
14095.38960	-5130.30127	1.74549	380.00	1-HR	ALL	1ST
18793.85550	-6840.40234	1.73035	360.00	1-HR	ALL	1ST
28190.77930	-10260.60350	1.45142	360.00	1-HR	ALL	1ST
37587.70700	-13680.80470	1.19983	360.00	1-HR	ALL	1ST
46984.63670	-17101.00590	1.01686	360.00	1-HR	ALL	1ST
86.60254	-50.00000	7.53693	207.30	1-HR	ALL	1ST
173.20508	-100.00001	3.91989	202.70	1-HR	ALL	1ST
259.80762	-150.00002	1.94186	202.70	1-HR	ALL	1ST
346.41016	-200.00002	0.60907	202.70	1-HR	ALL	1ST
433.01273	-250.00003	1.40083	213.40	1-HR	ALL	1ST
519.61517	-300.00003	17.92687	268.20	1-HR	ALL	1ST
606.21777	-350.00003	68.57710	317.00	1-HR	ALL	1ST
692.82031	-400.00003	53.22472	347.50	1-HR	ALL	1ST
779.42291	-450.00003	45.19359	353.60	1-HR	ALL	1ST
866.02539	-500.00006	40.00871	347.50	1-HR	ALL	1ST
1082.53174	-625.00006	33.03910	310.90	1-HR	ALL	1ST
1299.03821	-750.00006	25.07100	359.70	1-HR	ALL	1ST
1515.54443	-875.00006	19.61588	335.30	1-HR	ALL	1ST
1732.05090	-1000.00012	17.31517	359.70	1-HR	ALL	1ST
1948.55713	-1125.00012	17.01828	359.70	1-HR	ALL	1ST
2165.06348	-1250.00012	13.59570	347.50	1-HR	ALL	1ST
2598.07617	-1500.00012	11.98690	365.80	1-HR	ALL	1ST
3464.10156	-2000.00024	7.98354	359.70	1-HR	ALL	1ST
4330.12695	-2500.00024	6.89194	353.60	1-HR	ALL	1ST
6495.19043	-3750.00049	3.92211	402.30	1-HR	ALL	1ST

8660.25391	-5000.00049	2.78922	396.20	1-HR	ALL	1ST
12990.38090	-7500.00098	1.74092	380.00	1-HR	ALL	1ST
17320.50780	-10000.00100	1.22185	380.00	1-HR	ALL	1ST
25980.76170	-15000.00200	1.14704	360.00	1-HR	ALL	1ST
34641.01560	-20000.00200	1.02555	360.00	1-HR	ALL	1ST
43301.26560	-25000.00200	0.91796	360.00	1-HR	ALL	1ST
76.60445	-64.27876	5.97005	207.30	1-HR	ALL	1ST
153.20888	-128.55754	2.41463	202.70	1-HR	ALL	1ST
229.81332	-192.83629	2.96012	202.70	1-HR	ALL	1ST
306.41779	-257.11508	0.83440	202.70	1-HR	ALL	1ST
383.02225	-321.39377	10.33235	243.80	1-HR	ALL	1ST
459.62668	-385.67261	75.25845	298.70	1-HR	ALL	1ST
536.23108	-449.95132	51.98043	323.10	1-HR	ALL	1ST
612.83557	-514.23016	45.41471	353.60	1-HR	ALL	1ST
689.44000	-578.50885	39.49252	353.60	1-HR	ALL	1ST
766.04443	-642.78766	34.75198	353.60	1-HR	ALL	1ST
957.55554	-803.48462	28.23686	353.60	1-HR	ALL	1ST
1149.06665	-964.18146	24.33154	359.70	1-HR	ALL	1ST
1340.57764	-1124.87830	18.75085	341.40	1-HR	ALL	1ST
1532.08899	-1285.57520	16.38378	353.60	1-HR	ALL	1ST
1723.59998	-1446.27209	14.12012	353.60	1-HR	ALL	1ST
1915.11108	-1606.96924	11.84992	341.40	1-HR	ALL	1ST
2298.13330	-1928.36292	10.00768	359.70	1-HR	ALL	1ST
3064.17798	-2571.15039	6.79648	359.70	1-HR	ALL	1ST
3830.22192	-3213.93823	5.07020	359.70	1-HR	ALL	1ST
5745.33252	-4820.90674	2.91289	408.40	1-HR	ALL	1ST
7660.44434	-6427.87598	2.25937	408.40	1-HR	ALL	1ST
11490.66500	-9641.81348	1.46347	380.00	1-HR	ALL	1ST
15320.88870	-12855.75290	1.02686	360.00	1-HR	ALL	1ST
22981.33200	-19283.62700	0.68462	360.00	1-HR	ALL	1ST
30641.77730	-25711.50590	0.51672	360.00	1-HR	ALL	1ST
38302.22270	-32139.38090	0.41124	360.00	1-HR	ALL	1ST
64.27876	-76.60445	4.38358	207.30	1-HR	ALL	1ST
128.55754	-153.20888	2.52213	202.70	1-HR	ALL	1ST
192.83629	-229.81332	1.93266	202.70	1-HR	ALL	1ST
257.11508	-306.41779	1.76028	202.70	1-HR	ALL	1ST
321.39377	-383.02225	47.94463	268.20	1-HR	ALL	1ST
385.67261	-459.62668	80.78226	304.80	1-HR	ALL	1ST
449.95132	-536.23108	70.10665	310.90	1-HR	ALL	1ST
514.23016	-612.83557	59.61766	323.10	1-HR	ALL	1ST
578.50885	-689.44000	51.50412	329.20	1-HR	ALL	1ST
642.78766	-766.04443	46.42023	323.10	1-HR	ALL	1ST
803.48456	-957.55554	33.62111	347.50	1-HR	ALL	1ST
964.18146	-1149.06665	21.11974	359.70	1-HR	ALL	1ST
1124.87830	-1340.57764	17.29639	329.20	1-HR	ALL	1ST
1285.57520	-1532.08899	14.43187	359.70	1-HR	ALL	1ST
1446.27197	-1723.59998	12.16668	353.60	1-HR	ALL	1ST
1606.96912	-1915.11108	11.21856	359.70	1-HR	ALL	1ST
1928.36292	-2298.13330	8.61108	408.40	1-HR	ALL	1ST
2571.15039	-3064.17798	5.96116	420.60	1-HR	ALL	1ST
3213.93799	-3830.22192	5.16030	371.90	1-HR	ALL	1ST
4820.90674	-5745.33301	3.02526	392.00	1-HR	ALL	1ST
6427.87549	-7660.44434	2.13824	390.10	1-HR	ALL	1ST
9641.81348	-11490.66600	1.97471	340.00	1-HR	ALL	1ST
12855.75200	-15320.88870	0.93038	380.00	1-HR	ALL	1ST
19283.62700	-22981.33400	0.53573	400.00	1-HR	ALL	1ST
25711.50390	-30641.77730	0.37855	400.00	1-HR	ALL	1ST
32139.38090	-38302.22270	0.30412	380.00	1-HR	ALL	1ST
50.00000	-86.60254	2.77348	207.30	1-HR	ALL	1ST
100.00001	-173.20508	4.71098	202.70	1-HR	ALL	1ST
150.00002	-259.80762	1.42148	202.70	1-HR	ALL	1ST
200.00002	-346.41016	3.18960	213.40	1-HR	ALL	1ST
250.00002	-433.01273	89.94217	268.20	1-HR	ALL	1ST

300.00003	-519.61517	66.08169	298.70	1-HR	ALL	1ST
350.00003	-606.21777	66.22234	310.90	1-HR	ALL	1ST
400.00003	-692.82031	56.64050	323.10	1-HR	ALL	1ST
450.00003	-779.42291	49.93258	323.10	1-HR	ALL	1ST
500.00003	-866.02539	43.79440	329.20	1-HR	ALL	1ST
625.00006	-1082.53174	31.07504	298.70	1-HR	ALL	1ST
750.00006	-1299.03821	26.65701	341.40	1-HR	ALL	1ST
875.00006	-1515.54443	22.13122	341.40	1-HR	ALL	1ST
1000.00006	-1732.05090	17.84415	359.70	1-HR	ALL	1ST
1125.00012	-1948.55713	15.17900	365.80	1-HR	ALL	1ST
1250.00012	-2165.06348	13.08045	371.90	1-HR	ALL	1ST
1500.00012	-2598.07617	9.27843	408.40	1-HR	ALL	1ST
2000.00012	-3464.10156	6.20439	420.60	1-HR	ALL	1ST
2500.00024	-4330.12695	4.84817	408.40	1-HR	ALL	1ST
3750.00024	-6495.19043	2.84755	408.40	1-HR	ALL	1ST
5000.00049	-8660.25391	2.09474	396.20	1-HR	ALL	1ST
7500.00049	-12990.38090	1.65744	340.00	1-HR	ALL	1ST
10000.00100	-17320.50780	0.92703	360.00	1-HR	ALL	1ST
15000.00100	-25980.76170	0.50641	420.00	1-HR	ALL	1ST
20000.00200	-34641.01560	0.37813	400.00	1-HR	ALL	1ST
25000.00200	-43301.26560	0.28847	400.00	1-HR	ALL	1ST
34.20202	-93.96926	1.37136	207.30	1-HR	ALL	1ST
68.40405	-187.93851	3.75761	202.70	1-HR	ALL	1ST
102.60606	-281.90778	1.62716	202.70	1-HR	ALL	1ST
136.80809	-375.87701	2.51654	207.30	1-HR	ALL	1ST
171.01012	-469.84631	43.81467	268.20	1-HR	ALL	1ST
205.21213	-563.81555	45.06506	292.60	1-HR	ALL	1ST
239.41414	-657.78479	48.77239	304.80	1-HR	ALL	1ST
273.61621	-751.75409	42.64601	304.80	1-HR	ALL	1ST
307.81821	-845.72333	29.65354	286.50	1-HR	ALL	1ST
342.02023	-939.69257	26.27966	286.50	1-HR	ALL	1ST
427.52527	-1174.61572	33.52998	304.80	1-HR	ALL	1ST
513.03033	-1409.53894	27.65158	310.90	1-HR	ALL	1ST
598.53546	-1644.46204	22.71933	304.80	1-HR	ALL	1ST
684.04047	-1879.38513	18.64600	335.30	1-HR	ALL	1ST
769.54547	-2114.30835	16.64400	359.70	1-HR	ALL	1ST
855.05054	-2349.23145	14.82052	378.00	1-HR	ALL	1ST
1026.06079	-2819.07788	11.49531	396.20	1-HR	ALL	1ST
1368.08081	-3758.77026	8.14357	402.30	1-HR	ALL	1ST
1710.10107	-4698.46289	6.11550	411.50	1-HR	ALL	1ST
2565.15161	-7047.69434	3.85132	402.30	1-HR	ALL	1ST
3420.20190	-9396.92578	2.67066	408.10	1-HR	ALL	1ST
5130.30273	-14095.38870	1.75650	360.00	1-HR	ALL	1ST
6840.40430	-18793.85350	1.23901	360.00	1-HR	ALL	1ST
10260.60550	-28190.77730	0.66618	420.00	1-HR	ALL	1ST
13680.80860	-37587.70310	0.49753	400.00	1-HR	ALL	1ST
17101.01170	-46984.62890	0.35912	420.00	1-HR	ALL	1ST
17.36483	-98.48077	1.14018	207.30	1-HR	ALL	1ST
34.72966	-196.96155	1.51251	202.70	1-HR	ALL	1ST
52.09449	-295.44235	2.86994	202.70	1-HR	ALL	1ST
69.45933	-393.92307	1.32097	202.70	1-HR	ALL	1ST
86.82413	-492.40384	77.43610	249.90	1-HR	ALL	1ST
104.18897	-590.88470	53.58073	286.50	1-HR	ALL	1ST
121.55380	-689.36542	46.07051	280.40	1-HR	ALL	1ST
138.91862	-787.84613	34.40146	274.30	1-HR	ALL	1ST
156.28346	-886.32697	30.28798	286.50	1-HR	ALL	1ST
173.64827	-984.80774	26.93969	286.50	1-HR	ALL	1ST
217.06036	-1231.00964	23.40391	298.70	1-HR	ALL	1ST
260.47244	-1477.21143	20.81326	304.80	1-HR	ALL	1ST
303.88449	-1723.41370	17.37552	304.80	1-HR	ALL	1ST
347.29657	-1969.61548	13.80888	298.70	1-HR	ALL	1ST
390.70868	-2215.81738	12.04333	298.70	1-HR	ALL	1ST
434.12073	-2462.01929	14.79132	365.80	1-HR	ALL	1ST

External Review Draft
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520.94489	-2954.42285	11.16015	402.30	1-HR	ALL	1ST
694.59320	-3939.23096	8.32588	390.10	1-HR	ALL	1ST
868.24146	-4924.03809	6.01372	414.50	1-HR	ALL	1ST
1302.36230	-7386.05762	3.78614	408.40	1-HR	ALL	1ST
1736.48279	-9848.07715	2.73186	398.10	1-HR	ALL	1ST
2604.72412	-14772.11520	1.89869	380.00	1-HR	ALL	1ST
3472.96558	-19696.15430	1.60476	360.00	1-HR	ALL	1ST
5209.44824	-29544.23050	0.70296	400.00	1-HR	ALL	1ST
6945.93115	-39392.30860	0.49698	400.00	1-HR	ALL	1ST
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0.00011	-700.00000	60.24691	280.40	1-HR	ALL	1ST
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0.00023	-1500.00000	20.31074	304.80	1-HR	ALL	1ST
0.00026	-1750.00000	17.00008	304.80	1-HR	ALL	1ST
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0.00075	-5000.00000	5.53371	396.20	1-HR	ALL	1ST
0.00113	-7500.00000	3.49347	390.10	1-HR	ALL	1ST
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0.00302	-20000.00000	1.03666	360.00	1-HR	ALL	1ST
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-1710.10083	-4698.46289	6.82291	397.20	1-HR	ALL	1ST
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-300.00000	-519.61517	2.48093	202.70	1-HR	ALL	1ST
-350.00000	-606.21777	2.45845	202.70	1-HR	ALL	1ST
-400.00000	-692.82031	2.27271	202.70	1-HR	ALL	1ST
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-500.00000	-866.02539	9.57495	219.50	1-HR	ALL	1ST
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-750.00000	-1299.03821	8.12199	213.40	1-HR	ALL	1ST
-875.00000	-1515.54443	8.05387	213.40	1-HR	ALL	1ST
-1000.00000	-1732.05090	15.33556	231.60	1-HR	ALL	1ST
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-7500.00000	-12990.38090	1.82504	360.00	1-HR	ALL	1ST
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-1515.54456	-874.99982	24.77423	329.20	1-HR	ALL	1ST
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-1948.55725	-1124.99976	26.00478	286.50	1-HR	ALL	1ST
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-2598.07666	-1499.99976	23.81646	243.80	1-HR	ALL	1ST
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-855.05090	2349.23145	11.72927	347.50	1-HR	ALL	1ST
-1026.06104	2819.07764	10.96301	378.00	1-HR	ALL	1ST
-1368.08130	3758.77026	7.72337	385.00	1-HR	ALL	1ST
-1710.10181	4698.46289	6.04301	371.90	1-HR	ALL	1ST
-2565.15283	7047.69385	2.96586	329.20	1-HR	ALL	1ST
-3420.20337	9396.92578	2.36762	349.00	1-HR	ALL	1ST
-5130.30518	14095.38770	1.53541	360.00	1-HR	ALL	1ST
-6840.40674	18793.85350	1.08532	360.00	1-HR	ALL	1ST
-10260.61040	28190.77540	0.60606	340.00	1-HR	ALL	1ST
-13680.81450	37587.70310	0.47564	370.00	1-HR	ALL	1ST
-17101.01760	46984.62890	0.34774	350.00	1-HR	ALL	1ST
-17.36484	98.48077	12.20264	213.40	1-HR	ALL	1ST
-34.72969	196.96155	12.15792	225.60	1-HR	ALL	1ST
-52.09453	295.44235	7.01011	225.60	1-HR	ALL	1ST
-69.45937	393.92307	1.00551	225.60	1-HR	ALL	1ST
-86.82422	492.40381	2.05384	225.60	1-HR	ALL	1ST
-104.18906	590.88470	3.54073	243.80	1-HR	ALL	1ST
-121.55391	689.36542	4.76516	262.10	1-HR	ALL	1ST
-138.91873	787.84613	14.10182	292.60	1-HR	ALL	1ST
-156.28360	886.32697	16.50330	298.70	1-HR	ALL	1ST
-173.64844	984.80768	14.94542	298.70	1-HR	ALL	1ST
-217.06055	1231.00964	27.44732	335.30	1-HR	ALL	1ST
-260.47269	1477.21143	24.43270	365.80	1-HR	ALL	1ST
-303.88474	1723.41345	19.61405	359.70	1-HR	ALL	1ST
-347.29691	1969.61523	21.11319	359.70	1-HR	ALL	1ST
-390.70898	2215.81738	15.18397	341.40	1-HR	ALL	1ST
-434.12109	2462.01929	16.30547	378.00	1-HR	ALL	1ST
-520.94531	2954.42285	12.95497	384.00	1-HR	ALL	1ST
-694.59375	3939.23071	9.37742	378.00	1-HR	ALL	1ST
-868.24219	4924.03809	7.28307	365.80	1-HR	ALL	1ST
-1302.36353	7386.05713	3.88370	341.40	1-HR	ALL	1ST
-1736.48438	9848.07715	2.73447	339.90	1-HR	ALL	1ST
-2604.72656	14772.11430	1.68321	340.00	1-HR	ALL	1ST
-3472.96875	19696.15430	1.30668	360.00	1-HR	ALL	1ST
-5209.45264	29544.22850	0.73742	340.00	1-HR	ALL	1ST
-6945.93701	39392.30860	0.57570	330.00	1-HR	ALL	1ST
-8682.42188	49240.38670	0.49303	320.00	1-HR	ALL	1ST
-0.00003	100.00000	15.70024	213.40	1-HR	ALL	1ST
-0.00006	200.00000	11.35771	225.60	1-HR	ALL	1ST
-0.00009	300.00000	2.70458	225.60	1-HR	ALL	1ST
-0.00012	400.00000	3.69062	225.60	1-HR	ALL	1ST
-0.00015	500.00000	4.05660	225.60	1-HR	ALL	1ST
-0.00018	600.00000	4.32104	237.70	1-HR	ALL	1ST
-0.00021	700.00000	3.79221	256.00	1-HR	ALL	1ST
-0.00024	800.00000	13.82174	280.40	1-HR	ALL	1ST
-0.00027	900.00000	28.61089	298.70	1-HR	ALL	1ST
-0.00030	1000.00000	20.37133	292.60	1-HR	ALL	1ST
-0.00038	1250.00000	35.25359	353.60	1-HR	ALL	1ST
-0.00045	1500.00000	24.48816	323.10	1-HR	ALL	1ST
-0.00053	1750.00000	20.46308	341.40	1-HR	ALL	1ST
-0.00060	2000.00000	16.81103	317.00	1-HR	ALL	1ST
-0.00068	2250.00000	18.77208	359.70	1-HR	ALL	1ST
-0.00075	2500.00000	16.58580	359.70	1-HR	ALL	1ST
-0.00091	3000.00000	13.33968	378.00	1-HR	ALL	1ST
-0.00121	4000.00000	9.34522	383.40	1-HR	ALL	1ST
-0.00151	5000.00000	7.26469	359.70	1-HR	ALL	1ST
-0.00226	7500.00000	4.45992	371.90	1-HR	ALL	1ST
-0.00302	10000.00000	3.06368	380.10	1-HR	ALL	1ST
-0.00453	15000.00000	1.86240	360.00	1-HR	ALL	1ST
-0.00604	20000.00000	1.36128	340.00	1-HR	ALL	1ST
-0.00906	30000.00000	0.78080	380.00	1-HR	ALL	1ST
-0.01208	40000.00000	0.63847	350.00	1-HR	ALL	1ST
-0.01510	50000.00000	0.54603	350.00	1-HR	ALL	1ST

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* ISCST2 (94227):  WTI Storage Tank Rupture,  ISCOMDEP -- ONSITE ORGANIC TANK FARM
* MODELING OPTIONS USED:
*  CONC   RURAL  ELEV                  GRDRIS NOSTD

*         PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL
*         FOR A TOTAL OF   936 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,2X,A6,2X,A8,2X,I8)
*        X             Y            CONC       ZELEV     AVE      GRP      NUM HRS
*
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X	Y	CONC	ZELEV	AVE	GRP	NUM HRS
17.36482	98.48077	0.02545	213.40	PERIOD	ALL	8760
34.72963	196.96155	0.01694	225.60	PERIOD	ALL	8760
52.09445	295.44235	0.00306	225.60	PERIOD	ALL	8760
69.45927	393.92307	0.00344	225.60	PERIOD	ALL	8760
86.82409	492.40384	0.00391	225.60	PERIOD	ALL	8760
104.18890	590.88470	0.00438	225.60	PERIOD	ALL	8760
121.55373	689.36542	0.01219	243.80	PERIOD	ALL	8760
138.91852	787.84613	0.01832	256.00	PERIOD	ALL	8760
156.28337	886.32697	0.03929	280.40	PERIOD	ALL	8760
173.64818	984.80774	0.04757	286.50	PERIOD	ALL	8760
217.06021	1231.00964	0.12532	353.60	PERIOD	ALL	8760
260.47229	1477.21167	0.10666	353.60	PERIOD	ALL	8760
303.88428	1723.41370	0.06029	310.90	PERIOD	ALL	8760
347.29639	1969.61548	0.07316	347.50	PERIOD	ALL	8760
390.70837	2215.81738	0.06579	353.60	PERIOD	ALL	8760
434.12042	2462.01929	0.05995	359.70	PERIOD	ALL	8760
520.94452	2954.42310	0.04539	347.50	PERIOD	ALL	8760
694.59271	3939.23096	0.03239	341.40	PERIOD	ALL	8760
868.24084	4924.03809	0.02653	341.40	PERIOD	ALL	8760
1302.36133	7386.05762	0.01414	365.80	PERIOD	ALL	8760
1736.48169	9848.07715	0.01078	360.00	PERIOD	ALL	8760
2604.72241	14772.11520	0.00656	340.00	PERIOD	ALL	8760
3472.96313	19696.15430	0.00456	340.00	PERIOD	ALL	8760
5209.44531	29544.23050	0.00251	360.00	PERIOD	ALL	8760
6945.92627	39392.30860	0.00186	350.00	PERIOD	ALL	8760
8682.40820	49240.38670	0.00136	360.00	PERIOD	ALL	8760
34.20201	93.96926	0.03513	213.40	PERIOD	ALL	8760
68.40403	187.93851	0.03285	225.60	PERIOD	ALL	8760
102.60603	281.90778	0.00772	225.60	PERIOD	ALL	8760
136.80806	375.87701	0.01256	225.60	PERIOD	ALL	8760
171.01007	469.84631	0.00896	225.60	PERIOD	ALL	8760
205.21207	563.81555	0.00535	225.60	PERIOD	ALL	8760
239.41408	657.78491	0.00951	237.70	PERIOD	ALL	8760
273.61615	751.75409	0.01138	243.80	PERIOD	ALL	8760
307.81812	845.72339	0.01675	256.00	PERIOD	ALL	8760
342.02011	939.69263	0.04749	286.50	PERIOD	ALL	8760
427.52518	1174.61572	0.11497	329.20	PERIOD	ALL	8760
513.03021	1409.53894	0.10945	347.50	PERIOD	ALL	8760
598.53522	1644.46204	0.08917	335.30	PERIOD	ALL	8760
684.04022	1879.38525	0.07980	347.50	PERIOD	ALL	8760
769.54523	2114.30835	0.07215	353.60	PERIOD	ALL	8760
855.05035	2349.23145	0.06242	359.70	PERIOD	ALL	8760
1026.06042	2819.07788	0.05135	362.40	PERIOD	ALL	8760
1368.08057	3758.77051	0.03571	329.20	PERIOD	ALL	8760
1710.10071	4698.46289	0.02814	359.70	PERIOD	ALL	8760
2565.15112	7047.69482	0.01694	369.70	PERIOD	ALL	8760
3420.20142	9396.92578	0.01174	385.90	PERIOD	ALL	8760
5130.30176	14095.38960	0.00844	340.00	PERIOD	ALL	8760
6840.40283	18793.85350	0.00600	340.00	PERIOD	ALL	8760
10260.60450	28190.77930	0.00306	360.00	PERIOD	ALL	8760
13680.80570	37587.70310	0.00204	380.00	PERIOD	ALL	8760
17101.00590	46984.63670	0.00150	390.00	PERIOD	ALL	8760
50.00000	86.60254	0.05057	213.40	PERIOD	ALL	8760
100.00000	173.20508	0.02778	219.50	PERIOD	ALL	8760

150.00000	259.80762	0.04241	225.60	PERIOD	ALL	8760
200.00000	346.41016	0.02802	225.60	PERIOD	ALL	8760
250.00000	433.01273	0.02022	225.60	PERIOD	ALL	8760
300.00000	519.61517	0.01467	225.60	PERIOD	ALL	8760
350.00000	606.21777	0.01002	225.60	PERIOD	ALL	8760
400.00000	692.82031	0.01377	231.60	PERIOD	ALL	8760
450.00000	779.42291	0.02142	243.80	PERIOD	ALL	8760
500.00000	866.02539	0.03306	262.10	PERIOD	ALL	8760
625.00000	1082.53174	0.01570	225.60	PERIOD	ALL	8760
750.00000	1299.03821	0.13254	347.50	PERIOD	ALL	8760
875.00000	1515.54443	0.11912	359.70	PERIOD	ALL	8760
1000.00000	1732.05090	0.09986	353.60	PERIOD	ALL	8760
1125.00000	1948.55713	0.09015	353.60	PERIOD	ALL	8760
1250.00000	2165.06348	0.07452	329.20	PERIOD	ALL	8760
1500.00000	2598.07617	0.06321	323.10	PERIOD	ALL	8760
2000.00000	3464.10156	0.04596	361.20	PERIOD	ALL	8760
2500.00000	4330.12695	0.03511	366.70	PERIOD	ALL	8760
3750.00000	6495.19043	0.02129	378.00	PERIOD	ALL	8760
5000.00000	8660.25391	0.01400	396.20	PERIOD	ALL	8760
7500.00000	12990.38090	0.01018	320.00	PERIOD	ALL	8760
10000.00000	17320.50780	0.00598	360.00	PERIOD	ALL	8760
15000.00000	25980.76170	0.00343	380.00	PERIOD	ALL	8760
20000.00000	34641.01560	0.00241	370.00	PERIOD	ALL	8760
25000.00000	43301.26560	0.00171	400.00	PERIOD	ALL	8760
64.27876	76.60445	0.05370	213.40	PERIOD	ALL	8760
128.55754	153.20888	0.01995	213.40	PERIOD	ALL	8760
192.83627	229.81335	0.19797	225.60	PERIOD	ALL	8760
257.11508	306.41779	0.17097	225.60	PERIOD	ALL	8760
321.39377	383.02225	0.05783	225.60	PERIOD	ALL	8760
385.67258	459.62671	0.03036	225.60	PERIOD	ALL	8760
449.95132	536.23120	0.01963	225.60	PERIOD	ALL	8760
514.23016	612.83557	0.01457	225.60	PERIOD	ALL	8760
578.50885	689.44000	0.01843	225.60	PERIOD	ALL	8760
642.78766	766.04443	0.03922	243.80	PERIOD	ALL	8760
803.48456	957.55554	0.08612	280.40	PERIOD	ALL	8760
964.18140	1149.06665	0.17944	353.60	PERIOD	ALL	8760
1124.87830	1340.57764	0.16109	361.50	PERIOD	ALL	8760
1285.57520	1532.08899	0.13633	353.60	PERIOD	ALL	8760
1446.27197	1723.59998	0.12412	353.60	PERIOD	ALL	8760
1606.96912	1915.11108	0.10984	353.60	PERIOD	ALL	8760
1928.36292	2298.13330	0.08659	335.30	PERIOD	ALL	8760
2571.15039	3064.17798	0.06507	353.90	PERIOD	ALL	8760
3213.93799	3830.22192	0.05013	353.00	PERIOD	ALL	8760
4820.90625	5745.33301	0.02861	378.00	PERIOD	ALL	8760
6427.87549	7660.44434	0.01879	398.40	PERIOD	ALL	8760
9641.81250	11490.66600	0.01150	376.00	PERIOD	ALL	8760
12855.75200	15320.88870	0.00831	380.00	PERIOD	ALL	8760
19283.62700	22981.33400	0.00521	360.00	PERIOD	ALL	8760
25711.50390	30641.77730	0.00310	420.00	PERIOD	ALL	8760
32139.37890	38302.22270	0.00234	420.00	PERIOD	ALL	8760
76.60445	64.27876	0.03277	213.40	PERIOD	ALL	8760
153.20888	128.55754	0.00000	207.30	PERIOD	ALL	8760
229.81335	192.83629	0.20144	213.40	PERIOD	ALL	8760
306.41779	257.11508	0.22828	219.50	PERIOD	ALL	8760
383.02225	321.39377	0.08641	219.50	PERIOD	ALL	8760
459.62671	385.67261	0.04802	219.50	PERIOD	ALL	8760
536.23120	449.95132	0.03157	219.50	PERIOD	ALL	8760
612.83557	514.23016	0.02336	219.50	PERIOD	ALL	8760
689.44000	578.50885	0.03823	225.60	PERIOD	ALL	8760
766.04443	642.78766	0.02691	219.50	PERIOD	ALL	8760
957.55554	803.48456	0.03639	219.50	PERIOD	ALL	8760
1149.06665	964.18140	0.32847	323.10	PERIOD	ALL	8760
1340.57764	1124.87830	0.30432	353.60	PERIOD	ALL	8760

External Review Draft
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1532.08899	1285.57520	0.26639	353.60	PERIOD	ALL	8760
1723.59998	1446.27197	0.22985	335.30	PERIOD	ALL	8760
1915.11108	1606.96912	0.20481	347.50	PERIOD	ALL	8760
2298.13330	1928.36292	0.16437	347.50	PERIOD	ALL	8760
3064.17798	2571.15039	0.11599	341.40	PERIOD	ALL	8760
3830.22192	3213.93799	0.08966	335.30	PERIOD	ALL	8760
5745.33301	4820.90674	0.04832	373.10	PERIOD	ALL	8760
7660.44434	6427.87549	0.03265	396.20	PERIOD	ALL	8760
11490.66600	9641.81348	0.02060	360.00	PERIOD	ALL	8760
15320.88870	12855.75200	0.01307	380.00	PERIOD	ALL	8760
22981.33400	19283.62700	0.00770	380.00	PERIOD	ALL	8760
30641.77730	25711.50390	0.00492	420.00	PERIOD	ALL	8760
38302.22270	32139.38090	0.00370	420.00	PERIOD	ALL	8760
86.60254	50.00000	0.02886	213.40	PERIOD	ALL	8760
173.20508	99.99999	0.00000	207.30	PERIOD	ALL	8760
259.80762	150.00000	0.40564	207.30	PERIOD	ALL	8760
346.41016	199.99997	0.11439	201.20	PERIOD	ALL	8760
433.01273	249.99997	0.11840	207.30	PERIOD	ALL	8760
519.61517	300.00000	0.12144	213.40	PERIOD	ALL	8760
606.21777	349.99994	0.07655	213.40	PERIOD	ALL	8760
692.82031	399.99994	0.05486	213.40	PERIOD	ALL	8760
779.42291	449.99994	0.05410	213.40	PERIOD	ALL	8760
866.02539	499.99994	0.07719	219.50	PERIOD	ALL	8760
1082.53174	625.00000	0.11710	225.60	PERIOD	ALL	8760
1299.03821	750.00000	0.08957	219.50	PERIOD	ALL	8760
1515.54443	875.00000	0.19280	243.80	PERIOD	ALL	8760
1732.05090	1000.00000	0.32995	292.60	PERIOD	ALL	8760
1948.55725	1125.00000	0.33746	310.90	PERIOD	ALL	8760
2165.06348	1250.00000	0.31120	323.10	PERIOD	ALL	8760
2598.07617	1500.00000	0.24750	317.00	PERIOD	ALL	8760
3464.10156	2000.00000	0.17578	323.10	PERIOD	ALL	8760
4330.12695	2499.99976	0.12641	359.70	PERIOD	ALL	8760
6495.19043	3749.99976	0.07047	378.90	PERIOD	ALL	8760
8660.25391	4999.99902	0.04496	408.70	PERIOD	ALL	8760
12990.38090	7499.99902	0.02709	380.00	PERIOD	ALL	8760
17320.50780	9999.99902	0.01922	360.00	PERIOD	ALL	8760
25980.76170	14999.99900	0.01059	380.00	PERIOD	ALL	8760
34641.01560	19999.99800	0.00726	380.00	PERIOD	ALL	8760
43301.26560	24999.99800	0.00499	420.00	PERIOD	ALL	8760
93.96926	34.20201	0.00580	207.30	PERIOD	ALL	8760
187.93851	68.40403	0.00000	201.20	PERIOD	ALL	8760
281.90778	102.60603	0.03026	202.70	PERIOD	ALL	8760
375.87701	136.80806	0.05300	202.70	PERIOD	ALL	8760
469.84631	171.01007	0.06818	207.30	PERIOD	ALL	8760
563.81555	205.21207	0.05043	207.30	PERIOD	ALL	8760
657.78491	239.41411	0.03915	207.30	PERIOD	ALL	8760
751.75409	273.61615	0.05184	213.40	PERIOD	ALL	8760
845.72333	307.81815	0.05533	213.40	PERIOD	ALL	8760
939.69263	342.02011	0.05587	213.40	PERIOD	ALL	8760
1174.61572	427.52518	0.07287	213.40	PERIOD	ALL	8760
1409.53894	513.03021	0.08321	213.40	PERIOD	ALL	8760
1644.46204	598.53528	0.08773	213.40	PERIOD	ALL	8760
1879.38525	684.04022	0.08926	213.40	PERIOD	ALL	8760
2114.30835	769.54535	0.08794	213.40	PERIOD	ALL	8760
2349.23145	855.05035	0.14988	231.60	PERIOD	ALL	8760
2819.07788	1026.06042	0.13186	231.60	PERIOD	ALL	8760
3758.77051	1368.08057	0.18034	310.90	PERIOD	ALL	8760
4698.46289	1710.10071	0.12153	384.00	PERIOD	ALL	8760
7047.69482	2565.15112	0.07017	384.00	PERIOD	ALL	8760
9396.92578	3420.20142	0.04957	370.30	PERIOD	ALL	8760
14095.38960	5130.30176	0.02924	360.00	PERIOD	ALL	8760
18793.85350	6840.40283	0.01897	380.00	PERIOD	ALL	8760
28190.77930	10260.60450	0.01054	400.00	PERIOD	ALL	8760

37587.70310	13680.80570	0.00804	360.00	PERIOD	ALL	8760
46984.63670	17101.00780	0.00541	400.00	PERIOD	ALL	8760
98.48077	17.36482	0.00193	207.30	PERIOD	ALL	8760
196.96155	34.72964	0.00743	202.70	PERIOD	ALL	8760
295.44235	52.09447	0.02575	202.70	PERIOD	ALL	8760
393.92307	69.45930	0.01364	202.70	PERIOD	ALL	8760
492.40384	86.82410	0.00662	202.70	PERIOD	ALL	8760
590.88470	104.18893	0.00554	202.70	PERIOD	ALL	8760
689.36542	121.55376	0.00482	202.70	PERIOD	ALL	8760
787.84613	138.91856	0.00449	202.70	PERIOD	ALL	8760
886.32697	156.28340	0.00604	202.70	PERIOD	ALL	8760
984.80774	173.64821	0.00687	202.70	PERIOD	ALL	8760
1231.00964	217.06027	0.01209	202.70	PERIOD	ALL	8760
1477.21167	260.47235	0.01715	202.70	PERIOD	ALL	8760
1723.41370	303.88434	0.03400	213.40	PERIOD	ALL	8760
1969.61548	347.29648	0.02922	207.30	PERIOD	ALL	8760
2215.81738	390.70850	0.03127	207.30	PERIOD	ALL	8760
2462.01929	434.12051	0.07780	231.60	PERIOD	ALL	8760
2954.42310	520.94470	0.20499	304.80	PERIOD	ALL	8760
3939.23096	694.59296	0.16610	346.60	PERIOD	ALL	8760
4924.03809	868.24103	0.12215	365.80	PERIOD	ALL	8760
7386.05762	1302.36169	0.06699	384.00	PERIOD	ALL	8760
9848.07715	1736.48218	0.04665	371.90	PERIOD	ALL	8760
14772.11520	2604.72290	0.03223	320.00	PERIOD	ALL	8760
19696.15430	3472.96411	0.01940	360.00	PERIOD	ALL	8760
29544.23050	5209.44580	0.01084	380.00	PERIOD	ALL	8760
39392.30860	6945.92822	0.00747	380.00	PERIOD	ALL	8760
49240.38670	8682.41113	0.00536	400.00	PERIOD	ALL	8760
100.00000	0.00001	0.00169	207.30	PERIOD	ALL	8760
200.00000	0.00002	0.00582	202.70	PERIOD	ALL	8760
300.00000	0.00002	0.00530	202.70	PERIOD	ALL	8760
400.00000	0.00003	0.01446	202.70	PERIOD	ALL	8760
500.00000	0.00004	0.00697	202.70	PERIOD	ALL	8760
600.00000	0.00005	0.00373	202.70	PERIOD	ALL	8760
700.00000	0.00005	0.00276	202.70	PERIOD	ALL	8760
800.00000	0.00006	0.00284	202.70	PERIOD	ALL	8760
900.00000	0.00007	0.00357	202.70	PERIOD	ALL	8760
1000.00000	0.00008	0.00524	202.70	PERIOD	ALL	8760
1250.00000	0.00009	0.07934	243.80	PERIOD	ALL	8760
1500.00000	0.00011	0.46378	341.40	PERIOD	ALL	8760
1750.00000	0.00013	0.36300	323.10	PERIOD	ALL	8760
2000.00000	0.00015	0.34013	341.40	PERIOD	ALL	8760
2250.00000	0.00017	0.23964	304.80	PERIOD	ALL	8760
2500.00000	0.00019	0.18899	292.60	PERIOD	ALL	8760
3000.00000	0.00023	0.19649	310.90	PERIOD	ALL	8760
4000.00000	0.00030	0.15428	359.70	PERIOD	ALL	8760
5000.00000	0.00038	0.10985	402.30	PERIOD	ALL	8760
7500.00000	0.00057	0.07560	347.50	PERIOD	ALL	8760
10000.00000	0.00075	0.04574	380.10	PERIOD	ALL	8760
15000.00000	0.00113	0.02821	360.00	PERIOD	ALL	8760
20000.00000	0.00151	0.01931	360.00	PERIOD	ALL	8760
30000.00000	0.00226	0.01072	380.00	PERIOD	ALL	8760
40000.00000	0.00302	0.00692	400.00	PERIOD	ALL	8760
50000.00000	0.00377	0.00603	360.00	PERIOD	ALL	8760
98.48077	-17.36482	0.00243	207.30	PERIOD	ALL	8760
196.96155	-34.72964	0.00382	202.70	PERIOD	ALL	8760
295.44235	-52.09446	0.00167	202.70	PERIOD	ALL	8760
393.92307	-69.45927	0.00373	202.70	PERIOD	ALL	8760
492.40384	-86.82410	0.00591	202.70	PERIOD	ALL	8760
590.88470	-104.18891	0.00500	202.70	PERIOD	ALL	8760
689.36542	-121.55373	0.00446	202.70	PERIOD	ALL	8760
787.84613	-138.91853	0.01769	219.50	PERIOD	ALL	8760
886.32697	-156.28339	0.02819	225.60	PERIOD	ALL	8760

984.80774	-173.64819	0.50831	329.20	PERIOD	ALL	8760
1231.00964	-217.06023	0.47633	347.50	PERIOD	ALL	8760
1477.21167	-260.47232	0.42052	353.60	PERIOD	ALL	8760
1723.41370	-303.88431	0.30715	323.10	PERIOD	ALL	8760
1969.61548	-347.29642	0.30709	341.40	PERIOD	ALL	8760
2215.81738	-390.70840	0.27303	341.40	PERIOD	ALL	8760
2462.01929	-434.12045	0.22877	323.10	PERIOD	ALL	8760
2954.42310	-520.94458	0.21500	347.50	PERIOD	ALL	8760
3939.23096	-694.59277	0.15596	353.60	PERIOD	ALL	8760
4924.03809	-868.24091	0.11311	386.50	PERIOD	ALL	8760
7386.05762	-1302.36145	0.07546	353.60	PERIOD	ALL	8760
9848.07715	-1736.48181	0.05095	360.00	PERIOD	ALL	8760
14772.11520	-2604.72290	0.03242	340.00	PERIOD	ALL	8760
19696.15430	-3472.96338	0.01888	380.00	PERIOD	ALL	8760
29544.23050	-5209.44580	0.01095	380.00	PERIOD	ALL	8760
39392.30860	-6945.92676	0.00776	380.00	PERIOD	ALL	8760
49240.38670	-8682.40918	0.00552	400.00	PERIOD	ALL	8760
93.96926	-34.20201	0.00314	207.30	PERIOD	ALL	8760
187.93851	-68.40402	0.00304	202.70	PERIOD	ALL	8760
281.90778	-102.60603	0.00199	202.70	PERIOD	ALL	8760
375.87701	-136.80804	0.00096	202.70	PERIOD	ALL	8760
469.84631	-171.01006	0.00161	202.70	PERIOD	ALL	8760
563.81555	-205.21207	0.00595	213.40	PERIOD	ALL	8760
657.78491	-239.41406	0.06812	256.00	PERIOD	ALL	8760
751.75409	-273.61612	0.22038	298.70	PERIOD	ALL	8760
845.72339	-307.81812	0.16963	286.50	PERIOD	ALL	8760
939.69263	-342.02008	0.34941	323.10	PERIOD	ALL	8760
1174.61584	-427.52515	0.35778	347.50	PERIOD	ALL	8760
1409.53894	-513.03021	0.31240	347.50	PERIOD	ALL	8760
1644.46216	-598.53522	0.21257	310.90	PERIOD	ALL	8760
1879.38525	-684.04016	0.25030	353.60	PERIOD	ALL	8760
2114.30835	-769.54523	0.21184	350.20	PERIOD	ALL	8760
2349.23145	-855.05023	0.19760	347.50	PERIOD	ALL	8760
2819.07788	-1026.06030	0.16270	347.50	PERIOD	ALL	8760
3758.77051	-1368.08032	0.12625	345.90	PERIOD	ALL	8760
4698.46338	-1710.10059	0.09872	371.90	PERIOD	ALL	8760
7047.69482	-2565.15088	0.05979	365.80	PERIOD	ALL	8760
9396.92676	-3420.20093	0.03998	408.40	PERIOD	ALL	8760
14095.38960	-5130.30127	0.02457	380.00	PERIOD	ALL	8760
18793.85550	-6840.40234	0.01808	360.00	PERIOD	ALL	8760
28190.77930	-10260.60350	0.01076	360.00	PERIOD	ALL	8760
37587.70700	-13680.80470	0.00770	360.00	PERIOD	ALL	8760
46984.63670	-17101.00590	0.00579	360.00	PERIOD	ALL	8760
86.60254	-50.00000	0.00376	207.30	PERIOD	ALL	8760
173.20508	-100.00001	0.00257	202.70	PERIOD	ALL	8760
259.80762	-150.00002	0.00284	202.70	PERIOD	ALL	8760
346.41016	-200.00002	0.00067	202.70	PERIOD	ALL	8760
433.01273	-250.00003	0.00180	213.40	PERIOD	ALL	8760
519.61517	-300.00003	0.04448	268.20	PERIOD	ALL	8760
606.21777	-350.00003	0.25351	317.00	PERIOD	ALL	8760
692.82031	-400.00003	0.37065	347.50	PERIOD	ALL	8760
779.42291	-450.00003	0.34719	353.60	PERIOD	ALL	8760
866.02539	-500.00006	0.28853	347.50	PERIOD	ALL	8760
1082.53174	-625.00006	0.16991	310.90	PERIOD	ALL	8760
1299.03821	-750.00006	0.21772	359.70	PERIOD	ALL	8760
1515.54443	-875.00006	0.17343	335.30	PERIOD	ALL	8760
1732.05090	-1000.00012	0.16451	359.70	PERIOD	ALL	8760
1948.55713	-1125.00012	0.15628	359.70	PERIOD	ALL	8760
2165.06348	-1250.00012	0.13258	347.50	PERIOD	ALL	8760
2598.07617	-1500.00012	0.11563	365.80	PERIOD	ALL	8760
3464.10156	-2000.00024	0.08652	359.70	PERIOD	ALL	8760
4330.12695	-2500.00024	0.07382	353.60	PERIOD	ALL	8760
6495.19043	-3750.00049	0.04321	402.30	PERIOD	ALL	8760

8660.25391	-5000.00049	0.03182	396.20	PERIOD	ALL	8760
12990.38090	-7500.00098	0.01965	380.00	PERIOD	ALL	8760
17320.50780	-10000.00100	0.01359	380.00	PERIOD	ALL	8760
25980.76170	-15000.00200	0.00854	360.00	PERIOD	ALL	8760
34641.01560	-20000.00200	0.00593	360.00	PERIOD	ALL	8760
43301.26560	-25000.00200	0.00458	360.00	PERIOD	ALL	8760
76.60445	-64.27876	0.00298	207.30	PERIOD	ALL	8760
153.20888	-128.55754	0.00244	202.70	PERIOD	ALL	8760
229.81332	-192.83629	0.00236	202.70	PERIOD	ALL	8760
306.41779	-257.11508	0.00132	202.70	PERIOD	ALL	8760
383.02225	-321.39377	0.01719	243.80	PERIOD	ALL	8760
459.62668	-385.67261	0.15052	298.70	PERIOD	ALL	8760
536.23108	-449.95132	0.22776	323.10	PERIOD	ALL	8760
612.83557	-514.23016	0.25667	353.60	PERIOD	ALL	8760
689.44000	-578.50885	0.25865	353.60	PERIOD	ALL	8760
766.04443	-642.78766	0.24048	353.60	PERIOD	ALL	8760
957.55554	-803.48462	0.18747	353.60	PERIOD	ALL	8760
1149.06665	-964.18146	0.17190	359.70	PERIOD	ALL	8760
1340.57764	-1124.87830	0.14936	341.40	PERIOD	ALL	8760
1532.08899	-1285.57520	0.14194	353.60	PERIOD	ALL	8760
1723.59998	-1446.27209	0.12229	353.60	PERIOD	ALL	8760
1915.11108	-1606.96924	0.10734	341.40	PERIOD	ALL	8760
2298.13330	-1928.36292	0.09631	359.70	PERIOD	ALL	8760
3064.17798	-2571.15039	0.07056	359.70	PERIOD	ALL	8760
3830.22192	-3213.93823	0.05354	359.70	PERIOD	ALL	8760
5745.33252	-4820.90674	0.03138	408.40	PERIOD	ALL	8760
7660.44434	-6427.87598	0.02315	408.40	PERIOD	ALL	8760
11490.66500	-9641.81348	0.01464	380.00	PERIOD	ALL	8760
15320.88870	-12855.75290	0.01039	360.00	PERIOD	ALL	8760
22981.33200	-19283.62700	0.00621	360.00	PERIOD	ALL	8760
30641.77730	-25711.50590	0.00434	360.00	PERIOD	ALL	8760
38302.22270	-32139.38090	0.00338	360.00	PERIOD	ALL	8760
64.27876	-76.60445	0.00213	207.30	PERIOD	ALL	8760
128.55754	-153.20888	0.00317	202.70	PERIOD	ALL	8760
192.83629	-229.81332	0.00141	202.70	PERIOD	ALL	8760
257.11508	-306.41779	0.00202	202.70	PERIOD	ALL	8760
321.39377	-383.02225	0.05483	268.20	PERIOD	ALL	8760
385.67261	-459.62668	0.16639	304.80	PERIOD	ALL	8760
449.95132	-536.23108	0.16340	310.90	PERIOD	ALL	8760
514.23016	-612.83557	0.17782	323.10	PERIOD	ALL	8760
578.50885	-689.44000	0.18673	329.20	PERIOD	ALL	8760
642.78766	-766.04443	0.14656	323.10	PERIOD	ALL	8760
803.48456	-957.55554	0.17364	347.50	PERIOD	ALL	8760
964.18146	-1149.06665	0.14824	359.70	PERIOD	ALL	8760
1124.87830	-1340.57764	0.10904	329.20	PERIOD	ALL	8760
1285.57520	-1532.08899	0.10885	359.70	PERIOD	ALL	8760
1446.27197	-1723.59998	0.09206	353.60	PERIOD	ALL	8760
1606.96912	-1915.11108	0.09084	359.70	PERIOD	ALL	8760
1928.36292	-2298.13330	0.07773	408.40	PERIOD	ALL	8760
2571.15039	-3064.17798	0.05626	420.60	PERIOD	ALL	8760
3213.93799	-3830.22192	0.04241	371.90	PERIOD	ALL	8760
4820.90674	-5745.33301	0.02668	392.00	PERIOD	ALL	8760
6427.87549	-7660.44434	0.01965	390.10	PERIOD	ALL	8760
9641.81348	-11490.66600	0.01385	340.00	PERIOD	ALL	8760
12855.75200	-15320.88870	0.00843	380.00	PERIOD	ALL	8760
19283.62700	-22981.33400	0.00466	400.00	PERIOD	ALL	8760
25711.50390	-30641.77730	0.00322	400.00	PERIOD	ALL	8760
32139.38090	-38302.22270	0.00273	380.00	PERIOD	ALL	8760
50.00000	-86.60254	0.00146	207.30	PERIOD	ALL	8760
100.00001	-173.20508	0.00415	202.70	PERIOD	ALL	8760
150.00002	-259.80762	0.00138	202.70	PERIOD	ALL	8760
200.00002	-346.41016	0.00336	213.40	PERIOD	ALL	8760
250.00002	-433.01273	0.06463	268.20	PERIOD	ALL	8760

300.00003	-519.61517	0.16885	298.70	PERIOD	ALL	8760
350.00003	-606.21777	0.18694	310.90	PERIOD	ALL	8760
400.00003	-692.82031	0.19630	323.10	PERIOD	ALL	8760
450.00003	-779.42291	0.16994	323.10	PERIOD	ALL	8760
500.00003	-866.02539	0.17670	329.20	PERIOD	ALL	8760
625.00006	-1082.53174	0.08516	298.70	PERIOD	ALL	8760
750.00006	-1299.03821	0.12500	341.40	PERIOD	ALL	8760
875.00006	-1515.54443	0.10542	341.40	PERIOD	ALL	8760
1000.00006	-1732.05090	0.09865	359.70	PERIOD	ALL	8760
1125.00012	-1948.55713	0.08375	365.80	PERIOD	ALL	8760
1250.00012	-2165.06348	0.07867	371.90	PERIOD	ALL	8760
1500.00012	-2598.07617	0.06686	408.40	PERIOD	ALL	8760
2000.00012	-3464.10156	0.04844	420.60	PERIOD	ALL	8760
2500.00024	-4330.12695	0.03532	408.40	PERIOD	ALL	8760
3750.00024	-6495.19043	0.02278	408.40	PERIOD	ALL	8760
5000.00049	-8660.25391	0.01717	396.20	PERIOD	ALL	8760
7500.00049	-12990.38090	0.01213	340.00	PERIOD	ALL	8760
10000.00100	-17320.50780	0.00807	360.00	PERIOD	ALL	8760
15000.00100	-25980.76170	0.00401	420.00	PERIOD	ALL	8760
20000.00200	-34641.01560	0.00295	400.00	PERIOD	ALL	8760
25000.00200	-43301.26560	0.00232	400.00	PERIOD	ALL	8760
34.20202	-93.96926	0.00103	207.30	PERIOD	ALL	8760
68.40405	-187.93851	0.00361	202.70	PERIOD	ALL	8760
102.60606	-281.90778	0.00197	202.70	PERIOD	ALL	8760
136.80809	-375.87701	0.00218	207.30	PERIOD	ALL	8760
171.01012	-469.84631	0.06860	268.20	PERIOD	ALL	8760
205.21213	-563.81555	0.15540	292.60	PERIOD	ALL	8760
239.41414	-657.78479	0.18843	304.80	PERIOD	ALL	8760
273.61621	-751.75409	0.17923	304.80	PERIOD	ALL	8760
307.81821	-845.72333	0.08465	286.50	PERIOD	ALL	8760
342.02023	-939.69257	0.08048	286.50	PERIOD	ALL	8760
427.52527	-1174.61572	0.11051	304.80	PERIOD	ALL	8760
513.03033	-1409.53894	0.10331	310.90	PERIOD	ALL	8760
598.53546	-1644.46204	0.07953	304.80	PERIOD	ALL	8760
684.04047	-1879.38513	0.09491	335.30	PERIOD	ALL	8760
769.54547	-2114.30835	0.08882	359.70	PERIOD	ALL	8760
855.05054	-2349.23145	0.08416	378.00	PERIOD	ALL	8760
1026.06079	-2819.07788	0.06637	396.20	PERIOD	ALL	8760
1368.08081	-3758.77026	0.04711	402.30	PERIOD	ALL	8760
1710.10107	-4698.46289	0.03580	411.50	PERIOD	ALL	8760
2565.15161	-7047.69434	0.02268	402.30	PERIOD	ALL	8760
3420.20190	-9396.92578	0.01634	408.10	PERIOD	ALL	8760
5130.30273	-14095.38870	0.01084	360.00	PERIOD	ALL	8760
6840.40430	-18793.85350	0.00729	360.00	PERIOD	ALL	8760
10260.60550	-28190.77730	0.00368	420.00	PERIOD	ALL	8760
13680.80860	-37587.70310	0.00270	400.00	PERIOD	ALL	8760
17101.01170	-46984.62890	0.00200	420.00	PERIOD	ALL	8760
17.36483	-98.48077	0.00083	207.30	PERIOD	ALL	8760
34.72966	-196.96155	0.00177	202.70	PERIOD	ALL	8760
52.09449	-295.44235	0.00313	202.70	PERIOD	ALL	8760
69.45933	-393.92307	0.00203	202.70	PERIOD	ALL	8760
86.82413	-492.40384	0.04530	249.90	PERIOD	ALL	8760
104.18897	-590.88470	0.17778	286.50	PERIOD	ALL	8760
121.55380	-689.36542	0.10333	280.40	PERIOD	ALL	8760
138.91862	-787.84613	0.08049	274.30	PERIOD	ALL	8760
156.28346	-886.32697	0.10732	286.50	PERIOD	ALL	8760
173.64827	-984.80774	0.09488	286.50	PERIOD	ALL	8760
217.06036	-1231.00964	0.10856	298.70	PERIOD	ALL	8760
260.47244	-1477.21143	0.10526	304.80	PERIOD	ALL	8760
303.88449	-1723.41370	0.09116	304.80	PERIOD	ALL	8760
347.29657	-1969.61548	0.07445	298.70	PERIOD	ALL	8760
390.70868	-2215.81738	0.07088	298.70	PERIOD	ALL	8760
434.12073	-2462.01929	0.09381	365.80	PERIOD	ALL	8760

520.94489	-2954.42285	0.07467	402.30	PERIOD	ALL	8760
694.59320	-3939.23096	0.05239	390.10	PERIOD	ALL	8760
868.24146	-4924.03809	0.03825	414.50	PERIOD	ALL	8760
1302.36230	-7386.05762	0.02312	408.40	PERIOD	ALL	8760
1736.48279	-9848.07715	0.01769	398.10	PERIOD	ALL	8760
2604.72412	-14772.11520	0.01124	380.00	PERIOD	ALL	8760
3472.96558	-19696.15430	0.00804	360.00	PERIOD	ALL	8760
5209.44824	-29544.23050	0.00419	400.00	PERIOD	ALL	8760
6945.93115	-39392.30860	0.00297	400.00	PERIOD	ALL	8760
8682.41504	-49240.38670	0.00231	400.00	PERIOD	ALL	8760
0.00002	-100.00000	0.00087	207.30	PERIOD	ALL	8760
0.00003	-200.00000	0.00104	202.70	PERIOD	ALL	8760
0.00005	-300.00000	0.00198	202.70	PERIOD	ALL	8760
0.00006	-400.00000	0.00281	202.70	PERIOD	ALL	8760
0.00008	-500.00000	0.01558	219.50	PERIOD	ALL	8760
0.00009	-600.00000	0.17205	274.30	PERIOD	ALL	8760
0.00011	-700.00000	0.18625	280.40	PERIOD	ALL	8760
0.00012	-800.00000	0.11796	274.30	PERIOD	ALL	8760
0.00014	-900.00000	0.04582	243.80	PERIOD	ALL	8760
0.00015	-1000.00000	0.18976	298.70	PERIOD	ALL	8760
0.00019	-1250.00000	0.17140	304.80	PERIOD	ALL	8760
0.00023	-1500.00000	0.13440	304.80	PERIOD	ALL	8760
0.00026	-1750.00000	0.11465	304.80	PERIOD	ALL	8760
0.00030	-2000.00000	0.07858	292.60	PERIOD	ALL	8760
0.00034	-2250.00000	0.07567	298.70	PERIOD	ALL	8760
0.00038	-2500.00000	0.09419	365.80	PERIOD	ALL	8760
0.00045	-3000.00000	0.07330	406.30	PERIOD	ALL	8760
0.00060	-4000.00000	0.05339	402.30	PERIOD	ALL	8760
0.00075	-5000.00000	0.04182	396.20	PERIOD	ALL	8760
0.00113	-7500.00000	0.02512	390.10	PERIOD	ALL	8760
0.00151	-10000.00000	0.01794	396.20	PERIOD	ALL	8760
0.00226	-15000.00000	0.01092	380.00	PERIOD	ALL	8760
0.00302	-20000.00000	0.00809	360.00	PERIOD	ALL	8760
0.00453	-30000.00000	0.00457	380.00	PERIOD	ALL	8760
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-104.18893	-590.88470	0.02774	225.60	PERIOD	ALL	8760
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-347.29648	-1969.61548	0.09338	280.40	PERIOD	ALL	8760
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-434.12054	-2462.01929	0.11750	353.60	PERIOD	ALL	8760
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-1736.48218	-9848.07715	0.01987	392.00	PERIOD	ALL	8760
-2604.72314	-14772.11520	0.01281	360.00	PERIOD	ALL	8760
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-17320.50980	-9999.99805	0.01346	380.00	PERIOD	ALL	8760

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-25980.76370	-14999.99710	0.00825	380.00	PERIOD	ALL	8760
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-4924.03809	868.24072	0.03879	378.00	PERIOD	ALL	8760
-7386.05762	1302.36133	0.02591	384.00	PERIOD	ALL	8760
-9848.07715	1736.48157	0.01857	389.20	PERIOD	ALL	8760
-14772.11520	2604.72241	0.01065	400.00	PERIOD	ALL	8760
-19696.15430	3472.96289	0.00728	420.00	PERIOD	ALL	8760
-29544.23050	5209.44482	0.00488	380.00	PERIOD	ALL	8760
-39392.30860	6945.92578	0.00357	380.00	PERIOD	ALL	8760
-49240.38670	8682.40820	0.00259	400.00	PERIOD	ALL	8760
-93.96926	34.20201	0.00707	213.40	PERIOD	ALL	8760
-187.93851	68.40401	0.00379	213.40	PERIOD	ALL	8760
-281.90778	102.60603	0.00220	213.40	PERIOD	ALL	8760
-375.87701	136.80803	0.00243	219.50	PERIOD	ALL	8760
-469.84631	171.01004	0.00335	225.60	PERIOD	ALL	8760
-563.81561	205.21204	0.00319	225.60	PERIOD	ALL	8760
-657.78491	239.41405	0.01324	243.80	PERIOD	ALL	8760
-751.75409	273.61609	0.04530	274.30	PERIOD	ALL	8760
-845.72339	307.81808	0.06577	286.50	PERIOD	ALL	8760
-939.69263	342.02008	0.08734	298.70	PERIOD	ALL	8760
-1174.61584	427.52512	0.10862	317.00	PERIOD	ALL	8760
-1409.53894	513.03021	0.06421	298.70	PERIOD	ALL	8760
-1644.46216	598.53522	0.05717	298.70	PERIOD	ALL	8760
-1879.38525	684.04016	0.08890	359.70	PERIOD	ALL	8760
-2114.30835	769.54517	0.08513	384.00	PERIOD	ALL	8760
-2349.23145	855.05017	0.07500	378.00	PERIOD	ALL	8760
-2819.07788	1026.06030	0.06389	378.00	PERIOD	ALL	8760
-3758.77051	1368.08020	0.04667	378.00	PERIOD	ALL	8760
-4698.46338	1710.10034	0.03903	378.00	PERIOD	ALL	8760

-7047.69482	2565.15063	0.02651	371.90	PERIOD	ALL	8760
-9396.92676	3420.20093	0.01750	424.90	PERIOD	ALL	8760
-14095.38960	5130.30078	0.01054	420.00	PERIOD	ALL	8760
-18793.85550	6840.40186	0.00866	360.00	PERIOD	ALL	8760
-28190.77930	10260.60250	0.00468	400.00	PERIOD	ALL	8760
-37587.70700	13680.80370	0.00366	380.00	PERIOD	ALL	8760
-46984.63670	17101.00390	0.00261	400.00	PERIOD	ALL	8760
-86.60255	49.99999	0.00909	213.40	PERIOD	ALL	8760
-173.20509	99.99998	0.00298	213.40	PERIOD	ALL	8760
-259.80765	149.99997	0.00224	219.50	PERIOD	ALL	8760
-346.41019	199.99997	0.00289	231.60	PERIOD	ALL	8760
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-519.61530	299.99991	0.00363	231.60	PERIOD	ALL	8760
-606.21783	349.99991	0.02855	268.20	PERIOD	ALL	8760
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-1299.03833	749.99988	0.12045	323.10	PERIOD	ALL	8760
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-306.41782	257.11499	0.00281	231.60	PERIOD	ALL	8760
-383.02228	321.39374	0.00154	225.60	PERIOD	ALL	8760
-459.62671	385.67255	0.00297	231.60	PERIOD	ALL	8760
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-612.83563	514.22998	0.14881	304.80	PERIOD	ALL	8760
-689.44006	578.50873	0.17976	316.40	PERIOD	ALL	8760
-766.04449	642.78760	0.16868	317.00	PERIOD	ALL	8760
-957.55566	803.48444	0.10859	304.80	PERIOD	ALL	8760
-1149.06689	964.18121	0.15540	341.40	PERIOD	ALL	8760
-1340.57788	1124.87830	0.14294	353.60	PERIOD	ALL	8760
-1532.08899	1285.57507	0.12338	365.80	PERIOD	ALL	8760
-1723.60022	1446.27173	0.11137	371.90	PERIOD	ALL	8760
-1915.11121	1606.96887	0.09725	378.00	PERIOD	ALL	8760
-2298.13354	1928.36255	0.07671	384.00	PERIOD	ALL	8760
-3064.17822	2571.15015	0.05916	359.70	PERIOD	ALL	8760
-3830.22241	3213.93750	0.04344	384.00	PERIOD	ALL	8760
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-257.11511	306.41772	0.00172	231.60	PERIOD	ALL	8760

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-642.78772	766.04431	0.14121	310.90	PERIOD	ALL	8760
-803.48474	957.55542	0.13229	317.00	PERIOD	ALL	8760
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-1124.87854	1340.57751	0.11287	353.60	PERIOD	ALL	8760
-1285.57532	1532.08862	0.10092	353.60	PERIOD	ALL	8760
-1446.27222	1723.59973	0.08770	359.70	PERIOD	ALL	8760
-1606.96936	1915.11084	0.07507	365.80	PERIOD	ALL	8760
-1928.36328	2298.13306	0.06108	384.00	PERIOD	ALL	8760
-2571.15088	3064.17749	0.04295	384.00	PERIOD	ALL	8760
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-12855.75490	15320.88670	0.00540	400.00	PERIOD	ALL	8760
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-25711.50980	30641.77340	0.00273	360.00	PERIOD	ALL	8760
-32139.38670	38302.21880	0.00214	360.00	PERIOD	ALL	8760
-50.00002	86.60253	0.01205	213.40	PERIOD	ALL	8760
-100.00003	173.20506	0.00821	225.60	PERIOD	ALL	8760
-150.00005	259.80756	0.00338	231.60	PERIOD	ALL	8760
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-300.00009	519.61517	0.00928	243.80	PERIOD	ALL	8760
-350.00012	606.21771	0.01154	249.90	PERIOD	ALL	8760
-400.00012	692.82025	0.00983	243.80	PERIOD	ALL	8760
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-750.00024	1299.03784	0.08146	329.20	PERIOD	ALL	8760
-875.00031	1515.54431	0.07954	347.50	PERIOD	ALL	8760
-1000.00037	1732.05066	0.06947	353.60	PERIOD	ALL	8760
-1125.00037	1948.55701	0.05363	353.60	PERIOD	ALL	8760
-1250.00049	2165.06323	0.04944	384.00	PERIOD	ALL	8760
-1500.00049	2598.07593	0.04007	384.00	PERIOD	ALL	8760
-2000.00073	3464.10132	0.02813	384.00	PERIOD	ALL	8760
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-20000.00780	34641.01170	0.00160	380.00	PERIOD	ALL	8760
-25000.00780	43301.26170	0.00142	350.00	PERIOD	ALL	8760
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-239.41423	657.78479	0.01477	262.10	PERIOD	ALL	8760
-273.61633	751.75403	0.03610	286.50	PERIOD	ALL	8760
-307.81833	845.72327	0.02741	280.40	PERIOD	ALL	8760
-342.02036	939.69257	0.03747	292.60	PERIOD	ALL	8760
-427.52545	1174.61572	0.05964	323.10	PERIOD	ALL	8760
-513.03052	1409.53894	0.07052	353.60	PERIOD	ALL	8760
-598.53571	1644.46191	0.05843	359.70	PERIOD	ALL	8760
-684.04065	1879.38513	0.04815	359.70	PERIOD	ALL	8760
-769.54584	2114.30811	0.03696	329.20	PERIOD	ALL	8760

External Review Draft
Do Not Cite or Quote

-855.05090	2349.23145	0.03845	347.50	PERIOD	ALL	8760
-1026.06104	2819.07764	0.03339	378.00	PERIOD	ALL	8760
-1368.08130	3758.77026	0.02373	385.00	PERIOD	ALL	8760
-1710.10181	4698.46289	0.01773	371.90	PERIOD	ALL	8760
-2565.15283	7047.69385	0.01035	329.20	PERIOD	ALL	8760
-3420.20337	9396.92578	0.00815	349.00	PERIOD	ALL	8760
-5130.30518	14095.38770	0.00503	360.00	PERIOD	ALL	8760
-6840.40674	18793.85350	0.00356	360.00	PERIOD	ALL	8760
-10260.61040	28190.77540	0.00230	340.00	PERIOD	ALL	8760
-13680.81450	37587.70310	0.00154	370.00	PERIOD	ALL	8760
-17101.01760	46984.62890	0.00129	350.00	PERIOD	ALL	8760
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-86.82422	492.40381	0.00094	225.60	PERIOD	ALL	8760
-104.18906	590.88470	0.00594	243.80	PERIOD	ALL	8760
-121.55391	689.36542	0.01178	262.10	PERIOD	ALL	8760
-138.91873	787.84613	0.03511	292.60	PERIOD	ALL	8760
-156.28360	886.32697	0.04108	298.70	PERIOD	ALL	8760
-173.64844	984.80768	0.03979	298.70	PERIOD	ALL	8760
-217.06055	1231.00964	0.07424	335.30	PERIOD	ALL	8760
-260.47269	1477.21143	0.08236	365.80	PERIOD	ALL	8760
-303.88474	1723.41345	0.06907	359.70	PERIOD	ALL	8760
-347.29691	1969.61523	0.06204	359.70	PERIOD	ALL	8760
-390.70898	2215.81738	0.05155	341.40	PERIOD	ALL	8760
-434.12109	2462.01929	0.04931	378.00	PERIOD	ALL	8760
-520.94531	2954.42285	0.04094	384.00	PERIOD	ALL	8760
-694.59375	3939.23071	0.03026	378.00	PERIOD	ALL	8760
-868.24219	4924.03809	0.02326	365.80	PERIOD	ALL	8760
-1302.36353	7386.05713	0.01429	341.40	PERIOD	ALL	8760
-1736.48438	9848.07715	0.01032	339.90	PERIOD	ALL	8760
-2604.72656	14772.11430	0.00644	340.00	PERIOD	ALL	8760
-3472.96875	19696.15430	0.00421	360.00	PERIOD	ALL	8760
-5209.45264	29544.22850	0.00284	340.00	PERIOD	ALL	8760
-6945.93701	39392.30860	0.00202	330.00	PERIOD	ALL	8760
-8682.42188	49240.38670	0.00162	320.00	PERIOD	ALL	8760
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-0.00021	700.00000	0.01115	256.00	PERIOD	ALL	8760
-0.00024	800.00000	0.03124	280.40	PERIOD	ALL	8760
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-0.00045	1500.00000	0.07946	323.10	PERIOD	ALL	8760
-0.00053	1750.00000	0.08049	341.40	PERIOD	ALL	8760
-0.00060	2000.00000	0.05599	317.00	PERIOD	ALL	8760
-0.00068	2250.00000	0.06285	359.70	PERIOD	ALL	8760
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-0.00091	3000.00000	0.04487	378.00	PERIOD	ALL	8760
-0.00121	4000.00000	0.03086	383.40	PERIOD	ALL	8760
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-0.00226	7500.00000	0.01426	371.90	PERIOD	ALL	8760
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-0.00453	15000.00000	0.00619	360.00	PERIOD	ALL	8760
-0.00604	20000.00000	0.00480	340.00	PERIOD	ALL	8760
-0.00906	30000.00000	0.00235	380.00	PERIOD	ALL	8760
-0.01208	40000.00000	0.00196	350.00	PERIOD	ALL	8760
-0.01510	50000.00000	0.00153	350.00	PERIOD	ALL	8760

B. Off-Site Fire Scenario

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CO STARTING
   TITLEONE  WTI Truck Accident Off-Site, ISCOMDEP -- OFFSITE
   TITLETWO  1 Point source; 26 receptors up to 50KM away; Vapor.
   MODELOPT  GRDRIS NOSTD  RURAL  CONC
   AVERTIME  1 3 24 PERIOD
   POLLUTID  Chemical
   TERRHGTS  ELEV
   ELEVUNIT  METERS
   RUNORNOT  RUN
   ERRORFIL  OFFSITE.ERR
CO FINISHED

SO STARTING
   LOCATION  OFFSITE POINT    -908.  79.  212.1
** Point Source          QS    HS    TS    VS     DS
** Parameters:         ----  ----  ----  ----   ---
SO SRCPARAM  OFFSITE   1.0   38.0  997.  0.225  30.59
**SO SRCPARAM  OFFSITE   1.0   38.0  997.  0.075  52.98

SO SRCGROUP ALL
SO FINISHED

RE STARTING
RE DISCCART      17.36482     98.48077   213.4
RE DISCCART      34.72963    196.96155   225.6
RE DISCCART      52.09445    295.44232   225.6
RE DISCCART      69.45927    393.92310   225.6
RE DISCCART      86.82409    492.40387   225.6
RE DISCCART     104.18890    590.88464   225.6
RE DISCCART     121.55372    689.36542   243.8
RE DISCCART     138.91853    787.84619   256.0
RE DISCCART     156.28336    886.32697   280.4
RE DISCCART     173.64818    984.80774   286.5
RE DISCCART     217.06021   1231.00964   353.6
RE DISCCART     260.47226   1477.21167   353.6
RE DISCCART     303.88431   1723.41357   310.9
RE DISCCART     347.29636   1969.61548   347.5
RE DISCCART     390.70837   2215.81738   353.6
RE DISCCART     434.12042   2462.01929   359.7
RE DISCCART     520.94452   2954.42334   347.5
RE DISCCART     694.59271   3939.23096   341.4
RE DISCCART     868.24084   4924.03857   341.4
RE DISCCART    1302.36133   7386.05811   365.8
RE DISCCART    1736.48169   9848.07715   360.0
RE DISCCART    2604.72266  14772.11620   340.0
RE DISCCART    3472.96338  19696.15430   340.0
RE DISCCART    5209.44531  29544.23240   360.0
RE DISCCART    6945.92676  39392.30860   350.0
RE DISCCART    8682.40820  49240.38670   360.0
RE DISCCART      34.20201     93.96926   213.4
RE DISCCART      68.40403    187.93852   225.6
RE DISCCART     102.60604    281.90778   225.6
RE DISCCART     136.80806    375.87704   225.6
RE DISCCART     171.01007    469.84631   225.6
RE DISCCART     205.21208    563.81555   225.6
RE DISCCART     239.41409    657.78485   237.7
RE DISCCART     273.61612    751.75409   243.8
RE DISCCART     307.81812    845.72339   256.0
RE DISCCART     342.02014    939.69263   286.5
RE DISCCART     427.52518   1174.61572   329.2
RE DISCCART     513.03021   1409.53894   347.5
RE DISCCART     598.53522   1644.46204   335.3
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RE DISCCART	684.04028	1879.38525	347.5
RE DISCCART	769.54529	2114.30835	353.6
RE DISCCART	855.05035	2349.23145	359.7
RE DISCCART	1026.06042	2819.07788	362.4
RE DISCCART	1368.08057	3758.77051	329.2
RE DISCCART	1710.10071	4698.46289	359.7
RE DISCCART	2565.15112	7047.69482	369.7
RE DISCCART	3420.20142	9396.92578	385.9
RE DISCCART	5130.30225	14095.38960	340.0
RE DISCCART	6840.40283	18793.85160	340.0
RE DISCCART	10260.60450	28190.77930	360.0
RE DISCCART	13680.80570	37587.70310	380.0
RE DISCCART	17101.00590	46984.63280	390.0
RE DISCCART	50.00000	86.60254	213.4
RE DISCCART	100.00000	173.20508	219.5
RE DISCCART	150.00000	259.80762	225.6
RE DISCCART	200.00000	346.41016	225.6
RE DISCCART	250.00000	433.01270	225.6
RE DISCCART	300.00000	519.61523	225.6
RE DISCCART	350.00000	606.21777	225.6
RE DISCCART	400.00000	692.82031	231.6
RE DISCCART	450.00000	779.42285	243.8
RE DISCCART	500.00000	866.02539	262.1
RE DISCCART	625.00000	1082.53174	225.6
RE DISCCART	750.00000	1299.03809	347.5
RE DISCCART	875.00000	1515.54443	359.7
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RE DISCCART	1250.00000	2165.06348	329.2
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RE DISCCART	128.55753	153.20889	213.4
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RE DISCCART	257.11505	306.41779	225.6
RE DISCCART	321.39380	383.02222	225.6
RE DISCCART	385.67255	459.62668	225.6
RE DISCCART	449.95132	536.23114	225.6
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RE DISCCART	578.50885	689.44000	225.6
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RE DISCCART	1606.96899	1915.11108	353.6
RE DISCCART	1928.36279	2298.13330	335.3
RE DISCCART	2571.15039	3064.17773	353.9
RE DISCCART	3213.93799	3830.22217	353.0
RE DISCCART	4820.90674	5745.33350	378.0
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RE DISCCART	12855.75200	15320.88870	380.0
RE DISCCART	19283.62700	22981.33400	360.0

External Review Draft
Do Not Cite or Quote

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RE DISCCART	32139.37890	38302.22270	420.0
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External Review Draft
Do Not Cite or Quote

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RE DISCCART   -5745.33398   4820.90625   378.0
RE DISCCART   -7660.44531   6427.87500   379.2
RE DISCCART  -11490.66800   9641.81250   360.0
RE DISCCART  -15320.89060  12855.75000   400.0
RE DISCCART  -22981.33590  19283.62500   400.0
RE DISCCART  -30641.78130  25711.50000   400.0
RE DISCCART  -38302.22660  32139.37500   370.0
RE DISCCART     -64.27877     76.60443   213.4
RE DISCCART    -128.55754    153.20886   225.6
RE DISCCART    -192.83632    229.81331   231.6
RE DISCCART    -257.11508    306.41772   231.6
RE DISCCART    -321.39386    383.02216   225.6
RE DISCCART    -385.67264    459.62662   231.6
RE DISCCART    -449.95142    536.23102   274.3
RE DISCCART    -514.23016    612.83545   304.8
RE DISCCART    -578.50897    689.43988   310.9
RE DISCCART    -642.78772    766.04431   310.9
RE DISCCART    -803.48468    957.55542   317.0
RE DISCCART    -964.18158   1149.06653   347.5
RE DISCCART   -1124.87854   1340.57764   353.6
RE DISCCART   -1285.57544   1532.08862   353.6
RE DISCCART   -1446.27246   1723.59973   359.7
RE DISCCART   -1606.96936   1915.11084   365.8
RE DISCCART   -1928.36316   2298.13306   384.0
RE DISCCART   -2571.15088   3064.17725   384.0
RE DISCCART   -3213.93872   3830.22168   378.0
RE DISCCART   -4820.90820   5745.33252   378.0
RE DISCCART   -6427.87744   7660.44336   378.0
RE DISCCART   -9641.81641  11490.66500   380.0
RE DISCCART  -12855.75490  15320.88670   400.0
RE DISCCART  -19283.63280  22981.33010   400.0
RE DISCCART  -25711.50980  30641.77340   360.0
RE DISCCART  -32139.38670  38302.21880   360.0
RE DISCCART     -50.00002     86.60253   213.4
RE DISCCART    -100.00003    173.20506   225.6
RE DISCCART    -150.00005    259.80759   231.6
RE DISCCART    -200.00006    346.41013   231.6
RE DISCCART    -250.00009    433.01266   225.6
RE DISCCART    -300.00009    519.61517   243.8
RE DISCCART    -350.00012    606.21771   249.9
RE DISCCART    -400.00012    692.82025   243.8
RE DISCCART    -450.00015    779.42279   304.8
RE DISCCART    -500.00018    866.02533   304.8
RE DISCCART    -625.00024   1082.53162   286.5
RE DISCCART    -750.00024   1299.03796   329.2
RE DISCCART    -875.00031   1515.54431   347.5
RE DISCCART   -1000.00037   1732.05066   353.6
RE DISCCART   -1125.00037   1948.55688   353.6
RE DISCCART   -1250.00049   2165.06323   384.0
RE DISCCART   -1500.00049   2598.07593   384.0
RE DISCCART   -2000.00073   3464.10132   384.0
RE DISCCART   -2500.00098   4330.12646   378.0
RE DISCCART   -3750.00122   6495.18994   365.8
RE DISCCART   -5000.00195   8660.25293   371.9
RE DISCCART   -7500.00244  12990.37990   360.0
RE DISCCART  -10000.00390  17320.50590   360.0
RE DISCCART  -15000.00490  25980.75980   340.0
RE DISCCART  -20000.00780  34641.01170   380.0
RE DISCCART  -25000.00780  43301.26560   350.0
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RE DISCCART      -34.20204      93.96925   213.4
RE DISCCART      -68.40408     187.93851   225.6
RE DISCCART     -102.60611     281.90778   225.6
RE DISCCART     -136.80815     375.87701   225.6
RE DISCCART     -171.01018     469.84628   225.6
RE DISCCART     -205.21222     563.81555   243.8
RE DISCCART     -239.41425     657.78479   262.1
RE DISCCART     -273.61630     751.75403   286.5
RE DISCCART     -307.81833     845.72327   280.4
RE DISCCART     -342.02036     939.69257   292.6
RE DISCCART     -427.52545    1174.61572   323.1
RE DISCCART     -513.03052    1409.53882   353.6
RE DISCCART     -598.53564    1644.46191   359.7
RE DISCCART     -684.04071    1879.38513   359.7
RE DISCCART     -769.54584    2114.30811   329.2
RE DISCCART     -855.05090    2349.23145   347.5
RE DISCCART    -1026.06104    2819.07764   378.0
RE DISCCART    -1368.08142    3758.77026   385.0
RE DISCCART    -1710.10181    4698.46289   371.9
RE DISCCART    -2565.15283    7047.69385   329.2
RE DISCCART    -3420.20361    9396.92578   349.0
RE DISCCART    -5130.30566   14095.38770   360.0
RE DISCCART    -6840.40723   18793.85160   360.0
RE DISCCART   -10260.61130   28190.77540   340.0
RE DISCCART   -13680.81450   37587.70310   370.0
RE DISCCART   -17101.01760   46984.62890   350.0
RE DISCCART      -17.36484      98.48077   213.4
RE DISCCART      -34.72969     196.96155   225.6
RE DISCCART      -52.09453     295.44232   225.6
RE DISCCART      -69.45937     393.92310   225.6
RE DISCCART      -86.82422     492.40384   225.6
RE DISCCART     -104.18906     590.88464   243.8
RE DISCCART     -121.55391     689.36542   262.1
RE DISCCART     -138.91875     787.84619   292.6
RE DISCCART     -156.28360     886.32697   298.7
RE DISCCART     -173.64844     984.80768   298.7
RE DISCCART     -217.06055    1231.00964   335.3
RE DISCCART     -260.47266    1477.21155   365.8
RE DISCCART     -303.88477    1723.41345   359.7
RE DISCCART     -347.29688    1969.61536   359.7
RE DISCCART     -390.70898    2215.81738   341.4
RE DISCCART     -434.12109    2462.01929   378.0
RE DISCCART     -520.94531    2954.42310   384.0
RE DISCCART     -694.59375    3939.23071   378.0
RE DISCCART     -868.24219    4924.03857   365.8
RE DISCCART    -1302.36328    7386.05762   341.4
RE DISCCART    -1736.48438    9848.07715   339.9
RE DISCCART    -2604.72656   14772.11520   340.0
RE DISCCART    -3472.96875   19696.15430   360.0
RE DISCCART    -5209.45313   29544.23050   340.0
RE DISCCART    -6945.93750   39392.30860   330.0
RE DISCCART    -8682.42188   49240.38670   320.0
RE DISCCART       -0.00003     100.00000   213.4
RE DISCCART       -0.00006     200.00000   225.6
RE DISCCART       -0.00009     300.00000   225.6
RE DISCCART       -0.00012     400.00000   225.6
RE DISCCART       -0.00015     500.00000   225.6
RE DISCCART       -0.00018     600.00000   237.7
RE DISCCART       -0.00021     700.00000   256.0
RE DISCCART       -0.00024     800.00000   280.4
RE DISCCART       -0.00027     900.00000   298.7
RE DISCCART       -0.00030    1000.00000   292.6
RE DISCCART       -0.00038    1250.00000   353.6
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RE DISCCART      -0.00045   1500.00000   323.1
RE DISCCART      -0.00053   1750.00000   341.4
RE DISCCART      -0.00060   2000.00000   317.0
RE DISCCART      -0.00068   2250.00000   359.7
RE DISCCART      -0.00075   2500.00000   359.7
RE DISCCART      -0.00091   3000.00000   378.0
RE DISCCART      -0.00121   4000.00000   383.4
RE DISCCART      -0.00151   5000.00000   359.7
RE DISCCART      -0.00226   7500.00000   371.9
RE DISCCART      -0.00302  10000.00000   380.1
RE DISCCART      -0.00453  15000.00000   360.0
RE DISCCART      -0.00604  20000.00000   340.0
RE DISCCART      -0.00906  30000.00000   380.0
RE DISCCART      -0.01208  40000.00000   350.0
RE DISCCART      -0.01510  50000.00000   350.0
RE FINISHED

ME STARTING
ME INPUTFIL  DEPBIN.met
ME ANEMHGHT  30.0 METERS
ME SURFDATA  94823  1993
ME UAIRDATA  94823  1993
ME PROFFILE TEMPS ISC_TEMP.STK
ME PROFFILE WINDS ISC_WIND.STK
** DAYRANGE  1/3
ME FINISHED

TG STARTING
   INPUTFIL  wti100k.out
   LOCATION  538.4 4497.8 km
TG FINISHED

OU STARTING
   RECTABLE  ALLAVE  FIRST-SECOND
**   DAYTABLE ALLAVE
   MAXTABLE  ALLAVE  50
**   MAXIFILE   3  ALL  30.0   MAXIALL.FIL   25
**   MAXIFILE  24  ALL  10.0   MAXIALL.FIL   25
**   POSTFILE  1  ALL  INDIV POST2C.BIN    20
**   POSTFILE  PERIOD ALL PLOT PSTAALL.FIL  21
** Note that the following two input cards generate PLOTFILEs with the file
** unit dynamically allocated by the ISCST2 program.  When porting the model
** to another computer system, the user may need to specify the file units
** as is done on the previous four input cards.
**   PLOTFILE   3  ALL  2ND    PLT03ALL.FIL
**   PLOTFILE  24  ALL  2ND    PLT24ALL.FIL
**OU PLOTFILE 1 ALL FIRST OFFSITE.PL1
OU PLOTFILE 1 ALL FIRST OFFSITE.1
OU PLOTFILE 3 ALL FIRST OFFSITE.3
OU PLOTFILE 24 ALL FIRST OFFSITE.24
OU PLOTFILE PERIOD ALL OFFSITE.ANN
OU FINISHED


 *** Message Summary For ISC2 Model Setup ***

 --------- Summary of Total Messages --------

A Total of           0 Fatal Error Message(s)
A Total of           1 Warning Message(s)
A Total of           0 Informational Message(s)
```

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******** FATAL ERROR MESSAGES ********
           ***  NONE  ***


********    WARNING MESSAGES    ********
SO W320   17 PPARM : Source Parameter May Be Out-of-Range for Parameter      DS

************************************
*** SETUP Finishes Successfully ***
************************************
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* ISCST2 (94227):  WTI Truck Accident Off-Site, ISCOMDEP -- OFFSITE
* MODELING OPTIONS USED:
*  CONC   RURAL  ELEV                  GRDRIS NOSTD

*         PLOT FILE OF  HIGH 1ST  HIGH  1-HR VALUES FOR SOURCE GROUP: ALL
*         FOR A TOTAL OF   936 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4)
*        X            Y           CONC       ZELEV     AVE     GRP       HIVAL
*
```

X	Y	CONC	ZELEV	AVE	GRP	HIVAL
17.36482	98.48077	0.26880	213.40	1-HR	ALL	1ST
34.72963	196.96155	0.33598	225.60	1-HR	ALL	1ST
52.09445	295.44235	0.36408	225.60	1-HR	ALL	1ST
69.45927	393.92307	0.33730	225.60	1-HR	ALL	1ST
86.82409	492.40384	0.34637	225.60	1-HR	ALL	1ST
104.18890	590.88470	0.34860	225.60	1-HR	ALL	1ST
121.55373	689.36542	0.57377	243.80	1-HR	ALL	1ST
138.91852	787.84613	0.74484	256.00	1-HR	ALL	1ST
156.28337	886.32697	1.46575	280.40	1-HR	ALL	1ST
173.64818	984.80774	2.05302	286.50	1-HR	ALL	1ST
217.06021	1231.00964	12.61975	353.60	1-HR	ALL	1ST
260.47229	1477.21167	10.95565	353.60	1-HR	ALL	1ST
303.88428	1723.41370	3.79691	310.90	1-HR	ALL	1ST
347.29639	1969.61548	8.00698	347.50	1-HR	ALL	1ST
390.70837	2215.81738	7.59468	353.60	1-HR	ALL	1ST
434.12042	2462.01929	4.95435	359.70	1-HR	ALL	1ST
520.94452	2954.42310	4.70006	347.50	1-HR	ALL	1ST
694.59271	3939.23096	3.21313	341.40	1-HR	ALL	1ST
868.24084	4924.03809	2.67063	341.40	1-HR	ALL	1ST
1302.36133	7386.05762	2.82567	365.80	1-HR	ALL	1ST
1736.48169	9848.07715	1.94967	360.00	1-HR	ALL	1ST
2604.72241	14772.11520	0.98299	340.00	1-HR	ALL	1ST
3472.96313	19696.15430	0.74547	340.00	1-HR	ALL	1ST
5209.44531	29544.23050	0.60941	360.00	1-HR	ALL	1ST
6945.92627	39392.30860	0.40966	350.00	1-HR	ALL	1ST
8682.40820	49240.38670	0.34829	360.00	1-HR	ALL	1ST
34.20201	93.96926	0.26873	213.40	1-HR	ALL	1ST
68.40403	187.93851	0.33691	225.60	1-HR	ALL	1ST
102.60603	281.90778	0.37006	225.60	1-HR	ALL	1ST
136.80806	375.87701	0.28694	225.60	1-HR	ALL	1ST
171.01007	469.84631	0.28421	225.60	1-HR	ALL	1ST
205.21207	563.81555	0.36934	225.60	1-HR	ALL	1ST
239.41408	657.78491	0.51489	237.70	1-HR	ALL	1ST
273.61615	751.75409	0.57323	243.80	1-HR	ALL	1ST
307.81812	845.72339	0.72210	256.00	1-HR	ALL	1ST
342.02011	939.69263	1.96807	286.50	1-HR	ALL	1ST
427.52518	1174.61572	7.70763	329.20	1-HR	ALL	1ST
513.03021	1409.53894	9.52555	347.50	1-HR	ALL	1ST
598.53522	1644.46204	6.95155	335.30	1-HR	ALL	1ST
684.04022	1879.38525	7.50002	347.50	1-HR	ALL	1ST
769.54523	2114.30835	7.13345	353.60	1-HR	ALL	1ST
855.05035	2349.23145	6.57642	359.70	1-HR	ALL	1ST
1026.06042	2819.07788	5.47722	362.40	1-HR	ALL	1ST
1368.08057	3758.77051	2.96731	329.20	1-HR	ALL	1ST
1710.10071	4698.46289	2.47798	359.70	1-HR	ALL	1ST
2565.15112	7047.69482	2.91211	369.70	1-HR	ALL	1ST
3420.20142	9396.92578	2.52572	385.90	1-HR	ALL	1ST
5130.30176	14095.38960	0.97345	340.00	1-HR	ALL	1ST
6840.40283	18793.85350	0.76762	340.00	1-HR	ALL	1ST
10260.60450	28190.77930	0.60601	360.00	1-HR	ALL	1ST
13680.80570	37587.70310	0.50508	380.00	1-HR	ALL	1ST
17101.00590	46984.63670	0.40785	390.00	1-HR	ALL	1ST
50.00000	86.60254	0.28014	213.40	1-HR	ALL	1ST
100.00000	173.20508	0.28716	219.50	1-HR	ALL	1ST

External Review Draft
Do Not Cite or Quote

150.00000	259.80762	0.35662	225.60	1-HR	ALL	1ST
200.00000	346.41016	0.32557	225.60	1-HR	ALL	1ST
250.00000	433.01273	0.29595	225.60	1-HR	ALL	1ST
300.00000	519.61517	0.29250	225.60	1-HR	ALL	1ST
350.00000	606.21777	0.40863	225.60	1-HR	ALL	1ST
400.00000	692.82031	0.52095	231.60	1-HR	ALL	1ST
450.00000	779.42291	0.61621	243.80	1-HR	ALL	1ST
500.00000	866.02539	0.69656	262.10	1-HR	ALL	1ST
625.00000	1082.53174	0.52869	225.60	1-HR	ALL	1ST
750.00000	1299.03821	7.05143	347.50	1-HR	ALL	1ST
875.00000	1515.54443	8.60613	359.70	1-HR	ALL	1ST
1000.00000	1732.05090	7.51029	353.60	1-HR	ALL	1ST
1125.00000	1948.55713	6.75558	353.60	1-HR	ALL	1ST
1250.00000	2165.06348	4.36960	329.20	1-HR	ALL	1ST
1500.00000	2598.07617	3.28977	323.10	1-HR	ALL	1ST
2000.00000	3464.10156	3.88733	361.20	1-HR	ALL	1ST
2500.00000	4330.12695	3.04323	366.70	1-HR	ALL	1ST
3750.00000	6495.19043	2.02383	378.00	1-HR	ALL	1ST
5000.00000	8660.25391	1.50030	396.20	1-HR	ALL	1ST
7500.00000	12990.38090	0.63818	320.00	1-HR	ALL	1ST
10000.00000	17320.50780	0.57857	360.00	1-HR	ALL	1ST
15000.00000	25980.76170	0.39186	380.00	1-HR	ALL	1ST
20000.00000	34641.01560	0.26915	370.00	1-HR	ALL	1ST
25000.00000	43301.26560	0.22724	400.00	1-HR	ALL	1ST
64.27876	76.60445	0.29348	213.40	1-HR	ALL	1ST
128.55754	153.20888	0.25689	213.40	1-HR	ALL	1ST
192.83627	229.81335	0.31493	225.60	1-HR	ALL	1ST
257.11508	306.41779	0.34678	225.60	1-HR	ALL	1ST
321.39377	383.02225	0.31477	225.60	1-HR	ALL	1ST
385.67258	459.62671	0.29315	225.60	1-HR	ALL	1ST
449.95132	536.23120	0.34602	225.60	1-HR	ALL	1ST
514.23016	612.83557	0.36397	225.60	1-HR	ALL	1ST
578.50885	689.44000	0.45102	225.60	1-HR	ALL	1ST
642.78766	766.04443	0.66126	243.80	1-HR	ALL	1ST
803.48456	957.55554	1.25427	280.40	1-HR	ALL	1ST
964.18140	1149.06665	8.61035	353.60	1-HR	ALL	1ST
1124.87830	1340.57764	8.66311	361.50	1-HR	ALL	1ST
1285.57520	1532.08899	6.78554	353.60	1-HR	ALL	1ST
1446.27197	1723.59998	6.10540	353.60	1-HR	ALL	1ST
1606.96912	1915.11108	4.98055	353.60	1-HR	ALL	1ST
1928.36292	2298.13330	4.01522	335.30	1-HR	ALL	1ST
2571.15039	3064.17798	3.70575	353.90	1-HR	ALL	1ST
3213.93799	3830.22192	2.90410	353.00	1-HR	ALL	1ST
4820.90625	5745.33301	1.98154	378.00	1-HR	ALL	1ST
6427.87549	7660.44434	1.47763	398.40	1-HR	ALL	1ST
9641.81250	11490.66600	0.85381	376.00	1-HR	ALL	1ST
12855.75200	15320.88870	0.62720	380.00	1-HR	ALL	1ST
19283.62700	22981.33400	0.69921	360.00	1-HR	ALL	1ST
25711.50390	30641.77730	0.32790	420.00	1-HR	ALL	1ST
32139.37890	38302.22270	0.25307	420.00	1-HR	ALL	1ST
76.60445	64.27876	0.30847	213.40	1-HR	ALL	1ST
153.20888	128.55754	0.22848	207.30	1-HR	ALL	1ST
229.81335	192.83629	0.24067	213.40	1-HR	ALL	1ST
306.41779	257.11508	0.30236	219.50	1-HR	ALL	1ST
383.02225	321.39377	0.34634	219.50	1-HR	ALL	1ST
459.62671	385.67261	0.34414	219.50	1-HR	ALL	1ST
536.23120	449.95132	0.32472	219.50	1-HR	ALL	1ST
612.83557	514.23016	0.28523	219.50	1-HR	ALL	1ST
689.44000	578.50885	0.43696	225.60	1-HR	ALL	1ST
766.04443	642.78766	0.35947	219.50	1-HR	ALL	1ST
957.55554	803.48456	0.39340	219.50	1-HR	ALL	1ST
1149.06665	964.18140	5.49557	323.10	1-HR	ALL	1ST
1340.57764	1124.87830	7.44629	353.60	1-HR	ALL	1ST

1532.08899	1285.57520	6.75017	353.60	1-HR	ALL	1ST
1723.59998	1446.27197	5.10144	335.30	1-HR	ALL	1ST
1915.11108	1606.96912	5.28185	347.50	1-HR	ALL	1ST
2298.13330	1928.36292	4.48971	347.50	1-HR	ALL	1ST
3064.17798	2571.15039	3.21061	341.40	1-HR	ALL	1ST
3830.22192	3213.93799	2.39247	335.30	1-HR	ALL	1ST
5745.33301	4820.90674	1.90956	373.10	1-HR	ALL	1ST
7660.44434	6427.87549	1.52773	396.20	1-HR	ALL	1ST
11490.66600	9641.81348	0.80456	360.00	1-HR	ALL	1ST
15320.88870	12855.75200	0.64297	380.00	1-HR	ALL	1ST
22981.33400	19283.62700	0.42405	380.00	1-HR	ALL	1ST
30641.77730	25711.50390	0.39759	420.00	1-HR	ALL	1ST
38302.22270	32139.38090	0.30839	420.00	1-HR	ALL	1ST
86.60254	50.00000	0.32474	213.40	1-HR	ALL	1ST
173.20508	99.99999	0.25609	207.30	1-HR	ALL	1ST
259.80762	150.00000	0.24736	207.30	1-HR	ALL	1ST
346.41016	199.99997	0.21004	201.20	1-HR	ALL	1ST
433.01273	249.99997	0.24833	207.30	1-HR	ALL	1ST
519.61517	300.00000	0.33927	213.40	1-HR	ALL	1ST
606.21777	349.99994	0.37314	213.40	1-HR	ALL	1ST
692.82031	399.99994	0.38559	213.40	1-HR	ALL	1ST
779.42291	449.99994	0.38621	213.40	1-HR	ALL	1ST
866.02539	499.99994	0.41852	219.50	1-HR	ALL	1ST
1082.53174	625.00000	0.45109	225.60	1-HR	ALL	1ST
1299.03821	750.00000	0.50349	219.50	1-HR	ALL	1ST
1515.54443	875.00000	1.20829	243.80	1-HR	ALL	1ST
1732.05090	1000.00000	1.68499	292.60	1-HR	ALL	1ST
1948.55725	1125.00000	2.95695	310.90	1-HR	ALL	1ST
2165.06348	1250.00000	3.68385	323.10	1-HR	ALL	1ST
2598.07617	1500.00000	2.79491	317.00	1-HR	ALL	1ST
3464.10156	2000.00000	2.46894	323.10	1-HR	ALL	1ST
4330.12695	2499.99976	3.16175	359.70	1-HR	ALL	1ST
6495.19043	3749.99976	2.47585	378.90	1-HR	ALL	1ST
8660.25391	4999.99902	1.82327	408.70	1-HR	ALL	1ST
12990.38090	7499.99902	1.13814	380.00	1-HR	ALL	1ST
17320.50780	9999.99902	0.73721	360.00	1-HR	ALL	1ST
25980.76170	14999.99900	0.50751	380.00	1-HR	ALL	1ST
34641.01560	19999.99800	0.40480	380.00	1-HR	ALL	1ST
43301.26560	24999.99800	0.32852	420.00	1-HR	ALL	1ST
93.96926	34.20201	0.33624	207.30	1-HR	ALL	1ST
187.93851	68.40403	0.28222	201.20	1-HR	ALL	1ST
281.90778	102.60603	0.22933	202.70	1-HR	ALL	1ST
375.87701	136.80806	0.26756	202.70	1-HR	ALL	1ST
469.84631	171.01007	0.32014	207.30	1-HR	ALL	1ST
563.81555	205.21207	0.32257	207.30	1-HR	ALL	1ST
657.78491	239.41411	0.32209	207.30	1-HR	ALL	1ST
751.75409	273.61615	0.38282	213.40	1-HR	ALL	1ST
845.72333	307.81815	0.39198	213.40	1-HR	ALL	1ST
939.69263	342.02011	0.41010	213.40	1-HR	ALL	1ST
1174.61572	427.52518	0.44700	213.40	1-HR	ALL	1ST
1409.53894	513.03021	0.44691	213.40	1-HR	ALL	1ST
1644.46204	598.53528	0.43843	213.40	1-HR	ALL	1ST
1879.38525	684.04022	0.41389	213.40	1-HR	ALL	1ST
2114.30835	769.54535	0.40746	213.40	1-HR	ALL	1ST
2349.23145	855.05035	0.59610	231.60	1-HR	ALL	1ST
2819.07788	1026.06042	0.53807	231.60	1-HR	ALL	1ST
3758.77051	1368.08057	1.90567	310.90	1-HR	ALL	1ST
4698.46289	1710.10071	3.83804	384.00	1-HR	ALL	1ST
7047.69482	2565.15112	2.51031	384.00	1-HR	ALL	1ST
9396.92578	3420.20142	1.70149	370.30	1-HR	ALL	1ST
14095.38960	5130.30176	1.00714	360.00	1-HR	ALL	1ST
18793.85350	6840.40283	0.81427	380.00	1-HR	ALL	1ST
28190.77930	10260.60450	0.61590	400.00	1-HR	ALL	1ST

37587.70310	13680.80570	0.51459	360.00	1-HR	ALL	1ST
46984.63670	17101.00780	0.43678	400.00	1-HR	ALL	1ST
98.48077	17.36482	0.35359	207.30	1-HR	ALL	1ST
196.96155	34.72964	0.31369	202.70	1-HR	ALL	1ST
295.44235	52.09447	0.26612	202.70	1-HR	ALL	1ST
393.92307	69.45930	0.25329	202.70	1-HR	ALL	1ST
492.40384	86.82410	0.29654	202.70	1-HR	ALL	1ST
590.88470	104.18893	0.33247	202.70	1-HR	ALL	1ST
689.36542	121.55376	0.36039	202.70	1-HR	ALL	1ST
787.84613	138.91856	0.38045	202.70	1-HR	ALL	1ST
886.32697	156.28340	0.39332	202.70	1-HR	ALL	1ST
984.80774	173.64821	0.39995	202.70	1-HR	ALL	1ST
1231.00964	217.06027	0.39583	202.70	1-HR	ALL	1ST
1477.21167	260.47235	0.38275	202.70	1-HR	ALL	1ST
1723.41370	303.88434	0.42299	213.40	1-HR	ALL	1ST
1969.61548	347.29648	0.39281	207.30	1-HR	ALL	1ST
2215.81738	390.70850	0.37818	207.30	1-HR	ALL	1ST
2462.01929	434.12051	0.67194	231.60	1-HR	ALL	1ST
2954.42310	520.94470	1.50775	304.80	1-HR	ALL	1ST
3939.23096	694.59296	3.14562	346.60	1-HR	ALL	1ST
4924.03809	868.24103	3.31588	365.80	1-HR	ALL	1ST
7386.05762	1302.36169	2.59716	384.00	1-HR	ALL	1ST
9848.07715	1736.48218	1.71830	371.90	1-HR	ALL	1ST
14772.11520	2604.72290	0.62321	320.00	1-HR	ALL	1ST
19696.15430	3472.96411	0.73195	360.00	1-HR	ALL	1ST
29544.23050	5209.44580	0.50496	380.00	1-HR	ALL	1ST
39392.30860	6945.92822	0.36129	380.00	1-HR	ALL	1ST
49240.38670	8682.41113	0.29837	400.00	1-HR	ALL	1ST
100.00000	0.00001	0.37070	207.30	1-HR	ALL	1ST
200.00000	0.00002	0.34405	202.70	1-HR	ALL	1ST
300.00000	0.00002	0.30541	202.70	1-HR	ALL	1ST
400.00000	0.00003	0.26293	202.70	1-HR	ALL	1ST
500.00000	0.00004	0.22294	202.70	1-HR	ALL	1ST
600.00000	0.00005	0.23606	202.70	1-HR	ALL	1ST
700.00000	0.00005	0.25777	202.70	1-HR	ALL	1ST
800.00000	0.00006	0.27584	202.70	1-HR	ALL	1ST
900.00000	0.00007	0.29033	202.70	1-HR	ALL	1ST
1000.00000	0.00008	0.30148	202.70	1-HR	ALL	1ST
1250.00000	0.00009	0.62002	243.80	1-HR	ALL	1ST
1500.00000	0.00011	4.91194	341.40	1-HR	ALL	1ST
1750.00000	0.00013	2.94301	323.10	1-HR	ALL	1ST
2000.00000	0.00015	4.05619	341.40	1-HR	ALL	1ST
2250.00000	0.00017	1.53264	304.80	1-HR	ALL	1ST
2500.00000	0.00019	0.95428	292.60	1-HR	ALL	1ST
3000.00000	0.00023	1.49695	310.90	1-HR	ALL	1ST
4000.00000	0.00030	3.21661	359.70	1-HR	ALL	1ST
5000.00000	0.00038	4.47226	402.30	1-HR	ALL	1ST
7500.00000	0.00057	1.55106	347.50	1-HR	ALL	1ST
10000.00000	0.00075	1.87059	380.10	1-HR	ALL	1ST
15000.00000	0.00113	1.00112	360.00	1-HR	ALL	1ST
20000.00000	0.00151	0.75303	360.00	1-HR	ALL	1ST
30000.00000	0.00226	0.58147	380.00	1-HR	ALL	1ST
40000.00000	0.00302	0.46521	400.00	1-HR	ALL	1ST
50000.00000	0.00377	0.28991	360.00	1-HR	ALL	1ST
98.48077	-17.36482	0.38699	207.30	1-HR	ALL	1ST
196.96155	-34.72964	0.37283	202.70	1-HR	ALL	1ST
295.44235	-52.09446	0.34232	202.70	1-HR	ALL	1ST
393.92307	-69.45927	0.30411	202.70	1-HR	ALL	1ST
492.40384	-86.82410	0.26565	202.70	1-HR	ALL	1ST
590.88470	-104.18891	0.23660	202.70	1-HR	ALL	1ST
689.36542	-121.55373	0.26201	202.70	1-HR	ALL	1ST
787.84613	-138.91853	0.37834	219.50	1-HR	ALL	1ST
886.32697	-156.28339	0.43138	225.60	1-HR	ALL	1ST

984.80774	-173.64819	4.76881	329.20	1-HR	ALL	1ST
1231.00964	-217.06023	6.27329	347.50	1-HR	ALL	1ST
1477.21167	-260.47232	6.16611	353.60	1-HR	ALL	1ST
1723.41370	-303.88431	2.94307	323.10	1-HR	ALL	1ST
1969.61548	-347.29642	4.09769	341.40	1-HR	ALL	1ST
2215.81738	-390.70840	3.76287	341.40	1-HR	ALL	1ST
2462.01929	-434.12045	2.30627	323.10	1-HR	ALL	1ST
2954.42310	-520.94458	3.32791	347.50	1-HR	ALL	1ST
3939.23096	-694.59277	2.86217	353.60	1-HR	ALL	1ST
4924.03809	-868.24091	3.90679	386.50	1-HR	ALL	1ST
7386.05762	-1302.36145	1.72526	353.60	1-HR	ALL	1ST
9848.07715	-1736.48181	1.47350	360.00	1-HR	ALL	1ST
14772.11520	-2604.72290	0.76150	340.00	1-HR	ALL	1ST
19696.15430	-3472.96338	0.90514	380.00	1-HR	ALL	1ST
29544.23050	-5209.44580	0.58147	380.00	1-HR	ALL	1ST
39392.30860	-6945.92676	0.42380	380.00	1-HR	ALL	1ST
49240.38670	-8682.40918	0.35992	400.00	1-HR	ALL	1ST
93.96926	-34.20201	0.40190	207.30	1-HR	ALL	1ST
187.93851	-68.40402	0.39868	202.70	1-HR	ALL	1ST
281.90778	-102.60603	0.37433	202.70	1-HR	ALL	1ST
375.87701	-136.80804	0.33824	202.70	1-HR	ALL	1ST
469.84631	-171.01006	0.29924	202.70	1-HR	ALL	1ST
563.81555	-205.21207	0.32718	213.40	1-HR	ALL	1ST
657.78491	-239.41406	0.56942	256.00	1-HR	ALL	1ST
751.75409	-273.61612	1.97247	298.70	1-HR	ALL	1ST
845.72339	-307.81812	1.05365	286.50	1-HR	ALL	1ST
939.69263	-342.02008	4.18020	323.10	1-HR	ALL	1ST
1174.61584	-427.52515	6.32271	347.50	1-HR	ALL	1ST
1409.53894	-513.03021	5.63219	347.50	1-HR	ALL	1ST
1644.46216	-598.53522	2.16176	310.90	1-HR	ALL	1ST
1879.38525	-684.04016	5.05036	353.60	1-HR	ALL	1ST
2114.30835	-769.54523	4.39445	350.20	1-HR	ALL	1ST
2349.23145	-855.05023	3.88288	347.50	1-HR	ALL	1ST
2819.07788	-1026.06030	3.34770	347.50	1-HR	ALL	1ST
3758.77051	-1368.08032	2.54836	345.90	1-HR	ALL	1ST
4698.46338	-1710.10059	2.59361	371.90	1-HR	ALL	1ST
7047.69482	-2565.15088	1.64010	365.80	1-HR	ALL	1ST
9396.92676	-3420.20093	1.56278	408.40	1-HR	ALL	1ST
14095.38960	-5130.30127	0.89712	380.00	1-HR	ALL	1ST
18793.85550	-6840.40234	0.60835	360.00	1-HR	ALL	1ST
28190.77930	-10260.60350	0.49872	360.00	1-HR	ALL	1ST
37587.70700	-13680.80470	0.41280	360.00	1-HR	ALL	1ST
46984.63670	-17101.00590	0.35222	360.00	1-HR	ALL	1ST
86.60254	-50.00000	0.41493	207.30	1-HR	ALL	1ST
173.20508	-100.00001	0.42042	202.70	1-HR	ALL	1ST
259.80762	-150.00002	0.39936	202.70	1-HR	ALL	1ST
346.41016	-200.00002	0.36209	202.70	1-HR	ALL	1ST
433.01273	-250.00003	0.34550	213.40	1-HR	ALL	1ST
519.61517	-300.00003	0.52975	268.20	1-HR	ALL	1ST
606.21777	-350.00003	3.67296	317.00	1-HR	ALL	1ST
692.82031	-400.00003	8.20457	347.50	1-HR	ALL	1ST
779.42291	-450.00003	8.61100	353.60	1-HR	ALL	1ST
866.02539	-500.00006	7.31127	347.50	1-HR	ALL	1ST
1082.53174	-625.00006	2.32594	310.90	1-HR	ALL	1ST
1299.03821	-750.00006	6.84067	359.70	1-HR	ALL	1ST
1515.54443	-875.00006	4.02515	335.30	1-HR	ALL	1ST
1732.05090	-1000.00012	5.52586	359.70	1-HR	ALL	1ST
1948.55713	-1125.00012	5.03001	359.70	1-HR	ALL	1ST
2165.06348	-1250.00012	3.93320	347.50	1-HR	ALL	1ST
2598.07617	-1500.00012	4.15538	365.80	1-HR	ALL	1ST
3464.10156	-2000.00024	3.02563	359.70	1-HR	ALL	1ST
4330.12695	-2500.00024	2.29373	353.60	1-HR	ALL	1ST
6495.19043	-3750.00049	1.99081	402.30	1-HR	ALL	1ST

8660.25391	-5000.00049	1.42519	396.20	1-HR	ALL	1ST
12990.38090	-7500.00098	0.83092	380.00	1-HR	ALL	1ST
17320.50780	-10000.00100	0.60556	380.00	1-HR	ALL	1ST
25980.76170	-15000.00200	0.33625	360.00	1-HR	ALL	1ST
34641.01560	-20000.00200	0.24605	360.00	1-HR	ALL	1ST
43301.26560	-25000.00200	0.19235	360.00	1-HR	ALL	1ST
76.60445	-64.27876	0.42561	207.30	1-HR	ALL	1ST
153.20888	-128.55754	0.43716	202.70	1-HR	ALL	1ST
229.81332	-192.83629	0.41605	202.70	1-HR	ALL	1ST
306.41779	-257.11508	0.37383	202.70	1-HR	ALL	1ST
383.02225	-321.39377	0.49189	243.80	1-HR	ALL	1ST
459.62668	-385.67261	1.79875	298.70	1-HR	ALL	1ST
536.23108	-449.95132	4.64597	323.10	1-HR	ALL	1ST
612.83557	-514.23016	9.38023	353.60	1-HR	ALL	1ST
689.44000	-578.50885	8.82994	353.60	1-HR	ALL	1ST
766.04443	-642.78766	8.33411	353.60	1-HR	ALL	1ST
957.55554	-803.48462	7.29032	353.60	1-HR	ALL	1ST
1149.06665	-964.18146	7.00924	359.70	1-HR	ALL	1ST
1340.57764	-1124.87830	4.69202	341.40	1-HR	ALL	1ST
1532.08899	-1285.57520	5.23867	353.60	1-HR	ALL	1ST
1723.59998	-1446.27209	4.77284	353.60	1-HR	ALL	1ST
1915.11108	-1606.96924	3.16810	341.40	1-HR	ALL	1ST
2298.13330	-1928.36292	3.33343	359.70	1-HR	ALL	1ST
3064.17798	-2571.15039	2.56669	359.70	1-HR	ALL	1ST
3830.22192	-3213.93823	2.06776	359.70	1-HR	ALL	1ST
5745.33252	-4820.90674	2.03090	408.40	1-HR	ALL	1ST
7660.44434	-6427.87598	1.48196	408.40	1-HR	ALL	1ST
11490.66500	-9641.81348	0.83548	380.00	1-HR	ALL	1ST
15320.88870	-12855.75290	0.52174	360.00	1-HR	ALL	1ST
22981.33200	-19283.62700	0.37065	360.00	1-HR	ALL	1ST
30641.77730	-25711.50590	0.30105	360.00	1-HR	ALL	1ST
38302.22270	-32139.38090	0.24722	360.00	1-HR	ALL	1ST
64.27876	-76.60445	0.43359	207.30	1-HR	ALL	1ST
128.55754	-153.20888	0.44835	202.70	1-HR	ALL	1ST
192.83629	-229.81332	0.42392	202.70	1-HR	ALL	1ST
257.11508	-306.41779	0.37336	202.70	1-HR	ALL	1ST
321.39377	-383.02225	0.57794	268.20	1-HR	ALL	1ST
385.67261	-459.62668	2.43991	304.80	1-HR	ALL	1ST
449.95132	-536.23108	3.02561	310.90	1-HR	ALL	1ST
514.23016	-612.83557	4.53357	323.10	1-HR	ALL	1ST
578.50885	-689.44000	5.22348	329.20	1-HR	ALL	1ST
642.78766	-766.04443	4.11713	323.10	1-HR	ALL	1ST
803.48456	-957.55554	6.00279	347.50	1-HR	ALL	1ST
964.18146	-1149.06665	5.92884	359.70	1-HR	ALL	1ST
1124.87830	-1340.57764	2.83832	329.20	1-HR	ALL	1ST
1285.57520	-1532.08899	4.79220	359.70	1-HR	ALL	1ST
1446.27197	-1723.59998	3.50451	353.60	1-HR	ALL	1ST
1606.96912	-1915.11108	3.65866	359.70	1-HR	ALL	1ST
1928.36292	-2298.13330	5.16026	408.40	1-HR	ALL	1ST
2571.15039	-3064.17798	3.89373	420.60	1-HR	ALL	1ST
3213.93799	-3830.22192	2.27250	371.90	1-HR	ALL	1ST
4820.90674	-5745.33301	1.72043	392.00	1-HR	ALL	1ST
6427.87549	-7660.44434	1.24257	390.10	1-HR	ALL	1ST
9641.81348	-11490.66600	0.51671	340.00	1-HR	ALL	1ST
12855.75200	-15320.88870	0.53830	380.00	1-HR	ALL	1ST
19283.62700	-22981.33400	0.35506	400.00	1-HR	ALL	1ST
25711.50390	-30641.77730	0.25348	400.00	1-HR	ALL	1ST
32139.38090	-38302.22270	0.18634	380.00	1-HR	ALL	1ST
50.00000	-86.60254	0.43858	207.30	1-HR	ALL	1ST
100.00001	-173.20508	0.45374	202.70	1-HR	ALL	1ST
150.00002	-259.80762	0.42329	202.70	1-HR	ALL	1ST
200.00002	-346.41016	0.40890	213.40	1-HR	ALL	1ST
250.00002	-433.01273	0.84558	268.20	1-HR	ALL	1ST

300.00003	-519.61517	1.88338	298.70	1-HR	ALL	1ST
350.00003	-606.21777	3.12102	310.90	1-HR	ALL	1ST
400.00003	-692.82031	4.47822	323.10	1-HR	ALL	1ST
450.00003	-779.42291	3.44037	323.10	1-HR	ALL	1ST
500.00003	-866.02539	3.99676	329.20	1-HR	ALL	1ST
625.00006	-1082.53174	1.15026	298.70	1-HR	ALL	1ST
750.00006	-1299.03821	3.60656	341.40	1-HR	ALL	1ST
875.00006	-1515.54443	3.27483	341.40	1-HR	ALL	1ST
1000.00006	-1732.05090	4.40008	359.70	1-HR	ALL	1ST
1125.00012	-1948.55713	4.42819	365.80	1-HR	ALL	1ST
1250.00012	-2165.06348	4.40581	371.90	1-HR	ALL	1ST
1500.00012	-2598.07617	4.58552	408.40	1-HR	ALL	1ST
2000.00012	-3464.10156	3.37671	420.60	1-HR	ALL	1ST
2500.00024	-4330.12695	2.77139	408.40	1-HR	ALL	1ST
3750.00024	-6495.19043	1.79060	408.40	1-HR	ALL	1ST
5000.00049	-8660.25391	1.28702	396.20	1-HR	ALL	1ST
7500.00049	-12990.38090	0.51393	340.00	1-HR	ALL	1ST
10000.00100	-17320.50780	0.47360	360.00	1-HR	ALL	1ST
15000.00100	-25980.76170	0.43799	420.00	1-HR	ALL	1ST
20000.00200	-34641.01560	0.29078	400.00	1-HR	ALL	1ST
25000.00200	-43301.26560	0.24275	400.00	1-HR	ALL	1ST
34.20202	-93.96926	0.44039	207.30	1-HR	ALL	1ST
68.40405	-187.93851	0.45331	202.70	1-HR	ALL	1ST
102.60606	-281.90778	0.41498	202.70	1-HR	ALL	1ST
136.80809	-375.87701	0.42574	207.30	1-HR	ALL	1ST
171.01012	-469.84631	1.00140	268.20	1-HR	ALL	1ST
205.21213	-563.81555	1.42446	292.60	1-HR	ALL	1ST
239.41414	-657.78479	1.89658	304.80	1-HR	ALL	1ST
273.61621	-751.75409	1.81961	304.80	1-HR	ALL	1ST
307.81821	-845.72333	0.56008	286.50	1-HR	ALL	1ST
342.02023	-939.69257	0.54460	286.50	1-HR	ALL	1ST
427.52527	-1174.61572	1.26652	304.80	1-HR	ALL	1ST
513.03033	-1409.53894	1.47459	310.90	1-HR	ALL	1ST
598.53546	-1644.46204	1.08083	304.80	1-HR	ALL	1ST
684.04047	-1879.38513	2.65939	335.30	1-HR	ALL	1ST
769.54547	-2114.30835	4.18575	359.70	1-HR	ALL	1ST
855.05054	-2349.23145	4.83353	378.00	1-HR	ALL	1ST
1026.06079	-2819.07788	4.71148	396.20	1-HR	ALL	1ST
1368.08081	-3758.77026	3.58915	402.30	1-HR	ALL	1ST
1710.10107	-4698.46289	3.00845	411.50	1-HR	ALL	1ST
2565.15161	-7047.69434	1.84514	402.30	1-HR	ALL	1ST
3420.20190	-9396.92578	1.42660	408.10	1-HR	ALL	1ST
5130.30273	-14095.38870	0.57411	360.00	1-HR	ALL	1ST
6840.40430	-18793.85350	0.42987	360.00	1-HR	ALL	1ST
10260.60550	-28190.77730	0.44024	420.00	1-HR	ALL	1ST
13680.80860	-37587.70310	0.29190	400.00	1-HR	ALL	1ST
17101.01170	-46984.62890	0.24473	420.00	1-HR	ALL	1ST
17.36483	-98.48077	0.43894	207.30	1-HR	ALL	1ST
34.72966	-196.96155	0.44718	202.70	1-HR	ALL	1ST
52.09449	-295.44235	0.41836	202.70	1-HR	ALL	1ST
69.45933	-393.92307	0.42576	202.70	1-HR	ALL	1ST
86.82413	-492.40384	0.95598	249.90	1-HR	ALL	1ST
104.18897	-590.88470	0.80975	286.50	1-HR	ALL	1ST
121.55380	-689.36542	0.59230	280.40	1-HR	ALL	1ST
138.91862	-787.84613	0.55650	274.30	1-HR	ALL	1ST
156.28346	-886.32697	0.60195	286.50	1-HR	ALL	1ST
173.64827	-984.80774	0.58568	286.50	1-HR	ALL	1ST
217.06036	-1231.00964	1.00867	298.70	1-HR	ALL	1ST
260.47244	-1477.21143	1.21439	304.80	1-HR	ALL	1ST
303.88449	-1723.41370	1.12251	304.80	1-HR	ALL	1ST
347.29657	-1969.61548	0.81909	298.70	1-HR	ALL	1ST
390.70868	-2215.81738	0.77251	298.70	1-HR	ALL	1ST
434.12073	-2462.01929	4.30240	365.80	1-HR	ALL	1ST

520.94489	-2954.42285	4.96976	402.30	1-HR	ALL	1ST
694.59320	-3939.23096	3.15816	390.10	1-HR	ALL	1ST
868.24146	-4924.03809	3.16511	414.50	1-HR	ALL	1ST
1302.36230	-7386.05762	1.97938	408.40	1-HR	ALL	1ST
1736.48279	-9848.07715	1.33800	398.10	1-HR	ALL	1ST
2604.72412	-14772.11520	0.72961	380.00	1-HR	ALL	1ST
3472.96558	-19696.15430	0.64221	360.00	1-HR	ALL	1ST
5209.44824	-29544.23050	0.42567	400.00	1-HR	ALL	1ST
6945.93115	-39392.30860	0.30186	400.00	1-HR	ALL	1ST
8682.41504	-49240.38670	0.24893	400.00	1-HR	ALL	1ST
0.00002	-100.00000	0.43421	207.30	1-HR	ALL	1ST
0.00003	-200.00000	0.43548	202.70	1-HR	ALL	1ST
0.00005	-300.00000	0.41014	202.70	1-HR	ALL	1ST
0.00006	-400.00000	0.41080	202.70	1-HR	ALL	1ST
0.00008	-500.00000	0.39143	219.50	1-HR	ALL	1ST
0.00009	-600.00000	0.65616	274.30	1-HR	ALL	1ST
0.00011	-700.00000	0.59292	280.40	1-HR	ALL	1ST
0.00012	-800.00000	0.57072	274.30	1-HR	ALL	1ST
0.00014	-900.00000	0.44840	243.80	1-HR	ALL	1ST
0.00015	-1000.00000	1.15070	298.70	1-HR	ALL	1ST
0.00019	-1250.00000	1.38798	304.80	1-HR	ALL	1ST
0.00023	-1500.00000	1.27150	304.80	1-HR	ALL	1ST
0.00026	-1750.00000	1.04510	304.80	1-HR	ALL	1ST
0.00030	-2000.00000	0.56915	292.60	1-HR	ALL	1ST
0.00034	-2250.00000	0.67898	298.70	1-HR	ALL	1ST
0.00038	-2500.00000	3.83824	365.80	1-HR	ALL	1ST
0.00045	-3000.00000	5.07416	406.30	1-HR	ALL	1ST
0.00060	-4000.00000	4.70300	402.30	1-HR	ALL	1ST
0.00075	-5000.00000	3.72727	396.20	1-HR	ALL	1ST
0.00113	-7500.00000	2.34163	390.10	1-HR	ALL	1ST
0.00151	-10000.00000	1.65182	396.20	1-HR	ALL	1ST
0.00226	-15000.00000	1.00042	380.00	1-HR	ALL	1ST
0.00302	-20000.00000	0.64804	360.00	1-HR	ALL	1ST
0.00453	-30000.00000	0.56711	380.00	1-HR	ALL	1ST
0.00604	-40000.00000	0.44071	380.00	1-HR	ALL	1ST
0.00755	-50000.00000	0.33106	400.00	1-HR	ALL	1ST
-17.36482	-98.48077	0.42628	207.30	1-HR	ALL	1ST
-34.72964	-196.96155	0.41834	202.70	1-HR	ALL	1ST
-52.09447	-295.44235	0.38521	202.70	1-HR	ALL	1ST
-69.45930	-393.92307	0.37631	202.70	1-HR	ALL	1ST
-86.82410	-492.40384	0.31955	202.70	1-HR	ALL	1ST
-104.18893	-590.88470	0.37408	225.60	1-HR	ALL	1ST
-121.55376	-689.36542	0.57250	274.30	1-HR	ALL	1ST
-138.91856	-787.84613	0.51230	274.30	1-HR	ALL	1ST
-156.28340	-886.32697	0.25795	237.70	1-HR	ALL	1ST
-173.64821	-984.80774	0.89245	292.60	1-HR	ALL	1ST
-217.06029	-1231.00964	1.47436	304.80	1-HR	ALL	1ST
-260.47238	-1477.21167	0.68115	286.50	1-HR	ALL	1ST
-303.88437	-1723.41370	0.63180	292.60	1-HR	ALL	1ST
-347.29648	-1969.61548	0.55796	280.40	1-HR	ALL	1ST
-390.70853	-2215.81738	1.62834	304.80	1-HR	ALL	1ST
-434.12054	-2462.01929	6.01295	353.60	1-HR	ALL	1ST
-520.94470	-2954.42310	6.88369	384.00	1-HR	ALL	1ST
-694.59296	-3939.23096	4.99100	396.20	1-HR	ALL	1ST
-868.24115	-4924.03809	5.23266	415.40	1-HR	ALL	1ST
-1302.36182	-7386.05762	3.62055	390.10	1-HR	ALL	1ST
-1736.48218	-9848.07715	2.56038	392.00	1-HR	ALL	1ST
-2604.72314	-14772.11520	1.33527	360.00	1-HR	ALL	1ST
-3472.96436	-19696.15430	0.80047	340.00	1-HR	ALL	1ST
-5209.44629	-29544.23050	0.51337	340.00	1-HR	ALL	1ST
-6945.92871	-39392.30860	0.43789	360.00	1-HR	ALL	1ST
-8682.41113	-49240.38670	0.41517	380.00	1-HR	ALL	1ST
-34.20201	-93.96926	0.42530	213.40	1-HR	ALL	1ST

-68.40403	-187.93851	0.39598	202.70	1-HR	ALL	1ST
-102.60605	-281.90778	0.34401	202.70	1-HR	ALL	1ST
-136.80806	-375.87701	0.32278	202.70	1-HR	ALL	1ST
-171.01009	-469.84631	0.25914	202.70	1-HR	ALL	1ST
-205.21210	-563.81555	0.21915	202.70	1-HR	ALL	1ST
-239.41411	-657.78491	0.24554	219.50	1-HR	ALL	1ST
-273.61615	-751.75409	0.33595	249.90	1-HR	ALL	1ST
-307.81815	-845.72333	0.21976	219.50	1-HR	ALL	1ST
-342.02014	-939.69263	0.61132	280.40	1-HR	ALL	1ST
-427.52521	-1174.61572	0.70153	280.40	1-HR	ALL	1ST
-513.03021	-1409.53894	0.71219	280.40	1-HR	ALL	1ST
-598.53528	-1644.46204	0.60392	280.40	1-HR	ALL	1ST
-684.04034	-1879.38525	0.39741	262.10	1-HR	ALL	1ST
-769.54535	-2114.30835	1.32031	298.70	1-HR	ALL	1ST
-855.05042	-2349.23145	6.41596	353.60	1-HR	ALL	1ST
-1026.06042	-2819.07788	9.63020	371.90	1-HR	ALL	1ST
-1368.08069	-3758.77051	7.83263	402.30	1-HR	ALL	1ST
-1710.10083	-4698.46289	6.07217	397.20	1-HR	ALL	1ST
-2565.15112	-7047.69482	3.64463	384.00	1-HR	ALL	1ST
-3420.20142	-9396.92578	2.56743	384.00	1-HR	ALL	1ST
-5130.30176	-14095.38960	1.10097	340.00	1-HR	ALL	1ST
-6840.40332	-18793.85350	0.80734	340.00	1-HR	ALL	1ST
-10260.60450	-28190.77930	0.60040	360.00	1-HR	ALL	1ST
-13680.80660	-37587.70310	0.46494	380.00	1-HR	ALL	1ST
-17101.00780	-46984.62890	0.35528	380.00	1-HR	ALL	1ST
-50.00000	-86.60254	0.41205	213.40	1-HR	ALL	1ST
-100.00000	-173.20508	0.36889	202.70	1-HR	ALL	1ST
-150.00000	-259.80762	0.28972	202.70	1-HR	ALL	1ST
-200.00000	-346.41016	0.25468	202.70	1-HR	ALL	1ST
-250.00000	-433.01273	0.19106	202.70	1-HR	ALL	1ST
-300.00000	-519.61517	0.20399	202.70	1-HR	ALL	1ST
-350.00000	-606.21777	0.14085	202.70	1-HR	ALL	1ST
-400.00000	-692.82031	0.14063	202.70	1-HR	ALL	1ST
-450.00000	-779.42291	0.16760	202.70	1-HR	ALL	1ST
-500.00000	-866.02539	0.19979	219.50	1-HR	ALL	1ST
-625.00000	-1082.53174	0.30762	219.50	1-HR	ALL	1ST
-750.00000	-1299.03821	0.25293	213.40	1-HR	ALL	1ST
-875.00000	-1515.54443	0.47151	213.40	1-HR	ALL	1ST
-1000.00000	-1732.05090	0.68794	231.60	1-HR	ALL	1ST
-1125.00000	-1948.55713	0.68386	231.60	1-HR	ALL	1ST
-1250.00000	-2165.06348	1.31733	292.60	1-HR	ALL	1ST
-1500.00000	-2598.07617	8.69092	359.70	1-HR	ALL	1ST
-2000.00000	-3464.10156	8.28013	396.20	1-HR	ALL	1ST
-2500.00000	-4330.12695	6.06948	414.50	1-HR	ALL	1ST
-3750.00000	-6495.19043	2.34506	396.20	1-HR	ALL	1ST
-5000.00000	-8660.25391	2.29989	392.60	1-HR	ALL	1ST
-7500.00000	-12990.38090	1.08108	360.00	1-HR	ALL	1ST
-10000.00000	-17320.50780	0.92917	380.00	1-HR	ALL	1ST
-15000.00000	-25980.76170	0.50187	360.00	1-HR	ALL	1ST
-20000.00000	-34641.01560	0.36425	360.00	1-HR	ALL	1ST
-25000.00000	-43301.26560	0.31747	380.00	1-HR	ALL	1ST
-64.27876	-76.60445	0.39648	213.40	1-HR	ALL	1ST
-128.55753	-153.20888	0.33797	202.70	1-HR	ALL	1ST
-192.83627	-229.81335	0.24396	202.70	1-HR	ALL	1ST
-257.11505	-306.41779	0.19603	202.70	1-HR	ALL	1ST
-321.39377	-383.02228	0.18121	202.70	1-HR	ALL	1ST
-385.67258	-459.62671	0.18109	202.70	1-HR	ALL	1ST
-449.95129	-536.23120	0.11973	202.70	1-HR	ALL	1ST
-514.23010	-612.83557	0.10332	202.70	1-HR	ALL	1ST
-578.50873	-689.44000	0.14028	202.70	1-HR	ALL	1ST
-642.78766	-766.04449	0.20883	202.70	1-HR	ALL	1ST
-803.48456	-957.55560	0.21102	202.70	1-HR	ALL	1ST
-964.18134	-1149.06689	0.37988	213.40	1-HR	ALL	1ST

-1124.87830	-1340.57788	0.42113	213.40	1-HR	ALL	1ST
-1285.57520	-1532.08899	0.33151	213.40	1-HR	ALL	1ST
-1446.27185	-1723.60010	0.21041	213.40	1-HR	ALL	1ST
-1606.96912	-1915.11121	0.20507	213.40	1-HR	ALL	1ST
-1928.36279	-2298.13354	10.92368	371.90	1-HR	ALL	1ST
-2571.15039	-3064.17822	6.12952	378.00	1-HR	ALL	1ST
-3213.93774	-3830.22241	5.59288	396.20	1-HR	ALL	1ST
-4820.90625	-5745.33301	3.39607	396.20	1-HR	ALL	1ST
-6427.87500	-7660.44482	2.09512	378.00	1-HR	ALL	1ST
-9641.81250	-11490.66600	0.95523	349.00	1-HR	ALL	1ST
-12855.75100	-15320.88960	0.79460	360.00	1-HR	ALL	1ST
-19283.62700	-22981.33400	0.50451	360.00	1-HR	ALL	1ST
-25711.50200	-30641.77930	0.41394	380.00	1-HR	ALL	1ST
-32139.37890	-38302.22270	0.28435	360.00	1-HR	ALL	1ST
-76.60445	-64.27876	0.37915	213.40	1-HR	ALL	1ST
-153.20891	-128.55751	0.30194	201.20	1-HR	ALL	1ST
-229.81339	-192.83624	0.24334	207.30	1-HR	ALL	1ST
-306.41782	-257.11499	0.24787	207.30	1-HR	ALL	1ST
-383.02231	-321.39371	0.15675	202.70	1-HR	ALL	1ST
-459.62674	-385.67252	0.15750	202.70	1-HR	ALL	1ST
-536.23120	-449.95123	0.09817	202.70	1-HR	ALL	1ST
-612.83563	-514.22998	0.08347	202.70	1-HR	ALL	1ST
-689.44006	-578.50867	0.19057	207.30	1-HR	ALL	1ST
-766.04456	-642.78754	0.21027	207.30	1-HR	ALL	1ST
-957.55566	-803.48444	0.33033	207.30	1-HR	ALL	1ST
-1149.06689	-964.18115	0.22863	207.30	1-HR	ALL	1ST
-1340.57800	-1124.87830	0.08610	207.30	1-HR	ALL	1ST
-1532.08911	-1285.57483	0.12589	213.40	1-HR	ALL	1ST
-1723.60022	-1446.27173	0.16390	213.40	1-HR	ALL	1ST
-1915.11121	-1606.96887	0.33260	256.00	1-HR	ALL	1ST
-2298.13354	-1928.36243	2.51318	323.10	1-HR	ALL	1ST
-3064.17847	-2571.15015	4.78648	359.70	1-HR	ALL	1ST
-3830.22241	-3213.93750	5.21950	384.00	1-HR	ALL	1ST
-5745.33350	-4820.90576	2.99722	378.00	1-HR	ALL	1ST
-7660.44531	-6427.87451	2.12744	378.00	1-HR	ALL	1ST
-11490.66700	-9641.81250	1.21761	360.00	1-HR	ALL	1ST
-15320.89060	-12855.75000	1.04816	380.00	1-HR	ALL	1ST
-22981.33590	-19283.62500	0.70586	400.00	1-HR	ALL	1ST
-30641.78130	-25711.50000	0.49958	400.00	1-HR	ALL	1ST
-38302.22660	-32139.37700	0.35612	380.00	1-HR	ALL	1ST
-86.60255	-49.99999	0.36072	213.40	1-HR	ALL	1ST
-173.20509	-99.99998	0.30806	213.40	1-HR	ALL	1ST
-259.80765	-149.99997	0.30228	213.40	1-HR	ALL	1ST
-346.41019	-199.99994	0.23202	207.30	1-HR	ALL	1ST
-433.01276	-249.99994	0.19677	213.40	1-HR	ALL	1ST
-519.61530	-299.99991	0.20100	213.40	1-HR	ALL	1ST
-606.21783	-349.99991	0.11360	213.40	1-HR	ALL	1ST
-692.82037	-399.99988	0.12402	213.40	1-HR	ALL	1ST
-779.42297	-449.99988	0.20287	213.40	1-HR	ALL	1ST
-866.02551	-499.99988	0.23053	213.40	1-HR	ALL	1ST
-1082.53186	-624.99988	0.29869	225.60	1-HR	ALL	1ST
-1299.03833	-749.99988	0.68257	274.30	1-HR	ALL	1ST
-1515.54456	-874.99982	5.80748	329.20	1-HR	ALL	1ST
-1732.05090	-999.99982	2.85526	310.90	1-HR	ALL	1ST
-1948.55725	-1124.99976	1.02760	286.50	1-HR	ALL	1ST
-2165.06372	-1249.99976	0.47127	256.00	1-HR	ALL	1ST
-2598.07666	-1499.99976	0.61170	243.80	1-HR	ALL	1ST
-3464.10181	-1999.99963	6.05994	365.80	1-HR	ALL	1ST
-4330.12744	-2499.99951	5.13877	372.50	1-HR	ALL	1ST
-6495.19092	-3749.99927	3.36742	378.00	1-HR	ALL	1ST
-8660.25488	-4999.99854	2.81302	402.30	1-HR	ALL	1ST
-12990.38180	-7499.99805	1.22740	360.00	1-HR	ALL	1ST
-17320.50980	-9999.99805	1.05474	380.00	1-HR	ALL	1ST

-25980.76370	-14999.99710	0.65071	380.00	1-HR	ALL	1ST
-34641.01950	-19999.99610	0.50114	400.00	1-HR	ALL	1ST
-43301.27340	-24999.99410	0.38787	360.00	1-HR	ALL	1ST
-93.96926	-34.20201	0.34193	213.40	1-HR	ALL	1ST
-187.93851	-68.40401	0.27758	213.40	1-HR	ALL	1ST
-281.90778	-102.60602	0.30064	213.40	1-HR	ALL	1ST
-375.87701	-136.80803	0.24210	213.40	1-HR	ALL	1ST
-469.84631	-171.01004	0.23461	213.40	1-HR	ALL	1ST
-563.81561	-205.21204	0.15763	213.40	1-HR	ALL	1ST
-657.78491	-239.41403	0.08975	213.40	1-HR	ALL	1ST
-751.75409	-273.61609	0.12425	219.50	1-HR	ALL	1ST
-845.72339	-307.81805	0.16871	219.50	1-HR	ALL	1ST
-939.69263	-342.02008	0.20034	213.40	1-HR	ALL	1ST
-1174.61584	-427.52509	23.57302	353.60	1-HR	ALL	1ST
-1409.53894	-513.03009	17.52369	353.60	1-HR	ALL	1ST
-1644.46216	-598.53516	10.52689	341.40	1-HR	ALL	1ST
-1879.38525	-684.04016	7.80677	335.30	1-HR	ALL	1ST
-2114.30835	-769.54517	11.15181	353.60	1-HR	ALL	1ST
-2349.23145	-855.05017	2.12495	304.80	1-HR	ALL	1ST
-2819.07788	-1026.06030	0.85507	243.80	1-HR	ALL	1ST
-3758.77051	-1368.08020	1.22027	298.70	1-HR	ALL	1ST
-4698.46338	-1710.10022	4.52741	359.70	1-HR	ALL	1ST
-7047.69482	-2565.15039	2.97962	365.80	1-HR	ALL	1ST
-9396.92676	-3420.20044	3.34343	402.30	1-HR	ALL	1ST
-14095.38960	-5130.30029	1.78258	380.00	1-HR	ALL	1ST
-18793.85550	-6840.40137	1.37034	400.00	1-HR	ALL	1ST
-28190.77930	-10260.60160	0.76916	380.00	1-HR	ALL	1ST
-37587.70700	-13680.80270	0.58259	400.00	1-HR	ALL	1ST
-46984.63670	-17101.00390	0.37647	360.00	1-HR	ALL	1ST
-98.48077	-17.36481	0.32349	213.40	1-HR	ALL	1ST
-196.96155	-34.72963	0.23298	213.40	1-HR	ALL	1ST
-295.44235	-52.09444	0.26115	213.40	1-HR	ALL	1ST
-393.92307	-69.45926	0.25437	213.40	1-HR	ALL	1ST
-492.40384	-86.82407	0.18446	213.40	1-HR	ALL	1ST
-590.88470	-104.18888	0.11117	213.40	1-HR	ALL	1ST
-689.36542	-121.55370	0.08299	213.40	1-HR	ALL	1ST
-787.84613	-138.91849	0.05333	219.50	1-HR	ALL	1ST
-886.32697	-156.28334	0.17726	225.60	1-HR	ALL	1ST
-984.80774	-173.64813	30.73858	310.90	1-HR	ALL	1ST
-1231.00964	-217.06018	39.06137	359.70	1-HR	ALL	1ST
-1477.21167	-260.47223	29.75858	359.70	1-HR	ALL	1ST
-1723.41370	-303.88422	24.42535	365.80	1-HR	ALL	1ST
-1969.61548	-347.29630	24.63006	371.90	1-HR	ALL	1ST
-2215.81738	-390.70831	18.22574	353.60	1-HR	ALL	1ST
-2462.01929	-434.12033	21.34521	371.90	1-HR	ALL	1ST
-2954.42310	-520.94446	11.89429	353.60	1-HR	ALL	1ST
-3939.23096	-694.59253	9.83305	365.80	1-HR	ALL	1ST
-4924.03809	-868.24066	7.30066	365.80	1-HR	ALL	1ST
-7386.05762	-1302.36096	5.14318	390.10	1-HR	ALL	1ST
-9848.07715	-1736.48120	2.16896	339.90	1-HR	ALL	1ST
-14772.11520	-2604.72192	1.73067	360.00	1-HR	ALL	1ST
-19696.15430	-3472.96240	1.37949	380.00	1-HR	ALL	1ST
-29544.23050	-5209.44385	0.82775	420.00	1-HR	ALL	1ST
-39392.30860	-6945.92480	0.60091	400.00	1-HR	ALL	1ST
-49240.38670	-8682.40625	0.47073	400.00	1-HR	ALL	1ST
-100.00000	0.00000	0.30609	213.40	1-HR	ALL	1ST
-200.00000	0.00000	0.19980	213.40	1-HR	ALL	1ST
-300.00000	0.00000	0.18474	213.40	1-HR	ALL	1ST
-400.00000	0.00000	0.17931	213.40	1-HR	ALL	1ST
-500.00000	0.00001	0.15481	213.40	1-HR	ALL	1ST
-600.00000	0.00001	0.11702	213.40	1-HR	ALL	1ST
-700.00000	0.00001	0.04870	213.40	1-HR	ALL	1ST
-800.00000	0.00001	0.02153	213.40	1-HR	ALL	1ST

-900.00000	0.00001	0.61109	243.80	1-HR	ALL	1ST
-1000.00000	0.00001	102.67791	298.70	1-HR	ALL	1ST
-1250.00000	0.00001	11.27636	304.80	1-HR	ALL	1ST
-1500.00000	0.00002	7.64968	304.80	1-HR	ALL	1ST
-1750.00000	0.00002	18.61171	335.30	1-HR	ALL	1ST
-2000.00000	0.00002	16.82258	341.40	1-HR	ALL	1ST
-2250.00000	0.00003	26.26138	371.90	1-HR	ALL	1ST
-2500.00000	0.00003	21.94983	371.90	1-HR	ALL	1ST
-3000.00000	0.00004	16.40848	371.90	1-HR	ALL	1ST
-4000.00000	0.00005	11.44995	378.00	1-HR	ALL	1ST
-5000.00000	0.00006	7.90828	371.90	1-HR	ALL	1ST
-7500.00000	0.00009	4.61813	371.90	1-HR	ALL	1ST
-10000.00000	0.00012	2.85313	360.00	1-HR	ALL	1ST
-15000.00000	0.00018	1.39252	340.00	1-HR	ALL	1ST
-20000.00000	0.00024	1.22709	360.00	1-HR	ALL	1ST
-30000.00000	0.00036	0.83216	380.00	1-HR	ALL	1ST
-40000.00000	0.00048	0.58564	380.00	1-HR	ALL	1ST
-50000.00000	0.00060	0.45712	400.00	1-HR	ALL	1ST
-98.48077	17.36481	0.29029	213.40	1-HR	ALL	1ST
-196.96155	34.72963	0.17685	213.40	1-HR	ALL	1ST
-295.44235	52.09445	0.17193	213.40	1-HR	ALL	1ST
-393.92307	69.45927	0.15816	213.40	1-HR	ALL	1ST
-492.40384	86.82407	0.11901	213.40	1-HR	ALL	1ST
-590.88470	104.18890	0.24290	225.60	1-HR	ALL	1ST
-689.36542	121.55371	0.09810	225.60	1-HR	ALL	1ST
-787.84613	138.91850	0.39948	237.70	1-HR	ALL	1ST
-886.32697	156.28336	1.11855	243.80	1-HR	ALL	1ST
-984.80774	173.64815	58.00135	280.40	1-HR	ALL	1ST
-1231.00964	217.06020	23.04494	317.00	1-HR	ALL	1ST
-1477.21167	260.47226	5.07005	304.80	1-HR	ALL	1ST
-1723.41370	303.88428	2.77523	298.70	1-HR	ALL	1ST
-1969.61548	347.29633	11.35851	341.40	1-HR	ALL	1ST
-2215.81738	390.70834	17.64771	371.90	1-HR	ALL	1ST
-2462.01929	434.12039	10.66911	353.60	1-HR	ALL	1ST
-2954.42310	520.94452	11.35334	365.80	1-HR	ALL	1ST
-3939.23096	694.59259	6.09606	353.60	1-HR	ALL	1ST
-4924.03809	868.24072	6.66010	378.00	1-HR	ALL	1ST
-7386.05762	1302.36133	4.12978	384.00	1-HR	ALL	1ST
-9848.07715	1736.48157	2.94577	389.20	1-HR	ALL	1ST
-14772.11520	2604.72241	1.82016	400.00	1-HR	ALL	1ST
-19696.15430	3472.96289	1.31141	420.00	1-HR	ALL	1ST
-29544.23050	5209.44482	0.70949	380.00	1-HR	ALL	1ST
-39392.30860	6945.92578	0.50243	380.00	1-HR	ALL	1ST
-49240.38670	8682.40820	0.41544	400.00	1-HR	ALL	1ST
-93.96926	34.20201	0.27655	213.40	1-HR	ALL	1ST
-187.93851	68.40401	0.22452	213.40	1-HR	ALL	1ST
-281.90778	102.60603	0.22175	213.40	1-HR	ALL	1ST
-375.87701	136.80803	0.22916	219.50	1-HR	ALL	1ST
-469.84631	171.01004	0.32701	225.60	1-HR	ALL	1ST
-563.81561	205.21204	0.22276	225.60	1-HR	ALL	1ST
-657.78491	239.41405	1.55947	243.80	1-HR	ALL	1ST
-751.75409	273.61609	7.63906	274.30	1-HR	ALL	1ST
-845.72339	307.81808	6.42292	286.50	1-HR	ALL	1ST
-939.69263	342.02008	10.99466	298.70	1-HR	ALL	1ST
-1174.61584	427.52512	15.03052	317.00	1-HR	ALL	1ST
-1409.53894	513.03021	5.45310	298.70	1-HR	ALL	1ST
-1644.46216	598.53522	4.21474	298.70	1-HR	ALL	1ST
-1879.38525	684.04016	18.63396	359.70	1-HR	ALL	1ST
-2114.30835	769.54517	21.22736	384.00	1-HR	ALL	1ST
-2349.23145	855.05017	16.85374	378.00	1-HR	ALL	1ST
-2819.07788	1026.06030	12.63549	378.00	1-HR	ALL	1ST
-3758.77051	1368.08020	8.27160	378.00	1-HR	ALL	1ST
-4698.46338	1710.10034	6.06803	378.00	1-HR	ALL	1ST

-7047.69482	2565.15063	2.70285	371.90	1-HR	ALL	1ST
-9396.92676	3420.20093	2.30539	424.90	1-HR	ALL	1ST
-14095.38960	5130.30078	1.35730	420.00	1-HR	ALL	1ST
-18793.85550	6840.40186	0.71762	360.00	1-HR	ALL	1ST
-28190.77930	10260.60250	0.53734	400.00	1-HR	ALL	1ST
-37587.70700	13680.80370	0.34155	380.00	1-HR	ALL	1ST
-46984.63670	17101.00390	0.29475	400.00	1-HR	ALL	1ST
-86.60255	49.99999	0.26518	213.40	1-HR	ALL	1ST
-173.20509	99.99998	0.24978	213.40	1-HR	ALL	1ST
-259.80765	149.99997	0.25725	219.50	1-HR	ALL	1ST
-346.41019	199.99997	0.52660	231.60	1-HR	ALL	1ST
-433.01276	249.99994	0.28145	225.60	1-HR	ALL	1ST
-519.61530	299.99991	0.50071	231.60	1-HR	ALL	1ST
-606.21783	349.99991	2.31977	268.20	1-HR	ALL	1ST
-692.82037	399.99991	12.56153	304.80	1-HR	ALL	1ST
-779.42297	449.99991	8.51044	310.90	1-HR	ALL	1ST
-866.02551	499.99988	5.98353	304.80	1-HR	ALL	1ST
-1082.53186	624.99988	4.29002	292.60	1-HR	ALL	1ST
-1299.03833	749.99988	11.30454	323.10	1-HR	ALL	1ST
-1515.54456	874.99988	20.21211	359.70	1-HR	ALL	1ST
-1732.05090	999.99982	21.06346	371.90	1-HR	ALL	1ST
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-2165.06372	1249.99976	16.60686	378.00	1-HR	ALL	1ST
-2598.07666	1499.99976	12.78313	378.00	1-HR	ALL	1ST
-3464.10181	1999.99963	8.07451	378.00	1-HR	ALL	1ST
-4330.12744	2499.99951	6.21558	384.00	1-HR	ALL	1ST
-6495.19092	3749.99951	3.60204	384.00	1-HR	ALL	1ST
-8660.25488	4999.99854	2.36595	426.70	1-HR	ALL	1ST
-12990.38180	7499.99854	1.48311	400.00	1-HR	ALL	1ST
-17320.50980	9999.99805	1.02835	400.00	1-HR	ALL	1ST
-25980.76370	14999.99800	0.58675	420.00	1-HR	ALL	1ST
-34641.01950	19999.99610	0.43252	400.00	1-HR	ALL	1ST
-43301.27340	24999.99610	0.35588	350.00	1-HR	ALL	1ST
-76.60445	64.27876	0.25639	213.40	1-HR	ALL	1ST
-153.20891	128.55751	0.24495	213.40	1-HR	ALL	1ST
-229.81335	192.83626	0.38743	225.60	1-HR	ALL	1ST
-306.41782	257.11499	0.38003	231.60	1-HR	ALL	1ST
-383.02228	321.39374	0.39852	225.60	1-HR	ALL	1ST
-459.62671	385.67255	0.69673	231.60	1-HR	ALL	1ST
-536.23120	449.95126	1.79918	268.20	1-HR	ALL	1ST
-612.83563	514.22998	9.03989	304.80	1-HR	ALL	1ST
-689.44006	578.50873	8.15023	316.40	1-HR	ALL	1ST
-766.04449	642.78760	7.73161	317.00	1-HR	ALL	1ST
-957.55566	803.48444	5.19352	304.80	1-HR	ALL	1ST
-1149.06689	964.18121	14.63228	341.40	1-HR	ALL	1ST
-1340.57788	1124.87830	14.20238	353.60	1-HR	ALL	1ST
-1532.08899	1285.57507	16.35767	365.80	1-HR	ALL	1ST
-1723.60022	1446.27173	16.28965	371.90	1-HR	ALL	1ST
-1915.11121	1606.96887	15.55074	378.00	1-HR	ALL	1ST
-2298.13354	1928.36255	13.14836	384.00	1-HR	ALL	1ST
-3064.17822	2571.15015	6.27995	359.70	1-HR	ALL	1ST
-3830.22241	3213.93750	6.76263	384.00	1-HR	ALL	1ST
-5745.33350	4820.90576	3.83759	378.00	1-HR	ALL	1ST
-7660.44531	6427.87451	2.73596	379.20	1-HR	ALL	1ST
-11490.66700	9641.81250	1.39739	360.00	1-HR	ALL	1ST
-15320.89060	12855.75000	1.30532	400.00	1-HR	ALL	1ST
-22981.33590	19283.62500	0.79059	400.00	1-HR	ALL	1ST
-30641.78130	25711.50000	0.55817	400.00	1-HR	ALL	1ST
-38302.22660	32139.37700	0.38014	370.00	1-HR	ALL	1ST
-64.27877	76.60442	0.25132	213.40	1-HR	ALL	1ST
-128.55756	153.20885	0.37290	225.60	1-HR	ALL	1ST
-192.83632	229.81332	0.51027	231.60	1-HR	ALL	1ST
-257.11511	306.41772	0.37028	231.60	1-HR	ALL	1ST

-321.39383	383.02216	0.38429	225.60	1-HR	ALL	1ST
-385.67267	459.62665	0.73814	231.60	1-HR	ALL	1ST
-449.95142	536.23102	1.48122	274.30	1-HR	ALL	1ST
-514.23022	612.83551	7.38822	304.80	1-HR	ALL	1ST
-578.50897	689.43988	3.96963	310.90	1-HR	ALL	1ST
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-803.48474	957.55542	5.33894	317.00	1-HR	ALL	1ST
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-1124.87854	1340.57751	12.62711	353.60	1-HR	ALL	1ST
-1285.57532	1532.08862	10.85368	353.60	1-HR	ALL	1ST
-1446.27222	1723.59973	10.94782	359.70	1-HR	ALL	1ST
-1606.96936	1915.11084	10.99058	365.80	1-HR	ALL	1ST
-1928.36328	2298.13306	11.80894	384.00	1-HR	ALL	1ST
-2571.15088	3064.17749	8.64943	384.00	1-HR	ALL	1ST
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-12855.75490	15320.88670	1.29685	400.00	1-HR	ALL	1ST
-19283.63090	22981.33010	0.78718	400.00	1-HR	ALL	1ST
-25711.50980	30641.77340	0.63766	360.00	1-HR	ALL	1ST
-32139.38670	38302.21880	0.57366	360.00	1-HR	ALL	1ST
-50.00002	86.60253	0.26007	213.40	1-HR	ALL	1ST
-100.00003	173.20506	0.35202	225.60	1-HR	ALL	1ST
-150.00005	259.80756	0.47222	231.60	1-HR	ALL	1ST
-200.00006	346.41013	0.42356	231.60	1-HR	ALL	1ST
-250.00009	433.01270	0.38405	225.60	1-HR	ALL	1ST
-300.00009	519.61517	1.12187	243.80	1-HR	ALL	1ST
-350.00012	606.21771	1.26270	249.90	1-HR	ALL	1ST
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-450.00015	779.42279	6.07098	304.80	1-HR	ALL	1ST
-500.00018	866.02533	2.61061	304.80	1-HR	ALL	1ST
-625.00024	1082.53162	1.14350	286.50	1-HR	ALL	1ST
-750.00024	1299.03784	6.37388	329.20	1-HR	ALL	1ST
-875.00031	1515.54431	10.03524	347.50	1-HR	ALL	1ST
-1000.00037	1732.05066	9.18170	353.60	1-HR	ALL	1ST
-1125.00037	1948.55701	7.92651	353.60	1-HR	ALL	1ST
-1250.00049	2165.06323	9.35033	384.00	1-HR	ALL	1ST
-1500.00049	2598.07593	11.11055	384.00	1-HR	ALL	1ST
-2000.00073	3464.10132	7.92565	384.00	1-HR	ALL	1ST
-2500.00098	4330.12646	5.68018	378.00	1-HR	ALL	1ST
-3750.00122	6495.18994	3.04864	365.80	1-HR	ALL	1ST
-5000.00195	8660.25293	2.38825	371.90	1-HR	ALL	1ST
-7500.00244	12990.37990	1.32433	360.00	1-HR	ALL	1ST
-10000.00390	17320.50590	0.99726	360.00	1-HR	ALL	1ST
-15000.00490	25980.75980	0.52098	340.00	1-HR	ALL	1ST
-20000.00780	34641.01170	0.51678	380.00	1-HR	ALL	1ST
-25000.00780	43301.26170	0.40135	350.00	1-HR	ALL	1ST
-34.20204	93.96925	0.26499	213.40	1-HR	ALL	1ST
-68.40408	187.93851	0.34356	225.60	1-HR	ALL	1ST
-102.60610	281.90778	0.35157	225.60	1-HR	ALL	1ST
-136.80815	375.87698	0.33849	225.60	1-HR	ALL	1ST
-171.01018	469.84631	0.37139	225.60	1-HR	ALL	1ST
-205.21220	563.81555	0.97750	243.80	1-HR	ALL	1ST
-239.41423	657.78479	0.98373	262.10	1-HR	ALL	1ST
-273.61633	751.75403	2.66439	286.50	1-HR	ALL	1ST
-307.81833	845.72327	1.44381	280.40	1-HR	ALL	1ST
-342.02036	939.69257	2.72251	292.60	1-HR	ALL	1ST
-427.52545	1174.61572	5.24013	323.10	1-HR	ALL	1ST
-513.03052	1409.53894	11.87981	353.60	1-HR	ALL	1ST
-598.53571	1644.46191	12.02114	359.70	1-HR	ALL	1ST
-684.04065	1879.38513	10.61821	359.70	1-HR	ALL	1ST
-769.54584	2114.30811	4.87317	329.20	1-HR	ALL	1ST

-855.05090	2349.23145	6.00507	347.50	1-HR	ALL	1ST
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-1368.08130	3758.77026	5.26502	385.00	1-HR	ALL	1ST
-1710.10181	4698.46289	5.05579	371.90	1-HR	ALL	1ST
-2565.15283	7047.69385	1.51796	329.20	1-HR	ALL	1ST
-3420.20337	9396.92578	1.71593	349.00	1-HR	ALL	1ST
-5130.30518	14095.38770	1.31072	360.00	1-HR	ALL	1ST
-6840.40674	18793.85350	0.96014	360.00	1-HR	ALL	1ST
-10260.61040	28190.77540	0.54107	340.00	1-HR	ALL	1ST
-13680.81450	37587.70310	0.48135	370.00	1-HR	ALL	1ST
-17101.01760	46984.62890	0.32325	350.00	1-HR	ALL	1ST
-17.36484	98.48077	0.26755	213.40	1-HR	ALL	1ST
-34.72969	196.96155	0.34247	225.60	1-HR	ALL	1ST
-52.09453	295.44235	0.34539	225.60	1-HR	ALL	1ST
-69.45937	393.92307	0.31623	225.60	1-HR	ALL	1ST
-86.82422	492.40381	0.38416	225.60	1-HR	ALL	1ST
-104.18906	590.88470	0.77512	243.80	1-HR	ALL	1ST
-121.55391	689.36542	0.97966	262.10	1-HR	ALL	1ST
-138.91873	787.84613	3.52680	292.60	1-HR	ALL	1ST
-156.28360	886.32697	4.63940	298.70	1-HR	ALL	1ST
-173.64844	984.80768	3.76347	298.70	1-HR	ALL	1ST
-217.06055	1231.00964	11.53791	335.30	1-HR	ALL	1ST
-260.47269	1477.21143	14.17996	365.80	1-HR	ALL	1ST
-303.88474	1723.41345	10.98341	359.70	1-HR	ALL	1ST
-347.29691	1969.61523	9.79691	359.70	1-HR	ALL	1ST
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-434.12109	2462.01929	11.07024	378.00	1-HR	ALL	1ST
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-1302.36353	7386.05713	1.43443	341.40	1-HR	ALL	1ST
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-0.00015	500.00000	0.38591	225.60	1-HR	ALL	1ST
-0.00018	600.00000	0.54373	237.70	1-HR	ALL	1ST
-0.00021	700.00000	0.88000	256.00	1-HR	ALL	1ST
-0.00024	800.00000	1.56852	280.40	1-HR	ALL	1ST
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-0.00045	1500.00000	6.68559	323.10	1-HR	ALL	1ST
-0.00053	1750.00000	4.83731	341.40	1-HR	ALL	1ST
-0.00060	2000.00000	2.67474	317.00	1-HR	ALL	1ST
-0.00068	2250.00000	8.25474	359.70	1-HR	ALL	1ST
-0.00075	2500.00000	7.53438	359.70	1-HR	ALL	1ST
-0.00091	3000.00000	8.70597	378.00	1-HR	ALL	1ST
-0.00121	4000.00000	6.97202	383.40	1-HR	ALL	1ST
-0.00151	5000.00000	3.94968	359.70	1-HR	ALL	1ST
-0.00226	7500.00000	3.12449	371.90	1-HR	ALL	1ST
-0.00302	10000.00000	2.49004	380.10	1-HR	ALL	1ST
-0.00453	15000.00000	1.14165	360.00	1-HR	ALL	1ST
-0.00604	20000.00000	0.50949	340.00	1-HR	ALL	1ST
-0.00906	30000.00000	0.54475	380.00	1-HR	ALL	1ST
-0.01208	40000.00000	0.30209	350.00	1-HR	ALL	1ST
-0.01510	50000.00000	0.27912	350.00	1-HR	ALL	1ST

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* ISCST2 (94227):  WTI Truck Accident Off-Site, ISCOMDEP -- OFFSITE
* MODELING OPTIONS USED:
*  CONC   RURAL  ELEV                  GRDRIS NOSTD

*         PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL
*         FOR A TOTAL OF   936 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,2X,A6,2X,A8,2X,I8)
*        X             Y             CONC        ZELEV     AVE      GRP      NUM HRS
*
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X	Y	CONC	ZELEV	AVE	GRP	NUM HRS
17.36482	98.48077	0.00119	213.40	PERIOD	ALL	8760
34.72963	196.96155	0.00207	225.60	PERIOD	ALL	8760
52.09445	295.44235	0.00195	225.60	PERIOD	ALL	8760
69.45927	393.92307	0.00187	225.60	PERIOD	ALL	8760
86.82409	492.40384	0.00193	225.60	PERIOD	ALL	8760
104.18890	590.88470	0.00210	225.60	PERIOD	ALL	8760
121.55373	689.36542	0.00500	243.80	PERIOD	ALL	8760
138.91852	787.84613	0.00827	256.00	PERIOD	ALL	8760
156.28337	886.32697	0.01379	280.40	PERIOD	ALL	8760
173.64818	984.80774	0.01560	286.50	PERIOD	ALL	8760
217.06021	1231.00964	0.06360	353.60	PERIOD	ALL	8760
260.47229	1477.21167	0.04269	353.60	PERIOD	ALL	8760
303.88428	1723.41370	0.01242	310.90	PERIOD	ALL	8760
347.29639	1969.61548	0.02092	347.50	PERIOD	ALL	8760
390.70837	2215.81738	0.02022	353.60	PERIOD	ALL	8760
434.12042	2462.01929	0.01824	359.70	PERIOD	ALL	8760
520.94452	2954.42310	0.01368	347.50	PERIOD	ALL	8760
694.59271	3939.23096	0.01053	341.40	PERIOD	ALL	8760
868.24084	4924.03809	0.00938	341.40	PERIOD	ALL	8760
1302.36133	7386.05762	0.00856	365.80	PERIOD	ALL	8760
1736.48169	9848.07715	0.00615	360.00	PERIOD	ALL	8760
2604.72241	14772.11520	0.00361	340.00	PERIOD	ALL	8760
3472.96313	19696.15430	0.00269	340.00	PERIOD	ALL	8760
5209.44531	29544.23050	0.00187	360.00	PERIOD	ALL	8760
6945.92627	39392.30860	0.00134	350.00	PERIOD	ALL	8760
8682.40820	49240.38670	0.00109	360.00	PERIOD	ALL	8760
34.20201	93.96926	0.00121	213.40	PERIOD	ALL	8760
68.40403	187.93851	0.00210	225.60	PERIOD	ALL	8760
102.60603	281.90778	0.00198	225.60	PERIOD	ALL	8760
136.80806	375.87701	0.00187	225.60	PERIOD	ALL	8760
171.01007	469.84631	0.00185	225.60	PERIOD	ALL	8760
205.21207	563.81555	0.00197	225.60	PERIOD	ALL	8760
239.41408	657.78491	0.00359	237.70	PERIOD	ALL	8760
273.61615	751.75409	0.00514	243.80	PERIOD	ALL	8760
307.81812	845.72339	0.00874	256.00	PERIOD	ALL	8760
342.02011	939.69263	0.01711	286.50	PERIOD	ALL	8760
427.52518	1174.61572	0.04696	329.20	PERIOD	ALL	8760
513.03021	1409.53894	0.05825	347.50	PERIOD	ALL	8760
598.53522	1644.46204	0.03797	335.30	PERIOD	ALL	8760
684.04022	1879.38525	0.03427	347.50	PERIOD	ALL	8760
769.54523	2114.30835	0.02760	353.60	PERIOD	ALL	8760
855.05035	2349.23145	0.02720	359.70	PERIOD	ALL	8760
1026.06042	2819.07788	0.02144	362.40	PERIOD	ALL	8760
1368.08057	3758.77051	0.00999	329.20	PERIOD	ALL	8760
1710.10071	4698.46289	0.01111	359.70	PERIOD	ALL	8760
2565.15112	7047.69482	0.00855	369.70	PERIOD	ALL	8760
3420.20142	9396.92578	0.00779	385.90	PERIOD	ALL	8760
5130.30176	14095.38960	0.00419	340.00	PERIOD	ALL	8760
6840.40283	18793.85350	0.00318	340.00	PERIOD	ALL	8760
10260.60450	28190.77930	0.00231	360.00	PERIOD	ALL	8760
13680.80570	37587.70310	0.00178	380.00	PERIOD	ALL	8760
17101.00590	46984.63670	0.00144	390.00	PERIOD	ALL	8760
50.00000	86.60254	0.00123	213.40	PERIOD	ALL	8760
100.00000	173.20508	0.00160	219.50	PERIOD	ALL	8760

150.00000	259.80762	0.00201	225.60	PERIOD	ALL	8760
200.00000	346.41016	0.00191	225.60	PERIOD	ALL	8760
250.00000	433.01273	0.00187	225.60	PERIOD	ALL	8760
300.00000	519.61517	0.00192	225.60	PERIOD	ALL	8760
350.00000	606.21777	0.00214	225.60	PERIOD	ALL	8760
400.00000	692.82031	0.00303	231.60	PERIOD	ALL	8760
450.00000	779.42291	0.00530	243.80	PERIOD	ALL	8760
500.00000	866.02539	0.00950	262.10	PERIOD	ALL	8760
625.00000	1082.53174	0.00374	225.60	PERIOD	ALL	8760
750.00000	1299.03821	0.06222	347.50	PERIOD	ALL	8760
875.00000	1515.54443	0.06612	359.70	PERIOD	ALL	8760
1000.00000	1732.05090	0.05434	353.60	PERIOD	ALL	8760
1125.00000	1948.55713	0.04729	353.60	PERIOD	ALL	8760
1250.00000	2165.06348	0.03102	329.20	PERIOD	ALL	8760
1500.00000	2598.07617	0.02198	323.10	PERIOD	ALL	8760
2000.00000	3464.10156	0.02231	361.20	PERIOD	ALL	8760
2500.00000	4330.12695	0.01692	366.70	PERIOD	ALL	8760
3750.00000	6495.19043	0.01208	378.00	PERIOD	ALL	8760
5000.00000	8660.25391	0.00847	396.20	PERIOD	ALL	8760
7500.00000	12990.38090	0.00436	320.00	PERIOD	ALL	8760
10000.00000	17320.50780	0.00361	360.00	PERIOD	ALL	8760
15000.00000	25980.76170	0.00240	380.00	PERIOD	ALL	8760
20000.00000	34641.01560	0.00181	370.00	PERIOD	ALL	8760
25000.00000	43301.26560	0.00145	400.00	PERIOD	ALL	8760
64.27876	76.60445	0.00125	213.40	PERIOD	ALL	8760
128.55754	153.20888	0.00124	213.40	PERIOD	ALL	8760
192.83627	229.81335	0.00207	225.60	PERIOD	ALL	8760
257.11508	306.41779	0.00201	225.60	PERIOD	ALL	8760
321.39377	383.02225	0.00198	225.60	PERIOD	ALL	8760
385.67258	459.62671	0.00205	225.60	PERIOD	ALL	8760
449.95132	536.23120	0.00218	225.60	PERIOD	ALL	8760
514.23016	612.83557	0.00235	225.60	PERIOD	ALL	8760
578.50885	689.44000	0.00257	225.60	PERIOD	ALL	8760
642.78766	766.04443	0.00529	243.80	PERIOD	ALL	8760
803.48456	957.55554	0.01397	280.40	PERIOD	ALL	8760
964.18140	1149.06665	0.06933	353.60	PERIOD	ALL	8760
1124.87830	1340.57764	0.07158	361.50	PERIOD	ALL	8760
1285.57520	1532.08899	0.05866	353.60	PERIOD	ALL	8760
1446.27197	1723.59998	0.05599	353.60	PERIOD	ALL	8760
1606.96912	1915.11108	0.05104	353.60	PERIOD	ALL	8760
1928.36292	2298.13330	0.03614	335.30	PERIOD	ALL	8760
2571.15039	3064.17798	0.03260	353.90	PERIOD	ALL	8760
3213.93799	3830.22192	0.02655	353.00	PERIOD	ALL	8760
4820.90625	5745.33301	0.01971	378.00	PERIOD	ALL	8760
6427.87549	7660.44434	0.01550	398.40	PERIOD	ALL	8760
9641.81250	11490.66600	0.00936	376.00	PERIOD	ALL	8760
12855.75200	15320.88870	0.00650	380.00	PERIOD	ALL	8760
19283.62700	22981.33400	0.00386	360.00	PERIOD	ALL	8760
25711.50390	30641.77730	0.00278	420.00	PERIOD	ALL	8760
32139.37890	38302.22270	0.00214	420.00	PERIOD	ALL	8760
76.60445	64.27876	0.00127	213.40	PERIOD	ALL	8760
153.20888	128.55754	0.00098	207.30	PERIOD	ALL	8760
229.81335	192.83629	0.00127	213.40	PERIOD	ALL	8760
306.41779	257.11508	0.00166	219.50	PERIOD	ALL	8760
383.02225	321.39377	0.00170	219.50	PERIOD	ALL	8760
459.62671	385.67261	0.00179	219.50	PERIOD	ALL	8760
536.23120	449.95132	0.00190	219.50	PERIOD	ALL	8760
612.83557	514.23016	0.00201	219.50	PERIOD	ALL	8760
689.44000	578.50885	0.00263	225.60	PERIOD	ALL	8760
766.04443	642.78766	0.00230	219.50	PERIOD	ALL	8760
957.55554	803.48456	0.00271	219.50	PERIOD	ALL	8760
1149.06665	964.18140	0.03282	323.10	PERIOD	ALL	8760
1340.57764	1124.87830	0.05449	353.60	PERIOD	ALL	8760

1532.08899	1285.57520	0.05026	353.60	PERIOD	ALL	8760
1723.59998	1446.27197	0.03801	335.30	PERIOD	ALL	8760
1915.11108	1606.96912	0.04494	347.50	PERIOD	ALL	8760
2298.13330	1928.36292	0.04183	347.50	PERIOD	ALL	8760
3064.17798	2571.15039	0.03345	341.40	PERIOD	ALL	8760
3830.22192	3213.93799	0.02669	335.30	PERIOD	ALL	8760
5745.33301	4820.90674	0.02484	373.10	PERIOD	ALL	8760
7660.44434	6427.87549	0.01910	396.20	PERIOD	ALL	8760
11490.66600	9641.81348	0.01182	360.00	PERIOD	ALL	8760
15320.88870	12855.75200	0.00949	380.00	PERIOD	ALL	8760
22981.33400	19283.62700	0.00593	380.00	PERIOD	ALL	8760
30641.77730	25711.50390	0.00405	420.00	PERIOD	ALL	8760
38302.22270	32139.38090	0.00297	420.00	PERIOD	ALL	8760
86.60254	50.00000	0.00129	213.40	PERIOD	ALL	8760
173.20508	99.99999	0.00102	207.30	PERIOD	ALL	8760
259.80762	150.00000	0.00104	207.30	PERIOD	ALL	8760
346.41016	199.99997	0.00087	201.20	PERIOD	ALL	8760
433.01273	249.99997	0.00118	207.30	PERIOD	ALL	8760
519.61517	300.00000	0.00158	213.40	PERIOD	ALL	8760
606.21777	349.99994	0.00169	213.40	PERIOD	ALL	8760
692.82031	399.99994	0.00181	213.40	PERIOD	ALL	8760
779.42291	449.99994	0.00193	213.40	PERIOD	ALL	8760
866.02539	499.99994	0.00249	219.50	PERIOD	ALL	8760
1082.53174	625.00000	0.00336	225.60	PERIOD	ALL	8760
1299.03821	750.00000	0.00315	219.50	PERIOD	ALL	8760
1515.54443	875.00000	0.00632	243.80	PERIOD	ALL	8760
1732.05090	1000.00000	0.01629	292.60	PERIOD	ALL	8760
1948.55725	1125.00000	0.02254	310.90	PERIOD	ALL	8760
2165.06348	1250.00000	0.02680	323.10	PERIOD	ALL	8760
2598.07617	1500.00000	0.02348	317.00	PERIOD	ALL	8760
3464.10156	2000.00000	0.02227	323.10	PERIOD	ALL	8760
4330.12695	2499.99976	0.02923	359.70	PERIOD	ALL	8760
6495.19043	3749.99976	0.02324	378.90	PERIOD	ALL	8760
8660.25391	4999.99902	0.01981	408.70	PERIOD	ALL	8760
12990.38090	7499.99902	0.01295	380.00	PERIOD	ALL	8760
17320.50780	9999.99902	0.00905	360.00	PERIOD	ALL	8760
25980.76170	14999.99900	0.00619	380.00	PERIOD	ALL	8760
34641.01560	19999.99800	0.00438	380.00	PERIOD	ALL	8760
43301.26560	24999.99800	0.00329	420.00	PERIOD	ALL	8760
93.96926	34.20201	0.00100	207.30	PERIOD	ALL	8760
187.93851	68.40403	0.00082	201.20	PERIOD	ALL	8760
281.90778	102.60603	0.00092	202.70	PERIOD	ALL	8760
375.87701	136.80806	0.00100	202.70	PERIOD	ALL	8760
469.84631	171.01007	0.00129	207.30	PERIOD	ALL	8760
563.81555	205.21207	0.00140	207.30	PERIOD	ALL	8760
657.78491	239.41411	0.00152	207.30	PERIOD	ALL	8760
751.75409	273.61615	0.00200	213.40	PERIOD	ALL	8760
845.72333	307.81815	0.00212	213.40	PERIOD	ALL	8760
939.69263	342.02011	0.00225	213.40	PERIOD	ALL	8760
1174.61572	427.52518	0.00256	213.40	PERIOD	ALL	8760
1409.53894	513.03021	0.00285	213.40	PERIOD	ALL	8760
1644.46204	598.53528	0.00313	213.40	PERIOD	ALL	8760
1879.38525	684.04022	0.00338	213.40	PERIOD	ALL	8760
2114.30835	769.54535	0.00360	213.40	PERIOD	ALL	8760
2349.23145	855.05035	0.00557	231.60	PERIOD	ALL	8760
2819.07788	1026.06042	0.00576	231.60	PERIOD	ALL	8760
3758.77051	1368.08057	0.01818	310.90	PERIOD	ALL	8760
4698.46289	1710.10071	0.03402	384.00	PERIOD	ALL	8760
7047.69482	2565.15112	0.02356	384.00	PERIOD	ALL	8760
9396.92578	3420.20142	0.01780	370.30	PERIOD	ALL	8760
14095.38960	5130.30176	0.01099	360.00	PERIOD	ALL	8760
18793.85350	6840.40283	0.00904	380.00	PERIOD	ALL	8760
28190.77930	10260.60450	0.00575	400.00	PERIOD	ALL	8760

37587.70310	13680.80570	0.00394	360.00	PERIOD	ALL	8760
46984.63670	17101.00780	0.00324	400.00	PERIOD	ALL	8760
98.48077	17.36482	0.00102	207.30	PERIOD	ALL	8760
196.96155	34.72964	0.00090	202.70	PERIOD	ALL	8760
295.44235	52.09447	0.00097	202.70	PERIOD	ALL	8760
393.92307	69.45930	0.00106	202.70	PERIOD	ALL	8760
492.40384	86.82410	0.00117	202.70	PERIOD	ALL	8760
590.88470	104.18893	0.00129	202.70	PERIOD	ALL	8760
689.36542	121.55376	0.00142	202.70	PERIOD	ALL	8760
787.84613	138.91856	0.00155	202.70	PERIOD	ALL	8760
886.32697	156.28340	0.00167	202.70	PERIOD	ALL	8760
984.80774	173.64821	0.00180	202.70	PERIOD	ALL	8760
1231.00964	217.06027	0.00211	202.70	PERIOD	ALL	8760
1477.21167	260.47235	0.00239	202.70	PERIOD	ALL	8760
1723.41370	303.88434	0.00345	213.40	PERIOD	ALL	8760
1969.61548	347.29648	0.00320	207.30	PERIOD	ALL	8760
2215.81738	390.70850	0.00340	207.30	PERIOD	ALL	8760
2462.01929	434.12051	0.00609	231.60	PERIOD	ALL	8760
2954.42310	520.94470	0.02047	304.80	PERIOD	ALL	8760
3939.23096	694.59296	0.03276	346.60	PERIOD	ALL	8760
4924.03809	868.24103	0.03220	365.80	PERIOD	ALL	8760
7386.05762	1302.36169	0.02586	384.00	PERIOD	ALL	8760
9848.07715	1736.48218	0.01941	371.90	PERIOD	ALL	8760
14772.11520	2604.72290	0.01019	320.00	PERIOD	ALL	8760
19696.15430	3472.96411	0.00895	360.00	PERIOD	ALL	8760
29544.23050	5209.44580	0.00615	380.00	PERIOD	ALL	8760
39392.30860	6945.92822	0.00448	380.00	PERIOD	ALL	8760
49240.38670	8682.41113	0.00350	400.00	PERIOD	ALL	8760
100.00000	0.00001	0.00103	207.30	PERIOD	ALL	8760
200.00000	0.00002	0.00092	202.70	PERIOD	ALL	8760
300.00000	0.00002	0.00101	202.70	PERIOD	ALL	8760
400.00000	0.00003	0.00111	202.70	PERIOD	ALL	8760
500.00000	0.00004	0.00124	202.70	PERIOD	ALL	8760
600.00000	0.00005	0.00137	202.70	PERIOD	ALL	8760
700.00000	0.00005	0.00151	202.70	PERIOD	ALL	8760
800.00000	0.00006	0.00165	202.70	PERIOD	ALL	8760
900.00000	0.00007	0.00179	202.70	PERIOD	ALL	8760
1000.00000	0.00008	0.00194	202.70	PERIOD	ALL	8760
1250.00000	0.00009	0.00774	243.80	PERIOD	ALL	8760
1500.00000	0.00011	0.05510	341.40	PERIOD	ALL	8760
1750.00000	0.00013	0.03593	323.10	PERIOD	ALL	8760
2000.00000	0.00015	0.04748	341.40	PERIOD	ALL	8760
2250.00000	0.00017	0.02438	304.80	PERIOD	ALL	8760
2500.00000	0.00019	0.01977	292.60	PERIOD	ALL	8760
3000.00000	0.00023	0.02616	310.90	PERIOD	ALL	8760
4000.00000	0.00030	0.04243	359.70	PERIOD	ALL	8760
5000.00000	0.00038	0.04706	402.30	PERIOD	ALL	8760
7500.00000	0.00057	0.02397	347.50	PERIOD	ALL	8760
10000.00000	0.00075	0.02280	380.10	PERIOD	ALL	8760
15000.00000	0.00113	0.01462	360.00	PERIOD	ALL	8760
20000.00000	0.00151	0.01137	360.00	PERIOD	ALL	8760
30000.00000	0.00226	0.00788	380.00	PERIOD	ALL	8760
40000.00000	0.00302	0.00584	400.00	PERIOD	ALL	8760
50000.00000	0.00377	0.00437	360.00	PERIOD	ALL	8760
98.48077	-17.36482	0.00104	207.30	PERIOD	ALL	8760
196.96155	-34.72964	0.00094	202.70	PERIOD	ALL	8760
295.44235	-52.09446	0.00103	202.70	PERIOD	ALL	8760
393.92307	-69.45927	0.00115	202.70	PERIOD	ALL	8760
492.40384	-86.82410	0.00128	202.70	PERIOD	ALL	8760
590.88470	-104.18891	0.00142	202.70	PERIOD	ALL	8760
689.36542	-121.55373	0.00156	202.70	PERIOD	ALL	8760
787.84613	-138.91853	0.00292	219.50	PERIOD	ALL	8760
886.32697	-156.28339	0.00380	225.60	PERIOD	ALL	8760

984.80774	-173.64819	0.04641	329.20	PERIOD	ALL	8760
1231.00964	-217.06023	0.06475	347.50	PERIOD	ALL	8760
1477.21167	-260.47232	0.06638	353.60	PERIOD	ALL	8760
1723.41370	-303.88431	0.03500	323.10	PERIOD	ALL	8760
1969.61548	-347.29642	0.04653	341.40	PERIOD	ALL	8760
2215.81738	-390.70840	0.04435	341.40	PERIOD	ALL	8760
2462.01929	-434.12045	0.03190	323.10	PERIOD	ALL	8760
2954.42310	-520.94458	0.04333	347.50	PERIOD	ALL	8760
3939.23096	-694.59277	0.03981	353.60	PERIOD	ALL	8760
4924.03809	-868.24091	0.04436	386.50	PERIOD	ALL	8760
7386.05762	-1302.36145	0.02554	353.60	PERIOD	ALL	8760
9848.07715	-1736.48181	0.02136	360.00	PERIOD	ALL	8760
14772.11520	-2604.72290	0.01372	340.00	PERIOD	ALL	8760
19696.15430	-3472.96338	0.01286	380.00	PERIOD	ALL	8760
29544.23050	-5209.44580	0.00842	380.00	PERIOD	ALL	8760
39392.30860	-6945.92676	0.00618	380.00	PERIOD	ALL	8760
49240.38670	-8682.40918	0.00492	400.00	PERIOD	ALL	8760
93.96926	-34.20201	0.00104	207.30	PERIOD	ALL	8760
187.93851	-68.40402	0.00095	202.70	PERIOD	ALL	8760
281.90778	-102.60603	0.00105	202.70	PERIOD	ALL	8760
375.87701	-136.80804	0.00115	202.70	PERIOD	ALL	8760
469.84631	-171.01006	0.00128	202.70	PERIOD	ALL	8760
563.81555	-205.21207	0.00200	213.40	PERIOD	ALL	8760
657.78491	-239.41406	0.00905	256.00	PERIOD	ALL	8760
751.75409	-273.61612	0.02126	298.70	PERIOD	ALL	8760
845.72339	-307.81812	0.01533	286.50	PERIOD	ALL	8760
939.69263	-342.02008	0.03866	323.10	PERIOD	ALL	8760
1174.61584	-427.52515	0.05768	347.50	PERIOD	ALL	8760
1409.53894	-513.03021	0.05280	347.50	PERIOD	ALL	8760
1644.46216	-598.53522	0.02572	310.90	PERIOD	ALL	8760
1879.38525	-684.04016	0.05061	353.60	PERIOD	ALL	8760
2114.30835	-769.54523	0.04555	350.20	PERIOD	ALL	8760
2349.23145	-855.05023	0.04289	347.50	PERIOD	ALL	8760
2819.07788	-1026.06030	0.03547	347.50	PERIOD	ALL	8760
3758.77051	-1368.08032	0.03100	345.90	PERIOD	ALL	8760
4698.46338	-1710.10059	0.03265	371.90	PERIOD	ALL	8760
7047.69482	-2565.15088	0.02283	365.80	PERIOD	ALL	8760
9396.92676	-3420.20093	0.02178	408.40	PERIOD	ALL	8760
14095.38960	-5130.30127	0.01389	380.00	PERIOD	ALL	8760
18793.85550	-6840.40234	0.00965	360.00	PERIOD	ALL	8760
28190.77930	-10260.60350	0.00653	360.00	PERIOD	ALL	8760
37587.70700	-13680.80470	0.00488	360.00	PERIOD	ALL	8760
46984.63670	-17101.00590	0.00387	360.00	PERIOD	ALL	8760
86.60254	-50.00000	0.00104	207.30	PERIOD	ALL	8760
173.20508	-100.00001	0.00095	202.70	PERIOD	ALL	8760
259.80762	-150.00002	0.00104	202.70	PERIOD	ALL	8760
346.41016	-200.00002	0.00113	202.70	PERIOD	ALL	8760
433.01273	-250.00003	0.00176	213.40	PERIOD	ALL	8760
519.61517	-300.00003	0.00964	268.20	PERIOD	ALL	8760
606.21777	-350.00003	0.03294	317.00	PERIOD	ALL	8760
692.82031	-400.00003	0.06026	347.50	PERIOD	ALL	8760
779.42291	-450.00003	0.06335	353.60	PERIOD	ALL	8760
866.02539	-500.00006	0.05492	347.50	PERIOD	ALL	8760
1082.53174	-625.00006	0.02247	310.90	PERIOD	ALL	8760
1299.03821	-750.00006	0.05446	359.70	PERIOD	ALL	8760
1515.54443	-875.00006	0.03277	335.30	PERIOD	ALL	8760
1732.05090	-1000.00012	0.04736	359.70	PERIOD	ALL	8760
1948.55713	-1125.00012	0.04368	359.70	PERIOD	ALL	8760
2165.06348	-1250.00012	0.03224	347.50	PERIOD	ALL	8760
2598.07617	-1500.00012	0.03797	365.80	PERIOD	ALL	8760
3464.10156	-2000.00024	0.02757	359.70	PERIOD	ALL	8760
4330.12695	-2500.00024	0.02329	353.60	PERIOD	ALL	8760
6495.19043	-3750.00049	0.02125	402.30	PERIOD	ALL	8760

8660.25391	-5000.00049	0.01653	396.20	PERIOD	ALL	8760
12990.38090	-7500.00098	0.01040	380.00	PERIOD	ALL	8760
17320.50780	-10000.00100	0.00813	380.00	PERIOD	ALL	8760
25980.76170	-15000.00200	0.00492	360.00	PERIOD	ALL	8760
34641.01560	-20000.00200	0.00368	360.00	PERIOD	ALL	8760
43301.26560	-25000.00200	0.00292	360.00	PERIOD	ALL	8760
76.60445	-64.27876	0.00104	207.30	PERIOD	ALL	8760
153.20888	-128.55754	0.00095	202.70	PERIOD	ALL	8760
229.81332	-192.83629	0.00102	202.70	PERIOD	ALL	8760
306.41779	-257.11508	0.00110	202.70	PERIOD	ALL	8760
383.02225	-321.39377	0.00496	243.80	PERIOD	ALL	8760
459.62668	-385.67261	0.01780	298.70	PERIOD	ALL	8760
536.23108	-449.95132	0.03371	323.10	PERIOD	ALL	8760
612.83557	-514.23016	0.06255	353.60	PERIOD	ALL	8760
689.44000	-578.50885	0.05933	353.60	PERIOD	ALL	8760
766.04443	-642.78766	0.05308	353.60	PERIOD	ALL	8760
957.55554	-803.48462	0.04604	353.60	PERIOD	ALL	8760
1149.06665	-964.18146	0.04724	359.70	PERIOD	ALL	8760
1340.57764	-1124.87830	0.03173	341.40	PERIOD	ALL	8760
1532.08899	-1285.57520	0.03579	353.60	PERIOD	ALL	8760
1723.59998	-1446.27209	0.03246	353.60	PERIOD	ALL	8760
1915.11108	-1606.96924	0.02528	341.40	PERIOD	ALL	8760
2298.13330	-1928.36292	0.02883	359.70	PERIOD	ALL	8760
3064.17798	-2571.15039	0.02149	359.70	PERIOD	ALL	8760
3830.22192	-3213.93823	0.01828	359.70	PERIOD	ALL	8760
5745.33252	-4820.90674	0.01620	408.40	PERIOD	ALL	8760
7660.44434	-6427.87598	0.01258	408.40	PERIOD	ALL	8760
11490.66500	-9641.81348	0.00768	380.00	PERIOD	ALL	8760
15320.88870	-12855.75290	0.00517	360.00	PERIOD	ALL	8760
22981.33200	-19283.62700	0.00367	360.00	PERIOD	ALL	8760
30641.77730	-25711.50590	0.00262	360.00	PERIOD	ALL	8760
38302.22270	-32139.38090	0.00209	360.00	PERIOD	ALL	8760
64.27876	-76.60445	0.00103	207.30	PERIOD	ALL	8760
128.55754	-153.20888	0.00093	202.70	PERIOD	ALL	8760
192.83629	-229.81332	0.00099	202.70	PERIOD	ALL	8760
257.11508	-306.41779	0.00106	202.70	PERIOD	ALL	8760
321.39377	-383.02225	0.00792	268.20	PERIOD	ALL	8760
385.67261	-459.62668	0.01921	304.80	PERIOD	ALL	8760
449.95132	-536.23108	0.02076	310.90	PERIOD	ALL	8760
514.23016	-612.83557	0.02798	323.10	PERIOD	ALL	8760
578.50885	-689.44000	0.03000	329.20	PERIOD	ALL	8760
642.78766	-766.04443	0.02427	323.10	PERIOD	ALL	8760
803.48456	-957.55554	0.03828	347.50	PERIOD	ALL	8760
964.18146	-1149.06665	0.03784	359.70	PERIOD	ALL	8760
1124.87830	-1340.57764	0.01963	329.20	PERIOD	ALL	8760
1285.57520	-1532.08899	0.03018	359.70	PERIOD	ALL	8760
1446.27197	-1723.59998	0.02462	353.60	PERIOD	ALL	8760
1606.96912	-1915.11108	0.02448	359.70	PERIOD	ALL	8760
1928.36292	-2298.13330	0.03379	408.40	PERIOD	ALL	8760
2571.15039	-3064.17798	0.02699	420.60	PERIOD	ALL	8760
3213.93799	-3830.22192	0.01680	371.90	PERIOD	ALL	8760
4820.90674	-5745.33301	0.01339	392.00	PERIOD	ALL	8760
6427.87549	-7660.44434	0.01004	390.10	PERIOD	ALL	8760
9641.81348	-11490.66600	0.00526	340.00	PERIOD	ALL	8760
12855.75200	-15320.88870	0.00505	380.00	PERIOD	ALL	8760
19283.62700	-22981.33400	0.00343	400.00	PERIOD	ALL	8760
25711.50390	-30641.77730	0.00254	400.00	PERIOD	ALL	8760
32139.38090	-38302.22270	0.00187	380.00	PERIOD	ALL	8760
50.00000	-86.60254	0.00102	207.30	PERIOD	ALL	8760
100.00001	-173.20508	0.00091	202.70	PERIOD	ALL	8760
150.00002	-259.80762	0.00097	202.70	PERIOD	ALL	8760
200.00002	-346.41016	0.00145	213.40	PERIOD	ALL	8760
250.00002	-433.01273	0.00742	268.20	PERIOD	ALL	8760

300.00003	-519.61517	0.01396	298.70	PERIOD	ALL	8760
350.00003	-606.21777	0.01881	310.90	PERIOD	ALL	8760
400.00003	-692.82031	0.02424	323.10	PERIOD	ALL	8760
450.00003	-779.42291	0.02099	323.10	PERIOD	ALL	8760
500.00003	-866.02539	0.02441	329.20	PERIOD	ALL	8760
625.00006	-1082.53174	0.00981	298.70	PERIOD	ALL	8760
750.00006	-1299.03821	0.02313	341.40	PERIOD	ALL	8760
875.00006	-1515.54443	0.02187	341.40	PERIOD	ALL	8760
1000.00006	-1732.05090	0.02752	359.70	PERIOD	ALL	8760
1125.00012	-1948.55713	0.02884	365.80	PERIOD	ALL	8760
1250.00012	-2165.06348	0.02916	371.90	PERIOD	ALL	8760
1500.00012	-2598.07617	0.03120	408.40	PERIOD	ALL	8760
2000.00012	-3464.10156	0.02296	420.60	PERIOD	ALL	8760
2500.00024	-4330.12695	0.01869	408.40	PERIOD	ALL	8760
3750.00024	-6495.19043	0.01278	408.40	PERIOD	ALL	8760
5000.00049	-8660.25391	0.00902	396.20	PERIOD	ALL	8760
7500.00049	-12990.38090	0.00491	340.00	PERIOD	ALL	8760
10000.00100	-17320.50780	0.00417	360.00	PERIOD	ALL	8760
15000.00100	-25980.76170	0.00305	420.00	PERIOD	ALL	8760
20000.00200	-34641.01560	0.00236	400.00	PERIOD	ALL	8760
25000.00200	-43301.26560	0.00187	400.00	PERIOD	ALL	8760
34.20202	-93.96926	0.00100	207.30	PERIOD	ALL	8760
68.40405	-187.93851	0.00089	202.70	PERIOD	ALL	8760
102.60606	-281.90778	0.00094	202.70	PERIOD	ALL	8760
136.80809	-375.87701	0.00112	207.30	PERIOD	ALL	8760
171.01012	-469.84631	0.00671	268.20	PERIOD	ALL	8760
205.21213	-563.81555	0.01102	292.60	PERIOD	ALL	8760
239.41414	-657.78479	0.01327	304.80	PERIOD	ALL	8760
273.61621	-751.75409	0.01272	304.80	PERIOD	ALL	8760
307.81821	-845.72333	0.00679	286.50	PERIOD	ALL	8760
342.02023	-939.69257	0.00673	286.50	PERIOD	ALL	8760
427.52527	-1174.61572	0.01057	304.80	PERIOD	ALL	8760
513.03033	-1409.53894	0.01107	310.90	PERIOD	ALL	8760
598.53546	-1644.46204	0.00889	304.80	PERIOD	ALL	8760
684.04047	-1879.38513	0.01666	335.30	PERIOD	ALL	8760
769.54547	-2114.30835	0.02358	359.70	PERIOD	ALL	8760
855.05054	-2349.23145	0.02780	378.00	PERIOD	ALL	8760
1026.06079	-2819.07788	0.02527	396.20	PERIOD	ALL	8760
1368.08081	-3758.77026	0.02143	402.30	PERIOD	ALL	8760
1710.10107	-4698.46289	0.01714	411.50	PERIOD	ALL	8760
2565.15161	-7047.69434	0.01214	402.30	PERIOD	ALL	8760
3420.20190	-9396.92578	0.00829	408.10	PERIOD	ALL	8760
5130.30273	-14095.38870	0.00498	360.00	PERIOD	ALL	8760
6840.40430	-18793.85350	0.00365	360.00	PERIOD	ALL	8760
10260.60550	-28190.77730	0.00279	420.00	PERIOD	ALL	8760
13680.80860	-37587.70310	0.00218	400.00	PERIOD	ALL	8760
17101.01170	-46984.62890	0.00170	420.00	PERIOD	ALL	8760
17.36483	-98.48077	0.00099	207.30	PERIOD	ALL	8760
34.72966	-196.96155	0.00086	202.70	PERIOD	ALL	8760
52.09449	-295.44235	0.00090	202.70	PERIOD	ALL	8760
69.45933	-393.92307	0.00090	202.70	PERIOD	ALL	8760
86.82413	-492.40384	0.00413	249.90	PERIOD	ALL	8760
104.18897	-590.88470	0.00789	286.50	PERIOD	ALL	8760
121.55380	-689.36542	0.00586	280.40	PERIOD	ALL	8760
138.91862	-787.84613	0.00460	274.30	PERIOD	ALL	8760
156.28346	-886.32697	0.00628	286.50	PERIOD	ALL	8760
173.64827	-984.80774	0.00603	286.50	PERIOD	ALL	8760
217.06036	-1231.00964	0.00742	298.70	PERIOD	ALL	8760
260.47244	-1477.21143	0.00919	304.80	PERIOD	ALL	8760
303.88449	-1723.41370	0.00808	304.80	PERIOD	ALL	8760
347.29657	-1969.61548	0.00651	298.70	PERIOD	ALL	8760
390.70868	-2215.81738	0.00654	298.70	PERIOD	ALL	8760
434.12073	-2462.01929	0.02242	365.80	PERIOD	ALL	8760

520.94489	-2954.42285	0.02731	402.30	PERIOD	ALL	8760
694.59320	-3939.23096	0.01930	390.10	PERIOD	ALL	8760
868.24146	-4924.03809	0.01846	414.50	PERIOD	ALL	8760
1302.36230	-7386.05762	0.01294	408.40	PERIOD	ALL	8760
1736.48279	-9848.07715	0.00970	398.10	PERIOD	ALL	8760
2604.72412	-14772.11520	0.00592	380.00	PERIOD	ALL	8760
3472.96558	-19696.15430	0.00431	360.00	PERIOD	ALL	8760
5209.44824	-29544.23050	0.00331	400.00	PERIOD	ALL	8760
6945.93115	-39392.30860	0.00248	400.00	PERIOD	ALL	8760
8682.41504	-49240.38670	0.00209	400.00	PERIOD	ALL	8760
0.00002	-100.00000	0.00097	207.30	PERIOD	ALL	8760
0.00003	-200.00000	0.00083	202.70	PERIOD	ALL	8760
0.00005	-300.00000	0.00085	202.70	PERIOD	ALL	8760
0.00006	-400.00000	0.00082	202.70	PERIOD	ALL	8760
0.00008	-500.00000	0.00123	219.50	PERIOD	ALL	8760
0.00009	-600.00000	0.00511	274.30	PERIOD	ALL	8760
0.00011	-700.00000	0.00528	280.40	PERIOD	ALL	8760
0.00012	-800.00000	0.00444	274.30	PERIOD	ALL	8760
0.00014	-900.00000	0.00201	243.80	PERIOD	ALL	8760
0.00015	-1000.00000	0.00789	298.70	PERIOD	ALL	8760
0.00019	-1250.00000	0.00820	304.80	PERIOD	ALL	8760
0.00023	-1500.00000	0.00809	304.80	PERIOD	ALL	8760
0.00026	-1750.00000	0.00760	304.80	PERIOD	ALL	8760
0.00030	-2000.00000	0.00543	292.60	PERIOD	ALL	8760
0.00034	-2250.00000	0.00623	298.70	PERIOD	ALL	8760
0.00038	-2500.00000	0.02398	365.80	PERIOD	ALL	8760
0.00045	-3000.00000	0.03236	406.30	PERIOD	ALL	8760
0.00060	-4000.00000	0.02645	402.30	PERIOD	ALL	8760
0.00075	-5000.00000	0.02152	396.20	PERIOD	ALL	8760
0.00113	-7500.00000	0.01482	390.10	PERIOD	ALL	8760
0.00151	-10000.00000	0.01208	396.20	PERIOD	ALL	8760
0.00226	-15000.00000	0.00701	380.00	PERIOD	ALL	8760
0.00302	-20000.00000	0.00480	360.00	PERIOD	ALL	8760
0.00453	-30000.00000	0.00347	380.00	PERIOD	ALL	8760
0.00604	-40000.00000	0.00259	380.00	PERIOD	ALL	8760
0.00755	-50000.00000	0.00217	400.00	PERIOD	ALL	8760
-17.36482	-98.48077	0.00095	207.30	PERIOD	ALL	8760
-34.72964	-196.96155	0.00080	202.70	PERIOD	ALL	8760
-52.09447	-295.44235	0.00080	202.70	PERIOD	ALL	8760
-69.45930	-393.92307	0.00074	202.70	PERIOD	ALL	8760
-86.82410	-492.40384	0.00063	202.70	PERIOD	ALL	8760
-104.18893	-590.88470	0.00113	225.60	PERIOD	ALL	8760
-121.55376	-689.36542	0.00425	274.30	PERIOD	ALL	8760
-138.91856	-787.84613	0.00389	274.30	PERIOD	ALL	8760
-156.28340	-886.32697	0.00145	237.70	PERIOD	ALL	8760
-173.64821	-984.80774	0.00586	292.60	PERIOD	ALL	8760
-217.06029	-1231.00964	0.00807	304.80	PERIOD	ALL	8760
-260.47238	-1477.21167	0.00453	286.50	PERIOD	ALL	8760
-303.88437	-1723.41370	0.00599	292.60	PERIOD	ALL	8760
-347.29648	-1969.61548	0.00449	280.40	PERIOD	ALL	8760
-390.70853	-2215.81738	0.00851	304.80	PERIOD	ALL	8760
-434.12054	-2462.01929	0.02468	353.60	PERIOD	ALL	8760
-520.94470	-2954.42310	0.03526	384.00	PERIOD	ALL	8760
-694.59296	-3939.23096	0.03135	396.20	PERIOD	ALL	8760
-868.24115	-4924.03809	0.02653	415.40	PERIOD	ALL	8760
-1302.36182	-7386.05762	0.01653	390.10	PERIOD	ALL	8760
-1736.48218	-9848.07715	0.01200	392.00	PERIOD	ALL	8760
-2604.72314	-14772.11520	0.00632	360.00	PERIOD	ALL	8760
-3472.96436	-19696.15430	0.00407	340.00	PERIOD	ALL	8760
-5209.44629	-29544.23050	0.00282	340.00	PERIOD	ALL	8760
-6945.92871	-39392.30860	0.00230	360.00	PERIOD	ALL	8760
-8682.41113	-49240.38670	0.00199	380.00	PERIOD	ALL	8760
-34.20201	-93.96926	0.00122	213.40	PERIOD	ALL	8760

-68.40403	-187.93851	0.00077	202.70	PERIOD	ALL	8760
-102.60605	-281.90778	0.00075	202.70	PERIOD	ALL	8760
-136.80806	-375.87701	0.00067	202.70	PERIOD	ALL	8760
-171.01009	-469.84631	0.00055	202.70	PERIOD	ALL	8760
-205.21210	-563.81555	0.00048	202.70	PERIOD	ALL	8760
-239.41411	-657.78491	0.00076	219.50	PERIOD	ALL	8760
-273.61615	-751.75409	0.00216	249.90	PERIOD	ALL	8760
-307.81815	-845.72333	0.00069	219.50	PERIOD	ALL	8760
-342.02014	-939.69263	0.00404	280.40	PERIOD	ALL	8760
-427.52521	-1174.61572	0.00400	280.40	PERIOD	ALL	8760
-513.03021	-1409.53894	0.00441	280.40	PERIOD	ALL	8760
-598.53528	-1644.46204	0.00486	280.40	PERIOD	ALL	8760
-684.04034	-1879.38525	0.00377	262.10	PERIOD	ALL	8760
-769.54535	-2114.30835	0.00901	298.70	PERIOD	ALL	8760
-855.05042	-2349.23145	0.03169	353.60	PERIOD	ALL	8760
-1026.06042	-2819.07788	0.03623	371.90	PERIOD	ALL	8760
-1368.08069	-3758.77051	0.03386	402.30	PERIOD	ALL	8760
-1710.10083	-4698.46289	0.02467	397.20	PERIOD	ALL	8760
-2565.15112	-7047.69482	0.01501	384.00	PERIOD	ALL	8760
-3420.20142	-9396.92578	0.01020	384.00	PERIOD	ALL	8760
-5130.30176	-14095.38960	0.00451	340.00	PERIOD	ALL	8760
-6840.40332	-18793.85350	0.00327	340.00	PERIOD	ALL	8760
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-6495.19092	3749.99951	0.01673	384.00	PERIOD	ALL	8760
-8660.25488	4999.99854	0.01391	426.70	PERIOD	ALL	8760
-12990.38180	7499.99854	0.00802	400.00	PERIOD	ALL	8760
-17320.50980	9999.99805	0.00599	400.00	PERIOD	ALL	8760
-25980.76370	14999.99800	0.00383	420.00	PERIOD	ALL	8760
-34641.01950	19999.99610	0.00275	400.00	PERIOD	ALL	8760
-43301.27340	24999.99610	0.00201	350.00	PERIOD	ALL	8760
-76.60445	64.27876	0.00115	213.40	PERIOD	ALL	8760
-153.20891	128.55751	0.00106	213.40	PERIOD	ALL	8760
-229.81335	192.83626	0.00201	225.60	PERIOD	ALL	8760
-306.41782	257.11499	0.00290	231.60	PERIOD	ALL	8760
-383.02228	321.39374	0.00212	225.60	PERIOD	ALL	8760
-459.62671	385.67255	0.00354	231.60	PERIOD	ALL	8760
-536.23120	449.95126	0.01355	268.20	PERIOD	ALL	8760
-612.83563	514.22998	0.02567	304.80	PERIOD	ALL	8760
-689.44006	578.50873	0.02815	316.40	PERIOD	ALL	8760
-766.04449	642.78760	0.02289	317.00	PERIOD	ALL	8760
-957.55566	803.48444	0.01224	304.80	PERIOD	ALL	8760
-1149.06689	964.18121	0.03837	341.40	PERIOD	ALL	8760
-1340.57788	1124.87830	0.04391	353.60	PERIOD	ALL	8760
-1532.08899	1285.57507	0.04394	365.80	PERIOD	ALL	8760
-1723.60022	1446.27173	0.04976	371.90	PERIOD	ALL	8760
-1915.11121	1606.96887	0.04571	378.00	PERIOD	ALL	8760
-2298.13354	1928.36255	0.04507	384.00	PERIOD	ALL	8760
-3064.17822	2571.15015	0.02772	359.70	PERIOD	ALL	8760
-3830.22241	3213.93750	0.02629	384.00	PERIOD	ALL	8760
-5745.33350	4820.90576	0.01584	378.00	PERIOD	ALL	8760
-7660.44531	6427.87451	0.01195	379.20	PERIOD	ALL	8760
-11490.66700	9641.81250	0.00697	360.00	PERIOD	ALL	8760
-15320.89060	12855.75000	0.00556	400.00	PERIOD	ALL	8760
-22981.33590	19283.62500	0.00377	400.00	PERIOD	ALL	8760
-30641.78130	25711.50000	0.00271	400.00	PERIOD	ALL	8760
-38302.22660	32139.37700	0.00202	370.00	PERIOD	ALL	8760
-64.27877	76.60442	0.00115	213.40	PERIOD	ALL	8760
-128.55756	153.20885	0.00207	225.60	PERIOD	ALL	8760
-192.83632	229.81332	0.00282	231.60	PERIOD	ALL	8760
-257.11511	306.41772	0.00284	231.60	PERIOD	ALL	8760

-321.39383	383.02216	0.00223	225.60	PERIOD	ALL	8760
-385.67267	459.62665	0.00336	231.60	PERIOD	ALL	8760
-449.95142	536.23102	0.01332	274.30	PERIOD	ALL	8760
-514.23022	612.83551	0.02030	304.80	PERIOD	ALL	8760
-578.50897	689.43988	0.01651	310.90	PERIOD	ALL	8760
-642.78772	766.04431	0.01459	310.90	PERIOD	ALL	8760
-803.48474	957.55542	0.01385	317.00	PERIOD	ALL	8760
-964.18152	1149.06653	0.03184	347.50	PERIOD	ALL	8760
-1124.87854	1340.57751	0.03945	353.60	PERIOD	ALL	8760
-1285.57532	1532.08862	0.02816	353.60	PERIOD	ALL	8760
-1446.27222	1723.59973	0.03179	359.70	PERIOD	ALL	8760
-1606.96936	1915.11084	0.03032	365.80	PERIOD	ALL	8760
-1928.36328	2298.13306	0.02829	384.00	PERIOD	ALL	8760
-2571.15088	3064.17749	0.02444	384.00	PERIOD	ALL	8760
-3213.93872	3830.22144	0.01789	378.00	PERIOD	ALL	8760
-4820.90771	5745.33203	0.01153	378.00	PERIOD	ALL	8760
-6427.87695	7660.44336	0.00958	378.00	PERIOD	ALL	8760
-9641.81543	11490.66410	0.00579	380.00	PERIOD	ALL	8760
-12855.75490	15320.88670	0.00454	400.00	PERIOD	ALL	8760
-19283.63090	22981.33010	0.00283	400.00	PERIOD	ALL	8760
-25711.50980	30641.77340	0.00210	360.00	PERIOD	ALL	8760
-32139.38670	38302.21880	0.00164	360.00	PERIOD	ALL	8760
-50.00002	86.60253	0.00115	213.40	PERIOD	ALL	8760
-100.00003	173.20506	0.00205	225.60	PERIOD	ALL	8760
-150.00005	259.80756	0.00275	231.60	PERIOD	ALL	8760
-200.00006	346.41013	0.00279	231.60	PERIOD	ALL	8760
-250.00009	433.01270	0.00226	225.60	PERIOD	ALL	8760
-300.00009	519.61517	0.00635	243.80	PERIOD	ALL	8760
-350.00012	606.21771	0.00713	249.90	PERIOD	ALL	8760
-400.00012	692.82025	0.00373	243.80	PERIOD	ALL	8760
-450.00015	779.42279	0.01468	304.80	PERIOD	ALL	8760
-500.00018	866.02533	0.00992	304.80	PERIOD	ALL	8760
-625.00024	1082.53162	0.00459	286.50	PERIOD	ALL	8760
-750.00024	1299.03784	0.01560	329.20	PERIOD	ALL	8760
-875.00031	1515.54431	0.02205	347.50	PERIOD	ALL	8760
-1000.00037	1732.05066	0.02488	353.60	PERIOD	ALL	8760
-1125.00037	1948.55701	0.02400	353.60	PERIOD	ALL	8760
-1250.00049	2165.06323	0.03322	384.00	PERIOD	ALL	8760
-1500.00049	2598.07593	0.02752	384.00	PERIOD	ALL	8760
-2000.00073	3464.10132	0.01996	384.00	PERIOD	ALL	8760
-2500.00098	4330.12646	0.01401	378.00	PERIOD	ALL	8760
-3750.00122	6495.18994	0.00852	365.80	PERIOD	ALL	8760
-5000.00195	8660.25293	0.00633	371.90	PERIOD	ALL	8760
-7500.00244	12990.37990	0.00424	360.00	PERIOD	ALL	8760
-10000.00390	17320.50590	0.00334	360.00	PERIOD	ALL	8760
-15000.00490	25980.75980	0.00202	340.00	PERIOD	ALL	8760
-20000.00780	34641.01170	0.00179	380.00	PERIOD	ALL	8760
-25000.00780	43301.26170	0.00136	350.00	PERIOD	ALL	8760
-34.20204	93.96925	0.00116	213.40	PERIOD	ALL	8760
-68.40408	187.93851	0.00204	225.60	PERIOD	ALL	8760
-102.60610	281.90778	0.00193	225.60	PERIOD	ALL	8760
-136.80815	375.87698	0.00196	225.60	PERIOD	ALL	8760
-171.01018	469.84631	0.00221	225.60	PERIOD	ALL	8760
-205.21220	563.81555	0.00595	243.80	PERIOD	ALL	8760
-239.41423	657.78479	0.00876	262.10	PERIOD	ALL	8760
-273.61633	751.75403	0.01381	286.50	PERIOD	ALL	8760
-307.81833	845.72327	0.00743	280.40	PERIOD	ALL	8760
-342.02036	939.69257	0.00781	292.60	PERIOD	ALL	8760
-427.52545	1174.61572	0.01575	323.10	PERIOD	ALL	8760
-513.03052	1409.53894	0.02653	353.60	PERIOD	ALL	8760
-598.53571	1644.46191	0.02600	359.70	PERIOD	ALL	8760
-684.04065	1879.38513	0.02324	359.70	PERIOD	ALL	8760
-769.54584	2114.30811	0.01219	329.20	PERIOD	ALL	8760

-855.05090	2349.23145	0.01592	347.50	PERIOD	ALL	8760
-1026.06104	2819.07764	0.02119	378.00	PERIOD	ALL	8760
-1368.08130	3758.77026	0.01957	385.00	PERIOD	ALL	8760
-1710.10181	4698.46289	0.01509	371.90	PERIOD	ALL	8760
-2565.15283	7047.69385	0.00596	329.20	PERIOD	ALL	8760
-3420.20337	9396.92578	0.00551	349.00	PERIOD	ALL	8760
-5130.30518	14095.38770	0.00387	360.00	PERIOD	ALL	8760
-6840.40674	18793.85350	0.00283	360.00	PERIOD	ALL	8760
-10260.61040	28190.77540	0.00174	340.00	PERIOD	ALL	8760
-13680.81450	37587.70310	0.00152	370.00	PERIOD	ALL	8760
-17101.01760	46984.62890	0.00116	350.00	PERIOD	ALL	8760
-17.36484	98.48077	0.00117	213.40	PERIOD	ALL	8760
-34.72969	196.96155	0.00204	225.60	PERIOD	ALL	8760
-52.09453	295.44235	0.00193	225.60	PERIOD	ALL	8760
-69.45937	393.92307	0.00193	225.60	PERIOD	ALL	8760
-86.82422	492.40381	0.00214	225.60	PERIOD	ALL	8760
-104.18906	590.88470	0.00563	243.80	PERIOD	ALL	8760
-121.55391	689.36542	0.00902	262.10	PERIOD	ALL	8760
-138.91873	787.84613	0.01994	292.60	PERIOD	ALL	8760
-156.28360	886.32697	0.01919	298.70	PERIOD	ALL	8760
-173.64844	984.80768	0.01263	298.70	PERIOD	ALL	8760
-217.06055	1231.00964	0.02377	335.30	PERIOD	ALL	8760
-260.47269	1477.21143	0.03509	365.80	PERIOD	ALL	8760
-303.88474	1723.41345	0.02532	359.70	PERIOD	ALL	8760
-347.29691	1969.61523	0.02231	359.70	PERIOD	ALL	8760
-390.70898	2215.81738	0.01469	341.40	PERIOD	ALL	8760
-434.12109	2462.01929	0.02307	378.00	PERIOD	ALL	8760
-520.94531	2954.42285	0.02015	384.00	PERIOD	ALL	8760
-694.59375	3939.23071	0.01530	378.00	PERIOD	ALL	8760
-868.24219	4924.03809	0.01077	365.80	PERIOD	ALL	8760
-1302.36353	7386.05713	0.00640	341.40	PERIOD	ALL	8760
-1736.48438	9848.07715	0.00497	339.90	PERIOD	ALL	8760
-2604.72656	14772.11430	0.00343	340.00	PERIOD	ALL	8760
-3472.96875	19696.15430	0.00302	360.00	PERIOD	ALL	8760
-5209.45264	29544.22850	0.00183	340.00	PERIOD	ALL	8760
-6945.93701	39392.30860	0.00133	330.00	PERIOD	ALL	8760
-8682.42188	49240.38670	0.00106	320.00	PERIOD	ALL	8760
-0.00003	100.00000	0.00118	213.40	PERIOD	ALL	8760
-0.00006	200.00000	0.00205	225.60	PERIOD	ALL	8760
-0.00009	300.00000	0.00193	225.60	PERIOD	ALL	8760
-0.00012	400.00000	0.00190	225.60	PERIOD	ALL	8760
-0.00015	500.00000	0.00206	225.60	PERIOD	ALL	8760
-0.00018	600.00000	0.00392	237.70	PERIOD	ALL	8760
-0.00021	700.00000	0.00820	256.00	PERIOD	ALL	8760
-0.00024	800.00000	0.01354	280.40	PERIOD	ALL	8760
-0.00027	900.00000	0.02341	298.70	PERIOD	ALL	8760
-0.00030	1000.00000	0.01513	292.60	PERIOD	ALL	8760
-0.00038	1250.00000	0.04249	353.60	PERIOD	ALL	8760
-0.00045	1500.00000	0.01430	323.10	PERIOD	ALL	8760
-0.00053	1750.00000	0.01720	341.40	PERIOD	ALL	8760
-0.00060	2000.00000	0.01011	317.00	PERIOD	ALL	8760
-0.00068	2250.00000	0.02035	359.70	PERIOD	ALL	8760
-0.00075	2500.00000	0.01846	359.70	PERIOD	ALL	8760
-0.00091	3000.00000	0.02003	378.00	PERIOD	ALL	8760
-0.00121	4000.00000	0.01555	383.40	PERIOD	ALL	8760
-0.00151	5000.00000	0.00990	359.70	PERIOD	ALL	8760
-0.00226	7500.00000	0.00784	371.90	PERIOD	ALL	8760
-0.00302	10000.00000	0.00627	380.10	PERIOD	ALL	8760
-0.00453	15000.00000	0.00337	360.00	PERIOD	ALL	8760
-0.00604	20000.00000	0.00239	340.00	PERIOD	ALL	8760
-0.00906	30000.00000	0.00179	380.00	PERIOD	ALL	8760
-0.01208	40000.00000	0.00125	350.00	PERIOD	ALL	8760
-0.01510	50000.00000	0.00101	350.00	PERIOD	ALL	8760

APPENDIX VII-5

Off-Site Accident and Spill Frequency Analysis

OFF-SITE ACCIDENT AND SPILL FREQUENCY ANALYSIS FOR THE WTI FACILITY

Summary

Spills may occur during waste transport as a result of both major accidents and minor valve and fitting leaks. Based on an evaluation of site-specific traffic accident data, a collision-related spill involving trucks bringing waste to the WTI facility is estimated to have about a 1 in 60 chance of occurring each year on State Route 39 (SR 39) in East Liverpool, Ohio. Non-collision related are estimated to have about a 1 in 40 chance of occurring each year over the same route. Considering both collision and non-collision releases, a spill of greater than 100 gallons is estimated to have a 1 in 60 chance of occurring each year along SR39 in East Liverpool. A spill of greater than 5,000 gallons is estimated to have a 1 in 295 chance of occurring each year.

I. Collision-related Spill Frequency

The collision-related spill frequency for WTI trucks was derived using the equation shown in Table 1 and described below.

The potential number of spills each year on SR 39 involving trucks carrying waste to WTI is estimated by multiplying the number of accidents each year involving trucks carrying waste to WTI by the probability of a spill occurring during a truck accident:

$$S_w = A_w \times P_s$$

where:

- S_w = Number of spills involving trucks carrying waste to WTI (spills/year);
- A_w = Number of accidents involving trucks carrying waste to WTI (accidents/year); and
- P_s = Probability of a spill resulting from a collision (unitless).

According to FEMA (1993) the number of spills per truck accident (P_s) is approximately 0.2, or about 1 spill for every five collisions. The potential number of collisions each year on SR 39 involving trucks carrying waste to WTI (A_W) is calculated by multiplying the overall truck accident frequency on SR 39 by the annual vehicle miles travelled (AVMT) on SR 39 by trucks carrying waste to WTI:

$$A_W = AF_t \times AVMT_w$$

where:

AF_t = Overall truck accident frequency on SR 39 (accidents/vehicle-miles); and

$AVMT_w$ = Annual vehicle miles travelled on SR 39 by trucks carrying waste to WTI (vehicle-miles/year).

The overall truck accident frequency on SR 39 (AF_t) is equal to the total number of truck accidents on SR 39 (A_t) each year divided by the AVMT on SR 39 by all trucks ($AVMT_t$):

$$AF_t = A_t \div AVMT_t$$

where:

A_t = Number of overall truck accidents on SR 39 (accidents/year); and

$AVMT_t$ = Overall truck AVMT (vehicle-miles/year).

The $AVMT_w$ is equal to the number of trucks carrying waste to WTI on SR 39 annually (N_w) multiplied by the length of SR 39 in East Liverpool (D):

$$AVMT_w = N_w \times D$$

where:

N_w = Number of trucks carrying waste to WTI on SR 39 (trucks/year); and

D = Length of SR 39 in East Liverpool (miles/truck).

The Traffic Crash Records Division of the Ohio Department of Public Safety (ODPS) provided the number of truck accidents on SR 39 (At) in East Liverpool between 1990

and 1995 (see Attachment 1). These figures include pickup trucks and vans as well as tractor trailer trucks. The number of trucks carrying waste to WTI on SR 39 (N_w) was estimated to be 3,850, based on the tons of waste shipped to WTI annually (77,000 tons/year) and the assumption that each truck transports 20 tons at a time (77,000 tons/year ÷ 20 tons/truck = 3,850 trucks/year). According to ODPS, the length of SR 39 in East Liverpool (D) is 3.39 miles. The calculation of A_w is summarized in Table 2.

The AVMT on SR 39 by all trucks ($AVMT_t$) was calculated using the equation shown in Table 3. $AVMT_t$ is equal to the product of the general vehicle daily miles travelled ($DVMT_{GV}$), the fraction of truck DVMT to general vehicle DVMT in Ohio State (F), and a conversion factor of 365 days/year:

$$AVMT_t = DVMT_{GV} \times F \times 365\ days/year$$

where:

$DVMT_{GV}$ = General vehicle DVMT (vehicle-miles); and
F = Fraction of truck DVMT to general vehicle DVMT (unitless).

The ODOT provided general vehicle DVMT for SR 39 in East Liverpool (see Attachment 2), but was unable to provide similar data for trucks on this route. However, such data are available for other portions of SR 39. Between 1990 and 1994, the fraction of truck DVMT to general vehicle DVMT on SR 39 (F) was approximately 0.06 in Columbiana County, and 0.08 in the State. Although the traffic in Columbiana County is likely to be more representative of traffic in East Liverpool, the fraction of truck DVMT to general vehicle DVMT from Ohio State was used as a conservative measure. The truck DVMT was converted to truck AVMT by multiplying by 365 days/year.

On the basis of the foregoing assessment, it is estimated that the frequency of collision-related spills on the local access route is 0.017 per year, or about once in 60 years.

II. Non Collision-Related Spill Frequency

According to FEMA (1993), the likelihood of a transportation spill resulting from all causes including minor valve and fitting leaks as well as collisions, is about 2 1/2-fold higher than the likelihood of a collision-related spill. Thus, the combined collision and non-collision related spill frequency is about 0.043 per year (once in about 25 years), and the non-collision related spill is approximately 0.026 per year (once in 40 years).

III. Frequency of a Specific Size Spill

Two different spill sizes were chosen for evaluation in the Accident Analysis: 100 gallons and 5,000 gallons.

According to FEMA (1993), based on available information on spill sizes, and considering the likely causes of accidents, it can be assumed that 20% of collision-related spills will result in the loss of the entire tanker contents. In the Accident Analysis the off-site spill scenario is assumed to involve a 5,000 gallon tanker. On this basis, it has been assumed that 20% of all collision-related spills would be 5,000 gallons. The frequency of a 5,000 gallon spill on the local access routes is thus 0.0034 per year, or approximately once in 295 years.

The distribution of liquid releases from full size tankers (minimum 4,000 gallon capacity) during highway transit between 1971 and 1986 is presented in Table 4. As shown in Table 4, when all spills are considered, approximately 40% are 100 gallons or larger. On this basis, it has been assumed that 40% of all spills (including both collision and non-collision related spills) would be 100 gallons or larger. The frequency of a 100 gallon spill on the local access route is thus 0.017 per year, or approximately once in 60 years.

The calculation of frequency for 5000 gallon and 100 gallon spills is summarized in Table 5.

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TABLE 1
Number of Spills from WTI Truck Accidents

$$S_w = A_w \times P_s$$

Parameter		Value	Reference
S_w =	Number of Spills Involving Trucks Carrying Waste to WTI (spills/year)		
	1990	0.012	Calculated
	1991	0.014	
	1992	0.022	
	1993	0.008	
	1994	0.026	
	Average 1990-1994	0.017	
A_w =	Number of Accidents Involving Trucks Carrying Waste to WTI (accidents/year)		
	1990	0.06	Calculated -
	1991	0.07	See Table 2
	1992	0.11	
	1993	0.04	
	1994	0.13	
	Average 1990-1994	0.08	
P_s =	Probability of a Spill Resulting from a Collision (unitless)	0.2	FEMA 1993

TABLE 2
Number of WTI Trucks Accidents

$$A_w = AF_t \times AVMT_w$$
where:
$$AF_t = A_t \div AVMT_t$$
and
$$AVMT_w = N_w \times D$$

Parameter	Value	Reference
A_w = Number of Accidents Involving Trucks Carrying Waste to WTI (accidents/year)		
1990	0.06	Calculated
1991	0.07	
1992	0.11	
1993	0.04	
1994	0.13	
Average 1990-1994	0.08	
A_t = Number of Overall Truck Accidents (accidents/year)		
1990	5	ODPS 1995
1991	6	
1992	8	
1993	3	
1994	10	
Average 1990-1994	6	
$AVMT_t$ = Overall Truck AVMT in East Liverpool (vehicle-miles per year)		
1990	1,155,597	Calculated -
1991	1,163,448	See Table 3
1992	929,436	
1993	948,883	
1994	989,208	
Average 1990-1994	985,780	
N_w = Number of Trucks Carrying Waste to WTI on SR 39 (trucks/year)	3,850	Calculated - see text
D = Length of SR 39 in East Liverpool (miles)	3.39	ODOT 1995

TABLE 3
Overall Truck YVMT

$AVMT_t = DVMT_{GV} \times F \times 365$ days/year

Parameter	Value	Reference
$AVMT_t$ = Overall Truck AVMT in East Liverpool (vehicle-miles per year)		
1990	1,155,597	Calculated
1991	1,163,448	
1992	929,436	
1993	948,883	
1994	989,208	
Average 1990-1994	985,780	
$DVMT_{GV}$ = General Vehicle DVMT in East Liverpool (vehicle-miles per day)		
1990	35,178	ODOT 1995
1991	35,417	
1992	31,830	
1993	32,496	
1994	33,877	
Average 1990-1994	33,760	
F = Fraction of Truck DVMT to General Vehicle DVMT in Ohio State (unitless)		
1990	0.09	Calculated from ODOT 1995
1991	0.09	
1992	0.08	
1993	0.08	
1994	0.08	
Average 1990-1994	0.08	
365 (days/year)		Conversion Factor

TABLE 4
Distribution of Cargo Losses from Full Size Tankers During Highway Transit in the U.S. from 1971 to October 1986

Size of Spill (gallons)	Number of Incidents Less Than or Equal to Size of Spill	Cumulative Frequency of Spill
1	452	0.03
10	2,937	0.20
20	4,378	0.30
40	6,017	0.42
60	7,340	0.51
100	8,695	0.60
400	10,866	0.75
700	11,517	0.80
3,000	13,097	0.90
5,000	13,740	0.95
8,000	14,247	0.98
15,000	14,475	1.00

Source: USDOT. 1986.

TABLE 5 Frequency of Specific Size Spill Occurring on SR 39				
Size of Spill (gallons)	**Number of Spills Each Year Involving Trucks Carrying Waste to WTI (S_w) (spills/year)**	**Frequency of Specific Size Spill Occurring**	**Frequency of Size Spill Occurring on SR 39 (per year)**	**Recurrence Interval (Years) of Specific Size Spill Occurring on SR 39**
100	0.043	0.40	0.017	60
5,000	0.017	0.20	0.0034	295

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