

**GAO**

Report to the Chairman and Ranking  
Minority Member, Committee on Armed  
Services, U.S. Senate

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October 1998

# ENVIRONMENTAL CLEANUP

## DOD's Implementation of the Relative Risk Site Evaluation Process



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**National Security and  
International Affairs Division**

B-279582

October 7, 1998

The Honorable Strom Thurmond  
Chairman  
The Honorable Carl Levin  
Ranking Minority Member  
Committee on Armed Services  
United States Senate

The Department of Defense (DOD) uses a relative risk site evaluation process as part of its decision criteria to allocate about \$2 billion annually to clean up contaminated sites that pose the greatest risk to human health and the environment. DOD estimates that it will spend about \$27 billion to complete cleanup on contaminated sites from fiscal year 1998 to completion.

The Senate Report on the National Defense Authorization Act for Fiscal Year 1998 (Report 105-29, June 17, 1997) requires us to review DOD's relative risk site evaluation process. In response to that requirement, this report addresses (1) the extent to which DOD has issued uniform relative risk site evaluation guidance and the application of the guidance by the defense components and (2) whether the relative risk site evaluation process provided data that enabled the defense components to categorize sites and prioritize required work. This report complements the information previously provided to you on DOD's relative risk site evaluation process.<sup>1</sup>

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**Background**

DOD adopted the relative risk site evaluation process in 1994 to address inconsistencies in the evaluation methods it used to prioritize contaminated sites. The process is intended to provide defense components with a common methodology for assigning high, medium, and low relative risk categorizations at each potentially contaminated site on the basis of evaluations of water, soil, and sediments for their contamination levels; the likelihood of contaminant migration; and the presence of potential receptors such as humans, plants, and animals. In addition, DOD's relative risk site evaluation guidance requires that sites lacking sufficient information for a relative risk site evaluation be given a "not evaluated" designation, and provides that certain other sites do not

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<sup>1</sup>Environmental Protection: Information Used for Defense Environmental Management (GAO/NSIAD-97-135, June 11, 1997) and Environmental Cleanup: DOD's Relative Risk Process (GAO/NSIAD-98-79R, Feb. 26, 1998).

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require evaluation.<sup>2</sup> Not evaluated sites, sites that do not require evaluation, and sites with risk characterizations are reported in the Defense Environmental Restoration Program annual reports and budget justification exhibits provided to Congress.

Environmental remediation includes cleanup and other efforts aimed at reducing the risk to an acceptable level. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, serves as the statutory basis for the environmental remediation of contaminated sites. Under the act, the Environmental Protection Agency (EPA) ranks sites for inclusion on the National Priorities List on the basis of public health risks and other factors.<sup>3</sup> DOD's relative risk site evaluation process provides a tool for categorizing sites and sequencing priorities for cleanup on the basis of relative risk. In the relative risk site evaluation process, relative risk site evaluations are used only to screen and categorize sites and are not substitutes for baseline risk assessments.<sup>4</sup>

DOD has stated that the relative risk site evaluation process provides a quantifiable basis for justifying requirements and allocating funds. It has also stated that relative risk is only one of the priority-setting factors managers consider for programming and sequencing work at and across defense installations. Also important, according to DOD, are such things as program and economic evaluations and baseline risk assessments that managers may use to determine which sites should be worked on first in light of available resources.<sup>5</sup>

Since DOD's implementation of the process in 1994, Congress has raised questions about the relative risk site evaluation methodology. In

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<sup>2</sup>The guidance requires sites designated as not evaluated to be programmed for additional study, a removal action if warranted, or other appropriate response action, including deferral, before they are evaluated. DOD does not require relative risk site evaluations for sites that require only the removal of building demolition/debris or contain abandoned ordnance, have final cleanup remedies in place, or are designated as "response complete"—require no further cleanup action. A risk-based priority system is being developed for unexploded ordnance removal.

<sup>3</sup>The National Priorities List is the list of the nation's most heavily contaminated sites.

<sup>4</sup>DOD's 1997 updated Relative Risk Site Evaluation Primer and subsequent March 1998 guidance amplify this policy. Under the act, DOD performs comprehensive baseline risk assessments to identify potential exposure on receptors such as humans, and according to DOD, these assessments are used to justify decisions to clean up.

<sup>5</sup>DOD's March 1998 "Management Guidance for the Defense Environmental Restoration Program" details other management factors that may be considered in sequencing restoration requirements. These factors include, among other things, legal requirements; actual and anticipated funding availability; and acceptability of the action to regulators, tribes, and public stakeholders. DOD's primer describes the relative risk site evaluation process, and the Quality Assurance Plan defines objectives for relative risk site evaluation data as established by the Environmental Security office.

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September 1996, concerned that a high proportion of cleanup sites was justified as “high relative risk,” the House Committee on National Security requested that we review the relative risk process.<sup>6</sup> In June 1997, the Senate Committee on Armed Services questioned the credibility of DOD’s risk-based approach and the degree to which it facilitates the establishment of legitimate funding priorities. Because of this concern, the Committee directed DOD to define the elements of a relative risk site evaluation, develop uniform guidance for evaluations and ranking, and ensure consistent application of the guidance.

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## Results in Brief

DOD’s Environmental Security office provided guidance in August 1997 on its relative risk site evaluation process to defense components by updating its 1994 Relative Risk Site Evaluation Primer and publishing a Quality Assurance Plan. The principal change in the updated primer was to establish new, DOD-wide criteria for defining low-risk sites. Defense components are to provide site evaluation results to DOD semi-annually. The Environmental Security office issued the Quality Assurance Plan to help ensure the integrity of data that is reported to DOD managers and Congress. The plan requires defense components to ensure that data are credible, auditable, accountable, and consistent and to follow specific data verification and reporting procedures. For example, the plan requires defense components to review the process used to derive relative risk site evaluations for accuracy and consistency, and report the results to appropriate organizational elements.

DOD used the relative risk site evaluation process as one of several key factors for making site funding priority decisions. Our analysis of site evaluation data being reported by the defense components showed that over 99 percent of the reported categorizations were consistent with DOD’s criteria. However, while consistent with the criteria, we did note two categories that DOD identifies as high relative risk and evaluation not required, account for two-thirds of the sites and three-fourths of the estimated \$15 billion completion costs at the about 6,000 sites we analyzed. The high relative risk category contains 1,622 sites with an estimated \$9 billion cost to complete, and the evaluation not required category contains 2,584 sites, with an estimated \$2.2 billion cost to complete. Also, sites in the evaluation not required category may have high to low or no known levels of contamination, and costly long-term remedial actions or no anticipated costs. With so many sites in these categories, the

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<sup>6</sup>Environmental Protection: Information Used for Defense Environmental Management (GAO/NSIAD-97-135, June 11, 1997).

designations are not as helpful as they could be to managers as one of the key pieces of information they use in making cleanup priority decisions among competing projects. They are also not as helpful as they could be in assessing the status of sites not required to be evaluated. We found that officials at the installations we visited were differentiating further within the categories to aid in their decision-making processes.

## DOD Actions to Provide Uniform Guidance and Apply the Relative Risk Site Evaluation Process

DOD's Environmental Security office has taken steps to provide uniform relative risk site evaluation guidance to defense components. The office updated, in August 1997, its 1994 Relative Risk Site Evaluation Primer to establish new, agencywide criteria for categorizing low-risk sites. At that time, the office also published a new Quality Assurance Plan to help ensure data integrity in the application of the relative risk site evaluation process.<sup>7</sup> As a result of the updates to the primer and the establishment of the Quality Assurance Plan, defense components updated fiscal year 1996 and 1997 relative risk data. The updated data showed changes of pathway or receptor data, or changes of 20 percent or greater in reported contamination levels, for about 2,100 of the 6,000 sites considered in our review. Our analyses of data submitted for DOD's 1997 annual report showed that over 99 percent of the defense components' relative risk categorizations were consistent with the Environmental Security office's most recent criteria. DOD corrected the data for the other 1 percent (92 sites) where we found that categorizations were not consistent with the reported data. Officials from the Environmental Security office stated that they included the revised data in the current fiscal year 1997 annual report to Congress.<sup>8</sup>

About 1,600 of the 6,000 sites changed relative risk rankings from one year to the next because of changes in contamination data or site status and/or because of the establishment of a new threshold below which sites must be ranked as low relative risk. Table 1 shows the aggregate changes from fiscal year 1996 to 1997 that affected 1,637 of the 6,015 sites that were common to both years.

<sup>7</sup>DOD's primer describes the relative risk site evaluation process, and the Quality Assurance Plan defines objectives for relative risk site evaluation data as established by the Environmental Security office.

<sup>8</sup>In discussions with Environmental Security officials, they stated that the services and Environmental Security had discovered and corrected many, if not all, of the errors we had identified during DOD's quality assurance process.

**Table 1: Reported Changes in Site Evaluation Categories (fiscal years 1996-97)**

Category	Sept. 30, 1996	Sept. 30, 1997 <sup>a</sup>	1996-97	1996-97	1996-97
	Number of sites	Number of sites	Net change	Decreases	Increases
High	1,830	1,594	-236	443	207
Medium	626	674	48	218	266
Low	779	645	-134	369	235
Not evaluated	932	553	-379	506	127
Not required	1,848	2,549	701	101	802
<b>Total</b>	<b>6,015</b>	<b>6,015</b>	<b>0</b>	<b>1,637</b>	<b>1,637</b>

<sup>a</sup>At the time of our analysis, Environmental Security officials stated that they considered the data as draft input to the annual report to Congress on environmental restoration.

Note: This table does not include sites that the Environmental Security office removed from the fiscal year 1996 data or added to the fiscal year 1997 data. For the 97 high-cost installations in our review, DOD provided data on 6,088 sites for fiscal year 1996 and 6,279 sites for fiscal year 1997; 6,015 sites were common to both years.

## New Criteria for Low Relative Risk

In August 1997 Environmental Security officials revised the Relative Risk Site Evaluation Primer to provide more specific guidance for categorizing sites. The only substantive change to the primer was the addition of a requirement that media (water, soil, and sediment) with a numeric value called a “contaminant hazard factor” below 0.005 be assigned to the low relative risk category.<sup>9</sup> The Environmental Security office made this change to ensure that the defense components assign to the low relative risk category sites with reliable analytical data that are within measurement ranges normally found in noncontaminated areas surrounding a contamination site.<sup>10</sup> Although only five sites actually changed categories from fiscal year 1996 to 1997 as a result of the new criteria, media ranking changes that occurred from one year to the next show that the site data appeared to be consistent with DOD’s overall criteria for assigning relative risk categories.<sup>11</sup> For fiscal year 1997, DOD

<sup>9</sup>The contaminant hazard factor is a ratio that compares contamination levels with goals that DOD calls comparison values.

<sup>10</sup>Prior to the implementation of the revised primer, factors below 0.005 and within these measurement ranges could be categorized high or medium. Officials believe that assigning such a limit will help them to more accurately identify appropriate relative risk categories.

<sup>11</sup>We analyzed data reported to the Environmental Security office by the defense components after data were screened by Environmental Security officials. We verified relative risk site evaluation categories and supporting data only at the six locations we visited. In addition, defense components dropped some sites from their inventory, for example, Anniston Army Depot, one of the site locations we visited. Based on additional data, managers deleted this previously high risk site with an estimated cost to complete of \$118.5 million.

reported that 184 of 6,279 sites had contamination levels meeting the new criteria as low relative risk. Table 2 shows the five sites that changed categories.

**Table 2: Sites Where the Reported Overall Relative Risk Category Changed as a Result of New DOD Criteria in 1997**

Site	Fiscal year 1996 relative risk category	Fiscal year 1997 relative risk category
Underground Storage Site 00009, Marine Corps Air Station, Cherry Point, North Carolina	High	Low
Site 000005, Marine Corps Air Station, El Toro, California	Medium	Low
Site 000007, Naval Air Station, Moffett Field, California	High	Low
Site 00043, Naval Air Station, Patuxent River, Maryland	Medium	Low
Site 00048, Naval Coastal Station, Stockton, California	Medium	Low

Note: Our review of the reported data showed that the contamination levels for each of the five sites either did not change significantly from one year to the next or did not change at all.

**Relative Risk Categorizations Consistent With DOD Criteria**

Our review of data submitted for DOD’s 1997 annual report showed that over 99 percent of the defense components’ updated relative risk categorizations were consistent with the Environmental Security office’s most current criteria. Furthermore, before DOD published its most recent annual report to Congress, DOD corrected data for the 1 percent (92 sites) where we found that categorizations were not consistent with the reported data.

Specifically, our review of the reported data showed that 28 sites had contamination levels below DOD’s threshold for low relative risk but were categorized as medium or high relative risk. We brought these sites to the Environmental Security office’s attention during our review. Officials subsequently provided the final data for the sites in question, which revised data for 25 of the 28 sites and adjusted the relative risk evaluation categories for the remaining 3 sites. We also noted that another 67 sites had overall relative risk categories and/or individual media rankings that did not appear to be supported by the reported data. Of these, 61 had incorrect overall relative risk categorizations, and 6 appeared to have correct overall relative risk categorizations despite errors in supporting



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media rankings.<sup>12</sup> Environmental Security officials subsequently provided us with supplemental spreadsheets showing that the final data had been corrected by either changing the media or overall relative risk site evaluation categorizations.

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## Usefulness of Relative Risk Evaluation Process for Categorizing Sites

Our review of the reported fiscal year 1996 and 1997 relative risk evaluation data for over 6,000 sites shows that, with some minor exceptions, the relative risk site evaluation process enabled the defense components to categorize sites. However, two categories account for two-thirds of the sites and three-fourths of the estimated completion cost: the high relative risk category (1,622 sites with \$9 billion cost to complete) and evaluation not required category (2,584 sites with an estimated \$2.2 billion cost to complete). Having such a large number of sites in these two categories in comparison with the other categories, raises questions as to how useful the categorizations are to managers in assessing relative risks. We observed, however, that officials at the installations we visited were attempting to further differentiate within each of the two categories to aid in the decision-making process.

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## Wide Range of Characteristics in High Relative Risk Category

DOD's Relative Risk Site Evaluation Primer states that for all environmental media, three factors (contaminant hazard factor, migration pathway factor, and receptor factor) are used in determining a site's overall relative risk evaluation categories of high, medium, or low based on 27 possible different ways these factors can be related to each other. The high relative risk categorizations can be given based on a wide variety of characteristics; 8 out of 27 possible different combinations of contaminant levels, pathways, and receptors can be categorized as high, and the level of contamination can range from minimal to significant.<sup>13</sup> In fiscal year 1997, about 55 percent (1,622) of the 2,964 high, medium, and low relative risk sites fell in the high relative risk category.<sup>14</sup> These sites have an estimated cleanup completion cost of over \$9 billion of the reported \$15 billion total to complete cleanup at sites in all of the categories.

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<sup>12</sup>Defense components assign a ranking of high, medium or low to each affected media before assigning an overall relative risk categorization. In some cases, the supporting media rankings were inaccurate, but the overall relative risk categorization was correct.

<sup>13</sup>DOD defines contaminant hazard factors greater than 100 as "significant;" 2 to 100 as "moderate;" and less than 2 as "minimal." Our analysis showed that for the fiscal year 1997 sites categorized as high relative risk, the contaminant hazard factors for the four highest groundwater contamination sites were more than 3 million times greater than values for the four lowest sites.

<sup>14</sup>The 2,964 fiscal year 1997 relative risk site categorizations were as follows: high = 1,622; medium = 686; and low = 656.

Specific characteristics must be present for a site to be categorized high relative risk. Table 3 shows the eight combinations of the three factors that permit categorizing sites as high relative risk.

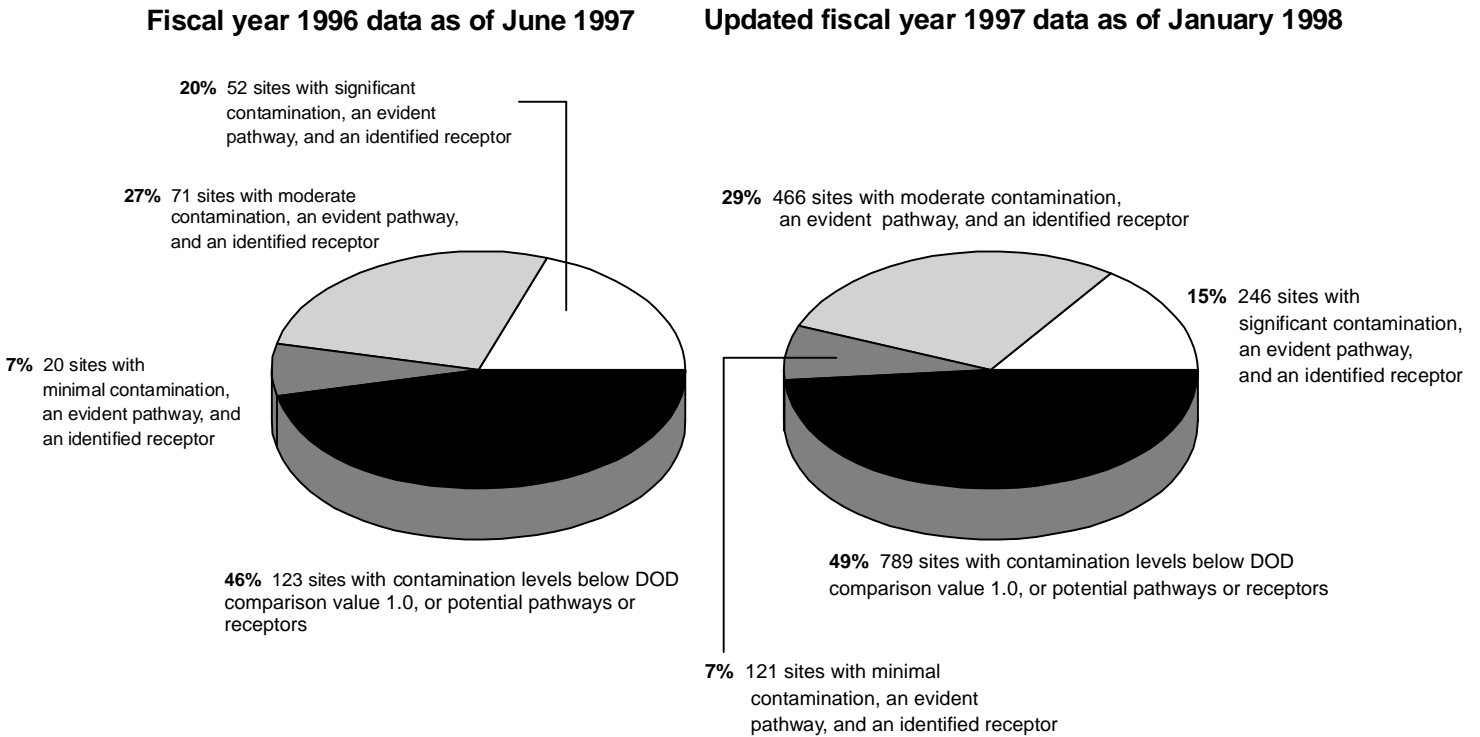
**Table 3: Combinations of Characteristics Required for the High Relative Risk Category**

Contamination <sup>a</sup>	Migration Pathway	Receptor
1. Significant	Evident	Identified
2. Significant	Evident	Potential
3. Significant	Potential	Identified
4. Significant	Potential	Potential
5. Moderate	Evident	Identified
6. Moderate	Evident	Potential
7. Moderate	Potential	Identified
8. Minimal	Evident	Identified

<sup>a</sup>Our report entitled Environmental Cleanup: DOD's Relative Risk Process (GAO/NSIAD-98-79R, Feb. 26, 1998) describes DOD's process for determining contamination levels.

Groupings of fiscal year 1997 high relative risk sites having similar reported characteristics of contamination, pathway, and receptor showed little change from our previously reported analyses. The major difference between our June 1997 analysis of 266 selected high relative risk sites and our current analysis of 1,622 fiscal year 1997 high relative risk sites was that the percentage of sites in the significant category fell from 20 percent to 15 percent. Sites in this category all had reported significant contamination, an evident pathway, and an identified receptor. In commenting on a draft of this report, DOD stated that these percentages indicate that the combination of relative risk and other management factors is working very well in sequencing requirements because the components are focusing their efforts on the high relative risk sites, and, within the high category, they are focusing on the sites with higher levels of contamination that also have evident pathways and identified receptors. Figure 1 shows that there has been little change in site categorizations between fiscal year 1996 and 1997.

Figure 1: DOD Sites With High Relative Risk



Source: Our analysis of high relative risk sites based on data provided by the Environmental Security office.

As shown in figure 1, we also reported in June 1997, that 54 percent of the high relative risk sites had significant, moderate, or minimal contamination with an evident pathway and identified receptor. DOD criteria require the categorization of sites to be evaluated based on available data. Forty-six percent of the high relative risk sites were first reported as having contamination levels that fell in EPA’s range of acceptable risk, or had pathways or receptors that were identified as

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potential although the available data were not reported.<sup>15</sup> This latter category increased to 49 percent for fiscal year 1997.

Finally, the high relative risk category, which is disproportionately large compared with the medium and low categories, contains contamination levels ranging from highly contaminated to minimally contaminated. To make this large category more meaningful, installation managers have ranked further within the category. They told us they found the additional differentiation useful in making management and assessment decisions.

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### Range of Characteristics in Evaluation Not Required Category

DOD's Primer also specifies the circumstances under which site evaluations are not required and permits a range within the evaluation not required category as to what can be included. The category can include sites that range from little or no contamination to sites with high levels of contamination. The sites may require costly long-term cleanup actions or less costly monitoring, continued expenditures under other programs, or no anticipated costs. DOD officials stated the category is one of the ways DOD defines success in the restoration program. They stated that they expect this category to grow as final remedies are put in place and the only funding requirements left, if any, are for remedial action operations or long-term monitoring. The evaluation not required category accounted for 41 percent of all five site evaluation categories for fiscal year 1997.<sup>16</sup>

Continued remediation can be costly, involving millions of dollars over long periods of time. A recent Army study on the effectiveness of soil remediation programs and groundwater treatment systems noted that some of the systems "appear to have an indefinite operational lifetime with no known or estimated target date for completion of remediation."<sup>17</sup> Annual costs for the operation and maintenance of Army remediation systems are approximately \$60 million. One remediation system at the Twin Cities Army Ammunition Plant, Minnesota, is planned to operate through the year 2080 at a total estimated cost of over \$300 million.

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<sup>15</sup>These include contamination levels with a DOD comparison value below 1.0. In commenting on a draft of this report, DOD stated some, but not all, of its comparison values are based on EPA's Preliminary Remediation Goals. For carcinogens, DOD stated that its comparison values are 100 times the corresponding remediation goal value.

<sup>16</sup>The five categories include high, medium, low, not evaluated, and evaluation not required. For fiscal year 1997, 2,584 sites were categorized as evaluation not required. The evaluation not required category also accounted for nearly 78 percent of those sites categorized as either not evaluated or evaluation not required.

<sup>17</sup>Evaluation of the Effectiveness of Existing Soil Remediation Programs and Groundwater Treatment Systems in the U.S. Army, U.S. Army Science Board Infrastructure and Environment Issue Group (Jan. 1998).

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Our analysis of fiscal year 1997 evaluation not required sites showed that

- At Bangor Naval Submarine Base, Washington, one of two sites that fall under the evaluation not required category has implemented a long-term “pump and treat” remedial action; the other site contains high levels of contamination requiring regulators to agree on future actions. The “pump and treat” remedial action is part of an estimated \$26.7 million remediation effort that is not immediately evident in the reported data. DOD’s annual report to Congress shows one evaluation not required site, but provides no data on continued associated estimated costs.
- At Camp LeJeune, North Carolina, a burn area site was found to require no further action after a remedial investigation was completed in 1996. Subsequently, the relative risk ranking was changed from high to evaluation not required. The site had previously been listed as high due to the presence of previously detected contaminants, which were not present during the remedial investigation. Additionally, within the underground storage tank program, two sites had been ranked as low and medium risk, respectively. After corrective action plans were completed, Camp LeJeune officials discovered that existing groundwater contamination at both sites contained chlorinated solvents and should be handled under a separate program. Therefore, the sites were administratively closed out under the underground storage tank program (listed as response complete), the cost to complete reduced to zero, and the relative risk changed to evaluation not required. These sites were then transferred to the installation restoration program to address groundwater contamination with the relative risk listed as high and medium, respectively. The combined cost to address groundwater contamination is estimated at \$13.3 million.
- At Norton Air Force Base, California, one site has begun remedial action that will include about 10 to 15 years of long-term operations and monitoring at an estimated cost of \$17 million. Another site plans to excavate about 5,000 tons of soil. At the time of this report, officials had not yet estimated completion costs.

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## Reporting of “Evaluation Not Required” Category

DOD’s annual environmental restoration report to Congress and attachments to the fiscal year 1998-99 budget submission include status information on relative risk sites that have been evaluated. But, for evaluation not required sites, the range of site characteristics is not easily distinguishable: the documents do not disclose associated ongoing or completion cost estimates, or which sites have ongoing long-term

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monitoring or operations.<sup>18</sup> For example, the latest report to Congress for fiscal year 1997 separately identifies 17,124 sites considered to be evaluation not required, of which over 15,000 are response complete.<sup>19</sup> But the report also separately identifies 3,177 sites that are in or planned for long-term operations without indicating how this information applies to the evaluation not required sites. DOD reported that such sites cost \$172 million in planned execution for fiscal year 1998. We believe that such an investment warrants identifying which evaluation not required sites are affected, and at what cost.

Appendix I illustrates the range of site characteristics on evaluation not required sites for three installations we visited.

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## Conclusion

DOD has taken actions that, if implemented properly, should improve the accuracy and consistency of information resulting from relative risk site evaluations. DOD is updating data in accordance with the Relative Risk Site Evaluation Primer and the Quality Assurance Plan. However, the current site categorizations are not as helpful as they could be to managers in making priority decisions among competing projects, or evident to Congress in the annual reports. The criteria used for determining whether a site is high relative risk are overly broad and the evaluation not required category contains sites with a range of characteristics that isn't easily evident in reviewing the annual environmental restoration report.

As the process works now, for example, a site with potential risk to humans can receive the same priority as a site with actual risk to humans. Similarly, an evaluation not required site with no contamination or remediation costs is grouped for reporting with contaminated sites with years of operational costs to remediate. Given that DOD uses these categories to define success in its restoration program, it would seem appropriate to separately identify, for example, the highest relative risk sites in the annual report, and to identify whether the "evaluation not required" sites have long-term monitoring or operations, along with their associated costs.

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<sup>18</sup>Also, the annual report differentiates evaluation not required sites "in progress" from sites with response complete.

<sup>19</sup>As reported in "DOD Summary Status" table B-6, for DOD installations and formerly used defense sites.

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## Recommendation

To assist managers in making priority decisions in the relative risk site evaluation process, we recommend the Secretary of Defense direct the Deputy Under Secretary of Defense for Environmental Security and/or service components to provide more specific categories that aid in priority setting and in the accurate reporting of the status of sites.

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## Agency Comments and Our Evaluation

In commenting on a draft of this report, DOD stated that it does not concur with our recommendation. It stated that the relative risk tool was never intended to differentiate precisely among sites or risk levels and that it is used in conjunction with a number of other factors to determine the priority of a site for funding. Consequently, it does not believe our recommendation would necessarily help managers make better decisions. DOD stated that flexibility in decision making about project sequencing may be lost if managers are required to address the top category of high relative risk sites first. Further, it stated that subdividing the evaluation not required category would also not improve management or oversight for sites in this group that have final remedies in place or have completed response actions. DOD stated that restoration activities at these sites are limited to remedial action operations and long-term monitoring, which it treats as non-discretionary cost commitments, not subject to prioritization. DOD stated that regulatory agencies and the public would be incensed if it delayed action at remedial sites in the evaluation not required category based on a presumed priority, rather than fulfill its commitments. Finally, DOD stated that implementing our recommendation would not benefit DOD's program but would actually be detrimental because it would require a reclassification of existing sites causing restructuring and expansion of programming and budgeting data.

We continue to believe that implementing our recommendation would be a useful aid in program management and congressional oversight. As we pointed out in our report, officials at installations we visited are already differentiating further within the categories to aid them in their decision-making process. We added information to our report to make it clear that relative risk is only one of a number of available factors. However, the remainder of DOD's position does not accurately characterize our recommendation. The intent of our recommendation is to provide more specific relative risk categories, and would not limit flexibility, since neither the current system nor our recommendation requires sites to be funded strictly in relative risk order. Also, our recommendation does not suggest the interruption or delaying of remedial actions. Such actions, if taken, would be a natural part of the decision-making process. Finally, we

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recognize that the recommendation could result in sites being reclassified, but it would not necessitate delays. Reclassification is a normal part of the relative risk site evaluation process and is provided for in DOD program guidance. For example, as noted in our report, 1,637 of 6,015 sites changed categories from 1996 to 1997.

DOD also suggested technical comments which we incorporated where appropriate. DOD's comments and our detailed evaluation are included in appendix II.

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## Scope and Methodology

To determine the extent to which DOD has issued uniform relative risk site evaluation guidance to defense components, we interviewed and reviewed policy and procedural documents from officials at DOD's Office of the Deputy Under Secretary of Defense for Environmental Security; the Army, Navy, Air Force, and Defense Logistics Agency headquarters; and selected defense component field offices. To address how defense installations applied the relative risk site evaluation process, we visited and obtained information from officials at DOD's Office of the Deputy Under Secretary of Defense for Environmental Security and selected defense component field offices. We also requested and analyzed fiscal year 1996-97 data on over 6,000 sites for 97 high-cost installations identified in our June 1997 report. The high-cost installations identified in our June 1997 report were reported in DOD's fiscal year 1995 annual report to Congress. Each installation accounted for more than \$20 million of planned funding during fiscal years 1996-98 or more than \$100 million of projected costs from 1996 to completion.

To determine whether the relative risk site evaluation process provided data that enabled the defense components to categorize sites and prioritize work, we analyzed the fiscal year 1996-97 data on the over 6,000 sites for the 97 high-cost installations identified in our June 1997 report. DOD extracted the data, which are input from the defense components, from the environmental Resource Management Information System database. The data were provided to us incrementally from November 1997 to January 1998. We relied on the accuracy of DOD and service data in conducting our analysis and selectively verified contamination data for specific projects but did not verify overall database accuracy. We did not assess installation judgments regarding pathways and receptors of individual sites. We visited and/or obtained information on the relative risk site evaluation process at the following military installations, which



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included installations in addition to the 97 high-cost installations just identified:

**Army**

Anniston Army Depot, Alabama

**Navy**

Engineering Field Activity, Northwest, Naval Facilities Engineering Command, Bangor Submarine Base, Washington  
U.S. Marine Corps, Camp LeJeune, North Carolina

**Air Force**

Kirtland Air Force Base, New Mexico  
Norton Air Force Base, California  
Tinker Air Force Base, Oklahoma

For this report, we analyzed reported data before (fiscal year 1996) and after (fiscal year 1997) DOD's quality control updates for all of the over 6,000 sites at the 97 high-cost installations considered in our June 1997 report. The sites account for about \$15 billion of DOD's estimated total remaining cleanup costs of \$27 billion.<sup>20</sup>

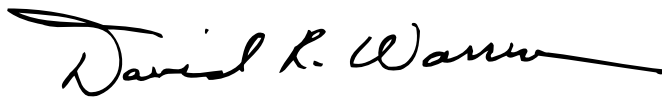
We conducted our analysis from November 1997 to May 1998 in accordance with generally accepted government auditing standards.

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<sup>20</sup>Cost estimates in DOD's database are reported for individual sites at an installation. Although we could not verify the estimates for each site, we noted that the total estimates for each installation generally agreed with the totals reported in DOD's fiscal year 1996 annual report to Congress.

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We are sending copies of this report to other appropriate congressional committees; the Secretaries of Defense, the Army, the Navy, and the Air Force; the Commandant, U.S. Marine Corps; and the Directors, Office of Management and Budget and Defense Logistics Agency. We will also make copies available to others on request.

A handwritten signature in black ink that reads "David R. Warren". The signature is written in a cursive style with a long horizontal flourish at the end.

David R. Warren, Director  
Defense Management Issues

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## Abbreviations

DOD	Department of Defense
EPA	Environmental Protection Agency

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# Characteristics of Sites Designated Evaluation Not Required at Three Installations

Site	Relative risk category		Status
	Fiscal year 1996	Fiscal year 1997	
Bangor 00204	H	R	Remedial actions implemented; in long-term operation
Bangor 00025	H	R	Remedial actions implemented; long-term monitoring
Norton WT007	R	R	Final decision document issued; no further response action required
Norton S1011	R	R	Final decision document issued; no further response action required
Norton TU015	R	R	Final decision document issued; no further response action required
Norton SS018	R	R	Final decision document issued; no further response action required
Norton SP009	R	R	Final closure report issued
Norton WR020	R	R	Final basewide radionuclide characterization report issued; no further actions anticipated
Norton CG097	R	R	Remedial action implemented; 10-15 years long-term operations and monitoring anticipated
Norton DA096	R	R	Closure report issued; remedial action complete; long-term monitoring required
Norton DP003	R	R	No further response action decision document signed
Norton DP004	R	R	No further response action decision document signed
Norton ID022	R	R	Final closure report issued; no removal action required
Norton AOC	N	R	Remedial actions implemented; closure report in regulatory review
Norton SA017	N	R	Remedial actions implemented; long-term monitoring
Norton DP012	N	R	Deed restriction placed on the use of contaminated parcels
Norton LF010	N	R	Deed restriction placed on the use of contaminated parcels
Norton SS008	H	R	Remedial actions implemented; site closed
Norton SI001	H	R	Remedial actions implemented; long-term monitoring
Norton AT005	H	R	Remedial actions implemented; additional excavation planned
Norton DP014	H	R	Final closure report issued; removal action complete
Norton WT013	H	R	Final closure report issued; removal action complete
Norton SA019	L	R	Remedial actions implemented—deed restriction
Norton TV021	N	R	Final closure report prepared; additional contamination detected
Norton S1016	N	R	Remedial actions implemented; long-term monitoring
LeJeune UST 000047	M	R	Corrective action plans completed; continuing work under installation restoration program as site 00091

(continued)

**Appendix I  
 Characteristics of Sites Designated  
 Evaluation Not Required at Three  
 Installations**

Site	Relative risk category		Status
	Fiscal year 1996	Fiscal year 1997	
LeJeune UST 000023	L	R	Corrective action plans completed; CERCLA investigation is underway under a separate installation restoration program; site name changed to site 00073 <sup>a</sup>
LeJeune 00016	H	R	Remedial investigation completed and record of decision signed; no further action required

Note: Categories are as reported by DOD's Environmental Security office—H=high relative risk; L=low relative risk; R=not required; and N=not evaluated.

<sup>a</sup>LeJeune site 00073, with an estimated completion cost of \$11.3 million, is also reported in DOD's fiscal year 1997 data as a high relative risk site.

# Comments From the Department of Defense

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



ACQUISITION AND TECHNOLOGY

## OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3000

0 4 SEP 1998

Mr. David R. Warren  
Director, Defense Management Issues  
National Security and International Affairs Division  
U.S. General Accounting Office  
Washington, D.C. 20548

Dear Mr. Warren:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "ENVIRONMENTAL CLEANUP: DoD's Implementation of the Relative Risk Site Evaluation Process," dated August 3, 1998 (GAO Code 709320/OSD Case 1664).

As indicated in the DoD's oral comments to the draft report, the Department does not concur with the recommendation that the DoD provide more specific categories for the "high" relative risk and "evaluation not required" categories included in the Relative Risk Site Evaluation (RRSE) Framework. GAO asserts that this would aid priority setting and more accurate reporting of the status of sites.

Relative risk is a tool designed to allow managers to place sites in three broad categories of "high", "medium" and "low." It was never intended to differentiate precisely among sites or risk levels. The results of relative risk site evaluations are used in conjunction with statutory and regulatory status of a particular installation or site, program goals, public stakeholder concerns, and economic factors to determine the priority of a site for funding. Consequently, attempting to subdivide the "high" category, as GAO recommends, would not necessarily help managers make better decisions.

Likewise, subdividing the "evaluation not required" category would also not improve management or oversight of the sites in this group that have final remedies in place or have completed response actions. Restoration activities at these sites are limited to "remedial action operations" and "long-term monitoring", which DoD treats as non-discretionary cost commitments, not subject to prioritization. It is DoD's view that neither the Comprehensive Environmental Response, Compensation and Liability Act nor the National Contingency Plan contemplated interruption of a selected remedial action until the goals for the remedial action are achieved. Regulatory agencies and communities expect that remedial actions will operate continuously until cleanup goals are achieved. Suspending operations would undermine DoD's relationship with surrounding communities and erode our relationship with regulators.

*Environmental Security*  *Defending Our Future*

See p. 13.

See comment 1.

See comment 2.

See comment 3.

See comment 4.



**Appendix II**  
**Comments From the Department of Defense**

See comment 5.

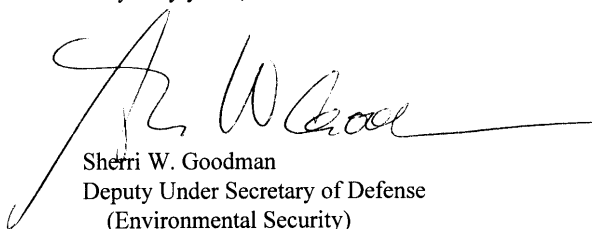
See comment 6.

See comment 4.

Implementing this recommendation would not benefit DoD's program, but would actually be detrimental. For example, once new criteria for the categories were established, sites would have to be re-classified. Programming and budgeting data would have to be restructured and expanded, and new program goals and guidance would have to be developed. More importantly, flexibility in decision making about sequencing of projects may be lost if managers are required to address the top category of high relative risk sites first, rather than being allowed to factor other management considerations into the decision process. Regulatory agencies and the public would be incensed if DoD delayed action at remedial sites in the "evaluation not required" category based on a presumed priority, rather than fulfilled its commitments. In summary, GAO's recommendation would have a disruptive effect on a mature program that is well on its way to meeting Defense Planning Guidance and other established goals.

More detailed comments are enclosed.

Very truly yours,



Sherri W. Goodman  
Deputy Under Secretary of Defense  
(Environmental Security)

Enclosures

GAO DRAFT REPORT - DATED AUGUST 3, 1998  
(GAO CODE 709320) OSD CASE 1664

“ENVIRONMENTAL CLEANUP: DoD’s Implementation of the Relative  
Risk Site Evaluation Process”

RECOMMENDATION

**RECOMMENDATION:** To assist managers in making priority decisions in the relative risk site evaluation process, the GAO recommended that the Secretary of Defense direct the Deputy Under Secretary of Defense for Environmental Security and/or service components to provide more specific categories that aid priority setting and more accurate reporting of the status of sites.

**DoD Response:** Nonconcur. DoD believes that this recommendation reflects a basic misunderstanding on GAO’s part as to how the relative risk site evaluation framework is used by DoD. The actual funding priority for a site is determined after relative risk site evaluation results are combined with other important considerations (e.g. statutory and regulatory status of a particular installation or site, program execution considerations, public stakeholder concerns and economic factors). In that relative risk is not the sole consideration, subdividing the “high” category and expanding the applicability of relative risk to “remedial action operations” and “long term monitoring” requirements now in the “evaluation not required” category would not help managers made better decisions. In fact, it would limit the flexibility of managers to sequence projects and have other detrimental effects on the program such as delaying remedial action (assuming that DoD has the authority to prioritize remedial action operations and long term monitoring requirements), requiring programming and budget data restructuring and additional data collection, upsetting an effective system for identifying requirements, and disrupting a mature program that is well on its way to meeting Defense Planning Guidance and other goals.

Attachment to Memo—GAO  
Draft Report—OSD Case 1664  
Page 1 of 1

See p. 13.

See comment 7.

GAO DRAFT REPORT - DATED AUGUST 3, 1998  
(GAO CODE 709320) OSD CASE 1664

“ENVIRONMENTAL CLEANUP: DoD’s Implementation of the Relative  
Risk Site Evaluation Process”

Detailed Comments

1. Page 1, “**INTRODUCTION**”

**First sentence.** Insert the following after sentence, from p. 3, line 7: “DoD estimates it will spend about \$27 billion to complete cleanup on contaminated sites beginning in fiscal year 1998, including annual estimates for the first six years and summary totals, where applicable, well into the next century.” Reason: Flow of report; important point to make early in report.

See comment 8.

2. Page 2, “**BACKGROUND**”

**First paragraph, second sentence.** Insert the word “relative” between low and risk. Reason: Accuracy.

Now on p. 1.

See comment 8.

**First paragraph, third sentence.** Recommend rewording as follows: “DOD does not require relative risk site evaluations for sites that only require building demolition/debris removal or contain abandoned ordnance, have final cleanup remedies in place, or are “response complete” (require no further cleanup action).” Reason: For completeness, add full list of criteria for DoD sites as provided in the DERP Management Guidance.

See comment 8.

**First paragraph, fourth sentence.** Recommend rewording the sentence as follows: “Not evaluated sites, sites that do not require evaluation, and sites with risk characterizations are reported in the Defense Environmental Restoration Program annual reports and budget justification exhibits provided to Congress.” Reason: As written this sentence does not accurately describe all the relative risk site information provided in the annual report and budget exhibits.

Now on p. 2.

See comment 8.

**Second paragraph, fourth sentence.** Change “health effects” to “exposure”. Reason: Baseline risk assessments are not so comprehensive as to identify health effects.

See comment 8.

3. Page 3, “**BACKGROUND**”

**First paragraph, first sentence.** Delete the word “previously”.

Now on p. 2.

See comment 8.

**First paragraph, second sentence.** Delete: “However, in responding to our July 1997 report,” and begin the sentence “They have also....”.

See comment 8.

**First paragraph, third sentence.** Delete “Equally” and begin the sentence with “Also”. Reason: Current wording inaccurately suggests that DoD has changed its statements over time on how relative risk is used. The changes reflect DoD’s consistent approach.

See comment 8.

4. Page 4, “**RESULTS IN BRIEF**”

**Last paragraph.** Recommend that GAO not apply descriptors such as the “top category” or “bottom category” to the relative risk site evaluation categories. This

Now on p. 3.

See comment 8.

miscategorization should be corrected in this paragraph and throughout the report. Particularly with regard to the category “evaluation not required,” it is inaccurate to characterize this as the “bottom category” since one of the program goals is to have all sites progress to that category. “Evaluation not required” corresponds to “remedy in place” or “response complete” which are major milestones in the program. Reason: Clarity and accuracy.

Now on p. 3  
See comment 9.

See comment 7.

**5. Page 5, “RESULTS IN BRIEF”**

**First paragraph, last sentence.** The meaning of “...officials at the installations we visited were attempting to make distinctions within both categories.” is unclear. Were officials attempting to make distinctions in their relative risk evaluations in these categories or were they following DOD’s management guidance and using other management factors in conjunction with the relative risk site evaluation framework to help make prioritization and sequencing decisions? The latter is expected and appropriate. The former sounds like a misunderstanding by the GAO representatives interviewing the officials at the base or bases visited. Regarding the “evaluation not required” category, one of the ways we define success in the program is the movement of sites into this category because that means that final remedies are in place for the site and the only funding requirements left, if any, are for remedial action operations or long-term monitoring. DOD does not have the ability, once a remedy has been selected and constructed, to choose not to operate the remedy prior to achieving the cleanup objectives or not to perform long-term monitoring required to confirm the success of the remedy. Therefore, the relative risk site evaluation framework does not apply to these sites. Recommend GAO clarify what point is being made. Reason: Clarity.

Now on p. 14.  
See comment 10.

**6. Page 5, “DOD ACTIONS TO PROVIDE UNIFORM GUIDANCE AND APPLY THE RELATIVE RISK SITE EVALUATION PROCESS”**

**First paragraph, fourth sentence.** The meaning of this sentence is unclear. “The updated data showed changes of 20 percent or greater in reported contamination levels, pathway, or receptor data for about 2,100 of the 6,000 sites considered in our June 1997 report.” What is the point? Also, did the referenced report address 6,000 sites or is it the current draft report that addresses that number of sites? Suggest GAO clarify the point being made and its significance. Reason: Clarity.

Now on p. 7.  
See comment 11.

**7. Page 11, “USEFULNESS OF RELATIVE RISK EVALUATION PROCESS FOR CATEGORIZING SITES”**

**First paragraph, second sentence.** Does the \$2.2 billion include “not evaluated” sites, as the first paragraph on Pg. 2 mistakenly indicates are in this category? Also, see comment 2 (first paragraph, fourth sentence). This paragraph seems to lose sight of the fact that relative risk site evaluation is a programmatic tool that is used in conjunction with other management factors and that remedial action operations and long term monitoring requirements are commitments, not subject to prioritization by DOD.

Now on p. 7.  
See comment 8.

See comment 8.

See comment 8.

Now on p. 8.  
See comment 12.

Now on p. 9.  
See comment 8.

Now on p. 9.  
See comment 8.

**8. Page 11, “Wide Range of Characteristics in High Relative Risk Category”**

**First paragraph, first sentence.** At the end of the sentence after “low” insert: “based on 27 possible different ways these factors can be related to each other.” Reason: Clarity.

**First paragraph, second sentence.** This sentence is misleading and should be deleted or at least the word “wide” should be deleted. Reason: Clarity.

**First paragraph, third, fourth sentences.** Recommend the following wording be substituted: “For example, eight out of 27 possible different combinations of contaminant levels, pathways and receptors can be categorized as high.” The fourth sentence beginning with “Contaminant levels...” should be deleted because it is incorrect as written and the point that the sentence is trying to make is correctly illustrated in Table 3 on page 12. Reason: Accuracy and balanced perspective.

**9. Pages 12-13, “Wide Range of Characteristics in High Relative Risk Category”**

**Two sentences that read:** “As shown in figure 1, the major difference between our June 1997 analysis of 266 selected high relative risk sites and our current analysis of 1,622 fiscal year 1997 high risk sites was that the percentage of sites in the “significant” category fell from 20 percent to 15 percent. Sites in this category all had reported significant contamination, an evident pathway, and an identified receptor.” The significance of these statements is not clear, however, they appear to indicate that the combination of relative risk and other management factors is working very well in sequencing requirements because evidently, not only are the Components focusing their efforts on the high relative risk sites, but within the high category they are focusing on the sites with higher levels of contamination that also have evident pathways and identified receptors. Suggest GAO clarify the point being made. Reason: Clarity.

**10. Page 13, “Wide Range of Characteristics in High Relative Risk Category”**

In the descriptions of the two pie charts of Figure 1: “DOD Sites With High Relative Risk” delete the word “EPA’s” and insert in its place “DOD comparison value screening criteria”. Not all of DOD’s comparison values are based on EPA’s Preliminary Remediation Goals (PRGs) and for carcinogens DOD’s comparison values are 100 times the corresponding PRG value. Delete the phrase “because data were not available.” The statement is not correct. Data can be complete and the pathway or receptor can still be “potential.” For example, data indicates that contamination is moving from the source but has not reached a receptor yet or property is contaminated and undeveloped but can be developed. In the first case, there are evident receptors and a potential pathway. In the second case, the receptors are potential. In both of these very common scenarios, the data are complete. Reason: Accuracy.

**11. Page 14, “Wide Range of Characteristics in High Relative Risk Category”**

**First paragraph.** The entire first paragraph should be rewritten to read: “As shown in figure 1, we also reported in June 1997, that 54 percent of the high relative risk sites had a moderate or significant contaminant hazard factor with an evident pathway and identified receptor.” The second sentence is not correct and should be deleted. In order to do relative risk site evaluations, all three factors have to be evaluated based on

**Appendix II**  
**Comments From the Department of Defense**

available information. Sites lacking information for any of the three factors are categorized as “not evaluated” (See page 5, Section 1.4 of the Relative Risk Site Evaluation Primer). For the corrections to the third sentence see Comment 8. Reason: Accuracy.

**12. Page 14, “Wide Range of Characteristics in “Evaluation Not Required” Category”**

This section is misleading and contains inaccuracies. It seems to have been written with the intent of trying to develop a rationale for expanding the applicability of relative risk site evaluations to the end phases of the program (remedial action operations and long term-monitoring), as a vehicle for prioritizing these requirements. However, remedial action operations and long-term monitoring funding requirements are commitments that are not subject to prioritization. Relative risk is not the right tool. These requirements should be addressed by using alternative, less stringent cleanup approaches based on future land use; careful examination of cleanup assumptions, and application of innovative technologies in order to minimize the associated costs for remedial action operations and long term monitoring. Recommend that this entire section be redrafted. Reason: Clarity.

**13. Page 15, Last paragraph. Replace with the following:**

“At Camp Lejeune, NC, a burn area site was found to require no further action after a Remedial Investigation (RI) was completed in 1996. Subsequently, the relative risk ranking was changed from “high” to “evaluation not required”. The site had previously been listed as high due to the presence of previously detected contaminants which were not present during the RI. Additionally, within the UST program, two UST sites had been ranked as low and medium relative risk, respectively. After Corrective Action Plans (CAPs) were completed, it was discovered that existing groundwater contamination at both sites contained chlorinated solvents and should be handled under a separate program. Therefore, the sites were administratively closed out under the UST program (listed as response complete), the cost to complete reduced to zero, and the relative risk changed to “evaluation not required”. These sites were then transferred to the Installation Restoration Program to address groundwater contamination with the relative risk listed as “high” and “medium” respectively. The combined cost to address groundwater contamination is estimated at \$13.3 million.” Reason: The paragraph is confusing and inaccurate as written.

**14. Page 16, Footnote.** Delete this footnote. Both USTs have been administratively closed out under the state’s UST program. The remaining contamination will be addressed under the Installation Restoration Program; however, this is now stated in the above paragraph. Reason: Accuracy.

**15. Page 16-17, “Use of Relative Risk Categories”**

Recommend a new title for this section. The current title seems to be unrelated to the discussion which is mostly about the FY1997 annual report.

Now on p. 10.  
See comment 9.  
See comment 7.

Now on p. 11.  
See comment 13.

See comment 8.

Now on p. 11.

**Appendix II**  
**Comments From the Department of Defense**

Now on p. 11.  
See comment 8.

**First paragraph, first sentence:** The meaning of this sentence is unclear. Is this sentence describing the FY1997 annual report? There is a lot of relative risk information in the annual report including statistics and uses of relative risk in setting program goals, measuring progress and as a tool for sequencing requirements. Recommend that this sentence be rewritten. Reason: Clarity.

See comment 8.

**First paragraph, second sentence.** The second sentence does not follow from the first sentence. Also, it is not evident how the document referenced at footnote 16 provides examples of discrepancies underlying relative risk information provided to Congress. Did the committee report mentioned come out before or after the FY1997 annual report was published? Recommend redrafting the paragraph to ensure logical flow from sentence 1 to 2, and deleting footnote 16. Reason: Flow of report.

See comment 8.

**Second paragraph, first sentence:** The report does in fact identify that sites in “remedial action operations” are categorized as “evaluation not required” (see notes on Tables 2 and 3, pages 13 and 14). Also, the use of the term “bottom category” to describe “evaluation not required” is not appropriate considering that one of the program goals is to have all sites advance into this category. DOD counts sites in this category as a success (see Comment 4). Also, is the \$2.2 billion estimate just for 97 installations or for all the installations and how does this estimate relate to the \$2.2 billion estimate on page 11 which is associated with a different number of sites? Reason: Accuracy.

See comment 8.

**Second paragraph, second sentence:** As pointed out in Comment 5, the statement in the second sentence that installation officials were attempting to make distinctions within categories needs more explanation than “for their own purposes”. Reason: Key statements need support for credibility.

See comment 8.

**Third paragraph:** What is GAO’s definition of broad? Appendix I does not illustrate a broad range of characteristics for the “evaluation not required” category as stated by GAO. All of the sites meet established criteria for the category. We count the reductions in the number of sites in the high, medium, and low categories as progress towards another program goal and track that progress with a measure of merit. Reason: Accuracy.

Now on pp. 12-13.  
See comment 15.

**16. Page 17, “CONCLUSION and RECOMMENDATION”**

In order to accurately reflect the findings stated on pages 9 and 10, recommend revising the first sentence in the “CONCLUSION” to read: “DOD has taken actions that have improved the accuracy and consistency of information resulting from relative risk site evaluations. In fact, 99 percent of the draft data and 100 percent of the final data reviewed was in accordance with the Relative Risk Site Evaluation Primer and QA Plan requirements.”

See comment 7.

DOD does not agree with the other conclusions and recommendation in this report for the following reasons:

- The conclusions and recommendation reflect a basic misunderstanding of what relative risk is and how it is used. GAO does not seem to recognize that the relative risk site evaluation framework is not a risk assessment and also is not the sole factor used to prioritize requirements. Other

See comment 7.

management factors (such as legal requirements, program execution, stakeholder concerns, and economic considerations) are used in addition to relative risk in order to sequence work.

- In addition, DOD does not believe that relative risk site evaluations are applicable to sites that have progressed to “remedy in place” or “response complete” because the only requirements left once these milestones have been achieved are for “remedial action operations” and “long-term monitoring” which are viewed as commitments and, therefore; not subject to prioritization.

- It is our view that neither CERCLA nor the NCP contemplated interruption of a selected remedial action until the goals for the remedial action are achieved. We do not believe DOD has the authority to suspend operations prior to achieving cleanup goals. We also do not believe that DOD has the authority to suspend required long-term monitoring necessary to confirm the success of remedial actions.



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The following are GAO's comments on the Department of Defense's (DOD) letter dated September 4, 1998.

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## GAO Comments

1. DOD's high relative risk category is overly large in relation to the medium and low categories, and thus does not provide three broad categories. To make this more clear, we added an example in the report that DOD's highest contaminant hazard factors were more than 3 million times greater than the lowest ones at sites within the high relative risk category.
2. We agree that relative risk is used in conjunction with other important factors, but DOD's conclusion does not follow. For those site rankings where relative risk affected managers' decisions, the additional category data would help the decision. We added to our report an example of a previously high relative risk site that managers deleted from inventory based on additional data.
3. DOD's comment that the two types of sites are non-discretionary cost commitments is inconsistent with defense components' ongoing reconsideration of remedial action operations, such as cited in our report. We agree such sites are not subject to further prioritization.
4. Our recommendation does not necessitate interruption of remedial actions. Reclassification is a normal part of the relative risk site evaluation process and is provided for in DOD's Relative Risk Site Evaluation Primer. Also, as stated in our report, defense components are themselves considering where such actions may be appropriate.
5. Although our recommendation could result in reclassified sites, such actions are a normal part of DOD's process, as evidenced by the over 1,600 category changes from 1996 to 1997.
6. Our recommendation does not prohibit managers from using other management considerations in their decision process. It simply suggests that more specificity within the two categories could be more helpful to decisionmakers.
7. Both our draft and final reports recognize that relative risk is one of several factors considered by decisionmakers. Also, as we stated in addressing DOD comments on our June 1997 report, we recognize that the relative risk site evaluation process is an initial screening method that is only one of the factors considered by decisionmakers. Further, DOD fully

concluded with the description of the relative risk site evaluation process in our report entitled Environmental Cleanup: DOD's Relative Risk Process (GAO/NSIAD-98-79R, Feb. 26, 1998). The recommendation, as written, is sufficiently broad as to allow DOD flexibility in how best to differentiate within the categories. We do not believe that better defining and making categories more specific would limit flexibility because neither the current system nor our recommendation requires sites to be funded strictly in relative risk order. Thus, the recommendation also would not delay remedial action, require programming and budget data restructuring and additional data collection, upset the existing system for identifying requirements, or disrupt the existing program.

8. We revised our report to reflect DOD's suggested changes.

9. We addressed DOD's questions. The evaluation not required category may have high to low or no known levels of contamination, and costly long-term remedial actions or no anticipated costs. Officials at installations we visited were differentiating further within both the high relative risk and evaluation not required categories to aid in their decision-making processes. We inserted DOD's statement that it uses the evaluation not required category to define success in the restoration program.

10. We revised our report to state that the updated data referred to the about 6,000 sites considered in our current review. This is simply a statement of fact describing the number of changes and their extent, and its purpose is evident, as stated.

11. We revised our report to make it more clear that the \$2.2 billion refers to sites in the evaluation not required category.

12. The statements simply reflect the results of our analysis. We added language to reflect DOD's comment that it believes the combination of relative risk and other management factors is working well in sequencing requirements.

13. The information in our draft report was based on specific input from Marine Corps officials. Although the information was accurate as stated, we included DOD's suggested language.

14. We modified this section of the report to focus on reporting of the evaluation not required category.

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15. We revised our report to include specific reference to DOD's positive actions. Although our tests confirmed that components followed processes for contamination levels, we could not state that 100 percent of all data met requirements.

# Major Contributors to This Report

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