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Mr. Donald A. Cool
Chief, Radiation and Health
Effects Branch
Division of Regulatory
Applications
Office of Nuclear Regulatory
Research
U.S. Nuclear Regulatory
Commission
Washington, DC 20555-0001

RE: Comments on Draft Proposed Rule, 10 C.F.R. Part 20, Developing Radiological Criteria for Decommissioning

Dear Mr. Cool:

On behalf of Union Oil Company of California dba Unocal (Unocal) and its wholly owned subsidiary, Molycorp Inc. (Molycorp), the following comments are provided concerning the draft rulemaking referenced above. Also, attached hereto and incorporated by reference, are comments generated by Dr. McDonald E. Wrenn, Professor, Utah University, and Director, Radiation Surveillance Associates, Inc., which were prepared for Molycorp. In accordance with the directions attached to the draft proposed rule, all of these comments are being submitted today for full consideration prior to actual publication of the proposed rule in the Federal Register.

Applicability

Several statements are contained in the draft rule which limit the applicability of the new decommissioning criteria to those facilities that have not already received approval for a decommissioning plan prior to the effective date of the rule. It is suggested that this applicability limitation be broadened slightly to include facilities that have submitted decommissioning plans that are deemed substantially complete prior to the effective date of the draft rule. Failure to broaden the applicability

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limitation as suggested will clearly slow the decommissioning process down at facilities currently engaged in decommissioning planning efforts or those contemplating such engagement. There will be no incentive for such facilities to continue or begin their decommissioning planning efforts until the draft rule is finalized since they will be attempting to plan around criteria that is realistically unknown until published in its final form in the Federal Register.

Additional Remediation Requirements

The NRC must maintain its present position that additional remediation will not be required of parties that have completed or are in the process of remediation, in full compliance with an NRC-approved decommissioning plan, at the time of final promulgation of the draft rule. This is important in that any currently ongoing remediation efforts will likely immediately be ceased if the NRC takes another position. Moreover, this position indicates consistency with the applicability limitation discussed immediately above.

Availability of GEIS

The fact that so much of the draft rule is supposedly based on information in the GEIS, lends support for the position that the GEIS should be finalized prior to publication of the proposed rule in the Federal Register. It is difficult to comment completely on the draft rule when most of the justification is supposedly contained in a document not ready for release (i.e., the GEIS). The availability of the GEIS will substantially improve the ability of reviewing parties to understand and comment adequately on the proposed rule.

Availability of Document Describing Acceptable Methodologies for Demonstrating Compliance

It is very difficult, if not impossible to provide serious comments concerning the decommissioning criteria when the methodologies for demonstrating compliance with the release criteria are not clearly announced and expressed in writing. As Molycorp's consultant points out, if the NRC only allows demonstration of compliance based on small quantity soil samples, the proposed release criteria will be completely unacceptable and most likely, not obtainable. The NRC states that would be inappropriate to prescribe, a priori, the methods to be used. On the contrary, a better

approach would be to describe, a priori, what methods will clearly be acceptable, while leaving room for approval of more innovative approaches in the future. It is of utmost importance that the document describing acceptable compliance demonstration methodologies be produced and available for public comment as part of this rulemaking process.

Basis for Criteria - Individual versus Collective Doses

The draft rule indicates that the NRC has decided to base cleanup criteria on cumulative TEDE but goes on to state that the GEIS concludes that the individual dose is controlling (and that consideration of collective doses is not useful in distinguishing between regulatory alternatives. This apparent inconsistency should be fully addressed.

Radiological Criteria

It is strongly suggested that the NRC continue to consider site-specific release criteria based on site-specific health risk assessment modelling. The generic criteria listed in the draft rule may in fact provide an economic advantage for some companies, since they would not have to conduct any modelling or spend large sums of money to determine adequate cleanup levels. However, at some facilities it will be very economical to perform a site-specific risk assessment (to determine the level of actual cleanup required in order to protect human health), in lieu of meeting overly conservative generic decommissioning criteria. It is suggested that the NRC consider the following hierarchy for establishing decommissioning criteria.

1. Site Specific Risk Assessment

2. Generic Release Criteria

Based on the rapidly developing ability of risk assessment modelling to accurately define suitable cleanup criteria, it seems wasteful not to take advantage of such tools. Moreover, these tools are readily accepted by other regulatory agencies, including the U.S. Environmental Protection Agency.

Remediation Technologies

The NRC states in the draft rule that "remediation technologies are believed by most commenters to be available for achieving whatever level is set by the NRC." It is unclear what technologies the NRC may be referencing. There are three technologies basically used in radiologic remediation: excavation and disposal; washing; and/or capping. Unocal and Molycorp would be most interested in obtaining more information on the technologies being referenced, if different from those listed herein. Based on the limited technologies listed herein, the proposed generic criteria are very troublesome from the standpoint of what may actually be required to protect human health and economics. In other words, the generic approach can be overly conservative and it is not clear how the benefits of such over conservatism are justified by the inherent increased costs.

Waste Disposal Issues

Disposal site capacity is clearly a concern of all parties, including the NRC. This issue is even more of a concern when the radiologic components in waste to be disposed of are accompanied with hazardous waste components. There is only one site available in the country to dispose of such "mixed-waste". Hence, the disposal site capacity problem could be more serious than currently contemplated. This issue should be addressed more fully by the NRC in the rulemaking effort.

In addition, the response to this issue in the draft rule, appears to be over-simplified. The NRC states that, if storage site capacity is temporarily limited, on-site storage and containment of wastes may be necessary. However, no mention is made of the prior regulatory approvals that will be required before such temporary actions are performed. This may include, but is not limited to, federal, state and local government approvals, not to mention the public notice requirements associated with such approvals. Hence, the amount of time to obtain the necessary approvals to perform the temporary actions may alleviate the need to perform the temporary actions. This clearly needs to be considered when addressing waste disposal site capacity issues.

Restricted Release Criteria

The NRC has proposed a variety of tests and associated demonstrations that a licensee can use to achieve restricted release status. It is strongly suggested that the terms mentioned in the proposed tests and demonstrations be clearly defined. For instance, what is "clearly excessive" and "in the future".

The third condition which must be evaluated for restricted release status is especially troublesome. The draft rule suggests that the "overall resources of society" must be taken into account when evaluating this criteria. The overall resources of society seems to be rather far reaching and clearly well beyond the capabilities of any company or consultant to define. This section is worthy of further consideration and thought by the NRC.

Site Specific Advisory Boards

Although, the use of such Boards may delay the ultimate compilation of a decommissioning plan, they can serve to alleviate public protests, and hence shorten the overall time to obtain approval. However, it seems that if such heavy public involvement is utilized in the planning process, there should be some consideration given to the licensee. It is suggested that the NRC seriously consider something like categorical exemptions under NEPA or similar environmental impact legal requirements, if site specific advisory boards are utilized. Another alternative may be to adopt something similar to the RegNeg process used by the EPA. Under this process, participants in the negotiation process are limited in their ability to obtain administrative or judicial relief, once the process is concluded.

The participant listing noted in the draft rule appears excessive for smaller sites. It is suggested that discretion be allowed for the actual participants on a site specific advisory board. For example, a smaller site, in the range of a few acres with only limited radiation contamination, may not warrant a 10 member board.

Finally, the actual requirements for site specific advisory boards must be clearly described in the proposed rule. This includes public notice criteria, record retention requirements, termination criteria.

Readily Removable Residual Radioactivity

The NRC should provide more clarification in this section. As currently written, the licensee will be left to determine how "large volumes of radioactive waste requiring subsequent disposal" should be defined. This will likely be accomplished by submitting a proposal for such as part of the decommissioning plan. Although flexibility is important and should be maintained (in other words readily removable residual radioactivity should be defined on a site specific basis), the NRC should provide assistance to licensees in the proposed rule to increase the efficiency of the decommissioning plan review process.

Radioactive Materials Previously Disposed of at the Site

The NRC position described in this section is troublesome. Earlier comments by the NRC suggested that once decommissioning had occurred under an approved plan, the NRC did not intend to require further remediation as a result of this rule. The position taken relative to previously disposed materials calls this intention into question. What's to stop the NRC from taking a "public risk is the overriding factor" position relative to previously approved decommissioning efforts that may not meet the more stringent requirements of this draft rule?

Finally, it is not clear why a site specific analysis is allowed for previously disposed materials but is not seriously considered for newly decommissioned sites (i.e., those subject to this draft rule)? The NRC should address this apparent inconsistency.

Time Frame

It appears that the NRC should provide more justification for the 1000 year time frame suggested in the draft rule. Although it may be possible to predict projected doses based on knowledge of the radioactive components and their decay properties, it is not clear how licensees are to predict changes in geohydrologic regimes or other matters clearly beyond the control of the licensee. The NRC states that it will not serve any useful purpose to estimate radiation doses from residual radioactivity thousands of years into the future, but decides instead to require it for 1000 years. How is this position jusitified?

Use of Land Use Restrictions or Other Institutional Controls for Restricted Releases

The NRC should provide additional information concerning how a licensee can demonstrate "that the controls proposed have a reasonable expectation of enforcement". The term "reasonable expectation of enforcement" is particularly subject to discretion.

Thank you for the opportunity to provide these comments. This draft rule is very important to Unocal and Molycorp and we are hopeful that the NRC will seriously consider and address the comments contained herein and attached hereto.

If you have any questions, please feel free to contact me.

Sincerely,

Mark A. Smith
Assistant Counsel

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MAS-054

cc: BEBalbierz
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COMMENTS PREPARED BY
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RADIATION SURVEILLANCE ASSOCIATES, INC.
FOR MOLYCORP, INC.

Review of Proposed Federal Register Notice, Nuclear Regulatory Commission 10 CFR Part 20, Draft Radiological Criteria for Decommissioning

MARCH 11, 1994

The first comments deal with the amendments proposed for 10 CFR part 20, specifically the paragraphs to be amended or inserted. Following these, additional comments will be provided on the commentary or preamble which the Commission staff expects to use in justifying the revisions.

10 CFR Section 20.1003

The definition of background radiation is vague to the extent that it does not define where exactly background is implied, the degree to which it is averaged over geographically relevant areas, or whether it includes highly diverse geographic regions. This is important because in the proposed regulation, background radiation serves a central function, namely the reference value against which the goal of decommissioning is to be judged.

10 CFR Section 20.1402

The proposed regulation at 10 CFR Section 20.1402 and elsewhere, contains references to ALARA. The definition of ALARA at 10 CFR Part 20 is:

> ALARA (acronym for "as low as is reasonably achievable") means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state o technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

The Commission indicates in the draft proposed rule that this concept and others in the proposed revisions are based on guidance from the NCRP and the ICRP. However, ALARA as used by the Commission, appears to be different from that conceived by and recommended by the ICRP. The Commission, in the draft

proposed regulations, defines 15 mrem/year to the average member of the appropriate critical group as ALARA. This appears to be an inappropriate use of ALARA since ALARA depends on an analysis of what is reasonably achievable. The ICRP defines reasonable in terms of the minimization of the collective dose from the operation under consideration. In this case, it would be the collective dose to the public as a result of with the decommissioning activity. However, the Commission has indicated that collective dose is not part of its regulatory considerations since it is not useful. The guidance of the ICRP provides that collective dose is the quantity to be minimized in order to determine what is "as low as reasonably achievable." This is an important distinction. Indeed, what is reasonable can only be determined using the concept of collective dose and costs. Both of these concepts (collective dose and cost) were apparently not used in development of the draft proposed rule. Thus, the tools for determining ALARA are apparently not part of nor considered in the draft proposed rules. It is recommended that "as low as reasonably achievable" be determined based on the collective dose and that time period over which the collective dose is assessed, not to exceed one lifetime.

10 CFR Section 20.1404: Radiological Criteria for Unrestricted Release.

The goal adopted in this section appears to be extremely strict. Moreover, the goal appears to be silent as to the extent that the concentration of a radionuclide can contribute to residual radioactivity, and how indistinguishable from the background radiation concentration that radionuclide must be. This is a vague requirement because the volume of soil or other material over which the radionuclide could contribute to background is not specified and therefore, the definition of background itself is not reasonably specified. This could be interpreted by the NRC staff to apply to volumes as small as a tiny grain of material. This is a serious comment because the NRC staff is already enforcing radioactivity concentration guide limits over volumes of soil samples as small as 100 grams. These small volumes could have no appreciable affect relative to producing external exposure. Indeed, in proposed rule 10 C.F.R. §20.1404(b), this site is considered acceptable for unrestricted use as long as dose to the average member in the critical group does not exceed 15 mrem per year and is as close to the decommissioning goal as is reasonably achievable. Contrary to guidance from the ICRP, there appears to be no manner identified in the proposed rule to determine what is reasonably achievable. What is reasonable depends often on who bears the cost. But because costs are not a part of this proposed regulation, there is no practical method for defining reasonable. Indeed, the choice of doses to average individuals almost by definition makes the evaluation of what is reasonable an impossible task when compared to how ALARA has been

generally understood in the international scientific community for many years.

Section 20.1405: Criteria for Licensee Determination Under Restricted Conditions.

This criteria, which is based on dose limitation, is more reasonable than criteria based on arbitrary concentration limits in soil, and should be an improvement over current guidance from the NRC staff.

However, there is some risk to using a single generic guidance number (i.e., dose limit) applicable to the whole United States. The limit specified in the proposed regulation is 15 mrems per year, which is apparently justified by saying that it is a small fraction of the 100 mrems per year which would be applicable to the average member of a critical group. It appears that the choice of 15 mrems per year is rather arbitrary, the possible rationale being that as many as six or more sites contributing 15 mrems per year could be present in a given locale. Hence, it is necessary for the commission to be very strict with respect to any one particular site. It is suggested that a numerical limit not be given as generic guidance but that the numerical value be determined on a site specific basis. For example, if an area had only one site capable of producing exposure to the public above background, then 100 mrems per year would be an appropriate limit (but not necessarily ALARA). If two such sites existed, 50 mrems per year may be appropriate. Therefore, dose limit should depend upon the local circumstances as opposed to being a generic limit.

There is a danger to requiring ultra conservative decontamination procedures in that: (1) it will drive the cost of remediation up; (2) may not be an optimum use of resources since the benefit to public health in terms of reduction of the collective dose may not be demonstrated (since it is not required in the proposed regulations); and (3) it will probably slow the rate at which the decommissioning of the facilities can occur because the proposed rules are insensitive to benefits versus costs. By setting a 15 mrem annual limit, irrespective of cost, many licensees may feel that they are being unfairly treated or subjected to a system for which, no matter what they spend or do, they cannot be sure of compliance, and cannot be sure of a limitation on expenditures. Indeed, the Commission is adopting these new regulations with the avowed purpose of speeding up the decommissioning process. However, it appears that because of the strict limits proposed, the absence of a relation to benefit versus cost and the absence of a process to determine what is "as low as reasonably achievable" such as that recommended by the ICRP, will in fact slow down the decommissioning of inactive facilities. Moreover, it may diminish the number of companies entering into activities involving potential radioactive contamination, even those which

might have a substantial benefit to mankind, because the costs for decommissioning may be too substantial.

It is reasonable that the Commission does not intend to apply the proposed criteria to the remediation of sites listed in the SDMP which have decommissioning plans approved at the time of adoption of the new rules. Further, it is appropriate that the NRC not include provisions to address non-radiological hazards. It is appropriate conceptually, that the rules provide for unrestricted and restricted termination of a license and that, if a licensee cannot satisfy the condition for license termination, that the license will not be terminated.

It is very appropriate that the NRC acknowledges the degree to which it relies on the recommendations of the ICRP and the NRCP in the existing and proposed 10 CFR Part 20. However, more reliance should be placed on the detailed guidance of the ICRP for the operational definition of ALARA, namely its association with minimization of collective doses in relation to the costs associated with reducing them.

It is inappropriate and unnecessary that the Commission continues to consider projecting a dose limit of only 15 mrems per year, of the entire dose limit, to be applied to a single site for members of the public. It is recommended that a site specific allocation, based on a justifiable fraction of the 100 mrem per year be made.

The Commission's decommissioning goal of returning a facility to levels approximating background is an overly strict goal which in exact terms, may be impossible to reach. It is also vague in that background itself is undefined and always has uncertainty associated with it. What is the background based on? How many samples? Over what areas? Indeed, the Commission's suggestion that the cumulative TEDE to an average member in the critical group, as distinguished from background, not exceed 3 mrem per year, appears to be arbitrary. It's basically based on detection limits, which have no relationship whatsoever to expectations of biological impacts.

We believe that a more rational and justified procedure would be:

1. Produce an analysis of ALARA, following ICRP detailed guidance.

2. If ALARA exceeds 100 mrems per year to the critical group, use 100 mrem per year as the dose limit.

3. If ALARA is less than 100 mrem per year, use ALARA as determined for the analysis.

On page 19 of the draft proposed rule it is pointed out that in the GEIS the Commission believes that individual dose should be controlling and that consideration of collective dose is not useful in distinguishing between alternative regulatory alternatives. This is quite contrary to the recommendations of the ICRP which recommends that collective dose be used for the process of deciding what is "as low as reasonably achievable." Estimates of collective doses are needed to assess the cumulative impact (the benefits being dose reduction and the reasonableness of expenditures which are associated with the cost of the dose reduction). It seems that any other method of determining what is "as low is as reasonably achievable" is somewhat arbitrary and very subjective. Lack of guidance such as that furnished by ICRP on determining ALARA could lead to a great deal of disagreement between the regulators and the regulated. The goal of reducing residual radioactivity at a site to levels that are indistinguishable from background is also vague since this criterion depends upon instrument sensitivity and specificity, which will change with instrument design and cost. Indeed, the recommendations made in some current draft guidance documents, although draft in nature, suggest that soil samples as small as 100 grams be analyzed, based primarily on detection limits of radiochemical analytical techniques. In view of the fact that the gamma background above normal soils originates from literally tons of material within approximately ten meters of a person standing out of doors, it seems unreasonable to have a remediation goal that could be applied to any size sample whatsoever. As such, the proposed rule of 15 mrem per year TEDE, as a dose limit appears to be overly conservative; not necessary for most sites in the U.S.; and will likely result in unjustified large resource expenditures which may in fact cause reluctance to proceed in a timely manner.

On page 22 of the draft proposed rule there are comments made about the finality of the draft proposed standards, indicating that the actions taken under this rule will not need to be revisited. The Commission staff go on to state however, that it is reasonable to believe that residual radioactivity remaining at the site could result in significant public or environmental harm. However, it seems more likely to me that any new information might suggest the contrary, and therefore, the proposed rule should expressly allow for revisiting the standard if it is shown that low dose and low dose rates of radiation are <u>less</u> harmful than predicted by linear extrapolation from high doses and high dose rates. It seems unlikely that limits which are a small percentage of the natural background (about 5% at 15 mrem per year) would be shown to be very harmful. Indeed, at most, relative to background itself for an average background area, this dose can only be equivalent to about 5% of the natural background.

In the event that license termination must be requested along with land use restrictions we see no disadvantages to convening a site specific advisory board provided that the Board has as technically competent members with sufficient expertise to understand the relationship between background radiation, radiobiology, and the risk from the release of the site. However, if this level of public and technical input is occurring during initial planning and implementation of decommissioning efforts, significant relief should be provided from NEPA or other impact analysis requirements.

On page 27 of the draft proposed rule, it's indicated that provisions are made for site specific implementation of the generic criteria. This appears to us to be appropriate, although generic criteria should also be determined by site specificity, namely the presence of other activities likely to use a portion of the 100 mrem per year dose limit.

With respect to ALARA it appears that the proposed regulation defines ALARA in a manner completely inconsistent with its historical use by ICRP and other organizations. Again, in order to evaluate what is reasonable, collective dose must be used, not individual dose to a member of a critical group. The concept of the individual dose to a member of a critical group was originally introduced by ICRP for the purpose of limiting risk to substantial populations.

On page 29 of the draft proposed rule, it states we are glad to hear that "the NRC is developing guidance on how the ALARA process could be applied in evaluating alternative radiological criteria for decommissioning on a site specific basis". Although this process should in fact be used (as noted above) it should be noted that on the surface, this statement is inconsistent with the proposed rulemaking as a whole.

It is very appropriate for the NRC to recognize that some sites are so contaminated with elevated levels of naturally occurring uranium and thorium and their decay products that it would be extremely difficult and costly to satisfy the proposed criteria either for restricted or unrestricted release. Therefore, it is appropriate that the Commission anticipates that these sites may remain under license indefinitely until new efficient technologies develop for decontamination or new information becomes available which might change the position of the Commission and others on the need for remediation.

It is also appropriate that, as part of this or any other rule, workers who perform radiological remediation be appropriately trained and protected.

The NRC's guidance on the acceptable methodologies for demonstrating compliance with the Commissions' residual

radioactivity criteria, which, it should be noted, are not part of this rulemaking, should not be similar to that already promulgated for the SDMP sites. Said existing methodologies require that small soil samples satisfy arbitrarily strict requirements, which appear to be essentially unrelated to expected dose to people. It will however, make it close to impossible for a licensee to demonstrate compliance. Moreover, without having this compliance guidance available as part of the draft proposed rule being commented on herein, and given the history of the Commission staff in interpreting prior guidance from 1981, there is no way licensees can be assured that the compliance demonstration criteria eventually issued will be reasonable or attainable.

On page 32 of the draft proposed rule it is indicated that "compliance will likely need to be determined by a computer model". It may be more accurate to state that compliance will be assessed by people using computers and models developed on computers.

For item 12, starting on page 33 of the draft proposed rule, it states that for those sites with significant volumes of thorium or uranium contamination which would require extensive remedial efforts without the expectation of necessarily meeting the unrestricted release guidelines, the license would remain in effect indefinitely. As noted previously, this appears to be a reasonable position.

It is also reasonable to require the licensee to consider any potentially significant radiation doses and risks associated with the remediation itself, including those from transportation and the disposal of radioactive wastes generated in the decommissioning process. These considerations should be made part of the determination of what is "as low as is reasonably achievable" for each specific decommissioning action. Furthermore, it is appropriate that the proposed rule not apply to sites already covered by a Commission approved decommissioning plan.

This is a good place to bring up the inherent problems associated with the propagation of conservatism. The NRC states that the reason they chose 15 mrem/year was to provide a substantial margin of safety below the NRC's dose limit for members of the public. Since the dose limits are not unsafe limits it is unclear why an additional margin is necessary, especially since an ALARA analysis will be required. Past experience indicated that NRC equations, and the parameters chosen for use in them, also involve safety factors often introduced at every step in the calculation process. (The NCRP cautions against performing dose evaluations in this manner, see NCRP-50). Any guidance issued by the NRC in the future should include recommendations that the dose be assessed as accurately as possible, using the best models

which are designed to predict the expected dose rather than an upper limit. In addition, if the Commission desires to evaluate the degree of safety involved, it should require the establishment of an analysis of variance concerning the expectation in said models. The NRC has indicated that the computer models will be screening models which employ generically derived conservative assumptions and factors. Under those conditions it is not clear what the expected doses will be relative to those estimated by conservative screening calculations.