

HAZARDS ANALYSIS THE RESULT OF THE PROCESS

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The Result Of The Process

Hazards Analysis - A Three Step Procedure

- ▣ Hazards Analysis is a three step procedure
 - Hazards Identification
 - Vulnerability Analysis
 - Risk Analysis
- ▣ Done properly, it will help to prioritize your time

The Result Of The Process

Software

- ▣ Software programs (CAMEO) are designed to assist with
 - Access chemical property and response information.
 - Model potential chemical releases
 - Display key locations and release predictions on a map
 - Manage planning data (especially data required by the Emergency Planning and Community Right-to-Know Act)

The Result Of The Process Software

- ▣ CAMEO Suite is a collection of software programs
 - CAMEO – Computer-Aided Management of Emergency Operations
 - ALOHA – Areal Locations of Hazardous Atmospheres
 - MARPLOT – Mapping Applications for Response, Planning, and Local Operational Tasks

The Result Of The Process

Software

- ▣ How can CAMEO Suite help meet ORC 3750?
 - Identifies facilities that have an extremely hazardous substance greater than the threshold quantity for that substance
 - ▣ 3750.04 (A)(1)(a)
 - Identifies facilities that are contributing or subject to additional risk due to their proximity to the facility
 - ▣ 3750.04 (A)(2)

The Result Of The Process Software

- ▣ CAMEO & ORC 3750 (continued)
 - Identifies routes likely to be used for the transportation of extremely hazardous substances to and from each facility
 - ▣ 3750.04 (A)(3)
 - Identifies the Community Emergency Coordinator for the district, the Facility Emergency Coordinator and the heads of the Emergency Response Organizations
 - ▣ 3750.04 (A)(5)

The Result Of The Process

Software

- ▣ CAMEO & ORC 3750 (continued)
 - Can aid in identifying methods and procedures to be followed by facility owners and operators and local emergency responders to an EHS release
 - ▣ 3750.04 (A)(6)
 - Identifies a composite statement of specialized equipment, facilities, personnel and emergency response organizations available within the district to respond to an EHS release
 - ▣ 3750.04 (A)(8)

The Result Of The Process Software

- ▣ CAMEO & ORC 3750 (continued)
 - Evacuation plans including, but not limited to, provisions for a precautionary evacuation and for alternative traffic routes in the event of a release of an extremely hazardous substance from a facility
 - ▣ 3750.04 (A)(9)

STEP 1

HAZARDS IDENTIFICATION

The Result Of The Process

Step1 - Hazards Identification

- ▣ Hazards Identification
 - EHS and HS facilities
 - Transportation routes for EHS and HS
 - ▣ Road, Rail, Waterway, Pipelines
 - Flood plain areas and dams
 - Abandoned mines (subsidence)
 - Bio-Facilities

Samples in this presentation are based upon chemical hazards

The Result Of The Process

Step1 - Hazards Identification

Facilities Last Modified 6/30/2010

Shipper Report Year 2009

Facility Name Avery Dennison - Industrial Products Division - (Strongsville)

Department Site of

Found: 2
Total: 1726
Unsorted

Home View List New Search Edit Help

ID Codes State Fields Map Data Site Plan Notes

Address Facility Phones Contacts **Chemical Inventory** Checklist

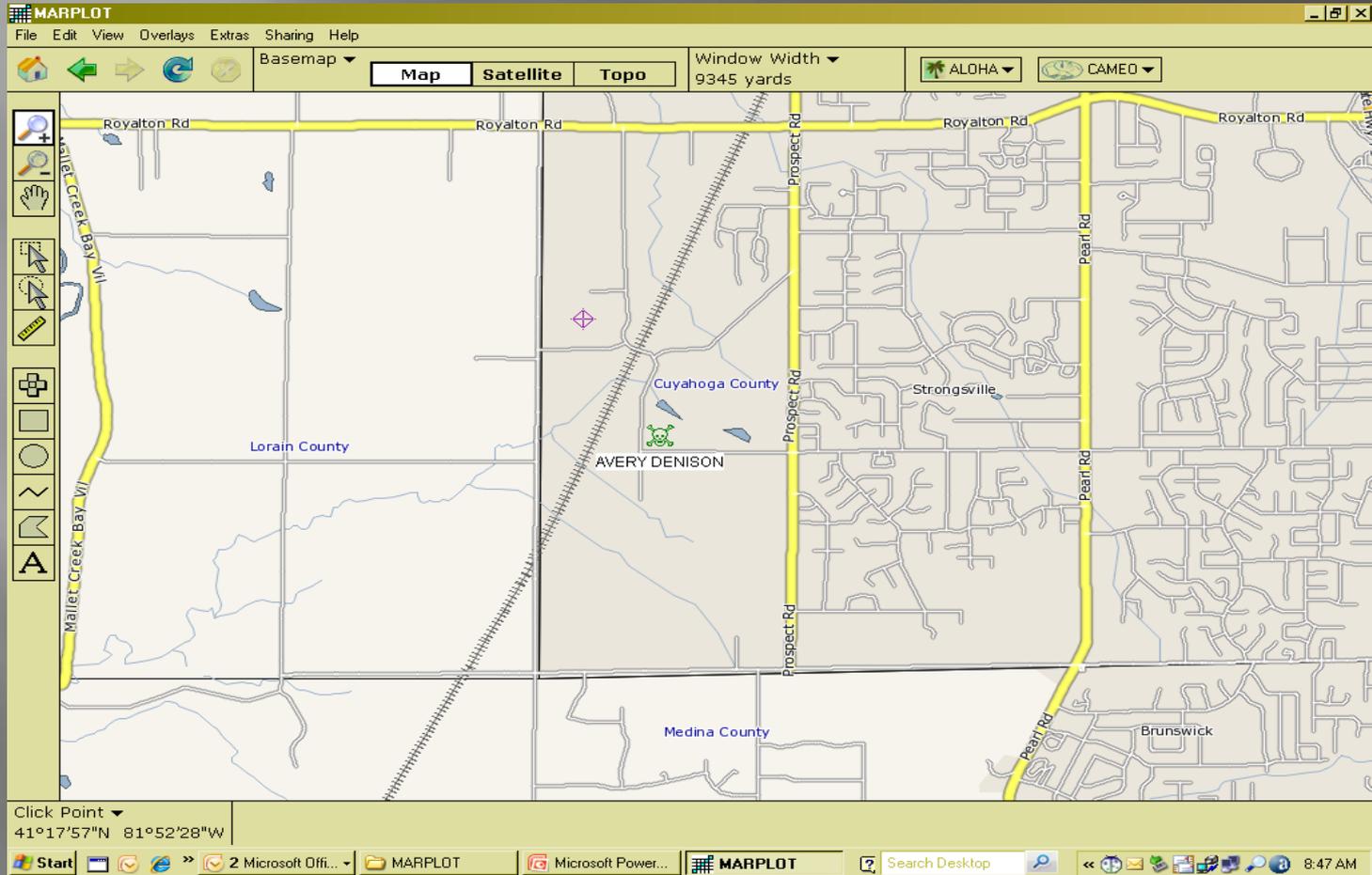
CAS	Chemical Name	
	70/30 Avery Solvent	Datashheet
141-78-6	ethyl acetate	Datashheet
	glycol ether	Datashheet
67-63-0	propanol	Datashheet

Double Click on a row to view additional chemical inventory information.

Identifies facilities that have an EHS - 3750.04 (A)(1)(a)

The Result Of The Process

Step1 - Hazards Identification



Identifies facilities that have an EHS - 3750.04 (A)(1)(a)

The Result Of The Process

Step1 - Hazards Identification

- ▣ Transportation points that could be discussed with the facility representative
 - Frequency of shipments
 - Form of shipments
 - ▣ Tank cars
 - ▣ Carboys
 - Quantity of shipments



The Result Of The Process

Step1 - Hazards Identification

Routes Last Modified 7/28/2010

Route Name: Avery Denison
Route Type: Other Road
Types of Vehicles: Evacuation Snow School HAZMAT Mass Transit

Start Point: Avery Denison
Endpoint: Customer
County/District: Cuyahoga/Strongsville
Fire District: Strongsville
Vehicles Per Day: 1
 Route plotted in MARPLOT

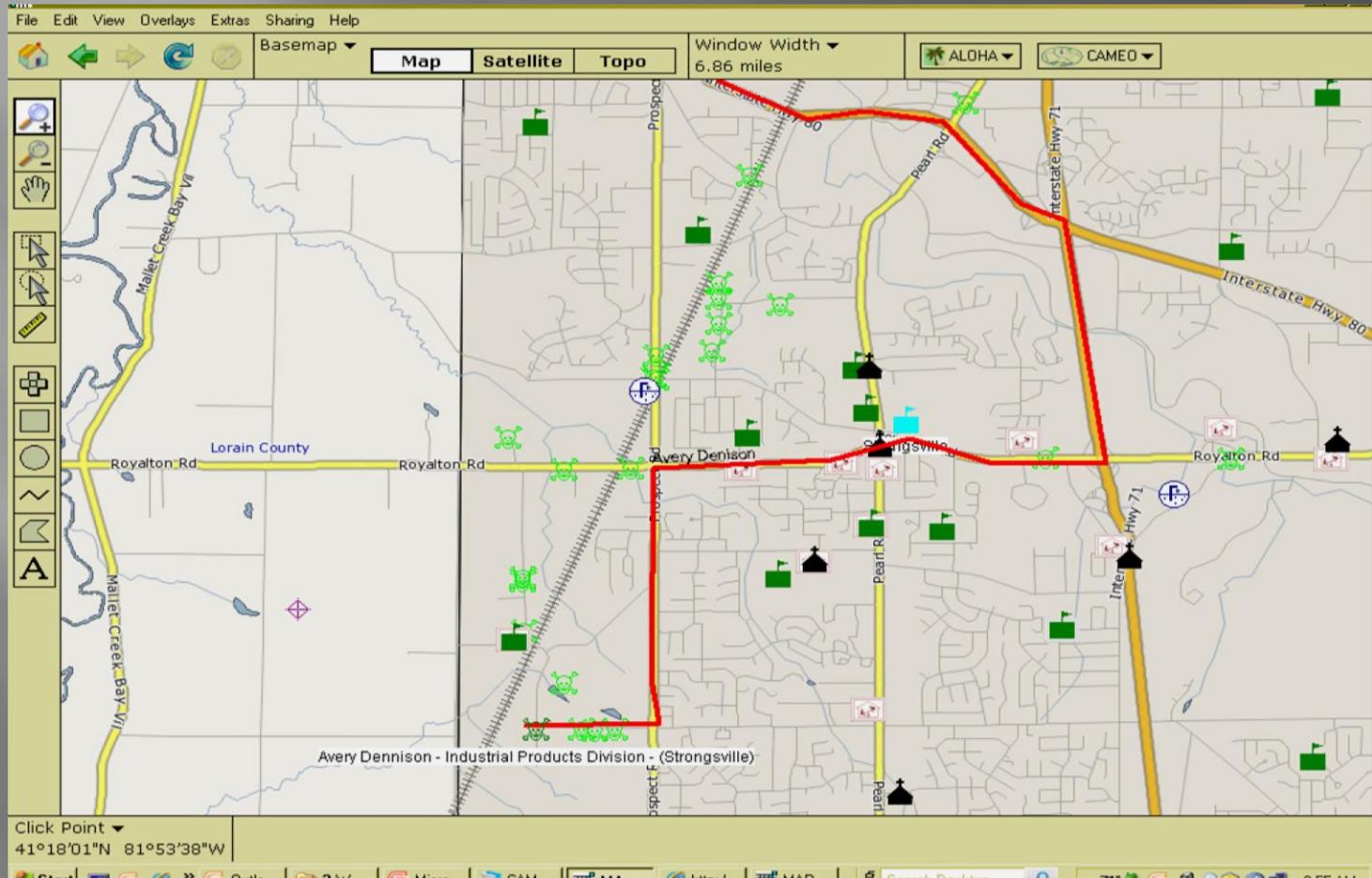
Intersections | Chemical Inventory | Notes

Order	Intersection
1	Foltz Ind Pkwy & Prospect Rd.
2	Prospect Rd. & Royalton Rd.
3	Royalton Rd. & Interstate 71 North
4	Interstate 71 North & Interstate 80 West
5	Interstate 80 West to Indiana State Line

Identifies likely transportation routes to and from each EHS - 3750.04 (A)(3)

The Result Of The Process

Step1 - Hazards Identification



Identifies likely transportation routes to and from each EHS - 3750.04 (A)(3)

Step 2

Vulnerability Analysis

The Result Of The Process

Step 2 – Vulnerability Analysis

- ▣ VULNERABILITY ANALYSIS
 - Vulnerability Zone (VZ) - An estimated geographical area that may be subject to concentrations of an airborne EHS at levels that could cause irreversible acute health affects/death.

The Result Of The Process

Step 2 – Vulnerability Analysis

- ▣ VULNERABILITY ANALYSIS
 - Human Populations
 - ▣ Numbers and types
 - Residents
 - High-density transient populations (workers, spectators)
 - Sensitive populations (assisted living, schools)

The Result Of The Process

Step 2 – Vulnerability Analysis

- ▣ VULNERABILITY ANALYSIS
 - Critical Facilities
 - ▣ Hospitals
 - ▣ Public safety services
 - ▣ Communications equipment
 - ▣ Utilities
 - Substations, Towers
 - Environmental
 - ▣ Drinking water
 - ▣ Food supply
 - ▣ Animal habitat



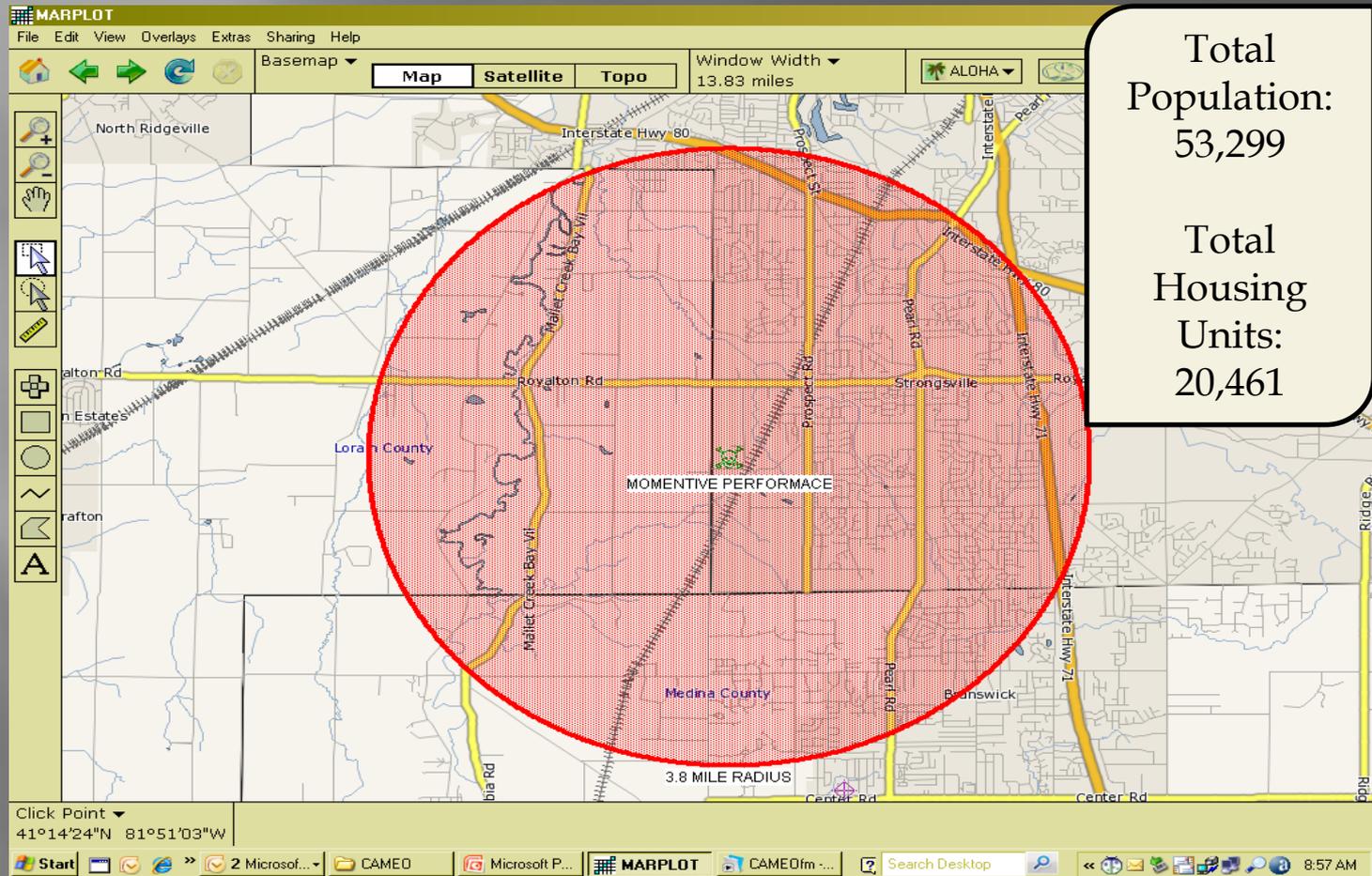
The Result Of The Process

Step 2 – Vulnerability Analysis

- ▣ Maps should identify parameters of VZ.
Labels/legends should provide such things as:
 - Chemical, quantity, rate of release, wind speed, etc.
 - Dam failure data
 - Flood stage levels
 - Other assumptions used to estimate the VZ

The Result Of The Process

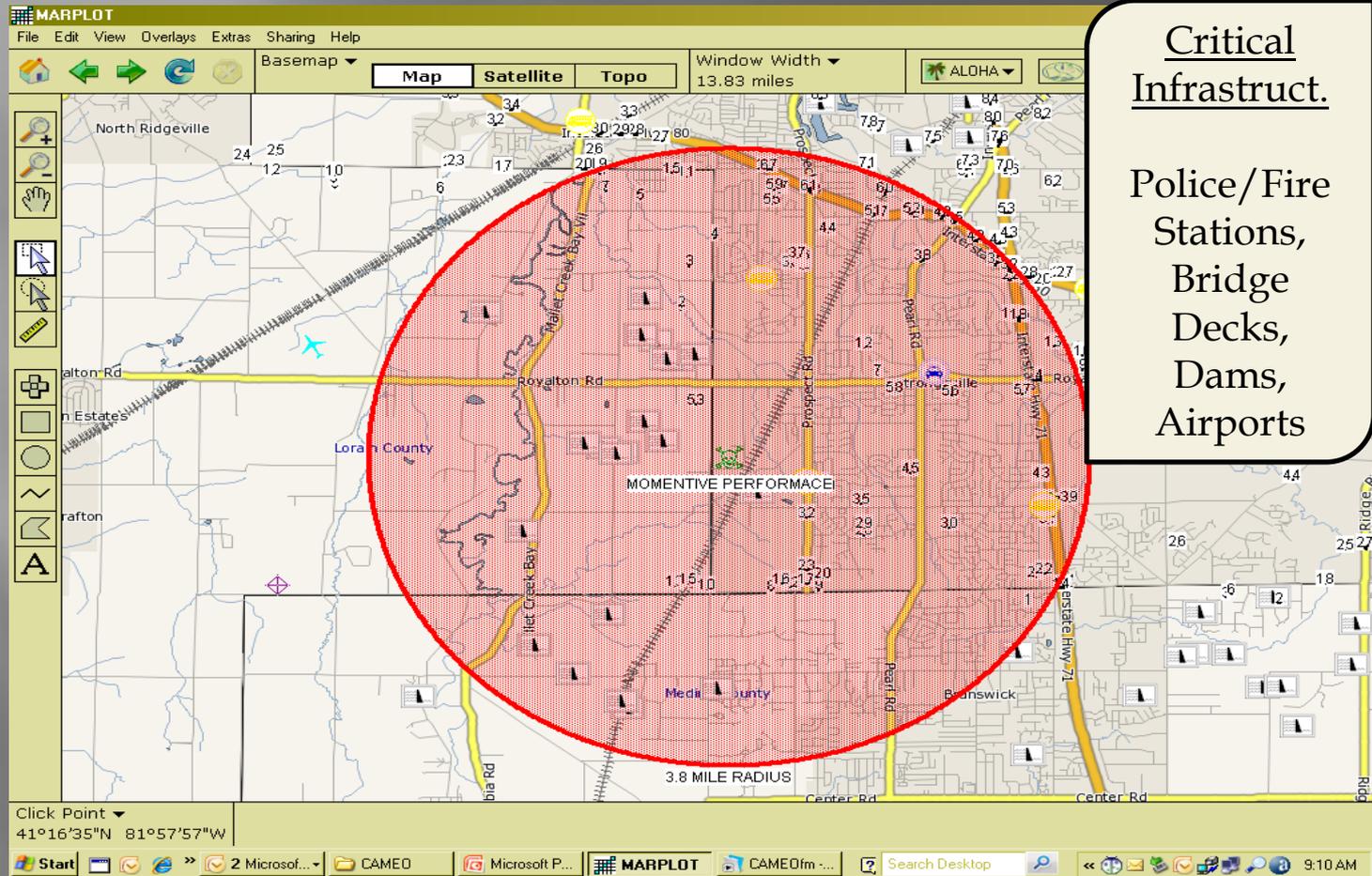
Step 2 - Vulnerability Analysis



Identifies facilities that contribute or subject to additional risk - 3750.04 (A)(2)

The Result Of The Process

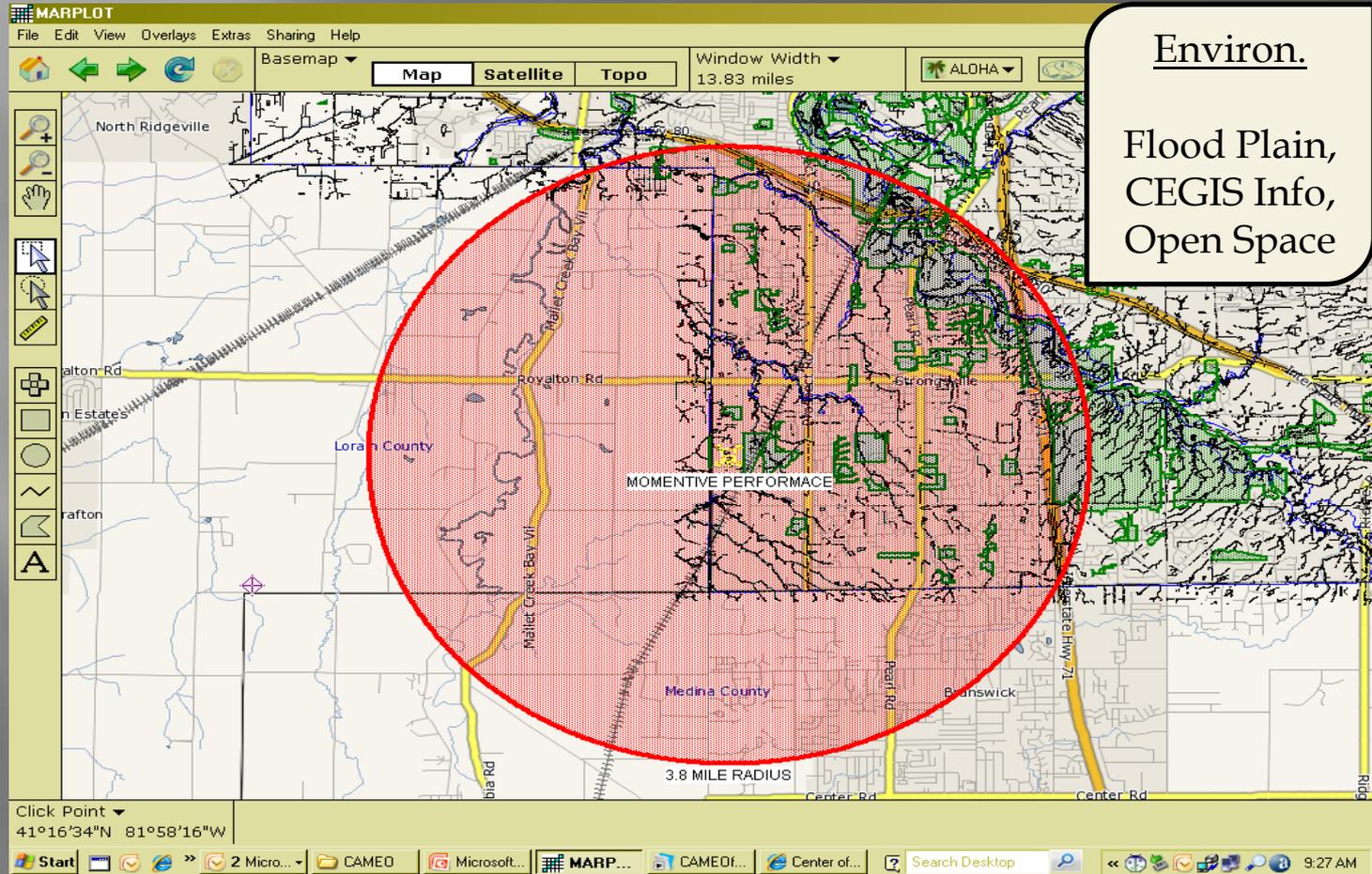
Step 2 - Vulnerability Analysis



Identifies facilities that contribute or subject to additional risk - 3750.04 (A)(2)

The Result Of The Process

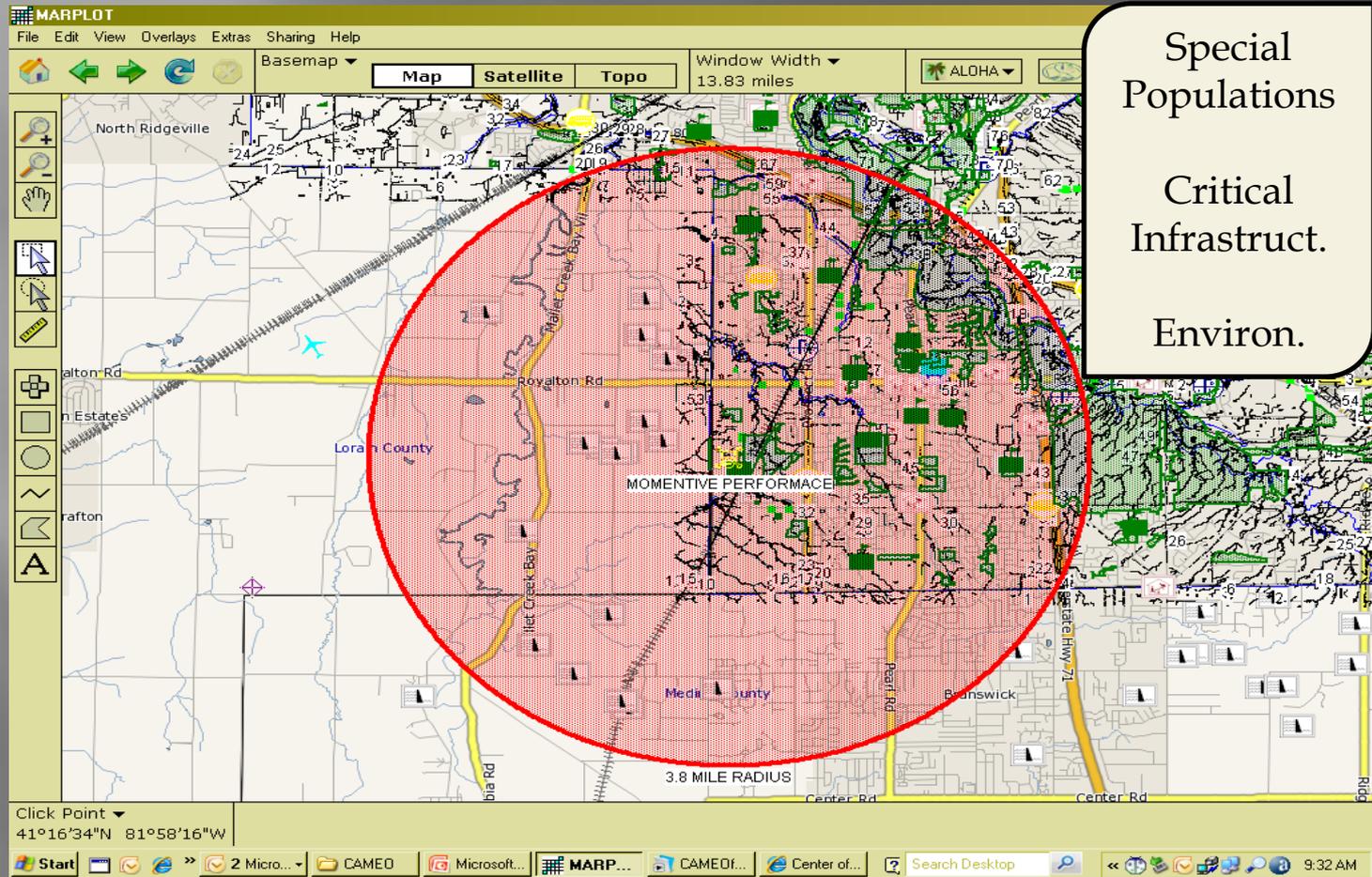
Step 2 - Vulnerability Analysis



Identifies facilities that contribute or subject to additional risk - 3750.04 (A)(2)

The Result Of The Process

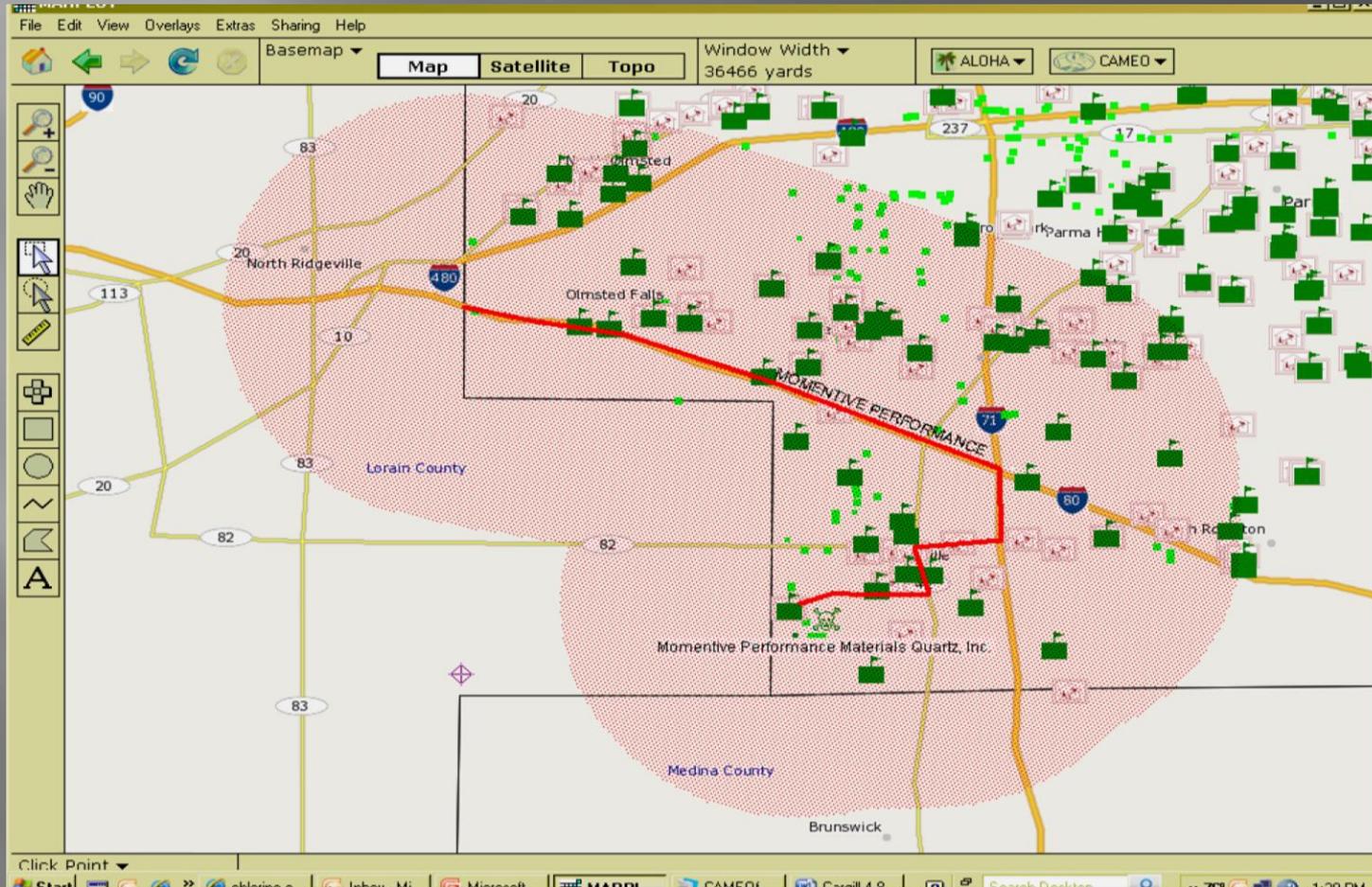
Step 2 – Vulnerability Analysis



Identifies facilities that contribute or subject to additional risk - 3750.04 (A)(2)

The Result Of The Process

Step 2 - Vulnerability Analysis



Identifies likely transportation routes to and from each EHS - 3750.04 (A)(3)

The Result Of The Process

Step 2 – Vulnerability Analysis

- ▣ Initial Screening : Credible Worst Case
 - Maximum quantity that could be released from largest vessel or interconnected vessels
 - Rate of release
 - Temperature
 - Meteorological conditions
 - Topography
 - Level of concern
- ▣ Will assist with possible re-prioritization of your time and effort

The Result Of The Process

Step 2 – Vulnerability Analysis

The screenshot displays a web-based contact management interface. The main content area is titled "Contacts" and shows a record for "Mary Ward". The record includes fields for First Name, Last Name, Organization, Title, Contact Type, Address, Mailing Address, and Email. The contact type is "Emergency Contact" and "Regulatory Point of Contact". The address is "17700 Foltz PArway, Strongsville, OH 44149, USA". The email is "mary.ward@averydennison.com".

Contacts		Last Modified 6/1/2009	
First Name	Mary	Last Name	Ward
Organization			
Title	EHS Manager		
Contact Type	Emergency Contact	Regulatory Point of Contact	
	Submitter		
Address		Phones	Notes
Street Address			
17700 Foltz PArway			
City	Strongsville	State	OH Zip 44149
County		Fire District	
Country	USA		
Mailing Address			
City		State	Zip
Country			
Email	mary.ward@averydennison.com		

Identifies facilities Emergency Coordinator - 3750.04 (A)(5)
Identifies head of emergency response agencies

The Result Of The Process

Step 2 - Vulnerability Analysis

Resources Last Modified 7/29/2010

Supplier Name: ABC RENTAL (EXAMPLE)
Type: Chemical Protective Clothing

Contacts	Map Data	Notes
Address	Supplier Phones	Items

Street Address

1234 W. MAIN ST.

City: STRONGSVILLE State: OH Zip: 44136
County: CUYAHOGA Fire District: STRONGSVILLE
Country: USA

Mailing Address

SAA

City: State: Zip:

Country:

Email XXXXX@ABCRENTAL.COM

Chemical equipment rental company that aids in ethyl acetate clean-up

Identifies specialized equipment- 3750.04 (A)(8)

The Result Of The Process

Step 2 – Vulnerability Analysis

File Edit Record Search Sharing Scripts Help

Home View Record New Search Edit Help

Browse

Layout: Found S

Record: 1

Found: 28
Total: 9122
Unsorted

Found Chemicals In Inventory

Results of search for: Chemical Name Contains characters ethyl acetate

Report Year	Facility or Route Name	Chemical	Mixture	CAS
2004	Blue Ridge Paper Products, Inc.	Methyl acetate	<input checked="" type="checkbox"/>	
2004	Chemical Solvents, Inc.	Ethyl Acetate	<input type="checkbox"/>	141-78-6
2006	Chemical Solvents, Inc.--Denison	ETHYL ACETATE	<input type="checkbox"/>	141-78-6
2006	Chemical Solvents, Inc.--Denison	METHYL ACETATE	<input type="checkbox"/>	79-20-9
2004	PPG Industries Ohio, Inc.	2-BUTOXYETHYL	<input checked="" type="checkbox"/>	112-07-2
2008	PPG Industries Ohio, Inc.	2-butoxyethyl acetate	<input type="checkbox"/>	112-07-2
2006	PPG Industries Ohio, Inc.	2-BUTOXYETHYL	<input checked="" type="checkbox"/>	112-07-2
2009	Chemcentral / Cleveland	Ethyl Acetate	<input type="checkbox"/>	141-78-6
2009	Chemcentral / Cleveland	Methyl Acetate	<input type="checkbox"/>	79-20-9
2008	PPG Industries Ohio, Inc.	Ethyl Acetate	<input type="checkbox"/>	141-78-6
2008	TECHNICAL PRODUCTS INC	ETHYL ACETATE	<input type="checkbox"/>	141-78-6
2007	Chemical Solvents, Inc.	METHYL ACETATE	<input type="checkbox"/>	79-20-9
2007	Chemical Solvents, Inc.--Denison	ETHYL ACETATE	<input type="checkbox"/>	141-78-6
2007	Chemical Solvents, Inc.--Denison	METHYL ACETATE	<input type="checkbox"/>	79-20-9
2007	DairyPak - Blue Ridge Paper Products	METHYL ACETATE	<input checked="" type="checkbox"/>	
2008	Chemical Solvents, Inc.	METHYL ACETATE	<input type="checkbox"/>	79-20-9
2008	Chemical Solvents, Inc.--Denison	ETHYL ACETATE	<input type="checkbox"/>	141-78-6
2008	Chemical Solvents, Inc.--Denison	Mask Wash	<input checked="" type="checkbox"/>	
2008	Chemical Solvents, Inc.--Denison	METHYL ACETATE	<input type="checkbox"/>	79-20-9

100% Browse

For Help, press F1

NUM

Start

NUM

These facilities could use the same clean-up equipment

Other facilities in district with ethyl acetate

The Result Of The Process

Step 2 – Vulnerability Analysis

- ▣ Evacuation Considerations
 - Evacuation decisions are incident-specific and the estimated VZ should not automatically be used as the basis for evacuation during an incident response.
- ▣ DOT's NAERG
 - Provides initial isolation and evacuation distances for transportation incidents. Initial = first 20/30 minutes of an incident.

The Result Of The Process

Step 2 – Vulnerability Analysis

- ▣ Evacuation Considerations
 - Physical/chemical properties
 - Health affects
 - Dispersion pattern
 - ▣ follow contour of ground
 - ▣ Plume



The Result Of The Process

Step 2 – Vulnerability Analysis

- ▣ Evacuation Considerations
 - Atmospheric conditions
 - Populations
 - ▣ self evacuate,
 - ▣ prisoners
 - Resource requirements for safe & effective evacuation



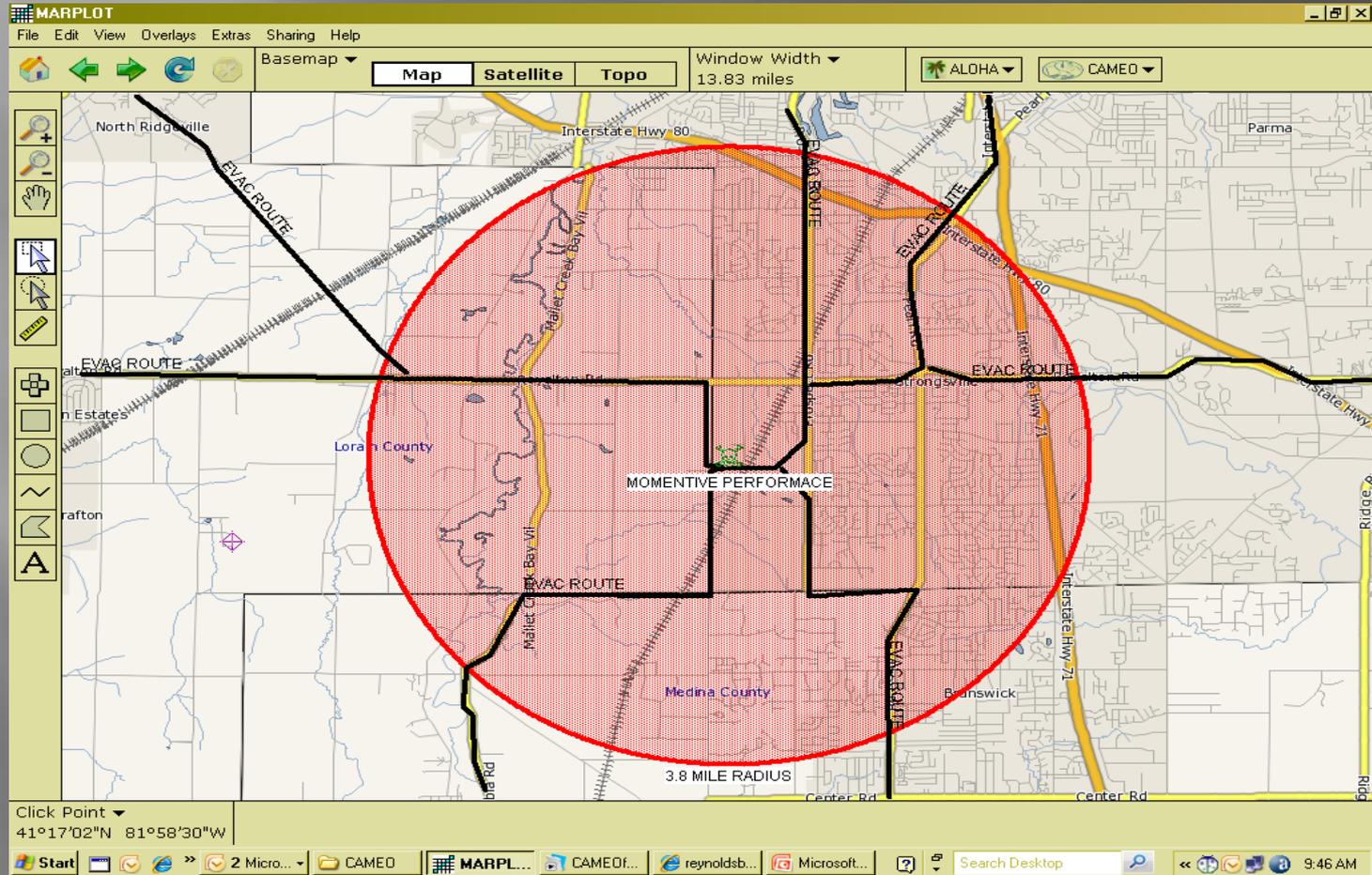
The Result Of The Process

Step 2 – Vulnerability Analysis

- ▣ Evacuation Considerations
 - If the vulnerability zone is greater than planners can cope with, the community should work closely with the facility to discuss the possibility of reducing the risk of exposure.
 - ▣ Reducing inventories
 - ▣ Establishing controls to prevent a release
 - ▣ Early warning system

The Result Of The Process

Step 2 – Vulnerability Analysis



Identifies evacuation / alternative traffic routes 3750.04 (A)(9)

The Result Of The Process

Step 2 – Vulnerability Analysis

- ▣ Evacuation Considerations - Mapping
 - Pick up points
 - Shelter & reception center locations
 - Humane shelter locations
 - Hotels and motel locations



Step 3

Risk Analysis

The Result Of The Process

Step 3 - Risk Analysis

- ▣ RISK ANALYSIS
 - Likelihood of a release
 - Severity of the consequences of a release

The Result Of The Process

Step 3 – Risk Analysis

- ▣ Requires information collected during the first two steps of the process
- ▣ You should also work with the facility to obtain
 - Anticipated adverse health effects
 - Safeguards in place on-site
 - Recommendations by facility for community safeguards
 - Risk management plans (RMPs)
 - Previous release history and lessons learned

The Result Of The Process

Step 3 – Risk Analysis

- ▣ You will also want to identify
 - Community plans and safeguards
 - Response capabilities within the district
 - Historical accident records – these may be off-site release reports
- ▣ Information gathered may prompt a re-evaluation of release consequences
 - Scenarios may be developed
 - May change priority status of facility
- ▣ Data can be stored in a hazards analysis matrix.

The Result Of The Process

Step 3 - Risk Analysis

Initial Screening	Hazard A
1.) Hazards Identification (Major)	
a) Chemical	Chlorine
b) Location	Water Treatment Plant
c) Quantity	800 pounds
d) Properties	Poisonous; may be fatal if inhaled. Contact my cause burns to skin and eyes.
HAZARDS ANALYSIS MATRIX	

The Result Of The Process

Step 3 - Risk Analysis

Initial Screening	Hazard A
2.) Vulnerability Analysis	
a) Vulnerable Zone (VZ)	A spill of 800 lbs of chlorine could result in an area of radius > 10 miles where the gas may exceed the LOC. Credible worst-case scenario.
b) Population within VZ	Approx. 29 water plant workers; total population in VZ > 125,000
c) Critical Infrastructure within zone	2 fire stations, 1 hospital
HAZARDS ANALYSIS MATRIX	

The Result Of The Process

Step 3 - Risk Analysis

Initial Screening	Hazard A
3.) Risk Analysis	
(Initial evaluation of reporting facilities - relative hazards)	Relative to potential hazards of other reporting facilities - High
HAZARDS ANALYSIS MATRIX	

The Result Of The Process

Step 3 - Risk Analysis

Qualitative Definitions of Probability of Occurrence	
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.

The Result Of The Process

Step 3 - Risk Analysis

Definitions of Severity of Consequences to People	
Low:	Negligible concentrations. Injuries expected only for exposure over extended periods or when individual personal health conditions create complications.
Medium:	Sufficient concentrations 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:	Sufficient concentrations to cause serious injuries and/or deaths upon exposure. Large numbers of people expected to be affected.

The Result Of The Process

Step 3 - Risk Analysis

RISK MATRIX	Severity of Consequences of Release to People			
		Low	Med.	High
Likelihood of a Release	Low			
	Med.			
	High			



These combinations of conclusions from risk analysis identify situations of major concern

The Result Of The Process

Reference

- ▣ Reference for slide presentation
 - Technical Guidance for Hazards Analysis
Emergency Planning for Extremely Hazardous
Substances
 - ▣ (Green Book)

<http://www.epa.gov/emergencies/docs/chem/tech.pdf>

HAZARDS ANALYSIS
THE RESULT OF THE
PROCESS

The Plan

