EDU-8

A COMMUNITY GUIDE TO CONTAMINATED SEDIMENT CLEANUP

Understanding and Participating in a Successful Cleanup

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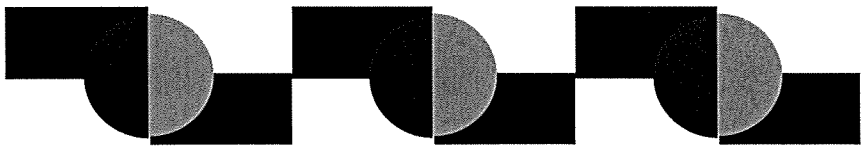

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I. LEARNING ABOUT CONTAMINATED SEDIMENTS

Introduction

Welcome to *A Community Guide to Contaminated Sediment Cleanup*! You may be reading this because your community is a "Great Lakes Area of Concern," or because you live where there are concerns that the bottom of a river or lake is polluted. If you would like to help with local cleanup efforts, but need to know where to start, you have come to the right place.

This guide will provide you with:

- Ø The basic background information you need to get involved;
- Ø A description of the steps that are taken to achieve a cleanup and how long it may take;
- Ø Ways in which you and other community members can get involved, with special advice for community leaders, and;
- Ø Resources to help you find more detailed information.

Let's get started with some important background information first.

Background

The Great Lakes Basin has been the setting of a unique approach to environmental restoration and citizen stewardship over the past few decades. This approach dates back to a turn-of-the-20th-century signing of the Boundary Waters Treaty and more recently, the Great Lakes Water Quality Agreement, both between the U.S. and Canada. Additions were made to the treaty in the late 1980s, when the governments confronted numerous cases of polluted waterways throughout the Great Lakes, both inland waterways and the lakes themselves.

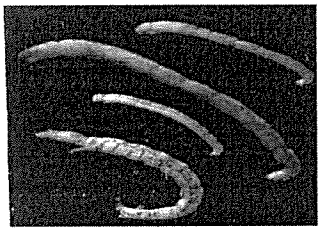
To address these serious problems, the treaty called for the identification and restoration of the waterways, naming them Areas of Concern (AOCs). The AOC program is unique in its requirement for the cleanup plans (or Remedial Action Plans) to look at the ecosystem or "big picture" and acknowledge the various connections between air, water, and land – and for its strong recommendation to fully involve communities throughout the entire process. Among other things, this focus provided a clear role for the public in the cleanup process and expanded opportunities for public input.

Even as environmental priorities shift and the availability of funds and resources change over time, the Great Lakes AOC program provides meaningful opportunities for communities to improve their environment. If you do not live in an AOC (see map at http://www.epa.gov/glnpo/aoc/), this guide can still prove useful for participating in river and lake sediment cleanups. Some of the information, especially that concerning public participation processes, can also be applied in other areas of environmental decision-making.

What are contaminated sediments?

The bottoms of lakes, rivers and streams are made up of soil and sometimes decomposed wood pieces, leaves, shells and debris. These materials are washed into lakes and rivers by rain and snow, a natural process called "sedimentation." With the rise of industrial and urban development, chemical wastes from discharge pipes, streets and parking lots, pesticides and fertilizers from farms, and pollutants from the air washed in as well, eventually accumulating in the sediments and posing problems for people and wildlife.

Benthic organisms



Why are contaminated sediments a problem?

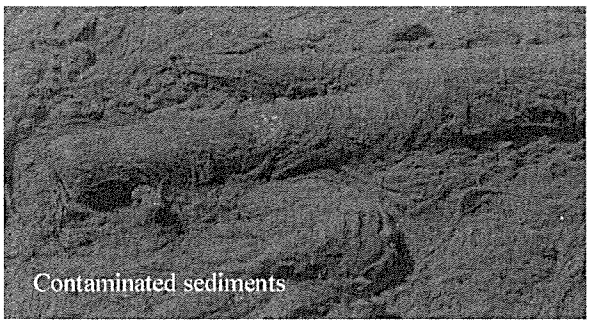
For decades, the contaminated sediments on the bottom of lakes and rivers were considered to be in a safe place – "out of sight; out of mind." They were not thought to be causing problems for fish, wildlife or people, even though many of the chemicals were known to be harmful to human health. In the early 1970s, with the passing of national environmental laws, direct discharges to water and air began to be controlled and less pollution entered the environment. Several decades later, however, scientists continued to find problems in humans and animals (especially fish) and suspected that a major cause was the sediments within lake and river bottoms. Inventories by the U.S. Environmental Protection Agency show that contaminated sediments are present in nearly every waterway in the country.

Understanding how contaminated sediments can pose health problems requires knowing a little more about lake ecology. Contamination in sediments can harm the overall health of a lake or river by changing the amount or variety of aquatic life it supports. The effects are felt throughout the entire food web, beginning with the 'benthic' organisms, or the tiny animals that live in sediments and "take up" certain contaminants. Fish that eat the benthic organisms then take in the contaminants, which then move further up the food chain to people, if they eat the contaminated fish.

Some of the chemicals that are found in contaminated sediments include PCBs, dioxins, mercury, and arsenic, which have been linked to reproductive problems in animals and humans. PCBs and dioxins have been shown to cause cancer in animals. Several studies have indicated that children of mothers who have eaten fish from the Great Lakes have learning problems and decreases in IQ. Some of the chemicals, like PCBs, end up in the fatty part of the fish and can be cleaned away before eating, but other chemicals, such as mercury, settle in the flesh of the fish. For more information on avoiding exposure to contaminants in fish, see http://www.great-lakes.net/humanhealth/fish/reduce.html.

Benthic organism

How do you know if contaminated sediments are a problem?



The presence of contamination in sediments doesn't necessarily mean that a cleanup should occur. Not all sediments that are contaminated cause environmental or health problems that require action. Site investigators study whether the contaminants are harming living organisms. Determining the *bioavailability* of the contaminants, or the likelihood that they will cause harm to plants and animals, is a necessary step in assessing the severity of the problem. For example, some pollutants might be "bound up" or not able to be taken up by plants or animals because they are attached to clay particles or are buried by the sediment at a level deep enough to minimize their impacts. The amount of oxygen, pH, temperature, and other conditions in the water can also affect the availability of a pollutant.

Studies also identify the source, location and amount of contamination or how much will need to be cleaned up. Other necessary studies may focus on answering questions about the health of *benthic* organisms, or aquatic plants or animals found on or near the bottom of a stream, lake, or other water body. Because of their impacts on the rest of the food chain, the health of these organisms, in addition to that of local fish species, needs to be carefully assessed.

In some areas there may be concerns that children are being exposed to contamination by playing in lakes or rivers with contaminated sediments. Children, because of their rapid metabolism, small size and weight, and type of play activities, are often more susceptible to harm from contamination. Ultimately, it has to be shown that the contaminated sediments are harmful to the lake's inhabitants or public health in order to justify a cleanup.

Roles and responsibilities in a cleanup

Community members

It is ideal to have as much of the broad community involved in the steps in a cleanup process as possible so no individuals or groups are left out of decisions and the cleanup, when it happens, can be considered successful. A community that participates fully in a contaminated sediment cleanup will also learn a great deal and will likely be more willing to adopt pollution prevention approaches and protect natural resources.

Various sectors within a community can take on specific roles to get a cleanup underway and make it successful. For example, economic development offices or chambers of commerce can lobby to get state and federal attention and dollars to a cleanup. They can also develop promotional materials to attract development to the site after a cleanup. Local politicians can also push for state and federal fund allocations. Local environmental, conservation, watershed, recreation, and sport fishing groups can help by mobilizing their members to push for action and by encouraging the community to participate in the cleanup decision-making process.

Public advisory councils or RAP committees

In most Areas of Concern, there is a local advisory group that directs local efforts to restore the AOC and coordinates with the appropriate local, state, regional, and federal agencies. These local groups have varying capacities. Some have been active for many years and others may have been newly established. Some groups have professional staff

assisting them with meetings and projects. In other cases, virtually all participants are volunteers. If the local PAC has staff to assist them, their role in a contaminated sediment cleanup can be much more meaningful and effective. Ideally, a major role of a PAC could be to facilitate the involvement of the broader community, by helping them to understand background and technical issues, how to provide an informed viewpoint in cleanup decisions, and when that input is needed throughout the process.

State environmental agency

State environmental agencies often have a considerable role in contaminated sediment cleanups if they are the agency charged with overseeing the cleanup. Community members sometimes interact more frequently with state agency officials because they are typically closer geographically to the community than federal agency offices. It is important for community members to understand the specific legal guidelines under which state agencies operate, depending on how the project is funded and which state program is leading the effort. Even though state agencies are often responsible for coordinating the public meetings and activities relating to a cleanup, tight state budgets can seriously limit the amount of time and resources put toward a cleanup effort and partnering activities. An effective and strong PAC or local group can help in times of resource limitations and can take a strong role in a cleanup and in coming up with creative and meaningful ways to gain input from the broader community.

Federal environmental agencies

The role of federal agencies, such as the U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE), is similar to that of state agencies. US EPA or USACE often provides all or part of the funding for cleanups. This can be done directly or with funds passed through to the state. Federal and state agencies prepare a contractual arrangement to outline roles and responsibilities, such as which entity will take the lead in directing the cleanup, hire contractors, and undertake other activities. All agencies involved usually attend public meetings to take comments on draft sampling plans, investigations and cleanup options in order to fully understand community needs and interests.

Responsible party

Those who have been determined to be responsible for the contaminated sediment problem sometimes work directly with state and/or federal agencies to clean up a site, with variable levels of efforts at including community input. In some instances, responsible parties deny responsibility and put their efforts toward opposing a cleanup. In those cases, state and federal agencies often move forward with a cleanup and eventually come to an agreement with the company or clean the site and recover costs through legal proceedings afterward. In other cases, however, the company is an active partner, participating in studies and the development and implementation of the cleanup plan and actively seeking community input into its activities.

Who pays for a cleanup?

Sometimes a responsible company or companies agree to pay for the total cost of a cleanup, but more often the total cost is borne by a combination of sources, including the responsible parties, public funds from local, state and federal government, legislative appropriations, or state bonds, such as the state of Michigan's Clean Michigan Initiative. Areas of Concern in the eight Great Lakes states can also apply for new Great Lakes Legacy funds, appropriated for sediment cleanups in 2003. Most state or federal fund sources require a match of local funds.

Local PACs and other organizations can work to ensure that their state provides funding through bonds and in the general fund for environmental cleanups so that there is an ability to match federal dollars. Cleanup funds for "brownfield" projects (abandoned contaminated industrial sites that qualify for cleanup funds) can also be a source of match. In-kind services, such as time spent by local group volunteers can sometimes be used as part of a local a match, especially if there is a cooperative working agreement with the state.

For more information on the potential roles of organizations, see a *Public Involvement Matrix* **at http://www.lakemichigan.org/elimination/c-sediments2.asp.**

William Creal, MDEQ, at public meeting

Students at public meeting

II. INVOLVING THE COMMUNITY IN ADDRESSING CONTAMINATED SEDIMENT PROBLEMS

Why is community involvement important?

Community involvement is essential to the success of environmental cleanups. Many people think that addressing large-scale pollution is out of their hands, but actually, the level of involvement by community members is one of the best indicators of the potential for a successful cleanup effort.

First of all, it is often concerned citizens that get and keep the attention of the appropriate agencies and politicians about the need for a cleanup. This kind of political will helps lay the groundwork for the next step in the process –identifying the extent of the pollution problems and providing the necessary scientific and legal rationale to justify moving forward with a cleanup. Without persistent and informed "prodding" by local residents and community groups, contaminated sediments may not be noticed by agencies for decades or longer, if at all. Or if they are noticed, they may not be acted upon, again, because they are not as visible as other forms of contamination. Community members may also have important information for agencies and scientists about past disposal and pollution-related activities in their neighborhoods. This can help to direct studies and ensure that all pollution is identified and addressed.

After the studies are done, it is often the continuous and well-informed work of local citizens that gets cleanups underway and keeps them moving forward. Without citizen involvement, a lake or river may not get a cleanup - or if it does, it may not be one that is acceptable to community members. Limited involvement from citizens, local governments, and community groups may put them last in line for state and federal cleanup funds, or not in line at all. Why is this? It's the old "squeaky wheel gets the grease" principle. State and federal environmental agencies have a limited number of staff and scarce dollars to spend on an ever-increasing number of sites that need cleanup. The attention and dollars a community gets is directly related to the amount of interest and activity by people who care.

Getting a cleanup underway is not the only goal of a few local citizens. There are diverse interest groups in each community and each may have differing opinions on the best cleanup alternative, including **how** to do the cleanup and **how much** is to be done. By becoming informed on cleanup options and getting involved in the decisions, local citizens can ensure that the final decision reflects all different viewpoints and that it is the best alternative for their community.

Finally, community involvement is important because citizens learn important lessons about their local waterway and environment while participating in efforts to understand and clean up pollution. In particular, individuals involved in cleanup efforts often work to prevent future pollution problems, and become active in their community to make sure that environmental progress continues.

Ways in which community members can participate

There are many different ways that community members can participate in contaminated sediment cleanups. Some people may want to get thoroughly involved in following the progress of studies, reviewing documents, and the many steps related to a contaminated sediment site assessment and cleanup. Others may just want to attend public meetings, read about the issue in local newspapers or through mail updates, and express their viewpoint at decision-making points throughout the process.

Step 1: Learn about the issue.

At whatever level community members wish to become involved at, it is important for them to ask questions about the local contaminated sediment issue – the technical aspects and its history -- and the process that will be followed to study the problem and result in a cleanup. Citizens will then know how and when to get involved and where to find accurate, reliable information.

Step 2: Track the progress of contaminated sediment studies.

By following the issue and working with government agencies, communities can also help to make sure that the appropriate studies are done to pinpoint the problem. This will establish a sound information base and provide a legal basis to move toward a cleanup. The responsible party or company can undertake studies to identify the extent of the contaminated sediment problem. Some communities, however, prefer to have the studies done by local scientists, to provide an independent viewpoint. Local citizen groups can push for studies by holding public meetings, gathering local anecdotal information, and alerting their local, state and local officials of the need for public attention to the issues they learn about. In the White Lake AOC in Michigan, for example, strong pushing by local citizens motivated state legislators to develop and pass a resolution in both houses of the state legislature that stated the need for a cleanup of their lake -- an un-

precedented action and one that carried considerable weight in determining whether or not a cleanup might occur.

Step 3: Join a local group for strength in numbers.

Join a local community group that is working to get the cleanup moving forward. If you are in a Great Lakes AOC, groups called PACs (public advisory councils) or RAP (Remedial Action Plan) committees are usually formed by state or federal authorities to gain viewpoints from different groups and people in the community. In some AOCs, local citizens have themselves taken the initiative to organize into PACs to provide advice and work cooperatively with state and federal environmental agencies. However they may have been formed, the groups can be an effective voice for local restoration and a good place to go for local citizens who want to get involved in a contaminated sediment cleanup. Keep in mind that these groups will be working on restoring your lake or river in other ways that may be of interest to you, such as restoring plant and wildlife habitat, cleaning up hazardous waste sites, or stopping runoff pollution.

How can community leaders and local groups assist public involvement?

Community leaders and local groups, such as PACs, can play a large role in facilitating the involvement of the rest of the community in a contaminated sediment cleanup. Sometimes local groups have different viewpoints about the preferred cleanup option and the process becomes a struggle to win support for a particular option. Ideally, a local group could take on a larger role, that of ensuring that as many individuals and community interests become informed and able to participate in a meaningful fashion in decisions that are made. With this goal as a guiding principle, it will be more likely that the final decision will reflect the interests of the entire community.

What methods are effective?

Get input from the community on their needs first.

One approach that has worked well in some communities is for the local group to develop and disseminate a questionnaire in order to gather input on community views of an impending cleanup. Information from the questionnaire can help determine the level of knowledge community members have about the contaminated sediment cleanup issue, what information the public needs in order to participate in the cleanup decision-making process, and the best way to communicate that information. Using a questionnaire approach also shows people that their opinion is valued and that their participation is needed and welcomed. The questionnaire can also be a useful tool in finding out who is interested and how to reach them during the entire cleanup process – by simply requesting contact information. Questionnaires can be placed at schools, churches, community centers, or libraries, and mailed out or placed as an "insert" in a local newspaper. Information gained from the questionnaire can prove tremendously useful in directing overall public participation efforts.

Schedule involvement activities throughout the process.

One of the most effective ways in which to properly involve community members in contaminated sediment decisions is to plan well in advance of decision points and schedule the types of activities that may suitably take place as the sequence of the cleanup proceeds -- things such as presentations on sediment pollution studies, potential cleanup methods, "hands on" activities, forums for community discussions on what factors to use in weighing cleanup alternatives, logistics of a cleanup, and monitoring are all necessary for encouraging effective community involvement.

Host public meetings.

Public meetings are usually one of the most efficient ways to get information about issues out to a sizeable group of people in a community. They offer the community a great chance to learn about contaminated sediments and the process for cleaning them up, and for community concerns, interests and viewpoints to be expressed. Important groundwork before putting on a public meeting might be small group meetings with neighborhood associations and local officials, newspaper articles, or a questionnaire. Well-attended public meetings show local media and elected leaders that there is considerable interest in the contaminated sediments issue. Be sure to be mindful of a meeting time that is convenient for most people in your community – this is an important question to include on your questionnaire. It also helps to start and end on time, and make sure the presentations are understandable to the layperson.

If community members indicate a need for specific information, plan well in advance to get "expert" speakers on those topics and schedule and publicize meetings far in advance. Prepare written information on the topics for use at meetings

and put this information on a web site. Even though public meetings are not always the preferred option of involvement by community members with hectic schedules, it helps to have them for a number of reasons. First, some people simply need to have a forum where they can discuss issues in person. Second, public meetings can attract media coverage that extends the information from the meeting to a larger audience. Third, it is a chance to give out information and also receive feedback to help guide the process of informing and involving the community. Lastly, it is visible and tangible. Sometimes people think if you don't have meetings, you are not doing anything. Consider having several half-day technical workshops throughout the process for those people who really want to get an in-depth understanding of issues such as cleanup techniques. This helps to broaden the public knowledge base.

Sponsor public dialogue forums.
Public meetings are primarily for information dissemination and question and answer sessions. Other types of meetings can be useful as well. For deliberating on options for cleanup, communities may wish to try a process termed "public dialogue." This is a focused, facilitated method for engaging a community in understanding an issue that weighs a variety of options and their advantages and disadvantages. A number of organizations promote the use of the approach, including the Kettering Foundation and National Issues Forums. (See resources section for more information.)

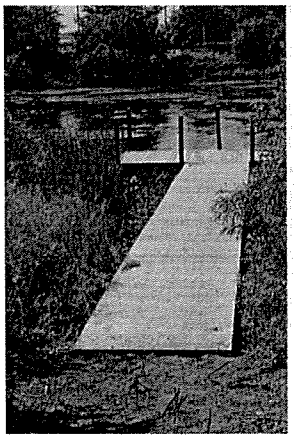
Encourage media coverage.
It's crucial to ensure that local reporters understand the contaminated sediment issue and the interest of local citizens in the cleanup. If reporters understand this, they will likely be more committed to learning about the issue and providing regular coverage for the community. Often good reporting will spur effective public participation; other times, citizens will raise the issue first and their voices will draw the attention of reporters. Some newspapers will even offer their assistance in getting specific information out. The White Lake Beacon in Whitehall, Michigan, for example, published a summary of cleanup options (developed by a local organization) to help community members understand the alternatives. See the example at this link: http://www.lakemichigan.org/elimination/wlsed_options.asp.

Expanding community awareness due to media attention results in greater chances that elected leaders feel compelled to offer their assistance. A steady stream of letters to the editor of a local newspaper helps to keep the issue in the public eye. The letters don't have to be long or technical - in fact, shorter letters get printed and read more easily. Newspapers gauge the level of interest in an issue by the number of letters it generates, and more letters can result in better coverage. In turn, elected officials read these letters to see what people feel strongly enough about to write about.

Plan "hands on" activities.
Some community members may only want to be involved in activities that they perceive as having observable direct results, such as plantings to help stop river or lake erosion, water quality monitoring, or removal of alien invasive species, for example. That's why it is important for community group leaders to plan a regular schedule of such activities. These people may then be invited to participate at the contaminated sediment cleanup decision points, by attending public meetings or by writing in public comments, helping to increase overall involvement in the cleanup.

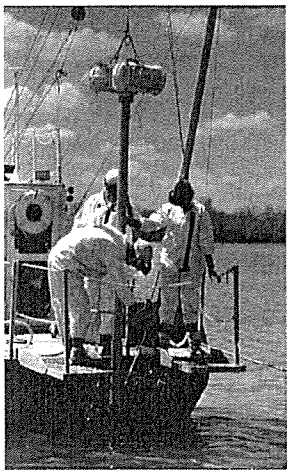
Check out existing or upcoming programs related to the waterbody and see how that fits into an overall framework for increasing support for a cleanup. For example, there are likely numerous native plant restoration projects, "River Days," school volunteer cleanup projects, and speaker series that could be incorporated into public involvement for the contaminated sediment cleanup process.

Overcoming obstacles to community involvement



Cleanup of contaminated sediments can seem like a lengthy, complicated, contentious prospect. The issue is not easy to understand nor easy to explain, even to interested community members. Moreover, there are a number of obstacles that can stand in the way of the public getting involved and having a large role in the decision-making process. Two environmental organizations, the Lake Michigan Federation and the Sierra Club, interacted with groups and individuals involved in contaminated sediment cleanups in order to identify these obstacles as well as potential solutions for overcoming them. Their report can be read at the following link: http://www.lakemichigan.org/elimination/communitydecisionmodel.asp

III. UNDERSTANDING THE EXTENT OF THE PROBLEM: THE REMEDIAL INVESTIGATION



What is a Remedial Investigation (RI)?

A Remedial Investigation is usually paired with another study, called a Feasibility Study, and referred to as the RI/FS. As part of the RI, samples are taken of the water, groundwater, soils or air, to determine if there is a contamination problem. If there is a contamination problem, the study determines the extent of the contamination, levels of contamination, and makes recommendations as to whether or not action is needed.

The RI also includes an evaluation of the risks from the contamination to the environment and humans. Cleanups don't occur simply because there is known contamination of sediments, but after careful assessment and identification of a serious threat by the contaminated sediments to aquatic organisms, wildlife and people. Scientists weigh a number of factors in determining the threat level. They will need to know the volume of contaminated sediments, in addition to the levels of contamination, to see how they compare to state or federal criteria. They will want to know how stable the sediments are and whether or not they are moving about in the waterway. If the sediments are stable and covered over by clean sediments, one option could be to leave them undisturbed.

Information is also needed on the contaminants and what happens to them in the sediment – are they entering the water and evaporating into the air, or are they bound up in the sediments and not available to be taken up by aquatic organisms? It is important to understand how the contaminants may be available to the food chain, not only at this time, but also in the future. If the contaminants bioaccumulate, or build up in the food chain, scientists will want to study local fish populations to determine the level of contamination in fish tissue. They may also want to gather information on wildlife reproduction rates and the health and diversity of benthic organisms, in order to understand the threat of the contamination. They will want to know the short and long-term risks of the sediments, in addition to the risks posed by actions to address them.

The information gathered during the RI is used in the next step (the Feasibility Study) of the process to identify potential ways in which to address the contamination. It also identifies criteria to be used in any action to address the contamination. The basic process for an RI can be as follows:

1. Gain an understanding of the site by reviewing existing information such as hydrogeologic studies of the area and any scientific or anecdotal data from local citizens.

2. Collect data, such as samples of soil, water, groundwater, sediments.

3. Define boundaries of groundwater aquifers.

4. Design and construct monitoring well systems to track pollutants.

5. Identify where contaminants are located, whether they are moving, and in what direction or by what method; develop models to show where contaminants may end up in the environment.

6. Conduct a study to determine risks posed by the site and what cleanup levels need to be established to be protective of human health and the environment. There are two types of risk assessments. A human health risk assessment looks at the risks to humans from contamination at the site and an ecological risk assessment looks at the risks to ecosystems, such as plants, fish, and animals, from contamination at the site.

7. Conduct tests to determine the treatability of contaminants, or what might work to reduce their harm.

Contaminated sediment sample. Photo credit: Great Lakes Commission

Who does an RI?

Environmental consulting/engineering firms hired by responsible parties or by state or federal agencies typically do RI's. These firms can either be very specialized in certain areas or offer a wide range of services in broad topic areas, such as water and air quality, wastewater, environmental compliance, hazardous waste, solid waste, and environmental impact statements. They can employ scientists, engineers, biologists, lawyers, public relations personnel, surveyors, GIS technicians, and public health experts.

Marc Tuchman, U.S. EPA, and former U.S. EPA Administrator Mike Leavitt looking at sediments from the Detroit River, Great Lakes Commission

How long does an RI take?

Each site varies, but it often takes approximately two years to complete both the RI and the FS. Contaminated sediment cleanups usually take a long time to get underway and even then, the time during which studies are being done can appear as wasted time. For those that want the best cleanup for their community it can be a time in which local citizens gain a better understanding of contaminated sediments and the options that are available. If not begun already, this is the time to lay out a schedule of public involvement for the cleanup process. See the community involvement section for more information.

What is the role of the community?

Members of the community can have a considerable role in ensuring that the RI is initiated and that it is done thoroughly. Citizens need to become familiar with the different parts of the RI, the schedule for its completion and points at which the public or a local committee can review and comment on draft documents. Individuals can take tours of contaminated site areas and point out potential contaminated sources. Media can also alert the public to the issue and call for information on past disposal methods at the site. The more information that is available about the contamination and how large an area it covers will help put the RI on a sound foundation. Members of the public can and should review and comment on where to sample for contaminants, the work plan developed after data collection, and the draft risk assessment.

Where can you get technical assistance to understand the RI?

Once it is decided that a cleanup investigation will take place, the local group could assemble a technical committee and schedule regular meetings. You may have technical experts right in your own community, such as retired chemists or biologists, who could form the basis of a local technical review committee. Local colleges or universities are also a good source of technical assistance, in addition to representatives from the local health department, drain commissioner office, conservation districts, and city and county planning or departments of public works.

The technical committee should encourage state and federal agencies and their consultants/contractors to participate in committee activities, such as meetings to review sampling plans, tours of the site, and discussions of studies and options. Often, the local committee can help to make the state and federal agencies aware of local resources that may be of help as the cleanup progresses. The technical committee can also be helpful in evaluating and improving public presentations made by the agencies that contain technical information before they are brought to the public.

Local groups can apply for a Technical Assistance Grant (TAG) to pay for an expert to help understand the studies that are being done at contaminated sediments sites that are also "Superfund" sites. (Superfund is the common name for the federal government's program to identify, study, and clean up what are considered to be the worst uncontrolled and abandoned toxic waste sites in the country. It is administered by the EPA.) The TAGs cannot, however, be used to conduct new studies.

Another valuable resource is the Hazardous Substance Research Centers located at five universities throughout the country. These Centers support a service to communities with hazardous wastes sites, called Technical Outreach Services to Communities, or TOSC, which uses an application procedure to determine the communities that qualify for their assistance.

Personnel from the U.S. Environmental Protection Agency, who serve as liaisons to AOCs, can assist communities in

IV. LOOKING AT OPTIONS FOR A CLEANUP: THE FEASIBILITY STUDY

What is a Feasibility Study (FS)?

To prepare for the Feasibility Study (FS), the first step is to outline what is to be done as part of the FS, which is called a "scope of work." The FS then uses information gathered as part of the Remedial Investigation to analyze technical, environmental and cost factors and evaluate possible options for cleanup of the contaminated sediments. The FS contains an initial design of the proposed cleanup option, its cost, and a beginning schedule for carrying out the cleanup.

Sediment samples

The FS is important because it lays out all of the potential ways to clean up the contaminated sediments and describes the different factors that will be considered before making a final decision. This is an important opportunity for the public to consider the details of the preferred cleanup option.

There are a number of options available and in use for addressing contaminated sediment problems. Some of them are short-term, used to address immediate risks. Others are long-term strategies, designed to be a permanent solution.

The first order of business is to completely identify and stop any continuing sources of contamination to the sediments. This can be done by installing erosion control measures or by blocking contaminated groundwater flows from land sources, for example.

Natural recovery or natural attenuation is an option that assumes that no actions are needed and that the contaminants will become less toxic as they break down naturally, the contamination will stay bound to the sediments and not move into the water, or that clean materials will cover or be placed over contaminated sediments, stopping contact with living creatures. Monitoring is necessary to ensure that levels of contaminants in the sediments, water, groundwater, fish and wildlife are being reduced.

Removal of the contaminated sediments is one option, along with placement or containment of the sediments in a landfill, or confined sediment disposal area. This is typically done by dredging, or the removal of sediment from the bottom of a water body. The sediments could also be treated after dredging to reduce their harm before being placed in a disposal area.

In-situ capping is where contaminated sediments are left in place and capped with sand or other materials to prevent contact with aquatic organisms.

In-situ treatment is where the sediments are not moved, but treated with a biological process to break down the contaminants.

How are cleanup options chosen?

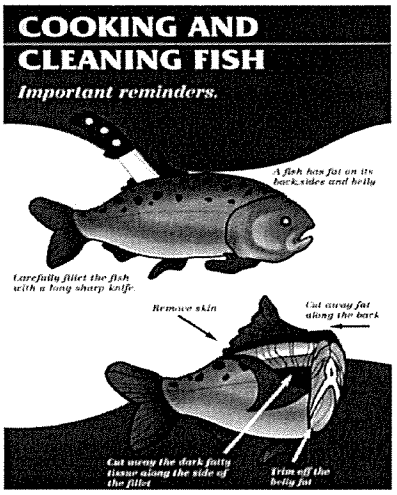
A cleanup method is chosen based on a number of factors, including:

- How much contamination it will address;
- How well it reduces risk;
- Permanency;
- Cost, and;
- The amount of potential disruption that will be caused by a proposed cleanup action.

How effective are the different cleanup options?

Once pollution is in the environment, it is virtually impossible to find every last bit and remove it, especially as there may be contaminants in the soils, groundwater and water in minute amounts from numerous sources. The goal is to leave only those levels of contamination that have been determined **not** to cause harm to aquatic organisms, wildlife, people or the uses of the waterway. Setting a goal for the cleanup involves assumptions and knowledge of the effects of the contamination on the environment and people. One size doesn't fit all --- there are no national standards for contaminated sediment cleanup, as there are so many different types of contaminants across the country and every site is unique. Those who undertake the cleanup need to know how much contaminated sediment to remove and how low the levels of

contamination need to be to allow for safe use of the water body, such as swimming, or fishing.



There can be widely differing opinions even within one community about the most effective cleanup method to use to clean up contaminated sediments. Individuals, groups, and companies often disagree about whether to let the sediments remain in place or having them removed. There are advantages and disadvantages to each option.

Conducting monitoring (sampling of sediments and aquatic organisms to determine contaminant levels) after a cleanup is crucial to confirming whether or not a cleanup is effective at lowering levels of contamination in the sediments and in fish and wildlife. Before a cleanup gets underway, it is important to have a goal for the amount of improvement that is desired in order to compare that goal with actual monitoring results. Monitoring is not an automatic element of every contaminated sediment cleanups, and so needs to be advocated for by the community.

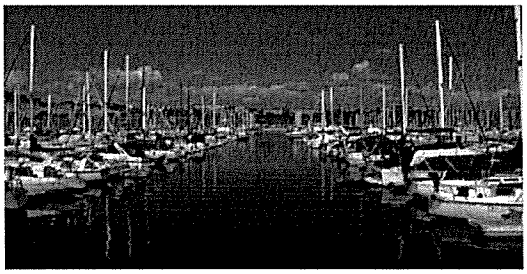
How can the community participate?

The public can and should be thoroughly involved from the beginning to the end of the FS. Interested members of the community and, if one is established, a local technical committee, should first review and comment on the FS scope of work, to ensure that any options the public wishes to have evaluated will be included in the study and thoroughly investigated. This is important because **only** options that have been part of the FS can be selected as a final cleanup alternative. Members of the community and the technical committee should also review and comment on a draft version of the FS, making sure to provide their community's viewpoint on the various factors that need to be weighed, and which factors may be more significant than others, since the cleanup may affect future uses of the waterway. Ideally, the more that the community is involved in providing their input into the final FS, the more likely the final decision will be one they approve of and support.

Local residents, businesses, and organizations must be clear on how choosing a cleanup option may affect the community. For example, if the community has future plans for a marina at the site, it may not be interested in a capping project, which could lower water levels. Alternatively, the community may have concerns about a dredging project's potential to impact a commercial fishery or disrupt a wetland. For sites that are intended to have a public use, the community may envision a high level of cleanup. Because of this, it will be crucial for the community to define what they would like to see happen after a successful cleanup, through public visioning meetings or forums or through questionnaires. It will also be important to review local government planning documents to see what already exists in the way of community plans that encompass the water body.

What kind of cleanup will the community support?

If a community is involved throughout the process and actively reviews and assists in choosing the cleanup option, it is more likely they will support the final decision that is reached. One model of effective public involvement occurred in the White Lake Area of Concern, in Muskegon County, Michigan. In that process, the information needs of the community were determined by an initial questionnaire. Information was provided with a "layperson" summary of cleanup options in a public meeting setting, in addition to being printed in the local weekly newspaper. Members of the community were also allowed the opportunity to provide their input at the meeting or through a questionnaire circulated in the local newspaper. For more information on the White Lake model, see http://www.lakemichigan.org/elimination/wlseds_index.asp.



V. THE DESIGN STAGE: DEVELOPING A PLAN FOR CLEANUP

How is a cleanup plan prepared?

The cleanup plan or Remedial Action Plan (RAP) is a comprehensive document that explains the cleanup option that has been chosen. It provides information on:

- Ø The community's role;
- Ø History of contamination at the site;
- Ø Results from the Remedial Investigation, and;
- Ø The Feasibility Study, such as the goals of the cleanup option and levels of cleanup to achieve, the options reviewed and the factors used in choosing the preferred option, the proposed option and analysis of its components.

It is usually first presented as a "proposed" Remedial Action Plan, with an opportunity for the community to provide their input.

Who prepares cleanup plans?

The RAP can be prepared by a consulting firm hired by the company or companies that have taken responsibility for the contamination, by the state or federal environmental agency, the U.S. Army Corps of Engineers, or by a combination of the agencies.

What is in a cleanup plan?

Most RAPs are developed according to a set of directions or guidance on the elements that should be contained, with a standard outline of contents. This is typically provided by the state or federal environmental agency. An example of the guidance provided by the EPA for cleanup plans for Superfund sites is at: http://www.epa.gov/superfund/resources/remedy/rods/.

Does the community have a role?

The community has a right and responsibility to review carefully and comment on the proposed RAP. This is best done with technical assistance and/or with the assistance of a technical committee.

How can the community keep the cleanup moving forward?

Investigating, developing plans, and obtaining resources for a cleanup will necessarily take time, at least several years. The best way the community can make sure that the cleanup process keeps moving is to keep a focus on the cleanup process by hosting public meetings, sending out mailings, and celebrating milestones, such as completing studies or actions.

Ensuring that there is funding for staff support for the local group is also important in order to keep everyone involved and coordinated and is a key component of continued successful public involvement.

White Lake, Michigan cleanup

VI. THE CLEANUP IN ACTION: CONSTRUCTION AND IMPLEMENTATION

Who leads the cleanup?

Once the cleanup option has been determined, the state or federal agency prepares and sends out a Request for Proposals or RFP. The RFP is an announcement soliciting competitive proposals from companies to design, construct, and implement a cleanup. Bids from companies are evaluated on a number of factors, including cost, technical and administrative capabilities, experience and track record, and how well they meet criteria laid out in the RFP. The company chosen through this process will likely subcontract with other companies to undertake specific parts of the cleanup. The company directing the cleanup usually has weekly and monthly progress meetings and reporting requirements as part of their oversight responsibilities.

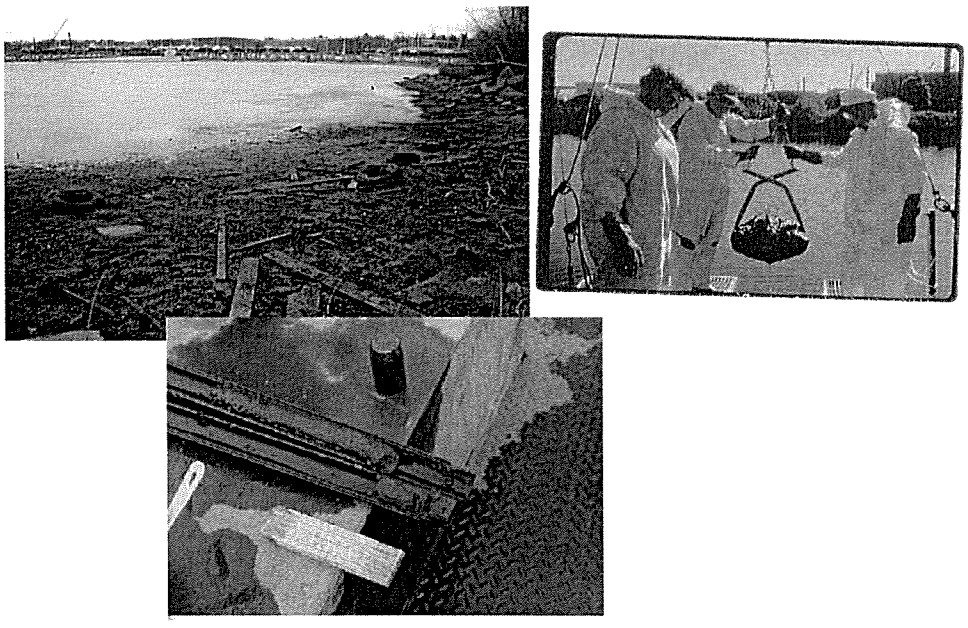
Detroit River cleanup.
Photo credit: Great Lakes Commission

How will logistics of the cleanup be handled?

While most community members are glad to know the cleanup will get underway, there can be concerns among some about the logistics of the cleanup or how the activities may affect the daily lives of area residents or community events. Most companies will or should host a public information meeting to explain what will happen at the site – when equipment will arrive, hours of operation of cleanup activities, such as trucking, truck routes, and any short-term impacts such as odor from the process, dust, release of air pollution and short-term impacts of the cleanup option. In some instances, a phone number is posted at the site, and also published in local newspapers if local residents have questions or concerns during the cleanup.

How can the community track progress?

Community members can follow the progress of the cleanup in several ways. There can be information meetings or tours of the site while the cleanup is in progress. Some local groups host update meetings, and post photos of the cleanup on a web site for community use. And too, local newspapers can follow and report on progress.



VII. AFTER THE CLEANUP: CONFIRMING A SUCCESSFUL CLEANUP, CELEBRATING, AND MAINTAINING ENVIRONMENTAL QUALITY

How can monitoring confirm a successful cleanup?

Monitoring should be included in the Remedial Action Plan to confirm the success of a cleanup. Unfortunately, not all cleanups include monitoring programs when the cleanup is completed to measure the effectiveness of the method used. Such a program could last a year or 5 years and might include taking samples of water, sediment, and/or aquatic organisms to look at levels of contaminants to confirm whether or not levels are going down. Monitoring is also important to ensure there has been no re-contamination, to evaluate long-term success of any containment measures, and to monitor any leftover materials from dredging projects, and the safety of disposal facilities

Why is it important to celebrate when the cleanup if finished?

Former U.S. EPA Administrator Mike Leavitt at Detroit River. Credit: Great Lakes Commission

Don't forget to celebrate when the cleanup is done! It is important in informing people about final progress at the site and it can be a symbol of closure for the community. For many communities that have struggled with the stigma of contaminated sediments and the complexity of getting a cleanup underway, it is an opportunity to begin viewing the water way as a positive asset and to affirm the work of the community in taking action. Activities could include: boat tours of the site, speakers, children's activities, and picnics.

How can you maintain your community's environmental quality after the cleanup?

An important goal to work toward after a contaminated sediment cleanup is maintenance of the waterway's newfound health. Sustaining environmental quality is not an easy task. Hopefully, most people who have experienced the pollution of a community waterway, and the struggles of getting it cleaned up will likely work hard to prevent further pollution. Many Areas of Concern and other places with historical pollution have struggled with the classic question of having good paying jobs or protecting the environment. The communities were so pleased to have thriving economies (and who wouldn't?) that the pollution that resulted was overlooked and accepted as the price to pay for jobs. Unfortunately, that pollution may have over time impacted the economy as much, if not more, than the jobs associated with it. The pollution may have caused damage to fish and wildlife populations, and public health and the current economy. Further, the cleanups needed are tremendously expensive for both responsible parties and taxpayers alike. Because of this, communities are becoming interested in attracting companies that understand the need to prevention pollution in order to avoid harming public health and natural resources, in addition to saving on cleanup costs.

Promoting stewardship in your community is essential to maintaining environmental quality. Environmental stewardship refers to a way of viewing natural resources that considers their condition for future generations. The concept of "sustainability" is related to stewardship. The basic goal of a sustainable community is to meets its basic resource needs in ways that can be continued in the future. Steps in becoming a sustainable community include:

1. Creation of a vision of a community future that balances economic, environmental and social needs. Viewing future in the long term: not on the order of years, but on the order of decades or generations.
2. Incorporation of the views of a wide cross-section of the community.
3. Establishment of a method to track progress in reaching the vision.

VIII. CONCLUSION

This guide was developed to help communities participate in decisions regarding contaminated sediments in their lakes, rivers or bays. It provides basic information for understanding the background, technical issues, agencies involved, and issues surrounding a cleanup. By understanding these issues, we hope that communities can meaningfully participate in restoring their water bodies to health, and further, envision a positive, sustainable future.

The overarching theme of this guide is the value of citizen and group involvement in ensuring that contaminated sediments are addressed satisfactorily. By participating in a contaminated sediment cleanup, we also hope that community members realize the importance of protecting environmental quality and being strong stewards of natural resources in their community. Thank you for your interest in this guide and the work you do in your communities!

IX. RESOURCES

Contaminated Sediment Sites

2004 U.S. EPA Report to Congress. This report identifies areas in the United States where the sediment may be contaminated at potentially harmful levels. www.epa.gov/waterscience/cs/report/2004

U.S. EPA Superfund Sediment Resource Center web pages. These pages provide support to EPA Superfund staff working on contaminated sediment sites, and have background information, a list of contaminated sediment Superfund sites throughout the nation, technical guidance documents, a listing of workshops and conferences, and more web links. www.epa.gov/superfund/resources/sediment/ssrc.htm

Contaminated Sediments Technical Information

U.S. EPA web site pages on Contaminated Sediment in Water. Has descriptions of the major contaminants in sediments, species affected by contamination, information on the extent of the problem of contaminated sediments in the United States, and ways to prevent contamination of sediment. www.epa.gov/waterscience/cs

U.S. Army Corps of Engineer's web pages on contaminated sediments. These serve as "a clearinghouse for technology and expertise concerned with contaminated sediments." It has many technical guidance documents and a "clickable" United States map with case studies and projects. http://el.erdc.usace.army.mil/dots/ccs

Emergency Response TV web site. This site has a number of videos and DVDs on a variety of topics, including one on contaminated sediments in water — impacts and solutions. www.ertvideo.org/home.html

Great Lakes Areas of Concern

U.S. EPA's Great Lakes National Program Office (GLNPO) web site. Provides extensive information about contaminated sediments in the Great Lakes, including background and information about the EPA's sediment program, overseen by GLNPO, information on the volumes of sediment cleaned up in the Great Lakes, case studies of sediment remediation, a map of Areas of Concern in the Great Lakes, and information on Remedial Action Plans, and delisting (removing an Area from the list of AOCs by completing cleanup activities.) The site has a list of technical publications, including guidance documents, summaries of sediment issues in AOCs, studies, risk assessments, and reports on cleanup technologies. www.epa.gov/glnpo/sediments.html

The International Joint Commission (IJC) web site. This site provides information on Great Lakes Areas of Concern and Remedial Action Plans. The IJC is an independent binational organization established by the Boundary Waters Treaty of 1909. Its purpose is to help prevent and resolve disputes relating to the use and quality of boundary waters and to advise Canada and the United States on related questions. The IJC also oversees progress of the United States and Canada to toward meeting the goals of the Great Lakes Water Quality Agreement, first signed in 1972 and renewed in 1978 to restore and maintain the chemical, physical and biological integrity of the Great Lakes Basin. www.ijc.org

Public Involvement

U.S. EPA's public involvement web pages. This site can be used by both agency staff and members of the public. Topics include laws and regulations, policies, approaches and tools, manuals, case studies, and related topics, such as sustainability, public involvement in regulatory programs, grant programs, and "how to " resources on focus groups, facilitation, and consensus building. www.epa.gov/publicinvolvement

Michigan State University's EnviroTools web site. The "community" section of the EnviroTools.org, has fact sheets, Power Point presentations, and links to other resources on a varied mix of topics including brownfields, environmental justice, conflict resolution, conducting outreach, watersheds, groundwater, landfills, and statistics. Created at Michigan State University and sponsored by the National Institute of Environmental Health Sciences, the site was made for citizens participating in cleanups primarily of contaminated land sites. The materials on the community section are starred, to indicate beginner, intermediate, and advanced content. www.envirotools.org/community.shtml

Lake Michigan Federation and Sierra Club Public Participation Model. This is a model plan for public involvement in contaminated sediment cleanups prepared by the Sierra Club and the Lake Michigan Federation. It describes the basic sequence of activities and how the community should be involved in each part and why. www.epa.gov/publicinvolvement/public/sierra2.pdf

The Kettering Foundation. An operating foundation (not a funding source) that conducts research on how to improve democracy, primarily through re-invigorating civic engagement in communities through public dialogue. The Foundation's site has a number of resources, such as 3,500 abstracts on related topics and links to resources. www.kettering.org

The National Issues Forums. Created by the Kettering Foundation, the Forum seeks to encourage public discussion about important policy issues, and maintains a network that "promotes nonpartisan public deliberation in communities across the country." The Forum's web site has discussion guides, a calendar of workshops, results of forums across the country, and information on how to organize a forum. www.nifi.org

Sustainable Communities

U.S. EPA Becoming a Green Community web pages. These pages describe how to become a "green community," and provide cases studies and resource links for businesses, building trades, and schools. www.epa.gov/greenkit

Sustainable Communities Network. This site has an abundance of resources relating to visioning and building partnerships, growing a sustainable economy, protecting resources, education, and developing policies and ordinances. www.sustainable.org

Glossaries

The Internet is host to numerous sites with glossaries of common terms used in contaminated sediment cleanups and other related topics.

U.S. EPA's Terms of the Environment web pages. Easy to use; laid out in "clickable" alphabetical order. www.epa.gov/OCEPAterms

U.S. EPA's Contaminated Sediment in Water pages. This glossary is more specific to contaminated sediments. www.epa.gov/waterscience/cs/aboutcs/glossary.html

EnviroTools. Has links to other web glossaries. http://www.egr.msu.edu/~envirotools/cgi-bin/glossary.php3#glossaries