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Alex Sager & Alex Zakaras

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The Hanford Advisory Board: participatory democracy, technology, and representation

Alex Sager · Alex Zakaras

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Abstract The Hanford Advisory Board (HAB) is a broadly representative, deliberative body that provides formal policy advice on Department of Energy (DOE) proposals and decisions at the Hanford nuclear cleanup site near Richland, Washington. Despite considerable skepticism about the effectiveness of citizen advisory boards, we contend that the HAB offers promising institutional innovations. Drawing on our analysis of the HAB's formal advice as well as our interviews with board members and agency officials, we explore the HAB's unique design, outline a normative framework for evaluating participatory institutions, and assess the HAB's effectiveness in rendering the DOE accountable to the local public.

Keywords Bureaucracy · Deliberative democracy · Hanford Advisory Board · Participatory democracy · Technology

Highly technical policy decisions present daunting challenges for democracy, for two reasons. First, their sheer complexity makes them difficult for even informed citizens to understand; second, these decisions are often entrusted to bureaucracies whose officials are not directly accountable to citizens and whose deliberations are often hidden from public view. In order to render government accountable to the public, citizens must be able to see how policy decisions stand to affect their interests and to understand—broadly speaking—the range of available policy alternatives. When they are unable to do so, for either of the two reasons just cited, they find themselves exposed to the discretionary power of bureaucrats, scientists, or policy experts. One of the major tasks of empirically informed democratic theory is to analyze and evaluate practices and institutions that use public participation to try to render highly technical public decision-making more transparent and accountable to the public, and therefore more legitimate (Fischer 2009; Dietz and Stern 2008; Fung and Wright 2003; Kleinman 2000; Dryzek 2010; Fishkin 2011).

This paper investigates one such institution: the Hanford Advisory Board (HAB), a broadly representative, deliberative body that provides formal, policy advice on Department of Energy (DOE) proposals and decisions at the Hanford nuclear cleanup site near Richland, Washington. Critics have expressed considerable skepticism about citizen advisory boards as instruments of democratic accountability; they have criticized their lack of independence, their lack of formal power, and their failure to adequately represent affected groups (Laurian 2007; Arnstein 1969; Vari 1995; Lynn and Kartez 1995; Santos and Chess 2003). We use these concerns to frame our central research questions: Does the HAB provide effective democratic oversight and accountability at the Hanford nuclear cleanup site? If so, what specific features of the HAB enable it to serve these democratic purposes? And, more broadly, what lessons can its successes (and limitations) teach us about rendering technical, bureaucratic decision-making more accountable to the public?

We argue that the HAB serves important democratic functions at Hanford. First, it produces and disseminates high-quality, accessible public information that helps affected citizens understand and defend their interests. Second, it represents affected constituencies' concerns to the DOE and pressures the DOE—successfully, in some cases—to frame cleanup policies that better protect public interests. We argue, moreover, that the HAB is able to perform these functions in virtue of several promising innovations that set it apart from

A. Sager (✉)
Philosophy Department, Portland State University, Neuberger Hall, 393, 724 SW Harrison, Portland, OR 97207-0751, USA
e-mail: asager@pdx.edu

A. Zakaras
Department of Political Science, University of Vermont, 522 Old Mill, 94 University Place, Burlington, VT 05405, USA
e-mail: azakaras@uvm.edu

other comparable institutions. These features contain important lessons for the design and improvement of other small-scale, participatory bodies—especially in technical, bureaucratic settings.

THEORY

Before introducing and evaluating the HAB, we must consider the normative justifications for public participation in highly technical, bureaucratic settings. These justifications fall into three broad categories, which we call *epistemic*, *political*, and *instrumental*. In this section, we focus especially on the second category, which we find most relevant to the circumstances at Hanford. In doing so, we draw attention to one of the most important normative problems that participation at Hanford can help mitigate: the persistent problem of bureaucratic domination.

We follow the National Research Council in adopting Daniel Fiorino's three categories of justification for citizen participation (Stern and Fineberg 1996, 23). The first he calls "substantive," though we will call it *epistemic* (Fiorino 1990, 227). Justifications in this category hold that agency decisions will be better informed if citizens are allowed to participate in their framing. The central insight here is that citizens can bring important information to the table—especially about local values and interests, and the way they stand to be affected by agency decisions (Wagle 2000; Brown and Mikkelsen 1990). Such information can help well-intentioned policymakers achieve a more accurate understanding of the costs and benefits associated with particular rules or policies.

Fiorino calls his second category "normative." Justifications in this category hold that strictly technocratic decision-making, without citizen input, is morally suspect. Fiorino frames this category using democratic criteria: "a technocratic orientation," he suggests, "is incompatible with democratic ideals" (Fiorino 1990, 227). We find it helpful to describe this as the *political* justification for public participation. The central insight here is that agency officials sometimes pursue agendas that conflict with the interests and values of affected citizens. Participation can be a way for citizens to defend their interests and values and try to compel government agencies to be responsive to them. The political justification of participation supposes that agency decisions will often be both more legitimate and more just if citizens are able to defend their interests against government abuse or neglect. These first two justifications correspond to two different styles of participation; the epistemic justification might be described as consensual, the political justification as adversarial.

The final category of justification is *instrumental*. In this instance, participation is considered valuable because it enables the agencies to achieve their own goals more efficiently (Fiorino 1990, 228). These justifications, which abound in the DOE's own literature, stress the importance of winning over the local population, of making agency decisions *appear* legitimate to those affected by them, and of preempting rancorous opposition and costly lawsuits which prevent government agencies from implementing their programs successfully (Coglianese 1997; Hanford Public Involvement Plan 2012).

Each of these three categories of justification corresponds to a different kind of problem that might afflict technocratic decision-making. First, a decision might be (relatively) inaccurate—either scientifically or in its grasp of the affected population's interests—and so impose unnecessary costs on either the government itself or on the affected population. Second, it might be illegitimate or unjust. Third, its implementation might be inefficient. Whereas the first and third problems are well-recognized in the official literature associated with the Hanford cleanup, the second problem—and the corresponding political category of justification—is substantially underdeveloped.

In our view, however, the second problem is the most important at Hanford and other sites with similar histories of government misconduct. The Hanford cleanup is especially vulnerable to a danger we call *bureaucratic domination*, which undermines the legitimacy of its decisions. Bureaucratic domination is a danger in any modern society with a well-institutionalized bureaucracy. The problem arises when bureaucracies amass substantial discretionary power, which is not adequately constrained by the interests of those affected by it. As Henry Richardson has emphasized, such power can arise within otherwise legitimate democracies (Richardson 2002, 4). He also argues that legislative oversight is typically not enough to rein in administrative discretion: some measure of participation by affected communities is also often necessary (219–222).

Bureaucracies form an essential part of legitimate, democratic governance in the modern world. They are indispensable to the rule of law, with its demand for "abstract regularity of the execution of authority" (Weber 1968, 983; c.f. Richardson 2002, 10); they also enable governments to bring important technical expertise to bear on difficult policy questions (10). Abstract regularity and the impartial application of public rules are themselves defenses against the arbitrary discretion of public officials. For these reasons, bureaucracies are, as Richardson puts it, "necessary means to the legitimate exercise of power" (10). However, bureaucrats can themselves accumulate tremendous power without direct accountability to the public. State and federal agencies' increasing reliance on private contractors to handle key responsibilities only heightens this danger by interposing another layer of powerful agents (in this case, private corporations), with their own interests, between the public and the work being done on its behalf. Any fully adequate democratic theory must therefore address the problem of constraining bureaucratic discretion.

Bureaucratic domination is a central problem that has plagued the Hanford site from the beginning and contributed to a chronic neglect of public safety. The US Department of Defense was spectacularly delinquent in attending to the interests of the local population (not just in the Hanford area, but throughout the Northwest). The litany of negligent decisions is well-known: the release of iodine-131 and other radioactive materials into the air between 1944 and 1957 despite documented knowledge of the risk of thyroid disease (DeJure 2003), the failure to warn Hanford employees of the risk of exposure to radioactive particles (Gerber 2007, 208), the knowledge of and failure to remedy high-level leakage from tanks into the groundwater (166), and the repeated violation of environmental law and suppression of whistleblowers (D'Antonio 1993). For the first 40-plus years of its operation, moreover, the shroud of secrecy that surrounded the nuclear facility prevented any effective oversight by local citizens or officials.

Even since 1989 when the EPA and Washington State Department of Ecology joined the DOE in managing the cleanup, the site has been plagued by scandals involving the safety culture of facilities and the adequacy of the cleanup strategies and technologies (HAB Advice #258). The most recent of these, which broke in early 2012, has raised serious questions about whether the principal subcontractor, Bechtel Corporation, is attending adequately to the long-term safety of several key facilities (Eisler 2012 and HAB Advice #259). Much of the misconduct illustrated at Hanford involves excessive bureaucratic discretion. The disastrous (and secret) handling of highly toxic waste over the years illustrates this excess all too plainly. The point here is not that agency officials are or have been malevolent. Rather, their pursuit of (often legitimate) agency objectives has not been adequately constrained by the interests of the local populations whose lives they have affected. Given this history, any effort to redesign the decision-making process at Hanford ought to be formulated with this problem squarely in view.

Focusing on the dangers of bureaucratic domination helps clarify the role that public participation should play in contexts such as the Hanford cleanup. Bureaucracies pose serious obstacles to public oversight, and these obstacles give rise to the power to dominate. The obstacles are both political and epistemic. First, bureaucrats are not directly answerable to the affected publics or even, in many cases, to their elected representatives. Second, even where channels of accountability exist, asymmetries of information between bureaucrats, specialists, representatives, and the general public can make democratic oversight very difficult. Bureaucrats with specialized knowledge can prevent relevant issues from being known to the public or can misrepresent issues through acts of omission and distortion.

Too often, official discussions of the epistemic benefits of public participation imagine that these benefits flow in one direction only: members of the public are thought to provide local information that is not easily accessible to agencies or to identify local values that policy-makers can use to design policies that reflect their interests accurately. This view assumes, by and large, that government agencies are benign. It also neglects the flow of information in the opposite direction: in fact, participation also serves the important function of providing the public with the information that it needs to hold public officials accountable (Wagle 2000).

In order to counteract bureaucratic domination, participatory institutions must enable citizens (1) to develop the capacity to evaluate agency agendas and policies and (2) to challenge these agendas and policies if they diverge too far from their interests. Such challenges can be pursued through various means—through public protest, interest-group politics, or legal challenge, for instance. Nonetheless, meaningful participation must give participants some means of influencing decision-making if it is to avoid serving as a rubber stamp for preexisting agency decisions.

To relate this discussion to our earlier justificatory categories: the flow of information from citizens to bureaucrats can help improve the quality of agency decision-making (especially when the relevant agency is *trying* in good faith to take affected citizens' interests and values into account). This is what we are calling the strictly *epistemic* justification of public participation; it presupposes no fundamental conflict of interest between bureaucrats and the affected public and so raises no deep normative controversies. On the other hand, the flow of information from bureaucrats to citizens can enable citizens to understand when (and in what ways) agencies do not have their interests at heart and can enable them to act politically to defend themselves. This is what we are calling the *political* justification of public participation (though it has an obvious epistemic dimension as well).

Participatory institutions designed with strictly epistemic justifications in mind will fail to address the danger of bureaucratic domination. The epistemic justification does not require that such institutions have any political power to challenge the public agencies they are informing. As we argue later, political power—albeit quite limited—is a significant part of the story of the HAB's relative success. Moreover, if agencies' dominant motives are instrumental, and if they design citizen participation largely with these motives in mind, then participatory institutions might simply serve the purpose of lending a veneer of public legitimacy to agency decisions—regardless of whether these decisions are normatively sound. Lynn and Kartez argue, in fact, that this has been one of the central functions of citizen advisory committees: "to rationalize established power through some degree of shared governance," or the appearance thereof (Lynn and Kartez 1995, 90). They argue that such committees, because they are commissioned and influenced by agency officials, tend to develop a "bias toward upholding the [agency's] goals" (90).

There is danger, in other words, that such committees can *worsen* the normative problem by pre-empting popular resistance to unjust or illegitimate agency decisions and thereby exacerbating bureaucratic domination.

METHODOLOGY

In determining whether (and to what extent) the HAB provides effective democratic oversight at Hanford, we faced two separate tasks. The first was to understand the internal operation of the HAB itself: the formal and informal processes by which deliberations were held and decisions made. The second was to understand the nature and extent of the HAB's influence over DOE decision-making. We began by canvassing the available literature and formal documentation pertaining to the HAB; we also attended and observed the HAB's meetings on two separate occasions.

We turned to interviews, however, as the centerpiece of our research approach to both key tasks. We conducted 17 unstructured interviews with people directly involved (or recently involved) with the HAB.[1] We chose our interviewees using two criteria: we wanted a wide variety of different perspectives, and we wanted people with extensive knowledge of the HAB's activities over several years. We began by identifying HAB members who occupy positions of responsibility—committee chairpersons, for example—and then used our interviews with them to identify other knowledgeable participants, including the public officials who have worked closely with the Board for some time. This process enabled us to assemble a diverse and knowledgeable group of interviewees, including officials from the DOE, EPA, and Washington Ecology; longstanding HAB members representing environmental and worker groups; a local government representative and longstanding HAB member; and a reporter with extensive experience covering Hanford (Appendix 1). Interviews were conducted between March and October of 2012; they typically lasted between an hour and an hour-and-a-half, though some were shorter.

In each of our interviews, we began with questions about the HAB's internal operation: Who participates? How are decisions made? How is disagreement handled? We asked our interviewees to reflect on the strengths and weaknesses of the HAB's deliberative procedures and informal rules. We then asked for specific examples to illustrate either the presence or absence of HAB influence on DOE policy. When interviewees identified areas of HAB influence, we pressed them to reflect on the mechanisms that make this influence possible. We also asked interviewees to address the concern that advisory boards are often ineffective or "captured" by agencies.

In order to deepen our understanding of the nature and extent of the HAB's influence over DOE decision-making, we also reviewed 5 years of formal HAB advice, which offers specific policy recommendations to the DOE (Appendix 2). The formal advice is spelled out in letters written by the HAB to the DOE. Each letter might contain anywhere from one to over 20 specific recommendations. This advice is available to the public, as are the formal responses written by the DOE. We coded agency responses to each specific HAB recommendation using the following categories: *no response*, *disagree*, *disagree (already done)*, *agree (general)*, *agree to change*, *agree (already doing)*, *will consider*, *mixed*, and *unclear*. The categories of *no response*, *disagree*, *will consider*, and *unclear* are straightforward, but our evaluation suggested the need for a more nuanced taxonomy to better capture the nature of agency responses.

Disagree (already done) indicates that the DOE believes that it has already fulfilled the HAB's recommendations, and that it found no need to change its (past or present) course of action. This category usually indicates that the HAB and DOE interpret agency actions differently. For example, HAB Advice #246 on the River Corridor Baseline Risk Assessment recommends that the DOE use a different risk-assessment methodology; in response, DOE rejects this advice on the grounds that its methodology already addresses the Board's concerns. In contrast, *agree (already doing)* describes instances in which the DOE agrees that a change was required (to some previous policy or course of action), but claims to have made the change already. In some such cases, the DOE response draws attention to actions that the HAB may have overlooked or actions that were taken while HAB advice was being discussed or issued. Responses were coded *mixed* when the DOE responded with a combination of willingness to consider HAB advice and dissention. "*Agree (general)*" means that the DOE expressed general, often vaguely worded, agreement with the HAB's criticisms or recommendations, but without signaling any clear intention to change course. Finally, *agree to change* indicates a clear intention on the DOE's part to modify its behavior to comply with board advice. This is the only category that indicates direct HAB influence on policy.

THE HAB: HISTORY AND INTERNAL STRUCTURE

The Hanford site was chosen as part of the Manhattan Project to produce plutonium for nuclear weapons under the War Powers Act. Hanford was selected because of its relative isolation, its proximity to a dependable source of power, and its access to the Columbia River's water to cool the reactors. In

[1] Two of these interviews were with the same interviewee (we conducted an original and a follow-up interview); so we have 16 distinct interviewees.

1944, the B Reactor—the world's first full-scale plutonium reactor—began producing plutonium for the "Fat Man" bomb dropped on Nagasaki. In the next 11 years, the Atomic Energy Commission added seven more reactors that produced most of the plutonium for the USA's nuclear arsenal for over 40 years.

Not until recent decades did the Hanford site become an object of public scrutiny. The Atomic Energy Commission operated Hanford under a mandate of state secrecy from 1947 until 1977 when the Department of Energy took control. A strict policy of secrecy continued until 1986, when in response to public pressure, the DOE released 19,000 pages of documents about Hanford (Gerber 2007, 201). The documents revealed extensive environmental damage to soil and groundwater and the Atomic Energy Commission's extraordinary neglect of public safety.

In 1989, Hanford officially ceased producing plutonium and began focusing on cleanup and waste disposal. With nine decommissioned reactors, the site was immediately recognized as the largest nuclear waste site in the United States, containing millions of gallons of highly radioactive waste, multiple toxic groundwater plumes, large amounts of transuranic elements, and square miles of toxic landfill. The Environmental Protection Agency (EPA) added Hanford to its Superfund National Priorities list and in May of 1989, the US Department of Energy, the EPA, and Washington State signed the Tri-Party Agreement (TPA), formerly titled the *Hanford Federal Facility Agreement and Consent Order*. The Tri-Party Agreement defined the agencies' priorities and responsibilities in managing the cleanup effort and bringing the site into full compliance with environmental laws, notably the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Resource Conservation and Recovery Act (RCRA) (1976). Both of these laws contain a legal mandate for public participation; to satisfy these mandates, the agencies have pursued several different strategies, but the centerpiece has been the Hanford Advisory Board.

The HAB is one of eight DOE advisory boards (called "Site-Specific Advisory Boards," or SSABs) created to facilitate stakeholder advice and recommendations on cleanup decisions (Convening Report, 1993). HAB members review and comment on all aspects of the cleanup, including, but not limited to, scientific risk assessments, the adequacy of cleanup technologies, the DOE's budget and schedule, the structure of DOE's contracts with subcontracting firms, the DOE's relationship with employees and employee unions, and the Tri-Party Agencies' public outreach. HAB meetings are open to members of the public and comments are on the record.

Though formally created in 1994, the Hanford Advisory Board stems from a 1991 Office of Technology Assessment report (the FFERDC Interim Report) that identified "public skepticism of the DOE's decision-making process" (Convening Report, 1993, 3) as an obstacle to the cleanup. It recommended citizen advisory boards as a way of addressing this skepticism. In response to the report, the DOE formed the "Hanford Future Site Uses Working Group" that included many of the stakeholders that would later form the HAB (Gerber 2007, 268). The initial plan for the HAB's design was drafted by the Keystone Center, a non-profit conflict management group that was asked to convene and oversee discussions among important stakeholders in the Hanford region.

The HAB was the first advisory board created by the DOE, and to this day it retains a unique structure that differentiates it from the seven others. To outline this structure and situate the HAB in the landscape of small-scale participatory democratic institutions, we draw on a taxonomy developed by Archon Fung. Fung classifies public participation along three dimensions: scope of participation, mode of communication and decision, and extent of authority (Fung 2006; c.f. Dietz and Stern 2008, 14–18). He asks three corresponding questions of participatory institutions: "Who participates? How do they communicate and make decisions? What is the connection between their conclusions and opinions on one hand and public policy and action on the other?" (Fung 2006, 67).[2] Each of these questions can be used to clarify important design features of the HAB.

Who Participates?

There are currently 37 members of the HAB (and one seat remains vacant). Five of those members represent the state and federal bureaucracies involved in the Hanford cleanup: the DOE (two seats), EPA, Washington State Department of Ecology, and Washington State Department of Health. The other participants represent different, overlapping local and regional constituencies (see Table 1). With the exception of the "public at large" representatives, each of the members is supposed to be answerable to the specific constituencies he or she represents and to "consult with these entities and constituencies on a regular basis" (Operating Ground Rules).

Each of the constituencies identified by Keystone's Convening Report was originally asked to nominate its own candidates for the Board. And when a seat is vacated, the Board is directed to consult with the relevant constituency and invite (no more than three) new nominations. The Tri-Party Agencies reserve the right to interview and vet these nominees, who are then submitted to DOE for final approval—so the agencies retain substantial

[2] In our view, Fung's theory is much more useful, concrete, and well-tailored than Habermas's ideal speech situation which has been used repeatedly in empirical studies of citizen participation in the USA (and especially in studies of citizen advisory boards); see for instance Santos and Chess 2003; Webler 1995, and Vari 1995.

Table 1 Hanford Advisory Board Membership

Local government interests (7)
Local business interests (1)
Hanford work force (5)
Local environmental interests (1)
Regional citizen, environmental, and public interest organizations (5)
Local and regional public health (2)
Tribal government (3)
State of Oregon (2)
Universities (2)
Public at large (4)
Liaison representatives (5)

discretionary control over the selection process (Memorandum of Understanding). Our interviews indicate, however, that the DOE does not generally exercise control over these appointments (Interviews C, G).[3]

Fung outlines several different ways of choosing participants for a deliberative process or institution. The first and most obvious is simply *self-selection*: meetings can be open to the public, and anyone interested can participate. Though this method has an obvious intuitive appeal, Fung notes that its limitations are also apparent: participants tend to be highly unrepresentative of the population whose interests are at stake (Fung 2006, 67). The group of participants can be made more representative through either *selective recruitment* or *random selection*. And selective recruitment can be guided by different goals: it can choose *lay participants* or *professional participants* (who work for government agencies or relevant non-profits) (Fung 2006, 67–68). It can also aim to render the institution more representative or simply more diverse. The goal of (descriptive) representativeness and diversity often pull in different directions, since the affected population may not itself be highly diverse.

The HAB combines these several possibilities. Seats on the board are deliberately allocated to certain groups. Moreover, broader public participation in the HAB's meetings is fairly limited. Members of the public must sit in the "galley" behind the main discussion table, and are invited to make comments only during a few brief public comment periods, typically at the end of HAB discussions. A 1999 evaluation of the HAB found, for instance, that HAB meetings "are not structured to facilitate public engagement" and "are generally not well attended by the public" (Bradbury and Branch 1999, 10). Our own observations confirmed that these findings still hold.

[3] One interviewee mentioned that the DOE did recently select two members from a pool of 19 applicants for "Public-at-Large" seats on the HAB without discussion or explanation to the HAB (Interview I). It is significant that this occurred for these at-large seats rather than seats representing specific constituencies—the constituencies have been more successful in choosing their own representatives.

The Keystone Center's report invokes the principle of affected interests as the rationale for the HAB's particular allocation of seats. After conducting interviews with local citizens and interest groups, Keystone identified these different constituencies as having a "clearly definable stake" in the outcome of the Hanford cleanup (Convening Report 1993, 12). Much of the Keystone Center's analysis is focused on delineating the discrete interests of these several affected constituencies. For instance, the state of Oregon has an interest in the cleanup because the Columbia River is threatened with contamination. The Keystone report does not, however, explain *why* certain groups are allocated more seats than others, and how the numbers of seats were determined.

How do Participants Communicate and Make Decisions?

The Board's communications and meetings are deliberative and participatory, in the sense that Board members are not merely passive spectators, but rather set the meeting agendas themselves. The Convening Report and the Operating Rules insist that Tri-Party agencies "not attempt to control the recommendations of the Board."

Board members deliberate with the agency representatives, and with one another. All members are entitled to speak, and many do. The Board is also divided into five different committees with specific responsibilities that meet separately (in addition to the joint meetings of the HAB) to allow for more detailed and more exploratory conversations.[4] Bradbury and Branch observe that "the committees frame issues, gather information, provide progress reports to the board, and develop draft recommendations, which they bring to the full board" for discussion (6). Tri-party officials also attend these meetings.

Members of the board often bring policy, scientific, and engineering expertise to the table through their experiences as research scientists, workers at the Hanford facility, or employees of environmental groups, and they typically serve on the board for years at a time. As a result, they tend to become familiar with agency jargon and scientific terminology. As a group, they are unlikely to be intimidated by technical discussions or cowed by bureaucratic specialists (Interviews C, G, J). This is significant from a democratic point of view: citizens' inability to understand technical policy discussions can be a substantial barrier to effective participation (Lynn and Kartez 1995, 98).

The board is committed to making its key decisions—concerning "major policy issues" and "major procedural" questions—by consensus. The board's Operating Ground

[4] Currently the operating committees are: Budgets and Contracts; Health, Safety, and Environmental Protection; Public Involvement and Communication; River and Plateau; and Tank Waste.

Rules stipulate, however, that there are several different "levels" of consensus, ranging from full consensus to instances in which some board members dissent from but can still "live with" majority recommendations, to instances in which dissenters, despite their stronger reservations, do not wish to "block" the Board's decision (Operating Ground Rules). In cases of still sharper disagreement, the Board is also entitled to write majority and minority opinions, though this very rarely occurs in the Board's formal advice. The Board's commitment to decision-making by consensus is sometimes framed as a commitment to inclusion and a way of preventing the discussion from becoming either too technical or too partisan (Bradbury and Branch 1999, 8).

Among groups that deliberate actively (rather than passively absorbing information), Fung draws a distinction between two styles of discussion: *aggregation and bargaining* and *deliberation and negotiation.* In the first style, writes Fung, "participants know what they want, and the mode of decision-making aggregates their preferences—often mediated by the influence and power that they bring—into a social choice" (Fung 2006, 68). Deliberation and negotiation, on the other hand, describes a process through which participants shape their own opinions through an exchange of "perspectives, experiences, and reasons" with the ultimate goal of reaching mutual agreement (69). The Board's commitment to (some form of) consensus, as well as the general culture of the HAB, renders the style of deliberation much closer to deliberation and negotiation. Board members know that they must do more than win over a faction of similarly disposed colleagues; they have to find common ground, and to do so they have to try to understand and engage with all of their colleagues' points of view (Interviews C, K). With its combination of stakeholder representation and consensus-oriented deliberation, the HAB thus presents a distinctive blend of deliberative and "pluralist" design features (Huitema, van de Kerkhof, and Pesch 2007).

Finally, Fung distinguishes a third discursive style, which he calls *technical expertise.* This kind of discussion typically aims to solve concrete, technical problems and is dominated by trained experts. "This mode," writes Fung, "does not typically involve citizens" (69). Part of what makes the HAB so interesting is that it seeks to involve citizens in precisely these sorts of technical discussions. The board's purpose is to provide policy-advice and this cannot be accomplished without an in-depth understanding of the technical issues (Interview A). The Board is routinely called on to assess different cleanup strategies at the Hanford site, to compare different cleanup technologies, and to make judgments about the acceptable levels of risk associated with each. In February 2012, for instance, the Board's agenda included a detailed review of the DOE's plan to clean up several contaminated sites near the Columbia River (HAB Advice #257).

What Is the Connection Between HAB Conclusions and Opinions and Public Policy and Action?

Fung outlines a range of possibilities concerning the power and authority that participatory institutions command. In many cases, participatory institutions have no power over public decisions, but exist largely as a way of allowing citizens to become more informed (Fung 2006, 69). In other cases, these institutions are structured to provide some form of "communicative influence" on public officials, either simply by helping officials understand the experiences and interests of participants or by offering formal advice (69). A third type of institution actually empowers participants with some measure of decision-making power, either through a "co-governing partnership" of some kind or through direct authority over public decisions (69). New England town meetings, for instance, serve as an example of direct authority: whatever the assembled citizens decide becomes policy.

The HAB advises state and federal bureaucracies, but commands no share of formal decision-making power. The most explicit "outcome" of the HAB's deliberation is the formal advice that it delivers to the Tri-Party Agencies. Each separate "piece" of advice is expressed in a published document, often several pages long and sometimes including a dozen or more specific recommendations. Since 1994, the Board has produced 270 letters of advice covering a broad range of issues from budgets and timetables to technical risk assessments to the adequacy of the agencies' plans to involve and inform the broader public.

The Ground Rules and the Final Guidance stipulate that the agencies should offer the Board "sufficient notice" about impending decisions, so that it has time to review them and offer advice. The agencies are also committed to responding in writing to the Board's advice and senior agency officials are required to attend HAB meetings. The HAB has no formal power, however, to compel the Tri-Party Agencies to follow its advice. Its influence is "communicative," and is expressed in the form of formal and informal advice. We should add, however, that any full assessment of an institution's power must consider both direct and indirect mechanisms. For instance, the Board could wield indirect power by influencing the EPA and Washington State Department of Ecology, both which have legal authority to prevent or mandate certain actions. Or the Board might, simply in virtue of the information it gathers about the Hanford cleanup effort and the implicit threat that it could bring damaging or incendiary information to the media, exercise some indirect power over agency decision-making. We return to these questions later in our assessment.

THE HAB'S INFLUENCE

In this section, we discuss four channels through which the HAB exerts influence over the DOE, and in each case we

assess the nature and extent of this influence.[5] The first mechanism is the HAB's practice of providing formal, publicly available advice to the DOE (to which the DOE is expected to respond). The second mechanism is media and constituency pressure enabled by the HAB. The third mechanism is informal discussion between Board members and DOE staff, especially in the context of committee consultations. Finally, EPA and the Washington Department of Ecology officials may use HAB advice as a mechanism for leverage in their negotiations with DOE or with their own supervisors. In our view, this four-part assessment gives reason for a measured optimism about the HAB's capacity to render DOE more accountable to the citizens it affects.

Formal Advice

Our review of DOE responses to the HAB's formal advice reveals that, in the vast majority of cases, the agency responses simply explain (a) why the Board's recommendations are not possible, (b) why the DOE disagrees with the Board's recommendations, (c) that the DOE is already largely complying with the Board's recommendations, or (d) that the Board's advice will be taken into consideration at some later date. The DOE very rarely expresses a firm commitment to abide by the HAB's advice. The DOE agreed to change its behavior in 4 % of the cases, but this was usually to accommodate recommendations for public involvement, an area that is ultimately peripheral to the main business of cleaning up the waste (e.g., HAB Advice #184 and DOE Response).

Thirty percent of the time, the DOE failed to respond to specific points raised by the HAB. It disagreed with the HAB in a further 16 % of the cases (this figure corresponds to the categories "disagree" and "disagree, already done"). In many of these cases, the DOE disputes the board's technical analysis and asserts that it has already taken the necessary measures to meet its cleanup goals. Furthermore, the mere fact that the DOE agrees with HAB does not necessarily indicate influence as its agreement was vague or non-committal in many cases. Our interviews suggest that these vague or non-committal responses do not typically result in later compliance with the HAB's recommendations. We are not arguing that the DOE *should* always implement the HAB's advice. We are in no position to adjudicate particular policy or technical disputes between the HAB and the DOE. Our concern, rather, is that the DOE's formal responses often do not show evidence of engagement and sustained dialogue and exhibit little evidence of responsiveness to the public's real and perceived needs and interests. This problem has troubled Board members for some time (Bradbury and Branch 1999, 11).

The story of the formal advice is not, however, entirely negative. Even if the DOE does not directly change its policy to take into account of HAB advice, the advice itself provides an informational bulwark that can mitigate bureaucratic domination. The HAB is unique among Site-Specific Advisory Boards in its ability to offer detailed, technical rebuttals to Environmental Impact Statements and other highly technical documents. For example, the HAB writes detailed assessments of DOE documents such as the 6,000-page Tank Closure and Waste Management Environmental Impact Statement. Furthermore, the formal advice documents an ongoing discussion with the DOE about how to address leaking tanks, plumes of waste contaminating the groundwater, worker health and safety, and other issues vital to the public interest. This formal advice provides a valuable repository for anyone looking for information about Hanford. The HAB is not the only agency capable of this role—e.g., the Oregon Department of Energy also provides expertise—but it adds epistemic dimensions not offered by other agencies.

In fact, the HAB provides a compelling response to what Alvin Goldman terms the "novice-expert problem" (Goldman 2001, 89). Novices who are unable to acquire technical expertise need criteria for identifying trustworthy experts. This problem is particularly vexing when experts (or those identified as experts) disagree. One of HAB's merits is the presence of people with specialized technical backgrounds such as former DOE engineers and academic scientists (the HAB has been fortunate to attract and retain a number of highly trained members). However, it is the presence of people without an engineering or scientific background that prevents the board becoming simply another technocratic group and provides novices—as well as citizens at large and members of the media—with a source of comprehensible and reliable information. Technically oriented people from the Tri-Party agencies and from the board need to explain their decisions in language comprehensible to people without a background in science and engineering. Furthermore, the HAB's diversity and its commitment to providing consensus advice help it remain relatively unbiased as an institution. Formal advice has gone through a rigorous vetting process and enjoys the support—or at least not the opposition—of groups representing environmental interests, workers, local businesses, tribes, and others.

Media and Constituency Pressure

Our interviewees identified relatively few examples where formal HAB advice clearly caused a change in the DOE's

[5] In our usage, "influence" occurs when the following two conditions are satisfied: (1) the DOE behaves differently than it would have absent the HAB, and (2) the shift in the DOE's behavior is congruent with the HAB's agenda. Such influence is easiest to see, of course, when the DOE *alters* its course of action in response to HAB inputs. As our discussion below illustrates, the HAB influences the DOE through formal and informal channels by providing reasons, shaping incentives, (implicitly) threatening popular resistance, and altering the terms of inter-agency negotiation.

decision-making. The case that our interviewees most frequently mentioned was the HAB's role in changing the safety culture around beryllium contamination. This case provides some optimism that the HAB can play a role in affecting DOE policy; it also reveals the complexity of this role and shows how it typically must combine with outside actors to be effective.

Beryllium is a light metal frequently used in nuclear reactors. In its natural form, it is present in low quantities or trapped in rock and soil and does not pose a health risk, but repeated exposure to beryllium dust in industrial settings can lead to chronic beryllium disease. For some people, sensitization to beryllium leads to an allergic reaction which causes scarring of the lung tissue and increases risk of cancer and possibly heart failure. On April 3, 2009, the HAB submitted Consensus Advice #217 warning that the extent of beryllium contamination might be greater than realized and that 42 % of Hanford workers had been exposed to beryllium. "From a worker safety perspective," it states, "based on the number of affected workers, beryllium currently rates as a greater hazard than radiation." The letter noted 27 verified cases of chronic beryllium disease, including an employee who died of lung cancer and another employee who now relies on oxygen 24 h a day. It also noted 88 confirmed cases of beryllium sensitivity. The letter advocated testing of buildings where beryllium was not thought to be present, the application of an "As Low As Reasonably Achievable" philosophy to beryllium, and the education of present and former workers about the risks of beryllium and the areas of potential exposure at Hanford. Consensus Advice #218, submitted the same day, identified some of the obstacles that prevent sensitized workers from receiving treatment, advocated for fair worker compensation, and emphasized the need to evaluate workers over their lifetimes as sensitivity can develop years or decades after initial exposure. The DOE responded 5 months later with a letter reiterating that its present safety rules "establish more stringent safety and health requirements at Hanford than those applied to work done in the private sector" and lauding the "outstanding safety records at Hanford" (DOE Responses to HAB Advice #217 and #218). The letter responded to the HAB's points by assuring that it had already met all reasonable concerns about beryllium exposure.

The February 5, 2010 HAB Consensus Advice #228 expressed dismay that the DOE had not followed the recommendations of two prior independent reviews and that it failed to carry out an independent review of its beryllium program in which workers would participate in selecting the review team (HAB Advice #228). The DOE instead sought to review the Chronic Beryllium Disease Program Plan using personnel from DOE Headquarters. Finally, after local media began covering the controversy, the DOE relented: in a letter dated November 18, 2010, the DOE returned to the points raised by the earlier HAB advice and provided a detailed response that promised to meet many of the HAB's concerns (DOE Responses #217, 218, and 228, Interview B, E). At the end of the process, the DOE ended up implementing most of the HAB's recommendations (Federal Register 2010).

The HAB's role in protecting workers from chronic beryllium disease is a story of mixed success. Several of our interviewees noted that the process of creating HAB advice can be frustratingly slow. Over a year elapsed between the HAB's initial advice and a productive response by the DOE. The DOE's initial response was defensive and it may be that no significant change would have occurred if the issue had not been picked up by the local media. Annette Cary, a reporter from the Tri-City Herald who attended the Board meeting in which concerns about beryllium were initially raised wrote a series of articles from April 2009 to March 2011 that kept the issue in the public eye. Her initial story on beryllium exposure drew heavily on the HAB's investigation. Given the local interest in the protection of Hanford workers, the resulting public outcry gave the DOE strong incentive to improve its practices (Interview B). In this case, the HAB provided a forum in which people with technical expertise and experience with beryllium were able to raise concerns which were later reiterated in independent scientific reviews.

The beryllium case offers an example of what we have been calling the *political* function of public participation. Through its formal advice, the HAB generated high-quality, accessible public information about an ongoing injustice at the Hanford site—information that was then used by media and other public interest groups and members of the public searching for an independent evaluation of DOE policy. The HAB was instrumental, therefore, in mobilizing the affected public to act in defense of its own interests. (The HAB's ability to generate vital public information for media and activists is all the more important now that media companies are devoting far fewer resources to investigative journalism. Annette Cary, for instance, used to devote 30 h a week to the Hanford site alone; budget cuts at the Tri-City Herald have made this impossible, and in recent years she has relied more heavily on information produced by the HAB (Interview F)). Nor is the beryllium case unique: our interviewees have pointed to several other cases, including the safety culture at Bechtel, in which the Board's objections to DOE policy have drawn the attention of media and the broader public (Interview G).

Several features of the HAB help it serve this political function. First, as we mentioned before, HAB members tend to serve long terms on the Board. Several Board members have been active since the Board's creation in the early 1990s, and so have more experience and institutional memory than most of the agency regulators. In fact, the HAB is the only one of the Site-Specific Advisory Boards that does not have term limits, and many of the members we interviewed cited this as a key precondition of the Board's effectiveness (Interviews C,

E, B, F, H). Several interviewees estimated that it takes 2 to 4 years for most new Board members—even highly educated members—to become fully conversant in the technical vocabularies used by agency officials and scientists or engineers (Interviews E, B). Longer terms are therefore crucial in enabling the board to develop and retain the scientific and policy knowledge needed to understand not only the DOE's decisions, but also the range of alternatives available to it well enough to convey this information to the broader, affected public and to make competent judgments and recommendations. Longer terms are also important in maintaining institutional memory about a cleanup effort that will be ongoing for generations.

Second, the HAB's ability to serve its political function also depends on its willingness and ability to attract attention to potential injustices, both from media and from broader public constituencies. On this score, we find that the HAB's record is mixed. On the one hand, the representative nature of HAB seats facilitates this communication and mobilization. On the other hand, our observations and interviews suggest that the Board's media and public outreach remains underdeveloped. A number of interviewees thought that the Board could do a better job of communicating with media and mobilizing the broader public (Interviews E, I).

One of the impediments here is cultural: many Board members are unwilling to adopt an adversarial relationship to the DOE, largely because the communities they represent are dependent on the DOE and its subcontractors for jobs and economic prospects. In fact, several interviewees described a notable "East–West" culture clash on the Board: members representing the (Eastern) local Tri-City communities and the Hanford workforce are largely pro-nuclear and want to retain nuclear jobs in the area (Interviews E, D). Members representing environmental agencies and other groups based in Portland and Seattle tend to be anti-nuclear and to mistrust the DOE and its subcontractors. This internal tension can prevent the Board itself from voicing strong public criticisms of the DOE. Even in the beryllium case, one of our interviewees noted that the Board's eventual action was largely the result of the dogged determination of a single member, who simply would not let the issue rest. We should add, however, that several of our interviewees argued that the diversity and inclusiveness of the Board, combined with the consensus decision rule, makes the DOE much more likely to take its recommendations seriously, since they do not simply express the views of environmental activists (Interviews J, E, F).

Committee Consultations and Informal Discussion

We have argued that the HAB formal advice has an important normative function that can translate into policy changes that track the interests of stakeholders, especially when this advice is used to mobilize media and segments of the broader, affected public. Does the HAB exert a more direct influence on the policies that govern the Hanford cleanup?

One way in which the HAB can exercise a more direct influence on agency decision-making is through the Tri-Party Agencies' consultations with the five specialized HAB committees. Our informal conversations with board members and regulators suggested that the HAB's influence is most significant in the early stages of the DOE's decision-making, when DOE officials bring preliminary ideas and proposals to HAB committee meetings and solicit committee feedback (Interviews K, B, E). During these committee meetings, and during the informal conversations that happen around the committee meetings, information flows both ways: committee members get an early look at the DOE's plans, and regulators get an early sense of the Board's reaction to its proposals. Several interviewees report that, if the committee response is sharply negative, the DOE commonly adjusts its strategy in response (Interview K, A). Indeed, they note a sharp contrast between the DOE's willingness to accommodate Board suggestions at the committee level (and early in the decision-making process), and its unwillingness to accommodate formal advice, which is typically offered much later in the process, after the DOE has formulated a concrete plan of action (Interview E, C). As we mentioned earlier, one interviewee noted that formal advice is often issued *only* in cases in which no agreement could be reached at the committee level (Interview C).

There are two ways of understanding the DOE's incentives for accommodating committee suggestions. First, regulators use the HAB as a way of anticipating potential controversies and public outcry (Interview M). One regulator described the HAB as a "canary in the coal mine," useful in helping regulators anticipate and address important public concerns (Interview L). Here again we see the HAB serving the *political* function that we have discussed, though here it succeeds in preempting public conflict altogether. Second, committee feedback can serve the *epistemic* function by helping the DOE formulate better policy in two respects: it can help well-intentioned regulators understand the interests and values of the affected populations more clearly, and so to design policies that reflect these interests and values more adequately; it can also contribute technical and scientific information that improves the DOE's procedures or standards (Interview D).

The political function described here is linked to the Board's capacity to mobilize the media and public (which we described in "Media and constituency pressure" section). But it is also enabled by another crucial feature of the Board's design: its representative quality. The HAB's composition is unique among Site-Specific Advisory Board in allocating seats to representatives of various stakeholding constituencies. In the HAB, the DOE confronts not simply a motley group of individual citizens, but rather a slate of representatives who

report to a wide range of constituencies, including local governments, state governments, tribes, unions, and advocacy groups. This fact gives the HAB a certain democratic credibility in the eyes of DOE officials: the DOE has good reason to believe that the HAB's responses to its early proposals will in fact reflect the broader, affected public's interests and values (Interview D, B, J).[6] The fact that the HAB speaks by consensus only strengthens its credibility in this respect. Moreover, the organizations represented on the HAB have more resources and political clout than individuals, raising the possibility of outside legal and political pressure on the DOE. When committee members react very negatively to an early DOE proposal, DOE officials have reason to anticipate public controversy if they continue as proposed.

The HAB's representative quality also enables it to serve the first of the two epistemic functions that we just outlined. Precisely because the HAB is broadly representative of the affected public, well-intentioned agency officials have reason to consult with it when they want to better understand the interests and values of affected constituencies (Interview B, L). When the DOE is motivated to be responsive to affected citizens' interests and values, these consultations can help them achieve this end. The second, more technical epistemic function is possible largely because of two features that we identified earlier: the expertise and institutional memory the Board members accumulate in virtue of their long terms in office, and the Board's good fortune in recruiting a number of highly knowledgeable members. The HAB represents an impressive repository of technical expertise, and to the extent that DOE officials recognize it as such, they sometimes find themselves disposed to listen to its technical or scientific advice. (Our interviews with agency officials, however, suggest that the agencies do not see technical advice as part of the HAB's mandate and that they are skeptical of the HAB's capacity to generate useful technical guidance) (Interview D, J). Institutional memory is no less important here: the fact that certain Board members have long-standing experience with the Hanford site and can draw attention, for instance, to specific problems and failures that arose in the past gives regulators reason to pay attention (Interviews K, O).

Our interviews also suggest that, in order to serve either of these epistemic functions, the Board must not be perceived (by the agencies) as a highly partisan or ideological body (Interview K). Since the Board's epistemic function depends largely on the DOE's willingness to look to it for help, this function requires a certain level of DOE trust and confidence in the Board. It is worth pointing out that this fact brings the epistemic function of the Board in some tension with its political function, which requires that Board members be willing to take adversarial stances and publicly criticize the DOE in some cases. Sharp public criticism and conflict can, of course, erode the trust that the epistemic function requires. (This, too, might explain why some Board members are hesitant to criticize the DOE publicly; Board members' desire to feel like trusted epistemic partners can therefore compromise their capacity to serve their political function.)

Two final points about the Board's informal influence should be stressed. First, one of our interviewees observed that there is great value in simply ensuring that DOE officials interact regularly with concerned members of the local community in informal and reasonably cordial settings (Interview K). Repeated, informal interactions can bring familiarity and mutual trust and create channels of communication and subtle negotiation that would not otherwise exist. Second, some interviewees note that the DOE's receptiveness to HAB feedback has varied over time as particular DOE officials have come and gone, and that it depends partly on the individual DOE officials and their relationship to the Board (Interview C). The success of deliberative democratic measures often depends heavily on key actors' willingness to engage in dialogue (Johnson 2007).

Agency Leverage

The final, though by no means least important, form of HAB influence occurs when agency officials use the Board's recommendations (either formal or informal) to gain leverage in inter- or intra-agency negotiations. First, some interviewees observed that DOE itself is often divided, with local officials resisting some of the imperatives handed down by the Washington office (Interview H, E).[7] Local officials can use the HAB's resistance to certain policies, for instance, to make a stronger case for some alternative (Interview H). Similarly, officials in the EPA or the Washington State Department of Ecology can use the HAB's views to support their own position when trying to impose changes on the DOE (Interviews I, K, J). In their negotiations with the DOE, officials from both the EPA and the Washington Dept. of Ecology argue that they have a specific mandate to heed the public's voice—a mandate which effectively constrains them not to ignore the HAB (Interview A). Such arguments can be effective even without the implicit threat of intra-agency lawsuits: the DOE does not like to proceed without the support of the other agencies, partly because of the heightened risk of public scrutiny and criticism (Interview A).

Moreover, officials at both the Washington State Dept. of Ecology and the EPA reported that their mandate to solicit and heed the public's voice comes from the top: from Olympia and

[6] One interviewee expressed skepticism, however, about the importance of the Board's representative quality (Interview G).

[7] Indeed, the local DOE has had to defend the Board and its unusual structure to Washington, D.C., DOE officials who would like it to more closely resemble the other SSABs (Interview R).

Washington, D.C. (Interviews A, M).[8] And in contrast with the strident and often ill-informed comments that they receive during open public meetings, the HAB provides the agencies with a version of the public voice that is sober, informed, and broadly representative. Our interviewees at both the EPA and the Washington Dept. of Ecology cite the HAB as a valuable resource to them as they strive to meet their commitment to public involvement.

These possible channels of influence highlight another important way in which the Hanford site is unusual: at Hanford, the DOE must work alongside EPA and the Washington State Department of Ecology (all three of which are parties to the Tri-Party Agreement). Officials from all three agencies attend committee and Board meetings and both receive and communicate information from the Board. Board members and regulators who have experience at many different DOE sites agreed that many of the DOE-commissioned advisory boards fall victim to the danger of simply affirming the agency's goals (Interviews B, C, D). However, the presence of the other two regulatory agencies makes it much more difficult for DOE to "capture" the HAB (Interview I) since citizens on the HAB are exposed to a range of agency opinions and styles. EPA and the Washington State Department of Ecology can (and do) suggest points of view or courses of action or investigation that run counter to what DOE officials see in their agencies (Interview A, J). All in all, this diversity of agencies reduces the probability of bureaucratic domination, especially when it is joined with a participatory institution such as the HAB. It may be true, of course, that the involvement of several agencies renders the cleanup effort more cumbersome and inefficient. But where one agency has a history of chronic abuse and mismanagement, it is important that its discretion be constrained by other powerful government agents who operate under different incentives.

CONCLUSIONS

In conclusion, we find that the HAB plays an important role in rendering the DOE's decision-making at Hanford more legitimate and in reducing the extent and probability of bureaucratic domination. It does so by helping make the DOE more accountable to the population it affects. By and large, the DOE wants to avoid public controversy, and it relies (in part) on the HAB to help it do so. As we have throughout the paper, we highlight the *political* function of the HAB, which we believe to be unique among DOE site-specific advisory boards (SSABs). In our view, the HAB's moderate successes can provide important lessons for the design and improvement of other small-scale participatory institutions—especially in technical, bureaucratic settings.

Two Democratic Functions

In facilitating informed public resistance and in helping the DOE avoid it, the HAB serves an essentially dual democratic role, both parts of which contribute to public accountability at Hanford:

> *Producing and disseminating high-quality, accessible information*: In several different ways, the HAB helps the public form a clearer conception of its own interests and policy preferences at Hanford. It does this mainly by generating and disseminating high-quality, detailed information about key decisions under consideration by public officials at Hanford, presented in terms that stakeholders and journalists can understand. In doing so, it addresses an important democratic deficit and *heightens* the probability that the public will understand and resist DOE policies that threaten its interests.
> *Influencing the DOE to address constituency interests in its practices and policies*: The HAB often communicates public interests and preferences to the DOE clearly and early enough in the policy process to make a difference. With the HAB's help, the DOE can better anticipate and avoid the very informed public resistance that the HAB itself facilitates. The DOE does so, in some cases, by adjusting its policy decisions to make them more congruent with the affected public's interests and preferences. Because of the HAB's first function, moreover, the DOE is less able to avoid public controversy through obfuscation or secrecy: this second role gains substantial democratic value, therefore, in light of the first.

Key Design Features

Several features of the HAB stand out as especially important in enabling these two democratic functions. The first, second, and fourth features listed below distinguish the HAB from the other site-specific advisory boards commissioned by the DOE.

No term limits Since it takes citizens so long (2 to 4 years, according to one interviewee) to feel "up to speed" and competent when it comes to highly technical deliberations, it is vital that board members serve long terms. High rates of turnover and/or short term limits would prevent board members from overcoming the informational asymmetries that leave them chronically vulnerable to bureaucratic discretion. The absence of term limits also allows HAB members time to build relationships of trust and respect with agency officials,

[8] The urgency of this mandate changes, of course, with different state and federal administrations.

particularly at the committee level, where the HAB can exert a decisive influence on policy.

Stakeholder representation Board members are not just individual citizens; they are stakeholder representatives selected by their constituents to serve on the board. This gives their voices political weight and credibility: the DOE can reasonably expect that board members' views reflect those of broader constituencies that might be mobilized if the DOE neglects their interests. It also helps ensure that (some) board members will be highly competent and dedicated, and it prevents the DOE from hand-picking board members who will simply rubber-stamp its decisions. The fact that the HAB includes a broad cross-section of different affected interests also (1) ensures that there will be some board members—representing environmental NGOs, for example—willing to take strong, adversarial positions when they feel that public interests are being neglected, but (2) prevents the DOE from dismissing the HAB as captured by activist communities that the DOE could write off as radical and unrepresentative.

This feature of the HAB makes it unlike all of the other site-specific advisory boards, whose members are individual citizens unconnected to organized constituencies.[9] Without such connections, these other boards can serve only epistemic and instrumental functions, not the political functions that we have emphasized above. If advisory boards are to have any chance of counteracting the problem of bureaucratic domination, then, stakeholder representation is vital.

Early feedback, informal contact Early-stage consultations between DOE officials and HAB committees enable the HAB to intervene early in the DOE decision-making cycle, making it much more likely to affect DOE policy. This early-stage feedback is further facilitated by repeated, informal interactions between board members and agency bureaucrats. The HAB creates space for such interactions, which build long-term trust and mutual understanding, around its committee meetings.

Overlapping agency mandates The formal involvement of EPA and the Washington Dept. of Ecology reduces the danger that the HAB will be captured by the DOE. The three agencies' competing and overlapping mandates help check each others' discretionary power and opens up space for contestation and disagreement. Again, public institutions genuinely interested in public accountability might experiment with similar models where citizens interact with multiple agencies.

Our research indicates that these several design features help render the DOE accountable to the public. If the HAB did not exist, or if it were replaced by an advisory board without its unique design features, local populations would stand at greater risk of bureaucratic domination; public health and safety in the Hanford area would be more vulnerable to neglect.

We should emphasize, however, that we have no desire to exaggerate the democratic benefits of the HAB. The HAB remains a small, volunteer organization, and its power to exact important concessions from the DOE (and its corporate subcontractors) is limited. Its political influence, moreover, depends ultimately on the broader public's willingness and capacity to mobilize to protect its own interests, or at least threaten credibly to do so.[10] The HAB facilitates such mobilization, but since it commands no formal power, it cannot serve as a surrogate for it. Where bureaucratic agencies make complex, technical decisions that implicate the interests of local populations, institutions such as the HAB can help make accountability possible. But as our analysis throughout this section suggests, they will not *achieve* accountability on their own.

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Appendices

Appendix 1: Interviews

Interview A: EPA official, 12:30 pm, Oct. 12th, 2012.

Interview B: HAB member (also committee chair), 9 am, June 4th, 2012.

Interview C: HAB member (also committee chair), 2 pm, June 11th, 2012.

Interview D: DOE official, 10 am, July 6th, 2012.

Interview E: HAB member (also committee chairperson), 4:15 pm, May 22nd, 2012

Interview F: Annette Cary, 11 am, May 23rd, 2012.

Interview G: HAB member, 2:30 pm, September 27th, 2012.

Interview H: EPA official, 3 pm, June 13th, 2012.

Interview I: HAB member (also committee vice-chair), 10 am, March 6th, 2012.

Interview J: DOE official, 1:15 pm, October 5th, 2012.

Interview K: Former HAB member, 2 pm, June 13th, 2012.

Interview L: Washington Dept. of Ecology official, 1 pm, June 11th, 2012.

Interview M: Washington Dept. of Ecology official, 2:30 pm, Sept. 18th, 2012.

Interview N: HAB Member, 11 am, May 30th, 2012.

[9] The Nevada SSAB also includes liaisons that represent institutions and organizations, but these liaisons are non-voting members.

[10] It also depends on elected executives' willingness to require meaningful public involvement in agency decision-making; but of course, this willingness too depends ultimately on the public's disposition to demand it.

Interview O: Follow-up interview with HAB member (also committee chairperson), 3 pm, November 9th, 2012 (same interviewee as Interview E).

Interview P: HAB member, 2 pm, February 16th, 2012

Interview Q: HAB Member, 6:30 pm, May 16th, 2012

Appendix 2

Table 2 Board advice (for years 1994, 1995, 2001, 2006, and 2011)

	DOE responses	
	Number of responses	Percentage
No response	117	30
Unclear	41	10
Disagree	51	13
Disagree (already done)	13	3
Agree (general)	44	11
Agree to change	16	4
Agree (already doing)	71	18
Will consider	16	4
Mixed	26	7
Total	395	100

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