APPENDIX A

RESPONSES TO COMMUNITY SURVEY

(N = 137)

COMMUNITIES PARTICIPATING IN THE STUDY AND THEIR DISTRIBUTION BY SIZE AND GEOGRAPHICAL LOCATION

A. Emergency Planning

Q A-1 Does your community have an emergency operations center (EOC)? (%)

45.6	Yes, a permanent dedicated EOC that is maintained in operating condition.
34.6	Yes, a permanent EOC that is also used for other purposes.
12.5	Yes, a temporary EOC that is established when the need arises.
2.2	No, an EOC does not exist.
2.9	Other arrangement

Q A-2 Is there an alternative or backup EOC? (%)

78.7	Yes
22.1	No

Q A-3 About how many personnel (FTEs or full-time equivalents) work on emergency planning in the community?

Mode = 1
Median = 2
15.4% with none

Q A-4 About what percentage of their time is devoted to chemical emergencies?

Mean = 13%

Q A-5 Does someone in the community have formal responsibility for planning for a chemical emergency? (%)

91.9	Yes
8.8	No

Q A-6 Does the community have an emergency plan? (%)

94.9	Yes
5.1	No

Q A-7 Does it have a section on chemical emergencies? (%)

27.2	No
73.5	Yes; if yes, in what year was it adopted?
3.6	Before 1978

5.1 1978-1982
15.5 1983-1985
14.7 1986
30.1 1987
4.4 1988

Q A-8 Is there a special plan or annex for this chemical facility? (%)

38.2 Yes
61.0 No

Q A-9 About how many emergency personnel would be available to respond to an accident at a chemical facility?

Mean number of persons

64 Full-time paid emergency personnel (35 hours per week or more)
9 Part-time paid emergency personnel (less than 35 hours per week)
42 Volunteer emergency personnel
47 Personnel from non-emergency agencies or departments
89 Personnel available from mutual aid agreements
28 Other personnel

B. Communication

Q B-1 Who at the facility has primary responsibility for initially notifying the local community about an emergency at the facility? (%)

50.7 Identified name and position
0.7 Identified name and organization
18.4 Identified position only
1.5 Identified name only
2.2 Identified organization only
25.0 Unknown or blank

Q B-2 Who would notify the community if those persons were not available? (%)

25.8 Identified name and position
0.7 Identified name and organization
0.7 Identified position and organization
27.9 Identified position only
3.7 Identified organization only
38.2 Unknown or blank

Q B-3 Who has the designated official responsibility for receiving an alert from the chemical facility? (%)

51.4	Identified name and position
0.7	Identified name and organization
8.1	Identified position and organization
38.7	Identified position only
1.5	Unknown or blank

Q B-4 Who would they notify if that person were not available? (%)

32.3	Identified name and position
0.7	Identified name and organization
10.3	Identified position and organization
39.0	Identified position only
7.4	Identified organization only
8.1	Unknown or blank

Q B-5 Are there any days of the week and times of day that it would be difficult for the community to receive an alert (either not issued or not received)? (%)

87.5	No
12.3	Yes (please describe when and why; indicate time periods by day and hours and the reasons each period presents difficulties.)
8.0	Nights
3.6	Weekends
0.7	Evenings, nights, and weekends

Q B-6 What communications equipment would the facility use to notify the community of a chemical accident (primary and backup)? (%)

Primary equipment:

65.7	Commercial telephone
35.0	Two-way radio
5.1	Dedicated telephone
3.6	Dedicated radio
2.2	Pager
7.3	Sirens
2.9	In person
13.1	TV or emergency broadcast system (EBS)
7.3	Public address (PA)/loudspeakers
3.5	Alarm system
2.9	911

Backup equipment:

5.1	Commercial telephone
14.5	Two-way radio
0.7	Dedicated telephone
2.9	Dedicated radio
0.7	Pager
1.5	Sirens
2.9	In person
0.0	TV or EBS
4.4	PA/loudspeakers
0.0	Alarm system
0.7	911

Q B-7 What procedure do you follow when the initial warning is received?

3.7	No procedure described
50.7	Vague procedure
46.3	Clear standard operating procedure (SOP)

Q B-8 Please describe the communications equipment within your EOC (e.g., commercial telephone, 911 telephone, dedicated telephone, automatic ring-down system, manual alarm, automatic alarm, radio, computer link, or other)

85.3	Commercial telephones
79.4	Two-way radio
33.1	911 system
28.7	Dedicated telephones
19.1	Automatic ring-down system
11.0	Manual alarms
5.1	Automatic alarms
19.9	Teletype/computer link

Q B-9 How often is this communications equipment routinely tested? (%)

2.2	Yearly
4.4	Semiannually
25.7	Monthly
17.6	Weekly
45.6	Daily
3.7	Never or blank

Q B-10 Please describe any mobile communications resources available to the community. (%)

11.0	None reported
6.6	Portable radios only
39.7	Radios in vehicles
43.3	Mobile communications vehicle

Q B-11 What information does the community need from the chemical facility in an emergency notification to make a decision to warn the public? (%)

79.4	Type of chemical
56.6	Size of release
36.8	Plume location (actual or projected or wind direction)
11.0	Plume size
24.3	Speed of dispersion (or wind speed)
7.4	Duration of release
41.9	Human health effects
22.1	Pathways
2.9	Available protective actions
19.9	Recommended protective actions
12.5	Facility response
13.2	Assistance needed
44.9	Other (mostly general information, e.g., What happened)

Mean = 3.7 items mentioned

Q B-12 The emergency warning system to alert and inform the public in the event of a chemical emergency at the facility is primarily made up of (%):

33.1	Fixed (permanently installed) mechanical sirens
22.1	Fixed electronic sirens
9.6	Fixed horns, bells, or whistles
12.5	Fixed loudspeakers/public address
5.1	Fixed flashing lights/strobes
67.6	Portable loudspeakers/public address
41.9	Portable sirens/whistles
35.3	NOAA Weather Radio
71.3	Emergency broadcast radio station
37.5	Tone alert radios
32.4	Radio pagers
5.9	Automated telephone dialers
37.5	Other

Q B-13 Is there a person in the community with the responsibility of maintaining communications with the facility during an emergency? (%)

46.3	Identified name and position
7.4	Identified position and organization
25.7	Identified position only
5.1	Identified organization only
13.3	Unknown or blank

C. Emergency Decision Making

Q C-1 Who has the legal authority to activate an emergency warning or public alert system in your community? (%)

66.9 Identified name and position
5.9 Identified position and organization
23.5 Identified position only
2.2 Identified organization only
1.5 Unknown or blank

Q C-2 Does anyone in the community have the assigned responsibility to make the decision to warn the public in the event of a chemical accident? (%)

7.4 No
79.4 Yes; same as the person(s) with legal authority in previous question
13 Yes; different than the person(s) with legal authority in previous question

Q C-3 Please describe the process for making the decision to warn the public after receiving an initial alert from the facility? (%)

5.9 No procedure described
63.2 Vague procedure
31.6 Clear SOP

Q C-4 Many different types of emergencies can occur at a chemical facility. One type is a very fast release of hazardous materials posing a clear threat to public safety. A second type is a slowly developing problem with a potential for a release.

a. What is the minimum number of people that would have to be involved in making the decision to warn the public?

Mean = 2.2 people in a fast-moving emergency

Mean = 4.6 people in a slowly developing emergency

Q C-5 Once you have received an initial alert from the facility, about how long would it take to mobilize the necessary people that make the decision once an initial alert is received and what is the basis for your estimate?

In a fast-moving emergency:

Minimum: mean = 8.5 min Most likely: mean = 15.0 min

In a slowly developing emergency:

Minimum: mean = 61.6 min Most likely: mean = 71.5 min

Basis for estimate:

7.3	Not described
72.3	Professional judgment
4.4	Exercise and drills
6.6	Routine experience
8.8	Previous disaster

Q C-6 Is there a written procedure for making the decision to issue a public warning? (%)

61.8	No or blank
39.0	Yes; please attach a copy of the procedure

Q C-7 How long would it take to make a decision to notify the public? (Please estimate the range as a minimum and most likely time in hours -H and minutes -M; if less than 1 hour write a 0 before the H and specify minutes only)

In a fast-moving emergency:

Minimum: mean = 9.9 min Most likely: mean = 15.3 min

In a slowly developing emergency:

Minimum: mean = 23.3 min Most likely: mean = 31.0 min

Q C-8 There are a number of ways to protect the health and safety of people from a release of hazardous chemicals (protective actions).

a. What protective actions would be considered for recommendation in a chemical emergency for the general population? (%)

8.0	None mentioned
1.5	To be developed
32.1	Evacuation only
4.4	Shelter only
0.0	Enhanced shelter only
43.8	Evacuation and shelter
10.2	Evacuation and enhanced shelter

b. What protective actions would be considered for recommendation in a chemical emergency for institutional facilities (such as hospitals, schools, prisons, or nursing homes)? (%)

10.9 None mentioned
0.7 To be developed
26.3 Evacuation only
9.5 Shelter only
0.7 Enhanced shelter only
32.8 Evacuation and shelter
16.8 Evacuation and enhanced shelter

Q C-9 Does your community have a written procedure for making a decision about what protective actions to recommend or order? (%)

69.8 No or blank
30.9 Yes; please attach a copy of the procedure

Q C-10 Does your community have a written plan or procedure for issuing an alert/warning? (%)

35.3 No or blank
65.4 Yes; please attach a copy of the procedure

Q C-11 Does your community have a written warning/alert plan or procedure that is specific to the facility? (%)

86.0 No or blank
14.7 Yes; please attach a copy of the procedure

Q C-12 What effort, if any, has your community made to provide the general public with information about chemical hazards and emergency response? (%)

Efforts

23.5 None or blank
16.9 None but recognize need
11.8 Program being developed
8.1 Vague description of program
21.3 Single activity described
19.1 Multiple activities described

Relevance

2.9 General program
52.2 Specific reference to chemical hazard
30.9 Cannot determine if it is specific to chemical hazard

Sample material

14.7 Provided actual material

D. Populations at Risk

Q D-1 About what percentage of the land use within 1 mile of the facility is in the following categories?

Mean percent

31% Open space
22% Industrial (wholesale; manufacturing)
10% Commercial (retail; offices)
21% Suburban residential (single family)
8% Urban residential (multi-family)
2% Other

Q D-2 About what percentage of the land use within 5 miles of the facility is in the following categories?

Mean percent

31% Open space
14% Industrial (wholesale; manufacturing)
12% Commercial (retail; offices)
29% Suburban residential (single family)
10% Urban residential (multi-family)
2% Other

Q D-3 Approximately how many people live within 1 mile of the facility?

Mean = 4,368 people

Q D-4 Approximately how many people live within 5 miles of the facility?

Mean = 42,583 people

Q D-5 Are there significant fluctuations in the size of the population (such as workers, tourists, or visitors) in any of the area within 5 miles of the facility?

a. During the day or night? (%)

50.0 No
50.0 Yes

b. During different seasons? (%)

83.8 No
15.4 Yes

c. During weekends? (%)

69.9 No
29.4 Yes

Q D-6 Are there institutional populations within 5 miles of the facility (e.g., schools, hospitals, nursing homes, correctional facilities)?

Type	% with type	Mean number in communities where they are reported
Day care	12.4	6
Schools	64.2	12
Universities	10.2	2
Hospitals	40.9	2
Nursing homes	44.5	3
Correctional facilities	24.8	1

E. Public Alert and Warning

Q E-1 Please indicate the primary and secondary methods, if any, for warning the following populations within 5 miles of the facility. Primary methods are those systems that are most likely to be used in an emergency. Secondary methods are backup options that are currently available for use if primary methods fail.

1 mile (%)

4.4 None
16.1 Door to door/route alert
29.2 EBS/media
10.9 Sirens
22.5 Sirens and EBS/media
3.6 Sirens and tone alerts
8.0 Sirens, tone alerts, and EBS/media
5.8 Other

5 miles (%)

4.4	None
16.1	Door to door/route alert
32.1	EBS/media
8.0	Sirens
20.4	Sirens and EBS/media
2.9	Sirens and tone alerts
5.8	Sirens, tone alerts, and EBS/media
1.2	Other

Institutions (%)

11.6	None
8.0	Door to door/route alert
23.4	EBS/media
9.5	Sirens
10.9	Sirens and EBS/media
2.9	Sirens and tone alerts
6.6	Sirens, tone alerts, and EBS/media
8.8	Tone alerts
18.2	Other

Transients (%)

18.4	None
12.4	Door to door/route alert
35.0	EBS/media
11.7	Sirens
10.9	Sirens and EBS/media
0.7	Sirens and tone alerts
1.5	Sirens, tone alerts, and EBS/media
9.5	Other (predominantly route alert with various other)

Q E-2 How often are the warning equipment and procedures routinely tested? (%)

10.3	Yearly
8.8	Semiannually
25.7	Monthly
31.6	Weekly
13.2	Daily
9.6	Never or blank

Q E-3 Is there a special warning system(s) in your community for another type of hazard (e.g., civil defense outdoor sirens, nuclear power plant system, flash flood warning system) (%)

46.3	No or blank
53.7	Yes
26.5	Civil defense sirens

8.1 Nuclear power plant
5.1 Flash flood
25.7 Other (mainly sirens without specifying a hazard)

Q E-4 Please estimate how long it would take to notify each population group and briefly describe the basis for that estimate.

a. Residents within 1 mile of facility:

Mean = 30.7 min 30.7% unknown

Basis for estimate:

36.5 Not described
44.5 Professional judgment
8.0 Exercises and drills
3.6 Routine experience
8.0 Previous disaster

b. Residents within 1 to 5 miles of facility:

Mean = 34.7 min 43.8% unknown

Basis for estimate:

48.9 Not described
42.3 Professional judgment
5.8 Exercises and drills
0.7 Routine experience
2.9 Previous disaster

c. Institutional populations listed in question D-6:

Mean = ___ min 22.6% unknown

Basis for estimate:

40.1 Not described
50.4 Professional judgment
6.6 Exercises and drills
2.2 Routine experience
1.5 Previous disaster

d. Fluctuating (transient) populations listed in question D-5:

Mean = ___ min 29.9 % unknown

Basis for estimate:

74.5 Not described
23.4 Professional judgment
1.5 Exercises and drills
1.5 Routine experience
0.0 Previous disaster

F. Warning Content

Q F-1 Which of the following authorities (or equivalents) would be identified in the warning as the source of the warning information ? (%)

52.9 Mayor
40.4 County executive
83.1 Civil Defense or emergency official
30.9 City or county manager
26.5 Public health official
22.1 Engineer/scientist from facility
7.4 Engineer/scientist from government
59.6 Police chief
46.3 Sheriff
73.5 Fire chief
47.1 Chemical facility manager
27.9 State official
2.9 No one would be identified
9.6 Other

Groupings (%)

2.2 None
18.2 Only emergency managers or administrators, but not both
40.1 Both emergency mangers and administrators
2.9 Technical experts and emergency managers or administrators
24.8 At least one of each
11.7 More than one of each

Q F-2 Do you have a written message protocol (e.g., EBS messages) for communicating with the general public in an emergency? (%)

66.9 No or blank
33.1 Yes

Q F-3 Do you have a written message protocol (e.g., EBS messages) for communicating with the institutional facilities in an emergency? (%)

80.1 No
19.9 Yes

Q F-4 Do you have warning messages for non-English-speaking populations? (%)

14.0 Yes
41.2 No, do not have non-English-speaking population(s).
44.9 No, have not developed.

G. Coordination

Q G-1 How has your community's emergency organization coordinated emergency planning for a chemical accident with each of the following agencies/organizations in the past several years?

	Does not apply in this community	No contact at all	Initial introductory contact only or missing	Developed emergency response plans with	Ongoing coordinated emergency effort	Participate in emergency exercises with
Chemical facility	0	5.9	27.7	2.9	14.0	50.0
Other local agencies	0	2.2	13.1	5.1	13.2	66.9
State civil defense	0	5.1	9.5	6.6	11.8	67.9
State police	3.2	8.1	16.8	6.6	14.7	52.2
Other communities	0	5.9	20.4	5.9	20.6	47.8
FEMA	0.7	11.8	24.1	8.1	22.1	33.8
Hospitals	1.5	3.7	12.4	7.4	11.0	64.7
U.S. EPA	2.2	27.2	38.0	6.6	11.0	15.4
Media	0.7	6.6	17.5	3.7	14.0	58.1

Q G-2 How many times in the last 2 years have you participated in emergency exercises on chemical accidents?

Median = 2 exercises
(19.9% had 0)

Q G-3 Has your community used information from the Chemical Manufacturers Association CAER Program (Community Awareness/Emergency Response)? (%)

67.6 Yes
33.1 No or blank

Q G-4 What entity has the state designated as the local emergency planning district in your area to develop an emergency plan for chemical accidents? (%)

10.3 City
1.5 Multi-city
61.8 County
9.6 Regional
4.4 State
4.4 Other
7.4 Not specified

Q G-5 Has the membership of this committee been appointed? (%)

12.5 No or blank
88.2 Yes; if yes, how is your community represented on this committee?
78.7 Represented
7.4 Not represented
14.7 Representation not specified

Q G-6 Has the facility provided the community with information describing the hazardous chemicals used at the facility?

18.4 No
80.1 Yes; if yes, what have they provided?

H. Computer Use

Q H-1 Does your community use a computer in emergency planning, that is, in preparing for an emergency? (%)

52.9 No
47.1 Yes

Q H-2 Does your community use a computer in emergency management, that is, in responding to an emergency? (%)

61.8 No
37.5 Yes

31.4 Use for both
15.3 Use for planning only
5.8 Use for management only

Q H-5 If you use software designed specifically for emergency planning functions, please describe the programs and their use. (%)

41.9 Not applicable
35.3 Do not use
23.5 Use

Q H-6 If you use software designed specifically for emergency management functions, please describe the programs and their use. (%)

39.7 Not applicable
40.4 Do not use
20.6 Use

Q H-7 Do you use a model for predicting the dispersion of chemicals? (%)

89.0 No or blank
11.8 Yes

I. Overall Assessment

Q I-1 What do you consider to be the weakest link in the sequence of tasks that are involved in getting a timely and effective warning to the public around the chemical facility? (%)

43.8 Problems in disseminating alert and notification to the public
24.1 Timely release of information from the facility
10.9 Communication problems within the community organization
10.2 Poor public response to warning
6.6 Cooperation from the facility
5.1 Communication problems with the facility
4.4 Lack of planning
2.2 Lack of training
2.2 No weak links
1.5 Feasibility of public protection
1.5 Problems in warning special populations
19.0 Other

Q I-2 Overall, what is your assessment of the capability to provide a timely warning to the public within 5 miles of the facility in the event of a serious emergency? (%)

25.7 It is highly certain that an effective warning would be made
48.5 It is somewhat certain that an effective warning would be made
19.9 It is somewhat uncertain that an effective warning would be made
5.1 It is highly uncertain that an effective warning would be made

Q I-3 Are there other facilities in your community that require emergency plans because they have hazardous chemicals? (%)

5.1 No
94.1 Yes; if yes, about how many facilities?

Mean = 142 facilities in the community

Q I-4 On the whole how do the emergency planning efforts of the facility identified in the cover letter compare to the other chemical facilities in your community? (%)

19.9 Much better than others
19.9 Somewhat better than others
40.4 About the same as others
1.5 Somewhat poorer than others
5.1 Much poorer than others

Q I-5 If an emergency occurred at the facility, how does the community's ability to issue a timely warning to the public around the facility compare with the ability to issue a warning around other facilities? (%)

13.2 Significantly better than for others
11.8 Slightly better than for others
61.8 About the same as for others
2.9 Slightly poorer than for others
2.2 Significantly poorer than for others

Q I-6 The following are areas in which the acquisition of new resources or improvements of existing capabilities could enhance preparedness for chemical emergencies in your community. If you could obtain these over the next several years, which would you want first, second, third, and so forth? Please rank these areas in the order which you feel they are needed by your community.

Mean rank

3.7 Public alert/warning equipment
4.1 Communications equipment
4.7 Computer with emergency management system
5.1 Protective clothing
5.5 Monitoring equipment
5.4 Funding for sending staff to training
5.7 Funding for a planner
5.9 Respiratory protection equipment
6.2 Funding to prepare an emergency plan
6.7 Decontamination equipment
7.2 Medical equipment

Q I-7 Advances in knowledge and technology can improve the basis for emergency preparedness. The following are areas in which improvements could enhance preparedness for chemical emergencies. If you could obtain these over the next several years, which would you want first, second, third, and so forth? Please rank these areas in the order which you feel they are needed by your community.

Mean rank

3.5	Improve public alert/warning technologies
4.4	Improve communications technologies
5.3	Improve knowledge on protective action effectiveness
5.4	Improve training programs/courses
5.5	Improve knowledge on the toxicity of chemicals
5.6	Improve monitoring technologies
5.7	Improve computerized dispersion models
6.0	Improve protective equipment
6.3	Improve decision support systems
6.3	Improve information hot-lines
7.0	Improve technical planning guides

Q I-8 Has any emergency occurred in the last 5 years that has resulted in a public warning in your community? (%)

39.0	No
61.0	Yes

How many people in total assisted in answering this questionnaire?

Mean = 2.4 people

About how long did it take to complete?

Mean = 4.5 hours

Table A-1. Primary warning technologies (% of communities)

	Public within 1 mile of facility	Public 1 to 5 miles from facility	Institutional facilities within 5 miles	Transient populations
Permanent sirens	43.4	39.0	27.9	22.8
Tone-alert radio	12.5	11.8	19.9	4.4
Telephone ringdown system	2.2	3.7	10.3	1.5
Fixed loudspeakers/ public address	10.3	10.3	10.3	5.1
Emergency broadcast system	48.5	52.9	35.3	34.6
Door to door	30.1	19.9	17.6	7.4
Portable sirens/ loudspeakers on vehicles	50.0	43.4	22.1	36.0
Television/radio	44.1	49.3	35.3	36.8
Cable override	20.6	22.1	13.2	10.3
Commercial telephone	14.0	10.3	38.2	4.4
Two-way radio	10.3	10.3	12.5	3.7
Airplane or helicopter	3.7	3.7	2.2	2.2
Other	1.5	1.5	1.5	4.4

Table A-2. Secondary warning technologies (% of communities)

	Public within 1 mile of facility	Public 1 to 5 miles from facility	Institutional facilities within 5 miles	Transient populations
Permanent sirens	2.2	3.7	3.7	6.6
Tone-alert radio	3.7	2.2	3.7	1.5
Telephone ringdown system	2.2	2.2	2.2	1.5
Fixed loudspeakers/ public address	7.4	7.4	6.6	5.1
Emergency broadcast system	20.6	16.9	22.1	11.8
Door to door	48.5	49.5	41.9	26.5
Portable sirens/ loudspeakers on vehicles	36.0	44.1	35.3	26.5
Television/radio	36.0	33.8	30.9	19.9
Cable override	24.3	22.8	19.9	11.0
Commercial telephone	24.3	23.5	19.9	10.3
Two-way radio	13.2	11.8	12.5	5.1
Airplane or helicopter	16.2	16.2	13.2	9.6
Other	1.5	1.5	2.2	0