

# Appendix B

## Scope of Work – Hazard Analysis

Develop one comprehensive Hazard Analysis plan to identify and assess potential hazards in the community, primarily from releases of Extremely Hazardous Substances (EHS) from fixed facilities and transportation of chemicals to and from the facilities (for HMEP funded projects). **Natural, civil, and vector** hazards can also be included to broaden the scope of the study. The final product will include the following:

**General Summary:** Provide an overview of:

- Background of the study
- Regulations and compliance issues
- Process used for analysis
- Utilization of information (purpose, how the product will be utilized)

**County Profile:** Describe county profile containing the summary of following information:

- Geographic
- Demographic
- Infrastructure
- Historical
- Geologic
- Climate & Weather
- Economic
- Transportation
- Response Organizations
- Critical Facilities

**Hazards Identification:** Identify, characterize and evaluate potential hazards in the jurisdiction, include pertinent maps as applicable:

- Identify EHS present in the community from County/State Tier II data, Environment Pollution Agency (EPA) data, Emergency Planning and Community Right To Know Act (EPCRA) data, United States Department of Transportation (USDOT) filings, Chemical Spill data, other state/federal databases that might contain information to identify hazard, field inspection of storage tanks, business sites, stored chemical sites, railroad spurs, water treatment plants, etc..
- Locate facilities with EHS exceeding the threshold planning quantity (TPQ), list type and quantity of EHS present in the community:
  - Identify the top ranked 10 facilities with EHS chemicals in the community:
    - List facility name, address, maps, longitude/latitude, and emergency contacts.
    - List chemicals on site, characterize by:
      - ❖ Chemical Abstract Service (CAS) #, physical state, type of hazard (explosive, reactive, toxic, etc.).
      - ❖ Maximum quantity stored at a time, amount in largest or interconnected vessels.
      - ❖ Type and design of container (size and shape) and condition of storage.
    - Identify transportation routes (on a map) for transporting chemicals, frequency of shipments, form of shipments, and quantity of shipments.
    - Depict evacuation routes in the event of and chemical release.
    - Additional facilities contributing or subjected to additional risk due to their proximity to facilities.
  - Other technological hazards such as radiological, electromagnetic pulse (EMP)/geomagnetic storms, solar radiation, dam failure, power failure, major transportation incidents, etc.).
- Identify potential hazards from natural events such as flood, tornado, earthquake, drought, winter storm, excessive heat, landslide, wildfire, etc.

- Identify potential hazards from civil disturbance, terrorism, deliberate human actions to threaten or harm another person or cause damage to property or running of government.
- Identify potential hazards from biological agents, foreign animal disease (FAD), infectious disease, etc.

**Vulnerability Analysis:** Determine vulnerability of population, property, essential services, and environment from information obtained from hazard identification and community profile, focus on hazards that present greatest risk. Use tables and maps as needed to illustrate results. Assess the following:

- Estimate vulnerable zones for the top 10 locations with reported EHS and depict on a map.
- Assess vulnerability based on threat from EHS present at the facility and safeguards present -- such as chemical detection devices, alerting systems, shelter in place, etc.
- Estimate impact on life (population, animal, endangered species, etc.) in the event of a release.
- Identify impact on critical facilities within the vulnerable zone.
- Determine impact on the environment within the vulnerable zones.
- Determine impact on essential services within the vulnerable zones.
- Determine impact on response organizations and equipments within the vulnerable zones.
- Determine vulnerabilities from other technological hazards that were identified in the hazards identification process.
- Determine vulnerability of population, property, and environment based on potential natural incidents such as flood, tornado, earthquake, storms, severe winter weather, excessive heat, etc.; historical data, forecasts and trends.
- Determine vulnerability based on historical data on terrorism, civil disorder and any unrest or unlawful use of force, data sources such as homeland security data, and subjects of interest.
- Determine vulnerability based on historical data on infectious diseases, FAD, biological agents, insects, etc.
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**Risk Analysis:** Evaluate risk using the following methods:

- Describe risk assessment methodologies. Collect chemical risk information (e.g. from EPA's Chemical Emergency Preparedness and Prevention Office), unusual environmental conditions, assess population and properties that could be at risk. Present data in the form of tables. Describe:
  - Risk rating methods for:
    - Chemical Hazards.
    - Natural Hazards.
    - Other Hazards such as Civil Hazards, Vector Hazards.
  - Describe models and algorithms used in risk analysis.
- Estimate risks for each hazard category using risk ratings and prioritizes risk based on conservative estimates and worst-case scenarios. Present data in tables for each hazard categories:
  - Prioritize and rate to 10 facilities based on EHS present in the facility, historical accident records, and probability of release based on observation at the facility.
  - Estimate probability that a release will occur and any unusual environmental conditions.
  - Rate the severity of consequence to life/damage to property/damage to environment, if an actual release were to occur; rank high, medium, low, or use numeric ratings based on appropriate technical consideration.
  - Assess risk due to other technological hazards that were identified in the hazards identification process.
  - Develop Cascading Hazard Risk Matrix, showing potential secondary risks from primary sources to reflect local conditions. Presents data in tables.
  - Assess potential risks for natural events such as flood, drought, wildfire, severe weather, earthquake, landslide, etc.; analyze other unique risk factors that might affect neighboring entities.
  - Assess potential Civil Hazards risks from historical and other data sources such as homeland security data, law enforcement data, suspected targets within the jurisdiction, etc.

- Assess Vector Hazard risks from agricultural, ecological, FAD, infectious disease, historical data, etc.

**Conclusion and Recommendations:** Assemble information concerning hazards, vulnerability, and risk. Identify highest threat and recommend response actions; identify any gaps observed in data collection; time period for which the plan is valid; recommend maintenance of the plan.

**Resources:** Include state/county maps and tables, historic site maps, contingency maps and tables, references, acronyms, glossary