Progress and Promise: Community Involvement at the MMR Cleanup

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INTRODUCTION

A report issued in October 1998 by the Office of the Inspector General (IG) in the Department of Defense (DoD) called into question the "validity of ... technical and managerial processes" governing the environmental cleanup at the Massachusetts Military Reservation (MMR). Among the recommendations in the IG report was the peer review of which this report is a part. In other sections of this assessment, our colleagues address the technical management of the cleanup since the Air Force Center for Environmental Excellence (AFCEE) took over from the National Guard Bureau in 1996. This section is devoted to the question of how good a job AFCEE is doing managing community involvement and risk communication at MMR, and what (if anything) it can do better.

FINDINGS

Our assessment of community involvement practices at MMR was time constrained; we make no claims to comprehensiveness. A large number of people – including government and contractor employees, regulators, citizens, environmental activists, elected officials and professionals in the media – have directly participated in or observed community involvement at MMR. We were unable to speak with everyone who might have added valuable observations. Nonetheless, we feel reasonably confident that our views represent an accurate snapshot of where community involvement at MMR stands today. Several findings emerged from our study which summarize our assessment:

1. By all accounts, the increased openness and opportunities for citizen engagement in decision-making that have occurred since AFCEE arrived in 1996 have markedly improved the credibility of the military's professional competence and commitment to cleanup at MMR.

2. The IG's belief (shared by many technical experts) that community-based decisions are necessarily excessive, wasteful and unresponsive to technical assessments has prevented AFCEE from considering or pursuing the possibility that superb community involvement practices might be a means of more closely aligning stakeholder preferences and less costly cleanup options.

3. The military has, as yet, failed to recognize and respond appropriately to the "outrage" caused by MMR pollution. Poor outrage management has, to some degree, triggered hazard management that DoD considers excessive. Superb outrage management might permit less excessive hazard management.

4. The revision of the 1996 Community Involvement Plan is an opportunity to incorporate community involvement practices into an overall strategy for the next phase of cleanup.

Community involvement programs at MMR must be institutionalized, deepened, broadened, and measured if they are to serve effectively as tools to align community values and technical analyses of cleanup.

5. Community concerns about past and present military activity at MMR are threatening AFCEE's credibility; DoD must establish a forum where these concerns can be addressed.

BACKGROUND

The MMR has been in continuous use by the military for most of this century. The site borders four towns on Upper Cape Cod, communities whose identity and economy depend on their scenic locale and the tourism they invite. MMR sits atop the sole source aquifer that supplies drinking water for one third of Cape Cod residents. It is now known that at least 13 plumes of contaminated groundwater, most containing volatile organic hydrocarbons from past spills of jet fuel and leaking landfills, have migrated beyond the base perimeter and are entering local ponds, cranberry bogs, and in some cases, drinking water wells.

As of 1996, the military's handling of MMR had incited so much controversy within the Upper Cape Cod community that DoD took the unusual step of having the Air Force Center for Environmental Excellence (AFCEE) take over management of the Installation Restoration Program (IRP) from the Air National Guard. Pentagon officials also pledged an unusually strong, personal commitment to "make the community whole", and directed AFCEE to pursue cleanup through "community based decision making". The MMR cleanup is the only fully funded environmental restoration project in the DoD. Yet, according to traditional quantitative assessments of risk, MMR is less dangerous than other sites.

Among the few points about the MMR cleanup on which virtually everyone agrees is this: The $800 million or so that the Department of Defense (DoD) expects to spend on the cleanup is far more than many of its own experts consider technically justified, given the extent of the known risk posed by the contamination.

Reactions to this point of unanimity are by no means unanimous:

- Most interested community members seem to believe that DoD is simply wrong - that the MMR contamination represents a serious threat to health and the environment, and that the extent of the cleanup to which DoD has reluctantly committed is justified or even inadequate.

- Regulators insist that restoration of the sole source aquifer to "background" levels of contamination is necessary to protect future drinking water supplies, and is, moreover, required by Massachusetts law.

- Many in the military believe that the extent of the cleanup is indeed unjustified, even* unconscionable , given the lack of "confirmed" health or ecological risks, more compelling environmental needs at other DoD facilities, and other possible uses of tax dollars.

Why is the military undertaking a cleanup that the military considers excessive? There is consensus on the answer to this question as well: successful stakeholder pressure. Opinions differ on the allocation of the responsibility/credit/blame - how much goes to environmental activists, how much to neighborhood organizations, how much to the general public, how much to the local media, how much to state and federal regulators, how much to local politicians and the Massachusetts Congressional delegation. But those who see the current cleanup plan as insufficient, adequate, and excessive all agree that DoD was pressured into it. While DoD deference to public and political pressure is by not rare, the extent of the concessions at MMR is unusual.

DISCUSSION OF FINDINGS

1. **The increased openness and opportunities for citizen engagement in decision-making that have occurred since AFCEE arrived in 1996 have markedly improved the credibility of the military's professional competence and commitment to cleanup at MMR.**

As the IG Evaluation points out, the public involvement program inaugurated by AFCEE in May 1996 when they took over management of the Installation Restoration Program (IRP) "goes far beyond the legal community involvement requirements contained in CERCLA." Our interviews and examination of newspaper clips, and minutes of public meetings from this period indicate that AFCEE had little choice.

To assess the community involvement efforts at MMR fairly, it is important to look at the situation AFCEE faced at the time, and to refrain from imposing the wisdom of hindsight on contemporary judgements. AFCEE should be expected, however, to study and learn from past experience – a point to which we shall return.

It is important to recognize the degree of outrage and worry that greeted AFCEE managers in 1996. The atmosphere when AFCEE took over was highly contentious. Citizens and elected officials were angry and upset about the failure of the 60% design, which was seen as a "debacle", a " disaster", a "$165 million failure", "an underground Chernobyl" (this from a US Senator). There are many opinions about why the "60% design debacle" occurred, but all agree that this event reflected badly on the military, and called into question the professional competence of the National Guard to manage the cleanup, and DoD's commitment to "do the right thing" at MMR.

The regional economy of Upper Cape Code is based on tourism and real estate. "Environment <u>is</u> the economy" on the Cape, as one official noted. Concern about the availability of drinking water for the Upper Cape was growing. All the towns surrounding MMR were predicting severe future water shortfalls. Falmouth was already searching for new public wells to keep up with demand. Rules governing septic systems were being tightened, for fear of impacts on local waterways. Virtually every interviewee – military, regulator, citizens, elected officials – attested to the "special" nature of Cape Cod. Cape Cod is where Henry David Thoreau spent his

summers. “It’s considered a holy place.” Threats to the “pristine" nature of the surrounding environment are taken seriously.

Revelations about new plumes, new contaminants kept coming even after AFCEE arrived. Three new plumes were discovered in 1997. As information about the contamination accumulated, the public got the impression that the pollution was expanding inexorably. There was a “seeping, changing quality to the crisis itself…. We keep hearing more and more information about the extent of the problem, and the new news is not good.” [Rolbein, About Face, p. 6}. All the plumes had migrated off-base. Most were literally under people’s backyards. Private drinking water wells were found to be contaminated. (20% of Cape Codders get drinking water from untreated private wells.) Cancer incidence on the Upper Cape was known to be higher than rates in other parts of the state. Epidemiologic studies designed to investigate the causes of these elevations were inconclusive. Many fear that the MMR pollution is at least a contributing cause.

In 1997, the Cape Cod Times ran a week-long series on the MMR cleanup titled “Broken Trust” that accused everyone involved – the military, the “Washington bureaucracy”, elected officials, state and federal regulators, contractors - with responsibility for wasting taxpayers’ dollars, endangering the health of Cape residents, and ruining the water supply. The issues were not portrayed as distant or arcane technical matters. The MMR contamination was regarded by the media and many others as an urgent priority that touched the vital interests of everyone who lived on the Upper Cape or treasured it as a natural resource and vacation site.

Regulators were seen as siding with activists’ demands. Some officials were angry that the regulatory agencies hadn’t caught the problems with the 60% design earlier. Some speculate that the regulators had political agendas of their own. Regulators point to Massachusetts’s law and the authority of Superfund to defend their decisions to push for full restoration of the site. At any rate, regulators at MMR have not, by and large, acted as a moderating influence to move decisions towards more risk-based criteria.

Everything was taking place in a “fishbowl atmosphere”. A new editor of the local paper decided to make coverage of MMR contamination a centerpiece of his tenure. Prevalent opinion was that the paper saw its role “as a public defender. They have a strong link to the activists. Anything negative [about MMR] is on the front page.”

No one disputes that AFCEE landed in a “crisis atmosphere”. There was an acute need to restore credibility and demonstrate that the military could perform adequately. AFCEE’s strategy for accomplishing these goals had two thrusts. First, they sought to move the feasibility study phase of the CERCLA process forward quickly so that they could begin to actually treat and contain the plumes. Second, they constructed an elaborate and intensive Community Involvement Program to engage stakeholders, including regulators, in cleanup decisions. This was a reasonable strategy. As we shall argue, while the community involvement at MMR encompasses a lot of activity, its effectiveness can be improved.

As the failure of the 60% design demonstrated, it is critically important to understand exactly what the community really wants from cleanup. The MMR Community Involvement Program continues to be hampered by an inadequate understanding of why the community appears to

regard “risk” from MMR pollutants differently from technical experts. Part of the problem is due to the military’s failure to appreciate the difference between the “hazard” and “outrage” components of “risk”. Part is due to failure to recognize community involvement as complementary to – not competitive with – technical analyses of risk.

2. **The IG’s belief (shared by many technical experts) that community-based decisions are necessarily excessive, wasteful and unresponsive to technical assessments has prevented AFCEE from considering or pursuing the possibility that superb community involvement practices might be a means of more closely aligning stakeholder preferences and less costly cleanup options.**

Community Based Decision-Making v. Risk Based Decisions: A Zero Sum Game?

Some - notably the DoD IG and military technical experts - believe or suspect that the community influence exerted at MMR is inappropriate or illegitimate. Indeed, most adherents to this view seem to believe that cleanup decisions are a zero sum, win/lose proposition: either cleanup is technically necessary (i.e. risk estimates indicate a clear risk to human health or to ecosystems) or the cleanup is not justified. In other words, the IG and others assume that there are only two alternatives:

(a) DoD continues the cleanup as promised, despite its excessiveness, wasting hundreds of millions of dollars; OR

(b) DoD reverses course, reneges on its promises, and endures the political repercussions of an empowered and betrayed public.

We suggest, however that there is a third option:

(c) DoD improves its community involvement and risk communications efforts to the point where community values are effectively integrated with technical assessments of risk so that stakeholders consider and adopt less expensive cleanup responses.

Adherence to the zero-sum view of community-based decision making is getting in the way of creating more efficient decision processes – and is causing the military to miss opportunities to more closely align community concerns with technical assessments of risk.

The extent to which improved community involvement saves money depends on the accuracy of the assumption that cleanup as now planned is excessive. If it is really true that the cleanup is more than is needed given the extent of the risks involved, then investments in community involvement and communication is likely to result in significant financial savings. If however, the cleanup is not excessive, but appropriate - or even inadequate - then investments in community involvement may not save a lot of money. Community involvement improvements would still be possible and worth achieving for their own sake - to improve public understanding, public acceptance, DoD’s local reputation, etc.- but they might not replace large cleanup expenditures.

Non-technical Justifications for Cleanup

It is important to recognize that there are many non-technical reasons that could justify an expensive cleanup. Indeed, failure to recognize the legitimacy of non-technical concerns is one of the barriers to a more effective community involvement process.

Interviewees in and out of the military have suggested rationales for the cleanup that are independent of whether or not it is a cost-effective way to mitigate known risks. A list of such rationales (not all of them mentioned by interviewees) includes the following:

- Uncertainty - Risk assessment is a very uncertain science; no one can say with confidence that the risks aren't much larger than the experts believe, or even that the highest-risk problems have already been discovered.

- Anxiety - Even if we assume that MMR poses small risks to health and the environment, the psychological toll exacted by the fear of MMR justifies the cleanup.

- Stigma - Even if we assume that MMR poses small risks to health and the environment, the associated stigma has real negative consequences (such as impact on property values) that justify the cleanup.

- Mistreatment - Even if we assume that MMR poses small risks to health and the environment, residents have been put through decades of worry, hassle, and DoD mistreatment; merely compensating for this is sufficient to justify the cleanup.

- Deterrence - Like everyone else, DoD must take responsibility for its actions, whether intentional or ignorant; requiring total cleanup regardless of risk establishes a precedent that will deter thoughtless pollution elsewhere.

- Equity - Irrespective of risk, the community must be made whole again; anything short of total cleanup would simply be unfair.

- Commitment - However excessive it may be, this is the cleanup that DoD promised, and it is the cleanup that DoD must deliver.

- Penance - DoD polluted the local environment, then denied the problem, then mishandled the problem and mistreated the community; after such a record, even an excessive cleanup is not too high a penance for DoD to pay.

- Symbolism - Cape Cod is special. The local environment has great symbolic significance in the minds of many Americans; a cleanup that might be excessive in more ordinary locations is not excessive here.

- Precedent - A successful cleanup at MMR can set powerful precedents – that political advocacy and local activism works, that other sites deserve similar expenditures, etc.

- Credibility - A successful cleanup at MMR can help resuscitate the credibility of DoD and the federal government in the minds of environmentalists and the general public.

- Democracy - When community feeling is strong and largely homogeneous, it should be honored regardless of technical considerations; to argue otherwise is to deny the very basis of democracy.

All of the rationales just listed are potential reasons why the cleanup should proceed, even if it is not a cost-effective response to the known risk to health and the environment. In addition, of course, many in and out of the military offer an obvious reason why they believe the cleanup will proceed regardless of risk assessment and cost-benefit analysis: political pressure. Not to stay the course, they say, would reinvigorate the opposition of environmental activists, neighborhood organizations, the general public, the local media, local politicians, state and federal regulators, and the Massachusetts Congressional delegation. Senior officers within DoD who suffered through this sort of MMR opposition in years past have no stomach for repeating the experience.

But, of course, this last argument in favor of continuing the cleanup has merit only if there is no other way to avoid reinvigorating the opposition. We suggest, however, that if MMR were to recognize and respond more appropriately to community outrage, and improve its capacity to engage the community in informed decision making, it is likely that the community will approve more "technically valid" approaches to risk mitigation.

<u>The LF-1 Plume Decision: the unspoken contest between technical expertise and value-based decisions</u>

Paradoxically, the decision process surrounding remediation of the LF-1 plume serves both as evidence that the “technical experts” remain unconvinced of the importance and legitimacy of community-based decisions, and also as evidence that the community is amenable to listening to technical arguments. There are several versions of what, exactly, happened on the way to the 1999 decision to apply monitored natural attenuation (MNA) to part of this large plume, and to pump and treat the VOCs that contaminated the rest – but to site the treatment wells within the boundaries of MMR, rather than on private property in Cataumet. Whatever the exact details, the issues of contention illustrate important points about community involvement at MMR.

One AFCEE manager described the final decision to use monitored natural attenuation on part of the plume as a validation of AFCEE’s growing credibility: “we got a chance to make our case on a technical basis for MNA and won a partial victory” by not having to install wells at the plume’s leading edge. A member of the public, on the other hand, referred to the LF-1 decision as edging toward the brink of disaster before the public managed to turn it around. Members of the community potentially affected by the plume, activists, regulators and community involvement personnel all describe the LF-1 decision process in negative terms as “excessively technical”, and “painful”. The public meetings were reportedly “well attended, but overly long”’, the source of “a lot of resentment about how it was handled”. “People were overwhelmed by the technical complexity and hostility”.

Some participants complain that the whole process was "hijacked" by AFCEE headquarters and the "techies" who insisted on giving laboriously detailed public presentations instead of heeding advice to explain alternatives in more succinct and simplified ways. Activists maintain that the LF-1 process attempted to deliberately subvert the consultation process AFCEE itself had established by bypassing the Joint Process Action Team and taking the case for MNA directly to the neighborhoods. Regulators are adamant about their authority to enforce strict cleanup goals, but less certain about how to impose the proper mix of community input and technical analysis. Most agree that the decision process was decided ("short-circuited" according to some) by political considerations – Massachusetts elected officials and political appointees in Boston and Washington delivered parameters of what was and was not acceptable.

Most seem to regard the ultimate decision as fair and reasonable. But it is striking that , at this late date there is so much controversy about the propriety and appropriateness of the decision process itself. Discontent is especially true among AFCEE employees, many of whom found the whole business very discouraging. Some were unhappy that advice about how best to interact with the community went unheeded; others were disheartened that their elaborate technical case didn't win the day – that "politics" once again held sway.

Community Involvement as a Tool for Integrating Community Values with Technical Analyses

We suggest that this story – which found its way, laboriously, to a relatively happy ending – reflects continuing confusion about the purpose and validity of community-based decision making and of community involvement generally. Community involvement (CI) should enable and support a vigorous exchange of information about technical issues and community interests and priorities and provide methodologies that promote consensus decisions - or at least decisions based on transparent precepts. AFCEE, regulators and community participants have successfully used the Decision Criteria Matrix as a tool to illuminate possible choices and trade-offs among remedies. It would be helpful to recognize that the entire community involvement program at MMR is a tool for understanding and integrating technical analyses of risk, cost, uncertainties, etc. with community values and priorities.

It is time to abandon the reductionist view that decisions are legitimate or valid only if they are based solely on technical considerations of estimated risk, cost, and benefit. Decisions, which incorporate community preferences and political judgements, can be valid and proper. It is, however, fair to insist that decision processes disclose an honest understanding of what's at stake, and what the options are. It may be legitimate to insist on a cleanup remedy that will not decrease health risks in any way known to science. It is also legitimate – and in keeping with principles of honesty and openness – to make clear that there is no evidence that such a decision will have any beneficial impact on risk.

We suspect that more honest and explicit discussion of proposed options is likely to reveal that outrage is being inappropriately treated as hazard, or that risks have not been adequately communicated, or that community resistance to "technically valid" decisions is not clearly understood, or that agendas beyond protection of health and environment are at issue. Whatever is causing the disagreement, community involvement processes should help to illuminate the points of contention and suggest the true spectrum of possible options.

The prejudice that the only valid decisions are technically based decisions may be preventing AFCEE from deriving greater benefits from its community involvement program. If the CI initiatives were viewed as tools for displaying, understanding and integrating the whole range of concerns and priorities and risks at play in cleanup decisions, the project of refining these tools, of using them more skillfully, and of measuring their effectiveness could be approached more straightforwardly, and the efficiency and performance of CI improved.

It is possible that the community would have accepted MNA had AFCEE and the regulators paid greater heed to community involvement experts' admonitions to present technical proposals more succinctly and to communicate risks more clearly. The public fact sheets describing MNA for example do not explain that the plume would continue to be monitored and actions taken to contain it if sampling revealed that the pollution was not behaving as expected. It is possible that, had a explicit protocol for decision-making been in place, the community would have been less anxious about the long interval of silence between December 1998 and the following spring and that political intervention would not have been initiated.

3. **The distinction between "hazard" and "outrage" as aspects of risk controversy helps clarify the situation at MMR. Poor outrage management has triggered hazard management that DoD considers excessive. The question is whether superb outrage management might permit less excessive hazard management.**

Recognizing and Responding to Outrage

To make sense of this situation, it helps to distinguish two components of any risk controversy. The technical side of the risk focuses on the magnitude and probability of undesirable outcomes: an explosion, an increase in the cancer rate, dead fish in the pond, even a decline in property values. Call all this hazard. The non-technical side of the risk focuses on everything negative about the situation itself (as opposed to those outcomes): Is it voluntary or coerced, familiar or exotic, dreaded or not dreaded? Is the source of the risk trustworthy or untrustworthy, responsive or unresponsive? Call all this outrage.

It is well established that outrage, not hazard, drives reputation and risk acceptance. Even significant (though not huge) hazards are usually tolerated when outrage is low, and even insignificant hazards are usually rejected when outrage is high. If the hazard is significant, of course, it is important to manage it right – for legal and regulatory reasons as well as ethical and technical reasons. But whether the hazard is significant or not, and whether it is managed right or not, if the outrage is high there is going to be controversy.

The typical risk controversy, in fact, comes when the hazard is low and the outrage is high. Captivated by the high outrage, the public insists the problem is serious; lulled by the low hazard, the source (the company or agency responsible) insists it isn't. The source is right about the hazard and wrong about the outrage. The public is right about the outrage and wrong about the hazard. Experience shows that until the source does something to reduce the outrage, it has very little chance of persuading the public that the hazard is low.

The principles governing the relationship between hazard and outrage are as follows:

1. Outrage is as real as hazard. Consider the dose-response curve of dimethylmeatloaf for pancreatic cancer (a typical hazard issue) versus how often the plant manager has misled the neighborhood about dimethylmeatloaf emissions (a typical outrage issue). Both questions are empirical. In either case we may be right or wrong, calm or emotional. Neighborhood opinions about the integrity of plant management do not constitute misperceptions of the dose-response curve, though of course they do lead to such misperceptions.

2. Outrage is as measurable as hazard - often more measurable. Measuring the effects of dimethylmeatloaf on people's attitudes (how upset they are and why) is usually a whole lot easier than measuring its effects on their health or environment.

3. Outrage is as manageable as hazard. The most effective strategies of outrage management are unpalatable and uncomfortable ... but they are effective. You don't have to just batten down the hatches and wait for the storm to abate; you can cope. You can even act preemptively to prevent outrage before it arises.

4. Outrage is as much a part of risk as hazard. The correlation between hazard and outrage is ridiculously low ... about 0.2. Hazard is most of what the experts mean by risk; outrage is most of what the public means by risk. They are thus two nearly independent variables, both called "risk" by different groups of people.

5. Outrage is as important to people as hazard. When hazard is very high - one-in-three, say - it obviously trumps outrage; everyone focuses on the emergency, not the relationship. But for routine hazards, even fairly serious ones, the outrage trumps. A one-in-three-thousand hazard may be tolerable if outrage is very low; a one-in-three-billion hazard may be intolerable if outrage is very high.

6. Hazard perception is correlated more with outrage than with hazard. The correlation between public perception of hazard and actual hazard (well, expert perception of hazard) is low – as low as the correlation between outrage and hazard. But the correlation between outrage and public perception of hazard is high.

7. Outrage affects hazard perception more than hazard perception affects outrage. High outrage and erroneously high perception of hazard go hand-in-hand. The question is which is mostly cause, which is mostly effect. If people are outraged because they misperceive the hazard, the solution is to explain the hazard better. But if people misperceive the hazard because they are outraged, the solution is to manage the outrage better. The second causal link is by far the stronger.

8. Outrage is as much a part of the risk management job as hazard. When hazard is high, manage the hazard. When outrage is high, don't ignore it, and don't manage the hazard instead: Manage the outrage. (When both are high, obviously, manage both.) If your problem is an outrage problem to begin with, outrage management is easier, cheaper, and more effective than hazard management. If what people need is an apology and a

Community Advisory Panel, in other words, don't install a dimethylmeatloaf vapor recovery system instead.

History of Hazard and Outrage Management at MMR

It is fair, if oversimplified, to divide the MMR cleanup into four periods. For each period, consider the performance of MMR on two metrics - managing the hazard and managing the outrage.

The period of problem creation, when military uses of the base led to substantial unrecognized (or at least unacknowledged) groundwater contamination, both on-site and off-site. During this period, the hazard was poorly managed. There wasn't any outrage yet.

The period of expanding conflict, when stakeholders became increasingly aware of the problem and began to force DoD to acknowledge it. During this period, the hazard was poorly managed. The outrage was also poorly managed, and grew enormously. This period ends in 1994 with the DoD decision to undertake a massive simultaneous cleanup of all the major plumes, a decision triggered by outrage and (we are assuming) unjustified in hazard terms. That is, having done virtually nothing to mitigate the outrage, DoD was pressured into overmitigating the hazard instead.

The period of dashed hopes, culminating in the infamous 1996 "60% design" meeting where it was suddenly discovered that the cleanup plan DoD had developed in response to stakeholder outrage was unworkable. During this period, DoD's strategy (or at least its practice; it is unlikely to have been a conscious strategy) was to get the outrage under control by over-mitigating the hazard. Public consultation and risk communication remained poor; relations with activists were hostile and relations with neighborhoods were scanty. DoD undertook to give stakeholders the outcome they sought (total cleanup) without the process they craved (involvement, respect, contrition, etc.). Even if the hazard mitigation had gone well, this would have left considerable unmitigated outrage. As it was, the hazard mitigation self-destructed, leaving DoD faced with extremely low technical credibility, extremely high stakeholder outrage, and a suspicion that it had wasted some $150 million in cleanup funds.

The period of conciliation, from the AFCEE takeover to the present. During this period, DoD has remained steadfast in its commitment to "make the community whole." While AFCEE does try to convince stakeholders that some cleanup options are excessive and unnecessary - and occasionally succeeds - it is widely understood on both sides that the stakeholders have the de facto power, that AFCEE will not abandon a cleanup option unless stakeholders are convinced it can be safely abandoned. Public consultation and risk communication during this period have improved significantly, and stakeholder outrage has declined significantly. Hazard mitigation has also improved significantly. But AFCEE continues to judge that it has no choice but to continue the policy of over-mitigation of hazard. DoD continues to pursue a cleanup it considers excessive. But in contrast to the previous period, DoD is now doing an effective job of implementing such a cleanup.

The question of greatest interest for this report is whether there is room for a fifth period. Under AFCEE, MMR risk communication and public consultation - and thus MMR outrage management - have progressed from terrible to adequate. Suppose an effort and investment was made in further progress from adequate to superb. Would this additional improvement in risk communication, public consultation, and outrage management make possible an adjustment in the plans for MMR hazard management, with a resulting cost savings? We believe the answer may be yes.

Hazard mitigation, even excessive hazard mitigation, is a very inefficient way to reduce outrage. Assume a typical high-outrage low-hazard risk situation. Assume that the stakeholders correctly feel mistreated, and therefore incorrectly feel endangered. Assume also that the organization in charge takes extraordinary steps to reduce the danger, while doing little or nothing to address the mistreatment. The likeliest outcome is that stakeholders will still feel mistreated - and therefore still feel endangered. In short, hazard mitigation does as little to reduce outrage as outrage mitigation does to reduce hazard; an apology doesn't protect people's health and a pumping system doesn't respond to their mistreatment. And since outrage, not hazard, determines hazard perception, hazard mitigation without outrage mitigation does not reduce hazard perception.

Even if DoD has irrevocably decided to pursue the excessive cleanup to which it is committed, in short, good risk communication, public consultation, and outrage management have value. And if DoD still has hopes of saving money on a less excessive cleanup, good risk communication, public consultation, and outrage management are essential.

DoD's performance on these dimensions at MMR is much better than it was prior to 1996. But as we will detail later in this report, it isn't as good as it could be. A still better program offers the prospect of reduced outrage, reliably leading to reduced perceived hazard, and potentially leading to a streamlined cleanup and a significant cost savings.

Principles of Outrage Management

Outrage management is the extent to which those in charge take steps to minimize stakeholder outrage. Public consultation and risk communication, as defined above, are key tools of outrage management - but outrage management is a broader concept, incorporating such additional strategies as the following:

1. Stake out the middle, not the extreme. In a fight between "terribly dangerous" and "perfectly safe," the winner will be "terribly dangerous." But "modestly dangerous" is a contender. If you deserve a B-, activists can get away with giving you an F instead; you can't get away with giving yourself an A.

2. Acknowledge prior misbehavior. The prerogative of deciding when you can put your mistakes behind you belongs to your stakeholders, not to you. The more often and apologetically you acknowledge the sins of the past, the more quickly others decide it's time to move on.

3. Acknowledge current problems. Omissions, distortions, and "spin control" damage credibility nearly as much as outright lies. The only way to build credibility is to acknowledge problems - before you solve them, before you know if you will be able to solve them - going beyond mere honesty to "transparency."

4. Discuss achievements with humility. Odds are you resisted change until regulators or activists forced your hand. Now have the grace to say so. Attributing your good behavior to your own natural goodness triggers skepticism; attributing it to pressure greatly increases the likelihood that we'll believe you actually did it.

5. Share control and be accountable. The higher the outrage, the less willing people are to leave the control in your hands. Look for ways to put the control elsewhere (or to show that it is already elsewhere). Let others - regulators, neighbors, and activists - keep you honest and certify your good performance.

6. Pay attention to unvoiced concerns and underlying motives. Unvoiced concerns make the most trouble. Bring them to the surface subtly: "I wonder if anyone is worried about...." And remember to diagnose stakeholder motives other than outrage and hazard: ideology, revenge, self-esteem, and greed.

   Conscious attention to outrage management offers the greatest prospect for reducing the pressure to over-mitigate hazard.

   Newcomers to the outrage management perspective often wonder if it isn't unethical to try to reduce stakeholder outrage. Interestingly, efforts to exacerbate outrage – the stock-in-trade of activists – are not usually considered ethically problematic, but efforts to reduce outrage are. Arguably, it is always appropriate to try to manage outrage so as to make it more consonant with hazard, and always inappropriate to try to manage outrage so as to make it more discrepant from hazard. That is, when the hazard is high, activist efforts to raise outrage (and thus raise perceived hazard) do good, while corporate efforts (or DoD efforts) to reduce outrage (and thus reduce perceived hazard) do harm. And when the hazard is low, efforts to raise outrage and perceived hazard do harm, while efforts to reduce outrage and perceived hazard do good.

   Of course when the hazard is disputed, activists may reasonably judge that they are doing good by trying to raise outrage, while companies (and DoD) also reasonably judge that they are doing good by trying to reduce it. To make the point even more aggressively: An activist group that considers the hazard serious should consider itself ethically obliged to figure out how best to provoke stakeholder outrage. And a company or government agency that considers the hazard minor should consider itself ethically obliged to figure out how best to deter stakeholder outrage. Judged by this standard, activists at MMR are doing their job well. DoD is doing better than it has in the past, but can do better still.

In a nutshell, we accept that DoD is genuinely committed to acceding to stakeholder demands. Particular stakeholders may - do - object to particular cleanup decisions, but overall, DoD will not make cleanup decisions to which significant numbers of stakeholders object. The cost of this

almost unprecedented sharing of power can be huge; it can force DoD to complete an expensive and unnecessary cleanup, and conceivably set precedent for similarly excessive cleanups at other sites as well. The value of this almost unprecedented sharing of power can also be huge; it can reduce stakeholder outrage and stakeholder demand for excessive cleanup, and this too can be a precedent for other sites.

At most sites, obviously, DoD has made a different decision. It has kept more of the decision-making power to itself. Its efforts at risk communication, public consultation, and outrage management are designed to help reconcile stakeholders to its decisions, and thus to help minimize pressure to alter those decisions. The situation at MMR is unique. By 1994, stakeholder pressure had forced DoD to promise a total cleanup; by 1996, the debacle of the 60% design had forced it to reaffirm that promise and begin again to try to keep it. Given this history, there is no way that DoD can reclaim control over MMR cleanup decisions. Any retreat from the promises of 1994 and 1996 would yield extremely high and vocal outrage; DoD knows this, and we think retreat is unlikely. There are thus only two options left: Do an excessive cleanup, or do such a superb job of risk communication, public consultation, and outrage management that an excessive cleanup is no longer required.

This choice isn't really a dichotomy, of course; there are plenty of options in the middle. Indeed, MMR has already achieved a position somewhere in the middle. Since 1996, many in the Upper Cape have come to accept that the groundwater will not be pristine even when the cleanup is done; that it is unwise to drain down too much water by pumping too many plumes at the same time; that cleanup equipment housed on MMR property is less disruptive of people's lives and property values than equipment in their back yards; even that "monitored natural attenuation" (doing nothing while the problem solves itself) is appropriate for some plumes, or at least for some parts of some plumes.

It must be said that the compromises emerging so far out of MMR's community-based decision-making process, while further from the environmentalists' than the proposals of 1994-1996 were, are nonetheless closer to the environmentalists' position than to DoD's position. And of course this comes at a time when nationwide trends in hazardous waste cleanups have moved toward quantitative risk assessment and the search for cost-effective though less-than-total cleanups. At the typical cleanup, the organization responsible for the cleanup is forced to do somewhat more than it thinks necessary, but a lot less than local activists think necessary. At MMR, DoD is doing somewhat less than local activists think necessary, but a lot more than DoD thinks necessary. Further improvement in risk communication, public consultation, and outrage management has potential to yield a more balanced compromise.

Outrage management relies on good risk communication and good public consultation; it is impossible without them. But it goes further. Two outrage management approaches of particular relevance to MMR deserve special attention: acknowledgment and negotiated compensation. They are areas where there is distinct room for progress.

Acknowledgment as an Outrage Management Strategy

A fundamental principle of outrage management is to acknowledge all negative information. We are not talking here about revealing secrets. That, too, is crucial to outrage management; nothing generates quite so much outrage as discovering negatives that have been covered up. But no one questions whether keeping dirty secrets is unwise or unethical. And for the most part, no one asserts that keeping dirty secrets remains common practice at MMR, at least with respect to AFCEE's role in the MMR cleanup.

Acknowledgment has to do mostly with negatives that are not secret. Since they are not secret, there is no particular obligation to mention them. And since they are negatives and therefore embarrassing, it is tempting not to mention them. But negatives that are not secret nonetheless possess the power to provoke outrage. The paradox is that they provoke far more outrage when they are ignored than when they are discussed. They are on stakeholders' minds anyway; they are raised by critics at will. Ignoring them doesn't make them go away; it makes them fester. It follows that for purposes of outrage management, the optimal strategy is to discuss the negatives as often as possible, to raise them proactively, to wallow in them.

Of course, wallowing in the negatives reduces outrage only if it is done with contrition. It isn't enough to acknowledge that the negatives are so. It is essential to acknowledge that they are negatives, that they shouldn't be so. Apology is central to effective acknowledgment.

What needs acknowledging at MMR? The following is a partial list:

- The fact that DoD damaged the Cape environment in the first place. This is obvious, implicit in all MMR communications. But it is rarely explicit. And when explicit, it tends to be matter-of-fact or even defensive, rather than apologetic. What is missing is statements like this: "We can't believe how dumb we were! We can't believe how little attention we paid back then to environmental problems that are obvious now!"

- The fact that DoD was slow to respond when problems began surfacing. Once again, recitals of the history of the cleanup in MMR communication materials certainly permit the conclusion that DoD's early response was inadequate and defensive. But they certainly don't draw that conclusion explicitly.

- The fact that the early years of the cleanup are widely considered to have been wasteful, and unanimously considered to have been rocky. The 60% design fiasco, for example, should be mentioned often - not just by stakeholders, but by AFCEE.

- The fact that no one can be sure about the health and environmental risks posed by MMR contamination. The uncertainty – how little we really know about toxic waste – is rarely acknowledged in AFCEE literature. Instead, AFCEE tends to over-reassure. This tone of excessive confidence is off-putting, as well as being scientifically questionable.

- The fact that the MMR issue has disrupted the lives of many local residents. Whether or not there is a serious risk to health or the environment, thousands of people have worried about

everything from cancer to property values. Many have felt the need to read thick technical reports and attend arduous meetings; some have put up with treatment facilities in their neighborhoods or wells in their yards.

- The fact that mistrust of DoD, MMR, and AFCEE remains high. It may be justified or unjustified; that's not the point. It is there, and it should be acknowledged. To be sure, the mistrust appears to be abating. Acknowledging the mistrust won't slow that progress; it will speed it up.

- The fact that new problems have kept materializing faster than old problems could be solved. And this may keep happening, especially if the northern part of the base is added into the equation (as it already is from the stakeholders' perspective). Although DoD seems less likely to hide problems than in the past, it is not yet doing a good job of acknowledging that its increased transparency has so far meant a continuing flow of bad news.

- The fact that known problems often turn out worse than was first believed. This is closely related to the preceding point. More often than not, plume characterizations have expanded, not contracted. It is a principle of outrage management to estimate problems conservatively, so you're sure you won't have to go back and say "it's worse than we thought." At MMR "it's worse than we thought" has been a recurring theme, with a substantial cost in outrage. There are two lessons here: estimate more conservatively in the first place, and predict worsening estimates from the outset.

- The fact that the cleanup has been largely a result of pressure from stakeholders, particularly activists, politicians, regulators, and neighborhoods. This is one of the most important areas of acknowledgment, because it also involves giving credit where credit is due. DoD often points with pride to its "community-based decision-making" at MMR. It virtually never concedes the universally known truth that it had no choice. Similarly, individual decisions with respect to individual plumes are typically depicted after-the-fact as science-based judgments, rather than as what everyone knows they are, political compromises with a wide range of stakeholders. Because MMR doesn't often acknowledge giving into pressure, its stakeholders don't feel as victorious as they are.

The point of acknowledgment is for stakeholders to hear the negatives from DoD, rather than just from its critics. For this to be useful, they must be recognizable, must still sound like negatives. There is a sort of seesaw here. To the extent that DoD ignores or denies or defends the negatives, stakeholders focus on them all the more, and all the more unforgivingly. To the extent that DoD acknowledges them, even belabors them, and does so with contrition, stakeholders are more willing to forgive and move on. Improvements in "acknowledgment" ought to be achievable and offer the prospect of significant reductions in stakeholder outrage.

Negotiated Compensation as an Outrage Management Strategy

Economists have long noted that sound cost/benefit decisions are unlikely when the cost and the benefit accrue to different parties. Suppose A damages the rear end of B's car in an accident that is clearly A's fault. B's body shop says the repair will cost $800. In a well-run society, the next

step is that A or A's insurance company pays B $800 - and then A is out of it. What B does about the car's rear end and what B does with the $800 (B's car and B's $800) is none of A's business.

Compare this to the MMR cleanup. Imagine if DoD and the various community stakeholders could negotiate the economic value of the MMR contamination; then the community gets the money and decides how much cleanup it wants to do (within regulatory constraints, of course). DoD would pay less, the cleanup would be sufficient but not excessive, and the community would have money left over for other priorities. Of course, there would still be disagreements. In all probability the activists and the regulators would urge more cleanup than the selectmen and the neighborhoods. But DoD would be out of it. It would have negotiated with the community the amount of compensation merited by the situation - putting a dollar value on the known health and environmental risk, on the remaining technical uncertainty, on the hassle and disruption and stigma and threat to property values, even on the misbehavior itself (the moral concept of "penance" is far older than the legal concept of punitive damages, but they serve similar functions). And with DoD out of it, with the fairness issue resolved through negotiated compensation, community disagreements over cleanup options would be far less contaminated by outrage.

To go back to the hypothetical example, outrage at A has little to do with B's decision whether to repair the accident damage, or spend the money on other priorities, or split the difference. But if A were responsible for fixing B's car, outrage alone would insure that B demanded a gold-plated rear end - especially if there were nothing A was permitted to do for B other than fix the car.

There are many reasons why federal hazardous waste cleanups cannot be handled like auto accidents. But the thought experiment is useful in establishing a crucial principle of outrage management. When people have been damaged, fairness demands - and therefore they demand - that they be made whole again (to use Tad McCall's much-repeated phrase). If there is only one way to make them whole, a DoD-managed cleanup, then demands for excessive cleanup are inevitable. A neighborhood might or might not prefer a new school plus an adequate cleanup to a pristine cleanup and no school. And surely a new school costs far less than the difference between an adequate cleanup and a pristine cleanup. But if DoD is not willing or not permitted to offer a new school, or even to respond to demands for a new school, then the stage is set for a pristine cleanup, irrespective of its cost.

It is worth noting that the outrage management value of negotiated compensation depends partly on the tone of the negotiation. If the organization responsible for the contamination and therefore for the cleanup offers a new school, stakeholders are likely to feel bribed - and outrage is likely to increase. If stakeholders demand a new school, on the other hand, the responsible organization may feel blackmailed (and experience considerable outrage of its own) - but the stakeholders will feel fine.

At a number of non-military CERCLA and RCRA sites, corporate polluters have successfully negotiated agreements with communities (local governments, neighborhoods, and even activists) under which the community endorses a less expensive cleanup in return for benefits unrelated to the cleanup - in one famous case, a Jack Nicklaus golf course to be built on top of the cap. Of

course, regulators retain the authority to require as much cleanup as they think necessary to protect public health and the environment. But regulators naturally tend to require more when the community is pushing them to do so than when the community is concerned about their unnecessarily endangering its golf course.

Negotiated compensation may not be impossible even at MMR. Consider the precedent established by the nitrate offset program. Several MMR plumes contain nitrates at levels above MCL. But nitrates are not a CERCLA contaminant; authority to require nitrate cleanup is questionable despite DoD's commitment to community-based decision-making. Moreover, the towns surrounding the site have nitrate problems elsewhere that are both more serious and less expensive to mitigate than the MMR plumes. At the instigation of a regulator, and with approval from the Pentagon, DoD contributed $8.5 million to the towns' nitrate management programs instead of spending $17 million on reducing nitrates in the MMR plumes - and achieved a greater total nitrate reduction at half the cost.

This differs from the hypothetical examples above in that the towns are required to spend the money on nitrate reduction. No-strings money would have had even greater appeal to the towns, and without strings on the money the towns presumably would have settled for even less than $8.5 million. It isn't clear whether DoD would have approved a smaller no-strings contribution; EPA and DOD were the ones that insisted on earmarking the money. Still, the precedent is meaningful. And there are intermediate possibilities.

Instead of earmarking the money for nitrate management, the specification could have been "nutrient management" or even "environmental management." If we assume that the towns are already spending money on these priorities, even earmarked money can function as if it were no-strings money, assuming town governments are permitted to spend DoD money on existing projects, freeing their own funds for other purposes. Interestingly, we are told that regulators saw the nitrate program as a sort of penance for DoD, a punishment for letting nitrates escape off base. The Air Force preferred to see it as simply a cost-effective way to manage the cleanup. From an outrage management perspective, of course, the more explicit the penance the greater the reduction in outrage.

Another relevant example is the decision to compensate cranberry growers for contamination of their crops. Property value compensation is prohibited under CERCLA; twice, DoD sought and got special Congressional action to make an exception for MMR's cranberry growers. Concern about this as a possible precedent led both the Pentagon and the Congress to suggest strongly that there be no request for a third such authorization. Even if further authorizations are forthcoming, the cranberry case is further from our negotiated compensation model than the nitrate offset program. The essence of what we are proposing is negotiated compensation in lieu of additional (and excessive) cleanup; there was no such quid pro quo in the cranberry situation, just compensation to growers for the crops they were unable to sell because of contamination.

Similarly, the law governing natural resource damages claims does constitute a possible legal handle on going beyond cleanup to compensation (or at least to restoration and replacement). But once again natural resource damages are conceptualized as a remedy in addition to cleanup,

not as a way to reduce outrage and thus reduce the demand for more cleanup than is justified by the risk to health or environment.

Finally, there has been discussion of a demonstration program on Ashumet Pond for phosphate mitigation, with the goal of developing a strategy the towns can use on other ponds unrelated to MMR. If the technology transfer value of the phosphate program is seen as a replacement for some of the cleanup - that is, if the stakeholders are willing to accept less phosphate mitigation in Ashumet Pond if it gives them a technology they can use elsewhere; or better yet, if they demand a technology they can use elsewhere rather than demanding total phosphate mitigation in Ashumet Pond - then it is indeed an example of what we are talking about. On the other hand, if the cleanup isn't affected, the offset isn't negotiated, and AFCEE simply gives the towns the new technology as a byproduct of the phosphate cleanup effort, then it isn't an example at all.

The two outrage management strategies we have focused on here - acknowledgment and negotiated compensation - are not the only two available to DoD at MMR. Nor are they the most vital two; transparency and responsiveness matter more. They are emphasized here because they are not much in evidence yet at MMR. Unlike transparency and responsiveness, where considerable progress has been made already, they are opportunities for progress yet to be considered.

Note also that there is a connection between the two. The essence of acknowledgment is DoD's apologetic awareness of the negatives; the essence of negotiated compensation is DoD's willingness to consider making up to stakeholders for those negatives in ways other than the cleanup itself. In the absence of acknowledgment, a DoD offer to compensate will tend to feel to stakeholders like a bribe, simply an effort to save on cleanup costs. For the compensation to feel like a penance instead, stakeholders must accept the apology before they accept the compensation.

4. **The revision of the 1996 Community Involvement Plan is an opportunity to incorporate community involvement practices into an overall strategy for the next phase of cleanup. Community involvement programs at MMR must be institutionalized, deepened, broadened, and measured if they are to serve effectively as tools to align community values and technical analyses of cleanup.**

<u>It’s time for a new CI Strategy</u>

The Community Involvement Program at MMR has evolved extensively over the past three years and includes many valuable practices. The 1993 Community Involvement Plan is now being update and revised. This effort presents a larger opportunity to establish realistic goals for CI during the next phase of the cleanup and to embrace CI as a strategic tool for aligning community preferences and technical analyses within the framework of community based decision making.

CI at MMR is not going to fade away. Although many people expressed the hope that as things “settle down”, as AFCEE demonstrates its ability to manage cleanup and engineering systems begin to operate, public interest in the cleanup will wane, and decision-making will become more

routine, less public, and more a matter of consultation among Remedial Project Managers. In our view, there is little likelihood that the communities surrounding MMR will permit much retreat from community based decision making. Questions about possible health impacts from MMR remain unanswered, and even barring new surprises, issues such as determining when to turn off treatment systems and the future use of the site will keep the MMR cleanup highly visible. AFCEE has now established expectations that there will continue to be a high degree of community involvement in cleanup *decisions*. A retreat from community based decision risks losing the credibility that AFCEE has accumulated and embroiling the cleanup once again in acrimony and dispute.

Although CI programs at MMR are accorded respect, and receive more resources than is typical at other Superfund sites, CI at MMR is not regarded by technical managers (or even by all CI staff) as a positive force, as a means for forging technically credible strategies. Everyone at MMR thinks CI is important, but most see it as a burden to be endured, rather than an opportunity to be exploited. The subtle (sometimes not so subtle) and ongoing competition between technical judgements versus community preferences is standing in the way of pursuing a different dynamic that offers opportunities for win/win outcomes.

It's time to move beyond the false dichotomy between technically "valid" cleanup decisions, and community based decision making processes that take a wider view of justifiable decision rationales. The MMR cleanup could benefit from a process that allows CI and technical staff (from the contractor and regulatory communities as well as AFCEE) to explore this dichotomy and the zero sum, win/lose view of community based decision making that it implies. The failure to confront the tension between a scientific view of the world and more heterodox views which incorporate (among other elements) non-empirical values such as those described on pages 5 and 6 of this document is preventing CI at MMR from reaching its full potential. Specifically, adherence to the idea that cleanup decisions are EITHER based solely on technical judgements OR are invalid, is preventing a clear understanding and strategic development of CI practices. The evolution of community involvement practices is the best tool for bringing technical analyses and community preferences into closer alignment.

It is important to be clear: we are not advocating abandoning community based decision making or a subtle shift of emphasis from community values to technical preferences. We are suggesting that CI needs to be taken seriously as a tool – or more accurately, a set of tools – that can legitimately and effectively heighten awareness of and better integrate alternative preferences and interpretations of "what matters" in cleanup decisions. The design of such tools can evolve; one can acquire greater skill in their use.

Even superb community involvement – brilliant risk communication, engaged citizens, open and efficient decision processes – will not succeed in melding all views or make everyone happy. Mistrust may diminish among parties, but dissension will continue – as it should. Happy meetings are not the intended outcome of CI.

AFCEE could use the revision of the Community Involvement Plan now beginning to create strategic plan for CI at MMR. Ideally, this CI strategic planning process would be fairly elaborate and intense, and include participation from top AFCEE technical managers,

contractors, regulators, activists and community members. Professional facilitation of the process could assist clarification and consensus about the purpose of CI and help integrate the CI strategy into the overall strategy for accomplishing the next phase of cleanup. It might be worthwhile to ask MMR's experienced facilitation staff to participate directly in planning efforts (rather than confine them to their roles as facilitators) to take advantage of their considerable experience and unique perspectives.

The importance of linking the CI strategy to overall cleanup strategy bears emphasis. Once the legitimacy and purpose of CI at MMR is squarely confronted, and the role of CI as a set of tools to help accomplish the next phase of cleanup is addressed, then specific CI goals, priorities and practices needing improvement will come into focus.

Upcoming Transitions – the Importance of Institutionalizing Community Involvement

It is time to "institutionalize" CI at MMR – to consciously link CI program priorities to the priorities of the cleanup itself (decisions which should be worked out openly and with stakeholder participation); to codify and document what's gone on in CI to date and establish clear expectations for future practice; to deepen and sharpen specific CI practices; and to measure progress. At present, though many aspects of CI at MMR are valuable, the overall program is somewhat haphazard and disconnected. This is no doubt due in part to the rapid evolution of many aspect of the program. It is particularly important that CI practices and protocols now be codified, so that valuable progress is not lost.

Several important transitions lie ahead at MMR. It is important to ensure that the effective public participation practices established thus far (and after great effort) are anchored in recognized, documented principles, programs and protocols. If this does not happen, critical aspects of CI at MMR – and the credibility they have garnered for the cleanup – could be lost as personnel move on, organizations change, and work shifts from mapping contamination and selecting remediation designs to monitoring progress and designing an exit strategy.

Several interviewees complained that the consultation and decision making processes – for determining meeting agendas, selecting cleanup remedies, soliciting input – are murky. The lack of clear protocols specifying such processes contributes to suspicion about the true "openness" of decision making and fuels complaints that secret deals are being negotiated, inadequate attention is being paid to community views, regulators are playing politics, AFCEE is making unreasonable last-minute demands on busy regulators, etc. Such complaints can gradually erode everyone's sense of trust. The solution is to create, codify - and follow - explicit procedures for consultation and decision making. The lack of such codified practices makes it difficult to maintain discipline and continuity and could threaten the integrity of CI in coming years.

One imminent transition involves the switch from using the Decision Criteria Process (DCP) to the CERCLA feasibility study process. Although laborious to develop and employ, the DCP developed by AFCEE and the regulators with public input, made trade-offs among alternative cleanup options visible, and allowed the public to review and provide input on the advantages and disadvantages of various remediation strategies before ideas were set in stone. The DCP also

forced the public to grapple with some of the technical considerations inherent in cleanup decisions. The DCP was applied to four plumes.

In constructing RODs for the remaining plumes, AFCEE intends to continue to employ the most useful features of the DCP, but wants to avoid some of the more arduous aspects of the DCP experience. AFCEE is also required to go back and document the DCP in CERCLA terms to establish a legally binding ROD. There is some peril in this change of process. Having invested the time needed to learn the DCP, citizens are unhappy that they must now "repeat" work to produce a ROD. AFCEE must take care that the transition to a more traditional feasibility study approach is spelled out and understood, and does not appear to be a retreat from robust community involvement.

No document defines exactly how the DCP will be translated into a CERCLA feasibility study process – and still retain adequate opportunity for community input. Officials are clearly committed to making this happen, but the attention being directed at the process itself seems vague and haphazard, and is perhaps less of a priority than it should be. This is particularly troublesome since the DCP appears to be an innovative improvement over traditional approaches and might find useful applications at other federal cleanups. But the MMR experience with DCP is not being captured in a way that lends itself to easy translation.

Another transition involves the inevitable changes in personnel that lie ahead. Many people are concerned about what will happen to public participation at MMR when Jim Snyder, the AFCEE RPM, moves on. Similar fears are expressed about the time when AFCEE is no longer the hands-on manager of MMR. The transition from the era of remedy design and installation now ending to the era of engineering systems operation and management could also result in inadvertent neglect of CI processes or loss of important pieces of institutional memory. Now is the time to clearly document important CI practices and programs, and ensure that they are fully incorporated into routine practice.

Risk Communication – Maintaining the Transparency of Technical Analyses

So far, there has been little need for the public to focus on risk communication at MMR because AFCEE has eliminated potential exposure pathways that could cause human health impacts (by placing people on bottled or public water) and has promised to restore groundwater to a pristine state. Thus, most MMR communications efforts focus on alternative engineering options, not on risk.

The Decision Criteria Process did incorporate an increased effort to quantify and compare risk and communicate risk data. But little seems to hinge on whether stakeholders accept the risk estimates, so they are neither pushed hard, nor did they resist the DCP estimates. Alternative remedies appear to be adjudicated with little attention to risk quantitation.

In the cleanup phase now beginning, issues of risk will re-emerge. Now that many of the major remedial design decisions have been made, and engineering systems are operational, attention will shift to the design of an eventual "exit strategy". This phase of the cleanup will require new

appraisals of risk, cost-effectiveness, and the efficacy of remedial systems. Risk communication will become more important.

One aspect of risk communication that needs improvement has to do with transparency – i.e. the accessibility and intelligibility of risk-related data, analyses and decisions. The peer review team was impressed with the clarity and usefulness of the "public fact sheets". These documents provide succinct summaries of such issues as the location and extent of contaminated plumes, the response alternatives, and describe opportunities for community involvement. Other fact sheets provide brief overviews of particular contaminants and associated health issues. Successive fact sheets are color-coded, so that, for example, all paper associated with the LF-1 plume is purple. The fact sheets are accessible overviews of the pollution problems at MMR and are good outlines of the cleanup decisions taken. At this level, the fact sheets are laudably transparent.

But when one tries to "drill down" into a deeper level of analysis, one finds that the technical data needed to support statements made in the fact sheets are not easily accessible. In fact, in some cases, it is not possible to trace the statements made in the fact sheets to more detailed documentation of MMR pollution. Technical documents and the recorded rationale for decisions are scattered. There is no index of documents that allows one to efficiently search for and request the data and analysis pertinent to a particular plume or problem or decision. In some instances, key documents (e.g. risk estimate calculations) are found only in contractors' files and not easily available. Other key data (e.g. sampling results from cranberries tested for EDB contamination) are held by regulators and not publicly available.

Better document control and organization could significantly augment risk communication at MMR. Conversely, poor document control and accessibility could undermine efforts the significant risk communication accomplishments represented by the public fact sheets. Failure to make technical data, analyses, and decision processes accessible and transparent could have serious repercussions in days to come when decisions about how to optimize treatment systems or when to turn them off must be confronted. Not only will risk communication be hampered if technical facts and deductions are difficult to assemble or verify, but the integrity of technical assertions will be subject to dispute, threatening the public's trust in the entire analytical process.

Another aspect of transparency has to do with the intelligibility with which ideas and analyses are presented. If AFCEE wants citizens (who have day jobs of their own) to appreciate sophisticated, technical aspects of cleanup then it must invest resources in making technical ideas comprehensible. Scientific and technical reports are too often poorly written, and engineers are infamously bad writers. This, or course, is not a problem limited to MMR.

Nonetheless, key technical documents should be intelligible and coherent. This is not always the case at MMR. The peer review team was surprised to discover that the description of monitored natural attenuation (MNA) contained in an important document intended to provide critical evidence of the usefulness of this remedy was inaccurate and misleading. (The paper neglected to explain that plumes would be monitored and that contingency plans would be implemented in the event of unexpected findings - i.e. the plume expanded or failed to attenuate.) The upshot of this sloppy writing was to undermine the attractiveness and efficacy of MNA as a viable remedy.

This example of inaccessible technical documentation is especially striking given AFCEE's strong advocacy for applying MNA to the LF-1 plume. (A video describing the same topic was quite clear and informative. Unfortunately, the absence of any catalogue of available information sources at MMR would make it difficult to seek out the video.) Obviously, not all technical documents can be reviewed for clarity and re-written, but a short list of critical papers might warrant such attention.

More attention might be paid to the use of graphics in displaying plumes and treatment strategies. The two dimensional depictions of plumes that are the primary means of displaying contamination from MMR are limited in their ability to convey the dynamic, three-dimensional reality of the pollution, and are of little help in describing the effects of alternative remediation strategies. Reliance on such primitive illustrations is not sensible in the computer age.

Consideration might also be directed toward innovative, computer-assisted "GroupWare" that allows diverse streams or categories of information to be sorted, displayed, and prioritized. There are a number of software technologies available that allow groups to work through complex and contentious issues relatively rapidly. The software algorithms do not make choices among categories of data and competing priorities – they allow the people involved to assert priorities, and then display the results of such choices for everyone to see. Use of such programs might have facilitated the use of the DCP, for instance, and might serve a useful role in discussions about possible ways to optimize engineering systems, etc.

A critical aspect of risk communication at MMR has to do with technical presentations to the public. The ubiquitousness of complaints about oral technical presentations is notable. People complained that presentations were "excessively technical", "overly long", "intimidating". One citizen noted that "people were overwhelmed by the technical complexity" during presentations of possible strategies for LF-1 plume and complained that the presenter failed to acknowledge limitations of the data. The volume and pervasiveness of complaints about public presentations is somewhat surprising, given the emphasis on community involvement at MMR, and suggests that either technical experts are not taking seriously the obligation to communicate effectively or that available coaching in risk communication and public speaking is inadequate.

Improving the Rigor and Understanding of Community Involvement Practices

We have already noted the pervasive belief that CI is a necessary, but burdensome, aspect of environmental restoration projects. This attitude is common at cleanups of federal and private sector facilities. It's time for community involvement to evolve beyond its present status as an unpleasant and expensive ancillary aspect of environmental restoration and to be taken seriously – not just as an obligation but as an opportunity. For this to happen, CI strategies and practices must be addressed with the level of intellectual rigor and scrutiny comparable to that accorded technical analyses of pollution and remediation. In addition, CI practices must be integrated into the "business" end – the calculated costs and benefits – of cleanup.

Given the huge investment of resources and political capital that DoD has already made at MMR, thought should be given to creating a "center of excellence" at MMR dedicated to the study and improvement of community involvement practices. There has been a lot of interest in

establishing a “center of excellence” for the development of innovative cleanup technologies at MMR. A center focused on developing and disseminating effective approaches to public participation in complex environmental restoration projects could provide unique and considerable value to DoD.

The talent pool located in New England universities and think tanks provides a handy source of intellectual firepower for such a center. The much remarked-upon insistence of local residents in participating in decisions that affect their communities, and the demonstrated willingness and savvy with which they engage the political would seem to provide fertile ground for such a center.

A less ambitious alternative to establishing a center devoted to CI, would be to hold an annual “state of the site” conference at MMR. Such a conference could present reports on cleanup progress as well as community involvement innovations and could include speakers from universities and other federal facilities around the country. Programs could be designed to allow local residents a “one-stop” opportunity to update their knowledge of environmental restoration at the site, could include workshops to inform participants of the latest advances in community involvement practices.

Measuring the Effectiveness of Community Involvement

In addition to intellectual rigor, another mark of the seriousness with which CI is treated is the degree to which CI program performance is tracked and measured. If CI is truly a valuable asset, a tool that can help bring about effective cleanups, then this ought to be demonstrable in measurable ways. The strategic review of CI at MMR should include an assessment of metrics now used to assess CI performance. Many of the current metrics track processes – the number of meetings held, fact sheets completed, additions to the mailing list, etc.- rather than outcomes.

A strategic plan for community involvement at MMR should include a realistic appraisal of what CI can produce, what levels of effort are needed to reach desired goals, and how CI processes might become more efficient and productive. Community involvement has become a complex enterprise at MMR, and it is not easy to reliably measure the outcomes of such efforts. But until CI is incorporated into the “business side” of cleanup and measured in terms that convey the investment of resources involved and expected returns on such investments, its role as a “valid” component of cleanup priorities and decision processes is likely to be suspect.

5. Community concerns about past and present military activity at MMR are threatening AFCEE’s credibility. DoD must establish a forum where these concerns can be addressed.

The Upper Cape communities, as well as Massachusetts Department of Public Health, are concerned about the elevated cancer incidence known to afflict residents of this area of the state. There is no evidence that convincingly links MMR activities to the cause of increased cancer rates, but many people are worried that past and present military activities at MMR may be contributing to the risk. A survey by the Massachusetts Department of Public Health (DPH) showed that a majority of Cape residents believe “environmental causes” are the primary source

of the problem. DPH fears that other risk factors which might be amenable to public health interventions are being ignored.

The mission and authority of the IRP do not extend beyond the CERCLA cleanup, and – as AFCEE repeatedly explains – under CERCLA, agencies other than DoD are responsible for assessing human health risks. Local residents don't care. The public does not recognize the distinction between CERCLA and non-CERCLA pollution, nor does it care which branch of the military caused the pollution or where it's located on the base. To the public, AFCEE's refusals to entertain discussions of possible health impacts related to MMR activities sound like weasely, bureaucratic buck -shifting.

It is worth repeating that the credibility AFCEE has accrued is fragile. AFCEE's claims to openness are being eroded by the failure to address people's core concerns. The continuing inability of existing structures – i.e. the Community Advisory Board sponsored by the Agency for Toxic Substances and Disease Registry – to deal effectively with MMR-related health questions is causing great frustration, and threatens to feed outrage among residents.

It is unlikely that there are simple answers to questions about cancer rates on the Cape. Attempts to conduct epidemiological studies of cancer patterns on the Cape have been inconclusive. Crafting a useful public involvement process to address this nexus of issues won't be easy. But we see no choice but for the DoD to exercise leadership in this matter. It is crucial that people have the opportunity to openly voice their concerns and receive responses from responsible experts. At present, AFCEE is being blamed for lack of progress in establishing such a forum. Public anxiety about these issues could easily spiral into a public relations nightmare – especially if the military is perceived as stonewalling (or worse).

Facilitating a discussion of health issues on the Upper Cape, might present new arenas for negotiation of more cost-effective - options. Such a process might also provide DoD with the opportunity to assist communities in understanding more fully the entire spectrum of health and ecological risks confronting the Upper Cape.

CONCLUSION

CI practices at MMR are serious, well established and producing clear benefits. Members of communities surrounding MMR now regard DoD as a professionally competent and committed manager of the site cleanup. This is a dramatic change from the situation in 1996 and a significant accomplishment. It is due in no small measure to the leadership and dedication of AFCEE employees and the persistent engagement of the citizens of Massachusetts in the arduous and often unpleasant business of participatory democracy.

Community involvement at MMR is not perfect, but it's come a long way since the days when anger and accusations dominated public meetings. It remains to be seen if AFCEE employees, regulators, and community members can take community involvement practices at MMR to the next level, and unite community values and scientific interpretations of the contamination in a manner that reflects the best of both worlds. The promise of community involvement is the

creation of ways of understanding and interacting that enable us all to get what we need. It takes a lot of trying.