bcc Julie Reitinger, PM
RC-24-06-06
RP (CAR)

Department of Energy
Oak Ridge Operations
Weldon Spring Site
Remedial Action Project Office
7295 Highway 94 South
St. Charles, Missouri 63304

September 10, 1996

Mr. Larry Erickson
Missouri Department of
Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Dear Mr. Erickson:

RESPONSES TO MDNR COMMENTS ON THE SOUTHEAST DRAINAGE ENGINEERING EVALUATION/COST ANALYSIS (EE/CA) (JUNE, 1996)

Enclosed are responses to the MDNR comments on the revised Draft Final EE/CA for the Proposed Removal Action at the Southeast Drainage near the Weldon Spring Site, June 1996. Note that prior comment/response correspondence is also enclosed for your reference.

If you have any further questions, please contact Karen Reed or Yvonne Deyo at (314)441-8978.

Sincerely,

Jerry S. Van Fossen

Jerry S. Van Fossen
Deputy Project Manager
Weldon Spring Site
Remedial Action Project

Enclosure:
As stated

cc w/enclosure:
D. Wall, EPA
G. Carlson, MDOH
M. Fleischmann, MDNR
R. Geller, MDNR
M. Windsor, MDNR
M. Picel, ANL
M. Schroer, MDC
K. Warbritton, PMC
Weldon Spring Citizens Commission

64362

Department of Energy
Oak Ridge Operations
Weldon Spring Site
Remedial Action Project Office
7295 Highway 94 South
St. Charles, Missouri 63304

February 13, 1996

Ms. Geri Kountzman
Missouri Department of
Natural Resources
7045 Highway 94 South
St. Charles, Missouri 63304

Dear Ms. Kountzman:

WELDON SPRING SITE REMEDIAL ACTION PROJECT (WSSRAP) RESPONSES TO MDNR COMMENTS ON THE SOUTHEAST DRAINAGE ENGINEERING EVALUATION/COST ANALYSIS (EE/CA)

Enclosed are responses to the MDNR comments on the Draft EE/CA for the Proposed Removal Action at the Southeast Drainage near the Weldon Spring Site, October 1995. Note that as a result of comments received, the proposed action for the drainage will be revised to include removal of contaminated sediments in Segment A. In addition, discussions held at the January 23, 1996 meeting raised another issue regarding costing of an alternative route to the Katy Trail. To address this concern, detailed information (including a cost estimate) will be provided in the EE/CA revision.

If you have any further questions, contact Karen Reed or Yvonne Deyo at (314)441-8978.

Sincerely,

Jerry S. Van Fossen

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Deputy Project Manager
Weldon Spring Site
Remedial Action Project

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As stated

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G. Carlson, MDOH
L. Erickson, MDNR
M. Fleischmann, MDNR
J. Garr, MDC
M. Picel, ANL
D. Wall, EPA
K. Warbritton, PMC

Responses to MDNR Comments on Southeast Drainage EE/CA

1. a) *Comment: Pg. 1 Section 1 - The MDNR does not agree with the statement, "To facilitate the decision-making process, the drainage was divided into four segments according to accessibility." It is the MDNR's contention that Sections D, C, and portions of B are readily accessible through the southern portion of the drainage and utilizing a portion of the Katy Trail as a haul route. Therefore, the issue of accessibility in the southern portion of the drainage is not justifiable a factor for determining which areas are to be remediated.*

Response: We agree with the comment, and did not intend for the indicated statement to be interpreted that accessibility alone would determine which areas in the drainage are to be remediated. The drainage was delineated into four segments to facilitate the decision-making process, and accessibility by standard excavation and hauling equipment was only one of the factors used to divide the drainage into segments. Other factors considered in the division of the drainage included main channel slope, side slope, channel width, vegetation characteristics, and safety and public access. Each of these parameters varies considerably as one proceeds along the drainage from its headwaters to the Missouri River. The longitudinal division of the drainage on the basis of these parameters is justifiable, and does in fact facilitate the decision-making process. Furthermore, accessibility to the different segments of the drainage directly affects implementability, which is one of the evaluation criteria under CERCLA. The text has been revised to identify the role of these other factors in the delineation of the drainage into four segments.

b.) *Comment: The statement, "Characterization data for sediment were collected for each segment." needs to be changed to "Preliminary characterization...". The data presented in the document may be sufficient to produce a preliminary risk assessment based solely on human risks. However, the additional characterization DOE has proposed in the document titled, "Engineering sampling Plan to identify Areas for Remediation in the Southeast Drainage, November 1995", is needed in order to provide a complete picture of the sediments and surface water within the drainage and the risks they pose. Subsequent data resulting from additional characterization will need to be evaluated to form a final risk assessment.*

Response: A data sufficiency exercise was performed and will be referenced in the next version of the EE/CA. The report concludes that the data utilized to perform risk assessment were statistically sufficient to support conclusions that risk to a future hypothetical child scenario is over the 10^{-5} risk level at all four segments; risk to the current hunter scenario exceeded this level in only Segment C. Therefore, incorporating additional data points to the calculations will not likely enhance the adequacy of the risk assessment. However, the additional data collected would provide valuable information in the design of the remediation.

c.) *Comment: Clarification is needed regarding the term, "natural uranium". Are there other than naturally occurring, i.e., synthetic or man-made? Is this statement implying that the levels of uranium in the surface waters of in the surface waters of the drainage are naturally occurring or "background"? What are the other contaminants of concern found within this drainage and addressed by this EE/CA?*

Response: The term "natural uranium" is not synonymous with background. The term refers to uranium in which the activity ratios of the three uranium isotopes are the same as that in naturally-occurring uranium ore (i.e., the activity ratio between U-238, U-234, and U-235 is 1:1:0.046, respectively). Uranium can be enriched in the fissionable isotope, uranium-235, but enriched uranium is not a concern at the Weldon Spring site because natural uranium constitutes the primary material processed.

Risk calculations were performed for all radioactive and chemical parameters detected in the drainage; this information is presented in Chapter 2. In conducting risk assessment, a screening analysis is typically performed to focus only those parameters that are more significant contributors to risk. In this case, a screening procedure was not performed a-priori to identify (i.e., limit) these contaminants of concern. Risk calculations incorporated contributions from all parameters detected.

d.) Comment: The document indicates that groundwater contamination in the drainage is being addressed under a separate operable unit. Will the extent of the proposed removal action also eliminate any potential for the remaining sediments to contaminate the groundwater, or for the groundwater to recontaminate the sediments? If not, explain the rationale for not removing all the contaminants which have the potential to adversely impact the groundwater or sediments at this time, thus requiring a second removal action within the same area at a greatly increased cost.

Response: The proposed action is to remediate known areas of sediment contamination in the drainage to levels that are protective of human health and the environment, including potential leaching to groundwater. Surface water at the springs is hydrologically connected to groundwater beneath the drainage. The springs are discharge points f groundwater and, in fact, would be the point of exposure for any potential receptor. These springs have been monitored over a period of several years; calculations estimated for contaminant levels measured in the springs do not indicate an unacceptable risk to a person drinking water from the drainage. Removal of what is considered to be the primary source of contamination (i.e., sediment) is expected to result in attenuation of contaminant levels found in surface water. Although the possibility exists for recontamination from groundwater, it is unlikely that this would be a significant source to the sediment. As discussed at the January 23 meeting, calculations were performed which support the hypothesis that recontamination from water is unlikely. See below:

Assumptions: Ave U(total) concentration in Spring water = 150 pCi/L
Kd values range from 10 to 300 ml/g
U-238 = 0.5 x U(total)

Formula: C (water)/1000 x Kd/2 = C (soil)

where:

Cwater = Conc. U (total) water in pCi/l
Kd = Distribution coefficient in ml/g
C soil = 0.5 x U (total)

U-238 soil for Kd (10) = 0.75 pCi/g

U-238 soil for Kd(300) = 22.5 pCi/g .

e.) Comment: The statement, "Risk calculation performed indicate portions of the drainage contribute to elevated exposures...to a projected recreational user." is not accurate. The scenario utilized for determining the risks has been described as a modified residential exposure scenario. The text needs to be modified to correct this discrepancy.

Response: Text will be added to clearly describe the scenario that was used to evaluate human health risks. The projected future scenario is a hypothetical child who lives in the vicinity and uses the drainage as a recreational area.

f.) Comment: The statement, "Therefore, the intent of the proposed removal action is to reduce...in select accessible areas within the drainage" needs modifications to accurately reflect the proposed removal action. The excavation proposed will address both radioactive and chemical contaminants. The statement should read, "Therefore, the intent of the proposed removal action is to reduce the potential for risk to human health from radioactively and chemically contaminated sediment present in areas within the drainage."

Response: The text has been revised to be more general (i.e., address removal of contaminated sediment). Although the proposed action is targeted at removal of radioactively contaminated sediments, removal of co-located chemical contamination will also be accomplished. (This will be clarified in the next revision.) However, the risk assessment did not indicate that cleanup was necessary to address chemicals.

g.) Comment: Additionally, although the removal of a portion of the contaminant presently existing at the SE Drainage reduces the risk to the environment, the proposed risk based scenario does not address environmental risks and is not "protective" of the environment. Consequently, the removal action does not reduce the specific risks to the environment.

Response: A screening level ecological risk assessment was conducted and was presented in Section 2.3. Current levels of most of the contaminants were estimated to pose no or low risks to ecological resources, while moderate risks were identified for only two contaminants. These risk estimates must be viewed in context with the overall ecosystem present in the drainage, the ecological significance associated with the estimated risks, and the ecological consequences of remediation. Because of the ephemeral nature of the surface waters in the drainage, the drainage supports only a relatively limited biota that could be exposed to potential contaminants. Thus, the low to moderate risks identified by the assessment are of little ecological significance, and the removal of contaminated sediments from the drainage should thus act to reduce the estimated risks. However, there is the potential that remediation activities in the drainage could be more ecologically significant (because of direct habitat destruction related to excavation activities) than are the ecological risks posed by current levels of contamination. The selection of the proposed action

included considerations of minimizing potential habitat destruction.

h.) Comment: Have the contaminated sediments been evaluated to determine if any treatment for stability is needed prior to disposal in the cell? If so, what factors were utilized to determine if treatment is necessary, and what type of treatment will be utilized? If the evaluation has not been made, we strongly suggest that it be performed.

Response: Stability testing was performed for wastes from the process sewer and Imhoff tanks, and the results concluded that treatment was not needed. Because the sediments in the drainage are less contaminated, it is assumed that treatment is unnecessary. A reference is available for the process sewer results, and can be referred to in the EE/CA. In addition, a physical description of the sediments in the drainage will be included in the next revision.

i.) Comment: A proposed schedule outlining the components of the remediation of SE Drainage and tentative milestone dates is needed in this document.

Response: A specific timeframe and schedule for the proposed action will be included in the decision document for the Southeast Drainage. Based on current planning, remediation of the Southeast Drainage will take place sometime within the next two years. Text to this effect will be added to the revision.

2. *Comment: Pg. 2 Figure 1 - A figure or map which depicts those areas of the Chemical Plant and the WSOW that contribute to the watershed of SE Drainage is needed.*

Response: Comment noted. Figure 1 will be modified to depict the drainage boundary.

3. *Comment: Pg. 4 Section 2.1 - The description concerning the site's background needs to define what the activities were when wastewater was discharged to the SE Drainage, including those of the DOD.*

Response: Text describing the general site background for each site will be added to the EE/CA as requested.

b.) Comment: Clarification is needed as to the "sink hole" referred to in this section. Where is this sinkhole located within the drainage? What interactions are present between the springs, the sink hole, and the groundwater within and outside the drainage? A mass balance indicating that groundwater and/or surface water outside of the drainage does not interact or influence the watershed/drainage is needed.

Response: The sink hole is located at the head of the first losing stream segment, north of State Route 94, and north of SP-5301. The flow characteristics (i.e., interactions between the sink hole, springs, and groundwater) have been investigated most recently by the MDNR DGLS. Based

on their study, surface water flow is lost at the sink hole to groundwater and reappears downstream at SP-5301. Flow from this spring is lost to the creek bed and reappears downstream at SP-5302. This process continues almost the entire length of the drainage, where losing stream segments and springs are groundwater recharge and discharge points, respectively. The one exception is downstream of SP-5304, where water is close to the surface all the way to the Missouri River. From these investigations, it was also determined that water introduced into the Southeast Drainage (e.g., runoff from the chemical plant area and training area and precipitation) remained in the drainage valley. From the water tracing and dye tracing tests as part of the MDNR DGLS investigation, it was also determined that in the Missouri river watershed, water in one drainage does not cross into another watershed. These tests were used rather than a mass balance to determine if water in the 5300 drainage interacts with water in other watersheds.

Per our discussion at the January 23 meeting, a follow-up discussion between the MDNR, ANL, and MDNR DGLS will take place. In the meantime, calculations were performed that may further support the conclusion that recontamination may not be an issue (See response 1d).

c.) *Comment: The statement, "The drainage channel includes four springs, a sink hole, and losing stream segments." needs to be changed to "gaining and losing stream segments."*

Response: The text will be revised to say that in previous investigations four losing stream segments and one sink hole were identified in the drainage.

4. *Comment: Pg. 6 Section 2.2 - Clarify what the term, "a decision for the southeast Drainage." is referring to.*

Response: The text will be revised to state that analytical data was collected and analyzed to perform a risk assessment that can be used to support remedial decisions for the Southeast Drainage.

5. a.) *Comment: Pg. 6 Section 2.2.1 - Include the background concentrations of the radiological constituents for the drainage.*

Response: Reference to background concentrations was deleted from the text. A control drainage was not identified and sampled for background levels. In this case, it was obvious that radioactive contaminants were elevated over what could be naturally-occurring levels, and the added expense of collecting background data was deemed unnecessary. However, background soil levels are available for the Weldon Spring area which can be used for general comparison.

b.) *Comment: Pg. 7 Section 2.2.1 - The two references listed in the first paragraph on this page were not included in Section 7 References.*

Response: The reference list has been revised to include these references.

Responses to MDNR Comments on Southeast Drainage EE/CA

c.) *Comment: The issues of accessibility of the segments of the drainage was previously addressed in Comment #1. As stated in Comment #1, the issues of access to the drainage and consequently mobilization of equipment is not acceptable as a factor for determining which areas will be remediated. Smaller size equipment may have to be used in some of the areas.*

Response: The use of smaller size equipment increases the cost of remedial activities.

These factors will be considered in selection of the final design. (See also response to comment 1a.)

d.) *Comment: A description or reference describing how the gamma walkover survey was performed is needed.*

Response: This information is contained in the supporting document (Southeast Drainage Soils Review Sampling Report, MKF 1995). Reference to this report on survey-protocol will be indicated in the next revision.

e.) *Comment: References are needed for the radiological data presented in Table 1. Does this table include only the data collected by MK in 1995 or does it include the ORAU survey data also? Why are the results of the 1995 sampling different from that collected by ORAU? Why are the thorium-230 concentrations much lower?*

Response: A reference will be added to Table 1. As explained in the text, the ORAU data was used qualitatively to focus the recent sampling. The results of the recent sampling were similar to the results of the historical ORAU survey. Previously, there were only five samples that were analyzed for thorium-230, all from biased locations having significantly elevated levels of uranium. In the recent sampling, a more thorough investigation effort was conducted where 81 sediment samples were collected and analyzed for thorium from both biased and systematic locations. Significantly elevated levels of thorium were detected, but the maximum level was an order of magnitude lower than an anomaly reported in the ORAU survey. The reason for this unknown, but hypothetical reasons could be discussed in the next revision. Regardless, the number of samples that were collected is considered sufficient to calculate representative exposure point concentrations for each segment for the risk calculations.

f.) *Comment: The number of samples taken as listed in Table 1 do not correspond with the number of sampling stations depicted in Figure 2.*

Response: Multiple samples were collected from locations where the gamma survey indicated a larger area of potential contamination.

g.) *Comment: As indicated in the document, "limited characterization of the chemical content of the drainage sediments" has been conducted" Although this limited characterization may not have revealed elevated levels of nitroaromatic compounds, given the history of the drainage and the*

elevated levels in two of the four springs, the possibility of areas with elevated concentrations still exists. A response to the MDNR letter of November 16, 1995 to the DOE and the COE/DOD regarding remediation of such areas is needed in a timely manner with regard to this action.

Response: Relatively low levels of nitroaromatic compounds have been detected in surface water from the two lower springs in Segment C and D. To address this concern, nitroaromatic sediment sampling was conducted at each of the springs in the December sampling effort. The analytical results indicate that all nitroaromatic compounds analyzed for were not detected. The absence of these contaminants could be attributed to the potential for biodegradation of these compounds in the environment.

Per discussions at the January 23 meeting, a response to MDNR's letter has been sent.

6. *Comment: Pg. 11 Section 2.2.1 - Which sampling effort does the statement, "A total of ten samples...were analyzed." refer to?*

Response: The paragraph was missing a sentence. The text has been corrected to read "To supplement the previous limited characterization efforts, the sediment content of nitroaromatic compounds, metals and PCBs were also analyzed in recent sampling efforts".

7. *Comment: Pg. 11 Section 2.2.2 - This section indicated that surface water has been "routinely sampled at the four springs". Define the term routinely, does this imply quarterly, semi-annually, etc.? Were these springs sampled during precipitation events? Is data available for the surface water located upstream and downstream of the springs? The springs do not represent the entire flow of surface water in the drainage. Depending on the interactions between all the hydrologic features of the drainage, the data collected for the springs may not reveal an accurate representation of the mechanisms which govern contaminant mobilization and dispersion in the drainage. As groundwater is noted as a source of contamination for surface water in the drainage, will the groundwater continue to contaminate the surface water (and possibly the sediments) after this area is remediated? The removal action proposed for the sediments in the SE Drainage may not preclude future contamination from the sources identified in this section, and does not release WSSRAP from future responsibilities should recontamination occur. Refer to comment #3.*

Response: The text will be revised to elaborate on sampling frequency of the four springs. The springs have been sampled at periods of high flow (during precipitation events) and low flow. The Southeast Drainage is an ephemeral stream; during high precipitation events, surface water is present upstream and downstream of the springs as temporary pools. Water from these temporary pools is lost to the streambed, and then reappears downstream in the springs. As discussed in comment response #3, this process continues almost the entire length of the drainage, where losing stream segments and springs are groundwater recharge and discharge points, respectively. From the previous investigations, surface water at the springs is representative of the drainage. As previously

determined, the surface water and groundwater are hydrologically connected; after the removal action is implemented a known source of surface water and groundwater contamination will be removed.

b.) *Comment: This section indicates that the "majority" of contaminated site soils located in the SE Drainage watershed have been removed. What areas or soils still exist which may contribute to further contamination of the drainage if it is remediated prior to these areas being cleaned? The MDNR is not aware that final disposition of all the contaminated materials associated with Imhoff tanks was completed. What action was taken regarding the pipe sections beneath the Army haul road? It was MDNR's understanding that a position paper was to be prepared regarding the final disposition of this pipe. Has such a paper been written? The MDNR requests a copy of this paper.*

Response: The majority of site soils have been remediated. Still remaining are a few surface drainages associated with previous buildings. Surface run-off from these areas flow to the Southeast Drainage through outfall NP-0005. These areas will be remediated as part of the 420 work package. The final disposition report for the for the remaining pipeline is being coordinated with ORISE, the organization responsible for verification. Current plans for the pipeline are for grouting in place.

c.) *Comment: Since the sources of contamination in the surface water of the drainage were removed in 1994, have samples collected in 1995 indicated an improvement in water quality? Why was data collected prior to 1990 considered not representative of current conditions?*

Response: Samples collected in 1995 do not appear to indicate an improvement in water quality. For uranium, between eight and 23 data points were available for each spring which was sufficient to calculate representative exposure point concentrations for the risk calculations.

8. *Comment: Pg. 14 Section 2.2.3 What is meant by the term, "consistently found" in reference to nitroaromatic compounds?*

Response: The term was used to refer to the high frequency, but low concentrations, of nitroaromatics detected in the two lower springs (refer to Table 2).

9. *Comment: Pg. 14 Section 2.3.1 - The SE Drainage area does not lack hiking trails. The area is easily accessible from the Katy Trail and a parking lot located off of Hwy 94, near segment B of the drainage. MDNR personnel have hiked the drainage on numerous occasions finding evidence of recent human activity in the area.*

Response: Although we agree that hiking is possible in the drainage, trails developed for the specific purpose of hiking do not exist with the exception of the Katy Trail which intersects the drainage at the end of Segment D. The scenarios that were developed for the EE/CA acknowledge

that it is likely that an individual may hike and hunt along the drainage. We believe that the hunter scenario represents a reasonable maximum scenario under current conditions. Furthermore, communications with the MDOC indicate that there are no plans to further develop this area in the future.

10. *Comment: Pg. 15 Table 3 - The hunter scenario proposed may not accurately reflect the frequency or duration which a hunter may visit the drainage and consideration should be given to a scenario in which avid hunters utilize the area. The exposure scenarios described in Table 3 should be considered for use on informational posting that will be needed for the drainage if contaminated areas with greater than a 10-5 risk level remain following excavation.*

Response: In previous discussions held at the site regarding the Southeast Drainage, the exposure parameters for the hunter scenario were considered reasonable by parties that were present (including the EPA, Missouri Department of Health [MDOH], and Missouri Department of Conservation). The risk calculations performed for the hunter scenario indicate that under current conditions the risk from any potential exposures is within the EPA acceptable risk range, and that remediation (and informational posting) would not be warranted for the drainage. The MDOH philosophy for protecting the public (i.e., risk level of 10^{-5}) would warrant cleanup of Segment C only, based on the hunter scenario.

11. *Comment: Pg. 17 Section 2.3.1 - Does the average area of contamination of about 100 sq. ft. refer to the area within each segment, each "hot spot", or the entire drainage?*

Response: Characterization data indicate that the drainage is heterogeneously contaminated. The average area of contamination is used to represent a discrete area of contamination within the drainage.

12. *Comment: Pg. 19 Section 2.3.3 - What sampling event is being referred to in the statement, "Any additional risks from dermal absorption of TNT would likely be small because of the very low concentrations of this substance in isolated drainage locations."*

Response: The statement is not referring to an additional sampling event. On the basis of the data collected, the contribution from dermal absorption of nitroaromatics would be minimal. The text will be revised to clarify.

13. *Comment: Pg. 20 Section 2.3.3 - As noted in Comment #7 the springs are not totally representative of the surface water within the drainage. Therefore, a risk determination based solely on this data does not accurately reflect the situation within the drainage. Only after evaluation of a thorough site characterization is it possible to evaluate a risk based removal action for its ability to be protective of human and natural resources.*

Response: As addressed in Response #7, surface water in areas between the springs exists

only as temporary pools. For this reason, a visitor in the drainage would most likely drink from one of the springs. In addition, we believe that enough surface water data were available to perform an adequate risk assessment.

14. *Comment: Pg. 24 Section 2.3.5 - Refer to Comment #10 above regarding the statements in this section. What controls will be implemented to prevent southward migration of any contamination which remains in the drainage with a risk of 10-5 or greater? Additional detail is needed regarding how the aquatic biota data is utilized to predict risks to animals which use the drainage as a drinking water source.*

Response: There are currently no plans to implement any additional control measures in the drainage after remediation is completed.

The ingestion of surface water from the drainage by terrestrial wildlife was not evaluated by the screening level ecological risk assessment because this exposure route was not considered significant. The surface waters in the drainage represent only a very small fraction of surface water in the area available for use by terrestrial wildlife. Water from the drainage is expected to account for only a very small fraction of the total drinking water ingested by the majority of terrestrial wildlife in the area. Only a few individuals of species with small home ranges would be expected to heavily rely on the drainage for drinking water, and the overall consequences and ecological significance of potential adverse impacts to these receptors from the ingestion of contaminated water is expected to be very low. Furthermore, removal of contaminated media is expected to reduce contaminant uptake by terrestrial biota from the ingestion of surface water.

15. Comment: *Pg. 25 Section 3.1 - The statement, "The removal action will address sediment contamination but will..." needs to be changed to, "The removal action will address sediment contamination but may also contribute to improving surface water conditions."*

Response: Comment noted. Text will be revised as suggested.

b) *Comment: Clarification and detail is needed regarding "to the extent possible" when referring to restoring the drainage to its natural condition.*

Response: Restoration to original natural conditions would be difficult to achieve. However, every measure will be taken to improve conditions in the drainage with minimal disruption.

16. *Comment: Pg. 25 Section 3.2 - The MDNR does not agree with complying with ARARs only if it is "practicable", and dependent upon the "urgency of the situation". What is the urgency of the situation regarding the SE Drainage? This statement is at odds with the concept of ARARs.*

Response: Comment noted. The language will be revised as needed.

17. *Comment: Pg. 25 Section 3.2 - Further details regarding DOE's intention for implementing*

DOE Orders (TBCs) at the WSSRAP is needed. A definition of the applicability of DOE Orders to the WSSRAP with any and all processes which the WSSRAP must complete in order to waive these orders (specifically Order 5400.5) needs to be provided.

Response: Treatment of DOE orders will be consistent with previous decision documents (i.e., the ROD for the Chemical Plant Area). The ARARs discussion will be revised accordingly.

18. *Comment: Pg 29 Section 4.1.4 - Why will the removed trees be dragged up the adjoining side slopes? Would it be possible to load these materials into a truck utilizing the haul road built to remove the contaminated soils or allow the trees to remain as wildlife habitat in undisturbed sections of the drainage?*

Response: Removed trees and shrubs will not be dragged completely out of the drainage but rather will be removed from the immediate remediation areas and placed in other nearby locations of the drainage for wildlife habitat. This section of the document will be modified to reflect this clarification.

19. *Comment: Pg. 29 Section 4.2 - Several factors were utilized to determine which areas within the segments would be remediated. Refer to comments 1, 5, 10, and 14 regarding the use of these factors for determining the areas that will be remediated and additional cost factors which will be involved. Further details on how these factors were utilized to determine the subalternatives is needed. Is the landowner aware of the rationale utilized to determine the areas of remediation and do they concur with the proposed actions?*

Response: This section will be expanded to discuss factors involved in selection the removal alternative. We will include a review of alternative access routes, equipment types and options to mitigate tracking of contaminated soils. The engineering design will allow for accommodations in construction and sequencing and labor and equipment loading scenarios but a specific scenario will be presented in the EE/CA in order to show comparative costs.

The MDOC has been provided with a copy of the EE/CA for their review and did not have any comment.

20. *Comment: Pg. 31 Section 5.1 - The MDNR does not agree that the potential modifications will not change the underlying costs, general environmental impact or implementability. Long delays associated with access license agreements, and/or deviations from standard design practices may impact schedules, budgets, availability of funds, etc. All of which would affect implementability of the alternative.*

Response: Comment noted. Hidden costs and potential delays will be addressed with the alternative presented in the EE/CA. These factors may necessitate a design change but an assumption must be made for an order of magnitude cost estimate for the EE/CA. The cost estimate will be applicable to several implementable design scenarios.

21. *Comment: Pg. 32 Section 5.1.2 - Clarification is needed regarding the reference to the "quarry haul road" and how excavated materials will be transported to the APSA. Is this the Hamburg Quarry road or the road used to transport quarry bulk waste to the TSA? If it is the road utilized to transport bulk waste, why is a permit required to cross Highway 94? Will the KATY Trail be utilized to transport materials to the Hamburg Quarry Rd., cross over Hwy. 94 and enter the haul road used for hauling bulk wastes?*

Response: A figure will be included in the next revision to clarify this route and the alternative routes that may be used based upon the cost and implementation.

22. *Comment: Pg. 33 Section 5.1.3 - This section indicates that an increase in potential health impacts to the public would occur if Hwy 94 were used for hauling contaminated materials. However, the WSSRAP has utilized Hwy 94 to haul contaminated materials from the NE corner of the quarry. Utilizing this rationale is contradictory to previous WSSRAP actions. Would it be possible to utilize engineering methods other than construction of haul roads into segment A for equipment access, thereby, minimizing disturbance to the vegetation and wildlife habitat?*

Response: Alternatives considering segment A remediation will be identified and discussed in greater detail in the revision.

23 a.) *Comment: Pg. 36 Section 6 - The alternative identified as the preferred alternative is not as protective of human health and the environment as other alternatives considered. Alternative 2.1 does not include remediation to any portion of Segment A. According to Tables 1 and 2, this segment has the second highest levels of radionuclides and the highest surface water nitroaromatic levels. Alternative 2.1 does not include measures which will need to be taken to prevent southward migration of contaminants from Segment A or the institutional controls which will be needed for all areas where contaminant concentrations which exceed the 10-5 risk level remain.*

Response: Based upon earlier comments in regard to MDNR's request to remove contaminated sediments in Segment A, DOE has agreed that the EE/CA will be revised to conduct remediation in Segment A.

b.) *Comment: What procedures will be instituted regarding sequencing of excavation, etc. to avoid recontamination of areas? What procedures will be instituted to confirm that the aggregate used for contamination tracking control is clean if it is to be used in clean areas at the chemical plant or as backfill in excavated areas? What procedures will be used to prevent contamination of clean portions of section B as isolated areas within the segment are removed? It is unclear from the description presented if the factors which need to be considered in determining the logistics of hauling the contaminated wastes have been identified and considered in selecting the alternative.*

Response: Construction sequencing options and controls will be used to avoid recontamination of the areas. On-site monitoring, scanning, design options, engineering controls

such as erosion control, tracking and mitigation controls, and general procedures will assist in minimizing recontamination. Surveys will be performed on the aggregate to ensure that contaminated material is not reused in other areas of the site. This section will be modified to discuss these concerns.

c.) *Comment: None of the alternatives presented identify specific areas within each segment that would be excavated or the cleanup concentrations which would be utilized to confirm that all the contamination has been removed. It is the MDNR's understanding that the EE/CA document is to serve the purpose, which is to thoroughly address remediation of this area.*

Response: Specific details will be included in a supporting document (e.g., engineering document).

24. *Comment: Pg. A-3 - Table A.1 needs to identify what the term. "DU" means.*

Response: A footnote has been added to define this term (i.e., duplicate sample).

Responses to Missouri Department of Natural Resources (MDNR) Comments
on the Draft Final Engineering Evaluation/Cost Analysis
for the Proposed Removal Action at the Southeast Drainage
(March 1996)

1. Comment: *As noted in the MDNR's comment letter of December 29, 1995, and discussed with DOE/PMC staff on March 29,1996, the soils characterization data collected by the PMC during the December 1995 sampling effort needs to be included in the EE/CA to provide a more thorough understanding of the situation in the drainage and the remediation measures proposed.*

Response: A comprehensive set of data, including the results of the data collected in December 1995, are provided as an attachment to this comment response package. These data will be published in a separate document which will be referenced in the EE/CA. The risk analyses for the hunter and child scenarios in the EE/CA have been revised to incorporate these new additional data. These updated analyses, in addition to the requested calculations for the residential scenario, are summarized as follows:

	Hunter	Child	Resident
Segment A	1×10^{-5}	5×10^{-5}	5×10^{-3}
Segment B	2×10^{-5}	1×10^{-4}	7×10^{-3}
Segment C	2×10^{-5}	1×10^{-4}	9×10^{-3}
Segment D	1×10^{-5}	6×10^{-5}	4×10^{-3}

The radiological risks to the Hunter and Child are based on the scenarios as described in the draft EE/CA. For the resident scenario (which is not included in the draft EE/CA), it is assumed that an individual lives in the drainage 350 days per year, 24 hours per day (20 hours indoors and 4 hours outdoors), over a 30-year period. It was assumed that the residence would be built directly on top of a contaminated location in the drainage. The pathways addressed in this resident scenario included external gamma irradiation and ingestion of contaminated sediment. The ingestion rate of sediment was taken to be 100 mg/event (with one event occurring per day) consistent with guidance of the U.S. Environmental Protection Agency. For the gamma irradiation pathway, it was assumed that the individual would spend 25% of the time outdoors in a contaminated area in the drainage, and while indoors, the gamma radiation is reduced to 70% of the outdoor rate due to shielding afforded by the structure. Inhalation of contaminated particulates and radon gas and dermal exposure to contaminated sediment in the drainage were not included for the same reasons as presented in the EE/CA, and ingestion of food grown in contaminated soil was not addressed since it is not reasonable to plant a garden in the drainage.

Comment: *The data currently included in the EE/CA does not address if contamination exists on the ballast of the KATY Trail State Park or if the ENTIRE length of the Drainage was characterized (i.e. the portion of the drainage between the KATY Trail and its confluence with the Missouri River does not appear to have been characterized). As requested by the Division of State Parks staff during the January 23, 1996, meeting between the DOE, MDNR, MDOC, and the St. Charles Citizens Commission regarding the draft of the EE/CA, characterization of the ballast is needed to determine if Trail visitors are being exposed and to insure that all materials in the Drainage which pose an unacceptable risk are removed in one efficient removal action. (Refer to comments 1b and 13 of the MDNR December comment letter.)*

Response: A comprehensive gamma walkover survey was performed for the KATY Trail in the vicinity of the Southeast Drainage and areas south of the KATY Trail, including the ballast, from April 23-25, 1996. This survey did not did not show elevated gamma radiation levels, so samples were not collected for laboratory analysis.

2. Comment: *The EE/CA states that, "calculated risk-based concentrations" were derived. Clarification is needed as to how these concentrations will "guide" cleanup activities. What is the difference between concentrations that guide clean-up activities and "soil clean-up concentrations"? Will these concentrations be utilized for both surface and subsurface soils? (Refer to comment 23c of the MDNR December comment letter.)*

Response: The phrase "calculated risk-based concentrations" refers to the derivation of residual concentrations of contaminants in environmental media that would result in a specified level of risk. As used in the EE/CA, these concentrations are synonymous with cleanup criteria. The EE/CA will be revised to refer to these concentrations as cleanup criteria. Although these criteria were derived for surface soils, they will also be utilized for subsurface soils.

3. Comment: *As discussed during meetings held between the MDNR and DOE staffs on January 23, February 16, and March 15, 1996, a mass balance of water into and out of the watershed is needed. This mass balance would further define the connection between the groundwater and surface water and the influence of the contaminated sediments on the surface water. The characteristics of the watershed and the factors controlling erosion in this drainage is also needed to be able to determine the fate and transport of remaining contaminants and to determine erosion control devices to be utilized during remediation. (Refer to comments 1d, 3b, 7a, 7c, and 13 of the MDNR December comment letter.)*

Response: This calculation will be performed following additional input from the MDNR.

4. Comment: *The EE/CA does not address current or future (if the proposed removal action is instituted) risks to the environment. Section 2.3.4 of the report addresses ecological risks however this assessment is based solely on aquatic organisms and did not include an assessment of the risks to other animal life (such as mammals). An assessment to determine the risks to other animals is needed to provide a complete and thorough understanding of the proposed removal action and its affects. (Refer to comment 1g of the MDNR December comment letter.)*

Response: Because of the nature of the contaminated media in the drainage (sediment and surface water), aquatic biota were identified as the ecological receptors most likely to be exposed to contaminants and thus most at risk from current conditions in the drainage. In response to this comment, risks to terrestrial biota will be evaluated and incorporated into the EE/CA. Specifically, contaminant exposure and uptake will be evaluated for three terrestrial wildlife species: the white-tailed deer, the deer mouse, and the barred owl. The former two are herbivorous species that are likely to occur in or otherwise utilize the drainage. Contaminant uptake by these receptors will occur primarily through the ingestion of drinking water and vegetation. The barred owl is a top level predator that may forage in the drainage, and contaminant uptake by this species would occur primarily through the ingestion of contaminated smaller mammals.

5. *Comment: In a letter dated February 13, 1996, the DOE responded to the MDNR December comment letter regarding the EE/CA. Several of these responses need to be included in the EE/CA document and/or need to be revised in order to specifically address the MDNR comment or to provide further detail. These include the responses to the following comments from the MDNR December comment letter: 1c, 1h, 1i, 5a, 7c, 8, 11, 12, and 16.*

Comment 1c: *Clarification is needed regarding the term "natural uranium". Are there other than naturally occurring, i.e., synthetic or man-made? Is this statement implying that levels of uranium in the surface waters of the drainage are naturally occurring or "background"? What are the other contaminants of concern found within this drainage and addressed by this EE/CA?*

Response: As noted previously, the phrase "natural uranium" was used to describe the relative abundance of the three uranium isotopes present in uranium as found in nature. Uranium also can be enriched (having an increased amount of uranium-235) or depleted (having a reduced concentration of uranium-235). The radiological risk for all three uranium isotopes is comparable. To avoid any confusion associated with this phrase (such as implying that the concentrations of uranium in the surface waters of the drainage are at background levels, which they are not), this phrase will not be used in the EE/CA.

As noted previously, the contaminants of concern in the drainage are presented in Chapter 2 of the EE/CA. The risk calculations presented in the EE/CA addressed all of these contaminants.

Comment 1h: *Have the contaminated sediments been evaluated to determine if any treatment for stability is needed prior to disposal in the cell? If so, what factors were utilized to determine if treatment is necessary, and what type of treatment will be utilized? If the evaluation has not been made, we strongly suggest that it be performed.*

Response: No treatment for stability is expected to be necessary prior to disposal in the cell based on the very small volume that these sediments will occupy in the cell and their physical similarity to other materials that have been determined to not need stabilization (such as contaminated soil). If necessary, these sediments can be mixed with other materials (such as soil) to provide a more homogeneous material as it is placed in the cell. Evaluations on the physical form of these materials as it effects waste emplacement will be made after the sediment has been removed from the drainage and placed in temporary storage on-site.

Comment 1i: *A proposed schedule outlining the components of the remediation of the SE Drainage and tentative milestone dates is needed in this document.*

Response: A tentative start date (summer of 1997) was added to Chapter 6 of the EE/CA. It is not possible to identify more details at this time (such as tentative milestone dates) given the very preliminary nature of planning activities for remediation of this drainage at this time. The state of Missouri will be kept informed of all activities associated with planning and implementing this removal action.

Comment 5a: *Include the background concentrations of the radiological constituents for the drainage.*

Response: Background soil concentrations for the radioactive contaminants in the drainage will be added to Chapter 2 of the EE/CA.

Comment 7c: *Since the sources of contamination in the surface water of the drainage were removed in 1994, have samples collected in 1995 indicated an improvement in water quality? Why was data collected prior to 1990 considered not representative of current conditions?*

Response: Although certain sources of surface water contamination were removed in 1994 (principally the Imhoff tank and contaminated soil at the chemical plant within the watershed of the Southeast Drainage), the limited amount of spring water collected and analyzed since that time do not indicate an improvement in water quality. The major source of surface water contamination is likely the contaminated sediment within this drainage, and removal of this sediment as proposed in the EE/CA is expected to improve water quality in the long term. The risk calculations presented in the EE/CA have been redone to include all data, including that collected prior to 1990. It should be noted that these calculations indicate that drinking water from the drainage at its current concentrations would not result in an unacceptable risk.

Comment 8: *What is meant by the term, "consistently found" in reference to nitroaromatic compounds?*

Response: The term was meant to describe the high frequency (albeit low concentrations) with which nitroaromatic compounds were found during sampling events. The document has been revised to more accurately reflect the contamination conditions in the drainage in regards to nitroaromatic compounds. This term is no longer used in the EE/CA.

Comment 11: *Does the average area of contamination of about 100 sq. Ft. refer to the area within each segment, each "hot spot", or the entire drainage?*

Response: This area is considered to be representative of each single area of contamination in the drainage and was used in the external gamma irradiation dose calculation. As used in this comment, this area refers to each "hot spot" in the drainage.

Comment 12: *What sampling event is being referred to in the statement, "Any additional risks from dermal absorption of TNT would likely be small because of the very low concentrations of this substance in isolated drainage locations".*

Response: This statement does not reflect any individual sampling event but is an interpretation of contamination conditions (based on current data) with regards to the risks posed by dermal absorption of trinitrotoluene in the drainage.

Comment 16: *The MDNR does not agree with complying with ARARs only if it is "practicable", and dependent upon the "urgency of the situation". What is the urgency of the situation regarding the SE Drainage. This statement is at odds with the concept of ARARs.*

Response: This discussion in the EE/CA is meant to be a general description on the use of ARARs as applied to a removal action (as excerpted from the National Contingency Plan [40 CFR 300.415]). The "practicability" refers to the ability to conduct this action in accordance with preset conditions, such as removing contaminants to prescribed levels (given the environmental setting of the drainage) and the "urgency of the situation" refers to the timing of the proposed removal action (it must be conducted before the cell is closed). There is no urgency in regards to protecting human health.

6. Comment: *How will trees, root balls, and vegetation from contaminated areas be managed?*

Response: The above-ground portion of removed vegetation will be used for wildlife habitat, and will be located away from the stream channel to prevent stream blockage. The below-ground portion of removed vegetation will be transported in covered trucks to the contaminated wood storage area at the chemical plant. Based on similar activities previously conducted at the chemical plant and quarry areas, above-ground portions of vegetation are not expected to contain detectable concentrations of radionuclides. Below-ground portions are retained because of the difficulty in separating contaminated soils from vegetation debris.

Comment: *The DOE needs to be aware of the KATY Trail during remediation. This is of special concern as the existing schedule indicates that the removal action will take place during the early summer months, a time when the trail is heavily utilized.*

Response: The DOE appreciates this concern and will coordinate activities with the appropriate state and local agencies to minimize any disruption that remediation activities could present. There are currently no plans to use the KATY Trail as an access or haul road. If a decision is made to use the KATY Trail, the timing will be adjusted to conduct remedial activities in accordance with the seasonal requirements of MDNR Parks. In addition, recreational visitors will be informed of remedial activities and safety issues.

7. Comment: *A definition is needed of elevated levels of contaminants. How will areas which cannot be reached or removed by track vehicles be managed?*

Response: Elevated areas of contamination are those that exceed a risk of 1×10^{-5} for the child scenario. These are the areas targeted for remediation. The text in Chapters 5 and 6 will be revised to clarify the meaning of this phrase. All locations exceeding a 1×10^{-5} risk level are targeted under the proposed action; preliminary design surveys conducted in the drainage indicate that track vehicles will be able to reach all targeted areas.

8. Comment: *The statement "would involve removal of all sediment locations" needs to be revised to read, "removal of all contaminated sediment/soil locations".*

Response: The text will be revised to note that all contaminated soil and sediment will be removed from locations targeted for remediation.

9. Comment: *A definition is needed of "administrative feasibility".*

Response: As given in guidance for conducting remedial investigations and feasibility studies under CERCLA (EPA/540/G-89/004), administrative feasibility is identified as those activities needed to coordinate with other offices and agencies, such as obtaining permits for off-site activities or rights-of-way for construction.

10. Comment: *This alternative does not address removing contaminated sediments in all segments of the drainage as it does not include those contaminated soils/sediments in the upper reaches of segment A.*

Response: The text will be revised to clarify that this alternative does not involve removing contaminated materials in the upper reaches of Segment A.

Comment: *Clarify in the text as to which quarry haul road will be utilized for this subalternative. Will repairs need to be made to the Hamburg Quarry haul road prior to its use during the Drainage's remediation? Do the costs included for each subalternative include activities to repair the drainage to natural conditions following removal actions?*

Response: For subalternative 2.1, material would be transported along the KATY Trail to the Hamburg Quarry haul road to the haul road built to transport the quarry bulk wastes to the chemical plant; this will be clarified to the text. If the Hamburg Quarry haul road were to be used, it is likely that some minor repairs would need to be made. These would be made as part of this removal action. The costs identified for each subalternative includes all activities associated with implementing the action, including those associated with repairing the drainage following the removal of contaminated soil and sediment.

11. Comment: *A residential scenario is possible in Segment A of the Drainage. How does the post-remedial risk listed for Subalternative 2.3 compare with the risk that would be associated with an unrestricted, residential use scenario?*

Response: Post-remedial risks for a residential scenario, assuming that the drainage was cleaned up to the levels proposed in the EE/CA (i.e., 13 pCi/g for radium isotopes, 290 pCi/g for uranium-238, and 350 pCi/g for thorium-230) are calculated to be 3×10^{-3}. (A description of this scenario and the parameters used to estimate this risk are provided in the response to Comment 1.) For comparison, the risk associated with remediating the drainage to the same levels as given in the record of decision for the chemical plant area is estimated to be 9×10^{-4}.

12. *A definition is needed to the stability testing previously performed for related wastes. A definition is needed of the existing materials which will be utilized to construct the two haul routes. Will contamination which is present under areas slated to be used for road construction be removed prior to building or after haul roads have been utilized? Will the ramp into the north end of Segment B remain following remediation of the Drainage?*

Response: Waste material is required to be tested for stability based upon two considerations; whether treatment is required to prevent leaching of contaminants in excess of those allowed by RCRA for land disposal and whether treatment is needed to provide a structurally stable material. The waste materials from the Southeast Drainage will not require treatment to prevent leaching of contaminants since the major contaminants are radionuclides which are not regulated by RCRA and similar materials from the process sewer lines and tank have been characterized and determined to be nonhazardous materials within the meaning of RCRA. Treatment of these materials to provide a structurally stable material is also not expected to be necessary (see related discussion in the response to Comment 1h).

The haul roads can largely be constructed with materials present in the vicinity of the Southeast Drainage. For example, materials currently in the drainage such as sand, silt, gravel, and cobbles are generally capable of supporting traffic without an engineered aggregate surface, and use of these materials will allow for implementation of this action without bringing similar materials into the drainage area for construction purposes Any contamination which is present beneath or along the haul route will be removed prior to use. Any ramp or other access route will be restored consistent with reasonable requests made by the Missouri Department of Conservation. Current plans include the use of soil/rock berms along any haul route to assist with erosion controls and discourage routine use of the cleared access routes by recreational visitors.

13. Comment: *What would determine if the light grey aggregate is reused, disposed or used as backfill grading in the excavated areas? Will more than one crossing be utilized at the intersection of HWY 94 and the haul road? Has the MHTD consented to providing traffic control?*

Response: The light colored aggregate will be used sparingly and will be surveyed with field instruments to determine if the material has become contaminated. If the gamma exposure rate is less than 1.5 times background, the material will be either left in place or utilized in grading/shaping excavation areas. If the measurement is equal to or greater than 1.5 times background, the material will be removed for disposal with the contaminated sediment.

Current plans call for a single crossing the state highway 94. Activities impacting this state highway will be coordinated with the MHTD prior to implementation.

14. Comment: *What types of barriers would be erected on the drainage access routes? A definition of "minimal backfilling" in needed. The possibility of this action requiring a land disturbance permit still exists. Obtaining approval from the St. Charles County Highway engineer does not exempt the DOE from applying for and receiving a land disturbance permit. Approval from the local agencies is a prerequisite for submitting an application to the MDNR for a land disturbance permit. Please contact Richard Laux with the WPCP for additional language need in the EE/CA and Appendix B to clarify the ARARs needed for this action.*

Response: The barriers noted refer to berming that would be placed during restoration of the access routes. These berms would be constructed from soils present along the access routes and would serve to reduce potential erosion and also pose some deterrence to increased utilization of the access routes by the public following restoration. The term "minimal backfilling" simply means that the amount of fill used in restoration of excavated areas will be kept to a minimum. It is not possible to quantify the amount of backfilling necessary for proper restoration at this time. All restoration activities will be coordinated with the Missouri Department of Conservation.

The DOE agrees that a land disturbance permit action is likely to be required for this action, and these permits are typically obtained for off-site areas from the County Highway Engineer's Office. The DOE has contacted Richard Laux and plans to submit the land disturbance permit application to his office prior to remediation. The text will be revised to reflect these requirements..

Responses to MDNR Requests:

1. Request: *Submittal of all field and analytical data which has been generated from all characterizations and investigations of the drainage.*

Response: The data generated from all characterizations and investigations of the drainage are being compiled, and this comprehensive data set will be included in a revision to the report entitled *Southeast Drainage Soils Review Sampling Report, DOE/OR/21548-559*, which was originally issued in November of 1995. Because this revision is still in preparation, the data have been included as an attachment to this comment response document.

2. Request: *Determine if contaminated materials exist on the Katy Trail ballast; the extent of any contamination, and how these materials would be managed.*

Response: The KATY Trail ballast was recently surveyed for radioactive contamination and determined to be uncontaminated (see response to Comment 1).

3. Request: *Dates as to when the upgradient contaminated areas which drains to the Southeast Drainage will be remediated. A rationale or explanation by the DOE if these areas are scheduled to be remediated after the drainage, thereby causing the possibility of recontamination of the drainage.*

Response: The relatively small contaminated area (approximately five acres) which drains to the Southeast Drainage is scheduled for remediation in the fall of 1996, prior to any remediation activities planned for the drainage. Remediation of this area will include excavation of the foundations and contaminated soils, and any contaminated water would be contained within the excavations and managed on-site.

4. Request: *A comparison of the volume of contaminated soils, costs, and ecological damage of the limited use, risk-based scenario to a risk assessment based on remediating the drainage to unrestricted residential use.*

Response: The currently proposed action in the EE/CA (summarized in Chapter 6) would result in excavating approximately 2,200 cubic yards of contaminated sediment and soil at a cost of about $830,000. These contaminated materials would be transported to the chemical plant area for temporary storage prior to disposal in the on-site cell. A total of approximately five acres would requiring clearing, including that associated with excavating contaminated materials above the cleanup criteria proposed in the EE/CA, and all access routes and haul roads.

It is very difficult to provide a similar estimate for remediating the drainage to the soil cleanup levels identified in the record of decision for the chemical plant area. Identification of contaminated areas in the drainage was performed by first doing a walkover gamma radiation survey. Such a survey (using standard sodium iodide detectors) can identify areas having radionuclide concentrations at or above levels proposed as cleanup criteria in the EE/CA. However, the highly heterogeneous nature of contamination in the drainage, the variable thickness and areal extent of this contamination, and the physical characteristics of the drainage would make field detection of contamination at levels identified in the chemical plant record of decision nearly impossible. A much more thorough and expensive characterization effort would be needed to develop these estimates.

At a minimum, an additional 620 cubic yards would need to be excavated (resulting in a total volume of 2,820 cubic yards) for a cost of about $1,050,000; one additional acre is estimated to be disturbed. Cleanup to these levels would result in additional costs, including those associated with additional characterization to identify these additional areas (which would be very difficult to do with standard radiation detection equipment such as sodium iodide detectors). In addition, confirmation planning would require adjustments to insure removal to such low levels. This could result in increasing the cost of implementing this removal action significantly. The difficulty in measuring these isotopes with field detection equipment primarily stems from the differing material types/geometry presented by the various gradation and occurrence of contaminated materials in the drainage. The additional volume, cost, and impacted area estimated above are considered an absolute minimum.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
726 MINNESOTA AVENUE
KANSAS CITY, KANSAS 66101

MAY 0 9 1996

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Mr. Jerry Van Fossen
Deputy Project Manager
U.S. Department of Energy
Weldon Spring Site Remedial
Action Project Office
7295 Highway 94 South
St. Charles, Missouri 63304

Dear Mr. Van Fossen:

RE: Southeast Drainage Removal Action

This letter expresses EPA's position on the proposed removal action in the Southeast Drainage based on a review of the draft Engineering Evaluation/Cost Analysis (EE/CA), dated March 1996, and a recent firsthand surveillance of the area.

For the reasons discussed below, we have strong misgivings about the advisability of using conventional construction techniques as described in the EE/CA to accomplish sediment removal in the Southeast Drainage. Comments on the EE/CA itself are followed by comments which help to evaluate this action within the remedy selection framework established by EPA.

1) With some exceptions as noted below, we believe the EE/CA to be technically adequate for purposes of supporting a decision on an appropriate response action. The analytical data and interpretation are generally adequate. There is sufficient presentation of risks for a full range of plausible exposure scenarios using appropriately conservative assumptions. The identified response action alternatives are adequately developed. We would like to see further information addressing the following areas:

The document is lacking in its characterization of the ecological consequences of remediation using conventional construction techniques and in its evaluation of the success of restoration efforts. Please provide an approximation of the acreage which would be cleared or otherwise impacted by construction activities, and evaluate potential erosional damage. Also, we request an assessment of the time frame within which the affected areas could be expected to fully recover their natural state. The assessment should estimate and incorporate the effects of human activities encouraged by the cleared areas remaining after restoration activities.

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RECYCLE

The document should evaluate the effectiveness and feasibility of innovative methods for addressing the contaminated sediments that don't require the deployment of heavy construction equipment within the drainage, or methods that otherwise minimize ecological damage to the drainage. As part of this effort, we suggest that DOE consult sources in the field of forest management for methods or technologies that enable access to wooded areas with minimal impact and/or in the mining industry for techniques which would allow recovery of sediments with minimal damage to the surroundings. Perhaps something akin to a sluicing operation by which sediments are slurried to an accessible downhill access point would be an effective and less damaging method of removing sediments from the drainage.

2) The NCP provides the regulatory framework for considering risks and land use in selecting appropriate response actions:

For known or suspected carcinogens, acceptable exposure levels are those that present an excess upper bound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6}. Therefore, excess lifetime risks to an individual greater than 1 in 10,000 will generally trigger the need for a response action, while risks less than 1 in 10,000 will generally not necessitate a response action.

The EPA directives which expand on discussions in the preamble to the NCP provide that the appropriate extent of remediation should be determined on the basis of reasonably anticipated future land use. Assumptions regarding the reasonably anticipated future land use should be developed with input from the affected community and from local land use planning authorities. While we have not yet taken the step of eliciting comment from the public on this issue, input from the Missouri Department of Conservation clearly indicates that it plans to maintain the Southeast Drainage in its current condition as a recreational resource. Pending input from the community, we believe the current use of the drainage is arguably equivalent to the reasonably anticipated future use of the drainage.

As presented in the EE/CA, the total excess lifetime risk to an individual under the current land use exposure scenario (hunter scenario) is less than 1×10^{-4} in all segments of the drainage and therefore, remediation of the drainage is not necessitated on this basis. The hypothetical future use exposure scenario (modified residential scenario) presents slightly greater risks; however, the risks exceed 1×10^{-4} in only one of the four segments of the drainage. The hypothetical future exposure scenario, therefore, provides only marginal impetus to remediate.

In isolation, the argument for remediation of the Southeast Drainage on the basis of risk is weak. However, the argument for remediation is bolstered by the fact that it must be considered within the context of an established remedial action project addressing a larger site and a cumulation of risks, as opposed to an independent site where it would be more difficult to meet a standard of cost effectiveness.

With the understanding that some further analytical data is forthcoming and that the EE/CA does not contain all of the analysis we would like to see, our position on the proposed removal action may be summarized as follows:

- It is our impression that removal of contaminated sediments from the drainage using conventional construction and excavation techniques as presented would have an overall negative impact on the environment, such that the minimal reductions in human health risk that could be achieved would not be justified.

- It is likely that there are other more innovative techniques that could be used to remove sediments from the drainage with only minimal environmental impacts. We believe it is worthwhile to pursue these options even if it involves sacrificing some efficiency in sediment removal or time needed to implement.

- We believe the potential human health risks are sufficient to support an argument for removal action if an option can be identified that can effectively remove sediments, is not prohibitively expensive, and has only minimal ecological consequences.

Thank you for the opportunity to review this proposal. Please call me at (913) 551-7710 if you have any questions or concerns.

Sincerely,

Daniel R. Wall
Project Manager
Superfund Division

cc: Robert Geller, MDNR
MDNR Field Office
Jim Garr, MDC
Gale Carlson, MDOH

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Weldon Spring Citizens Commission
100 N. Third Street
St. Charles, MO 63301

July 11, 1996

Mr. Jerry Van Fossen
Department of Energy
7295 Highway 94 South
St. Charles, MO 63304

Dear Jerry,

Upon a thoughtful review of the latest draft of the EE/CA document (6/96) regarding the proposed removal action at the southeast drainage, the commission has concluded that the measures detailed in subalternative 2.1 provide the best balance of public health and environmental protection considerations. We agree that a selective approach to the removal of contaminated material in all four sections of the drainage using existing cleared right-of-way routes will effectively accomplish the dual objectives of lowering potential health risks to the public while minimizing environmental damage. Please inform our office as to the status of the final decision on this removal action as soon as practical.

Sincerely,

Glenn A. Hachey
Chairman

cc: Karen Reed - DOE
Pamela Thompson - DOE
Commission members
Helene Diller
Larry Erickson - MDNR
Martha Windsor - MDNR
Dan Wall - EPA

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