



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
SOLID WASTE AND EMERGENCY  
RESPONSE

OCT 9 2002

QSWER No. 9295.8-06a

**MEMORANDUM**

**SUBJECT:** Distribution of Memorandum of Understanding between EPA and the Nuclear Regulatory Commission

**FROM:** Michael B. Cook, Director  
*Michael B. Cook*  
Office of Emergency and Remedial Response (OERR)  
Office of Solid Waste and Emergency Response

**TO:** Addressees

**PURPOSE**

The purpose of this memorandum is to transmit and explain the implementation of a final document entitled "Memorandum of Understanding Between the Environmental Protection Agency and the Nuclear Regulatory Commission: Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites" (OSWER 9295.8-06). This Memorandum of Understanding (MOU) between EPA and the Nuclear Regulatory Commission (NRC) identifies the interactions of the two agencies for only the decommissioning and decontamination of NRC-licensed sites and the ways in which those responsibilities will be exercised. Except for Section VI, which addresses corrective action under the Resource Conservation and Recovery Act (RCRA), this MOU is limited to the coordination between EPA, when acting under its Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) authority, and NRC, when a facility licensed by the NRC is undergoing decommissioning, or when a facility has completed decommissioning, and the NRC has terminated its license.

This MOU does not address EPA's role under other statutory authorities. Also, the MOU does not address EPA's role at sites that are being addressed under CERCLA (e.g., a site where a removal action is occurring or that is listed on the National Priorities List (NPL)) or under RCRA Corrective Action authorities, except when NRC is decommissioning a facility or when NRC has completed decommissioning a facility and terminated its license at the same site. The MOU provides new guidance **only** when EPA acting under CERCLA authority, and NRC need to consult during the decommissioning and decontamination process as part of NRC's license termination of a facility.



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The MOU does not establish any rights or responsibilities that may be enforced against the government. For example, the MOU does **not** establish protective cleanup or action levels. This document provides guidance to EPA Regions exercising responsibility under CERCLA and RCRA concerning the MOU between EPA and NRC. The CERCLA or RCRA provisions described in this document contain legally binding requirements. However, this document does not substitute for those provisions, nor is it a regulation. Thus, it cannot impose legally-binding requirements on EPA, NRC, States, or the regulated community, and may not apply to a particular situation depending upon the circumstances. EPA decisionmakers retain the discretion to adopt approaches on a case-by-case basis that differ from this guidance where appropriate. EPA may change this guidance in the future.

## **BACKGROUND**

The House Committee on Appropriations has directed EPA and NRC to work together on an MOU. The Committee first addressed the issue of EPA/NRC coordination at NRC licensed or decommissioned sites in the House Committee on Appropriations Report 106-286, Department of Veterans Affairs and Housing and Urban Development, and Independent Agencies Appropriation Bill 1999, pages 58-59, August 3, 1999. Subsequent Reports by the Committee have continued this direction (Report 106-674, page 58, June 12, 2000, Report 107-159, page 65, July 25, 2001). The attached MOU represents an agreement between EPA and NRC that addresses the concerns of this Committee.

## **OBJECTIVE**

The objective of this memorandum is to transmit to you and provide additional clarification of the MOU with NRC for CERCLA response actions and to provide supporting information.

## **IMPLEMENTATION**

The following subsections provide a discussion of sites covered by the MOU, lack of MOU applicability at CERCLA sites, MOU consultation triggers and their basis, and the MOU consultation strategy for EPA.

### **I. MOU Covered Sites**

The MOU covers any facility that is licensed by the NRC and undergoing decommissioning and decontamination, or that has completed decommissioning and the NRC has terminated its license. It is limited to those facilities that meet one or more of the consultation triggers specified in the MOU. It does not address NRC-Agreement State licensed facilities or facilities decommissioned by such states. This is a continuation of EPA's current policy of deferral, which does not include NRC-Agreement State licensees.

At some sites, EPA may be conducting a removal action, or the site may be listed on the NPL, while remaining an NRC licensed facility. If, during the decommissioning process or after the decommissioning process has been completed and one or more of the consultation triggers are met at such a site provisions of the MOU consultation procedure would come into effect.

EPA is committed to maintaining a constructive dialogue with NRC on sites of potential mutual interest as identified by this MOU. Although this MOU addresses specific interactions with NRC related to the decommissioning of contaminated sites, EPA intends to maintain an open dialogue with NRC on other issues as well. Therefore, communication with NRC on sites not subject to this MOU should occur as the need arises.

## II. Limits to MOU Applicability at CERCLA Sites

The MOU does not govern **how** response actions (e.g., removal or remedial) are conducted under CERCLA authority, at either NPL or non-NPL sites. **Response actions conducted under CERCLA authority should continue to use the CERCLA response approach**, including the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and EPA guidance documents. Cleanup levels for response actions under CERCLA are developed based on applicable, or relevant and appropriate requirements (ARARs), site-specific risk assessments, and/or to-be-considered material<sup>1</sup> (TBCs). Where ARARs are not available or are not sufficiently protective, EPA generally sets site-specific remediation levels for: 1) carcinogens at a level that represents an excess upper bound lifetime cancer risk to an individual of between  $10^{-4}$  to  $10^{-6}$  (with  $10^{-6}$  as the point of departure); and for 2) non-carcinogens such that the cumulative risks from exposure will not result in adverse effects to human populations (including sensitive sub-populations) that may be exposed during a lifetime or part of a lifetime, incorporating an adequate margin of safety. (See 40 C.F.R. §300.430(e)(2)(i)(A)(2).) The site-specific cleanup levels are determined using the nine criteria specified in Section 300.430(e)(9)(iii) of the NCP. EPA has provided guidance regarding how radioactive contaminants should be addressed at CERCLA sites, which is available on the Internet at:

<http://www.epa.gov/oerrpage/superfund/resources/radiation/index.htm>.

## III. MOU Consultation Triggers

The MOU establishes four triggers for when EPA and NRC will consult on the radiological decommissioning and decontamination of NRC-licensed sites. These four

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<sup>1</sup>To-be-considered material (TBCs) are non-promulgated advisories or guidance issued by Federal or State governments that are not legally binding and do not have the status of potential ARARs. However, TBCs will be considered along with ARARs as part of the site risk assessment and may be used in determining the necessary level of cleanup for protection of health and the environment.

consultation provisions are triggered when NRC determines one or more of the following will or may be exceeded during the license termination process:

1. NRC determines that residual levels in groundwater will exceed radionuclide Maximum Contaminant Levels (MCLs) established under the Safe Drinking Water Act, or
2. Residual levels in soil will exceed the soil concentrations in “MOU Table 1: Consultation Triggers for Residential and Commercial/Industrial Soil Contamination,” or
3. NRC contemplates that future use of the site will be restricted by conditions contained in the license termination (as specified in 10 C.F.R. 20.1403), or
4. NRC contemplates the use of alternative criteria for license termination (i.e., a site-specific dose greater than NRC’s primary dose limit of 25 mrem/yr may be allowed)<sup>2</sup>.

The consultation triggers determine when NRC and EPA consult on sites. They do not imply a level below which radionuclide levels would be deemed protective. These consultation triggers represent situations where EPA and NRC would benefit most from sharing knowledge and technical experiences to address the situation. These triggers were developed to identify the potential areas that would benefit most from an EPA/NRC dialogue and that would have the highest potential for CERCLA involvement. These consultation triggers provide information to industry and other stakeholders of when it is most likely that EPA and NRC will interact on these sites. Although the MOU only addresses certain interactions with NRC and provides a framework for consultation under the MOU when triggered, EPA intends to continue to have a positive dialogue on other sites where consultation has not been triggered by the MOU. The MOU’s consultation triggers do not provide any new guidance to CERCLA site decision-makers regarding when CERCLA response actions should be taken, or how CERCLA response actions should be conducted, and do not represent levels that are deemed to be protective or unprotective.

### **Basis for Restricted Future Use and Alternative Criteria Consultation Triggers**

The third and fourth consultation triggers (i.e., restricted future use, and alternative criteria of site-specific dose limits of greater than 25 mrem/yr) were identified as consultation triggers because these represent scenarios that have the potential for greater exposure and

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<sup>2</sup>NRC’s decommissioning regulations require that NRC shall notify and solicit comments from EPA in this situation (see 20 C.F.R. 20.1405). Inclusion of this consultation trigger should not be interpreted as EPA changing its previous guidance regarding 25 mrem/yr. Generally, regions should **not** use dose-based ARARs greater than 15 mrem/yr effective dose equivalent to establish cleanup levels under CERCLA, and should **not** use dose-based recommendations as TBCs (see OSWER Publication 9200.4-31P “Radiation Risk Assessment At CERCLA Sites: Q & A” December 1999 and transmittal memo from Steve Luftig to EPA regions entitled ["Distribution of OSWER Radiation Risk Assessment Q & A's Final Guidance"](#) December 17, 1999.)

therefore, there is additional potential for CERCLA concern. Again, the consultation triggers do not imply an endorsement of these levels as cleanup levels but rather that they are appropriate levels to trigger consultation.

### **Basis for MCLs and Table 1 Consultation Triggers**

Two of the consultation triggers (MCLs and soil concentrations in MOU Table 1) were included to provide NRC with a simplified framework for determining when groundwater and soil radiological contamination levels are at levels which have a greater potential for EPA concern.

This potential for EPA concern is derived from EPA's policies for taking action under CERCLA at a site. At a CERCLA site, EPA's decision to take action is based on risk using reasonably anticipated land use considerations and may also be based on requirements (e.g., Federal and State environmental regulations that are potential ARARs) that help define protectiveness. Unless there are current or potential adverse environmental effects, EPA generally would not consider action under CERCLA warranted if **all** of the following four circumstances are met:<sup>3</sup>

1. The cumulative carcinogenic risk to an individual is estimated at less than  $10^{-4}$  for the reasonably anticipated land use based on a reasonable maximum exposure scenario. Although  $1 \times 10^{-4}$  is not a discrete upper boundary, EPA generally uses  $1 \times 10^{-4}$  in making risk management decisions.
2. Noncarcinogenic hazard index (HI) quotient to an individual is estimated at less than 1 for the reasonably anticipated land use based on a reasonable maximum exposure scenario. EPA calculates HI for uranium to account for kidney toxicity.
3. MCLs or non-zero Maximum Contaminant Level Goals (MCLGs) are not exceeded in groundwaters that are current or potential sources of drinking water.
4. Other chemical-specific ARARs that define acceptable risk levels are not exceeded. Chemical-specific ARARs usually are either health- or risk-based numerical values or methodologies that establish the acceptable amount or concentration of a chemical that may remain in or be discharged to the environment. Several chemical-specific Federal ARARs (e.g., soil standards in 40 C.F.R. Part 192 issued under the Uranium Mill Tailings Radiation Control Act (UMTRCA), MCLs, and non-zero (MCLGs), are used

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<sup>3</sup>For further information regarding when EPA takes remedial action under CERCLA, see OSWER Directive 9355.0-30, ["Role of Baseline Risk Assessment in Superfund Remedy Selection Decisions."](#) April 22, 1991.

as benchmarks for determining if sites should be listed on the NPL<sup>4</sup>.

While the basis for selecting Table 1 soil levels and MCLs as consultation triggers is related to the four factors listed above, additional information is necessary to understand the basis for the Table 1 soil levels that trigger consultation. Table 1 is a list of 37 radionuclides with soil concentrations based on either a residential or industrial/commercial land use scenario. These radionuclides were selected because they were considered the radionuclides with the greatest potential for being a contaminant in soil at an NRC facility<sup>5</sup>. Table 1 levels are based either on ARARs (40 C.F.R. 192), HI of 1, or a  $1 \times 10^{-4}$  excess carcinogenic risk based on residential and industrial/commercial land use. Residential and industrial/commercial land uses were selected because these were considered the most restrictive, reasonably anticipated land uses at nearly all NRC facilities that may have significant radioactive soil contamination.

In Table 1, the 5 pCi/g soil concentrations for radium-226 and thorium-232 are based on soil standards developed under the UMTRCA and implementing regulations (40 C.F.R. 192). The UMTRCA standard is often identified as an ARAR at CERCLA sites and generally determines protective levels for radium-226 and thorium-232. For further information regarding how EPA interprets this potential ARAR, see OSWER Directive 9200.4-25, [“Use of Soil Cleanup Criteria in 40 CFR Part 192 as Remediation Goals for CERCLA sites.”](#)

The soil concentrations (mg/kg) for total uranium are based on a HI of 1, calculated using the Soil Screening electronic calculator. The soil screening approach was developed by EPA to identify and define areas, contaminants, and conditions at a particular site that do not require further Federal attention. This calculation tool may be found on the Internet at: [http://risk.lsd.ornl.gov/calc\\_start.htm](http://risk.lsd.ornl.gov/calc_start.htm).

For the remainder of radionuclides, the soil concentrations (pCi/g) are based on a  $1 \times 10^{-4}$  cancer risk, developed using an electronic calculator entitled: “Radionuclide Preliminary Remediation Goals (PRGs) for Superfund.” This calculator generates PRG concentrations at the  $1 \times 10^{-6}$  risk level. The PRG value at  $1 \times 10^{-6}$  was multiplied by 100 to derive the  $1 \times 10^{-4}$  value for Table 1 consultation triggers. (At CERCLA sites, PRGs based on cancer risk should continue to be developed at the  $1 \times 10^{-6}$  level.) The radionuclide PRG calculation tool may be found on the Internet at: <http://epa-prgs.ornl.gov/radionuclides/>.

The residential and commercial/industrial risk (both cancer and noncancer) estimates

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<sup>4</sup>For further discussion how chemical-specific Federal ARARs are used as benchmarks when sites are evaluated by EPA for potential listing on the NPL, see the Hazard Ranking System (HRS) Final Rule, 55 FR 51532 (December 14, 1990).

<sup>5</sup>NRC had developed screening values for surface soil contamination release levels for them in a Federal Register notice entitled “Supplemental Information on the Implementation of the Final Rule on Radiological Criteria for License Termination” (see [64 FR 68395](#), December 7, 1999).

for soil were developed using the default reasonable maximum exposure scenarios found in EPA guidance documents [“Soil Screening Guidance for Radionuclides: User’s Guide.”](#) October 2000 (OSWER 9355.4-16A) and [“Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites.”](#) February 2001 (OSWER 9355.4-24).

### **Table 1 and MCL Caveats**

The Table 1 soil levels do not necessarily constitute protective soil concentration values. Land use and other site-specific circumstances influence the soil concentration values that constitute protective levels for a given situation. The soil concentration values using  $1 \times 10^{-4}$  cancer risk and HI of 1 for total uranium were developed using conservative default parameters. At most sites, higher soil concentrations corresponding to a given risk level generally may be justified using site-specific parameters.

On the other hand the generic risk assessment scenarios used to develop soil concentration values in Table 1 may not account for certain exposures that may be cause for concern at an NRC facility. For example:

1. Site is adjacent to contaminated surface water bodies.
2. Contamination presents potential ecological concerns.
3. Additional likely human exposure pathways exist (e.g., an agricultural scenario that includes consumption of livestock and additional produce).
4. Unusual site conditions exist (e.g., large areas of contamination, unusually high fugitive dust levels).

The soil concentration values do not account for migration into groundwater, which could cause groundwater contamination in the future to exceed MCLs. Also, the presence of multiple contaminants may lead to a potential concern that non-radionuclide (chemical) contaminants or radionuclides-not in Table 1-may cause residual levels to rise above  $1 \times 10^{-4}$  or an HI of 1. Multiple contaminants may result in EPA potential concern for human health or the environment even when chemical specific ARARs (e.g., UMTRCA soil standards or MCLs) are being met. Table 1 also does not consider State regulations (e.g., exceedance of State MCLs) which could be used to determine protectiveness.

#### **IV. Coordination Policy**

The MOU designates the EPA principal contact as the Director, Office of Emergency and Remedial Response (OERR). The NRC designated contact is the Director, Office of Nuclear Materials Safety and Safeguards. EPA and NRC intend that communication related to



potential CERCLA interest and NRC communication about sites that meet or exceed the consultation triggers will be discussed initially at that level. On a site-specific basis, it is expected that follow-up discussions would happen at the staff level at Headquarters (HQ) and the Regions.

Regions are requested to contact OERR as issues arise for sites that may potentially be subject to this MOU. This request for consultation is an expansion of the request contained in OSWER Directive 9272.0-15P, [“Interim Final Evaluation of Facilities Currently or Previously Licensed NRC Sites under CERCLA.”](#) When considering requests for listing a former or current NRC licensed facility, the Regions should contact Robert Myers (703) 603-8851, OERR. When considering requests to evaluate the protectiveness of a previous or proposed NRC decommissioning or to engage otherwise in dialogue regarding NRC cleanup levels and CERCLA standards of protectiveness with the NRC, the licensee, or stakeholders at the site outside the context of the MOU, the Regions should contact Stuart Walker (703) 603-8748, OERR. When considering a removal action at a former or currently NRC-licensed facility, the Regions should contact Craig Beasley (703) 603-9015, OERR.

The four MOU consultation triggers are provisions for **initiating dialogue only**, and **identifying those sites that should be under consultation** between NRC and EPA. We anticipate that the vast majority of NRC-licensed sites undergoing decontamination and decommissioning will be cleaned to protective levels and no EPA/CERCLA consultation will be necessary. In other cases, we anticipate that a dialogue on ways of achieving protective levels, including the range of flexibility available under CERCLA (e.g., phased approach to addressing groundwater contamination or remediating sites to allow for the reasonably anticipated land use) will be beneficial. EPA and NRC have worked closely together over the last three years as this MOU was developed. We anticipate that EPA and NRC will continue to work cooperatively on sites of mutual interest in the future.

## **FURTHER INFORMATION**

The subject matter specialists for this MOU are Stuart Walker (703-603-8748) and Robin M. Anderson (703-603-8747) of OERR.

### Addressees:

National Superfund Policy Managers  
Superfund Branch Chiefs (Regions I-X)  
Superfund Branch Chiefs, Office of Regional Counsel (Regions I-X)  
Radiation Program Managers (Regions I, IV, V, VI, VII, X)  
Radiation Branch Chief (Region II)  
Residential Domain Section Chief (Region III)  
Radiation and Indoor Air Program Branch Chief (Region VIII)

Radiation and Indoor Office Director (Region IX)  
Federal Facilities Leadership Council  
OERR Center Directors and Senior Process Managers  
OERR NARPM co-chairs

cc: Elizabeth Cotsworth, ORIA  
Jim Woolford, FFRRO  
Robert Springer, OSW  
Elliott Gilberg, FFEO  
Barry Breen, OSRE  
Joanna Gibson, HOSC/OERR  
Earl Salo, OGC  
Jeff Josephson, Region II  
Marianne Horinko, OSWER  
Mike Shapiro, OSWER  
Tom Dunne, OSWER  
Jeff Denit, OSWER