



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street  
San Francisco, CA 94105-3901

April 18, 1997

Mr. Stephen Chao  
Naval Facilities Engineering Command  
Engineering Field Activity, West  
900 Commodore Way, Bldg. 101  
San Bruno, CA. 94066-2402

Re: *Revised Draft Operable Unit 1 Record of Decision*, dated March 7, 1996

Dear Mr. Chao,

The U.S. Environmental Protection Agency (EPA) has received the subject document and provides the following comments. Many important corrections and additions have been made to this ROD since late last year and we believe it represents an important step towards moving forward with the closure of the OU1 landfills. However, some items remain unresolved. The most important issues are: the clarifying the designation of Site 1 as a CAMU, the lack of a trigger for activating the groundwater collection trench, the necessity of insuring that institutional controls are carried out, and the issue of whether Title 14 CCR or RCRA Subtitle D is more stringent. Other comments are included to point out necessary corrections or clarifications. Many comments were provided by Danita Yocom of EPA's Office of Regional Counsel. If you have any questions, please don't hesitate to call (M.Gill at 415-744-2385 or D. Yocom at 415-744-1347).

Sincerely,

A handwritten signature in cursive script that reads "Michael D. Gill".

Michael D. Gill  
Remedial Project Manager  
Federal Facilities Cleanup Office

Attachment: SWRCB Memorandum of November 4, 1996

cc: C. Joseph Chou (DTSC)  
Ken Eichstaedt (URS) (email)  
Tim Mower (PRC) (email)  
Sandy Olliges (NASA)  
Michael Rochette (RWQCB)  
Peter Strauss (MHB)

## COMMENTS

*Revised Draft Operable Unit 1 Record of Decision, dated March 28, 1997*

### GENERAL COMMENTS

1. EPA believes that a Corrective Action Management Unit (CAMU) is unnecessary under the circumstances described in this ROD, because Subtitle C waste (hazardous waste) to be excavated from Site 2 will be transported to an offsite licensed facility. The CAMU Rule applies to land disposal restrictions (LDRs) for hazardous wastes under Subtitle C of RCRA and the corresponding State requirements. Subtitle D wastes are not subject to LDRs, and therefore may be consolidated without triggering any LDRs. EPA is concerned that designating a Subtitle D solid waste landfill as a CAMU potentially could result in a remedy that is not environmentally protective because, under the circumstances and absent any agreed upon restrictions, it would allow the Navy to place hazardous wastes in a facility designed to receive only solid waste.

In response to concerns expressed by the State, and in light of the fact that all wastes will be removed from Site 2 so as to reduce the restrictions on future land use, EPA agrees to the designation of Site 1 as a CAMU, subject to certain restrictions which must be set forth in the ROD. The restrictions and any necessary clarifications regarding the remedy must be included in the ROD in order to justify departure from EPA policy. The designation of Site 1 as a CAMU will not guarantee protectiveness if hazardous waste is placed into Site 1, but with the clarifications outlined below, its designation is appropriate to move the CERCLA process forward. This action is not intended to set precedent for any other site.

EPA believes that the ROD should contain language to guarantee the following:

- (1) The Navy will not consolidate any waste into the Site 1 landfill from any other sites, or facilities. Only that waste screened as municipal solid waste from Site 2 will be consolidated into Site 1.
- (2) Immediately following the consolidation, the engineered, multi-layered municipal solid waste cap will be constructed according to regulations outlined in the ROD to close the landfill so that no other waste can be placed at the site.
- (3) If the Navy encounters any hazardous waste in Site 1 during consolidation, more characterization may be necessary.
- (4) Any soils from Site 2 which appear to be potentially contaminated (e.g. discolored soils, sludge-like soil, etc.) will be shipped off-site to a hazardous waste facility.

2. The ROD should clarify that when contaminant levels are detected greater than Federal Ambient Water Quality Criteria (AWQCs), the activation of the groundwater collection trench will be triggered.
3. Assurances that institutional controls will be upheld need to be included in the ROD. The ROD mentions in numerous places that any institutional controls will be annotated in Moffett Federal Airfield's "Master Plan". According to NASA Environmental staff (phonecon between EPA/Gill and NASA/Olliges of April 2, 1997), there is no Master Plan for MFA. Some type of agreement between Navy and NASA and an amendment to the site's deed will be necessary to insure that future owners/operators are aware of necessary O&M requirements to keep the remedies operational.
4. With respect to whether or not the Federal municipal solid waste regulations or the State regulations are the ARAR, the State has determined for internal purposes (see attached memorandum dated November 4, 1996) that its current regulations are equivalent to the federal regulations with the exception of the following:

The State requires monitoring and cleanup of the vadose zone and surface water. In contrast, the federal regulations require only monitoring and cleanup of surface water. Thus the State requirement is broader and therefore an ARAR for the vadose zone beneath the landfill and any surface water affected by the landfill.

The State requires monitoring points to be located wherever necessary to detect a release at the earliest opportunity, given site-specific conditions. The federal regulations require downgradient monitoring at the relevant point of compliance. Thus, the State requirement potentially is broader and may be an ARAR.

The State requires that seismic design criteria withstand all damaging motions caused by an earthquake. The federal regulations address only horizontal acceleration. Therefore, the State requirement is broader and an ARAR.

The State requires a minimum five-foot separation of waste from groundwater, while the federal regulations do not. Thus, the State requirement is broader than the federal and potentially an ARAR.

The State distinguishes between hazardous, designated, non-hazardous and inert wastes, while the federal regulations address only solid waste and hazardous waste. Thus, State regulations imposing requirements for designated wastes are broader than the federal requirement and may potentially be an ARAR.

In addition, the State adopted requirements regarding Construction Quality Assurance (Title 14, Section 17774), Final Site Face (Title 14, Section 17777), Final Drainage (Title 14, Section 17778 (e),(f)(1), (g) and (j)) Slope Protection and Erosion Control

(Title 14, Section 17779) and Final Grading (Title 14, Section 17776), which are broader than the federal regulations and consequently, are potential ARARs. Because the State requirements are equivalent to the federal in all other respects, the remaining federal requirements in Part 258 are the ARAR. The assertion that the State regulations are the ARAR because the landfills no longer accept waste does not apply where waste will be consolidated to a new or existing landfill. This is further described below. Given the complexity of matching these regulations, the Navy may wish to simply cite both the Federal and the State citations and note that the more stringent requirement as of the date of the ROD will be followed.

## SPECIFIC COMMENTS

5. Page 2. In #4, the second sentence should read: "Activation of the groundwater collection trench is contingent upon future leachate migration and exceedences of Federal AQWC levels".
6. Page 2. In #8, wording should be changed to reflect that a document, such as the deed, needs an amendment. Suggest modifying the wording to read: "Institutional controls - Fencing, signs, operation and maintenance (O&M) of Building 191 pump station and drain/subdrain system, restrictions on cap disturbances and amendment of the Moffett Federal Airfield deed to incorporate these restrictions".
7. Page 2. It is stated: "...the selected remedy also includes construction of a groundwater collection trench as a contingency measure to provide immediate protection to this adjacent surface water...". Clarify that Federal AWQC will be used as the trigger for activation of the groundwater collection trench.
8. Page 3, para 2, last sentence. Please replace "Master Plan" with the appropriate document, as there apparently is no Master Plan.
9. Section 2.5.2.2, page 19, para 1. Please update the mention of the Alternatives Analysis Tech Memo, as it has been updated since February 3, 1997.
10. Section 2.6.1, page 20, para 1. Clarify that although a human health risk assessment has limited use, it was performed and is part of the OU2 Remedial Investigation Report (IT, 1993a).
11. Figure 3, page 21. Please remove the "Cross Section Location" symbol from the legend, as it is not used, and replace it with a dashed line that shows the approximate boundaries of the waste to be excavated.
12. Section 2.6.2, page 25, para 3. Provide a schedule for the completion of the COE wetlands delineation currently that is underway.

13. Section 2.7.1.2.1, page 26, 27. Please replace "Master Plan" with the appropriate document.
14. Section 2.7.1.2.3, page 29. Clarify that Federal AWQC will be used as the trigger for activation of the groundwater collection trench.
15. Section 2.7.2, page 34, third full para. Following general comment #1, the ROD should more specifically describe the steps that will be taken to minimize the likelihood that hazardous waste will inadvertently be consolidated into the Site 1 landfill. It is important that a loophole is not created, which would allow, or give the impression that the Navy has been allowed to dispose of hazardous waste in a solid waste landfill. In part, this section should describe the visual inspection of containers and other materials and the Navy's agreement to send them off-site. In addition, to the extent that any soil visually appears to be contaminated, it should also be sent off-site. The ROD should also state that the employment of the State's CAMU criteria shall not be interpreted or construed to exempt the Navy from taking such agreed steps.
16. Section 2.10, page 50, last bullet. To be consistent with the Proposed Plan of December, 1995, the permeability should read  $10^{-8}$  cm/sec minimum.
17. Section 2.10, page 51, bullet 4. Add a section to this bullet to read: "...and restrictions on cap disturbances and amendment of the MFA deed (or appropriate document)".
18. Section 2.10, page 51, last para. Clarify in this paragraph that Federal AWQC will be used as the trigger for activation of the groundwater collection trench.
19. Section 2.10, page 52, para 1. The mention of a "Master Plan" should be replaced with the appropriate document, since a Master Plan does not seem to exist. NASA, as caretaker of this Federal property will probably be the entity to affect any changes, possibly in a deed. In this section, the following language should be added to the ROD to further clarify what is required to occur. It is language adapted from a Marine Corps Base Barstow ROD.

"The Moffett Federal Airfield (legal document [e.g., deed]) will be amended to incorporate the land use limitations and O&M requirements. As the Navy transferred control of the base to NASA on July 1, 1994, and NASA is not a party to the FFA or this ROD, the Navy agrees to enter into an agreement with NASA to obligate NASA to comply with the use restrictions discussed below, or to otherwise provide assurance that such use restrictions will not be violated. Approval of the selected remedy is conditioned upon the Navy's obtaining an agreement or sufficient assurances from NASA regarding such use restrictions. The use restrictions are discussed below.

To ensure that human health and the environment are protected in the future,

absent the prior approval of all of the FFA signatories, NASA or any future owners or operators, their heirs, successors, assigns, employees, or contractors, lessee or any other person exercising control over the Site now or in the future (hereinafter collectively referred to as "Owner/Operator") are prohibited from (i) breaching the Site 1 landfill cap or other portion of the landfill, whether through trenching, excavation or any other activity, or (ii) ceasing the operation and maintenance of the Building 191 pump station and drain/subdrain system. These restrictions do not apply to maintenance activities intended to (i) preserve, restore or maintain the physical and structural integrity of the Site 1 landfill cap, or (ii) repair or maintain the Building 191 pump station and drain/subdrain system.

Any Owner/Operator proposing to breach the Site 1 landfill cap or to cease operation and maintenance of the Building 191 pump station and drain/subdrain system for any reason other than the purposes stated above shall first submit written notification of such proposal to the FFA signatories. The Owner/Operator shall prepare and include in the written notification of such proposal an evaluation of the risk to human health and the environment and an evaluation of any need for additional remedial action resulting from the proposed action and shall propose any necessary changes to the remedial action selected in this ROD. The EPA will advise whether a ROD amendment or an ESD document is required. The FFA signatories must provide written concurrence with the Owner/Operator's evaluation of risk, its proposal and any proposed changes to the remedial action necessary to implement the proposal before such an action may be implemented.

NASA shall notify the FFA signatories of any plan to lease or transfer any real property parcel which includes the Site 1 landfill or the Building 191 pump station and drain/subdrain system to any other person or entity, whether federal or non-federal. Such notification shall be provided at least 30 days in advance of the lease or transfer conveyance. NASA shall comply with Section 120(h)(3) of CERCLA in any such transfers to a non-federal entity. Any transfer to a non-federal party shall attach deed restrictions imposing the use restrictions and notice requirements described herein; the deed restrictions shall be imposed in consideration of the transfer and shall run with the land. Any lease or sublease shall impose such use restrictions and notice requirements upon the lessee and any sublessee.

Any land use plan or other planning restrictions used by NASA shall be amended to incorporate the above-mentioned use limitation and notice requirements for the Site 1 landfill and the Building 191 pump station and drain/subdrain system. If NASA does not have such a land use plan, NASA, the Navy, EPA and the State shall enter into a memorandum of agreement for the purpose of binding NASA to the above-discussed use restrictions. The NASA land use plan or agreement will also (i) include language that describes the risk to human health and the

environment that exists at the Site 1 landfill or that may arise in connection with ceasing operation and maintenance at the Building 191 pump station and drain/subdrain system; (ii) reference the OU 1 Remedial Investigation and Feasibility Study and this ROD by full title, date and storage location; and (iii) provide a legal description (in metes and bounds) of the boundaries of the Site 1 Landfill. Any amendments to NASA's land use plan or any agreement with NASA will be completed within 1 year following signing this ROD. The FFA signatories will be provided with a copy of such amendment to the land use plan or memorandum of agreement."

In addition, since Moffett Federal Airfield no longer is controlled by the Navy, the Memorandum of Understanding between Navy and NASA (dated December 22, 1992) should be cited in the ROD. This document states that the Navy is responsible for environmental site remediation related to Navy activities, but that NASA is responsible for daily non-environmental operations.

20. Section 2.10, page 52, para 1. In the previous version of this document (December 24, 1996), there was language in this section describing increases to the hydraulic head (and leachate elevation) due to loading from the consolidated waste. It was removed from this version of the document. Either explain why it was removed or include it in the text of the final version.
21. Section 2.11.1, p. 52, final para. Following "pertinent" add "Federal and".
22. Section 2.11.2.1, page 55, para 2. Following "Chemical-specific ARARs do not exist for landfill refuse" add "or soils."
23. Section 2.11.2.1, page 55, last para. Clarify in this paragraph that Federal AWQC will be used as the trigger for activation of the groundwater collection trench.

#### Table 1 Comments

24. Regarding regulations applying to 100 year flood plains, the correct federal citation is 40 CFR 258.11. Please delete the reference to 40 CFR 264.18(b) (which applies to hazardous waste facilities) and 40 CFR 761.75.
25. Regarding the requirements for landfill cap design and closure, the comment no longer applies because the selected remedy employs consolidation. By moving waste from Site 2 to Site 1, the action triggers the Subtitle D requirements. Please delete the comment.
26. 17773(a). EPA has taken the position at other federal facilities that employing a registered engineer or certified engineering geologist is not an environmental requirement, and therefore, not an ARAR. The Navy, however, may agree to comply

with this requirement regardless of whether or not it is an ARAR. This comment also applies to 17774(b), 17777(c), 17778(b), 17779(b) and 2580(b).

27. The citation listed as 17774(I) is different from the last version of the document. It was listed there as 17774(i). Please clarify which is correct.
28. 17788. The corresponding regulation is 40 CFR 258.61. Only 17788(3) (site security), clearly is broader than the federal requirement. 17778(5) is the same and therefore the federal requirement is the ARAR. 258.61(a)(2) and (a)(3) are not addressed in the State citation. The time periods are the same and therefore the federal requirement is the ARAR. Given the complexity of matching these regulations, the Navy may wish to simply cite both the federal and the State citations and note that the more stringent requirement as of the date of the ROD will be followed.
29. 17792. These regulations address change of ownership during closure or post-closure. These seem to duplicate the institutional control restrictions which are part of the remedy. In addition, the requirements appear to be procedural and do not set substantive requirements for the closure period (e.g. it does not restrict the kinds of use for environmental reasons, such as prohibiting residential use). Please delete this citation.
30. 17778. The requirements are equivalent to the requirements in 40 CFR 258.61. Please add or substitute that citation.
31. 2581(1). The corresponding federal regulation is 40 CFR 258.60((a)(2). While the State requires a thicker layer of material (2 feet vs 18 inches), it allows the use of contaminated soil which are not provided for in the federal requirement. Thus, the State requirement is more stringent in one respect and less stringent in another. We suggest citing both the State and Federal ARAR and noting that the more stringent requirement as of the date of the ROD will be followed.
32. 40 CFR 258.10 and 258.12. The Navy should analyze whether these regulations (regarding proximity to airports and wetlands) are applicable or relevant and appropriate for the remedy selected at OU1.
33. 14 CCR 17702. Please look at 40 CFR 258.21 and 258.22, as there are some requirements that appear to go unaddressed. In addition, please look at 40 CFR 258.23 (Explosive Gases Control), 40 CFR 258.24 (Air Criteria) and 258.28 (Liquids Restrictions).
34. 22 CCR 66262.10-.45. These regulations appear to direct the Navy to handle materials which are going to be shipped off-site in accordance with these requirements. If these regulations are intended to address hazardous wastes which will be shipped off-site, then they are not an ARAR, but are applicable to materials because they will be handled off-site. The corresponding federal citations are 40 CFR Part 262. A stringency comparison

should be done to show which requirement is more stringent, state or federal.

35. Section 2.11.2.2, page 59, Location Specific ARARs, Flood Plains. Change "40 CFR 264.18(b) to 40 CFR 258.11. Part 264 applies to hazardous waste while Part 258 applies to non-hazardous solid waste.
36. Section 2.11.2.2, p. 60, Executive Order 11990, Protection of Wetlands, 40 CFR 6.302. Add 40 CFR 258.12 and an appropriate analysis.
37. Section 2.11.2.3, page 62, para 2, first sentence. This sentence states: "State and federal hazardous waste landfill closure regulations (Subtitle C of RCRA and Title 22 CCR) are not applicable...". Sections of Title 22 CCR are applicable; see Table 1. Please correct this discrepancy.
38. Section 2.11.2.3, page 62, Landfill ARARs, last sentence. Please change this sentence to conform to comments above that indicate that only some of the State regulations are ARARs, while the other federal regulations are the ARAR.
39. Section 2.11.2.3, page 63, para 1. Clarifications for designating Site 1 a CAMU should be included here, as mentioned in General Comment #1.
40. Section 2.11.2.3, page 63, para 1. Following the last sentence, add: "Notwithstanding the employment of the CAMU for Site 1, the Navy will visually inspect all materials removed from Site 2, will send containers, liquid and any soils which on the basis of a visual inspection appear contaminated off-site to an authorized hazardous waste disposal facility."
41. Section 2.11.2.3, page 63, para 3. The red-lined language is incorrect. Unlike Subtitle C, approval of a State program does not allow the State regulations to operate in lieu of the federal regulations. Subtitle D is unique in that its requirements apply regardless of whether or not the State has a federally approved solid waste program. Thus, arguable in a citizen suit, parties may allege that the State requirements are not equivalent to the federal regulations. In the ARARs context, the potential for contesting actions would be that EPA did not select the correct ARAR if the State requirement is not more stringent. If the landfills were not being consolidated, there might be an argument that the federal regulations do not apply and, hence the state regulations are the ARAR. Consolidation, however, renders Site 1 a landfill receiving solid waste after the applicable date for the federal regulations. A stringency comparison was done to compare to the extent possible for the State and federal requirements and these are presented in comments above. Accordingly, delete the red-lined sentences and substitute with appropriate language.
42. Section 2.11.2.3, page 63, last para. Change the first sentence to reflect that federal regulations also apply. Given that the State requirement is equivalent to the federal with the exception of the requirement to monitor in the vadose zone, it does not seem that the

State requirement is still the ARAR under these circumstances.

43. Section 2.11.2.3, page 64, para 1. Please have all citations of State ARARs conform to meet the Table 1 comments regarding inclusion of federal ARARs.
44. Section 2.11.2.3, page 64, para 2. Clarify in this paragraph that Federal AWQC will be used as the trigger for activation of the groundwater collection trench.
45. Section 2.11.2.4.1, page 65. A summary of EPA concerns of designating Site 1 a CAMU should be included here, as mentioned in General Comment #1.
46. Section 2.11.2.4.1, page 65, para 1. Please correct the first line to read: "...within a facility designated for the purpose of implementing corrective action requirements...".
47. Section 2.11.2.4.1, page 65, para 2. Please correct the last line to read: "...the Site 2 remediation wastes and meeting LDRs and MTRs".
48. Section 2.11.2.4.3, page 68, para 2. "Minor modifications to the area may be necessary during remedial design of the Site 1 cap...". As mentioned in EPA comments on the *Draft Operable Unit 1 Alternatives Analysis Technical Memorandum*, any impacts to the wetlands surrounding Site 1 need to be agreed to by the natural resource trustees, as it provides useful habitat to various ecological receptors.
49. Section 2.11.2.4.3, page 68, para 3, Remediation Waste Management Requirements. Check to be sure that the citations to Title 14 conform to the comments on the ARARs table.
50. Section 2.11.2.4.3, page 71, para 1. Title 22 is included in the ARARS table (Table 1) and should be mentioned here for completeness.
51. Section 2.11.2.4.3, page 71, para 2, Summary of Specific Information. The CAMU needs a statement that it is being designated by the appropriate regulatory authority. This section should add, or be changed to include, a section designating the area as a CAMU based upon the finding of the regulator(s). At a non-federal site that is not State lead, EPA would make the designation. In this instance, it might require an action of both regulatory agencies. Please add the following:

"By concurring on the ROD, EPA and the State designate as a CAMU the area designated for a landfill under the selected remedial alternative as shown in Figure 8. The CAMU regulation is an ARAR as discussed in Section 2.11 of this ROD. The ROD amendment documents the CAMU designation pursuant to 40 CFR part 264.552(f) as implemented through the California EPA, Department of Toxic Substances Control, Hazardous Waste Regulations, Title 22, Chapter 14, 66264.552. Hereinafter the CAMU regulation will be referred to as Section

66264.552. The proposed plan for this ROD amendment shall satisfy public notice requirements under such CAMU regulations. In designating the CAMU, EPA and the State have considered the criteria set forth in Section 66264.552 and determined that the CAMU satisfies each of the criteria set forth therein."

52. Section 2.11.4, page 72, first line. Please correct this line to read: "...will permanently remove the threats associated with Site 2."



NOV - 4 1996

<See Distribution List>

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Pete Wilson  
Governor

Dear <See Distribution List>:

**PROPOSAL FOR REVISING MUNICIPAL SOLID WASTE (MSW) LANDFILL  
REGULATIONS**

This letter is to transmit for your review our proposal for revising the State Water Resources Control Board's (SWRCB's) regulations for MSW landfills. As you know, these requirements are currently found in Chapter 15; however, we are in the process of a rulemaking to move the requirements to Title 27 pursuant to AB 1220 (Chapter 656, Statutes of 1993). During External Program Review and Cal/EPA's Regulatory Reform Initiative, we received requests that Chapter 15 be as similar as possible to the federal regulations for MSW landfills promulgated pursuant to Resource Conservation and Recovery Act (RCRA) Subtitle D.

Our proposal is to use the existing federal requirements for MSW landfills, with the following additional SWRCB requirements:

- o **composite liners** for new landfills or expansions of existing landfills as a minimum design to meet the federal performance standard and ensure leak prevention, based on results of the SWAT Program;
- o **monitoring systems** that permit earliest possible detection of leakage from the liner system;
- o **seismic criteria** that are adequate to protect critical containment features;
- o **adequate financial assurances** funded prior to corrective action; and
- o **maintaining a five-foot separation** between waste and ground water.

We also recommend the following substantive change in order to mesh Subtitle D, which addresses only MSW, with the existing regulatory structure, which addresses all wastes. We propose to eliminate the designated waste category for



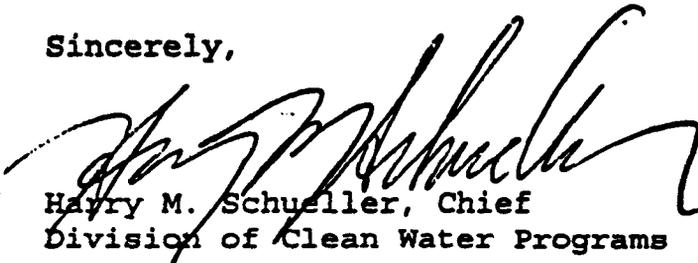
*Our mission is to preserve and enhance the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations.*

MSW landfills and specify a process for acceptance of non-MSW (primarily industrial waste) at MSW landfills that are not composite-lined.

As a reminder, the meeting to discuss the proposal and gather input regarding revision of the regulations will be held Thursday, November 21 at our office at 1:00 p.m., ending no later than 4:00 p.m.

If you have any questions, please contact Liz Haven at (916) 227-4395.

Sincerely,



Harry M. Schueller, Chief  
Division of Clean Water Programs

Enclosure

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PROPOSAL: THE STATE WATER RESOURCES CONTROL BOARD (SWRCB) SHOULD RELY ON FEDERAL SUBTITLE D REGULATIONS, WITH ADDITIONAL SWRCB REQUIREMENTS, TO REGULATE MUNICIPAL SOLID WASTE (MSW) LANDFILLS.

#### SUMMARY

We received public comments requesting that the SWRCB's requirements for MSW landfills either rely on or be as similar as possible to federal requirements for MSW landfills [implementing Subtitle D of the Resources Conservation and Recovery Act (RCRA)]. The SWRCB's requirements are found in Chapter 15 and SWRCB Resolution No. 93-62, the Policy for Regulation of Discharges of MSW. We propose that the SWRCB adopt the federal requirements to regulate MSW landfills, with a few additional SWRCB requirements. Additional SWRCB requirements are necessary because in several areas the federal regulations lack requirements to provide adequate protection of water quality.

The additional SWRCB requirements are:

- . composite liners for new landfills or expansions of existing landfills as a minimum design to ensure leak prevention, based on results of SWAT reports;
- . monitoring systems that are capable of detecting leakage from the liner system at the earliest opportunity;
- . seismic criteria that are adequate to protect critical containment features;
- . adequate financial assurances funded prior to corrective action; and
- . maintaining a five-foot separation between waste and ground water

We recommend another substantive change in order to mesh Subtitle D, which addresses only MSW, with the existing regulatory structure, which addresses all wastes: elimination of the designated waste category for MSW landfills. Instead, the regulations would specify a process for acceptance of non-MSW (primarily industrial waste) at MSW landfills that are not composite-lined.

Finally, because Subtitle D is only a framework of criteria, it does not include an administrative process. The regulations will need to include administrative processes as well as acknowledge some fundamental Water Code concepts, including:

- . issuance of Regional Water Quality Control Board (RWQCB) orders for waste discharge requirements and enforcement;
- . protection of water quality from all waste constituents, not solely those specified in Subtitle D;
- . issuance of RWQCB orders addressing site-specific conditions which may not be adequately provided for in Subtitle D; and
- . consistency of design, maintenance, and operations of MSW landfills with performance standards, in order to meet industry standards.

## **DISCUSSION**

### **COMPOSITE LINERS**

#### **Federal Requirements**

A new or expanding MSW landfill must have a composite (i.e., plastic over clay) liner with a prescriptive design, unless the discharger successfully demonstrates to the Director of the approved state that an alternative design can meet a specified performance standard. This standard is that chemicals that leak from the landfill must not exceed maximum contaminant levels (MCLs) of a specified list of chemicals at a specified point of compliance. There is an exemption from the liner requirement for very small (< 20 tons/day), rural landfills in arid areas (< 25" precipitation/year).

#### **Existing SWRCB Requirements**

The SWRCB requires dischargers to install composite (i.e., plastic over clay) liners for new and expanding MSW landfills, except for very small, rural landfills in arid areas. The composite liner can have either the federal prescriptive design or an alternative composite design that performs as well as the prescriptive design, because we have found that the minimum design to meet the federal performance standard is a composite liner.

### Proposal

We would retain the existing SWRCB requirement which requires composite liners for new or expanding MSW landfills, except for landfills overlying areas where there is no usable aquifer and except for very small, rural landfills in arid areas. Composite liners are necessary to prevent ground water degradation, based on overwhelming evidence from the SWAT Program that unlined or clay-lined MSW landfills pollute ground water with hazardous constituents in a wide range of climatological and hydrogeological conditions. Once a landfill leaks, it is nearly impossible to contain or clean up the pollution, and costs can be exorbitant. Because of the limitations, RWQCBs may not require cleanup, and an almost-permanent source will continue to degrade larger and larger volumes of ground water over time.

The concept of allowing a waiver from this requirement is an issue that will need to be considered. However, we have not yet seen a successful demonstration that alternative non-composite liner designs can meet the federal performance standard. These attempts rely on site-specific mathematical model studies. The preparation and review of these studies would be costly to both dischargers and RWQCBs. Example: Kern County submitted a report to SWRCB staff in an attempt to demonstrate that the clay-only liner design of the Bena Landfill in Bakersfield was sufficient to meet the federal performance standard and to prevent leakage. SWRCB staff found significant deficiencies in the report, and the county recently prepared a second report. These attempted demonstrations have consumed both discharger and SWRCB resources. Furthermore, despite the reports' attempts to demonstrate that the liner would prevent leakage, Kern County has now reported that a release from the Bena Landfill has been tentatively identified.

### **MONITORING SYSTEM DESIGN THAT PERMITS EARLIEST POSSIBLE DETECTION OF A RELEASE**

#### **A. VADOSE ZONE AND SURFACE WATER MONITORING AND CLEANUP**

##### Federal Requirements

The federal MSW landfill regulations neither prohibit releases to the vadose zone nor require that the vadose zone be monitored or cleaned up in the event of a release. Regarding

surface water, the federal requirements prohibit releases to surface water, but do not require that it be monitored or cleaned up in the event of a release.

#### Existing SWRCB Requirements

Chapter 15 requires monitoring and cleanup of not only ground water, but also the vadose zone and surface water.

#### Proposal

We propose to retain current SWRCB requirements for vadose zone and surface water monitoring and cleanup. The SWRCB requirements provide for monitoring systems that are capable of detecting leakage from the liner system at the earliest opportunity, an approach that protects beneficial uses and reduces long-term costs to clean up polluted waters. In these areas, the federal MSW landfill regulations do not contain adequate requirements for monitoring for releases from landfills. Ground water is very deep in much of California, and the vadose zone can be up to several hundred feet thick. Without vadose zone monitoring, a release from a landfill in an area with deep ground water would not be detected until it is very large and expensive to clean up. Also, monitoring and cleanup of surface water from releases from MSW landfills is necessary to protect water quality, consistent with Water Code mandates.

### **B. LOCATION OF GROUND WATER MONITORING POINTS**

#### Federal Requirements

The federal requirements state that "the downgradient monitoring system must be installed at the relevant point of compliance".

#### Existing SWRCB Requirements

The SWRCB requires monitoring points to be located wherever necessary to detect a release at the earliest opportunity, given site-specific conditions.

#### Proposal

We propose to keep the current SWRCB approach. The SWRCB requirements provide for monitoring systems that are capable of detecting leakage from the liner system at the earliest opportunity, an approach that protects beneficial uses and reduces long-term costs to clean up polluted waters. The

federal approach for downgradient monitoring only is unduly rigid and does not allow for "sidegradient" or "upgradient" monitoring. Geologic conditions in much of California are very complex. In these complex areas, a downgradient-only monitoring system could fail to detect a release until significant pollution has occurred.

### **SEISMIC DESIGN CRITERIA**

#### **Federal Requirements**

New and expanding MSW landfills within "seismic impact zones" must be designed to resist the maximum horizontal acceleration for the site. "Seismic impact zones" are defined as areas where there is a 10% or greater probability that the maximum horizontal acceleration will exceed 0.1g in 250 years. There are no seismic design requirements for sites located outside seismic impact zones; however, all of California is located in a seismic impact zone. There is a prescriptive and an alternative option for determining the maximum horizontal acceleration. Using the prescriptive option, the maximum expected horizontal acceleration is found on a seismic hazard map showing the acceleration that has a 90% or greater probability of not being exceeded in 250 years [corresponding roughly to a 2500-year return period]. The alternative option for determining the maximum expected horizontal acceleration is through a site-specific seismic risk assessment. The federal regulations do not specify the probability of occurrence of the maximum horizontal acceleration under this option.

#### **Existing SWRCB Requirements**

USEPA considers the Chapter 15 requirements to be equivalent to the seismic risk assessment option allowed in the federal MSW regulations. Under Chapter 15, most MSW landfills are Class III. Within the entire state, Chapter 15 requires Class III landfills to be designed to withstand the maximum probable earthquake at the site. The maximum probable earthquake means the maximum earthquake that is likely to occur during a 100-year period. The landfill must withstand all damaging motions caused by the design earthquake, rather than solely the maximum horizontal acceleration as specified in the federal regulations. Other ground motions, such as low-frequency motions, are even more damaging to critical containment features of landfills than is the maximum horizontal acceleration.

### Proposal

We propose that new or expanding MSW landfills be designed for the earthquake that has a probability of occurrence of 10% in 250 years [return period of 2500 years]. We would retain the current SWRCB requirement that the design must include consideration of all aspects of the design earthquake, not solely the maximum horizontal acceleration.

### **ADEQUATE FINANCIAL ASSURANCES FOR CORRECTIVE ACTION**

#### Federal Requirements

The federal MSW regulations require financial assurances for corrective action only after the discovery of a release. At the time of discovery, which could be after any revenues are produced, the discharger is required to immediately provide financial assurance for corrective action.

#### Existing SWRCB Requirements

The SWRCB Requires dischargers to set aside funds to provide for possible corrective action.

### Proposal

We propose to retain the SWRCB requirement for advance funding for corrective action with modifications as discussed below. The SWRCB promulgated this requirement because dischargers have historically been unable to provide funds for the necessary investigation of a release, much less fund the cleanup itself. The federal approach does not reliably provide for the discharger to have adequate funds to pay for corrective action immediately after detection. We propose to change the name to "financial assurances for future corrective action" and to have an optional chart to determine the appropriate amount of coverage and to rely on California Integrated Waste Management Board's existing financial assurance mechanism regulations.

### **MAINTAIN A 5-FOOT SEPARATION BETWEEN WASTE AND GROUND WATER**

#### Federal Requirements

There is no federal provision for a five-foot separation between waste and ground water.

#### Existing SWRCB Requirements

Chapter 15 requires a minimum five-foot separation of waste from ground water.

### Proposal

We would retain this provision. Our experience has been that ground water seeping into waste causes long-term production of large quantities of leachate, which can then pose a threat to water quality.

### **ACCEPTANCE OF NON-MSW AT UNLINED LANDFILLS**

Finally, the following divergence from the federal regulations is necessary in order to mesh federal requirements for MSW with non-MSW requirements. MSW landfills routinely accept other waste streams, which may pose a greater or a lesser threat to water quality than MSW. Some of these MSW landfills are composite-lined and some are not.

### Federal Requirements

There are federal regulations governing discharges of MSW and hazardous waste only; industrial waste is not addressed.

### Existing SWRCB Requirements

The SWRCB distinguishes between hazardous, designated, nonhazardous, and inert wastes.

### Proposal

We propose that composite-lined landfills could accept any waste except hazardous waste. Existing MSW landfills that are not composite-lined could continue to accept those wastes already specified in waste discharge requirements (WDRs), including MSW. Should the discharger propose to add acceptance of other non-MSW waste streams to the WDRs, RWQCB approval would be necessary. The regulations would contain factors the RWQCBs should consider regarding acceptance of such waste streams, including waste constituents, leachability of waste constituents in the landfill environment, volume of waste to be discharged, and likelihood of movement out of the unlined landfill.