

## MEMORANDUM

To: Charles W. Powers, CRESP

From: Richard B. Stewart

Date: June 21, 2005

Re: Legal and Related Policy Issues for Integrating Remediation and NRD Strategies at DOE Sites

---

### **I. Introduction: A Long-Term Land Use Management/Remediation/Restoration/Strategy for DOE Sites**

This memorandum summarizes some of the key legal and policy issues relating to potential natural resource damages (NRD) liabilities at DOE sites. It is based on a strategy that would integrate NRD considerations and restoration planning in remediation decision making, with the objective, at appropriate sites, of managing sites for long-term habitat and other ecological values. Indeed, under this strategy, it may often be difficult in many instances to distinguish remediation and restoration, reinforcing the need for a seamless process in which trustees are fully engaged and to which they and remedial authorities are committed. The strategy would include appropriate land use and institutional controls to limit development activities and public use. This future land use strategy would be consistent with a less intensive approach to remediation than if sites were open to development and unrestricted public use. Less intensive remediation would avoid short-term health risks to workers and others as well as the higher costs to taxpayers that would result from more ambitious remediation strategies. Furthermore, moderating the intensity of remediation would reduce short-term and long-term environmental harm and ecological disruption and consequent natural resource injuries and liabilities. Restoration planning would proceed jointly with remedial decision making. This strategy could reduce the burden on taxpayers of both remedial and restoration costs as well as provide significant environmental benefits to the public while protecting public health.

This strategy is responsive to a number of special circumstances at many larger DOE sites. Many of these sites have extensive mixed waste problems that will make extraordinarily costly to attempt to achieve cleanup levels like those that have been selected for more typical CERCLA sites, including those near current or potential future residential or commercial locations. Further, DOE has designed and managed a number of its sites with extensive undeveloped buffer zones that provide habitat for wildlife and provide other significant ecological services as well as limiting potential exposures by nearby populations. Prior to their acquisition and management by DOE, a number of these sites were being used for intensive, chemically dependent agriculture that was environmentally damaging. Also, some of these sites would likely have been subject to

development. Thus, DOE acquisition and management of these sites has in these respects provided important environmental benefits that need to be considered along with the environmental impacts of DOE site development activities and the environmental risks posed DOE wastes.

There are opportunities to continue/expand the management of DOE sites for ecological and limited access recreation and other values in the future.<sup>1</sup> Such an approach dovetails with a remediation strategy that would leave on site and contain an appreciable amount of less hazardous wastes, and minimize ongoing risks to health and the environment from the presence of such wastes through arrangements to assure continuing containment integrity and through land use, institutional, and other management controls to limit human and environmental exposures. These long term stewardship (LTS) arrangements must be durable, resilient, and include transparent monitoring and corrective mechanisms with adequate financial assurances that provide an appropriate role for local communities, tribes, states, and the public. This approach could avoid or reduce the need for ambitious, costly, wide-scale remediation of many high volume wastes that would pose serious risks of harm to workers and cause environmental disruption and natural resource damage. Intensive remediation could also defeat or impair the ability to manage sites for wildlife and other ecological values in the future.<sup>2</sup>

The success of such a strategy will depend critically on acceptance by local communities and state and tribal authorities, including trustee authorities. The credibility of containment and other LTS arrangements will be critical for winning such acceptance, as will the local benefits from managing sites for ecological and related educational and recreational values.<sup>3</sup>

In order to implement such a strategy, planned future use of DOE sites for ecological values and restricted development and public access should be a key element in remedial decision making. Such decisions would balance the long term risks of leaving wastes in place, taking into account containment and related LTS arrangements, against the short term health risks and the environmental injury from more aggressive remediation as well as the short-term and long-term impairment of opportunities to manage site resources for wildlife and other ecological and associated values. In addition, restoration decision making should, as far as feasible, be integrated with remedial decision making. The strategy outlined above should substantially reduce potential NRD liabilities by reducing the amount of ecological harm caused by remediation activities and tailoring remediation to promote restoration and long term management of sites for ecological values. In addition, DOE should receive recognition for the environmental benefits that it has

---

<sup>1</sup>See M. Greenberg, K. Lowrie, D. Krueckeberg, H. Mayer, and D. Simon, Bombs and butterflies: a case study of the challenges of post cold-war environmental planning and management for the United States = nuclear weapons sites, *Journal of Environmental Planning and Management*, vol. 40, 1997, 739-750.

<sup>2</sup>See M. Greenberg, J. Burger, M. Gochfeld, D. Kosson, K. Lowrie, H. Mayer, C. Powers, C. Volz, and V. Vyas. End State Land Uses, Sustainable Protective Systems, and Risk Management: A Challenge for Multi-Generational Stewards, CRESPP report May 2005.

<sup>3</sup>See Michael Greenberg, Karen Lowrie, Henry Mayer and Michael Frisch, *External Stakeholders' Influence on the DOE's Long-Term Stewardship Programs*, *Federal Facilities Environmental Journal/Spring 2002* p. 65.

provided in the past as a result of its site acquisition and management decisions by avoiding the environmental harms that would have been caused by continuation of prior uses or by alternative forms of site development, and by the environmental services provided by the buffer zones and other undeveloped areas.

In order to successfully carry out this strategy, natural resource trustees should be actively engaged in the design and implementation of remedial measures, which should be closely coordinated with plans for restoration activities needed in the future after remedial activities have been undertaken.

## **II. Remedial Law, Policy, and Process**

This section of the memorandum provides an overview of the issues of remedial law and policy posed by the long-term land use management/remediation/restoration strategy outlined above, and the process for integrating restoration decision making and remediation decisions. It first examines the legal structure for remedial decision making in relation to balancing among different types of health and environmental risks, and then consider how NRD issues might be integrated in remedy decision making.

### A. Balancing Among Different Risk Categories in Remedial Decision Making

Remedy selection under CERCLA is governed by the National Contingency Plan (NCP) regulations, 30 C.F.R. § 300.430, which set nine criteria for evaluating and selecting remedies:

Two threshold criteria which all remedies must satisfy:

- Protection of human health and the environment from unacceptable risks in both the short-and long-term; and
- Compliance with ARARs.

Five primary balancing criteria for selecting among remedial alternatives:

- Long term effectiveness and permanence controls such as containment systems and institutional controls;
- Reduction of toxicity, mobility or volume through treatment;
- Short-term effectiveness including short-term risks to the community and workers during remedy implementation and environmental impacts from remedy implementation;
- Implementability; and
- Life cycle cost

Two modifying criteria to be used in modifying a selected remedy or choosing an alternative:

- State acceptance, and
- Community acceptance

Each remedial action shall utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. The balancing performed in selecting a remedy shall emphasize long-term effectiveness and reduction of toxicity, mobility or volume through treatment, and consider the preference for treatment as a principal element and the bias against off-site land disposal of untreated waste.

In order to select a remedy, including application of the balancing criteria, it is necessary to weigh and balance among health risks and environmental risks, different types of health risks and among different types of environmental risks, and among short term and long term risks in each category. The regulations provide no enlightenment as to how this weighing and balancing process should be carried out.

Guidance has been issued by EPA and, to a more limited extent, by DOE. The available documents also fail to provide clear guidance for decision makers in balancing among different categories of risks, including: short term versus long term risks, health risks to remediation workers versus risks to the general public, human health risks versus ecological risks, and different environmental risks to different ecological receptors. Review of the existing EPA and DOE documentation confirms that risk managers lack the appropriate guidance and analytic framework to address risk balancing on a consistent basis using risk-based analysis.<sup>5</sup> This lack undoubtedly contributes to the circumstance, as found by CRESA researchers, that remedial decision making at nearly all of the DOE sites studied exhibited a “lack of clear qualitative and quantitative risk balancing.”<sup>6</sup>

Health-health risk comparisons and tradeoffs can be made through a common end point/metric such as mortality risk. Environmental/environmental comparisons and tradeoffs are much more difficult because of need to select appropriate end points and difficulty in establishing common metric. Environmental/health comparisons tradeoffs are more difficult still.

Human health risk balancing is explicitly recognized in EPA and DOE guidance as a risk-based approach, but the guidance fails to provide helpful direction for risk managers to assess and weigh short-term versus long-term risks. In cases involving human health versus ecological risk, the two risks are given equal weight in the guidance, consistent with the NCP’s mandate to protect human health *and* the environment. However, the

---

<sup>5</sup> This conclusion is confirmed by the report of the National Research Council, RISK AND DECISIONS ABOUT DISPOSITION OF TRANSURANIC AND HIGH LEVEL RADIOACTIVE WASTE (2005).

<sup>6</sup> See Joanna Burger, Charles W. Powers, Michael Greenberg and Michael Gochfeld, *The Role of Risk and Future Land Use in Cleanup Decisions at the Department of Energy*, 24 RISK ANALYSIS 1539, 1543-45 (2004). CRESA reported that nearly all sites mentioned human health as primary receptors of concern, while 53% mentioned both human health and the environment. Ecological concerns were “mainly in connection with surface clean-up.”

modifying factors of State and community acceptance, as well as more standardized human health requirements, may lead risk managers to give greater weight to reducing human health risks. There is a need, in the context of remediating and managing DOE sites, to give more systematic consideration to ecological values. Methods have been and can be developed to do so.<sup>7</sup> Risk managers balancing among ecological receptors are, as a practical matter, mainly constrained by the interests of the NRD Trustees.

Future land uses. Future land uses play a critical role in the different types of risk balancing noted above.<sup>8</sup> A 1998 DOE Information Brief recognizes this critical role in the context of remedial decisions and discusses how land use assumptions can influence the importance of ecological risk in the decision making process.<sup>9</sup> The brief, however, is mainly concerned with the situation in which non-residential assumptions are not protective of ecological resources, thus resulting in more stringent remedial standards than would be required to protect and support ecological services if the land is managed for more limited and less environmentally stressful human uses. DOE does not address the situation in which land use assumptions (such as managing for wildlife values or limiting NRD) might actually call for less remediation in order not to disturb the ecological resources on the site.

Balancing short term versus long term health risks. The NCP, EPA's "Rules of Thumb,"<sup>10</sup> and the EPA Risk Assessment Guidance for Superfund (RAGS)<sup>11</sup> instructs risk assessors to evaluate long-term human health risks (residual risks) and short-term human health risks (risks that are associated with implementation of a remedial alternative) in selecting a remedy that will protect public health. Although risk managers are instructed to select the alternative that overall is most protective of human health, the documents do not provide any guidance for how to compare dissimilar risks, e.g. short-term versus long-term health risks, or risks to workers versus risks to the public.

Balancing among different ecological risks. EPA's Environmental Risk Assessment Guidance for Superfund (ERAGS) is mainly concerned with how to perform a risk assessment, but also contains a section addressed to risk managers.<sup>12</sup> The manager must

---

<sup>7</sup>See J. Burger, N. Tsipoura, M. Gochfeld and M. Greenberg, *Ecological Considerations for Evaluating Current Risk and Designing Long-Term Stewardship on Department of Energy Lands* (CRESP); Joanna Burger, *Use of Ecological Risk Data in the Development of Visions, Conceptual Site Models and Maps for Department of Energy Lands* (CRESP).

<sup>8</sup> See Joanna Burger et. al., supra note 4.

<sup>9</sup> U.S. Department of Energy, *Effects of Future Land Use Assumptions on Environmental Restoration Decision Making* (July 1998) [*hereinafter* Effects of Future Land Use].

<sup>10</sup> U.S. Environmental Protection Agency, *Rules of Thumb for Superfund Remedy Selection* 12-13, August 1997 (citing the Preamble for the 1990 NCP regulations and stating that it is appropriate to consider containment the appropriate remedy when treatment would "result in greater overall risk to human health and the environment due to risks posed to workers, the surrounding community or impacted ecosystems (to the degree that these risks cannot be otherwise addressed through implementation measures).").

<sup>11</sup> U.S. Environmental Protection Agency, *Risk Assessment Guidance for Superfund: Volume I— Human Health Evaluation Manual (Part C, Risk Evaluation of Remedial Alternatives)* 11-23, October 1991 (Interim).

<sup>12</sup> U.S. Environmental Protection Agency, *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting an Ecological Risk Assessment* 8-1-4 (June 1997) (Interim final).

balance between the ecological impacts of the release and the ecological impacts of the remedy, as well as between long-term and short-term risks. The ERAGS state that “the preferred remedy should minimize the long-term impacts that could result from the remedy,” including employing mitigation to offset damage caused by the remedy. A subsequent directive issued by EPA outlines six general principles for approaching ERA.<sup>13</sup> It suggests that managers consider whether a clean-up action will cause more ecological harm than the current site contamination, and provides several factors to be considered in making this determination. Neither this directive nor the ERAGS provide much guidance about *which* ecological receptor to prefer in a tradeoff situation. One potentially determinative factor is that both the NCP and the ERAGS state a preference for the alternative that minimizes long-term risks to ecological resources. Thus, if short-term harm will be caused to one receptor but long-term harm to another will be ameliorated by taking an action, the regulations and the ERAGS would favor taking the remedial action. The directive also requires EPA risk managers to consult with both the ecological risk assessor and the NRD trustees to determine the appropriate remedial action for the site. This points to the fact that, as a practical matter, the balance struck among different ecological receptors will depend substantially on stakeholders’ valuation of the respective receptors rather than a purely risk-based analysis. Thus, NRD trustees may value certain resources more than other, more threatened resources.

Balancing health versus ecological risks. Both the NCP and the Rules of Thumb suggest that harm to human health and the environment are to be given equal weight in risk balancing. The NCP demands protection of human health *and* the environment. The Rules of Thumb suggest that containment may be appropriate when the risk of ecological harm caused by treatment outweighs the risk to human health caused by leaving the contaminants in place.<sup>14</sup> However, the risk manager must keep in mind the NCP modifying factors of State and community acceptance, which may counsel against selection of a remedy which appears to reduce protection of human health in order to provide greater protection for ecological receptors. Also, ecological risk assessment in the CERCLA context is far less developed than the techniques for risk assessment and the decision-making framework for human health risks.<sup>15</sup> There are well developed and widely used quantitative measures of human health risk, and EPA has prescribed standard human health risk exposure tolerance levels. Ways of measuring and analyzing the state of ecological receptors are not standardized and are often site-specific. These differences, together with the lack of more specific guidance on how health-environmental risk tradeoffs are to be assessed and made, may lead decision makers to

---

<sup>13</sup> Stephen D. Luttig, Director, Office of Remediation and Response, EPA, Memorandum, Issuance of Final Guidance: Environmental Risk Assessment and Risk Management Principles for Superfund Sites 3-4 (October 1999).

<sup>14</sup> Rules of Thumb 12-13. (citing the Preamble for the 1990 NCP regulations). Thus it advises containment when “implementation of the treatment technology would have severe effects across environmental media.” It also advises managers to consider containment the appropriate remedy when treatment would “result in greater overall risk to human health and the environment due to risks posed to workers, the surrounding community or impacted ecosystems (to the degree that these risks cannot be otherwise addressed through implementation measures).”

<sup>15</sup> The RAGS were available by 1991; the ERAGS were not available until 1997.

give greater weight to human health-based risks because of greater familiarity and official direction.

Uncertainties in risk analysis and risk balancing. DOE developed its Streamlined Approach to Environmental Restoration (SAFER) policy with the assumption that uncertainty is always present in remediation activities.<sup>16</sup> Although SAFER contains the phrase “environmental restoration,” the approach is geared toward the RI/FS process in remediation decision making. SAFER’s goal of streamlining remediation involves acknowledging uncertainty and addressing it in one of two ways: reducing uncertainty through additional data collection or managing uncertainty through contingency planning. However, neither SAFER nor other EPA or DOE guidance specifically address how uncertainties are to be addressed in the context of balancing short terms versus long-term health risks, different categories of health risks, health versus ecological risks, or different types of environmental risks.

The need for improved risk analysis and risk-balancing techniques. In order to develop an appropriate framework for remedial decision making that examines all relevant risks on a consistent basis, it will be necessary to develop more systematic and coherent techniques to evaluate different categories of risks (different health risks, different environmental risks, short-term risks and long-term risks) and develop the data to support application of such techniques at specific sites. Ideally, one should construct an inclusive algorithm to assess and weigh these different risks in the context of remedial decisions. A “net benefits” approach that considers all risk tradeoffs systematically and in an integrated fashion will best promote overall protection of health and the environment.<sup>17</sup>

Conclusion. Current EPA and DOE regulations and guidance on CERCLA remediation provide sufficient flexibility to accommodate the land use management, remediation, and restoration strategy outlined in Section I of this memorandum. A more detailed examination of RODs and other evidence of practice at particular sites would be necessary to determine whether and how far precedent in support of or inconsistent with such a strategy can be found in remediation practice.

## B. Integrating NRD and Resource Management Goals in Remediation Decision Making

To implement the “modifying” role played by the NRD Trustees in remediation decision-making, the DOE’s 1997 policy directs heads of field organizations and program/project managers to do the following when planning response actions: 1) establish a mechanism for consultation with NRD trustees, early and often; 2) share data and perform integrated ecological risk assessment; 3) *select response actions that minimize/mitigate adverse impacts to natural resources*; 4) seek covenants not to sue from NRD trustees; and 5) make sure that any injuries to natural resources are specifically identified in the

---

<sup>16</sup> U.S. Department of Energy, Remedial Investigation/Feasibility Study Process, Elements and Techniques Submodule 7 (SAFER) (Dec. 1993).

<sup>17</sup>See Joanna Burger, Thomas M. Leschine, Michael Greenberg, James R. Karr, Michael Gochfeld and Charles W. Powers, Forum: Shifting Priorities at the Department of Energy’s Bomb Factories: Protecting Human and Ecological Health, Environmental Management, Volume 31, No. 2, pp. 157-167 (2003).

remediation ROD, including those identified in an EIS.<sup>18</sup> Similar to EPA's policy as stated above, DOE states a preference for addressing long-term ecological risks, particularly those that will result in increased NRD. DOE suggests consultation with NRD Trustees in balancing two or more long-term ecological risks.

DOE's SAFER decision-making framework emphasizes that stakeholders should be involved at all stages of remediation, including determining the acceptable level of uncertainty at the site and developing decision rules for action.<sup>19</sup> NRD Trustees are not only stakeholders in the process, they are also identified as potential members of the extended project team with decision-making authority.<sup>20</sup> Trustees' authority is emphasized particularly in their role in the ecological risk assessment.<sup>21</sup> An EPA directive counsels that no ecological risk management decision should be made without consultation with NRD Trustees.<sup>22</sup> Thus, NRD Trustees should be able to influence remediation decisions, including uncertainty management, to reflect concerns for residual damage and restoration of natural resources. For example, NRD Trustees should ensure that any contingency plan adequately considers the impact of the prescribed contingency plan action on natural resources.<sup>23</sup> The DOE has developed a Natural Resource Trustee Coordinators Steering Committee (NRTCSC) to implement the 1997 DOE policy "Integrating Natural Resource Concerns into Response Actions." The NRTCSC is comprised of DOE employees and "key support contractors who serve as technical points of contact" for trustees and NRDA issues.<sup>24</sup>

In addition to suitable institutional arrangements, analytic techniques and decision making frameworks need to be developed in order to integrate NRD considerations with remedy decision.<sup>25</sup> There is a need to ensure that remedies do not cause unnecessary or disproportionate resource injury, and that they be designed to facilitate restoration. Ideally, the decision algorithm for assessing and weighing different categories of health and environmental risks in connection with remedy selection should be expanded to include natural resource injuries caused by remediation and the implications of alternative restoration scenarios for NRD and for future land use strategies, including strategies to manage lands for ecological values.

---

<sup>18</sup> Alvin L. Alm, Assistant Secretary for Environmental Management, DOE, Memorandum, Policy on Integration of Natural Resources Concerns into Response Actions (Sept. 8, 1997).

<sup>19</sup> SAFER at 7-19.

<sup>20</sup> SAFER at 1-15.

<sup>21</sup> See SAFER at 2-63.

<sup>22</sup> Stephen D. Luttig, Director, Office of Remediation and Response, EPA, Memorandum, Issuance of Final Guidance: Environmental Risk Assessment and Risk Management Principles for Superfund Sites 5 (October 1999).

<sup>23</sup> Developing cost effective contingency plans to avoid potential for substantial injury to natural resources has been suggested as a strategy for DOD sites as well. See Daniel J. Sheehy and Susan F. Vik, *Natural Resource Damage Claims: Potential DOD Liabilities and Mitigation Opportunities*, FED. FACILITIES ENVTL. J. 17, 24 (Autumn, 2003).

<sup>24</sup> NRSTC maintains a website a <http://www.eh.doe.gov/oeпа/nrtcsc/index.html>.

<sup>25</sup> See CRESF documents cited Note XX supra.



Conclusion. Overall, risk managers balancing two human health risks are much more constrained by formal regulations and guidance than managers balancing between health risks and the environmental risks, or between two ecological receptors. However, the role of the extended project team, especially NRD Trustees, may as a practical matter constrain risk managers in risk balancing that involves environmental harms. Tugging in the other direction, States and communities may be more willing to accept environmental harm as the price for greater protection for human health, particularly when there is the chance of future recovery for NRD. Risk managers facing these difficult tradeoffs would benefit from more guidance on comparative risk balancing, including the development of an algorithm for comparing and balancing different types of risks. Such guidance should also address the role NRD Trustees and stakeholders, such as local communities, will have in making addressing risk characterization and balancing (e.g. what role should “perceived risk” and stakeholder education play in the decision-making process). The role of future land use decisions, and especially decisions to manage lands for ecological values, in making the different types of risk tradeoffs also deserves specific attention and development, including specifically in the treatment of uncertainty and in implementing the land use management, remediation, and restoration strategy outlined in Section I.

### **III. Natural Resources Damages**

This section of the memorandum provides an summary of NRD law and policy and discusses its application to and consistency with the long-term land use management, remediation, and restoration strategy outlined in Section I.

#### **Basic Principles of NRD Liability**

CERCLA provides that responsible parties (RPs) who are legally responsible under CERCLA for releases for hazardous substances are liable in damages to federal, state, or tribal trustees of natural resources for “injury to, destruction of, or loss” of natural resources “resulting from” such releases. The causation requirement for natural resource damages, which are based on injury to resources “resulting from . . . a release,” CERCLA § 107(a) (4) (C), is more robust than the causation requirement for recovery of response costs.

“Natural resources” are statutorily defined as “land, fish, wildlife, biota, air, water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by” a government or an Indian tribe. CERCLA § 101 (16). As this definition suggests, a government need not own the injured resources in order to recover damages under CERCLA. “Rather, a substantial degree of government regulation, management, or other form of control” is sufficient. *State of Ohio v. DOI*, 880 F.2d 432, 460 (D.C. Cir. 1989). Trustees must use damages recovered solely to “restore, replace, or acquire the equivalent of” the injured resources. Damages also include the “reasonable costs” incurred by trustees in assessing injury and damages. CERCLA § 107(a)(4)(C), (f)(1). Federal trustees may expend damage recoveries for restoration without further authorization or appropriation by Congress, freeing trustee agencies from the constraints of the regular budget process.

As authorized by CERCLA, the Department of Interior (DOI) has promulgated regulations to guide trustees in assessing natural resource damages. CERCLA § 301 (C). Trustee findings made pursuant to these regulations have “the force and effect of a rebuttable presumption on behalf of the trustee” in an action for NRD. CERCLA § 107(f) (2) (C); 43 C.F.R. §11. In reviewing the DOI NRDA regulations, the *Ohio* court held that damages must ordinarily be based on the cost of restoring the injured resource, rather than on the diminished value of the resource if that value is less than restoration cost. A trustee must first assess the natural resource damages resulting from a hazardous substance release by determining the nature and extent of injuries caused and developing a restoration plan, and then, if warranted, bring a damage action against those responsible.

Many states also have statutory provisions authorizing recovery or NRD and/or common law doctrines that state authorities have asserted in order to recover NRD.

#### Trusteeship; Scope of Potential State and Tribal NRD Claims Against DOE

NRD claims can only be asserted by natural resource trustees. Natural resources are defined as “land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by” the United States, a state, or a tribe. 42 USC § 9601(16). Trustees are federal, state and tribal agencies or other authorities that own, manage, regulate or otherwise control such resources.

DOE addressed the issue of trusteeship over natural resources on its facilities in a 1991 Trusteeship Report.<sup>26</sup> It noted that DOE plays multiple roles in NRD actions related to its facilities. It will frequently be the “lead agency” for remediation, a natural resource trustee, and a responsible party. As lead agency, DOE will perform or oversee the response action. E.O. 12580 established DOE as the federal trustee for “natural resources located on, over or under, land administered by DOE.” As natural resource trustee, DOE will be responsible, along with any co-trustees, for determining whether and to what extent natural resources under its trusteeship have been damaged. Other trusteeship interests on a DOE site may include other federal agencies which are trustees for particular natural resources. In such cases, DOE will be the primary federal trustee for resources on its facilities. At most DOE sites, state and tribal authorities will be the most important non-DOE trustees. DOE’s policy on integrating natural resource concerns into response actions, which provides guidance on fulfilling DOE’s multiple roles, “requires heads of field organizations and program and project managers to consider natural resource risk issues and, when appropriate, seek to resolve them with the other natural resource trustees, such as States and Tribes.”<sup>27</sup> The objectives in requiring such action “are to promote more complete consideration of the risks associated with cleanup

---

<sup>26</sup> DOE, Natural Resource Trusteeship and Ecological Evaluation for Environmental Restoration at Department of Energy Facilities (1991) (“1991 Trusteeship Report”).

<sup>27</sup> DOE, Policy on the Integration of Natural Resource Concerns into Response Actions (1997) (“1997 Policy”) at 1.

alternatives, lower the total life-cycle costs of the program, and minimize potential claims against the Department.” In regard to the last consideration, the potential for claims comes from state and tribal trustees.

The scope of trusteeship by states or tribes and the potential for their assertion of NRD claims requires an assessment of the basis of their trusteeship and its relation to specific DOE sites. Neither the CERCLA statute, nor the DOI NRDA regulations, nor court decisions provide clear answers to this question. The extent of state and tribal trusteeship in regard to natural resources on and around DOE facilities remains an unresolved legal question in many, if not most, instances. In a 1996 report to Congress estimating the potential liability of DOE for NRD, the GAO identified the extent of state and tribal trusteeship as an issue that “has not been clearly resolved” in many instances.<sup>28</sup> Following the GAO report, DOE issued a report to Congress estimating its potential liability.<sup>29</sup> This report noted the effect of unresolved trusteeship issues on its estimates, but did not build on the statements in GAO’s report.

Generally, state trusteeship attaches to “natural resources, including their supporting ecosystems, within the boundary of a state or belonging to, managed by, controlled by, or appertaining to such state.” 40 CFR §300.605. Tribal trusteeship includes resources and their supporting ecosystems “belonging to, managed by, controlled by, or appertaining to such Indian tribe, or held in trust for the benefit of such Indian tribe, or belonging to a member of such Indian tribe, if such resources are subject to a trust restriction on alienation.” 40 CFR §300.610. The particular resources under a state’s or a tribe’s trusteeship will vary in each case, as well the percentage interest that a state has when it serves as a co-trustee. Examples of resources subject to state trusteeship include: state forest lands; state-owned minerals; state parks and monuments; state rare, threatened, and endangered species; and state wildlife refuges and fish hatcheries. Examples of resources subject to tribal trusteeship include: Tribal-owned minerals; ground and surface water resources on Tribal lands; and any other natural resources found on Tribal land.<sup>30</sup>

The 1991 DOE Trusteeship Report 4, 18, noted that “trusteeship is not a function of geographical location, nor is it strictly tied to land ownership or land management. Natural resource trusteeship derives primarily from resource management responsibility, regardless of the geographic location of the resource.” In elaborating the scope of state trusteeship, the report explains that states retain sole trusteeship for natural resources “uniquely managed or protected under state law” even if they occur on a DOE site. It provides the example of a species protected under state endangered species law, but not federal law. According to the report, state and federal co-trusteeship exists for groundwater, fish and wildlife in most instances.

A 2003 district court opinion concerning NRD provides the most extensive and recent discussion of the division of CERCLA trusteeship at federal facilities. *Coeur D’Alene Tribe v. Asarco Inc.*, 280 F. Supp. 2d 1094 (D. Idaho 2003). The natural resources at

---

<sup>28</sup> GAO, Natural Resource Damages at DOE (1996) (GAO/RCED 96-206R) at 3, 15, 17.

<sup>29</sup> DOE, Estimate of Potential Natural Damage Liabilities at U.S. Department of Energy Sites (1997).

<sup>30</sup> EPA, Trust Resources webpage, [http://www.epa.gov/superfund/programs/nrd/trust\\_r.htm](http://www.epa.gov/superfund/programs/nrd/trust_r.htm).

issue in that case involved mining wastes deposited over a large area. The State of Idaho, the Coeur D'Alene Tribe, and the United States asserted trusteeship over the resources. The state had previously settled the case. The court discussed trusteeship mainly in the context of the defendants' assertion that the United States and the tribe were not trustees.

The court acknowledged that co-trusteeship is a common situation and that determining trusteeship involves questions of fact as well as law. It announced that “[t]he factual predicate of trusteeship [ ] is to be determined on a case by case basis depending on who the resource belongs to, who is it managed by, who controls the same and how the resource appertains to other resources.” *Id.* at 1115. The court then focused on which entity exercises “hands on day-to-day activities” regarding the resources at issue and specifically rejected an argument that mere statutory authority to manage resources establishes trusteeship. *Id.* Under this approach, apportioning trusteeship involves a case-by-case, fact-specific inquiry. The court then turned to issues of apportioning recovery, concluding that a party can only recover in proportion to its percentage of trusteeship. The court specifically rejected two arguments, one by the tribe and another by the United States, that trusteeship was based on whether the resources “appertain to” those entities. *Id.* at 1117. It found that tribal use of certain resources for cultural activities was insufficient to establish trusteeship. It also found an argument that trusteeship exists for “all resources on, under, over or associated with federal or tribal owned or administered land” to be too broad. *Id.* The court reserved findings on the trusteeship of water, groundwater, fish, wildlife, and biota until further hearings were conducted. In regard to land, however, it found that the United States is 100% trustee over federal land, the tribe is 100% trustee over tribal land, the state is 100% trustee over state land, and that the United States and the tribe have no trusteeship interest over privately owned land.

The decision in *New Mexico v. General Electric, Co.*, 335 F. Supp. 2d 1185 (D.N.M. 2004), is broadly consistent with the approach taken by the court in *Coeur d'Alene Tribe*. That case involved NRD claims by New Mexico for groundwater contamination based on New Mexico statutory nuisance and common law. The court found that the state had not established any ownership interest in the soils or minerals of the aquifer in question, and rejected its NRD claims for current injury to the aquifer resulting from its contamination, on the ground that the entire portion of the aquifer available for appropriation and use had been appropriated by private owners. It did, however, uphold the state's claims with respect to ground waters that had not yet been appropriated for private use, finding that the state acted as trustee for future appropriators and users of the water whose use might be impaired in the future if and when additional supplies might be available for appropriation. Compare *State ex rel. Brown v. Georgeoff*, 718 F. Supp. 413, (M.D.Pa. 1989), where the court upheld, in the context of motion to dismiss, the state's claim for injury to an aquifer underlying privately owned land.

Congress deliberately excluded rights of action for damage to privately owned resources from the scope of CERCLA. See *Ohio v. United States Dep't of the Interior*, 880 F.2d 432, 460 (D.C. Cir.), *reh'g denied, en banc*, 897 F.2d 1151 (D.C. Cir. 1989), *Artesian Water Co. v. New Castle County*, 851 F.2d 643, 644-45 (3d Cir. 1988). A private owner

presumably retains whatever causes of action for injury due to contamination that he is afforded under state law. Allowing trustees to also recover under CERCLA would sanction impermissible double recovery. It follows that to the extent that trustees do not have a legal interest in natural resources owned by third parties, trustees are unable to recover damages for injury to such resources.

In addressing the scope of trusteeship, DOI's 1988 NRD assessment rule merely tracked the statutory language. On review of the rule, the court in Ohio rejected the State and environmental petitioners' claim that CERCLA establishes liability for injuries to all resources within a state, even those privately owned. But it also recognized that trusteeship, and hence NRD liability, could extend to private resources: "If the words 'managed by, held in trust by, appertaining to, or otherwise controlled by' mean anything at all, they must refer to certain types of governmental (federal, state or local) interests in privately-owned property." 880 F. 2d at 460. The court remanded the issue to DOI for clarification, which was not forthcoming.

State laws may be important for determining the extent of state interest in particular resources, based on whether and the extent to which they may and have been appropriated by private parties. Private parties may gain significant property interests in surface and/or groundwater, depending on the law of the state. In *New Mexico v. General Electric, Co.*, for example, the court reasoned that New Mexico could not recover for damages to groundwater because of the extent to which the water had been appropriated for private use. See 335 F. Supp. 2d at 1215. Likewise, private parties may gain an interest in streambeds and sediments of navigable waters under the laws of some states. Non-navigable waters may be privately owned.<sup>31</sup> As noted above, private owners may not assert NRD claims under CERCLA. They may have claims under state law, but assertion of such claims against DOE and other federal agencies may be limited by sovereign immunity, as discussed below.

If the *Coeur D'Alene* opinion is followed by other courts, it is safe to say that the federally owned land will not be subject to state or tribal trusteeship. Analysis of the scope of potential state or tribal trusteeship over other resource on and around federal facilities will turn on actual management practices and, perhaps, consideration of tribal treaty rights. This will likely afford states a significant percentage of the trusteeship in fish, wildlife, other biota, and groundwater. Overall, the recent but limited precedent – *Coeur D'Alene* and *New Mexico* – reflects a somewhat restrictive approach to state trusteeship claims. Tribal trusteeship will likely be more limited, although tribal trusteeship may require a more complex analysis in situations where DOE activities have off-site impacts, for example, through groundwater contamination, on resources to which tribes have treaty rights. The extent of state and tribal trusteeship with respect to resources located on or under DOE sites or affected by DOE activities on those sites will require a detailed site-by-site analysis.

---

<sup>31</sup> This is the case in Arizona and Kansas, for example. See *West Maricopa Combine, Inc. v. Arizona Dep't of Water Res.*, 200 Ariz. 400, 408 (Ariz. Ct. App. 2001); *State ex rel. Meek v. Hays*, 246 Kan. 99 (1990); *Kregar v. Fogarty*, 78 Kan. 541, 549 (1908).

Recognizing the trusteeship of other entities, DOE has in a number of instances sought to involve them and reach a common understanding of their duties and responsibilities. *See e.g.* 1997 Policy. Perhaps the most important form of such involvement is the formation of site-specific trustee councils. *See e.g.*, GAO, Natural Resource Restoration Issues at DOE (1996, GAO/RCED 97-28R). Such councils, which have been established at sites such as Hanford in Washington and Oak Ridge in Tennessee, include state and tribal trustees. The councils work to integrate natural resources concerns (i.e., the concerns that underlie potential NRD suits) into remedial decision making and restoration planning, which may mitigate the potential for NRD actions against DOE by formally engaging potential claimants in these processes.

### Federal Sovereign Immunity Defenses to State and Tribal NRD Claims

CERCLA contains a waiver of federal government sovereign immunity for actions under the Act itself and a second, narrower waiver for the application of certain state laws to some federal facilities and government actions. 42 USC § 9620 (a)(1),(4). Courts have held that Congress waived federal sovereign immunity for NRD suits under CERCLA against federal agencies and other federal entities in most circumstances.<sup>32</sup> For suits under state laws involving NPL sites, however, there is no such waiver.<sup>33</sup> The scope of the waiver for non-NPL sites is somewhat less clear and whether state-law NRD actions could be maintained in this context is undecided.<sup>34</sup>

The one academic commentator who has examined it in depth concluded that sovereign immunity would provide a viable defense to NRD actions based on state law.<sup>35</sup> The vast majority of courts addressing the issue have determined that waiver of sovereign immunity for state law actions does not encompass facilities not currently owned or operated by the United States.<sup>36</sup>

### Limitations on Liability

CERCLA contains a number of provisions containing apparent limitations on NRD liability. These provisions, however, have been interpreted quite narrowly by the courts so that in practice they provide very little protection to defendants. For example, CERCLA provides that NRD recoveries are limited to \$50 million “for each release ... or incident involving release of a hazardous substance” unless the release resulted from willful misconduct or willful negligence or from a violation of federal safety or operating standards. 42 U.S.C. § 9607(c)(1)(D), (c)(2). The courts have interpreted this provision

---

<sup>32</sup> *United States v. Shell Oil Co.*, 294 F.3d 1045, 1053 (9<sup>th</sup> Cir. 2001); *See East Bay Mun. Util. Dist. v. United States Dep't of Commerce*, 330 U.S. App. D.C. 31, 142 F.3d 479, 482 (D.C. Cir. 1998); *FMC Corp. v. United States Dep't of Commerce*, 29 F.3d 833, 840-41 (3<sup>rd</sup> Cir. 1993).

<sup>33</sup> *Warminster Twp. Mun. Auth. v. United States*, 903 F. Supp. 847, 851 (1995).

<sup>34</sup> *See United States v. Pennsylvania Dep't of Env'tl. Resources*, 778 F. Supp. 1328 1330-32 (1991).

<sup>35</sup> Marc G. Laverdiere, *Natural Resource Damages: Temporary Sanctuary for Federal Sovereign Immunity*, 13 Va. Env'tl. L.J. 589, 636 (1994).

<sup>36</sup> *E.g.*, *Miami-Dade County v. United States*, 2003 U.S. Dist. LEXIS 23660 (S.D. Fl. 2003); *Robinson v. United States Cold Storage*, 2002 U.S. Dist. LEXIS 1784 (D. Del. 2002); *Wilson v. Squirrel*, 2001 U.S. Dist. LEXIS 913 (E.D. Pa. 2001).

to limit it to single spills or events of relatively short duration. They have held that it does not apply to the cumulative discharges of the same materials over a substantial period of time at a given site; in such cases, each instance of continued release has been deemed a separate “release . . . or incident” to which the \$50 million cap applies. *California v. Montrose Chem. Corp.*, 104 F. 3d 1507 (9th Cir. 1997).

Courts have also narrowly construed the CERCLA provisions that trustees cannot recover NRD for losses that were specifically identified in an environmental impact statement or environmental assessment or that were authorized by a federal permit. 42 U.S.C. §§ 9607(f)(1), (j). For example, the latter provision has been interpreted as not to apply to activity that occurred before the permit was issued. *Idaho v. Hanna Mining Co.*, 882 F. 2d 392 (9th Cir. 1989). In a nutshell, CERCLA has been interpreted to take a very narrow view of the circumstances in which natural resource damages were authorized by the federal government or were the result of a single release or incident.

Section 107(f) of CERCLA bars NRD claims if “such damages and the release of a hazardous substance for which such damages resulted have occurred wholly before December 11, 1980,” the date of CERCLA's enactment. The courts have held that natural resource injury occur when a trustee incurs restoration expenses or, alternatively, when the public suffers a loss of use or enjoyment (lost resource use services) or an impairment of non-use resource services based on preservation of resources in their uninjured state regardless of whether or not they are currently used by people.<sup>37</sup> If compensable “injury” is equated with trustee restoration expenditures, then trustees may recover for all such expenditures made after CERCLA's enactment, regardless of whether the releases or the impairment of use or non use services occurred prior to enactment, thus eviscerating the Section 107(f) limitation. If “injury” is equated with loss of use or non-use resource services, trustees may recover for all such losses occurring after CERCLA's enactment even if they were caused by the continuing effects of releases that occurred prior to its enactment, severely restricting the benefit of the limitation.

The remaining question in the analysis of 107(f) is whether, under the lost services approach to defining injury, trustees may recover for losses of services occurring before CERCLA's enactment. In addressing this last question, courts have divided on the interpretation of Section 107(f). One court held that it precludes recovery only to the extent that all releases ended before December 11, 1980, and no damages were suffered on or after that date as a result of such release,<sup>38</sup> a reading which would make preclusion of liability unavailable at DOE sites. Another court held that an RP can escape liability for injury occurring prior to 1980 if the RP can carry the burden of showing that the pre-1980 and post-1980 injuries are divisible and establishing the respective amounts of each.<sup>39</sup> Divisibility may, however, be difficult to prove where releases are ongoing and effects in the form of impairment of resource services are cumulative. A third court concluded, rather unhelpfully, that liability is not barred where releases occurred pre-

---

<sup>37</sup> The concepts of use and non-use services are discussed below.

<sup>38</sup> *United States v. Reilly Tar & Chemical Co.*, 546 F. Supp 1100, 1120 (D. Minn 1982).

<sup>39</sup> *In re Acushnet & New Bedford Harbor Proceedings re Alleged PCB Pollution*, 716 F. Supp. 676, 687-88 (D. Mass. 1989).

enactment but caused injury post-enactment.<sup>40</sup> The law is thus unclear on this point. It would be prudent for DOE to proceed on the assumption that it will be liable for all resource injuries due to pre-1980 releases unless it can make a very strong case for divisibility of injury by establishing which losses of use or non-use resource services occurred prior to CERCLA's enactment and which after.

#### Payment of NRD Judgments Against DOE

Must DOE pay any NRD out of its own appropriations? 31 U.S.C. §1304 establishes a permanent indefinite appropriation for payment of judgments against the United States that are 'not otherwise provided for.' A 1993 Comptroller General opinion directly addressed the question of using the Judgment Fund to pay liabilities of federal agencies resulting from judgments or settlements under CERCLA.<sup>41</sup> The opinion concludes that there is nothing in CERCLA or its legislative history that provides for payment from another source (such as agency appropriations) and, therefore, payment will normally be from the Judgment Fund, provided that the generally applicable criteria for use of the fund are satisfied and that payment is not otherwise provided for by statute. Based on the opinion, the generally applicable criteria are a final award, providing for monetary relief, made under one of several specified authorities (including provisions covering district court judgments, DOJ settlements, and Court of Federal Claims judgments), and that payment of the award is not otherwise provided for.

The normal context in which the Judgment Fund is used, however, is in the context where the United States is required by a judgment to pay monies to another party. As developed below, in many cases RPs discharge their NRD liabilities through restoration work which they carry out rather than monetary payments to trustees. Further, we are informed by knowledgeable former DOJ officials that in the past DOE appropriations bills have provided that monies expended on current remediation, including payments to DOE site operator/contractors for remedial work, are to be paid out of DOE appropriations. They are not aware of any such provisions with respect to NRD court judgments, including consent decrees, that resulted in an outright payment of monies to the states. If so, such judgments would be paid out of the Judgment Fund. Where restoration takes the form of on site work by DOE, even if pursuant to a court judgment, , it would be necessary to carefully distinguish such work from remediation work and closely examine applicable appropriations legislation to determine whether the costs of such work would be paid out of the Judgment Fund or out of the DOE appropriations.

#### Timing of NRD Claims by States and Tribes

Timing of NRD actions under CERCLA is governed by CERCLA § 113(g)(1). It provides that for any NPL facility or federal facility, no NRD action may be commenced until after 60 days notice of intent to file suit has been given to the President and the potentially responsible party. In addition, no action may be commenced "before selection

---

<sup>40</sup> Idaho v. Bunker Hill Co. 635 F. Supp. 665, 675 (D. Idaho 1986)>

<sup>41</sup> Matter of the Judgment Fund and Litigative Awards Under the Comprehensive Environmental Response, Compensation, and Liability Act, B-253179, 73 Comp. Gen. 46(1993).



of the remedial action if the President is diligently proceeding with a remedial investigation and feasibility study under section 9604(b) [§104(b)] or section 9620 [§120] (relating to Federal facilities).” Accordingly, therefore, DOE must receive 60 days notice prior to the filing of any CERCLA NRD action. Further, where a remedy has not been selected, but an investigation and feasibility study is underway, DOE cannot be subject to a CERCLA NRD action.

The ordinary statute of limitations for CERCLA NRD actions is three years from discovery of the loss. CERCLA §113(g) (1). However, for federal facilities and NPL sites, the period does not begin to run until completion of the remedial action, after which a suit must be brought within three years. In the case of tribal trustees, they must assert claims prior to the later of (a) the three-year period described above, or (b) two years after written notice from federal trustees to the Tribe governing body that they will not present a claim on the Tribe’s behalf. The timing of NRD claims by state trustees pursuant to State law of the specific state depends on the law.

### Settlements

Another timing element related to NRD concerns is raised by the possibility of settlements to resolve anticipated NRD claims before they are filed. Almost uniformly, NRD claims have sooner or later been settled rather than litigated. There is no legal barrier to settling potential CERCLA NRD actions before the claim is brought. In actions against private RPs, NRD claims are often settled together with response claims in a global agreement that may include covenants not to sue for NRD. In the case of claims brought by the federal government, settlements are ordinarily lodged with and entered by a federal court in the form of a consent decree. Because CERCLA bars claims until the selection of a remedial action in the case of major DOE sites, DOE may have a substantial opportunity to seek advance settlement during the process of remediation decision making. Experience indicates that NRD settlements have been promoted where RPs take a proactive approach to engage trustees in the remediation phase. As noted above, however, early engagement of trustees may also run the risk of alerting them to their potential NRD claims. Further, experience at large complex sites, such as the Fox River in Wisconsin, suggest that it may not be possible to settle NRD claims before the remedial action is selected because of the uncertainties and complexities presented.

Among the most important DOE settlement experiences has been at the Fernald site in Ohio. It was not an anticipatory settlement, as the state filed an NRD claim in 1986. Reaching agreement has been a slow process. In 2001, a trustee council established to reach final resolution signed a memorandum of understanding regarding how to work toward a solution.<sup>42</sup> Now trustee councils have been established at several DOE sites to address natural resources issues. As an alternative to attempting to settle NRD claims and obtain covenants not to sue during the remedial stage, DOE could choose to work with trustees to ensure that ecological issues are properly addressed in the RI/FS process

---

<sup>42</sup> See generally, Fernald Closure Project, at <http://www.fernald.gov/Future/flu.htm>.

and that the remedy selected will avoid a minimize injury to natural resources and facilitate restoration, postponing any effort to resolve potential NRD liabilities.<sup>43</sup>

The value of anticipatory action regarding potential NRD claims has been noted in the context of DOD sites. In a paper and conference presentation on opportunities for mitigation of NRD claims against DOD, several possible anticipatory measures were noted.<sup>44</sup> In particular, it was recommended that DOD identify and prioritize sites at risk of generating NRD claims, then assess the potential liability associated with priority sites through NRD-focused audits and baseline environmental studies. Further, the authors urged the value to DOD of negotiated settlements, which they noted would allow merging NRD concerns with remedial action negotiations and de-emphasize the NRD elements of the negotiation, as well as reducing negotiation and settlement costs overall. Although these advantages to settlement are discussed in the context of filed NRD claims, there is no reason these benefits of settlement could not be achieved or even enhanced by incorporating NRD settlement considerations into remedial decision-making and negotiations with state and tribal trustees.

As developed below, the NRDA process gives trustees considerable flexibility in shaping restoration packages that respond to local needs and priorities. This flexibility is further enhanced by the substantial discretion that parties customarily enjoy in settling claims. However, because trustees are acting on behalf of the public, their settlements of NRD claims is potentially vulnerable to legal challenge on the grounds that they are seriously inadequate or otherwise contrary to the public trust.<sup>45</sup>

### NRD Assessment and Valuation

To provide a basis for NRD claims, trustees conduct a damage assessment by determining the extent of injury and developing a plan for restoring, replacing, or acquiring the equivalent of the injured resources (recall that NRD recoveries must be spent exclusively for this purpose). In many cases, NRD assessments are conducted on a cooperative basis by RPs and trustees. RPs have an incentive to follow this approach in order to reduce assessment costs (for which they are liable) and have greater influence on the assessment.

---

<sup>43</sup> At the Oak Ridge site in Tennessee, DOE agreed in principle to set aside approximately 3,000 acres of land for conservation purposes and provide the state with a conservation easement. Since that agreement in late 2002, the state has held several hearings and otherwise worked to involve the public in decision-making regarding future land use. No information concerning a specific claim filed by Tennessee was found, and it is not clear that the agreement resolved any NRD claims. *See generally*, Advocates for the Oak Ridge Reservation (AFORR) website, at <http://www.kornet.org/aforr/>.

<sup>44</sup> Daniel J. Sheehy and Susan F. Vik, *Natural Resource Damage Claims: Liabilities and Mitigation Opportunities*, Federal Facilities Environmental Journal 17, 24-25 (Autumn 2003); their power point presentation from a 2003 conference is available at: <http://www.dtic.mil/ndia/2003environ/sheehy.pdf>.

<sup>45</sup> For example, in *Utah v. Kennecott Corp.*, 80 F. Supp. 553 (D. Utah 1992), the Salt Lake County Water Conservancy District successfully challenged as inadequate the State's settlement of NRD claims for contaminated ground water; the court refused to enter a consent decree lodged by the settling parties.

In the NRD assessment (NRDA) context, resources can be analyzed in terms of their physical properties or the services that they provide to humans (commercial products, recreation, etc.) and to other resources (habitat, nutrients, etc.). The DOI NRDA regulations refer to “resources and . . . services” as the basis for NRD, 43 C.F.R §§11.80-.81, although elsewhere they focus on services alone as the basis for quantifying injuries, 43 C.F.R § 11.71(a). Natural resource services are defined as the physical and biological functions performed by a resource, including the human uses of these functions. 43 C.F.R. § 11.14. Conceptualizing resources in services is the sounder approach, and is generally followed in NRD assessments. As a practical matter, an injured resource can never be returned to precisely its pre-injury physical state. Moreover, the statutory reference to “restoring, replacing or acquiring the equivalent” suggests that replacement or acquisition of the equivalent of injured resources is functionally equivalent to rehabilitating the actual resource suffering injury; the only way that such equivalency could be evaluated is through the services provided. The concept of services is also more consistent with valuation approaches, whether in terms of dollar amounts or resources that are functionally equivalent to those injured. Nonetheless, trustees occasionally assert NRD based on the mere presence on contamination in soil or groundwater.

The damages for which NRD can be sought include past losses and future losses pending completion of restoration. Under a resource services approach, injury from releases is conceptualized as a diminution in the level of services provided by the resource. Remediation will in most cases enable the injured resources to begin natural recovery. Restoration measures designed to rehabilitate the injured resource or replace some of the resources lost or injured at the same site (e.g., replanting of wetlands vegetation) can enhance or accelerate recovery. See the restoration scenarios developed in DOE’s 1995 NRDA for the Savannah River Site.<sup>46</sup>

To the extent that it is not possible to restore the pre-injury level of services at the injured site, trustees may acquire equivalent resources in the vicinity to compensate for the shortfall. Such measures to reinstate the service levels provided by the injured resource to baseline (the level of services that would be provided in one absence of hazardous substances releases) are termed (in NOAA’s discourse and frequent practice) primary restoration. Primary restoration (through one or a combination of these means) will, however, not make the public whole, because it has suffered losses in services from the onset of injury through to completion of restoration. In order to make up for these losses, trustees may acquire equivalent resources on either a temporary or permanent basis or “over restore” the injured site to provide a higher level of services than those provided pre-injury. This is termed compensatory restoration.

The elements of loss (both past and future) can be conceptually divided into lost use services to humans, and lost non use services. Trustees assert claims for both past and future lost use and non use values. Use services are the services provided by resources to support uses of a resource by humans, such as fishing or hiking to enjoy scenery. A number of economic valuation methodologies are available to measure these use values,

---

<sup>46</sup> U.S. Department of Energy, Natural Resource Damage Assessment Implementation Project: Savannah River Site (Oct. 1995) (Technical Assistance Project)

including market prices, appraisal value, travel cost method, and hedonic pricing. DOE acquisition and management has probably resulted at lower levels of public access to and use of site resources than would otherwise have been the case. This circumstance may enable DOE to reduce its NRD liability for lost use values, depending on how relevant baselines are determined (see discussion below). Non use services include those provided by resources to other natural resources such as plants or animals, insofar as these are not reflected in human uses; option value (the value to the public of the opportunity to use an uninjured resource in the future); and existence value (the value to the public of having the resource preserved in its uninjured state). Examples of the latter include the value that people would place on the option to visit and enjoy Prince William Sound in an uninjured state in the future, or the value that they place on the mere existence of an uninjured Sound regardless of any human use. The only established available economic valuation methodology for determining non-use values is contingent valuation methodology (CVM), in which individuals comprising a representative sample of the public are surveyed and asked how much they would be willing to pay to preserve etc. the resource in question.<sup>47</sup> The reliability of the CVM is much debated, and the concept of recovery for non use values (and especially past non use values) is disputed. Skeptics argue that the option and existence values concern the long run preservation and availability of a resource, which is fully satisfied by restoration.

Originally, CERCLA NRD assessments, consistent with the DOI NRDA regulations, sought to determine a dollar value for the various categories of losses. Practice, however, has shifted, under the influence of NRDA regulations issued by NOAA under the Oil Pollution Act and NOAA's Cooperative Assessment Program. The predominant approach today is to assess the lost resource services due to injury and then devise restoration plans which will provide the lost services (including those lost in the interim between injury and completion of primary restoration) through rehabilitation, replacement, or acquisition of equivalent resources. This approach of ecological rather than economic valuation requires use of techniques of resource service scaling and equivalency such as habitat equivalency methodologies.<sup>48</sup> Trustees' application of these techniques has created controversy, although the methodologies are gradually developing. One problem that remains when these resource-to-resource methods are used without putting an economic value on the injured and substitute resources is whether and how to apply the economic concept of discounting when the lost services from the injured resource and those provided by the substitute resources occur in different time periods.<sup>49</sup> Restoration

---

<sup>47</sup>See Josephine Faas and Michael Greenberg, Contingent Valuation of Natural Resource Damages: How might this technique be successfully employed in valuing the perceived damage to the snake river plain aquifer caused by the migration of contaminants from the DOE's INEEL Site? (CRESP Social and Economic Group, Rutgers University, Report 94, Initial Draft, December 9, 2004).

<sup>48</sup> See e.g., David Chapman, et al. Damage Assessment and Restoration Program, NOAA, Calculating Resource Compensation: An Application of the Service-to-Service Approach to the Blackbird Mine Hazardous Waste Site (Oct. 1998) (Technical Paper 97-1). Steve Hampton and Matthew Zafone, Calculating Compensatory Restoration in NRDA's: Recent Experience in California, prepared for the Proceedings of the 2002 California World Oceans Conference, Santa Barbara, CA, available at <http://www.dfg.ca.gov/ospr/organizational/scientific/nrda/CWO-REA-paper.pdf>.

<sup>49</sup> Damage Assessment and Restoration Program, NOAA, Discounting and the Treatment of Uncertainty in Natural Resource Damage Assessment (Feb. 1999) (Technical Paper 99-1), available at <http://www.darp.noaa.gov/library/pdf/discpdf2.pdf>.

planning must also confront uncertainties about site conditions, the impacts of past and future releases, future land uses, the efficacy and impacts of remediation measures, and the efficacy of restoration measures. Another problem is created by restoration measures that provide resources and services (“out of kind restoration”) that are different in kind than those injured.

The rather fledgling state of resource services-to-service restoration methodologies and approaches, and the data demands in applying them leave trustees, as a practical matter, with considerable discretion in determining what restoration packages will adequately restore the injured resource and compensate for interim losses.<sup>50</sup> The same is true of many economic valuation methodologies. This flexibility may be useful in reaching settlement with trustees or otherwise accommodating their interests and needs.

### Estimates of NRD at DOE Sites

In order to integrate NRD concerns into remediation decisions at DOE sites, there is a need to estimate the extent of natural resources injury for the specific site under consideration and develop valuations of the injury in the development restoration plans.<sup>51</sup>

In 1996, the GAO estimated likely NRD at DOE sites to be within the range of \$2.8 billion to \$13 billion, although it found that damages within the range of \$2.3 billion to \$20.5 billion were possible.<sup>52</sup> Because of the lack of filed NRD claims against DOE and the lack of detailed information regarding natural resources injury at DOE sites, GAO used experience with private settlements as its basis for estimating NRD at DOE. The report also relied heavily on DOE’s 1995 report estimating remedial costs and arrived at an NRD estimate by calculating a ratio of NRD to clean-up costs, which was then applied to DOE’s clean-up cost estimates. The range in potential damages estimate by GAO reflects several scenarios for remedial costs developed by DOE, as well as different clean-up cost/NRD ratios.<sup>53</sup> This method relies on the questionable assumption that the contamination and the dynamics of settlement negotiation at DOE sites are or will be the same as at non-DOE sites.

In 1997, DOE provided its own report concerning its potential NRD liability. While noting a large range of uncertainty, it estimated liability to be in the range of \$1.4 to \$2.5 billion. This was arrived at through a methodology similar to GAOs, but included consideration of its efforts to minimize NRD claims in the future through working with trustees. Following a discussion of its methodology in estimating NRD, the DOE report examines the limited experience with NRD issues on its sites. It noted that with the exception of some limited work at Hanford, there had been no effort to conduct NRDA or

---

<sup>50</sup> As a practical matter, economic methods for valuing NRD, especially for non-use values, also afford trustees wide flexibility.

<sup>51</sup> See Christine Danis and Henry Mayer, *Natural Resource Damage Assessments as Related to Department of Energy Site Clean up Concerns: A Preliminary Review*, (CRESP Report 93 – Revised, December 5, 2004).

<sup>52</sup> GAO, *Natural Resources Damage at DOE* (1996, GAOLRCED-96-206R) 2.

<sup>53</sup> *Id.* at 10-11.

preassessment screening of DOE sites by trustees.<sup>54</sup> The report discussed DOE efforts to address NRD concerns, including trusteeship councils established at several sites, which are designed to engage trustees in remedial decision making and thereby reduce the potential for NRD suits at those facilities.<sup>55</sup> However, these councils will not always lead to amicable solutions, as was demonstrated at the Hanford site where Oregon, Washington, and several tribes sought to compel DOE to perform an NRDA in the fall of 2004.

If DOE is to integrate NRD into decision making for remediation in a meaningful way that may permanently resolve significant NRD concerns, a more detailed site-by-site estimate of specific natural resource injuries and restoration strategies, taking into account alternative remedial and future land use scenarios, will be required.

#### NRD Credit for Ecological Benefits of DOE Site Acquisition and Management.

DOE may seek to offset its NRD liabilities by invoking and valuing environmental benefits associated with its acquisition and management of sites. A 1997 DOE policy memorandum states that heads of field organizations and project managers should take into account on-site environmental benefits provided by the Department's stewardship, such as enhanced biodiversity and habitat protection, when considering ways to offset or minimize liability for natural resource damages.<sup>56</sup> Analytically these benefits maybe grouped in three basic categories:

1. Past and future ecological benefits from DOE's acquisition of sites that had been used for environmentally damaging agriculture or that would have been developed in ways that would have caused environmental degradation had DOE not acquired them.
2. Past and future ecological benefits from DOE's creation of buffer zones and other undeveloped or cleared areas on its sites that it managed in ways that provide habitat and otherwise support ecological values.
3. Future ecological benefits that will be provided if DOE adopts land use, remediation, and restoration measures to manage sites for ecological values.

There are two basic ways in which DOE might seek to secure recognition of these benefits in the determination of NRD. It could seek credit for benefits of Types 1 and 2 in determining the extent of natural resource injury, including establishing the relevant baseline for injury determination. Alternatively, it could seek credit for benefits of Type 3, and possibly Types 1 and 2, in the context of restoration.

*Credit for environmental benefits in the determination of baselines and injury.* DOI's NRDA regulations define the NRDA baseline as follows: "'Baseline' means the

---

<sup>54</sup> 1997 rpt at 17.

<sup>55</sup> See *id.* at 19-21.

<sup>56</sup> Memorandum from Alvin L. Alm, Assistant Secretary for Environmental Management, DOE, Policy on Integration of Natural Resources Concerns into Response Actions (Sept. 8, 1997).

condition or conditions that would have existed at the assessment area had the discharge of oil or release of the hazardous substance under investigation not occurred.” 43 C.F.R. §11.14(e) (2004). The regulations further define “assessment area” as “the area or areas within which natural resources have been affected directly or indirectly by the discharge of oil or release of a hazardous substance and that serves as the geographic basis for the injury assessment.” 43 C.F.R. §11.14(c) (2004). Thus, the relevant baseline is the condition of the assessment area without the hazardous substance release. This approach to defining are baseline reflects a tort-like “but for” approach to determining injury and causation.<sup>57</sup>

Rigid use of a “without release” baseline would be inappropriate for DOE sites because it would disregard any Type 1 and Type 2 environmental benefits conferred by DOE’s acquisition and management of sites and provide an undeserved windfall to state and tribal trustees. The problem may be illustrated by a simple numerical example. Assume that the natural resource services that would be provided by the site if it had not been acquired and managed by DOE would be 100, that the Type 1 and Type 2 environmental benefits from DOE’s site acquisition and management (disregarding adverse effects of DOE’s site development activities and wastes) have increased services by 50; that DOE’s site development activities have caused a service’s reduction of 10; and that waste releases have caused a reduction in services of 50. Under a strict “but for” approach to determining the baseline, NRD would be based on the difference in service levels without the releases (140) and with the releases (90), yielding an injury of 50. It would, however, be logical and equitable to take into account all of the environmental effects of DOE’s site acquisition and management, positive as well as negative, in assessing NRD. This could be achieved by defining the baseline as the condition of the site without DOE (100), and comparing that to the site with DOE, including all positive and negative impacts (90), yielding NRD of 10.<sup>58</sup> The same result can be achieved by netting the environmental benefits conferred by DOE (50) against all of the environmental harms that it has caused (60), yielding net injury of 10.<sup>59</sup>

One way to approximate such a result would be to take as the baseline the service levels as of the time releases first occurred, rather than when service reductions occur. Such an interpretation of 43 C.F.R. §11.14(e) would, however, face two difficulties. First, that provision defines baseline as the condition that the resource “would” be in absent

---

<sup>57</sup> See *Idaho v. Bunker Hill Co.*, 635 F. Supp. 665 (D. Idaho 1986)(applying tort principles to determining NRD liability).

<sup>58</sup> The baseline is often established by comparing the assessment area to a control area. 43 C.F.R. §11.14(i) (2004). “‘Control area’ or ‘control resource’ means an area or resource unaffected by the discharge of oil or release of the hazardous substance under investigation. A control area or resource is selected for its comparability to the assessment area or resource and may be used for establishing the baseline condition and for comparison to injured resources.” 43 C.F.R. §11.14(i) (2004). The 1997 memorandum suggests that the value of DOE’s created environmental benefits (both past and current) be extracted from the relevant control areas, thus reducing the baseline and, consequently, the amount of damages.

<sup>59</sup> The example given in the text assumes that the environmental benefits of DOE acquisition and management are greater than the environmental detriments (other than releases) caused by DOE. If the reverse is true, then DOE would benefit by the approach based on a “but for” approach that compares the condition of the site with and without the effects of releases at the time that reductions in resource services due to releases occur.

releases, rather than the condition that it was in prior to releases. The conditional “would” implies a consideration of the resource at the relevant (later) time when injury in the form of service reductions has occurred relative to a baseline consisting of the condition of the site at the same time without the effects of the releases. Second, this approach would be contrary to basic tort principles. Consider a person who manifests a cancer caused by exposures beginning 20 years earlier. Damages would be based on the current and future condition of the individual without and with the cancer, not the person’s condition 20 years before versus his current and future condition with the cancer.

Although we have not found any precedent for such an approach in the context of NRD that would give credit for DOE’s environmental contributions, a recent important D.C. circuit decision establishes a requirement of considering both beneficial as well as adverse impacts of phenomena in the context of environmental regulation. In *American Trucking Ass’n v. Whitman*,<sup>60</sup> the D.C. Circuit held that EPA had acted illegally when, in setting national ambient air quality standards for ozone, it disregarded the environmental benefits of tropospheric ozone in blocking cancer-causing UV radiation and considered only the adverse effects of ozone on asthma and lung function. The court held that EPA must consider beneficial as well as adverse effects and determine the health risk posed by ozone on a net basis. The same principle is applicable here.

A 1995 DOE Technical Assistance Project report addressing integration of remediation and NRD at the Savannah River Site<sup>61</sup> discusses two possible baselines: 1954 (when DOE took over the site) or 1980 (when CERCLA went into effect). It states (p. 26) that the 1980 CERCLA baseline can be used when the pre-and post-CERCLA damages can be “readily distinguished” and suggests (see Tables 8 and 9, pp. 28, 30) that liability may be limited to resource service reductions due to releases occurring after 1980. The report also notes that SRS was agricultural land before DOE’s tenure, and much of it has reverted to native forest and swamp during DOE’s tenure (p. 16). The report also notes that the number of threatened and endangered species at the site has increased during DOE’s tenure, but does not address how this benefit should be factored into the NRDA.

The report’s invocation of a potential 1980 baseline is problematic on two grounds. First, the use of the baseline concept in relation to Section 107(f) and CERCLA’s enactment is erroneous. A baseline is a benchmark for determining whether and to what extent a change has occurred. In the context of CERCLA NRD, as noted above, the general benchmark for determining injury is the condition the resource would be in without releases. In Section 107(f), the 1980 enactment of CERCLA is not a baseline for determining injury but a reference point for limiting liabilities that would otherwise attach. Second, as previously discussed, this limitation applies, if at all, only to damages in the form of use and non use resource service reductions occurring prior to CERCLA’s

---

<sup>60</sup> 175 F. 2d 1027 (D.C.Cir. 1999). Other rulings by the court were reversed by the Supreme Court, 531 U.S. 457 (2001) but the government did not seek review of the court’s ruling on ozone risk netting.

<sup>61</sup> U.S. Department of Energy, Natural Resource Damage Assessment Implementation Project: Savannah River Site (Oct. 1995) (Technical Assistance Project).



enactment, where the RP carries the burden of establishing divisibility. DOE is fully liable for past-enactment losses due to pre-enactment releases.

The environmental benefits provided by DOE site acquisition and management and their application in determining injury and baselines must of course have to be developed on a site-by-site basis.

*Credit for Environmental Benefits in the Context of Restoration.* In pursuing a resource management strategy like that outlined in Section I, DOE would be engaging in measures to provide Type 3 environmental benefits by maintaining and enhancing the ecological values provided by undeveloped areas of sites. Developed areas might be converted into landscape forms that would also support such values, and steps taken to enhance development of habitat to support wildlife and reinstatement or development of other ecosystem functions. These land use and management measures, including LTS arrangements, would constitute restoration that would maintain and in many cases enhance the resource services provided by the site.

A question arises as to the appropriate services baseline for determining the enhancement of services provided by these Type 3 restoration activities. Take the numerical example developed above: pre-acquisition services are 100; past DOE acquisition and resource management activities increased services levels by a net of 40. DOE site development and releases reduced services levels by 50, so they are currently 90. If, as discussed above, the baseline for purposes of determining injury is set at 100, or if the past environmental benefits conferred by DOE are netted against reductions due to releases (leaving a net reduction of 10), then DOE would already have received full credit for the Type 1 and Type 2 benefits conferred, and it could not claim any credit for past benefits as restoration. In order to return services levels to baseline, primary restoration measures would have to be undertaken that would increase services by 10. In addition, compensatory restoration measures would have to be taken to provide services equivalent (in resource services/years) to the reduction in service levels below the baseline during the period between the onset of injury and the completion of primary restoration. This might be accomplished by enhancing services at the site injured to a level above baseline, and/or acquiring equivalent resource services in the vicinity

If DOE is not able to gain credit for past environmental benefits in the determination of the baseline or by netting these benefits against services reductions caused by releases, it could to claim credit for Type 1 and Type 2 benefits as an anticipatory restoration/mitigation measure on the part of DOE (similar to mitigation measures required in wetlands development or habitat conservation plans). While we have found no precedent for such a claim, there are strong reasons of policy and equity to support it. At the very least, these benefits and the associated equities in favor of DOE may provide a favorable basis for restoration planning and settlement negotiations.

Experience with the resolution of NRD claims at the Rocky Mountain Arsenal, where DODS has actively pursued a strategy of managing the site for ecological values, may provide some precedent on these questions.

## An Integrated Approach to Restoration Decision Making at DOE Sites

As discussed in Part II, under a strategy designed to manage significant portions of DOE sites on a long term basis for wildlife and other ecological values, it will be important to integrate remediation and NRDA and restoration planning. Remedial measures should be designed to maintain or help develop landscapes and ecosystem functions that will support ecological values and be consistent with restoration and long-term management strategy. Restoration planning should dovetail with this approach to remediation so as to ensure the greatest possible functional consistency between remediation and restoration and reduce the costs of both. It may, for example, be possible to devise landscaping and resource management measures that simultaneously address residual risks and promote environmental values.<sup>62</sup> Under this strategy, properly designed, robust, and adequately funded LTS measures would be a key component of both remediation and restoration.

In terms of decisionmaking frameworks, integration could best be achieved by developing a decisional algorithm that would include the different categories of short term and long term health and environmental risks to be addressed by remedies, the natural resource injury caused by remedial alternatives, and the consistency or inconsistency of alternative remedies with different options for primary and compensatory restoration. Such an algorithm would have to develop metrics for comparing these variables and techniques for addressing uncertainties and discounting issues.

In institutional and procedural terms, trusteeship councils for DOE's site provide a vehicle for consultation and coordination to involve trustees along with DOE, EPA, and state remedial authorities in developing agreement by all parties on a long term strategy for management of land uses, ecosystem functions, and the risks of residual contamination to protect human health and maintain and enhance the resource services provided by sites. The remedial design and the restoration plan should dovetail with this strategy and with each other. The trustees' views as to how sites should be managed, including suitable opportunities for public education and recreation, will be critical. To the extent that compensatory or even primary restoration requires acquisition of equivalent resources in the vicinity, trustees' views will also be critical in the selection and use of those resources.

### **IV. Conclusion**

This memorandum has discussed the legal and related policy issues presented by a DOE strategy option that would integrate NRD considerations and restoration planning in remediation decision making, with the objective (at appropriate sites) of managing sites

---

<sup>62</sup> See John J. Bascietto, Department of Energy, Integrating Natural Resource Concerns with DOE Clean UP, presented at Cooperative Natural Resource Damage Assessment and Restoration Workshop (June 9, 2004) (Power Point presentation), available at <http://darp.noaa.gov/partner/cap/pdf/CAPcleanup.pdf>, (providing example at DOE Fernald site of creation of wetlands in remediated soil "hot spots" to offset groundwater contamination).

for long-term habitat and other ecological values with corresponding land use and institutional controls to limit development activities and public access. Properly designed on the basis of a thorough site-by-site process of data collection and analysis, this strategy could protect public health, provide significant environmental benefits, and save the taxpayers money in terms both of remedial and restoration costs. The memorandum concludes that the CERCLA statute, current EPA and DOE regulations and guidance, and relevant judicial decisions provide DOE with considerable flexibility to pursue this option. There are no clear legal barriers to implementing this option. A more detailed examination of relevant remedial and restoration practice would be helpful in determining the extent to which such a strategy and its components would or would not be consistent with existing operational policy. It will, of course, be critical to convince EPA, state remedial authorities, and relevant resource trustees that the strategy is desirable and that DOE will implement it in a sound, effective, and durable fashion. It will also be important to devise ways to obtain appropriate regulatory recognition for the environmental benefits provided by EPA's acquisition and past as well as future management of sites.