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Social, Cultural, Economic Impact Assessments:
A Literature Review

Prepared for
The Office of Emergency and Remedial Response
US Environmental Protection Agency

Submitted October 2002

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Background

One of the major conclusions from the recent National Research Council report, A Risk Management Strategy for PCB-Contaminated Sediments (2001) was that this type of risk management strategy should "comprehensively evaluate the broad range of risks...including societal, cultural, and economic impacts as well as human health and ecological risks...when developing risk-management goals for the contaminated sediment sites" (National Research Council 2001:115). Elsewhere in the report, EPA was faulted for lack of attention to societal, cultural, and economic impacts in its decision-making processes.

There are two major implications of these conclusions. The first is that EPA is more than just a risk *assessor* in its management of Superfund sites: it is a risk *manager*, with all the attendant implications of trade-offs among clean-up options (Stahl 2001). The second is the implied requirement to develop an assessment methodology for societal, cultural, and economic impacts so they can be incorporated into the risk management process.

The current CERCLA Hazard Ranking System only evaluates risks to public health and to ecosystems associated with sites as part of the process determining whether they should be listed. Scores are based on the level of contamination in the air, soil, and water; the size of the population at risk; the size of the ecological area at risk; and the likelihood of direct contact with the contaminants. The Hazard Ranking System process pays no formal attention to what Endter-Wada, et al call the "sustainability of human...communities," (Endter-Wada, et al 1998:891), that is, the impact manage-

ment interventions (with 'no intervention' being one option) will have on human and ecological communities.

Introduction

The notion of assessing the response of human communities to policy-driven interventions (including those associated with Superfund site remediation) is not new. The passage of the National Environmental Policy Act of 1969 (NEPA) established the requirement to conduct environmental impact statements for specified types of programs and projects. One of the first large environmental impact statements was that done for the Trans-Alaska pipeline in 1973. A key part of this environmental impact statement was a discussion of potential changes in Inuit culture should the pipeline be built as a response to the NEPA requirement to understand the impact on the 'human environment.'

This type of discussion came to be known as a 'social impact assessment.' The President's Council on Environmental Quality (CEQ) strengthened the requirement for conducting social impact assessment by noting that the "human environment" referred to in NEPA was to be interpreted to include "the natural and physical environment and the relationship of people with that environment." This meant that agencies needed to assess the "aesthetic, historic, cultural economic, social, or health [effects]...whether direct, indirect, or cumulative" (40 CFR 1508.8, CEQ Regulations for Implementing the Procedural Provisions of the National Environmental Protection Act *in* Interorganizational Committee 1995:13). At this point, agencies became legally vulnerable as much for failing to consider

negative impacts as for actually creating those impacts.

Social impact assessments grew in frequency through the 1980's. They were of particular interest in Australia and New Zealand where large development projects were being implemented on indigenous lands, although they occurred with reasonable frequency in the United States as well. (See Becker 1997 for a good review of the growth and spread of SIAs.) An International Association for Impact Assessment was formed in 1981, and international organizations such as the European Economic Community and the World Bank adopted the environmental impact statement, which included the social dimension, into their practices by the end of the decade. The practice fell into disuse in the United States in the 1990's however, although it continues to be used for a wide variety of policy interventions elsewhere, particularly in the developing world.

What is a social impact assessment?

There are a variety of definitions of a social impact assessment, or SIA. Here we will follow the one presented by the Interorganizational Committee on Guidelines and Principles for Social Impact Assessment (1995)[1]*, as it embodies most of the concepts contained in other defini-

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[1] The Interorganizational Committee was sponsored by the National Marine Fisheries Service. It had a broad membership, including representation from several government agencies and academic disciplines and professional associations involved in impact assessment. We cite here the version that was published in a peer-reviewed journal. Many government agencies reference an earlier 1994 version, which we have also included in our list of references.

tions. According to the Interorganizational Committee, an SIA is an

> effort to assess or estimate, in advance, the social consequences that are likely to follow from specific policy actions (including programs, and the adoption of new policies), and specific government actions (including buildings, large projects, and leasing large tracts of land for resource extraction), particularly in the context of the U.S. National Environmental Policy Act of 1969 or 'NEPA'" (Interorganizational Committee 1995:12)

The acknowledgment of the need for SIAs stems from an evolving recognition of the complexity of human communities, and the realization that the negative, unintended consequences of policy interventions may outweigh positive effects (see Western and Lynch 2000:35). One of the primary functions of an SIA is to anticipate the effects of defined types of change on the human community and to provide these anticipated effects to decision makers able to use them to evaluate the 'goodness' of alternative interventions (Burdge and Robertson 1998:189, Carley and Bustelo 1984:7, Goldman and Baum 2000:1, Western and Lynch 2000:3). We have come full circle to risk management.

It is very important at this stage to note what an SIA is not. It is not synonymous with public participation or public involvement, although public involvement is an important data collection tool in the conduct of an SIA. Public or community participation is a means to acquire information on the human community and potential changes in it as a result of the intervention (NRC 2001:78). As Burdge and Robertson (1998) note, public involvement

is a key component of an SIA as it is the process by which the affected community can provide systematic input to the decision (Burdge and Robertson 1998:189). Note also that construction of a methodology requiring community involvement for data collection requires dependence upon a pluralistic and democratic, participatory form of decision-making, rather than a technocratic approach (Barrow 1997:232, Carley and Bustelo 1984:7, Glicken 1999). We will return to this point later when we address some of the issues related to the conduct of SIAs.

Finally, an SIA does not produce risk management decisions. Just as an ecological or human health risk assessment yields information which is fed into the risk management process (see, e.g. Stahl 2001), so does an SIA. The social impact assessor should make no judgment as to the 'goodness' of the interventions he or she evaluates. The purpose of the assessment is to present information as to their consequences.

Methodological approaches to SIA

An SIA is fundamentally a comparative exercise (Interorganizational Committee 1995:17, Burdge and Johnson 1998:14). It compares a baseline (today) to hypothetical future states, often by comparing community A to community B, where community B serves as a surrogate for a possible future state of community A. The future states of community A are functions of various, defined interventions, with 'no action' serving as a member of the set of possible futures.

Conceptually, an SIA is similar to an ecological or human health risk assessment. An ecological risk assessment, for exam-

ple, is designed to "evaluate the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more stressors" (U.S. EPA 1998:1). An SIA attempts to evaluate the likelihood that adverse *social* effects may occur as a result of an intervention. Human communities are very different than ecological communities or from the biological 'community' that is the human body. Human communities will react in anticipation of change (Barrow 1997:231): introducing the potential for intervention is, itself, an intervention. Human communities also can influence the nature of the intervention. Engaging them in planning processes through public involvement strategies changes both the process and its outcomes. As the Interorganizatonal Committee (1995) put it, "change has a way of creating other changes" (Interorganizational Committee 1995:17). Since the proposed and ultimately introduced changes do not unfold in a linear fashion, it is important to conduct SIAs at all stages of the intervention (see Interorganizational Committee 1995:18-19, Burdge and Johnson 1998:16-17) and to account for the emergent properties of what is truly a dynamic system.

There are several, high-level areas that need to be included in any SIA methodology and approach. The approach needs to start with a clear description of the proposed action. This is true in any policy discussion. Also, the way in which the action is phrased will impact the way in which it is considered and the response to it (Stokey and Zeckhouser 1978; Reich 1988).

All discussions of SIA agree that social, cultural, and economic impacts need to be considered, although there is poor defini-
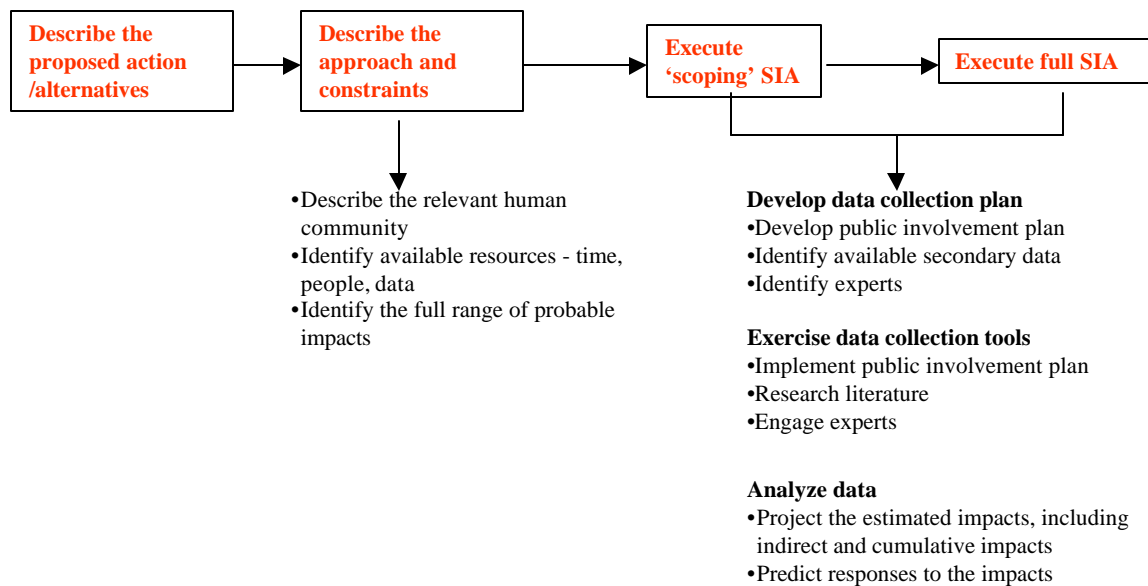
tion and even less agreement on what constitutes these impacts (see next section). There needs to be some definition or description of the targeted portion of the human environment.

Burdge (1998) notes that the biophysical and social boundaries of impact assessments are usually measured at the project or community level, whereas economic impacts often are assessed at the regional or national levels (Burdge 1998:9). There also are questions of how (or the extent to which) one incorporates the impact of decisions made outside of local communities on a given community. The SIA literature contains virtually no discussion of methodologies for defining this environment other than to note that neighborhoods and local communities are more strongly emphasized than regions and larger political communities in an SIA. Finally, of course, an SIA needs to discuss the alternative futures. These principles of approach are shown in Table 1.

Table 1: Principles of approach

Give a clear description of the proposed action
Include social, cultural, and economic impacts
Clearly describe/delineate the targeted human community
Describe alternative future states

The Interorganizational Committee did provide a 10-step, high-level process for conducing an SIA (Interorganizational Committee 1995:25-30). If we combine their approach with others, such as that proposed by Western and Lynch (2000:43), we see a process such as that pictured in Figure 1. Note that a 'scoping' SIA is a relatively quick and resource-light survey of the potential impacts of a proposed action, similar to a scoping EIS. Should resources permit and should the results of the scoping SIA warrant, the investigators would proceed to a full SIA. Again, following the EIS model, the full SIA is a more in-depth, resource-intensive investigation of the domain covered by the scoping SIA. Note also the role of public participation in both the scoping and full SIA. In all cases, it is a data collection tool, to be used in conjunction with input from secondary sources and expert testimony. We will discuss data sources at greater length in our discussion of the impacts below.

Describe the proposed action /alternatives → **Describe the approach and constraints** → **Execute 'scoping' SIA** → **Execute full SIA**

•Describe the relevant human community
•Identify available resources - time, people, data
•Identify the full range of probable impacts

Develop data collection plan
•Develop public involvement plan
•Identify available secondary data
•Identify experts

Exercise data collection tools
•Implement public involvement plan
•Research literature
•Engage experts

Analyze data
•Project the estimated impacts, including indirect and cumulative impacts
•Predict responses to the impacts

(Note: the process for the scoping SIA is the same as that for the full SIA. The difference lies in the depth to which the analysis is taken, and the associated resource requirements.)

Figure 1: Preliminary SIA process

Note that under this process, an SIA can be conducted *at any stage in a decision-making process.* Endter-Wada et al (1998) characterize this as

> "an on-going, process-oriented as-sessment approach…where scientific analysis is continuous and used to evaluate the outcomes of management decisions and to re-vise and improve future management actions (Enter-Wada et al 1998:898)

The CERCLA process has eight steps or stages, as illustrated in Figure 2.
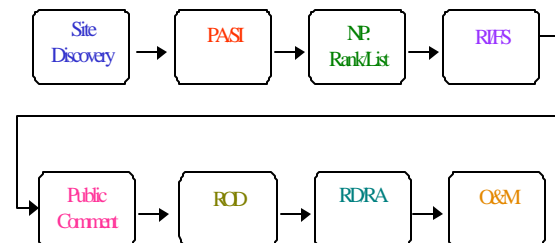

Figure 2: The CERCLA process

Historically, community involvement ef-forts have been focused largely (although not exclusively) on step 5, 'Public Com-ment.' If we recall what we said earlier—that simply introducing new information into a community will change (i.e. 'impact') that community (Barrow 1997:231), it is clear from **Error! Reference source not found.** that *any* CERCLA step, ranging from initial identification through the se-lection of remedial options in the RI/FS

step to the operation and maintenance of the site after remediation will have some impact on the community in which it is located. Therefore, an SIA should be performed at all steps in the process. Most steps will only warrant a scoping SIA. Others, particularly the RI/FS step, will require a full impact assessment.

When implementing any impact assessment, it is important to keep some basic principles in mind. As with any analysis methodology, analytical rigor is critical to assessment replicability and consequent credibility. Therefore, the analyst should be sure to clearly focus the assessment, primarily through a clear statement of the problem, and explicit definition of the targeted community. Methods and assumptions should be clearly spelled out.

This underscores the importance of the involvement of a specialist or expert skilled in this type of analysis, who will be familiar with these types of methodologies. Impacts are rarely evenly felt throughout a community. The data collection methodology, particularly the public involvement plan, should be sure to account for and analyze impact (in)equities. Finally, the analyst and project manager should plan for gaps in data that are either too expensive or too time-consuming to fill. Again, an experienced social science practitioner will know how to account for these gaps in ways that least compromise the assessment.

The methodological principles are summarized in Table 2.

Table 2: Methodological principles

Clearly focus the assessment
- give a clear problem statement
- explicitly delineate the targeted community
Explicitly describe methods and assumptions
- use SIA experts
Account for impact inequities
- use accountable data collection methodologies
Expect data gaps

Choosing the impacts to address

Social impacts are measurable changes in a variety of dimensions in human communities resulting from some sort of intervention (see Interorganizational Committee 1995:23), whether it be a project or a policy. Note, again, that since the impact can come simply through the introduction of new information, proposed interventions can also have an impact on any community.

Impacts are caused by changes in a variety of indicators (or variables, in social science parlance) that are present in human communities. Social science theory and methodology has identified the relationships between these indicators and a

range of manifestations in a community's social structure, values and attitudes, and economic activity. For example, the influx of a labor force required by a large construction project will change the demographic makeup of a community (a 'variable') which will manifest itself in changes in values and attitudes in the community (cultural impact), job profiles (economic impact), and, perhaps, the size and structure of local government (social impact).

Human communities are very complex, and are made up of interlocking networks of relationships and the values that are ascribed to them and to other patterns of activity. For the SIA analyst, the challenge is to delimit those areas of relevance for the analysis at hand (Goldman and Baum 24) and to identify the causal relationships among them. As every human community is unique, the "cookbook" approach listing a set of impacts and associated indicators that must be addressed in every SIA will require the collection of a great deal of data that is not directly relevant to any particular SIA (Carley and Bustelo 1984:43, Goldman and Baum 2000:25, Burdge and Vanclay 1998:274, Interorganizational Committee 1995:36, Western and Lynch 2000:41). A more effective approach would be to establish a set of principles for the selection of specific impacts, and a set of high-level categories of impacts. The analyst would then identify a set of impacts specific to a given community, ensuring that every impact is necessary and that the set of impacts is sufficient to understand the potential ramifications of any proposed change. The SIA would address the indicators associated with those impacts. Figure 3 illustrates the relationship between the sets of all impacts and indicators, and the set with which a specific SIA will deal.
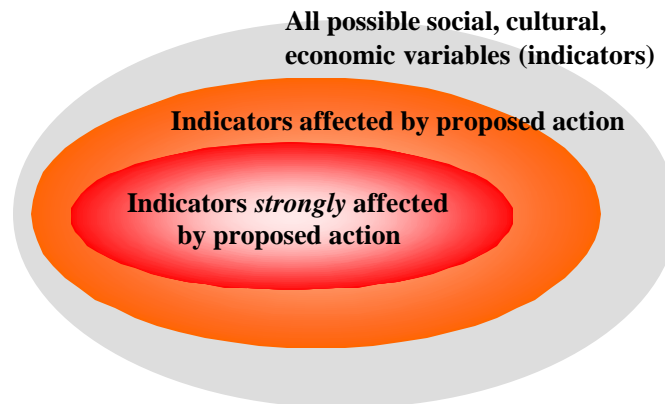

All possible social, cultural, economic variables (indicators)

Indicators affected by proposed action

Indicators *strongly* affected by proposed action

Figure 3: SIA impacts and associated indicators

As with the methodology, there are some principles that can be followed when selecting indicators for study. First, of course, only those indicators are chosen to study that generate an impact. As the Interorganizational Committee (1995) put it, "SIA variables [indicators] do not refer to the total social environment, they explain only the consequences of the proposed impact event" (Interorganizational

Committee 1995:36). Secondly, the impacts caused by changes in the indicators must be measurable. This does not necessarily mean 'quantifiable'—qualitative descriptions of change are acceptable. As King (1998) stated, "SIA is often seen as the study of those attributes of society that can easily be counted" (King 1998: 126), noting that "over 90% of the EISs we reviewed discussed social aspects of the environment primarily in terms of demography, employment, and economic statistics" (King 1998:126 n.9). This effectively eliminates most of the 'cultural' dimensions of a community, i.e. the norms, values, and beliefs. The Interorganizational Committee said that an SIA should deal with "issues and public concerns that really count, not those that are just easy to count" (Interorganizational Committee 1995) This means that any variable chosen to study must have some observable associated with it so that data can be collected about it. The observable may be statements of informants as to attitudes or values—still there must be empirical indicators. These principles for selection of indicators are summarized in Table 3.

Table 3: Principles for selecting impact indicators

Only those indicators affected by the proposed action
Only those whose change will generate an impact
Indicators must be measurable (not just quantifiable)

The analyst must determine if the impact is a direct or indirect result of a change in a variable, and what order impacts are relevant for the study. Second and third order impacts should be included based on the analyst's assessment of their importance to the community, as determined through the scoping SIA. Each impact will have a duration that must be assessed, that is, a length of time that the change is felt, i.e. the impact may cause

a temporary change or a permanent change. The intensity of the impact also will change over time. The intensity of each impact will have a geographic dimension (Carley and Bustelo 1984:5-6). Impacts also can be socially concentrated or equitably distributed throughout the community (Barrow 1997:233), which raises important issues often treated under the category of environmental justice. In addition, the analyst should consider the probability of an impact actually occurring and the potential reversibility of that impact. Attributes to measure are summarized in Table 4

Table 4: Significant attributes of social indicators

First, second, n order impacts
Duration
Intensity as a function of time
Intensity as a function of geography
Intensity as a function of social dispersion
Potential for reversibility

Impacts generally will fall into three categories: social, cultural, and economic (National Research Council 2001:106-110). We give a brief definition of each category, and then expand upon each with examples from the literature. It is important to note, however, that these are not mutually exclusive categories. Some impacts may fall into one, two, or all three of these groupings.

Categories of impacts
Social impacts are the broadest category. These impacts are generally reflected in *changes in the ways in which a community is organized.* These could include such organizational structures as residence patterns, the ethnic composition of a neighborhood, or the number and types of community organizations which are active

at some given time. Structural analyses of communities, such as those conducted through social network analyses and other approaches, and classic functional analyses are often used in this arena. Under current practice, the application of agent-based and complexity-based approaches seeks to understand emergent rather than evolutionary characteristics of these structures. Data usually comes from census material and other similar secondary sources, as well as from community participants. Community involvement is key to the construction of an accurate picture of social relationships and networks.

Cultural impacts are some of the most difficult to deal with as they are the hardest to quantify. They are generally elicited through informant interviews, participant-observation in the community, or through research in secondary sources such as local histories. It is important to note at the outset that 'cultural impacts' in the context of an SIA means far more than identified historic and/or archeological resources. Many EISs only deal with this limited set (cf King 1998), and ignore the full set of belief structures, lifestyles, and general life expectations that should be included in this category. A community's culture generally includes all activities that are regarded as normal and conventional by that community, and the values (both positive and negative) placed on those activities. Changes in any valued activity would have an impact on the culture. The task of the SIA analyst is to determine which behaviors are positively valued and, subsequently, what might change those behaviors in a negative way.

Economic impacts are generally defined as a change in the market value of some process, asset, or resource because of an environmentally-related decision or activity; a change in basic economic indicators such as unemployment levels or the presence/absence of major industrial sectors. The indicators associated with these impacts would include property values, the level of business activity, and the quality or quantity of jobs in a community.

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There has been an entire literature developed around the field of economics and the environment. Tensions have long existed between the business and economic communities. A wide range of thought and emotions characterize the relationship between the two communities. There are radical environmentalists on one side of the spectrum and equally passionate business and development interests on the other. Somewhere in the center are environmentally concerned economic interests and environmental sub-communities who understand and, to some extent, even support the need for consideration of both macro and micro-economics in creating and administering environmental policies.

A valuable contribution to understanding the relationship between business and the environment is the 1995 collaboration of Costanza, et.al., which defines the emerging discipline of environmental economics. This book provides a useful overview of the ways in the environment has been underplayed in the creation and execution of economic policy. It also provides a decidedly, and perhaps correctly, biased view of the existing situation as to the relationship between economies and the environment. References as to "the plundering of the earth" (Costanza et. al. 1995:242) are not, on their face, likely to encourage cooperation in communities

with conflicting social, economic and cultural needs.

Costanza et al (1995) point out two important areas in the definition of this relationship. One is that individual choices need to be emphasized in order to ensure a sustainable economy and that education as to the environmental consequences of such choices needs to be undertaken both for the sake of socio-economic sustainability and environmental preservation and enhancement (Costanza et. al. 1995:242). Both of these outcomes are products of the participatory nature of the data collection phase of an SIA. Costanza also postulates a differing tax structure from that currently in place for both individuals and corporations, one which would result in higher taxes for some. These tax disincentives could potentially be offset with a series of credits offered for desirable behaviors vis-à-vis the environment. These credits could be bought and sold among affected parties. (Costanza et.al., 1995:220-21). This would seem to be beyond the scope of any SIA process, as it would involve major tax policy alterations.

Environmental economics as the discipline now exists may not offer value in our current discussion because 1) it is an emerging discipline (Armsworth and Roughgarden 2001, Sagoff 2000:1426-1432) and 2) it does not address social and cultural aspects of Superfund decision making in any formal way. The existing literature in the field seems not to include social or cultural thought in its focus or in its practice.

A more trustworthy tool for this particular effort may exist in more classical eco-

nomic theory. Trade-offs among the larger social communities, the business community and the more singularly focused environmental community may not be possible. Many political theorists believe and feel that the search for universal, pragmatic moral principles is destined to be fruitless.

This wider body of economic thought encompasses social needs ("welfare" is the term of art) with pure economic advantage of any given action (Nicholson 1985). There will always be winners and losers in any decision process undertaken for economic, and for that matter, ecological purposes. The question becomes then one of balance. For example, the presence of funds available through the CERCLA process to communities with Superfund sites can, in itself, have an economic impact on a community. The 'deep pockets' of Superfund may cause a community to make certain decisions supporting list of a site that will have other, adverse economic impacts (such as a drop in property values).

Impact indicators

The Interorganizational Committee (1995) identified 26 SIA indicators, drawing on the work of Bowles (1981), Branch et al (1983), Carley and Bustelo (1985), Burdge (1994), Finsterbush (1980), and Leistritz and Ekstrom (1986). Our review of more recent work, such as Burdge (1998), shows these types of indicators to hold reasonable consistent. A somewhat modified presentation of the Interorganizational Committee indicators is shown in Table 5, along with their relationship to our three major categories of impacts.

Table 5: Social impact indicators

Indicators	IMPACT TYPE		
	Social	Cultural	Econ.
Population impacts			
Population change	■		
Influx or outflux of temporary workers	■		■
Presence of seasonal (leisure) residents	■		■
Relocation of individuals and families	■		■
Dissimilarity in age, gender, racial or ethnic composition	■	■	
Community Infrastructure Needs			
Change in community infrastructure	■		■
Land acquisition and disposal		■	■
Effects on known cultural, historical, sacred and archeological resources		■	
Community / Institutional Arrangements			
Interest group activity	■		
Alteration in size and structure of local government	■		
Presence of planning and zoning activity	■		■
Industrial diversification	■		■
Enhanced economic inequities			■
Change in employment of minority groups			■
Change in occupational opportunities			■
Formation of attitudes toward the project		■	
Conflicts between residents and newcomers			
Presence of an outside agency	■		
Introduction of new social classes	■		
Presence of weekend residents	■		■
Change in the commercial/industrial focus of the community			■
Political and social structures			
Changes in distribution of power and authority	■	■	■
Changes in mechanisms for exercise of power and authority	■	■	■
Individual and family level impacts			
Disruption in daily living and movement patterns	■		
Alteration in family structure	■	■	
Disruption in social networks	■		
Change in leisure opportunities	■		■
Dissimilarity in religious practices		■	
Perceptions of public health and safety		■	

Adopted from Interorganizational Committee 1995:37

Data collection

The data collection process follows the SIA process shown in Figure 1. It is based on the SIA principles enumerated above, and requires expertise in social science data collection and analysis.

The first step is to identify indicators relevant to the decision or project at hand. Local knowledge is one of the best resources for this information, so this will be a highly participatory process, involving various aspects of the local community. There is a great deal of literature on public involvement in environmental decision-making (see Turnley [2001] for a review of some of the literature and methodologies), and we will not repeat it here. However, the SIA analyst should consider the full range of participatory techniques, from key informants through advisory groups, community forums, and questionnaires (Burdge and Robertson 1998:186). Finally, the SIA analyst, in conjunction with the CERCLA project manager, must recognize that, as Carley and Bustelo (1984) put it, "such participatory impact assessment is in itself an educative social process which may change society" (Carley and Bustelo 1984:9). We should note that this point that the Superfund Community Involvement Handbook primarily describes ways to let the community know what EPA is doing (U.S. EPA 2002). It thus may be an appropriate guide for step 5, Public Comment, of the CERCLA process, but is not applicable to the type of information elicitation and participatory activities that we are discussing here.

Local expertise is a very important source of data for an SIA. It, should, however, always be supplemented by secondary sources such as census information and other, similar types of community data collected and analyzed by experts. Many communities have had social and/or economic profiles conducted, or analyses performed for other projects that might provide useful information. Local oral history projects or researched, written histories often are valuable sources for cultural information.

The final source of information will be new data elicited from experts in a variety of fields. Anthropologists or historians may be engaged to collect data on cultural histories and/or current organizational structures. It may be necessary to use economists to interpret some of the raw data acquired from the census, the business community, or other sources.

The data that will be collected and analyzed in for the SIA is qualitatively different than the bio-physical data that is required for an EIS, and for much of the CERCLA process. An effective SIA must have available to it the social science expertise necessary to assess the relative importance of the SIA indicators; guide the data collection efforts, including the public participation; analyze the data that has returned; and translate the results into concepts and language that are familiar to the CERCLA project manager.

Implementation: the current state

NEPA compliance requires the preparation of an environmental impact statement (EIS) which includes an assessment of the impact of the proposed action on the environment. The CEQ regulations interpret 'environment' broadly to include the ecosystem, human health, and the 'human environment.' EPA has fairly detailed guid-

ance for the conduct of both human health and ecological risk assessments which are used by federal and state agencies in addressing NEPA requirements. However, EPA has not yet issued any guidance regarding the third area of impact assessment, the SIA. Therefore, individual agencies and services have developed their own social impact assessment guidance, with a consequent large amount of variance in detail, method, and approach.

Implementation by agency
Different agencies have pursued the conduct of social impact assessments with different levels of interest and detail. The level of aggressiveness roughly corresponds to the level of investment each agency or organization must make in NEPA compliance, based on its charter and mandated activities. Table 6 shows the relative number of EIS prepared by various agencies over an arbitrary five-year period

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Table 6: EIS prepared by federal agencies, 1979-1994

Federal Agency	EISs Prepared	Percentage
Department of Transportation	2,230	22%
Department of Agriculture	1,734	17%
Department of the Interior	1,623	16%
Corps of Engineers	1,501	15%
Dept of Housing and Urban Development	664	7%
Environmental Protection Agency	595	6%
Other	535	5%
Department of Commerce	299	3%
Department of Energy	261	3%
Army	175	2%
Air Force	172	2%
Navy	154	2%
General Services Administration	90	1%
Tennessee Valley Authority	33	0%
Department of Defense	12	0%
TOTAL	**10,102**	**100%**

Source: National Academy of Public Administration 1998

The Department of Transportation tops the list with almost a quarter of the EISs prepared during the targeted period. We find that the Department of Transportation, Federal Highway Administration, offers detailed guidance for the preparation of environmental documents to en-

sure NEPA compliance (U.S. Department of Transportation 1987). This guidance includes several sections requiring information collection by category. These categories include land use impacts, farmland impacts, social impacts, relocation impacts, economic impacts, joint develop-

ment (referring to activities that cross many of the other categories), and others. Many of the categories request the same or similar information, and specific guidance on data collection and analysis is not given. However, a good SIA practitioner would ultimately gather information on most, if not all, the indicators identified in Table 5.

The Departments of Agriculture and Interior and the Army Corps of Engineers all conduct more or less the same number of EISs. The Department of Agriculture's Forest Service has developed some of the most comprehensive materials related to the conduct of SIAs. The Forest Service offers a training course in social impact assessment for forest and district level employees with responsibility for conducting SIAs and has prepared formal guidelines for the conduct of SIAs (U.S. Department of Agriculture n.d.; U.S. Department of Agriculture 1998). Both the guidelines and the training closely following the principles and outline of the Interorganizational Committee's findings (1995). The Forest Service also has held many national workshop and symposia on the social dimensions of forest management. The Department of Interior, on the other hand, focuses its NEPA work on the preparation of EIS, as seen in the Bureau of Reclamation's NEPA compliance handbook (U.S. Department of Interior 2000). Finally, the Army Corps of Engineers includes in its "Environmental Operating Principles" statements that it will "build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work" (U.S. Army Corps of Engineers 2002). However, elsewhere it limits 'risk assessment' to human health and the ecosystem

(U.S. Army Corps of Engineers May 2002b) and 'cultural resources management' to archeological and historic sites (U.S. Army Corps of Engineers May 2002).

The remainder of the agencies on the list each do a small percentage of the total EISs filed. However, the General Services Administration's (GSA) 'Fact Sheet' on conduct of an SIA is worthy of note (U.S. General Services Administration n.d.). The Fact Sheet gives a general description of an SIA, details the enabling language (including the NEPA and CEQ requirements, as well as some GSA-specific Executive Orders), gives typical steps in conducting an SIA, general indicators to consider, and outlines a sample statement of work. Most of the language is from the Interorganizational Committee's report (1995). Also of note is the material issued by the National Marine Fisheries Service (NMFS) of the National Oceanic and Atmospheric Administration (NOAA), Department of Commerce. The NMFS has developed an extensive requirements description for assessing the social impact of fishery management actions (U.S. Department of Commerce 2001)[3]. This guidance takes the practitioner through much of the same material as does the GSA 'Fact Sheet,' but at much greater depth and tailored to NMFS and NOAA policies and enabling legislation.

The role of the EPA as the 'setter of standards' in the NEPA compliance arena is important to note. Many of the agency NEPA web sites have links to the EPA site. Others reference EPA guidance and documents in their own guidance and policy statements. However, of course, EPA

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[3] Recall that the NOAA and the NMFS were the lead agencies on the Interorganizational Committee.

at this time does not formally address nor offer guidance on the social impacts of proposed actions in the same way as it does human health and ecological impacts. The default guidance for many of these agencies has been the Interorganizational Committee's report. We assume that many of the other agencies which conduct EISs have either not addressed the social dimensions of proposed actions at all, or have included them tangentially under activities other than NEPA compliance such as environmental justice or general 'community involvement.'

Implementation across agencies
Attention has been paid to the social dimensions of proposed actions in some large, cross-agency, ecoregional environmental management projects. These include the Forest Ecosystem Management Assessment Team (FEMAT) Report on the forests of the Pacific northwest (FEMAT Report 1993), the Interior Columbia Basin Ecosystem Management Project (U.S. Department of Agriculture 1996), the South Florida Everglades Restoration Project (Harwell et al. 1996), and the Southern Appalachian Assessment (Southern Appalachian Man and Biosphere Cooperative 1996). However, we find that there was wide variation in the delimitation of the units of analysis in these projects (i.e. the 'community'), and in the social impact indicators selected for analysis (see Endter-Wada et al 1998:896).

Issues and concerns
An SIA is a hybrid beast. It combines anthropological and sociological models of human society and culture with socio-psychological concepts. It uses data that generally have been collected for other purposes, and which ultimately must be used by individuals with little or no formal

training in the social sciences (see Burdge and Johnson 1998:13).

This methodological confusion has been exacerbated by the absence of a single approach or guidelines accepted by the SIA community. The Interorganizational Committee pointed this out in 1995 (Interorganizational Committee 1995:12), and Burdge reinforced it as late as 1998 (Burdge 1998b:8). This absence of accepted methodology has had several consequences. First, it has allowed unskilled practitioners to conduct assessments in which assumptions were not made clear, methodologies were imprecise, data collection was poorly handled, and analysis was undocumented. This has led to questions about the replicability of the work, raising issues about its scientific validity and general credibility. Equally important, the absence of methodological rigor created opportunities for the introduction of bias into the analysis. There are many ways in which such bias can enter an SIA. The simple association of the researcher with the sponsoring agency casts the effort in a particular political position that must be countered during the public involvement and information elicitation process. The design of the community involvement process as well as the selection of SIA indicators to include can be highly political and must be carefully managed and rigorously controlled to exclude any bias. As Goldman and Baum put it,

> ...[SIAs] are never politically neutral endeavors...as such, they invoke for the investigator profound ethical issues concerning their commission, their conduct, their communication, and judgments about their efficacy for the community about which, if not

for which, they speak (Goldman and Baum 2000:14)

Methodological rigor is one important way to control for ethical bias in the conduct of an investigation and the communication its results.

The emerging science of complexity and the recognition of emergent behaviors that result from the non-linear interaction of indicators in dynamic systems has strong relevance to an SIA analysis. Among other contributions, it may offer opportunities for cross-modeling the effects of indicators at a given site, as well as CERCLA-related decisions made at different sites. Though nascent in its commercial applications, complexity theory is well established as a scientific modeling tool. However, it has not yet been well-incorporated into mainstream social science theory and analysis, and the computational modeling tools currently available are not applicable to the multiple dimensions found in a Superfund community. However, this is a theoretical and methodological area that cannot be ignored as the SIA development process moves forward.

Finally, it is important to recognize that there is a great deal of resistance to the conduct of SIAs in the Superfund community. This resistance comes from several sources. First, it requires a type of resource (social science expertise) that generally is not directly available on project staff. In a resource-constrained world, acquiring this resource means not doing something else. Secondly, there is a methodological bias against the high profile given to community participation in an SIA that stems from the technocratic approaches of the 1960's and early 1970's. These approaches gave precedence to efficiency rather than to

ficiency rather than to appropriateness, and depended heavily on quantitative analyses of bio-physical data. Although this changed a great deal in the following decades (see Glicken 1999 and Becker 1997 for discussion), there still are residual elements of it in government decision-making processes. The NRC report clearly required a turn away from technocracy in its reflection that "The appropriate [risk management] goals depend in part on the judgment of the affected parties, who must be involved in establishing [them]" (National Research Council 2000:113).

Summary

Social impact assessments are not a new concept. The primary factor affecting their acceptance and increased use in the NEPA arena has been an absence of methodological rigor and enabling guidance. This lack of protocols for application at the field level has resulted in ambiguity in application and a lack of clarity as to the need and place for such data in the NEPA compliance process.

Staff involved in NEPA compliance efforts across agencies generally is not trained in either the collection or analysis of the type of social science data SIAs require. The absence of formal guidance makes the job even more difficult. Limited resources constrain the ability to hire contractors to perform the assessments. However, growing pressure from oversight groups such as the National Academy may increase pressure to include a social impact assessment along with the human health and ecological risk assessments already being performed.

The role of the EPA in this process could be a pivotal one. Most agencies look to the EPA for guidance in NEPA compliance. Links to the EPA website or references to EPA documentation are prevalent in NEPA compliance guidance at various agencies. EPA's development of guidance for the conduct of SIAs has the potential to provide the methodological rigor and consistency now lacking in their performance. It also would enhance the ability of many agencies to move into the arena by providing an understanding of the process, the expertise required, and the output expected

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