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Community Environment and Health Assessment

and Action Roadmap

CARE

LOCAL PARTNERSHIPS. HEALTHY COMMUNITIES.

EPA

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Introduction

Purpose

This Roadmap will help you and your community to:

- Learn about local environmental and environmental health risks and impacts
- Build the community consensus necessary to take effective action
- Mobilize a community partnership to take action to reduce impacts and risks
- Build long-term capacity within your community to understand and reduce environmental impacts and risks

Origin of the Roadmap

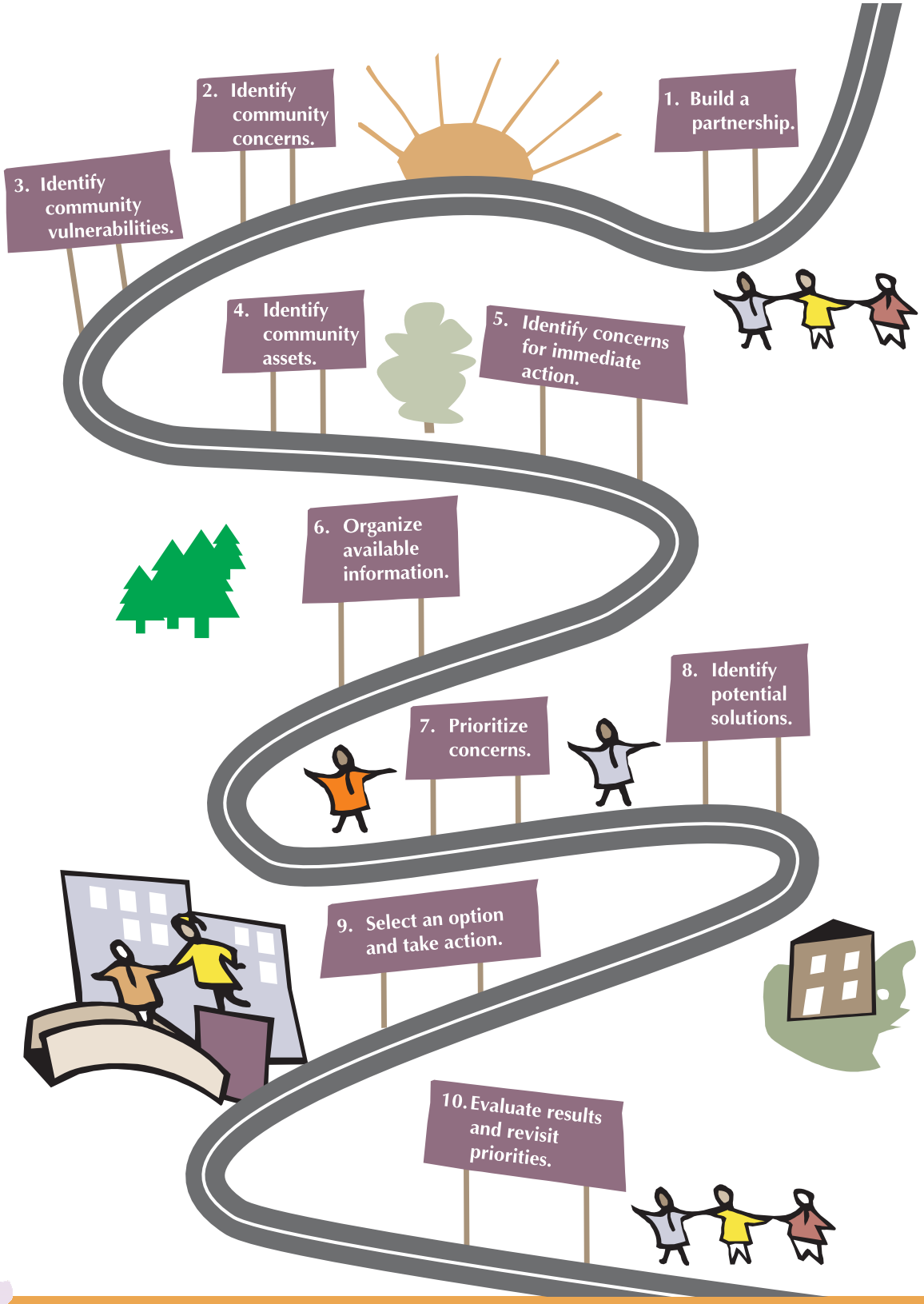
This Roadmap is the result of an effort by the CARE (Community Action for a Renewed Environment) Program of the Environmental Protection Agency (EPA) to develop a practical tool for communities that incorporates the perspectives of the National Environmental Justice Advisory Council (NEJAC) report on ensuring risk reduction in communities with multiple stressors and EPA's Framework for Cumulative Risk Assessment. With permission of the author, the Roadmap also incorporates and builds on the Community Environmental Health Assessment Workbook published by the Environmental Law Institute. To find more information on the CARE Program and these documents, please see the General Resources section on page 15.

How this Roadmap differs from existing guides

This Roadmap differs from previous assessment guides in two ways. First, it looks at risk from the community perspective by outlining a method to develop as comprehensive an understanding of local environmental risks and impacts as possible, including both considerations of combined concerns resulting from multiple sources and the contribution of community vulnerabilities to risk. This comprehensive overview of concerns gives the community the information it needs to ensure that efforts to address concerns will do the most to improve the health of the community and its environment.

Second, it incorporates NEJAC's "bias for action" perspective. This means that the Roadmap encourages partnerships to take actions to reduce risk as soon as possible. This does not mean that collecting and analyzing information is not important—in fact, a community's work to improve its understanding of risk is an essential part of the "bias for action." Without a shared understanding of risk, mobilizing your community will not be possible and without a clear understanding of the sources of risk, community actions may not be focused where they can do the most good. The Roadmap encourages communities to take action on known risks from the start, and suggests practical ways to collect and analyze the information needed to build consensus and target risk reduction efforts where they will do the most good.

The Roadmap: Ten Steps to a Healthier Community and Environment



How to use the Roadmap

- **How can you build an effective partnership?** Broad and effective partnerships are the key to mobilizing the whole community to take action. Because strong partnerships are key, all the work described in this Roadmap should be done in a way that builds both the partnership and trust among the partners. This can be accomplished if everyone in the partnership has the opportunity to be heard and to participate fully as equals in the work and decisions of the partnership. Since members of the partnership will come to the partnership with different backgrounds and resources, the partnership may have to find ways to work with these differences. All the time and effort required up-front to build real trust and a strong partnership will pay off in the long run when the broader community is mobilized to take actions that make a difference.
- **Do the steps need to be done in order?** The order in which a community takes the steps listed below will vary depending on the situation in the community. For example, some residents will want to begin with Step 2 and develop a summary of environmental and health concerns and community assets before starting the work to form a partnership. In other communities, the work to form a partnership will come first and all parts of the community will work together to complete Step 2. Communities will have to decide how to sequence the steps, choosing the approach that best helps to get the necessary information and build the consensus and broad partnership that will be needed to reach community goals.
- **What should the scope of the environment and health assessment be?** The definition of "environment" will vary from community to community so the scope of the assessment will also vary. In communities that have ongoing development, crime prevention, or education projects, the scope of the environmental health assessment may stick to traditional environmental concerns. But communities without these efforts may need to interpret "environment" more broadly to include such things as jobs, lack of adequate health care, and crime. You may need to bring other partners to the table to address all the issues. And even in communities that define environment more narrowly, addressing vulnerabilities may also broaden the scope of the work.
- **Should all communities do an assessment?** A comprehensive environmental and health assessment is especially valuable as a tool to get everyone in a community on the same page in their understanding of environmental and health risk. A comprehensive assessment also helps a community to set priorities and focus resources where they will do the most good. But some communities may already agree on the need to address a particular priority risk. Or some communities may need a fairly long trust-building process before they can agree to work with all stakeholders to get the more complete view of risk. So making the judgment about when to do a comprehensive assessment will depend on the situation in each community.
- **How can you incorporate a bias for action?** The steps below should be completed from existing data and the knowledge of the participants in a short time frame so that consensus priorities can be quickly identified and actions can be taken to reduce risks and impacts. The first review will also identify data gaps and areas where there will not be consensus. Once preliminary priorities are identified, the partnership will organize efforts to fill in significant gaps at the same time as taking action on the identified priorities. Once the community has new information, the assessment steps will need to be repeated using the more complete information so that the priorities and actions can be reset as needed.

Basic elements of the process

- **Organize** a broad partnership needed to reach community goals (Step 1)
- **Collect** the information needed to understand community impacts and risks (Steps 2–6)
- **Analyze** the information to identify community priorities and to identify options for reducing risks (Steps 7–8)
- **Mobilize** the community and its partners to take action (Step 9)
- **Evaluate** the work of community, measure progress, and begin a new effort to address remaining risks (Step 10)

A summary of the Roadmap

1. **Build a Partnership**: Build a collaborative partnership that is able to identify environmental risks and impacts, build consensus, and mobilize all the resources necessary to achieve community goals.
2. **Identify Community Concerns**: Identify the environmental, health, and related social and economic concerns of the community.
3. **Identify Community Vulnerabilities**: Identify community vulnerabilities that may increase risks from environmental stressors.
4. **Identify Community Assets**: Develop a list of community assets in order to build on the existing strengths of the community.
5. **Identify Concerns for Immediate Action**: Identify and begin to address immediate concerns and vulnerabilities.
6. **Organize Available Information**: Collect and summarize available information on stressors, concerns, and vulnerabilities. Identify information gaps where the information on stressors, concerns, and vulnerabilities is missing or inadequate.
7. **Prioritize Concerns**: Identify priorities for possible community action and establish baseline indicators and standards.
8. **Identify Potential Solutions**: Identify and analyze options for reducing the priority concerns and vulnerabilities and for filling information gaps.
9. **Select an Option & Take Action**: Decide on an action plan to address concerns, fill information gaps, and mobilize the community and its partners to carry out the plan.
10. **Evaluate Results & Revisit Priorities**: Evaluate the results of community action, analyze new information, and start the process again to reset priorities as needed and to develop new plans for action and, if needed, for information collection.

The Roadmap

The following brief descriptions are designed to provide communities with an overview of the steps needed to build consensus on community environmental and environmental health priorities. A list of general resources with more detailed information and guidance can be found on page 15. Links to additional resources to help communities accomplish each of these steps can be found on the CARE website at: www.epa.gov/CARE/tools.

1. Build a partnership.

Build a collaborative partnership that is able to identify environmental risks and impacts, build consensus, and mobilize all the resources necessary to achieve community goals.

Partnership members should consist of a broad cross-section of the community who are concerned and involved with the environment, as well as the human and socioeconomic health and well-being of the community.

Partnerships will need to make special efforts to ensure that all sectors of the community participate fully in this effort. Special efforts to involve some sectors of the community may be necessary, especially sectors not used to being involved in partnership efforts, such as affected residents or small businesses in the community. Partnerships should lay out clear plans for involving these members of the community and provide the support they need to participate fully in all aspects of the partnership's work and in the leadership of the partnership. The success of the partnership will depend on its ability to fully engage all sectors of the community.

POTENTIAL PARTNERSHIP MEMBERS

- Community members from the focus community
- Minority members of the focus community
- Local environmental justice organizations
- Local, regional, and national environmental organizations
- Health care providers
- Faith-based organizations
- Local churches
- Business organizations
- Civic organizations
- Local economic organizations
- Educational institutions (schools, universities, and colleges)
- Community development groups
- Environmental and natural resource agencies (local, State, and Federal)
- Health agencies (local, State, and Federal)
- Elected officials
- Local governmental agencies

2. Identify concerns.

Identify the environmental, health, and related social and economic concerns of the community.

Community groups often focus on one or a few issues of greatest interest or immediate concern. In order to address community issues on a comprehensive and cumulative basis, a broader look at community issues will be needed. Taking a broader view will ensure that important risks are not overlooked and that the actions that can most effectively improve community health can be identified.

These broader issues can be identified by drawing on the resources of all of the partners and by considering a number of types of concerns such as:

- Community environmental health concerns
- Disease incidence in the community
- Sources of pollution
- Routes of exposure
- Chemicals and biological health and ecological hazards
- Effects of chemicals and biological hazards identified in the community
- Social and economic conditions

Assembling these issues into a matrix format may enable your community partnership to better appreciate the scope of issues impacting the environment and health of the community. As an example, here is a matrix prepared by a community group for the Mississippi River industrial corridor:

Multiple, Aggregate, and Cumulative Risks and Impacts in the Mississippi River Industrial Corridor

Demographics	Pollution Sources	Existing Health Problems & Conditions	Unique Exposure Pathways	Social/Cultural Conditions	Community Capacity & Infrastructure/ Social Capital
• African American: 63% • Caucasian: 35% • Asian: 3%	• Petrochemical facilities • Refineries • Wastewater treatment facilities not meeting permit limits and bypassing raw sewage due to under capacity • Drinking water taken from Mississippi River • Toxic organics, pesticides, and heavy metals in drinking water • Atrazine from Midwest agricultural fields present year round in raw and finished water • Pesticides, herbicides, and fertilizers applied to sugar cane crops • Aerial and tractor application drifts onto adjacent residential areas and school yards • Burning sugar cane during fall harvest season results in particulate matter and pesticides being dispersed into the air for 1/3 of the year	• Asthma • Respiratory distress • Skin rashes • High rate of a large variety of cancers • Lack of access to health care • Lack of trained environmental health physicians	**Air** • Industrial facilities: semi-volatile and volatile organics, dioxins, pesticides and herbicides, toxic heavy metals, and smoke from sugar cane burning **Water** • Drinking water contaminated • Surface water contaminated with industrial and agricultural chemicals and partially treated waste water • Contaminated crops • Contaminated terrestrial game species • Seafood contaminated with pesticides, industrial chemicals, mercury from chlor-alkali facilities by way of air deposition	• Very poor/ minority communities • Live off land and gardens contaminated with air deposited chemicals • Hunting and fishing of contaminated organisms • Generations have lived off the land and not profited by industrial development in the area	• Good infrastructure in areas of low-income communities of color with respect to roads and rail; the industry needs these items • Poor infrastructure within the communities: poor road conditions, improper drainage, waste water collection and treatment system Inadequate • Very little to no social capital: education system very minimal; the area was impacted by white flight; primarily African Americans attend the public schools

3. Identify vulnerabilities.

Identify community vulnerabilities that may increase risks from environmental stressors.

A community or part of a community may be vulnerable if it is more likely to be adversely affected by poor environmental conditions than the general population. Disadvantaged, underserved, and overburdened communities may have existing physical and social conditions that make the effects of environmental pollution (or "stressors") more, and in some cases unacceptably, burdensome. It is important to consider these conditions when determining the extent of risks or impacts. Understanding community vulnerabilities may also allow communities to identify effective options for risk reduction. For example, if a group within the community is more vulnerable to the effects of lead paint because of language barriers in health care, increasing access to health care materials in the appropriate language may be an effective option to reduce risk.

EXAMPLES OF VULNERABILITY FACTORS

Susceptibility/Sensitivity. Pre-existing health conditions can make a group more sensitive to negative impacts from stressors than the general population. These susceptibility/sensitivity factors could include:

- Genetic predisposition to disease
- A young population—infants and children may experience different impacts
- An elderly population
- Compromised immune system
- Other preexisting health conditions

Exposure Conditions. Living or working near a source of pollution could lead to exposure to a higher level of pollution than the general population. For example, higher exposure could be due to:

- Proximity to pollution sources
- Employment in jobs that involve hazardous chemicals
- Past exposure to environmental pollutants
- Multiple routes of exposure to one chemical
- Multiple exposures to different pollutants
- Subsistence consumption
- Discrimination
- Lack of information
- Lack of social capital, such as poor education

Preparedness/Ability to Recover. In addition to increased sensitivity and exposure, other existing conditions in some communities make them less prepared than the general population to withstand and recover from environmental stressors. Such conditions could include:

- Poor nutrition
- Compromised health/immune system
- Limited health care
- Cultural practices
- Lack of recreational facilities
- Poor community services
- Low income
- Low education
- Poor housing conditions
- Emotional stress
- Crime
- Vermin (insects and rodents)
- Unemployment or underemployment
- Discrimination
- Lack of information
- Lack of social capital

4. Identify community assets.

Develop a list of community assets in order to build on the existing strengths of the community.

Assets are your community's existing strengths, skills, and resources. Communities with environmental, social, and economic problems and stressors still have many assets. Developing a list of your community's strengths can help in choosing an action plan later in the process. For example, if a community has a strong network of churches, their ability to communicate effectively with large sections of the community is an asset that can be used to meet partnership goals.

EXAMPLES OF COMMUNITY ASSETS

- Special skills and capacities of community members
- Detailed knowledge of all aspects of community
- Ability and networks to communicate with community members
- Culture
- Longevity
- Neighborhood associations
- Religious institutions
- Businesses
- Civic and community leaders
- Political abilities
- Community building resources
- Human resources
- Outreach
- Historical information

5. Identify concerns for immediate action.

Identify and begin to address immediate concerns and vulnerabilities.

After your group has identified environmental, health, and other concerns (Step 2), as well as vulnerabilities and assets that can impact the risks from those concerns (Steps 3 and 4), it is time to identify any risks that need immediate attention. Working as a group, the stressors, concerns and vulnerabilities should be evaluated and those that everyone (or the majority) agrees need immediate action should move forward to Step 8 to identify options for action. Since there is agreement on these concerns, risk reduction actions should begin as soon as possible. This will allow the community to begin work as quickly as possible on key concerns.

At the same time as the partnership takes action on some key concerns, the remaining stressors, concerns, and vulnerabilities should be analyzed further using Steps 6 and 7. Once additional priorities are identified, the work that has begun to address key concerns can be adjusted as necessary.

6. Organize available information.

Collect and summarize available information on stressors, concerns, and vulnerabilities. Identify information gaps where that information is missing or inadequate.

Before your community can set priorities on the remaining stressors and concerns, you will need to collect and organize available information, and identify where information is missing or inadequate.

Gather information

To estimate the magnitude of each of the identified environmental, health, and socioeconomic issues, the partnership should collect all available information on stressors, observed impacts, potential risks, and vulnerabilities. Some sources of information include:

- Members of the partnership, especially those directly affected by a stressor
- Databases with information on the amounts and sources of releases of pollutants to your environment
- Information on levels of chemicals measured in your environment
- Formal studies of risk in your community, if they are available
- Studies done to estimate the risk for similar communities
- Studies done to estimate the health and vulnerability of your community
- National studies of risk

Residents of the community, local businesses, and local doctors and public health staff can help locate and collect available information. Government and university staffs can identify any existing studies of the community and of similar communities. The partnership will require the participation of all of its members to complete this part of the process.

Identify where more information is needed
Communities beginning to collect information on stressors and risks are likely to find many areas with little or no available information. All information gaps should be noted so that the partnership can decide, in the next step, how to address this lack of information.

Summarize findings
For each stressor or combination of stressors, summarize the available information, and describe the impacted community members or impacted environment. Organizing this information in an easily viewed format, such as a table or flowchart, may help the partnership choose priorities in the next step. See an example format including priority rankings in Step 7 below.

7. Prioritize concerns.

Identify priorities for possible community action and establish baseline indicators and standards.

Using the organized information on concerns, your partnership can choose the most important concerns the community needs to address to improve the environment and health of the community. At this point, whether or not something can be done about an issue should not be a concern. This priority-setting exercise should be based strictly on how important the issue is to the health and quality of life of the community and its environment. It is important for a community to know which concerns are most significant, even if it is not possible to do something about some of them immediately.

This priority-setting exercise will depend heavily on your community's goals and values. The partnership will need to consider issues that are very different, and difficult to compare. A clear view of community values will provide a basis for making the judgments necessary to set community priorities. It will also be important for members of the partnership to keep in mind that the goal is to reach an agreement on the priorities that best meet community needs, so there is the consensus needed for mobilizing everyone to take action.

Setting community priorities
To use the information organized in Step 6 to identify priority concerns, communities will need to adopt a method, such as a numerical (e.g., 1–10) or a "high" to "low" scale that will allow all the concerns to be compared. The ranking method used by the community will need to take into account the severity of the impact, including the vulnerability of the affected people, as well as the number of people exposed or the extent of the environment affected. The number of high priority concerns should be reasonable; not so many that addressing them all will be impossible. The high priority concerns could include risks, impacts, vulnerabilities, or information gaps. For example, you could choose lead exposure as both a priority risk and a priority information gap. Give a high ranking to all the concerns that you think need to be addressed by the action plan that you will develop next. Remember, you will not be able to do everything at once. With limited resources, some concerns may have to be addressed in the next phase of partnership work.

Estimating levels of concern for stressors with missing information

In some, and probably most cases where there are gaps in the information on a stressor, the partnership should use the available information and its best judgment to estimate the potential harm that a stressor may have on the community or its environment. For example, if there is a significant amount of old housing in the community but insufficient information on blood lead levels to determine how many children are affected, the partnership would likely identify the potential concern from lead paint, given the likelihood of exposures, as very high. It is important to note, however, that the information is incomplete and thus this estimate may have some amount of uncertainty.

In some cases, more information or further analysis will be needed before the partnership can agree on its level of concern. For example, if the community only has release amounts for a facility, it may decide to do further work, such as collecting information on the toxicity of the chemicals released and using modeling to estimate the exposures that result from the releases in the community, to develop the information needed to estimate the level of concern. (Screening tools are available that would allow partnerships to estimate levels of concern from releases relatively quickly.) The partnership will need to decide when more information and further analysis are needed to estimate the community's level of concern. The partnership could decide to wait to set priorities until this analysis is completed or it could set priorities for those stressors with adequate information and then do the analysis on stressors that need more work. Once this work is completed, the partnership can use this new information to revisit and adjust its priorities as needed.

You may also need to track those concerns that the partnership was not able to reach agreement on. If some members of the partnership rank a concern high and some rank it low, your action plan should also include a process for coming to agreement on this issue.

The following table is an example of a format that could be used to summarize available information and community rankings. This example contains only a partial list of stressors and vulnerabilities.

Stressor or concern	Level and type of risk	Extent of impact (Who and what is affected? To what extent?)	Information used, certainty, and gaps in information
Diesel particulates	High risk to human health	Impacts most members of community; high exposure along truck routes; elderly, children, and asthmatics especially vulnerable	Based on national studies of similar exposures; need more detailed information on local truck traffic
Lack of access to health care	High level of vulnerability for human health	High impact on elderly and children; 80% of community has inadequate access to health care	Detailed information on access to health care used
Contaminated drinking water from community wells	High risk to human health	Small number of households, about 50, on private well water	Little information available on well water quality
Exposure to lead in water/paint/soil	High risk to human health	Impacts most members of community; 80% live in homes built before new lead paint regulations in 1972	Based on incomplete childhood blood level screening and no household water sampling
Odor from water treatment plant	High impact to quality of life	Impacts all members of community	Well-known impact

Consider combined or cumulative concerns

At this point, it will also be important for the partnership to include, if possible, considerations of the risks and impacts from all stressors and vulnerabilities combined (the cumulative risk). Given the limits of science in this area, developing estimates of cumulative risk will be difficult. But, once the information on known concerns has been collected, the partnership will be able to develop a sense of the magnitude of the combined concern resulting from all stressors affecting the community. This information, in the form of a written summary or a matrix displaying all concerns due to stresses on the environment as well as a summary of the health and vulnerabilities of the community, can be used in the following steps to determine the level of effort and resources that will be used to address these risks.

If the information is available, the partnership should consider the aggregate impact from individual chemicals when they are released from multiple sources. For example, the risk from particulate matter in the air from an electric generation facility may be compounded by releases from local traffic. Other things to consider include evaluating the impact from all the chemical releases from a single source. In addition, you should evaluate the combined effect of different sources, possibly releasing different pollutants, when the pollutants may have the same effect. These kinds of assessments may provide information to help the partnership identify its priorities.

8. Identify potential solutions.

Identify and analyze options for reducing the priority concerns and vulnerabilities and for filling information gaps.

Once your community partnership has identified its priority concerns and information needs, the next step will be to find out what can be done to address these priorities. For priority concerns, the partnership should explore the available options for reducing risk. For example, if diesel particulates were identified as a priority, the community should do some research to identify approaches that have been developed to address this issue, such as retrofitting diesel engines on public and private truck and bus fleets, changing traffic routes, or restricting idling.

Information on risk reduction benefits, the costs of risk reduction efforts, the community resources that will be needed to implement the various approaches, and the assets and resources available in the community to address concerns will need to be determined. To do this, communities should consider:

- **Resources**. The resources needed to reduce risks will vary depending on the source. For example, some risks, such as indoor exposure to tobacco smoke, might be effectively addressed through education while other risks, such as diesel retrofits, will also require significant investments in new technology.
- **Working with other communities**. Some risks may not be able to be addressed by a single community and will require a longer-term effort to work with other communities. For example, the siting of major highways or the clean up of a river, stream, or lake shared by other communities may require cooperative efforts.
- **Missing information**. A similar effort will be required to develop options for collecting missing information. The different approaches to information collection and the resources it will require should be gathered and summarized.

Once all the necessary information has been collected, it should be compiled into a format that will help the community choose the actions it will take. Each community will have to use its best judgment to balance information collection and risk reduction work. On the one hand, requiring too much information on available options may delay action unnecessarily. On the other hand, too little time spent gathering available data to better inform your action plan may result in actions that are not as effective as they could be in reducing risk.

9. Select a solution and take action.

Decide on an action plan to address concerns, fill information gaps, and mobilize the community and its partners to carry out the plan.

Now that your community partnership has prioritized its concerns and information needs and compiled the possible solutions, the next step is to decide on a plan of action and mobilize the community to begin work. Depending on the resources that can be mobilized in the community and partnership, a number of teams may be required to address multiple priorities. You may also need to develop a short-term plan for immediate actions and a long-term plan to address priorities that will require more time to collect needed resources. Some communities may decide to prioritize information collection in order to help build consensus or to make sure that significant risks have not been overlooked. Others may focus primarily on risk reduction and put less emphasis on filling gaps in information.

Developing a plan that allows the community to achieve some early successes while pursuing longer-term goals may help the partnership build community support for its work. Most importantly, make sure that your plan takes advantage of all your local assets and mobilizes as many members of your community and partnership as possible. Getting everyone involved in building a healthy community will not only get results, it will also give everyone a chance to learn about the local environment and acquire the skills and knowledge needed to sustain a long-term effort to build a healthy community.

10. Evaluate results and revisit priorities.

Evaluate the results of community action, analyze new information, and start the process again to reset priorities as needed and to develop new plans for action and, if needed, for information collection.

To make sure that your efforts are achieving the proper results, it will be important for the partnership to find effective ways to measure progress. For each priority and action plan, the partnership should develop indicators or measures to evaluate the effectiveness of community action. Reductions in releases, exposures, and risk, and reductions in health effects can all be used to measure progress. It is also important to try to measure progress in building the community's capacity to understand and address risks. To be successful, communities will need to measure their progress and adjust their work to build on their successes and learn from their mistakes.

Resources

General Resources

- *Community Action for a Renewed Environment (CARE) Resource Guide*. U.S. Environmental Protection Agency. Last updated Jan. 2005. Available at: http://cfpub.epa.gov/care/index.cfm?fuseaction=Guide.showIntro
- *Community Environmental Health Assessment Workbook, A Guide to Evaluating Your Community's Health and Finding Ways to Improve It*. Environmental Law Institute. 2000. Available at: http://www.elistore.org/Data/products/d10.09.pdf
- *Ensuring Risk Reduction in Communities with Multiple Stressors: Environmental Justice and Cumulative Risks/Impacts.* National Environmental Justice Advisory Council, Cumulative Risks/Impacts Work Group. Report, December, 2004. Available at: http://www.epa.gov/compliance/resources/publications/ej/nejac/nejac-cum-risk-rpt-122104.pdf
- *Framework for Cumulative Risk Assessment*. U.S. Environmental Protection Agency, Office of Research and Development, National Center for Environmental Assessment, Washington Office, Washington, DC, EPA/600/P-02/001F. 2003. Available at: http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=54944
- *PACE EH: Protocol for Assessing Community Excellence in Environmental Health*. National Association of County & City Health Officials. 2000. Available for purchase at: http://66.153.70.186/NACCHO_eBiz/Default.aspx?tabid=39&action=L&args=ENH

Additional resources for Steps 1–10

References and links to resources to help communities implement each of the 10 steps can be found on the CARE website at www.epa.gov/CARE/tools.