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Responsiveness Summary for the Remedial Investigation/Feasibility Study for Management of the Bulk Wastes at the Weldon Spring Quarry, Weldon Spring, Missouri

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prepared by

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prepared for

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CONTENTS

NOTATION

The following is a list of the acronyms, initialisms, and abbreviations (including units of measure) used in this document.

ACRONYMS, INITIALISMS, AND ABBREVIATIONS

ALARA	as low as reasonably achievable
ARAR	applicable or relevant and appropriate requirement
BRE	baseline risk evaluation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended
CFR	Code of Federal Regulations
DNT	dinitrotoluene
DOE	U.S. Department of Energy
EE/CA	engineering evaluation/cost analysis
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
FS	feasibility study
NEPA	National Environmental Policy Act of 1969, as amended
NPL	National Priorities List
NRC	U.S. Nuclear Regulatory Commission
RI	remedial investigation
RMW	St. Charles County monitoring well
TNB	trinitrobenzene
TNT	trinitrotoluene
TSA	temporary storage area

UNITS OF MEASURE

cm	centimeter(s)	mi	mile(s)
h	hour(s)	mrem	millirem(s)
ha	hectare(s)	pCi	picocurie(s)
in.	inch(es)	rem	roentgen equivalent man
km	kilometer(s)	s	second(s)
L	liter(s)	yd^3	cubic yard(s)
m^2	square meter(s)	yr	year(s)
m^3	cubic meter(s)		

1 INTRODUCTION

The U.S. Department of Energy (DOE) is responsible for conducting remedial actions at the Weldon Spring site in St. Charles County, Missouri, under its Surplus Facilities Management Program. The site consists of a quarry and a chemical plant area located about 6.4 km (4 mi) northeast of the quarry. The quarry is surrounded by the Weldon Spring Wildlife Area and is near an alluvial well field that constitutes a major source of potable water for St. Charles County; the nearest supply well is located about 0.8 km (0.5 mi) southeast of the quarry. From 1942 to 1969, the quarry was used for the disposal of various radioactively and chemically contaminated materials. Bulk wastes in the quarry consist of contaminated soils and sediments, rubble, metal debris, and equipment. As part of overall site remediation, DOE is proposing to conduct an interim remedial action at the quarry to manage the radioactively and chemically contaminated bulk wastes contained therein.

Potential remedial action alternatives for managing the quarry bulk wastes have been evaluated consistent with U.S. Environmental Protection Agency (EPA) guidance for conducting remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended. The three primary documents that support the proposed management of the quarry bulk wastes are the remedial investigation (RI), the baseline risk evaluation (BRE), and the feasibility study (FS). The RI presents information on the environmental setting of the quarry and the physical, chemical, and radioactive characteristics of the bulk wastes. The BRE assesses the risks associated with current conditions at the quarry in the short term (i.e., the next several years). The FS develops, screens, and evaluates alternatives for managing the quarry bulk wastes. The contents of these documents were developed in consultation with EPA Region VII and the state of Missouri and reflect the focused scope defined for this interim remedial action.

Based on the analyses in these documents, the preferred alternative for managing the quarry bulk wastes is to remove them from the quarry and transport them to a temporary storage facility at the chemical plant area. This interim action would (1) eliminate the primary source of radioactively and chemically contaminated materials from the quarry, (2) facilitate subsequent characterization of the quarry and its vicinity, and (3) support disposal decisions for the bulk wastes and other contaminated materials from the Weldon Spring site. A comprehensive assessment of the need for additional remedial action at the quarry will be performed following bulk waste removal and detailed characterization activities.

The RI/FS documents were issued to the general public on March 5, 1990. A public comment period was held from March 5, 1990, through April 9, 1990, consistent with the public participation process identified in CERCLA. Comments on the proposed action were received both in writing and at a public meeting held on March 29, 1990, at the Ramada Inn in Wentzville, Missouri. Representatives from DOE, EPA Region VII, and the state of Missouri participated in the meeting. Transcripts of the meeting are included as part of the administrative record associated with this interim action. Most of the questions raised by the public at this meeting were addressed orally. In addition to

the public meeting, DOE held numerous briefings and meetings with public officials, school administrators, special interest groups, and members of the general public. These meetings, which were generally informal, allowed for an effective exchange of information and receipt of public input.

This document has been prepared to summarize and provide responses to the major issues identified in oral and written comments made on the proposed action. General issues are discussed in Chapter 2, and specific issues are discussed in Chapter 3. Chapter 3 includes copies of the letters received on the proposed action and responses to individual issues (comments) identified in these letters. Full citations for documents referred to in this responsiveness summary are provided in Chapter 4.

2 GENERAL ISSUES: COMMENTS AND RESPONSES

Issue 1

Comment. The RI/FS documents include a disclaimer in which it is stated that DOE does not assume any legal liability or responsibility for the accuracy, completeness, or usefulness of the information included in the documents. How can DOE proceed with this action when it does not stand behind the information supporting its selection?

Response. Inclusion of the disclaimer in these documents was an error. The DOE does indeed stand behind the information and analyses provided in the RI, BRE, and FS. This disclaimer is used in documents summarizing work sponsored by DOE that is experimental or developmental in nature; its purpose is to exempt DOE and its contractors from legal liability for research activities to allow new ideas and concepts to be explored without being restricted by legal constraints. These conditions do not apply to this RI/FS.

Issue 2

Comment. The proposed action entails temporary storage of the bulk wastes at the chemical plant area. How long is "temporary" storage?

Response. The quarry bulk wastes are scheduled to be in temporary storage for three to six years.

Issue 3

Comment. How do we know that temporary storage will not become permanent?

Response. The temporary storage facility will not be designed to meet permanent disposal requirements nor is there any consideration of ever upgrading it to meet such requirements. Permanent disposal requires separate processes of environmental compliance, regulatory concurrence, and public involvement. This does not mean that construction of a permanent disposal cell on-site will not be considered in the future; however, it does mean that temporary storage of the bulk wastes will not influence that disposal decision.

Issue 4

Comment. Removal of the quarry bulk wastes with temporary storage at the chemical plant area is only an interim action in the overall remediation of the Weldon Spring site. When will a decision on the permanent disposal of all site wastes be reached?

Response. The DOE is currently preparing an RI/FS to evaluate alternatives for the permanent disposal of all wastes generated by remediating the Weldon Spring site. The analyses in that RI/FS will include those required in an environmental impact statement (EIS) for compliance with the National Environmental Policy Act (NEPA). This integrated CERCLA/NEPA approach is being referred to as the RI/FS-EIS process. The RI/FS-EIS is being prepared consistent with EPA guidance, and a preliminary internal review draft will be available in late 1990. The RI/FS-EIS documents will be available for review by EPA Region VII, the state of Missouri, and the general public in 1991, and a joint EPA/DOE record of decision for this proposed action will be issued in 1992.

Issue 5

Comment. The quarry bulk wastes should not be moved until a permanent disposal decision has been reached for managing all wastes from the Weldon Spring site and a disposal facility is ready to accept the wastes. This interim remedial action is not a wise expenditure of tax dollars.

Response. Delaying this interim remedial action would postpone the attainment of remedial action objectives at the quarry (e.g., to respond to ongoing releases by removing the primary source of contamination from the quarry and to initiate necessary characterization activities). The preferred alternative can be implemented in a manner that will not endanger students and staff at Francis Howell High School or any other individuals in the area. The extensive monitoring program currently in place will be expanded prior to initiating the proposed action to ensure the health and safety of nearby residents and the environment.

The DOE is currently preparing an RI/FS-EIS to evaluate alternatives for the permanent disposal of all wastes generated by remediating the Weldon Spring site. Although the RI/FS-EIS will be available for public review and comment in 1991, the length of time to implement permanent disposal options will take several more years. Delaying the proposed removal of the bulk wastes would result in continued, uncontrolled release of contaminants to the environment in the quarry area. The proposed action is being taken at this time to respond to this release.

Although some additional cost will be incurred by placing the bulk wastes in temporary storage, most of the components associated with this action will be required whether the action is taken now or in the future. The wastes must be removed and characterized to permit an informed evaluation of various treatment options prior to final disposal. Hence, the incremental cost is a good expenditure of funds based on the considerable benefits associated with expediting the action, i.e., the proposed action will protect human health and the environment and support overall waste management decisions for the project. These (and other) reasons for conducting the proposed action are discussed in greater detail in the FS.

Issue 6

Comment. Why not simply move the well field to ensure the safety of this source of potable water? This would be a much simpler and cheaper solution.

Response. There is currently no need to consider moving the well field or providing an alternative source of potable water because the water in this well field is not contaminated. Removing the source of potential threat to the well field is only one of the reasons for this action. The bulk wastes must be removed in order to perform detailed characterization of the wastes for evaluating appropriate treatment technologies and disposal alternatives. In addition, the wastes must be removed to allow for detailed characterization of the quarry area. Removal of the bulk wastes is responsive to the need to protect human health and the environment and also serves to protect an important natural resource (i.e., the groundwater in this area).

Issue 7

Comment. Will any wastes from other areas be brought to the Weldon Spring site for disposal?

Response. The proposed action is limited to management of the quarry bulk wastes; management of all wastes from cleanup of the Weldon Spring site is the subject of a separate RI/FS-EIS process that is currently under development. There are no plans to bring wastes from other areas to the Weldon Spring site for disposal. The record of decision for remediation of the chemical plant area of the Weldon Spring site will address the scope of waste disposal and will address limitations on use of the Weldon Spring site for future actions, as appropriate.

Issue 8

Comment. The wastes should be sorted and containerized at the quarry prior to transport to the chemical plant area for temporary storage.

Response. This type of issue would typically be addressed during the engineering design phase of the project. However, DOE has reviewed this concept and believes it has merit. The approach currently being evaluated is to conduct basic sorting at the quarry, load the sorted wastes into containers such as large steel boxes, and transfer the containers to trucks for transport to the chemical plant area. At the chemical plant area, the containers will be unloaded and the wastes placed directly into controlled storage; the empty containers will be returned to the quarry for reuse.

This approach would tend to decouple the excavation, transportation, and unloading activities. For example, extra waste containers could be loaded at the quarry during a second shift or while wastes were being transported to the temporary storage area. Trucks could travel along the haul road in small convoys (i.e., three to six trucks) to the temporary storage area where the containers will be off-loaded. The wastes would

subsequently be removed from the containers and placed into controlled storage, and empty containers loaded onto trucks for the return trip to the quarry. Such an approach could allow for the return trip to the quarry to be on the dedicated haul road. Plans for the haul road may need to be modified to include several turnouts which, in conjunction with radio contact, would allow safe passage of truck traffic. This would eliminate all truck traffic on Route 94.

Issue 9

Comment. Why is it necessary to move the wastes closer to Francis Howell High School for temporary storage? Why not take the quarry wastes somewhere else for disposal?

Response. No disposal facility is currently available for the quarry wastes. Furthermore, a permanent waste disposal decision is a very complex issue and will not be made for a few years. Therefore, the only alternatives at this time are to remove the quarry bulk wastes and temporarily store them pending a waste disposal decision or delay the quarry cleanup action. The DOE believes it is important to initiate the quarry cleanup action as soon as possible (see responses to Issues 5 and 6). The question then becomes where to store these wastes.

In addition to the fact that there is simply no other available space, there are several good reasons to temporarily store the wastes at the chemical plant area. On-site storage will ensure that no individuals are inadvertently exposed because access to the chemical plant area is controlled; also, the presence of on-site DOE and contractor staff will ensure continuous oversight. The wastes can be safely and expeditiously characterized to allow for an informed waste disposal decision to be made as soon as possible. Finally, the extensive monitoring capability available at the chemical plant area can be used to ensure the health and safety of nearby residents. This is the best way to store these materials in the near term.

Issue 10

Comment. There is insufficient engineering information on the proposed action to adequately assess the feasibility of its implementation. It is not possible to select an alternative with the level of detail provided in the RI/FS documents.

Response. The level of detail provided in the RI/FS documents is consistent with that required by EPA for actions of this magnitude. Detailed engineering for this action cannot be initiated until the record of decision has been issued. However, the analyses presented in the RI/FS and supporting documents demonstrate that this action can be performed safely and in compliance with all applicable standards and regulations. This information is sufficient to allow for selection of an alternative.

The level of detail necessary to determine the engineering feasibility of this action is presented in the preliminary engineering report supporting the FS. The design

documents to be developed following issuance of the record of decision will focus on the physical aspects of this action -- such as equipment needs, operational requirements, material handling, and cost. Planning related to dealing safely with the various types of contaminants and hazards that may be encountered will be presented in an operational environmental, safety, and health plan. The results of these two planning efforts will ensure that this action is implemented safely.

Issue 11

Comment. There is insufficient characterization data to adequately plan this action.

Response. A significant amount of information is available on the physical, chemical, and radiological characteristics of the bulk wastes from previous investigations. The results of these investigations, which are presented in the RI, are consistent with the disposal history at the quarry. This information is sufficient to design a safe plan for the removal, transport, and temporary storage of the bulk wastes.

It is possible that some unknown waste material was placed in the quarry. In designing the waste removal process, an observational approach will be used to deal with this possibility. In this approach, planning is based on available data and realistic assumptions concerning field conditions, and adjustments are made in the field as work proceeds. Deviations from expected conditions and mechanisms by which to identify their occurrence are defined, and plans are developed to address or mitigate adverse effects that result from these deviations. This approach ensures responsiveness to actual field conditions.

Issue 12

Comment. The quarry bulk wastes contain residual concentrations of trinitrotoluene (TNT), dinitrotoluene (DNT), and their decomposition products. Is there any possibility for an explosion to occur while the bulk wastes are being removed?

Response. The highest measured concentration of TNT in the bulk wastes is about 2%. This value resulted from biased sampling in which areas of surficial discoloration were targeted in an effort to define the maximum concentrations. The measured value of 2% is well below the concentration that presents an explosive hazard during excavation (i.e., 12 to 15%). The concentrations of DNT and decomposition products of TNT and DNT in the bulk wastes are much lower than the measured concentration of TNT. The proposed action has since been reviewed by Hercules, Inc., a company with extensive expertise in dealing with explosives. Their technical review concluded that the current plan is feasible and that an explosion is highly unlikely. However, the concentration of nitroaromatic compounds in the bulk wastes will be evaluated as the wastes are being excavated to ensure that there are no pockets containing much higher concentrations of TNT that could present an explosive hazard.

Plans will be in place to deal with explosive concentrations of TNT in the unlikely event of such an occurrence.

Issue 13

Comment. Effective radon and dust control measures should be used to minimize atmospheric releases while implementing this action.

Response. Extensive radon and dust control measures will be implemented during all phases of this action that have a potential for creating airborne emissions. During excavation of the wastes, emissions will be controlled by water sprays, foams, and tarps, as needed. The wastes will be transported to the chemical plant area in trucks along a dedicated haul road. Current plans are to package the wastes in containers to ensure minimal releases. Dust control measures similar to those at the quarry will be used while unloading the bulk wastes at the temporary storage area. Finally, all wastes susceptible to windblown erosion or release of radon gas will be covered as soon as practical following placement in the temporary storage area. These measures will ensure minimal atmospheric releases of radon gas or contaminated dust from implementing this action.

Issue 14

Comment. It is essential that remedial actions at the Weldon Spring site be implemented in a manner that will not compromise the health and safety of the people of St. Charles County. A thorough environmental monitoring program should be put in place prior to initiating this action to ensure the health and safety of nearby residents and students and staff at Francis Howell High School.

Response. An extensive environmental monitoring program is currently in place at both the quarry and chemical plant areas. This program provides extensive information on the current status of these two areas. The monitoring program will be expanded at both the quarry and chemical plant areas prior to initiating the bulk waste remedial action. An operational environmental, safety, and health plan is currently being prepared to address the specific needs of this action. An array of air monitors will be placed at the temporary storage area and site perimeter to detect any airborne contamination that could impact Francis Howell High School. The health and safety of nearby individuals will not be compromised by the conduct of this action.

Issue 15

Comment. An emergency response plan should be developed prior to initiating this action to address actions that would be taken if there are any spills or natural disasters. This plan should address earthquakes, high winds, tornadoes, spills, and any other events that could cause large releases of radioactive and chemical contaminants to

the environment. The Francis Howell School District should be part of the planning process because of the close proximity of its elementary and high schools.

Response. The DOE will develop an emergency response plan to address credible emergency situations consistent with the hazards posed by the proposed action. This plan will identify measures to be taken in the event of a spill, transportation accident, or natural disaster. In developing this plan, DOE will involve the Francis Howell School District and local officials who would require notification or coordination in the event of an emergency. Removal of the bulk wastes will not begin until an emergency response plan is in place.

Issue 16

Comment. The ongoing environmental monitoring program at the quarry needs to continue without interruption before, during, and after removal of the bulk wastes. This is the only way to ensure the safety of the St. Charles County well field.

Response. The St. Charles County well field is being extensively monitored by federal, state, and local authorities. This monitoring indicates that the well field has not been impacted by contaminants migrating from the quarry. The DOE will increase its monitoring efforts during the bulk waste remedial action to ensure that this action does not result in contamination impacting the well field. Monitoring of the well field will continue following removal of the bulk wastes while studies are undertaken to evaluate the need for additional remediation of this area. Monitoring activities at the quarry will not be discontinued until all follow-on studies have been completed and any additional remedial actions have been implemented. Such future decisions will rely on input from EPA Region VII, the state of Missouri, and officials from St. Charles County.

Issue 17

Comment. Since the levels of radon are elevated at the quarry, why move these materials closer to Francis Howell High School and increase the risk to students from radiation exposure?

Response. Removal of the bulk wastes is being taken, in part, to control radon emissions from these materials. The radium-contaminated soils will be placed in controlled storage at the temporary storage area and covered with a liner that is very effective at reducing radon gas releases. Modeling studies presented in the FS indicate that the radon concentrations at Francis Howell High School resulting from this action would be indistinguishable from background levels. The DOE will monitor for radon-220, radon-222, and their short-lived decay products at the temporary storage area, the site perimeter, and Francis Howell High School during implementation of the action and during the temporary storage period. This monitoring program will allow for upgrading of radon emission controls, if necessary, to prevent impacts to the high school.

Issue 18

Comment. Results of environmental monitoring activities need to be provided to the general public in a timely manner. The results of 1988 environmental monitoring activities were not issued until January 1990. The general public needs to be kept better informed, especially as the bulk waste remedial action proceeds.

Response. The 1988 environmental monitoring report was issued late due to the internal review process within DOE. The 1989 environmental monitoring report will be issued in the near future. The DOE agrees on the need to provide environmental monitoring results in a timely manner and is currently developing a plan to issue the results of environmental monitoring on a more frequent basis. Any anomalous environmental monitoring data associated with the bulk waste remedial action will be made available to local authorities and any potentially affected individuals as soon as possible.

Issue 19

Comment. The report recently released by the Committee on the Biological Effects of Ionizing Radiations (i.e., the BEIR V report) indicates that the biological effects of exposure to low levels of radiation are greater than previously estimated. Are there likely to be any changes in the federal government's limits for permissible levels of radiation exposure to workers or the general public as a result of this study? What impact do these results have on the proposed action?

Response. The recently issued BEIR V study presents a detailed description of current data on the health risks of exposure to low levels of ionizing radiation. This study estimates that the health risk is about three times greater than estimated in the previously issued BEIR III report. However, it should be noted that the data used to reach these conclusions have limitations, as noted in the BEIR V study. Assessment of the carcinogenic risks that may be associated with low doses of radiation were extrapolated from effects observed at doses larger than 10 rem delivered over a short period of time. In addition, it was necessary to use assumptions about the relevant dose-effect relationships and the underlying mechanisms of carcinogenesis.

Health hazards associated with chronic exposure to low levels of ionizing radiation have been studied in areas such as those having high levels of background radiation, areas receiving fallout from nuclear weapons testing, and areas near nuclear installations; the data from these studies do not indicate an elevated level of cancer risk. Hence, it is still not possible to draw definitive conclusions of the cancer risks associated with chronic exposure to low levels of ionizing radiation.

The permissible level of radiation exposure for workers is based on limiting their health risk to levels that are comparable to the occupational risks from other industries that are considered to be safe. The permissible level (5 rem/yr) may be reduced as a result of recent studies indicating that the risk from exposure to low levels of ionizing radiation is higher than previously estimated. The DOE and other federal agencies are

currently examining this issue. The radiation doses to workers who would implement this action would be considerably below current limits.

The results of the BEIR V study are not expected to result in significant changes in the permissible levels of radiation exposure to the general public or in DOE concentration limits for radionuclides in liquid or gaseous effluents. The risk factors presented in the BEIR V report are consistent with those used by the EPA in developing revisions to the National Emission Standards for Hazardous Air Pollutants under Section 112 of the Clean Air Act for radionuclides and by the U.S. Nuclear Regulatory Commission (NRC) in developing revisions to Title 10, Part 20, of the Code of Federal Regulations (10 CFR 20) for permissible levels of radionuclides in air and water in controlled and uncontrolled areas. The DOE standards are consistent with those developed by the EPA and NRC.

A major element of DOE's radiation protection program for occupational and public exposures is the as low as reasonably achievable (ALARA) concept. Under the ALARA process, all exposures to radiation and all releases of radioactivity to the environment must be reduced to levels that are as low as reasonably achievable. The DOE is committed to this approach. The proposed action would not be impacted even if more stringent standards were in effect because the predicted levels of radiation exposure to workers and the public are well below applicable standards.

Issue 20

Comment. Transporting the wastes by truck from the quarry to the chemical plant area has the potential for spreading contamination to currently clean areas. How will this possible spread of contamination be controlled?

Response. The wastes will be transported to the chemical plant area in trucks that will travel at low speeds along a dedicated haul road. Current plans are to package the wastes in containers to ensure minimal releases during transport. The exteriors of the trucks will be surveyed for contamination before leaving the quarry and chemical plant area; any loose contamination will be removed before the trucks are allowed to exit these two areas. Finally, periodic surveys of the haul road will be performed to ensure that contamination controls are effective. If any contamination is detected on the haul road, the area will be cleaned up immediately and measures will be taken to prevent a reoccurrence. This approach will ensure that contamination is not being spread to the environment as a result of waste relocation.

Issue 21

Comment. As currently planned, trucks leaving the quarry would cross State Route 94 near the quarry and then proceed along a dedicated haul road to the chemical plant area. Empty trucks would return to the quarry using Route 94. The DOE should investigate further the use of grade separation (i.e., an underpass) at the intersection of State Route 94 and the haul road to avoid any crossing of Route 94 by trucks. In

addition, plans should be developed to minimize or eliminate truck traffic on Route 94 during time periods that bus or student traffic are on this roadway.

Response. The DOE agrees that transportation safety is one of the most significant issues associated with this action. As presented in the FS, wastes would be loaded directly into trucks. In this approach, the rate of waste removal could be limited by the time required for a truck to travel to the temporary storage area and return to the quarry for another load. By staging the containers at the quarry, and using the trucks only to shuttle containers back and forth to the temporary storage area, the entire operation can sustain the extra time required for trucks to share the single lane haul road. To provide further flexibility, plans for the haul road could be modified to include turnouts which, in conjunction with radio contact, would allow safe passage of truck traffic. This would eliminate all truck traffic on Route 94.

In addition, discussions are currently taking place with the state of Missouri on the use of grade separation where the dedicated haul road crosses State Route 94. This would eliminate all crossing of Route 94 by trucks. Use of grade separation would require reconstruction of a section of Route 94. The decision on use of this option will be largely dictated by the cost of the reconstruction relative to that associated with other safety measures that could be used at this crossing (e.g., flagmen, traffic signals). The DOE will continue working with the state to resolve this issue.

Issue 22

Comment. Will this action have any impact on wildlife in the immediate area?

Response. Activities related to this action will destroy about 15 ha (37 acres) of vegetation at the quarry, along the haul road, and at the chemical plant area. Some small, relatively immobile wildlife will be lost, and other more mobile wildlife will be disturbed, displaced, and possibly lost during construction and operation. However, the overall impact will be very minor given the extensive amount of wildlife habitat in the surrounding area.

Issue 23

Comment. There has been a higher incidence of childhood leukemia in St. Charles County than that expected in the general population. It is imperative that this action be conducted in a manner to ensure that no additional cancers will result from removing the bulk wastes from the quarry and transporting them to the chemical plant area for temporary storage.

Response. The Missouri Department of Health's retrospective childhood leukemia study does not support the contention that there are elevated levels of childhood leukemia in St. Charles County. The study indicated an increased level of childhood leukemia cases during the period of 1975 through 1979, but the incidence rate over the entire period of the study (i.e., 1970 through 1983) was not statistically

different from that to be expected in the general population. The Department of Health was not able to establish a link between these leukemia cases and any specific cause; they specifically ruled out exposure to releases from the Weldon Spring site.

Even though the risks to the general public from this action are estimated to be very low, DOE, under its ALARA process, will ensure that the risks are reduced to extremely low levels. It is highly unlikely that there will be any health impacts associated with radiation exposure resulting from this action.

Issue 24

Comment. What will become of the quarry after the bulk wastes have been removed?

Response. After the bulk wastes have been removed, detailed studies will be performed to evaluate the need for additional remedial action (such as the removal of residual materials from the cracks and fissures in the quarry and the remediation of contaminated groundwater). The water treatment plant at the quarry will continue to operate to keep the quarry pond from refilling. After all necessary remedial actions are complete, the quarry area will be stabilized. Plans for stabilizing this area will be prepared cooperatively with state of Missouri agencies such as the Missouri Departments of Natural Resources and Conservation to ensure that future uses of the quarry area are consistent with those planned for the surrounding Weldon Spring Wildlife Area.

Issue 25

Comment. How do we know that sufficient funds will be available to complete all necessary remedial actions.

Response. Funding for remediation of the Weldon Spring site is provided by Congress on an annual basis. There is no guarantee that all required funds will be made available each and every year; however, cleanup projects such as that at the Weldon Spring site are currently top priority activities within DOE. In addition, because the site is on the National Priorities List (NPL), EPA Region VII is responsible for ensuring the adequacy of the cleanup. Representatives from EPA Region VII have made it very clear that they will not delist the site from the NPL until they are satisfied that all required remedial actions have been completed.

Issue 26

Comment. The proposed plan states that Alternative 5 is preferred by DOE. Has DOE already decided on implementing this alternative?

Response. The DOE has not yet reached a decision on implementing Alternative 5. However, this alternative is preferred by DOE. A joint EPA/DOE record of decision will be issued this year documenting which alternative will be implemented.

Issue 27

Comment. The DOE has apparently already concluded that truck transport of the bulk wastes is the preferred mode of transportation. Additional consideration should be given to using the existing rail spur between the quarry and chemical plant area.

Response. The existing rail spur between the quarry and chemical plant area is in a state of disrepair and would require a significant amount of effort (and cost) to upgrade for use. The results of a recent detailed cost estimate indicate that the rail option would cost about $1 million more than the haul road option. In addition, this rail spur crosses State Route 94 three times between the quarry and chemical plant area. Each crossing presents a safety concern. The wastes can be safely and efficiently transported by truck along a dedicated haul road that will be constructed using portions of the existing rail spur. This dedicated haul road will cross State Route 94 only once (near the quarry). Discussions are currently taking place with the state of Missouri on the use of grade separation where the haul road crosses Route 94. This would eliminate any crossing of Route 94 by trucks.

Issue 28

Comment. The sorting pad at the temporary storage area should be completely enclosed and ventilated to minimize airborne releases of contaminants. In addition, the entire quarry area should be enclosed during removal of the bulk wastes.

Response. The need for an extensive sorting pad at the temporary storage area is being reevaluated because the current plan is to conduct basic waste sorting at the quarry. Although some sorting may still be required at the temporary storage area, enclosing the sorting pad with an engineered structure is probably unnecessary; however, this consideration will be evaluated as engineering design proceeds.

Enclosing the entire quarry during excavation of the bulk wastes was considered in the preliminary engineering report and rejected due to its high cost. In addition, there is simply no need to enclose the quarry to remove the wastes safely. Radon and dust suppression measures will be implemented to ensure that releases of hazardous contaminants to the atmosphere will be low and not present a health risk to nearby individuals.

3 WRITTEN COMMENTS AND RESPONSES

Comment letters on the RI/FS documents were received from the individuals listed in the following table. Each of these letters has been assigned an identification code according to date of receipt, and specific issues within each letter have been identified with a number. For example, the earliest letter received is Letter A; issues (comments) identified within Letter A are labeled A-1, A-2, and so forth; and the respective responses to these comments are labeled Response A-1, Response A-2, and so forth. A copy of each letter is reproduced in this section, and the responses to identified comments are presented on succeeding pages.

Letter A

CAPITOL OFFICE
State Capitol - Room 115-G
House Post Office
Jefferson City, MO 65101
(314) 751-8437

TED HOUSE
STATE REPRESENTATIVE - 20th DISTRICT

HOME ADDRESS
1437 Summergate Parkway
St. Charles, MO 63303
(314) 949-1777

March 26, 1990

Mr. Steve McCracken
Project Manager
Weldon Springs Site Remedial Action Project
7295 Highway 94 South
St. Charles, Missouri 63303

Dear Steve:

Thanks so much to you and Jim and the other members of your staff for the detailed briefing on the Weldon Spring Quarry Cleanup project last week. It was a pleasure to meet with you and to receive the information which you provided.

I will be unable to attend the public hearing scheduled for March 29, 1990, in Wentzville on the proposed removal and cleanup of the
A-1 contents of the quarry. Please announce at the hearing and note for the record my continued strong concern that the treatment and discharge of the water and the removal and storage of the bulk waste be conducted in a manner which will pose no danger to the area residents, the students, and staff of Francis Howell High School, or any passersby, or any other person.

It is essential to the health and safety of the people of St. Charles County that the St. Charles County Well Field be closely monitored for migrating contaminants and that the items removed from the quarry be stored in a manner which poses no health risk.

A-2 I agree that the quarry clean-up does need to proceed even though no permanent storage site has been arranged, however I wish you and the Department to consider the permanent disposal of this material as soon as possible.

I stand ready to be of assistance to you any time I may help to clean up this site in the quickest and safest manner.

Very truly yours,

Ted House

TED HOUSE
STATE REPRESENTATIVE

TCH/cls

Response A-1

This interim remedial action is being taken to respond to ongoing releases of contaminants into the environment, which currently occur via uncontrolled airborne emissions and leaching to soil and groundwater. Releases from the quarry bulk wastes can be much more effectively controlled if the materials are stored in an engineered facility at the chemical plant area. The ongoing environmental monitoring program indicates that the St. Charles County well field is not being impacted by current releases to the nearby groundwater. This monitoring program will be increased both in the quarry area and in the vicinity of the chemical plant area to ensure that implementing this action does not adversely affect the health and safety of nearby residents, students and staff of Francis Howell High School, passersby, workers, or any other individuals in the area.

The first step in remediating the quarry is management of the surface water currently in the quarry, which is radioactively and chemically contaminated as a result of leaching from the bulk wastes. An engineering evaluation/cost analysis (EE/CA) report was prepared to evaluate alternatives for managing this water. The response alternative selected as a result of the EE/CA process, which included public review and comment, was to treat the contaminated water and discharge it to the Missouri River in compliance with a permit issued to DOE by the Missouri Department of Natural Resources. The health and safety of the public will be ensured by treating the water to very stringent standards and guidelines prior to release.

Management of the bulk wastes constitutes the second step in remediating the quarry. As currently proposed, the wastes will be removed from the quarry and transported to the chemical plant area where they will be safely stored. The DOE is committed to conducting this action in a manner that will not compromise the health and safety of nearby individuals. The DOE will evaluate the need to perform additional remedial actions at the quarry area following removal of the bulk wastes. The DOE will involve EPA Region VII, the state of Missouri, and officials from St. Charles County in these decisions.

Response A-2

The DOE is currently preparing an RI/FS-EIS to evaluate alternatives for the permanent disposal of all wastes generated by remediating the Weldon Spring site. This RI/FS-EIS is being prepared consistent with EPA guidance, which requires a thorough review of alternatives for this action. The RI/FS-EIS is being prepared as expeditiously as possible and will be available for public review and comment in 1991.

Letter B

JACK BUECHNER
SECOND DISTRICT, MISSOURI

COMMITTEE ON THE BUDGET
ECONOMICS AND TRADE
POLICY TASK FORCE
DEFENSE AND INTERNATIONAL
AFFAIRS TASK FORCE
COMMITTEE ON SCIENCE,
SPACE, AND TECHNOLOGY
SUBCOMMITTEE ON SPACE
SCIENCE AND APPLICATIONS
SUBCOMMITTEE ON SCIENCE
RESEARCH AND TECHNOLOGY

Congress of the United States
House of Representatives

March 29, 1990

Mr. Steve McCracken
Project Manager
Dept. of Energy
7225 Hwy. 94 S.
Weldon Springs, Missouri 63303

Dear Mr. McCracken:

Thank you for the opportunity to preview the waste cleanup presentation scheduled for the March 29th public meeting. This is a highly sensitive issue as I'm sure you well know. I commend the D.O.E. on their efforts up to this point.

However, I have one major concern regarding the one time finding of contaminated soil that was claimed to have been measured in error.
B-1 There is no room for error in a bulk waste cleanup project, especially when you are dealing with the drinking water supply supporting thousands of citizens. We must continue well monitoring of the region south of the slough and make every effort to remove the toxic waste in a timely fashion. Your points regarding the characterization of the waste
B-2 material makes tremendous sense in the D.O.E.'s efforts to eliminate contamination. I have one question concerning the time frame surrounding this characterization process and at what point a permanent site can be anticipated. The bulk waste removal plan appears to be well thought out and must remain that way to insure the continued support of state agencies and the citizens of St. Charles County.

I support the efforts of toxic waste cleanup and would appreciate being keep abreast of the operation. Thank you for the consideration.

Sincerely,

Jack Buechner
Member of Congress

JWB/wje

502 CANNON HOUSE OFFICE BUILDING
WASHINGTON, DC 20515
(202) 225-2501

13545 BARRETT PARKWAY DRIVE
SUITE 150
BALLWIN, MO 63021
(314) 966-1101

ST. CHARLES CITY HALL
200 NORTH SECOND STREET
ST. CHARLES, MO 63301
(314) 946-9377

Response B-1

The DOE agrees with the need to proceed expeditiously, but carefully, with this activity. Detailed engineering and environmental monitoring plans will be prepared prior to excavation of the bulk wastes to ensure that this activity will be done safely. The DOE intends to expand the groundwater monitoring program in the quarry area to ensure the safety of the St. Charles County well field.

Response B-2

Characterization of the bulk wastes will occur very soon after their placement into temporary storage at the chemical plant area. Plans will be based, in part, on information developed from the bulk waste excavation activity. Plans and schedules for waste characterization will be developed prior to initiating bulk waste removal. The DOE is currently preparing an RI/FS-EIS to evaluate alternatives for the permanent disposal of all wastes generated by remediating the Weldon Spring site. The RI/FS-EIS is being prepared consistent with EPA guidance, which requires a thorough review of alternatives for this action. The RI/FS-EIS is being prepared as expeditiously as possible and will be available for public review and comment in 1991.

Letter C

April 2, 1990

Mr. Steve McCracken
Project Manager for the Energy Dept.
Weldon Spring Site Remedial Action Project
Route 2, Highway 94 South
St. Charles, Missouri 63303

Kind Sir,

I have been a resident of the western part of St. Charles Co. all my life, and have been interested in what has been happening here; and I am still very much interested.

I remember when the land was taken over by the Federal Government in 1940 for the TNT Plant; when the site was nominated as a probable location of the Air Force Academy; how thankful we were when the building of a plant to manufacture Agent Orange was scrapped; when the site was used for the refining of uranium and thorium; and the area was the disposal site for radioactive waste from Mallinckrodt Chemical Company.

Likewise, I am interested in the clean-up of the Weldon Spring Plant. As a resident of St. Charles Co (and especially the
C-1 clean-up area); and also a tax-payer, permit me to offer a suggestion. I feel it to be practical to first decide where the permanent site for the storage of the waste is to be located; provide that permanent facility, and then move the waste to the permanent facility. Thus much tax-payer money and much man-power would be saved; and certainly decrease the risk of contamination to Francis Howell High School and also the surrounding area.

Since it is not planned to begin moving material from the quarry until 1992, surely with today's modern and sophisticated machinery and know-how; the building of a permanent facility could be accomplished by that time.

I hope you will give this suggestion your utmost consideration. I would appreciate the favor of a reply.

Respectfully,

Alberta Toedebusch

Alberta Toedebusch
4600 Highway D
Defiance, Missouri 63341

Response C-1

Delaying this interim remedial action would postpone the attainment of remedial action objectives at the quarry (e.g., to respond to ongoing releases by removing the primary source of contamination from the quarry and to initiate necessary characterization activities). The preferred alternative can be implemented in a manner that will not endanger students and staff at Francis Howell High School or any other individuals in the area. The extensive monitoring program currently in place will be expanded prior to initiating the proposed action to ensure the health and safety of nearby residents and the environment.

Although some additional cost and manpower will be incurred by placing the bulk wastes in temporary storage, most of the components associated with this action will be required whether the action is taken now or in the future. The wastes must be removed and characterized to permit an informed evaluation of treatment options prior to final disposal. Hence, the incremental cost and effort is a good use of resources based on the considerable benefits associated with expediting the action, i.e., the proposed action will protect human health and the environment and support overall waste management decisions for the project. These (and other) reasons for conducting the proposed action are discussed in greater detail in the FS.

The DOE is currently preparing an RI/FS-EIS to evaluate alternatives for the permanent disposal of all wastes generated by remediating the Weldon Spring site. Although the RI/FS-EIS will be available for public review and comment in 1991, the length of time to implement permanent disposal options will take several more years. Delaying the proposed removal of the bulk wastes would result in continued uncontrolled releases of contaminants to the environment in the quarry area. The proposed action is being taken at this time to respond to this release.

Letter D

Mrs. Leo Drey
515 West Point Avenue
University City, MO 63130

April 5, 1990

Comments and questions on the proposed plan for the **Weldon Spring Quarry Bulk Waste Removal** interim remedial action. Presented in part at the Department of Energy/Environmental Protection Agency public meeting on **March 29, 1990**, at the Ramada Inn in Wentzville, Missouri.

[The following comments and questions which I am submitting for the record are a combination of those I was given time to read at the March 29 public meeting and some supplemental ones.]

D-1 I am here first to make it clear, for the record, that the citizens who participated in the appeal of the National Pollutant Discharge Elimination System permit for the Quarry Water agreed not to continue our protest of the proposed release of the treated water into the Missouri River only with respect to the amount and types of informational monitoring the Department of Energy would be required to perform. The Missouri Department of Natural Resources had determined that we were not allowed to pursue any of our other concerns, such as whether this water should be released into St. Louis County's drinking water supply -- that is, into the Missouri River about 10 miles upstream from the St. Louis County Water Company's main intake structure. We also never discussed the question of whether the bulk wastes should be excavated and removed from the Quarry before the Quarry pond water begins to be pumped out, or after.

We remain concerned about the continuing supply of water that will need to be treated -- and that could then end up in our St. Louis drinking water supply -- such as the contaminated ground water from the adjacent and underlying vicinity areas that will flow into the Quarry as the pond water is removed; the rainwater and snow that will percolate through the wastes; and the processing water, such as from the high-pressure hosing of the Quarry walls (for radon and dust control), and from the dewatering of the bulk wastes after they are excavated and prior to their transport four miles to the Temporary Storage Area (TSA) at the abandoned Chemical Plant.

Obviously the Quarry must be cleaned up. However many questions remain unanswered:

D-2 1. How can responsible decisions about water treatment technologies and bulk waste excavation and storage be made with only the minimal amount of monitoring data you have available? We have no indication that anyone really knows the quantity of radioactive isotopes in the Quarry Pond water -- or in the bulk wastes. Until extensive and, in fact, expensive isotopic analyses are performed of the Quarry Pond water and groundwater, it seems premature and unscientific to design the water treatment plant. How can anyone know which water treatment technologies, if any, will be effective in removing all the radioactive and other hazardous pollutants if a full characterization of those

Response D-1

The RI/FS is limited to management of the quarry bulk wastes. An EE/CA report issued in January 1989 evaluated alternatives for management of surface water in the quarry. The response alternative selected as a result of the EE/CA process, which included public review and comment, was to treat the contaminated water and discharge it to the Missouri River in compliance with a permit issued to DOE by the Missouri Department of Natural Resources. The health and safety of the public will be ensured by treating the water to very stringent limits prior to release.

The quarry water treatment plant will be used to treat contaminated water resulting from the bulk waste remedial action. Sources of contaminated water include (1) surface runoff from the quarry and the immediate vicinity of the treatment plant (much of which will flow to the plant's equalization basin while the wastes are being removed), (2) water used to decontaminate equipment at the quarry, (3) water used to wash down exposed rock surfaces, and (4) incidental volumes of wastewater generated by support activities.

The treatment plant will also be used to treat surface water inflows to the quarry following removal of the bulk waste to keep the quarry pond from refilling. Releases of treated water to the Missouri River will be in compliance with the perr it issued to DOE by the Missouri Department of Natural Resources. The treatment plant could also be used to treat contaminated groundwater if such action is deemed necessary in the future. The discharge limits are protective of human health and the environment. The potential health risks to downstream consumers of Missouri River water are very low.

Response D-2

There is sufficient information on the radioactive constituents in the quarry pond and in the bulk wastes to proceed with design activities. The chemical and physical characteristics of the contaminants, which are well known, are the important parameters for treatment plant design because these characteristics dictate which treatment technologies will be effective. The water treatment plant will utilize standard technologies to remove the hazardous chemical and radioactive constituents. The safety of this system will be ensured by testing the treated water for compliance with the requirements of the discharge permit prior to release to the Missouri River. Any water that is not in compliance with this permit will not be released but will be recycled through the plant until the requirements are met. Batch testing and release of the treated water will ensure that there are no significant risks to downstream users of this water.

D-2 pollutants is not available? As a St. Louisan living downstream, I remain extremely concerned.

D-3 2. How can anyone plan adequately for the removal, transport and interim storage of the bulk wastes when inadequate data are available on the bulk wastes, as well. To quote in an abbreviated form from page 6-10 of the Feasibility Study: "Drilling . . . would be extremely difficult. . . . representative sampling is infeasible. . . . "

D-4 3. Has there been an explosives expert who has had input into this whole plan of excavation? Has he or she determined if the TNT in the Quarry soil is in high enough concentrations for there to be a detonation? Has a contingency plan been drawn? Could the 2, 6 DNT -- which is a potent carcinogen -- volatilize when exposed to the water that is to be sprayed in the Quarry for dust control during excavation and that is to be used for the high pressure hosing of the walls?

As stated in the remedial investigation and feasibility study reports, the wastes in the Quarry have not and cannot be fully characterized at this time due to difficulties in sampling. Therefore it should not be presumed that the concentrations of TNT, DNT or TNB are below the level of concern for detonation potential. There is insufficient evidence to claim that a maximum concentration of 2% TNT exists in the soil at the Quarry; much higher concentrations may be present.

Because of the large number of unknowns and the corresponding high degree of uncertainty, the DOE should provide a more thorough discussion of this uncertainty and the associated risks. Supporting documentation and references should be provided to substantiate the claim made at the public hearing on March 28 that a detonation potential does not exist at the Quarry. The DOE has not provided any evidence that an explosives expert has been directly involved in identifying, selecting, or evaluating the alternatives for the Quarry bulk waste. Given the uncertainty and potential hazards, a more comprehensive evaluation of the problems and risks associated with TNT and DNT and their potential transformation products should be provided; references and expert testimony should be included in the response.

D-5 4. Where do you expect to dispose of the radioactive resins that will accumulate during the operation of the Quarry water treatment plant? Are these concentrated wastes to be stored on the asphalt pad?

D-6 5. Has any evidence been collected as yet that indicates whether any of the contaminated groundwater has migrated south of the slough near the Quarry? How far is the plume moving each year? At what depths below the surface are you extracting water for monitoring? What precautions are you taking to make sure that water samples are being extracted from a range of depths -- such as, from the top of the aquifer where the contamination level is likely to be highest -- and to make sure that each water sample is extracted from a discrete stratum so that less contaminated water from a different depth is not also present in

Response D-3

A significant amount of information is available on the physical, chemical, and radiological characteristics of the bulk wastes as a result of previous investigations; the results of these investigations are presented in the RI. The types of contaminants and their concentrations are consistent with the disposal history at the quarry. This information is sufficient to plan for the removal, transport, and temporary storage of the bulk wastes.

It is possible that some unknown waste material was placed in the quarry. In designing the waste removal process, an observational approach will be used to deal with this possibility. In this approach, planning is based on available data and realistic assumptions concerning field conditions, and adjustments are made in the field as work proceeds. Deviations from expected conditions and mechanisms by which to identify their occurrence are defined, and plans are developed to address or mitigate adverse effects that result from these deviations. This approach ensures responsiveness to actual field conditions.

Detailed characterization of the bulk wastes will be performed after the wastes are placed in temporary storage at the chemical plant area. The results of this detailed characterization will be used to evaluate various treatment technologies for these wastes prior to their disposal.

Response D-4

Expert input with regard to explosives contamination is being solicited consistent with the level of detail required for each phase of project planning. Representatives from the U.S. Department of the Army, who are familiar with the Weldon Spring site and who have expertise in removing wastewater lines contaminated with explosives, were consulted during development of the RI/FS. The U.S. Army Toxic and Hazardous Materials Agency provided documents related to dealing with explosive materials, such as the report entitled *Testing to Determine the Relationship Between Explosive Contaminated Sludge Components and Reactivity* prepared by Arthur D. Little, Inc., in 1987. This report describes the results of laboratory tests to determine the range of concentrations (i.e., 12 to 15%) that present explosive hazards during excavation activities. As the project progresses into the conceptual and detailed design phases, additional expert input and review will be provided. For example, the project recently obtained the services of Hercules, Inc., a company known for their expertise in dealing with explosives. This company is providing technical reviews, safety assessments, and contingency scenario analyses to facilitate development of conceptual design and safety plans. Their technical review of the proposed action concluded that the current plan is feasible and that an explosion is highly unlikely.

No appreciable volatilization of 2,6-DNT or other nitroaromatic compounds present in the quarry bulk wastes is likely during water spraying operations. These compounds have very low vapor pressures and therefore do not readily evaporate into the air. Water spraying will, in fact, reduce the emissions of nitroaromatic compounds that would otherwise be present during the excavation operations.

The highest measured concentration of TNT in the bulk wastes is about 2%. This value resulted from biased sampling in which areas of surficial discoloration were targeted in an effort to define the maximum concentration. The project will not, however, rely solely on existing characterization data. An observational approach will be instituted during remediation. This approach was developed by geotechnical engineers in performing subsurface foundation work and is a well accepted mechanism for managing uncertainty. The EPA supports this concept for remediating hazardous waste sites such as the Weldon Spring quarry. The method will be described in detail in design documents but, very simply, it consists of (1) conducting design based on the most probable set of field conditions; (2) identifying all reasonably foreseeable deviations; (3) establishing field mechanisms to determine if a deviation is occurring; and (4) developing contingency designs and controls to mitigate any adverse impacts associated with the respective field occurrence. This provides a structured approach to managing uncertainty and will allow the work to be performed safely and in a manner that will protect human health and the environment.

Response D-5

Wastes associated with operation of the quarry water treatment plant will be packaged and placed in the quarry for temporary storage; these wastes will subsequently be removed and stored in the drum storage area at the chemical plant area. Any wastes generated from operation of the water treatment plant following removal of the bulk wastes from the quarry will also be transported to the chemical plant area for storage. Disposal decisions for these wastes will be incorporated into the RI/FS-EIS currently being prepared, which addresses remediation of the chemical plant area of the Weldon Spring site.

Response D-6

Groundwater south of Femme Osage Slough is not currently contaminated as a result of contaminant migration from the quarry. Slightly elevated uranium concentrations have been detected in monitoring well RMW-2. The cause of these elevated levels is not known. However, these levels have been stable (i.e., there has been no upward trend) and they are below levels of concern for human health and the environment. In addition, the 1984 environmental monitoring report indicated an elevated concentration in one well south of the slough. The reported value (402 pCi/L) was the average of two values -- one less than the detection limit and one of 804 pCi/L; the latter value has been determined to be erroneous. Previous and subsequent sampling indicates background concentrations of uranium.

The plume does not appear to be migrating southward. Current understanding of the situation indicates that contaminated groundwater is discharged to Femme Osage Slough. Groundwater both north and south of the slough is monitored at several depths. Monitoring wells south of the slough monitor groundwater both potentially migrating under the slough and originating from the slough. All wells are completed and purged in accordance with current EPA guidelines for groundwater monitoring.

D-6 the column of water extracted, thereby potentially diluting the sample and thus distorting the findings?

D-7 6. Have you estimated the probability of a tornado's having a direct hit at the chemical plant site -- that is, at the site of the proposed temporary storage pad -- over the next 5 or 10 years when the pad is to be used?

The probability of a direct hit by a tornado at the Weldon Spring Site during the 10 year period the Quarry waste is to be stored at the Temporary Storage Area should be presented in the Feasibility Study. The risk to human health and the environment from the dispersal of contaminated material from a tornado should be described.

D-8 Alternative methods for storing the Quarry materials, such as in drums, containers or under a weighted plastic cover as proposed, should be evaluated on the basis of risk minimization, effectiveness, and cost, and this evaluation should be presented in the feasibility study.

The public should be made aware of your rationale for selecting the plastic cover alternative when other methods for storage of the Quarry waste, especially the fine-grained soils and sediments, are available which could reduce the risk of wind dispersal. Of special concern is the potential impact from the widespread distribution of thorium-contaminated soils. Since this could result in the evacuation of people from their homes and businesses for tens of square miles and make remediation much more difficult and costly, the DOE should provide a detailed explanation of its decision in selecting the proposed method for waste storage at the TSA. The DOE should also specify any guidelines or rules regarding risk acceptability that were used in this analysis.

D-9 7. Is there to be a dike constructed and maintained around the temporary storage asphalt pad so as to contain any runoff?

D-10 8. According to page 10-2 of the Feasibility Study, the bulk waste may be stored on the asphalt pad for up to 10 years. What are the DOE's plans for the final disposition of this material? According to the Final Environmental Impact Statement published in February 1987, the DOE was expecting to establish a permanent disposal cell at the chemical plant site. Is this currently the preferred alternative? How confident are you that you could build a permanent cell on this site that would meet federal regulations (such as the Superfund, Resource Conservation and Recovery Act, and Department of Energy regulations) and state regulations?

[My oral testimony was interrupted at this point. At the start of my testimony I had offered to read only as many of my prepared questions, and sub-questions, as I could fit into 5 minutes. I was notified that my time was up when I had gotten to this point in my 8th question. When

Response D-7

The probability of a tornado striking the chemical plant area in any one year is estimated to be about 0.002. The probability of a tornado strike during the three to six years the wastes would be in temporary storage would therefore be 0.006 to 0.012. If a tornado were to hit the temporary storage area, material in storage could be dispersed off-site, which would result in members of the general public incurring radiation doses. However, the risk to nearby individuals from radiation exposure would be much lower than that from the physical hazards associated with a tornado strike.

The DOE will prepare an emergency response plan prior to initiation of this action. In developing this plan, DOE will involve the Francis Howell School District and local officials who would require notification or coordination in the event of an emergency. The DOE will not initiate this interim remedial action until an emergency response plan has been developed to ensure the health and safety of nearby individuals under credible conditions, including tornadoes.

A tornado strike could occur at any time. A tornado hitting the quarry in its current condition would result in the dispersal of material into the nearby environment. Similarly, a tornado strike at the raffinate pits could result in the spread of contamination off-site. This emphasizes the need to clean up the entire site as soon as possible and to properly dispose of all contaminated materials. This is the best solution to safeguard against tornadoes.

Response D-8

The feasibility of sorting and containerizing the waste prior to transport to the chemical plant area was reevaluated; this approach has been determined to be preferable. In this approach, the wastes will be sorted and packaged in containers such as large steel boxes and transported to the chemical plant area in trucks along a dedicated haul road. The containers will be unloaded at the temporary storage area and the wastes placed directly into controlled storage. There are currently no plans to store these wastes in containers. Detailed characterization of the wastes cannot be performed effectively if they are stored in containers at the temporary storage area. Materials subject to wind erosion and radon emissions will be covered to minimize atmospheric dispersal.

The risk from wind dispersal of these materials will be minimal. There are no conceivable circumstances that could require the evacuation of people from their homes and businesses for tens of square miles. The safety of this action will be verified by a thorough environmental monitoring program that will be conducted before, during, and after completion of the action. An operational environmental, safety, and health plan is being prepared for this action. In addition, an emergency response plan will be prepared to detail the measures to be followed in the event of unforeseen circumstances. This plan will be prepared utilizing input from the Francis Howell School District and local emergency response officials. This action will not be initiated until an emergency response plan is in place.

In accordance with CERCLA requirements, detailed engineering for this action will not be initiated until the record of decision has been issued. The exact procedures to be used for excavation, transport, and storage of these materials will be defined during detailed engineering. No design modifications will be made, however, that would be less protective than the scenarios presented in the RI/FS documents. The analyses provided in the FS indicate that the risks to the general public from implementing this action will be very low, at or below those identified by the EPA as being of concern (i.e., 1×10^{-4} to 1×10^{-7}). The risk from temporary storage of the wastes will also be very low.

Response D-9

A surface water runoff collection system will be an integral component of the temporary storage area. Surface water runon to the temporary storage area will be controlled by diversion ditches surrounding the area. Storm-water runoff and leachate from within the temporary storage area will drain by ditches and swales to collection ponds located within the temporary storage area. This water will be treated in the water treatment plant to be constructed at the chemical plant area prior to discharge. A dike around the temporary storage area is not needed to contain runoff.

Response D-10

The DOE is currently preparing an RI/FS-EIS to evaluate remedial action alternatives for the chemical plant area of the Weldon Spring site. This RI/FS-EIS is being prepared in place of revising the draft EIS that was issued in February 1987. The RI/FS-EIS will be available for public review and comment in 1991. A major component of the RI/FS-EIS is an evaluation of alternatives for the permanent disposal of all wastes generated by remediating the Weldon Spring site. On-site disposal of these wastes is one alternative that is being evaluated. An evaluation of applicable or relevant and appropriate requirements (ARARs) is a key element of the RI/FS-EIS process. All potential state and federal ARARs will be evaluated and reviewed by DOE, EPA Region VII, and the state of Missouri. The selected alternative must satisfy all pertinent regulatory requirements.

D-10 I asked for another minute and a half to finish, the moderator said no.]

Would the choice of this site be affected by the State's prohibition against siting a hazardous waste landfill in a karst terrain? That is, has the state given the DOE any assurance that it would approve this karst terrain as a permanent landfill site?

D-11 9. Are you planning to place a soil cap over the wastes (under the plastic cover) in the Temporary Storage Area in order to reduce the release rate of the radon, which will continue to be emitted for hundreds of thousands of years? If so, how deep have you estimated the soil cap will have to be in order to keep the radon release rate within the EPA's permissible standard? How can you predict the height of the cap if you do not as yet know the uranium and thorium concentration levels of the Quarry bulk wastes?

D-12 10. What are the highest levels of gamma radiation to which you expect the remediation workers to be exposed during the exhumation, and during and after the consolidation of the wastes? Will protective clothing be provided that can shield the workers against penetrating gamma radiation? Will masks be provided to protect against the inhalation of alpha- and beta-emitting dust particles? Are personnel masks available that technologically can screen out radon gas?

D-13 11. Do you expect any changes in the federal government's permissible levels of radiation to which workers will be allowed to be exposed as the result of the recently released report of the Committee on the Biological Effects of Ionizing Radiations of the National Research Council, namely, the BEIR V report (December 1989)? Do you expect any changes in the concentration levels of radionuclides the federal government will allow in liquid and gaseous releases to the environment, either onsite or offsite? Have analyses been made of how more stringent standards in either the workplace or in the environment could affect the proposed Quarry bulk waste interim remedial action plan?

D-14 12. Regarding the following answer in your "Informational Bulletin": "Contamination will not reach the school, therefore the students and staff will not be in any danger.": How can you accurately estimate the future risk to high school students and staff at this time from exposure to radioactive dust and radon gas emissions from the proposed Temporary Storage Area, approximately a mile from the high school, when you do not know as yet the quantity or exact nature of the Quarry bulk wastes that are to be placed on the TSA pad?

D-15 13. Have you considered vitrifying the Quarry wastes (that is, fusing them into a glassy matrix), or containerizing them at the Quarry -- before moving them to the TSA? Have you considered containerizing the wastes, for example, in metal containers -- and then storing the wastes in the containers at the storage site until a final disposal site is found? Would a containerization alternative be more in keeping with the Superfund requirement that the choice of an Interim Remedial Action may not prejudice the choice of the final disposal

Response D-11

The existing characterization data, with respect to the concentrations of radium isotopes, are adequate to design approaches for controlling radon releases. A detailed evaluation of radon emissions and potential control requirements was prepared in support of the FS. These analyses demonstrate that a soil cap is not needed to reduce the release of radon gas to low levels. An impermeable cover (such as a flexible-membrane liner) will be used to control radon emissions from radium-contaminated soils and sludges. A flexible membrane liner will reduce radon emissions to levels below the EPA permissible standard of 20 pCi/m^2-s. Soil covers are typically used when designing disposal cells because long-term integrity is of paramount importance; a soil cap is not needed for this action given the short duration of the temporary storage period. Although impermeable covers alone are expected to adequately control radon emissions, uncontaminated soil will be available nearby as a contingency measure for placement on top of the covers, if needed.

Response D-12

The average dose rate from external gamma radiation is estimated to be 0.5 mrem/h for all phases of this action during which workers will be in close contact with the wastes. Although the maximum dose rate could be as high as 20 to 30 mrem/h in very localized areas of the quarry, the dose rate would generally not be expected to exceed a few mrem/h. It is not practical to provide shielding against penetrating gamma radiation by protective clothing. Such clothing would be very heavy and would greatly limit worker effectiveness, resulting in a longer exposure period. Thus, although the dose rate would be somewhat lower, the net effect could be higher worker doses. It should be noted that shielding against gamma radiation will be provided by the excavation equipment, which is constructed of iron and steel. In order to keep worker exposure to penetrating gamma radiation at low levels, areas within the quarry and at the temporary storage area having gamma dose rates in excess of 0.5 mrem/h will be posted and roped off. Strict work time limitations will be placed on workers entering these posted areas.

Workers in the quarry and temporary storage area who are not enclosed within controlled-air work stations will be provided with masks or other protective equipment to protect against inhalation of radioactively contaminated dust. Although such masks do not screen out radon gas, they do remove the radioactive decay products (solids) that constitute the primary hazard associated with radon gas. Effective dust and radon control measures, as well as use of appropriate personnel protective equipment, will be used to protect workers. The work place will be thoroughly monitored for hazardous airborne contaminants to ensure that worker health and safety is not compromised.

An operational environmental, safety, and health plan is being prepared that details worker, public, and environmental protection procedures; this plan will be completed prior to removal of the bulk wastes from the quarry. In addition, DOE will prepare an emergency response plan prior to initiating the proposed action. These plans will provide procedures for protecting workers and the general public under routine and potential emergency situations during the quarry bulk waste remedial action.

Response D-13

The permissible levels of radiation exposure for workers is based on limiting their health risk to levels that are comparable to the occupational risks from other industries that are considered to be safe. The permissible level (5 rem/yr) may be reduced as a result of recent studies indicating that the risk from exposure to low levels of ionizing radiation is higher than previously estimated. The DOE and other federal agencies are currently examining this issue. The radiation doses to workers who would implement this action would be considerably below current limits.

No significant changes are expected in DOE concentration limits for radionuclides in liquid or gaseous effluents as a result of the BEIR V study. The risk factors presented in the BEIR V report are consistent with those used by the EPA in developing revisions to the National Emission Standards for Hazardous Air Pollutants under Section 112 of the Clean Air Act for radionuclides and by the NRC in developing revisions to 10 CFR 20 for permissible levels of radionuclides in air and water in controlled and uncontrolled areas. The DOE standards are consistent with those developed by the EPA and NRC.

A major element of DOE's radiation protection program for occupational and public exposures is the ALARA concept. Under the ALARA process, all exposures to radiation and all releases of radioactivity to the environment must be reduced to levels that are as low as reasonably achievable. The DOE is committed to this approach. The proposed action would not be impacted even if more stringent standards were in effect because the predicted levels of radiation exposure to workers and the public are well below applicable standards.

Response D-14

Sufficient data are available regarding the concentrations of radioactive contaminants in the quarry bulk wastes based on the history of disposal activities and the results of previous characterization studies, as presented in the RI. However, detailed waste characterization to evaluate treatment options cannot be performed without removing the wastes from the quarry. Because the exact quantity or physical characteristics of the bulk wastes are not known, conservative assumptions were used to estimate the risks to students and staff at Francis Howell High School. The actual risks will likely be lower than those presented in the FS.

Contamination will not affect students, faculty, or staff at the high school because work at the temporary storage area will stop and exposed areas will be covered if elevated concentrations of radioactive contaminants are detected at the high school. Work will not resume at the temporary storage area until the cause of the release is identified and corrective actions are implemented.

Response D-15

See page 37.

D-15 solution -- that is, may not bias the decision-making process?

D-16 14. What are your plans, in detail, for excavating and segregating the Quarry waste? In particular, what precautions are to be implemented to mitigate the potential for explosions and/or chemical reactions? Both thorium and uranium and chemical compounds of thorium and uranium are pyrophoric and may ignite spontaneously upon contact with air. Some uranium and chemical forms of uranium may react violently when in contact with water; it is proposed in the feasibility study that water sprays will be used for dust suppression, but this potential danger is not addressed. Given that the nitroaromatics are explosive/flammable materials, the presence of pyrophorics and strong oxidizers would create a greater potential hazard than has been presented in the feasibility study. These problems should be identified, a comprehensive evaluation of the potential hazards should be provided, and details on methods that can be implemented to minimize these hazards should be given in the feasibility study. It is not at all clear from the information

D-17 presented in the remedial investigation, risk evaluation, or feasibility study reports that the potential risks associated with the proposed excavation and storage of Quarry waste have been identified, evaluated, and quantified. The proposed alternatives have not been thoroughly evaluated with regard to the hazards and risks associated with the excavation and storage alternative. Methods of stabilizing the waste in place with subsequent removal and storage at the TSA should be evaluated in more detail so that a more objective comparison of risk and cost for the alternatives can be made.

D-18 15. The proposed plan for the Quarry bulk waste removal and storage does not provide for any backup protection in the event of a failure of the plastic cover or the unintentional removal of the cover during an unplanned incident, such as a tornado or a storm with high winds. Could a monitoring system possibly provide sufficient warning of a large airborne release to be able to evacuate the school and nearby residences? Do you propose to provide respirators to all school children, teachers, and nearby residents? What other contingency measures are being considered to prevent unintentional airborne releases if the primary protection method (that is, the weighted plastic cover) fails?

Response D-15

Vitrification of the quarry bulk wastes was ruled out as a treatment option for several reasons, one of which is the biasing of final treatment and disposal options for these materials. In addition, the nature and placement of materials in the quarry is not conducive to in-situ vitrification. As currently planned, the bulk wastes will be loaded into large containers and transported by truck along a dedicated haul road to the temporary storage area. There, the containers will be unloaded and the wastes placed directly into controlled storage. Storage of the bulk wastes in containers at the temporary storage area would not permit efficient characterization. However, neither bulk storage nor containerized storage will bias the selection of the final disposal alternative for these wastes.

Response D-16

Detailed plans for excavating and segregating the wastes will be developed and presented in design documents. The level of detail necessary to determine the engineering feasibility of this action was presented in the preliminary engineering report supporting the FS. Conceptual and final design documents that will be developed will focus on the physical aspects of waste removal such as equipment, operations, material handling, and cost. Planning related to dealing safely with the various types of contaminants and hazards encountered -- such as environmental monitoring plans, health and safety analyses, contingency plans, and worker protection plans -- will be described in the operational environmental, safety, and health plan. The results of these two planning efforts will be integrated into the subcontract bid document to ensure that the subcontractor has the equipment and expertise to respond to conditions likely to be encountered during this action.

No evidence exists to suggest that concentrated forms of thorium or uranium were deposited in the quarry. Such materials would have economic value, and it is unlikely that they would have been intentionally discarded. Furthermore, the quarry wastes have been exposed to water infiltration for more than 20 years, which would contribute to corrosion of the original waste containers and oxidation of the waste materials. There is no basis to suspect that reactivity hazards associated with uranium and thorium compounds will be encountered during the excavation process.

The proposed action was reviewed by Hercules Incorporated, a company with extensive expertise in dealing with explosives. The results of this review are provided in the report entitled *Explosive Hazard Review for the Weldon Spring Site Remedial Action Project Quarry Excavation*, which was completed in July 1990. This review concluded that potential explosion hazards could be effectively mitigated by personnel training and operational controls. Mitigative measures will be used to ensure that the proposed action is implemented safely, e.g., materials will be sprayed with water to minimize the chance of ignition. Recommendations provided in the review will be incorporated into appropriate environmental, safety, and health plans prior to initiation of the proposed action.

Response D-17

The level of detail provided in the RI/FS documents is consistent with that required by EPA for actions of this type. Detailed engineering for this action cannot be initiated until the record of decision has been issued. The analyses presented in the RI/FS and supporting documents clearly indicates that there is a need for timely response and that this action can be performed safely and in compliance with all pertinent standards and regulations. Additional evaluation of the various alternatives is not warranted.

Response D-18

The DOE will prepare an emergency response plan prior to initiation of the proposed action. This plan will detail steps that will be taken in the event of an unplanned incident such as a tornado strike or a storm with high winds that causes massive damage to the cover. In developing this plan, DOE will involve the Francis Howell School District and local officials who would require notification or coordination in the event of an emergency. The DOE will not initiate this action until an emergency response plan has been developed to ensure the health and safety of nearby individuals. It will not be necessary to provide respirators to members of the general public to ensure their safety under any credible conditions. Contingency measures to deal with unintentional airborne releases will be included in the operational environmental, safety, and health plan currently being developed.

Letter E

BURLINGTON NORTHERN RAILROAD

April 9, 1990

Mr. Stephen H. McCracken
Project Manager
United States Department of Energy
Weldon Spring Site Remedial Action Project
7295 Highway 94 South
St Charles, Mo 63303

Dear Mr. McCracken :

This is in response to the Weldon Spring Remedial Action Project whereas written comment be postmarked on or before April 9, 1990 to become part of the Administrative Record and will be considered in the Record of Decision.

E-1 Burlington Northern Railroad request that we be part of the bid process for the transporation portion on hazardous or contamined commodity on movement from St Charles area to Richland, Wa or alternate destinations.

If we can assist you in any way, please do not hestiate to give us a call at numbers shown on enclosed business cards.

Sincerely,

Patrick S LeClaire
Market Manager
Enivronmental Logistics

Response E-1

The proposed action involves truck transportation of the bulk wastes from the quarry to the chemical plant area along a dedicated haul road. The one-way distance is about 5.4 km (3.4 mi). This action does not entail movement of any materials to Richland, Washington, or any other off-site destination.

The DOE appreciates the interest expressed by Burlington Northern Railroad on this project. Burlington Northern Railroad will be included in the bid process for any action that entails the bulk transportation of large volumes of contaminated materials to off-site areas for treatment and disposal.

Letter F

Steven H. McCracken, Project Manager
U. S. Department of Energy
Weldon Spring Site Remedial Action Project Site
7295 Highway 94 South
St. Charles, MO 63303

Dear Steve,

I am sending herewith my written comments to you in response to the proposed plan for the management of the Weldon Spring Quarry bulk wastes (DOE/OR/21548-105). This response is being sent to you within the extension of comment period obtained by Meredith Bollmeier through your office and with the consent of Bob Morby, Chief, Superfund Branch, U.S. EPA Region VII.

My remarks will pertain to the documents, DOE/OR/21548-066, -065, -104, and -106. These reports seem to be technically sound and well written with ideas and facts obtained from extensive studies of the available data for the Weldon Spring site. I am pleased that the actual logistics of the waste removal was considered in the context of the effects on the Francis Howell school children as well as other bioloigical forms. My overall impression is that of a positive one for the project and I would like to commend the DOE personnel for the soundness of the proposal.

F-1 However, I am not convinced that alternative 5 is any better than alternative 6 as proposed in Table 1 of document -105. Higher monitoring costs and inflation are cited as the main drawbacks of delayed action. As reported in the public hearing on March 29, 1990 expediated action is expected to cost $ 11 million. According to my calculations, if ROD can be reached by 1994 (a reasonable estimate even by DOE and according to OTA-ITE-362), and allowing for a moderate inflation in moving costs the Quarry wastes could be moved after ROD,at a savings of substantial tax dollars. In addition, students, public, and other living forms will not be exposed to radioactive dusts twice. Therfore, it seems prudent to wait and move the bulk wastes at the time of the ROD for the site.

F-2 I am also perplexed at the assumption made as a basic guiding principle for the proposal (-104) that somehow by removing the radioactive waste from the quarry and restoring it in another temporary site which is about 6.4 km from the quarry will reduce the radioactive emission of Radon. How is this reduction in radiactivity going to be achieved?

Response F-1

Alternative 5 is preferred over Alternative 6 because Alternative 5 is responsive to ongoing, uncontrolled releases to the environment in the quarry area and is consistent with current plans for remediating the entire Weldon Spring site. Alternative 6 would postpone the attainment of remedial action objectives at the quarry (e.g., removing the source of contamination and initiating necessary characterization activities in the quarry area). The preferred alternative can be implemented in a manner that will not endanger students and staff at Francis Howell High School or any other individuals in this area. The extensive monitoring program currently in place will be expanded to ensure the health and safety of nearby residents and the environment as a result of this action.

The DOE is currently preparing an RI/FS-EIS to evaluate alternatives for the permanent disposal of all wastes generated by remediating the Weldon Spring site. Although the RI/FS-EIS will be available for public review and comment in 1991, the length of time to implement permanent disposal options will take several more years. Delaying the proposed removal of the bulk wastes would result in continued, uncontrolled releases of contaminants to the environment in the quarry area. The proposed action is being taken at this time to respond to this release.

Some additional cost and environmental impacts will be associated with placing the wastes in temporary storage, but most of the components associated with this action will be required whether the action is taken now or in the future. The wastes must be removed and characterized to evaluate various treatment options prior to final disposal. The incremental cost is a good expenditure of funds based on the considerable benefits associated with expediting the action, i.e., the proposed action will further protect human health and the environment and support overall waste management decisions for the project. These (and other) reasons for conducting the proposed action are discussed in greater detail in the FS. This action will be taken in a manner that will minimize impacts to students, the general public, and nearby wildlife.

Response F-2

The emissions of radon gas from the bulk wastes will be reduced by compacting the radium-contaminated soils and covering them with a liner that is very effective at reducing radon gas releases. Because radon isotopes have short half-lives (3.8 days for radon-222 and 55 seconds for radon-220), control of radon releases is achieved by increasing the length of time it takes for radon gas to reach the atmosphere. This permits a significant amount of radioactive decay to occur (i.e., to solids). Compacting the materials reduces the pore space through which radon gas can diffuse, and using a heavy cover (such as a flexible-membrane liner) greatly reduces radon gas migration out of the soil. These two measures allow for a significant amount of radioactive decay to occur prior to release to the atmosphere.

F-3 Indeed, the remarks made on p 53 of document -065 suggest that the quantities of radioactive material in the quarry are high and therefore, warrant a better containment of the wastes rather than move the material twice, once for temporary storage and a second time for overall cleanup. The estimated 83,200 cubic yards (p 85, document -066) was later increased to 95,000 cubic yards of radiological waste becuase of discrepancoes in measurements (p 75, document -066). Because of such uncertainities in estimating the total waste (because of the nature of the waste) I cannot suggest the removal of unknown quantities and expose the public to even greater risks.

F-4 DOE may not have been able to characterize the nature of the radioactive waste, since the available records could have been incomplete and inaccurate (see attachments 1,2). I make this assumption because there was no reference as to the nature of the waste originated at the Destrehan plant (p 75 document -066). Earlier documents indicate that Belgian Congo ore was processed at this plant and that this ore was of higher grade. Therefore, much more exensive characterization of the radiological waste at the quarry seems to be needed before the final removal for cleanup.

F-5 The available documents seem to indicate that alternative 5 is the preferred choice for DOE, and if the decision has already been made to move the quarry waste, then I would like to make the following suggestions.

F-6 1. Because of the wind directions the waste should be hauled in off-school times and in the night during winter and early spring (p 9 document -065).

F-7 2. Further exhaustive investigations for TSA should be carried out. The proposed location seems to overlap with potential nitroaromatic source areas (see attachments 3,4).

F-8 3. A careful analysis of advantages of pre-sorting the wastes prior to hauling as opposed to the DOE preferred after-sorting procedure should be carried out with the idea of minimizing the potential risks to living organisms and ecology.

F-9 4. The design of the TSA should be suitable for not only storing radiological wastes but also for chemical wastes including solvents. Is the 4 inch thick concrete layer sufficient to stop the leakage of industrial solvents?

Response F-3

One of the reasons for expediting this action is to place the wastes into controlled storage to reduce releases to the environment. The fractured limestone quarry is not an acceptable location for storage of these materials. The volume of material in the quarry is estimated to be about 73,000 m^3 (95,000 yd^3). This volume will likely increase due to swelling as the wastes are excavated. The temporary storage area will be designed to store 110,000 m^3 (140,000 yd^3) of contaminated materials associated with this action. The exact volume of materials will be known only upon completion of the action. Contingencies will be built into engineering design to ensure sufficient storage space.

Response F-4

Although Belgian Congo ore was processed at the Destrehan Street Plant, it is highly unlikely that significant quantities of the wastes from processing this ore were deposited in the quarry. The residues from processing this ore are located at two other DOE facilities (i.e., at the Feed Materials Production Center near Fernald, Ohio, and at the Niagara Falls Storage Site near Lewiston, New York). These residues do contain high concentrations of radium-226 because the Belgian Congo material was a very high-grade ore. Any processing materials from the Belgian Congo ore that were deposited in the quarry would be dispersed in the bulk wastes, greatly reducing their concentrations. The radioactive constituents in the quarry bulk wastes are well known based on previous characterization activities; this information is summarized in the RI. Detailed characterization to evaluate treatment options cannot be performed without removing the wastes, due to their highly heterogeneous nature. Additional characterization to support removal of the bulk wastes is not warranted.

Response F-5

The DOE has not yet reached a decision on implementing Alternative 5. However, this alternative is preferred by DOE. A joint EPA/DOE record of decision will be issued this year documenting which alternative will be implemented.

Response F-6

The DOE will consult with the Francis Howell School District to ensure the safety of students and staff during all phases of the proposed action, including transportation activities between the quarry and chemical plant area. However, there is no need to restrict transportation activities due to wind direction. Transporting the bulk wastes to the chemical plant area and placing them into temporary storage can be much more safely performed during daylight hours. Transporting the wastes would be much more hazardous at night than during the day because of reduced visibility. The most significant risk to the general public from implementing this action is that associated with transportation accidents, which is the primary reason for constructing and using a dedicated haul road. An extensive environmental monitoring program will be utilized to ensure the health and safety of workers and the general public.

Response F-7

The potential nitroaromatic source area identified in Attachment 4 is located off-site, just west of the proposed temporary storage area. The location of the proposed temporary storage area has been thoroughly characterized for nitroaromatics; the results of this characterization are summarized in Section 9.7 of the FS and described in detail in the cited references.

Response F-8

On the basis of continuing engineering studies, DOE has reviewed its conceptual plans for removing the bulk wastes and has developed a strategy that will allow the wastes to be sorted at the quarry. Some sorting may still be required at the temporary storage area. This limited sorting can be safely performed at the chemical plant area with minimal risk to living organisms and the environment.

Response F-9

The temporary storage area will be designed to safely store all of the quarry bulk wastes. As currently envisioned, the foundation of the temporary storage area would consist of a 10-cm (4-in.) thick asphalt-concrete surface underlain by an aggregate base and a 30-cm (12-in.) thick layer of recompacted clay. The asphalt-concrete pad will function primarily as a working surface for the heavy equipment and as protection for the clay liner. The low-permeability clay layer will function to prevent the migration of solvents at the low concentrations present in the wastes. In addition, a major component of the temporary storage area will be a leachate collection system that will collect any leachate that may occur during the temporary storage period. This design will adequately contain any leaks of industrial solvents that may occur during the relatively short temporary storage period (i.e., three to six years).

F-10 5. What will happen if excessive moisture gets into the TSA? A report in a book on "Construction Dewatering" (p 50, J. Patrick Powers/Wiley-Interscience publishers) suggests that clay will turn into liquid state in excessive moisturtes. If this should occur, can the TSA hold the moisture or can the leachate be contained from overflowing and causing additional contamination?

F-11 6. What will happen to the TSA in the event of an earthquake? This natural disaster which according to experts has a high probability in Missouri was not considered in the document -066. Emergency procedures and protocols should be developed for this and other natural disasters. These measures must be in place before any quarry waste can be moved (see attachments 5,6).

F-12 7. What about the contaminated Femme Osage Slough? Is that part of another remedial action?

F-13 8. Fears arising out of past DOE's actions and partial cleanups and solutions make me skeptical of an eventual complete cleanup of the Weldon Spring site. Therefore I hesitate to accept the good intentions behind this piece-meal approach to the cleanup.

F-14 In conclusion, I am not convinced that the DOE has yet recognized the increase in health hazards due to the chronic exposure of low-levels of radioactivity. This is somewhat surprising in view of the slowly accumulating published literature. But, I remain optimistic about a successful remedial action of the Weldon Spring site. I welcome the chance to forward my comments to this project and appreciate your and DOE's efforts in this regard.

Sincerely Yours,

L Rao Ayyagari

(L. Rao Ayyagari)
14 Red Oak
St. Peters, MO 63376

4/11/90

Response F-10

The temporary storage area will be designed to ensure its structural stability. Provisions to prevent excessive amounts of moisture from reaching the recompacted clay will be incorporated into the design. Storm-water runoff and leachate from within the temporary storage area will drain by ditches and swales to collection ponds located within the temporary storage area. This water will be treated prior to discharge in the water treatment plant to be constructed at the chemical plant area. Surface water runon to the temporary storage area will be controlled by diversion ditches surrounding the area. These measures to control surface water in the immediate vicinity of the temporary storage area will eliminate the possibility of damage to the clay foundation due to excessive moisture.

Response F-11

According to the Building Officials and Code Administrators (BOCA) National Building Code, seismic zones are numbered from 0 to 4, with Zone 4 being highest in terms of earthquake risk. Based on this code, the temporary storage area is located in Seismic Zone 2. If a major earthquake were to occur during the active waste storage period, the primary concerns would be cracking of the asphalt-concrete working pad and/or slide failures on the steeper slopes of the piles. It should be noted, however, that an earthquake would not produce forces that could result in the widespread dispersal of stored materials. The temporary storage area would be repaired, if needed, following the earthquake.

The DOE will prepare an emergency response plan prior to initiating the proposed action. In developing this plan, DOE will involve the Francis Howell School District and local officials who would require notification and coordination in the event of an emergency. The DOE will not initiate this action until an emergency response plan has been developed to ensure the health and safety of nearby individuals under credible conditions, including the effects of earthquakes and other severe natural phenomena.

Response F-12

A decision on the need to remediate Femme Osage Slough will be included in the follow-on decision-making process to be conducted for the quarry area following removal of the bulk wastes. A decision cannot be reached at this time because Femme Osage Slough appears to be hydraulically connected to the contaminated local groundwater system.

Response F-13

The history of environmental compliance and protection at DOE facilities has not been good. However, this is currently DOE's highest priority. The DOE looks forward to your careful review of actions at the Weldon Spring site to allay your fears. In addition, because the site is on the NPL, EPA Region VII is responsible for ensuring the adequacy of the cleanup. Representatives from EPA Region VII have made it very clear that they will not delist the site from the NPL until they are satisfied that all required remedial actions have been completed.

Response F-14

The DOE does indeed recognize that the risk from exposure to low levels of ionizing radiation may be higher than had previously been estimated. The recently issued BEIR V study presents a detailed description of current data on the health risk of exposure to low levels of ionizing radiation. This study estimates that the health risk is about three times greater than estimated in the previously issued BEIR III report. The DOE takes this information seriously. However, it should be noted that the data used to reach these conclusions have limitations, as noted in the BEIR V study. Assessment of the carcinogenic risks that may be associated with low doses of radiation were extrapolated from effects observed at doses larger than 10 rem delivered over a short period of time. In addition, it was necessary to use assumptions about the relevant dose-effect relationships and the underlying mechanisms of carcinogenesis.

Health hazards associated with chronic exposure to low levels of ionizing radiation have been studied in areas such as those having high levels of background radiation, areas receiving fallout from nuclear weapons testing, and areas near nuclear installations; the data from these studies do not indicate an elevated level of cancer risk. Hence, it is still not possible to draw definitive conclusions of the cancer risks associated with chronic exposure to low levels of ionizing radiation.

A major element of DOE's radiation protection program is the ALARA concept. Under the ALARA process, all exposures to radiation and all release of radioactivity to the environment must be reduced to levels that are as low as reasonably achievable. This ensures minimizing radiation doses and resultant health risks.

WELDON SPRING QUARRY DISPOSAL HISTORY

1942-1945	NITROAROMATICS AND RESIDUES	? QTY
1946	NITROAROMATICS AND RESIDUES	90 TONS
1946-1957	TNT RESIDUES AND RUBBLE	? QTY
1959	THORIUM RESIDUES, DRUMS	200 C.Y. - 5 TONS
1963-1964	BUILDING RUBBLE, EQUIPMENT, SOILS	50,000 C.Y.
1963-1965	THORIUM AND URANIUM RESIDUES (MUCH REMOVED FOR REPROCESSING)	(1,000 C.Y.)
1966	THORIUM RESIDUES	? QTY

Attachment 1

Table 5.2 Dilution - Dispersion Effects Characterization

I.D.	Dilution-Dispersion Location	Dilution-Dispersion Characteristics
D_1	ATMOSPHERE	X/Q based on local meteorology, waste form mobility & particle size distribution.
D_2	QUARRY POND	Discharge - recharge rates, total volume, chemical composition of fluid.
D_3	WATER TABLE	Definition of recharge and discharge are as and rates, value of dispersivity coefficient, water table contour, chemical composition of fluid, annual water table fluctuation.
D_4	FEMME OSAGE CREEK AND TRIBUTARIES	Baseflow data and discharge recharge recharge areas.
D_5	FEMME OSAGE "SLOUGH"	Baseflow data, fluctuation with water table - Missouri River

AGENDA FOR DISCUSSION OF THE TECHNICAL REQUIREMENTS FOR PROTECTING THE ST. CHARLES COUNTY WELL FIELD

APRIL 27, 1988

Introduction

1. Historical Review

2. Current Monitoring Status - what is the current picture of contaminant extent and migration using data sources from DOE, DNR and St. Charles County.

   a. Sources - Slough & Quarry
   b. Extent of migration
   c. Monitoring wells in place

3. Evaluation of Monitoring Efforts

   a. Adequacy of existing well network for well field protection

      - Hydrologic effect of Wells 2, 3, and 9
      - Effect of slough as a source
      - Best indicator parameter for monitoring
      - New production wells on line

   b. Redundancy or overlap of monitoring efforts

   c. Future Characterization Activities

      - Bedrock/alluvium interface
      - Groundwater to west and north of quarry
      - Flow patterns and migration pathways
      - Treatment of slough water
      - Other

4. Discussion

5. Issues and Topics for Future Meetings

Source for attachments 1, 2

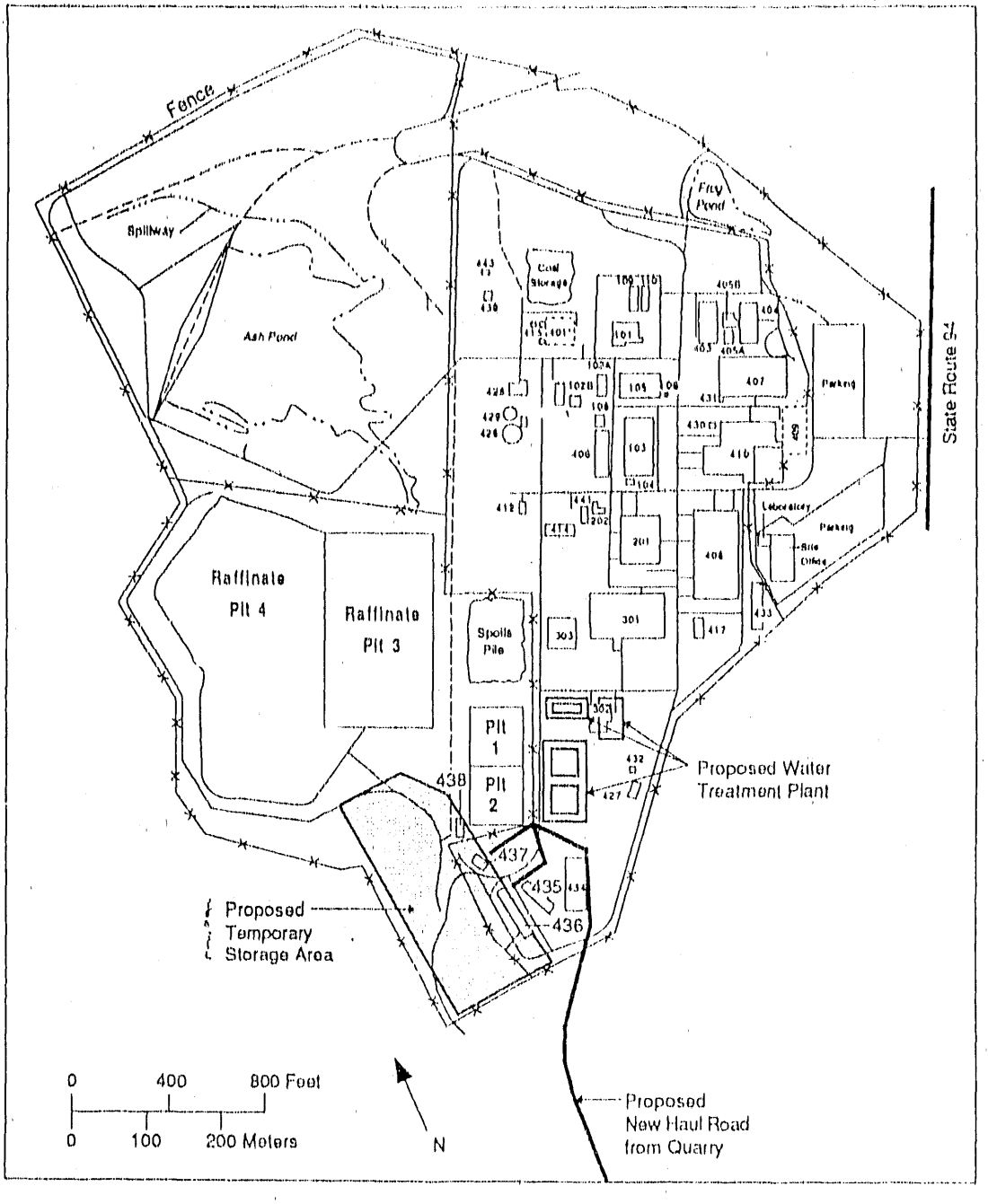


FIGURE 8.8 Proposed Location of the TSA (Source: Modified from MK-Ferguson Company and Jacobs Engineering Group 1990b)

Attachment 3

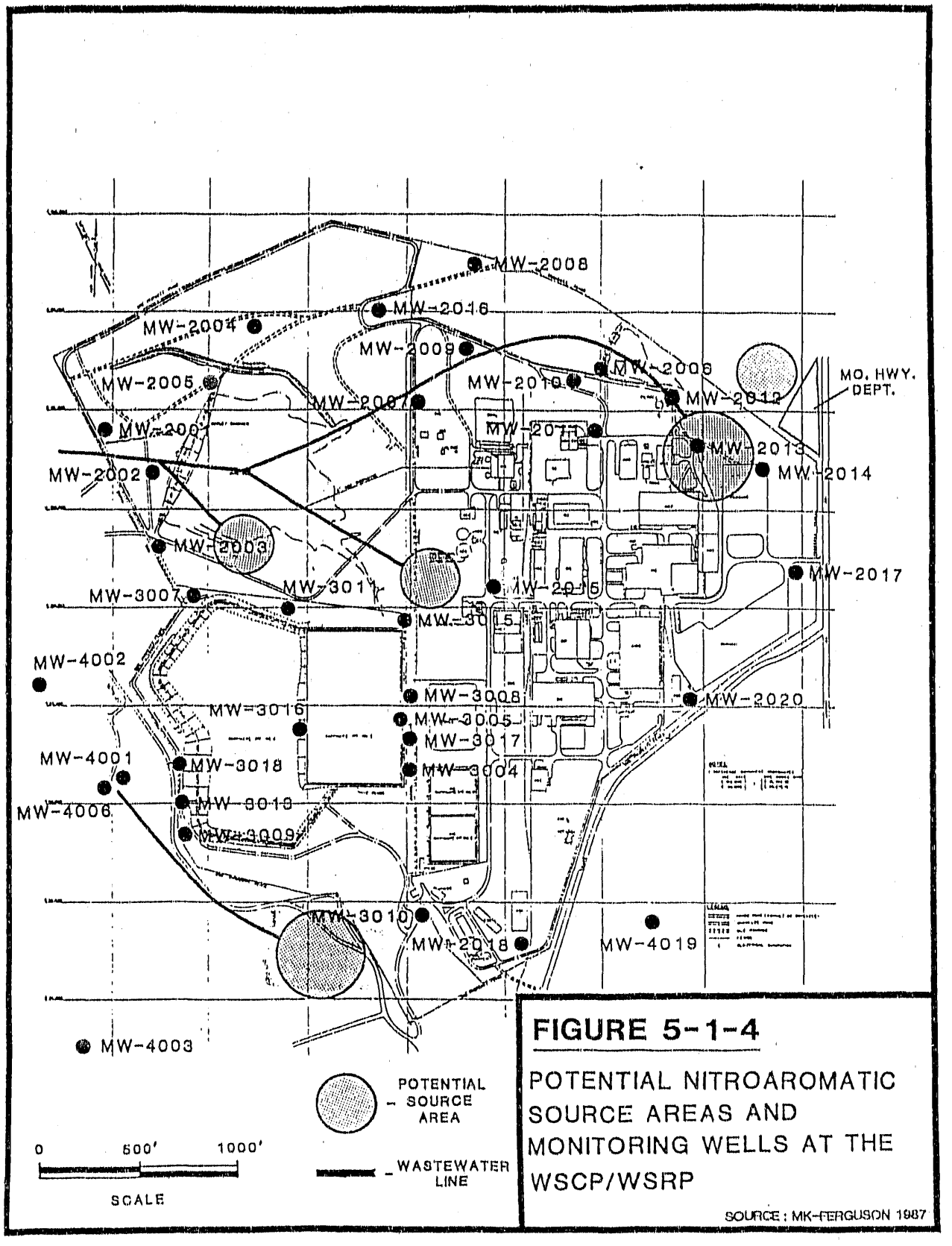


FIGURE 5-1-4

POTENTIAL NITROAROMATIC SOURCE AREAS AND MONITORING WELLS AT THE WSCP/WSRP

SOURCE : MK-FERGUSON 1987

DOE/OR/21548-003

United States Department Of Energy

W.S.S.R.A.P.

WATER QUALITY PHASE I ASSESSMENT REPORT

DECEMBER, 1987

Weldon Spring Site Remedial Action Project

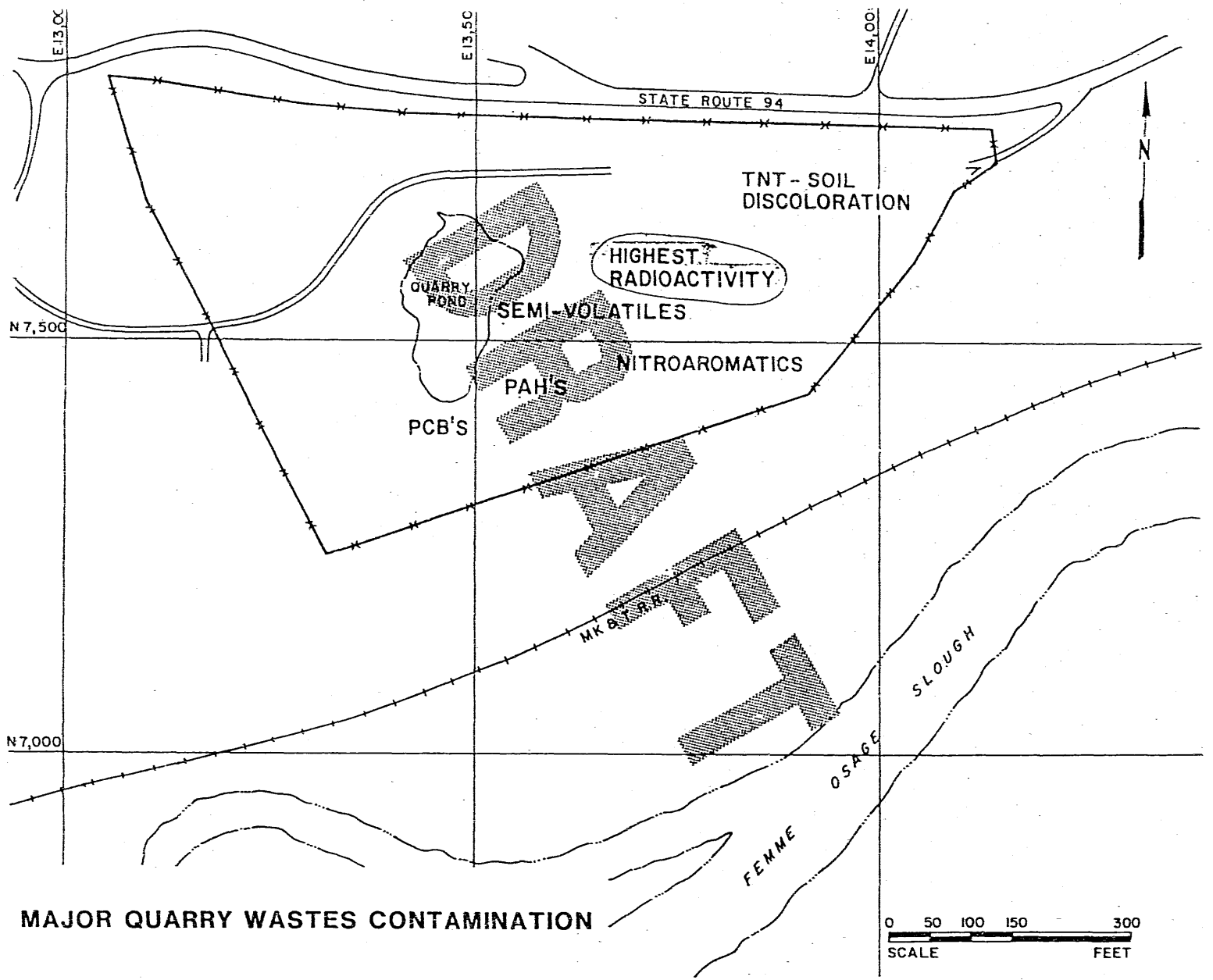
Source for attachment 4

DRAFT

Table 5.3. Effect of Abnormal Events on Control Barriers and Dilution

Event	Adverse Effect on Control Barrier	Adverse Effect on Dilution-Dispersion
Earthquake	B_o, B_1, B_2, B_3, B_4, B_5, B_6, B_7, B_8, B_9	
Lightning, Meteorite	Bo, B_1, B_2, B_3	
Flood/Heavy Rain	B_o, B_1, B_2, B_3, B_4, B_5, B_6, B_7, B_8, B_9	
Drought	B_o, B_1, B_2, B_3,	D_2, D_3, D_4, D_5, D_6
Tornado	B_o, B_1, B_2, B_3	D_1
Vandalism/Sabotage	B_o, B_1, B_2, B_3	

Attachment 5



MAJOR QUARRY WASTES CONTAMINATION

SAI-OR-79-135-01

DRAFT

PRELIMINARY RISK ASSESSMENT OF THE WELDON SPRING ROCK QUARRY

September 1979

Science Applications, Inc.
Oak Ridge, Tennessee 37830

Prepared for

Oak Ridge National Laboratory
Oak Ridge, Tennessee 37830

Under Letter Release 84Y11
of Subcontract 84B-13861C

Source for attachments 5, 6

Letter C

This hand-written letter was typed verbatim for clarity of presentation. The original letter is available for inspection at the DOE office at the Weldon Spring site.

April 13, 1990

Mr. Steve McCracken, Project Manager
U.S. Department of Energy
Weldon Spring Site Remedial Action Project Office
7295 Highway 94 South
St. Charles, MO 63303

Dear Mr. McCracken:

I would like to take this opportunity to express some of my concerns regarding the RI/FS and the proposed plan for the quarry bulk waste remedial action. They are listed as follows:

G-1 1. Why bring the wastes to the plant site before sorting? Wouldn't it be far better to sort and containerize at the quarry site before transporting to the temporary storage site at the plant.

G-2 2. I can find no mention of the Belgium/Congo Ore which has been dumped at the quarry. This should not be stored or taken to the plant site storage area! It should be removed to a safer permanent storage site as this is not really "low level" radioactive waste.

G-3 3. The wastes should be hauled at night or when school is not in session in order to further safeguard the students and faculty.

G-4 4. The sorting pad should be completely enclosed and air-filtered to prevent movement of air-borne contaminates during separation/containment. Also, if possible, the entire quarry area should be enclosed during cleanup procedures.

G-5 5. There should be a solid 12 ft. high fence (not merely chain-link) to cut down on air-borne particles escaping and to prevent thrill-seekers from easy access to the temporary storage site and sorting pad.

G-6 6. In the Feasibility Study manual on page 7-1 under compliance with ARARs, what are the applicable ARARs being considered? Is the waiver of compliance a loophole so that proper procedures do not have to be adhered to?

Response G-1

On the basis of continuing engineering studies, DOE has revised its conceptual plans for removing the bulk wastes and has developed a strategy that will allow for the wastes to be sorted at the quarry. In this revised approach, the wastes will be sorted as they are being excavated and will be loaded into containers such as large steel boxes. These containers will be transferred to trucks for transport to the chemical plant area where they will be unloaded and the wastes placed directly into controlled storage. The empty containers will be returned to the quarry for reuse. This approach will provide an efficient means for conducting this proposed action with increased operational flexibility.

Response G-2

Although Belgian Congo ore was processed at the Destrehan Street Plant, it is highly unlikely that significant quantities of wastes from processing this ore were deposited in the quarry. The residues from processing this ore are located at two other DOE facilities (i.e., at the Feed Materials Production Center near Fernald, Ohio, and at the Niagara Falls Storage Site near Lewiston, New York). These residues do contain high concentrations of radium-226 because the Belgian Congo material was very high-grade ore. Any processing materials from the Belgian Congo ore that were deposited in the quarry would be dispersed in the bulk wastes, greatly reducing their concentrations.

Response G-3

The DOE will consult with the Francis Howell School District to ensure the safety of students and staff during all phases of this action, including transportation activities between the quarry and chemical plant area. However, there is no need to restrict transportation activities to times of the day when school is not in session or at night. Transporting the bulk wastes to the chemical plant area and placing them into temporary storage can be much more safely performed during daylight hours; transporting them at night would be much more hazardous due to reduced visibility. An extensive environmental monitoring program will be utilized to ensure the health and safety of workers and the general public. The health of students and staff at the Francis Howell High School will not be compromised by implementing this action.

Response G-4

The need for a sorting pad at the temporary storage area is being reevaluated because the current plan is to conduct basic waste sorting at the quarry. Some limited sorting may still be required at the temporary storage area. Enclosing the sorting pad with an engineered structure is probably unnecessary; however, this consideration will be evaluated as engineering design proceeds.

Enclosing the entire quarry during excavation of the bulk wastes was considered in the preliminary engineering report and rejected due to its high cost. In addition, there is simply no need to enclose the quarry to remove the wastes safely. Radon and dust suppression measures will be implemented to ensure that releases of hazardous contaminants to the atmosphere will be low and not present a health risk to nearby individuals.

Response G-5

The temporary storage area will be located within the chemical plant area, which is surrounded by a fence. This area is located on the southernmost portion of the chemical plant area and is not visible from highways or public access areas (i.e., the surrounding state-owned wildlife areas). Hence, there is no need to construct a 12-foot-high fence to keep unauthorized individuals from this area. The DOE will, however, consider the use of a solid fence at the north rim of the quarry to minimize visibility from State Route 94.

A 12-foot-high solid fence could reduce local airborne concentrations by a small amount, but most of the particles striking the fence would fall to the ground prior to reaching the site perimeter (especially in the direction of Francis Howell High School). Such a fence would not effectively reduce the emission of airborne contaminants that could migrate off-site. More effective measures -- such as water sprays, chemical surfactants, and covers -- will be used to minimize airborne emissions.

Response G-6

A preliminary evaluation of applicable or relevant and appropriate requirements (ARARs) is provided in Appendix C of the FS. The ARARs will be finalized in consultation with EPA Region VII and the state of Missouri, following selection of the alternative to be implemented. The waiver condition mentioned on page 7-1 of the FS refers to specific requirements for final remedial actions, such as development of cleanup criteria. Development of cleanup criteria for the quarry is beyond the scope of this action but will be addressed in future documents following removal of the bulk wastes and completion of detailed characterization studies of the quarry area. Waiver conditions for cleanup standards are limited in scope and were established by the U.S. Congress in Section 121(d)(4) of CERCLA, as amended. This waiver condition is not a loophole that will be used to get around proper safeguards. The quarry bulk waste remedial action will be performed under the scrutiny of both EPA Region VII and the state of Missouri to ensure that it is done properly.

G-7 7. Could we please get a clarification from DOE as to the status of bringing in any outside wastes included in the Record of Decision. It seems that we cannot get definite answer once and for all. It is always alluded to but there is no guarantee from DOE that it will not be done!

G-8 8. How often will air monitors be checked and by whom? Who will be notified of a high reading and what other actions will be taken? What reading will be high enough to warrant action?

G-9 As you are aware, my major concern is the safety of the children and young adults at Francis Howell H.S. and Weldon Spring Sch. as well as those living in close proximity to the site. I am glad that you are so committed to a "safety-first" attitude, but I am concerned that if you are transferred or promoted, the new project manager may not share this attitude. Also, it is impossible to determine how many others involved in the project share your views in this matter. One person cannot possibly oversee every aspect of clean up and therefore, there are too many unforeseen problems that could occur.

I wish that it were possible for all the workers, subcontractors, and all of your staff to share these ideals, but humans, being as they are, make this an impossibility. They must be made to understand that their lives and the lives of our children are at risk for every slip-up or mistake or short-cut they take. The attitude of some of your own staff appears too blase about the risks associated with the contaminates they are dealing with. Maybe if their children were in these schools or down-wind from the site, they would be taken more seriously.

Thank you for considering my views.

Sincerely,

Linda N. Hoenig
50 Park Charles No.
St. Peters, MO 63376

Response G-7

The record of decision for this action is limited to management of the quarry bulk wastes. Management of all wastes from cleanup of the Weldon Spring site is the subject of an ongoing RI/FS-EIS; a separate record of decision will be issued for that action. There are no plans to bring wastes from other areas to the Weldon Spring site for disposal. The record of decision for remediation of the chemical plant area of the Weldon Spring site will address the scope of waste disposal and will include provisions or limitations on use of the Weldon Spring site for future actions, as appropriate.

Response G-8

An extensive environmental monitoring program is currently in place at both the quarry and chemical plant areas. This program provides extensive information on the current status of these two areas. The monitoring program will be expanded at both the quarry and chemical plant areas prior to initiating the bulk waste remedial action. An operational environmental, safety, and health plan is currently being prepared that outlines the anticipated air monitoring program to meet the specific needs of this action. Air monitoring will be performed in three general areas: (1) the workplace (i.e., quarry and temporary storage area), (2) site perimeters (i.e., the quarry fence line and the perimeter of the chemical plant area), and (3) off-site sensitive receptor locations such as Francis Howell High School. Air monitors will be checked by on-site personnel. Although the details associated with this program have not been finalized (e.g., how often air monitors will be checked, individuals to be notified in the event of high readings, and levels warranting additional actions), the following information provides a brief summary of the planned program.

Air monitoring at the quarry and the temporary storage area workplace will be performed daily during work hours. Workplace monitoring is intended primarily to document potential worker exposure but also helps determine the effectiveness of engineering controls. Air monitoring at the site perimeters will be performed continuously. These monitoring results will be compared to applicable environmental release standards to ensure that bulk waste removal and temporary storage operations are being performed safely. Additional engineering controls will be implemented, if warranted, to maintain releases within applicable standards. In addition, work at the temporary storage area will stop and exposed areas will be covered if elevated concentrations are detected at Francis Howell High School. Work at the temporary storage area will not resume until the cause of the release is identified and corrective measures are implemented.

A number of engineering control methods are available to minimize the release of radioactive air particulates and radon, including water sprays, surface sealants, tarps, and uncontaminated soil. It is anticipated that one or more of these methods will be implemented constantly throughout the operation, regardless of air monitoring results, in order to keep releases as low as reasonably achievable. These engineering controls will be upgraded and/or combinations of methods will be implemented if perimeter monitoring results indicate that the potential exists for exceeding environmental release standards.

Response G-9

The DOE shares your views on the need to protect the health and safety of the students and staff at the nearby elementary and high schools. This action will not be initiated until detailed plans are in place to ensure that it can be performed safely. Safety and environmental protection are paramount in this and all other phases of the project. This attitude is shared by all personnel at the site and is not limited to a single individual.

Letter H

April 14, 1990

Stephen H. McCracken, Project Manager
U.S. Department of Energy
Weldon Spring Site Remedial Action Project Office
7295 Highway 94 South
St. Charles, MO 63303

Dear Steve,

I contacted Glen Newtown while you were out of town to see about an extension of the comment period for the RI/FS materials and Meeting on March 29, 1990. Glen called me back saying an informal extension had been granted for Dr. Ayyagari and myself. SCCAHW needed an extension for four people, Dr. Ayyagari, George Farhner, Linda Hoenig and myself. So that Glen wouldn't have to call EPA again I contacted Bob Morby as Dan Wall was unavailable, and got approval for all four of us from him. I hope this meets with your approval.

I think that this most recent meeting was another "mutual experience" in our ongoing citizen/government relationship. Before Weldon Spring is ultimately remedied I'm sure we will have an even longer history of public meetings. So we still have time to perfect "the perfect public meeting." We haven't experienced the perfect one yet from the citizens perspective.

H-1 As I said the evening of March 29th, I had received phone calls criticizing both SCCAHW & DOE for scheduling an evening meeting for 7:00 pm. While this seemed to register with some of the state and federal officials (by their facial expressions) as a rather trivial concern; I assure you that it is not to the people who want to attend but cannot for the reasons stated.

Since the 29th I have received even more comments about the early hour and the choice the location of the meeting. The comments break down as follows:

* MEETING - TIME: It is traditional in St. Charles County to have evening meetings scheduled for 7:30-8:00. The main factor for this is very reasonable - most of the people that live in St. Charles County work in St. Louis and St. Louis County. Anyone who has experienced the stalled traffic on Hwy 70 from Hwy 270 to the Blanchette (St. Charles) Bridge during rush hour traffic can attest to the fact that for many it is almost impossible to get home early. All traffic in St. Charles County, whether it is Hwy 70, 94, or 40 has worsened; although Hwy 40 is not as bad unless it is Friday evening and people are heading for the Lake of the Ozarks. Once home they need to eat a rushed dinner and then drive another 5 or 10 miles to the meeting in Wentzville. A 7:30 meeting at a more convenient location would solve this problem - 8 would even be better, but 7:30 would be a good compromise.

Response H-1

The public meeting was scheduled to begin at 7:00 p.m. so that it could be concluded without running too late into the night. The points raised in this letter are good reasons for scheduling future meetings to begin at 7:30 p.m. Depending on the anticipated duration, future public meetings will be scheduled to begin at 7:30 p.m.

H-2 * MEETING - PLACE: Wentzville is not the geographic center of St. Charles County. Some callers commented that "at night they couldn't see where to get off Hwy 70." You might think about contacting Dr. Bernie DuBray, Superintendent of the Fort Zumwalt School District to see if it would be possible to schedule the Sept. or next meeting at Fort Zumwalt South located on Mexico Road in St. Peters. It is a new school that would be much more convenient to the St. Charles County population as a whole, and not far from the St. Peters Holiday in for any incoming travelers.

H-3 To schedule an important public meeting at an inconvenient time and place defeats the very purpose of what DOE is trying to achieve at these meetings - that being to inform the public and get their input on the proposed plans.

H-4 * ADVERTISEMENT OF MEETING: I did see a large (5x7) notice in the papers about 10 days - 2 weeks before the 29th, however, the week of the 25th I did not see anything except in the NIGHT AND DAY meeting notices in the St. Charles Post which are brief, small and easily missed. One large advertisment in both newspapers early in the week of the meeting would probably be more efficient. Most people plan for the immediate ahead

H-5 * MEETING FORMAT: Follow-up comments to me were indicators that people who had prepared statements would have liked the opportunity to read what they had spent their time preparing. Distilling statements down to questions on cards that were then grouped with other cards does not adequately serve the purpose of a RI/FS Public Meeting.

The process of "grouping" questions and assigning a state or federal agency representative to respond to them works very well at other information meetings, but in my opinion as well as others, if DOE is going to the trouble and expense of having a stenographer at the "official" hearing, then the resultant transcript would be more understandable to later readers if the citizens full thoughts and exact words were in the public record and not second hand interpretations.

H-6 On March 29th a major scheduling conflict occurred; it was the same night as the prestigious grand opening of St. Peters new City Hall to elected county officials. The St. Peters affair started at 6:00 pm and was the reason that there were very few elected county officials in attendance at the RI/FS meeting at the Ramada in Wentzville. You would be surprised at how many people thought this was a deliberate ploy by DOE. I tried to assure them it was a coincidence.

Whenever the Dept. of Defense schedules any current meeting they check with me to make sure that there are no

Response H-2

The Wentzville Ramada Inn has good facilities for conducting public meetings and is located reasonably close to the Weldon Spring site. The DOE felt that it was important to hold this meeting close to the site so that individuals who would be most affected by the proposed action would be able to attend. As noted in this comment, there are other facilities that could be used. The DOE will try to schedule future public meetings at facilities that are close to the Weldon Spring site and accessible to as many people as possible.

Response H-3

The DOE believes that the public meeting was scheduled at a convenient time and location to obtain public input on this action. However, we will consult with local officials during scheduling of future public meetings.

Response H-4

Large notices advertising the public meeting were placed in local newspapers twice. The meeting was advertised in the St. Charles Journal on March 4, 1990, and in the St. Charles section of the St. Louis Post Dispatch on March 28, 1990. These two announcements provided sufficient notice of the public meeting to allow interested individuals to attend.

Response H-5

The meeting format was arranged to obtain public input on the proposed action. There are many people who do not feel comfortable speaking in a public forum. Use of cards allows these people to obtain information without feeling intimidated by the need to ask their questions orally. This format also allows for an expeditious exchange of information on specific topics. Individuals who do not feel that their questions were properly interpreted or addressed can repeat their questions orally. In addition, any individual who does not wish to use cards but prefers to ask questions orally can do so within the format used for this meeting.

Response H-6

The schedule for the public meeting was coordinated by DOE with EPA Region VII and the state of Missouri more than one month in advance. All three entities (as well as support contractors) arranged their schedules to attend this public meeting. The DOE was not aware of the opening of the new city hall in St. Peters, Missouri, on the same evening. There was no attempt made to keep the attendance low by scheduling the meeting to occur on March 29, 1990. Any county official who could not attend the public meeting due to schedule conflicts was still able to submit written comments on the RI/FS during the public comment period.

H-6 major conflicts that I know of since they did schedule one last year that even I could not attend. I know only too well how difficult this is and that there will usually be "something," but efforts should be made in the future to assure broader public participation. St. Charles County's population is now almost 200,000 and good meeting preparation should produce more than 50 people (after you subtract the DOE, Jacobs, MKF, EPA and state agency employees).

H-7 ***** DOCUMENT & MEETING COMMENT RESPONSE TIME: In DOE's document OR/21548-105 the Proposed Plan for Management..... on page 16 under **Community Participation** stresses the importance of public review of documents and comment for the official record. To do this adequately a longer response time period is necessary, I have no doubts about this.

In 1987 at the DEIS meeting April 10th the comment period was to May 5th (25 day response time) and extensions were "available" if needed. The recent RI/FS meeting on March 29th announced a comment period that ended April 9th - this is only 11 days!

H-8 * NOTE: Meetings held for the goal of community information and response should not be scheduled in late March or early April. Citizens are busy preparing their income taxes, and any meeting and document reading have to take a back seat to income tax return preparation.

H-9 * NOTE: In your Proposed Plan document - 105 it puts forth six proposals <u>with a preferred alternative</u> seemingly pre-selected??? In their comments to me citizens have wondered if their input counts for anything - especially if they would disagree with the preferred alternative.

In closing I have comments on the following items:

H-10 * What is the reason to take unsorted waste from the Quarry area up to the Plant site to be sorted up there in an open atmosphere? The Temporary Storage Area is 75% closer to Francis Howell High School Campus and the Busch Wildlife Area increasing possible exposures to contaminants.

H-11 * I do not think that any waste removal and transport should be inlated as an interim remedial action as the public safeguards are less than if they are performed <u>after</u> the Record of Decision.

H-12 * When Quarry wastes are moved why can't it be moved by railroad? The NRC decided that rail was the **safest form of transportion** for the high level waste from Three Mile Island as it crossed the United States.

I am very familiar with Mo. State Highway 94 between the Quarry and the Weldon Spring Chemical Plant. In the eight years that I have been involved with Weldon Spring and Have had many occasions to travel that particular route. During

Response H-7

The RI/FS documents were issued to the general public on March 5, 1990, and the public comment period extended to April 9, 1990. The public meeting was scheduled to occur near the end of the public comment period. The public comment period was 35 days in length, not 11 days. A 30-day public comment period is required for actions of this nature under CERCLA. The comment period was actually longer than required.

Response H-8

The DOE and EPA Region VII feel very strongly about the need to remediate the Weldon Spring site. The RI/FS was issued to the public immediately upon completion. A public comment period is required upon issuance of the RI/FS to the public. Release of the documents was not timed to occur during the time period that many citizens were preparing their income tax returns.

Response H-9

The DOE has not yet reached a decision on implementing Alternative 5. However, this alternative is preferred by DOE. A joint EPA/DOE record of decision will be issued this year documenting which alternative will be implemented.

Response H-10

The DOE has revised its conceptual plans for removing the wastes from the quarry and has developed a strategy that will allow for the wastes to be sorted at the quarry. Some sorting may still be required at the temporary storage area. This limited sorting can be safely performed at the chemical plant area with minimal risk to nearby individuals and the environment.

Response H-11

Delaying this interim remedial action would postpone the attainment of remedial action objectives at the quarry (e.g., to respond to ongoing releases by removing the primary source of contamination from the quarry and to initiate necessary characterization activities). The preferred alternative can be implemented in a manner that will not endanger students and staff at Francis Howell High School or any other individuals in the area. The extensive monitoring program currently in place will be expanded prior to initiating the proposed action to ensure the health and safety of nearby residents and the environment.

The DOE is currently preparing an RI/FS-EIS to evaluate alternatives for the permanent disposal of all wastes generated by remediating the Weldon Spring site. Although the RI/FS-EIS will be available for public review and comment in 1991, the length of time to implement permanent disposal options will take several more years. Delaying the proposed removal of the bulk wastes would result in continued, uncontrolled release of contaminants to the environment in the quarry area. The proposed action is being taken at this time to respond to this release.

H-12 this time the traffic on Hwy 94 has continued to increase dramatically. Why take the risk?

The major part of St. Charles County's phenonmenal growth is in the West/South West area of St. Charles County. Several years ago there would be spells of time when no traffic went past the Quarry, but not anymore!

There is also the hazard of the other local quarry's 36 ton trucks that need to use that stretch of Hwy 94. If DOE's 40 additional trucks use Hwy 94 for return trips to the Quarry are added to the daily use tally combined with Hwy 94 being a two lane, extremely winding highway without ANY shoulders and you have all the ingredients of an accident waiting to happen because the FACTS ARE:

1. The Dept. of Energy cannot ban the Quarry trucks or traffic.

2. The Dept. of Energy cannot stop the residential growth of the region.

3. The Dept. of Energy cannot change the topography of the stretch of highway between the Quarry and the Plant area.

4. However, the Dept. of Energy can re-evaluate the option of railroad transport and its potential safety features.

Please accept this information as well intentioned problem solving exercise that will increase the level of trust and communication that we, as citizens, have tenuously established with the U.S. Dept. of Energy. As long as we can openly communicate in order to bring about a safer, speedier cleanup of the Weldon Spring Site, we are doing exactly what all responsible citizens need to do to work within the process of our United States government. As SCCAHW TAG project manager, I feel a certain sense of responsiblility to make NEPA, RCRA/CERCLA, or whatever, understandable and workable from the citizens standpoint.

Respectfully yours,

Meredith

Meredith Hunter Bollmeier
SCCAHW, TAG Project Manager

Response H-12

The rail spur between the quarry and chemical plant area is in a state of disrepair and would require a significant amount of effort (and cost) to upgrade for use. The results of a recent detailed cost estimate indicate that the rail option would cost about $1 million more than the haul road option. In addition, this rail spur crosses State Route 94 three times between the quarry and chemical plant area. As currently planned, a dedicated haul road will be constructed using a portion of the existing railroad easement. This haul road will cross State Route 94 only at the quarry; discussions with the state of Missouri are currently taking place on the use of grade separation at this location to eliminate all crossing of Route 94 by trucks.

As presented in the FS, loaded trucks would transport the bulk wastes to the chemical plant area on a dedicated haul road. The return trip to the quarry would be on State Route 94. However, the increased operational flexibility associated with using containers could allow for the return of empty trucks along the haul road. Plans for the haul road may need to be modified to include several turnouts which, in conjunction with radio contact, would allow safe passage of truck traffic. This would eliminate all truck traffic on Route 94.

Letter I

This hand-written letter was typed verbatim for clarity of presentation. The original letter is available for inspection at the DOE office at the Weldon Spring site.

May 9, 1990

Mr. Stephen H. McCracken, Project Manager
U.S. Department of Energy
Weldon Spring Site Remedial Action Project
7295 Highway 94 South
St. Charles, Missouri 63303

Dear Mr. McCracken:

First, before I begin I would like to express my thanks to Mr. Robert Morby, Chief of Superfund Branch, U.S. Environmental Protection Agency, Region VII for the time extension granted to SCCAHW for written comment on the Quarry Plan to be included as part of the Administrative Record for consideration in the Record of Decision.

The following listed areas are addressed in priority order for implementation before the clean up phase begins at the Weldon Spring Quarry.

I-1 1. Relocate all people living in the surrounding areas that are affected by increased background radiation which is produced by the Quarry waste materials before clean up activities begin. This includes the people living near the Quarry Site as well as those near the proposed haul route & the Temporary Storage Site (TSA) at the Weldon Spring Chemical Plant specifically Francis Howell High School. This would include the buyout of those properties adversely affected by this increased background radiation. The public safety must not be compromised by the off site migration of radioactive & other hazardous substances contained in the Quarry waste. (Figure 3.3 & Figure 10.1 Attached pages)

I-2 2. Relocate the St. Charles County Public well field to an area that can be safety relied upon to provide a constant supply of clean water. St. Charles County Residents deserve nothing less than responsible decisions regarding a safe water source. The existing wells are located below the Quarry Site. These should be capped & monitored for possible transfer of contaminated materials from the excavation process. If you wait until the radiation level at the county well field goes above background levels or state standards, & then decide that it's unsafe, it well be too late to protect the public. The publics health & safety cannot be sacrificed for lack of proper management in the area! (Figure 1.5 & Figure 3.10 Attached pages)

Response I-1

There is no need to relocate individuals or institutions (i.e., Francis Howell High School) in the vicinity of the Weldon Spring site to safeguard them from releases from either the quarry or chemical plant area. An extensive environmental monitoring program is currently in place at both areas. This monitoring program indicates that the areas being impacted by the releases are confined to the immediate vicinity of the quarry and chemical plant areas. The concentrations of radioactive and hazardous chemical substances in environmental media at off-site locations are not high enough to cause health concerns under current land-use patterns.

The analyses contained in the RI/FS documents indicate that the preferred alternative can be implemented in a manner that will not endanger nearby individuals. The existing environmental monitoring program will be expanded at both the quarry and chemical plant areas prior to initiating the bulk waste remedial action to ensure the health and safety of nearby residents and the environment.

Response I-2

There is currently no need to consider moving the St. Charles County well field because the water from this well field is not contaminated. This well field is being extensively monitored by federal, state, and local authorities. The DOE intends to increase its monitoring efforts during the bulk waste remedial action to ensure that this action does not result in contamination impacting the well field. Monitoring of the well field will continue following removal of the bulk wastes from the quarry while studies are undertaken to evaluate the need for additional remediation of this area. Because the monitoring wells are located between the quarry and the well field, remedial actions can be taken in a timely manner, if required, to safeguard the quality of water in this well field.

I-3 3. Construct an enclosure for the Quarry Site designed to include:

A. Interior compartments for isolation & controlled release of radon gas.

B. Roof structure based on crest of highwall around quarry rim with pillar support from base of limestone hill near center of quarry site.

C. Double air lock entry/exit system for men & machinery with decontamination facilities for transportation vehicles after loading for shipment, (i.e. remote wash down sprayer). (Figure 1.3, Figure 2.2, Figure 4.16) Attached pages

I-4 4. Refurbish existing rail spur from the Quarry to the Weldon Spring Chemical Plant for railroad transport of the Quarry waste. Preliminary studies indicate that this rail spur is of standard gauge & is intact with the following exceptions: (See attached photos & maps of same)

A. 50 feet rail & tie section missing

B. 34' length x 12' Depth wash out area

C. Bad switch at Water Treatment Plant #1

D. 2 switches & rail sections missing at Hwy 94 road crossing at Quarry Site

E. 3 Road crossings on Hwy 94 covered with asphalt

F. Verification needed on track storage area, existing rail, rail cars and/or locomotive at the Weldon Spring Chemical Plant.

G. Railroad tie replacement as needed for those which have weathered and deteriorated (accurate survey required).

A comparative cost estimate for repair & rebuild of this rail line is necessary! This analysis should involve the total cost estimate for removal of the rail line for truck use as a haul route compared to refurbishment of the existing rail for train transport of the quarry waste materials. (Figure 1.2, Figure 1.6, & Figure 8.7) Attached pages

I-5 5. Burlington Northern Railroad, the closest available rail service to the Weldon Spring Quarry Site, has expressed a definite interest in further evaluation on transportation of the quarry waste to the Weldon Spring Chemical Plant. The railroad should be given every opportunity to competitively bid on transportation of the quarry waste materials.

Response I-3

Enclosing the entire quarry during excavation of the bulk wastes was considered in the preliminary engineering report and rejected due to its high cost. In addition, there is simply no need to enclose the quarry to remove the wastes safely. Radon and dust suppression measures will be implemented to ensure that releases of hazardous contaminants to the atmosphere will be low and not present a health risk to nearby individuals.

Response I-4

The DOE appreciates the information provided on the current status of the rail spur between the quarry and chemical plant area. As noted in this comment, several sections would have to be rebuilt. In addition, the rail spur has not been used for many years and would require thorough review, repair, and confirmatory testing before it could be used to transport the bulk wastes. This option would be very expensive and time-consuming to implement. A detailed cost estimate was recently performed in response to this comment. In this evaluation, the total cost of rail transport, including material-handling facilities at both the quarry and temporary storage area, was compared with the total cost of truck transport, including construction and use of a dedicated haul road. The rail transport option was estimated to cost about $1 million more than the truck transport option. This option was dismissed due to its excessive costs with no meaningful risk reduction. Truck transport of the bulk wastes is the most efficient and cost-effective means of moving the bulk wastes from the quarry to the chemical plant areas.

Response I-5

The Burlington Northern Railroad has expressed an interest in transporting the wastes from the Weldon Spring site to Richland, Washington, or an alternate destination. The railroad has not expressed an interest in transporting the bulk wastes from the quarry to the chemical plant area. The existing rail spur between the quarry and chemical plant area is in a state of disrepair and would require a significant amount of effort (and cost) to upgrade for use. In addition, this rail spur crosses State Route 94 three times between the quarry and the chemical plant area. Each crossing presents a safety concern. The wastes can be safely and efficiently transported by truck along a dedicated haul road that will be constructed using portions of the existing rail spur. The dedicated haul road will cross State Route 94 only once (near the quarry). Discussions are currently taking place with the state of Missouri on the use of grade separation where the haul road crosses State Route 94. This would eliminate all crossing of Route 94 by trucks.

As presented in the FS, loaded trucks would transport the bulk wastes to the chemical plant area on a dedicated haul road. The return trip to the quarry would be on State Route 94. However, the increased operational flexibility associated with using containers could allow for the return of empty trucks along the haul road. Plans for the haul road may need to be modified to include several turnouts which, in conjunction with radio contact, would allow safe passage of truck traffic. This would eliminate all truck traffic on Route 94.

I-5 As a public safety issue the amount of tonnage estimated to be removed from the Quarry equals 248,00 tons of materials (Appendix B see attached pages). The 11,800 trips by truck needed to haul this estimated 248,000 tons can be moved by train with only 310 trips at 8 (100 ton) railcars per train! This represents a substantial reduction in the number of trips required to move the quarry waste. This translates into a great benefit as far as public safety is concerned regarding reduced traffic hazards & potential for accidents. Other benefits of railroad transportation include:

(1) less delay due to inclement weather conditions that would otherwise render temporary shut down of operations (i.e. trucks on an unpaved surface after rain),

(2) eliminates pothole problem on an unpaved surface (i.e., no road grader needed),

(3) eliminates tire failure due to, i.e. (truck weight on out of round tires or puncture of tire causing a flat),

(4) easier decontamination of rail cars (i.e. high pressure water sprayer against steel wheels & rail car body),

(5) reduces potential for driver error during hauling of waste materials (i.e. rail line itself acts as a guide mechanism to follow the haul route) (Figure 9 & Figure 10 Attached pages)

I-6 6. NEPA Regulations: According to the regulations for implementing the National Environmental Policy Act as of July 1, 1986 specifically Title 40 of the code of Federal Regulations Part 1506.1(c)(3). The Dept. of Energy shall not undertake any interim action which will "prejudice the ultimate decision" on the program. (i.e. Cleanup of the Weldon Spring Quarry Site) Interim action prejudices the ultimate decision on the program when it tends to determine subsequent development or limit alternatives.

For the Dept. of Energy to transport bulk wastes from the quarry and dump them in a pile at the Temporary Storage Area (TSA), and then add a radon cap of dirt above that, would make it more likely that this massive quantity of radioactive waste & other hazardous wastes would remain permanately at the TSA. On the other hand, to place the excavated quarry bulk wastes in a MARK III Bin or similar appropriate container (Before transport and storage of the containerized materials at the TSA) would be more in compliance with 40 CFR 1506.1(c)(3).

By the same token, removal of the existing rail line spur between the Quarry Site & the Weldon Spring Chemical Plant, (so the DOE can move the quarry waste material by truck over the gravel roadbed), this action would also violate NEPA 40 CFR 1506.1(c)(3) by determining subsequent development for truck hauling & would limit alternative shipment to only one source (i.e. trucks being the only method of transport). This action would also circumvent any railroad involvement

Response I-6

Limitations on interim actions that can be undertaken while an EIS is in preparation are given in 40 CFR 1506.1. Remedial action alternatives for the chemical plant area of the Weldon Spring site are being evaluated in an RI/FS modified to incorporate the requirements of an EIS. This integrated CERCLA/NEPA approach is being referred to as the RI/FS-EIS process. A major element of the RI/FS-EIS is a decision on the appropriate means to dispose of all wastes generated by remediation of the Weldon Spring site. The quarry bulk waste remedial action will be undertaken in a manner that will not bias the decision-making process for the RI/FS-EIS.

Relocation of the bulk wastes from the quarry to the chemical plant area will not bias future decisions for waste disposal. The scope of this action has been focused to ensure that the action complies with the constraints imposed by 40 CFR 1506.1. Removal of the bulk wastes from the quarry with transport to and temporary storage at the chemical plant area is an interim action being taken to reduce ongoing releases of radioactive and chemically hazardous substances into the environment at the quarry area. This action will not prejudice the final decision for remediation of the Weldon Spring site.

There are several means by which the quarry bulk wastes can be safely removed, transported, and temporarily stored at the chemical plant area. Neither bulk storage nor containerized storage will bias the selection of the final disposal alternatives for these wastes. Similarly, converting portions of the existing rail spur to a dedicated haul road for truck transport of these wastes will not bias future decisions. If analyses in the RI/FS-EIS demonstrate that off-site disposal is the best solution for management of the wastes resulting from remediation of the Weldon Spring site, additional studies will be performed to determine the optimal means for transporting these materials. Use of rail for transport of these wastes off-site is very unlikely given the recent dismantlement of the Missouri-Kansas-Texas rail line in the vicinity of the Weldon Spring site and construction of the Missouri River State Trail. Converting portions of the rail spur between the quarry and chemical plant area into a dedicated haul road will not bias future decisions or limit alternatives being evaluated in the RI/FS-EIS.

I-6 for either temporary storage or permanent disposal of the total waste to be removed from the Weldon Spring Site at a future date. To prejudice the ultimate decision against transportation by rail service cannot be tolerated in this time of public need for a safe solution to this hazardous waste problem!

I-7 7. The Dept. of Energy should allow independent inspections during the cleanup of the Weldon Spring Quarry. This would address the need to monitor the operational procedures and verify compliance with all Federal, State & Local County requirements being met as work progresses. An appointment of an unbiased oversight committee with the power of enforcement is necessary to control any violations should they occur.

Sincerely,

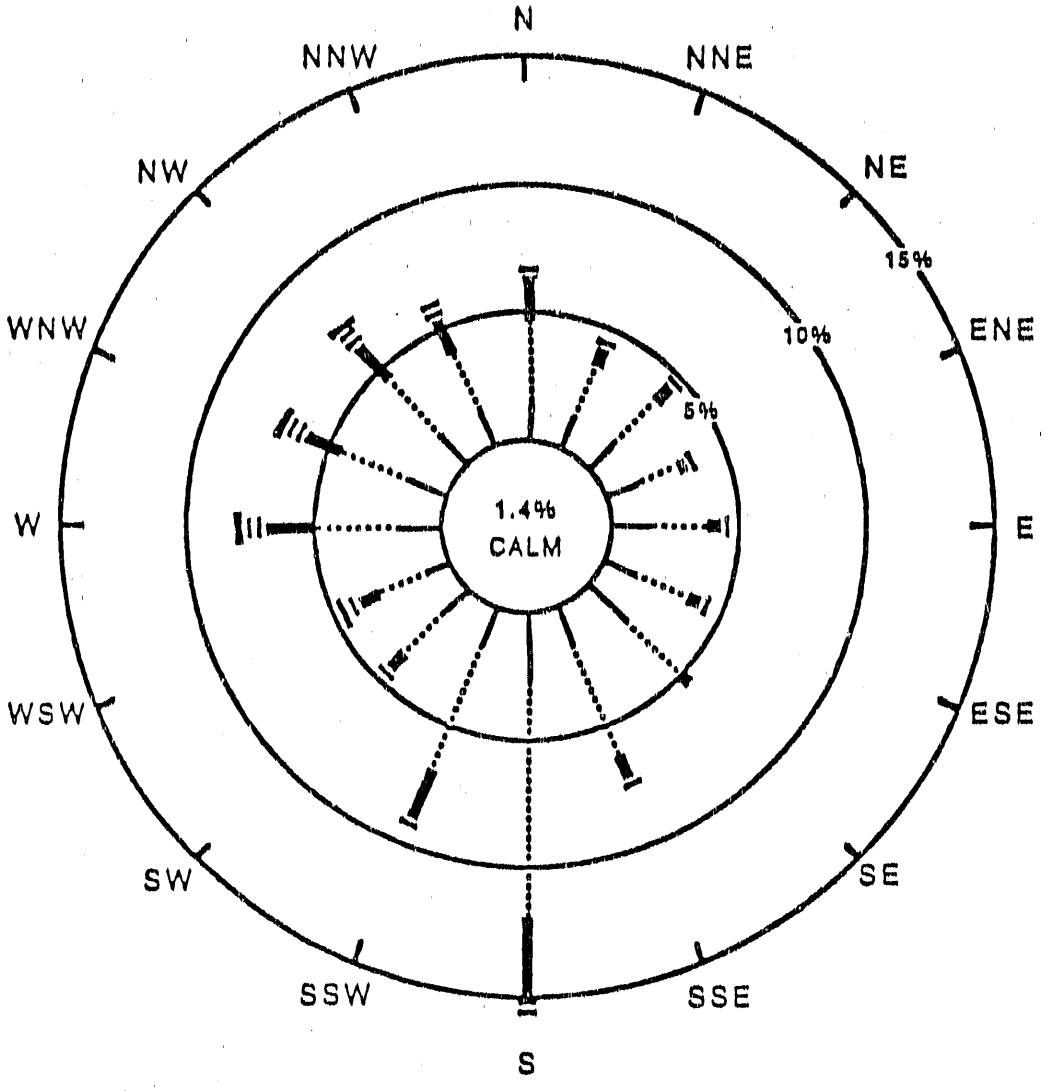
George A. Farhner
892 California Trail
St. Charles, Mo. 63303

Weldon Spring Quarry Waste Removal Project

cc: U.S. Senator John Danforth
U.S. Senator Christopher S. Bond
U.S. Representative Harold Volkman - 9th Dist.
Mo. State Senator Fred Dyer
Mo. State Representative Joseph Ortwerth - Dist. 18
Mo. Governor John Ashcroft
U.S. EPA Region VII Robert Morby
Mo. Dept. of National Resources Dr. David E. Bedan
St. Charles Countians Against Hazardous Waste
Coalition for the Environment
Burlington Northern Railroad

Response I-7

All response actions undertaken by DOE at the Weldon Spring site are reviewed by EPA Region VII and the state of Missouri. Both entities provide independent oversight of DOE actions. In addition, because the Weldon Spring site is on the National Priorities List, EPA, not DOE, has ultimate responsibility for ensuring that appropriate actions are taken at the site to safeguard human health and the environment. The DOE welcomes independent review of their actions by citizen groups. However, there is no need to appoint an oversight committee with the power of enforcement to ensure compliance with all federal, state, and local requirements.



NOTE:
BASED ON DATA FROM WELDON SPRING SITE METEOROLOGICAL STATION DURING 1985.

WIND SPEED

MPH 0 2.2 6.7 11 18 24.5

FIGURE 3.3

ANNUAL WIND ROSE FOR THE WELDON SPRING SITE

SOURCE: BNI, 1986

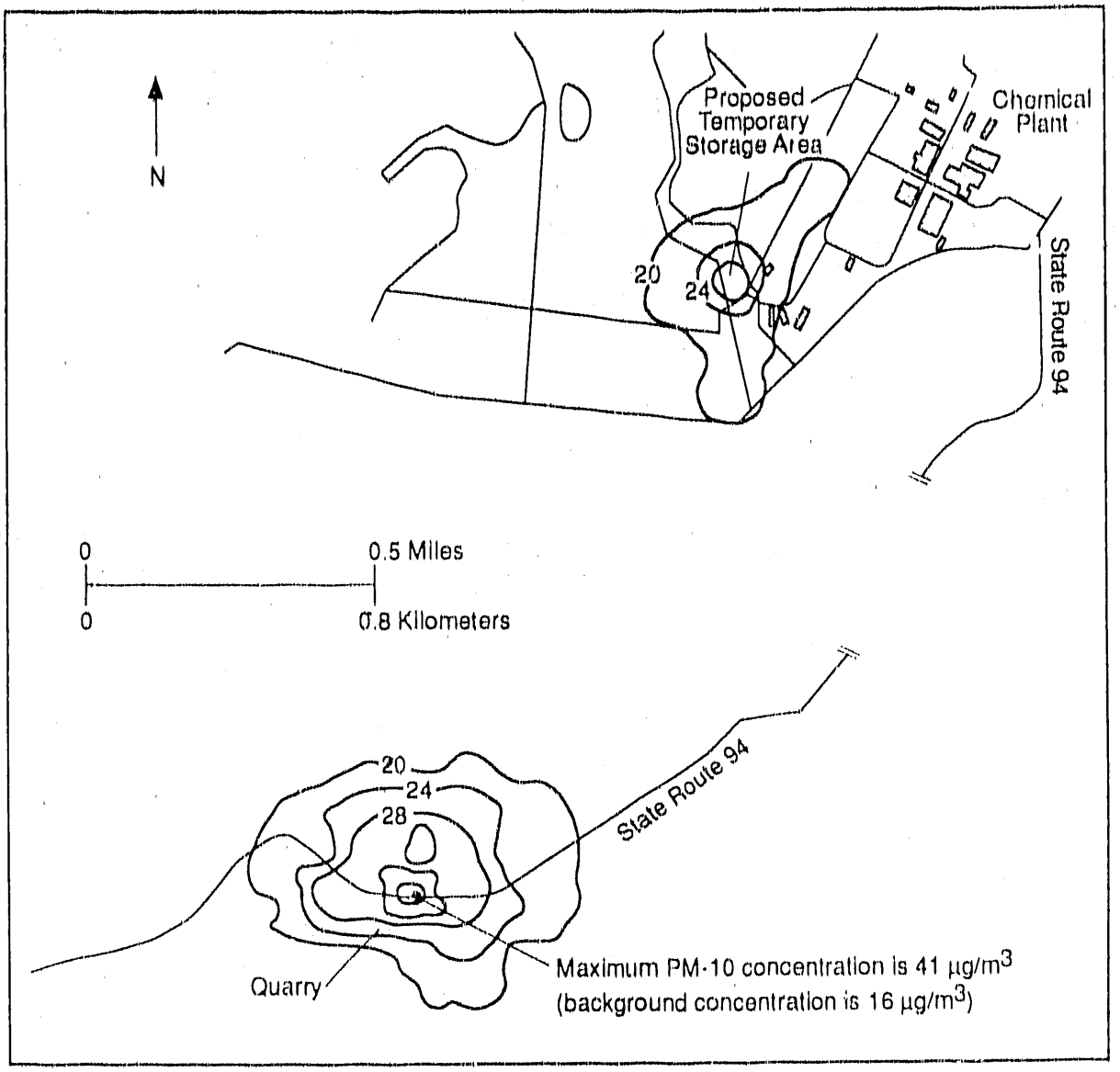


FIGURE 10.1 Estimated Total Annual Mean PM-10 Concentrations ($\mu g/m^3$) Resulting from the Bulk Waste Remedial Action (does not include estimates for the area near the western TSA fence line)

Concentrations of airborne particulates cannot be predicted accurately for receptors close to a source of fugitive dust. However, because the subarea for fine-grained, nitroaromatic-contaminated soils at the TSA could be close to the fence line (e.g., about 15 m [50 ft]), the 24-hour and annual total PM-10 concentrations at the fence line could be elevated. Concentrations above the 24-hour standard are predicted to occur at three receptor locations: the property fence line, 30 m (100 ft) west of the fence line, and approximately 100 m (300 ft) south of the contaminated-soils area. Maximum concentrations are estimated to be 388 $\mu g/m^3$ at the receptor west of the

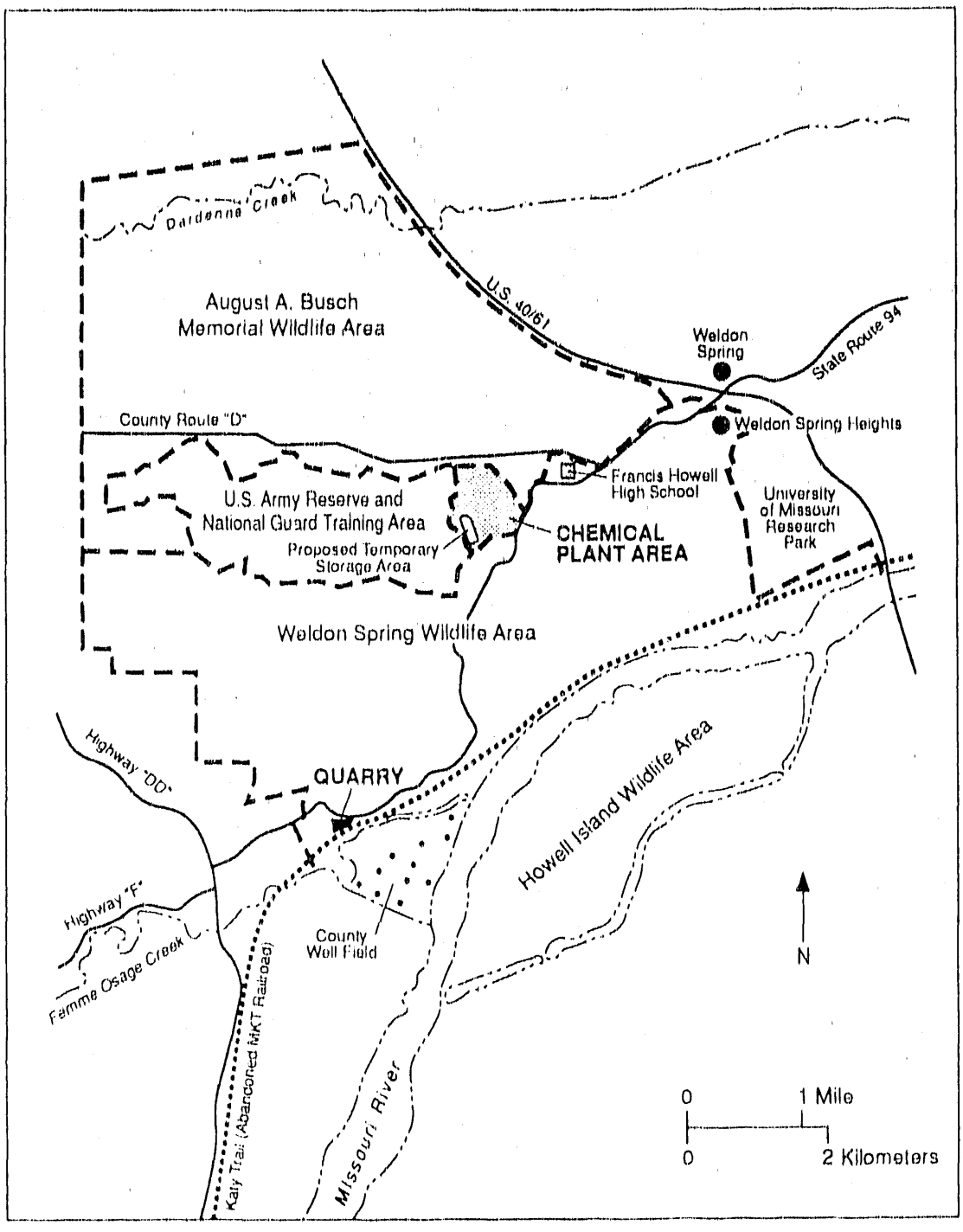


FIGURE 1.5 Map of the Weldon Spring Site and Vicinity

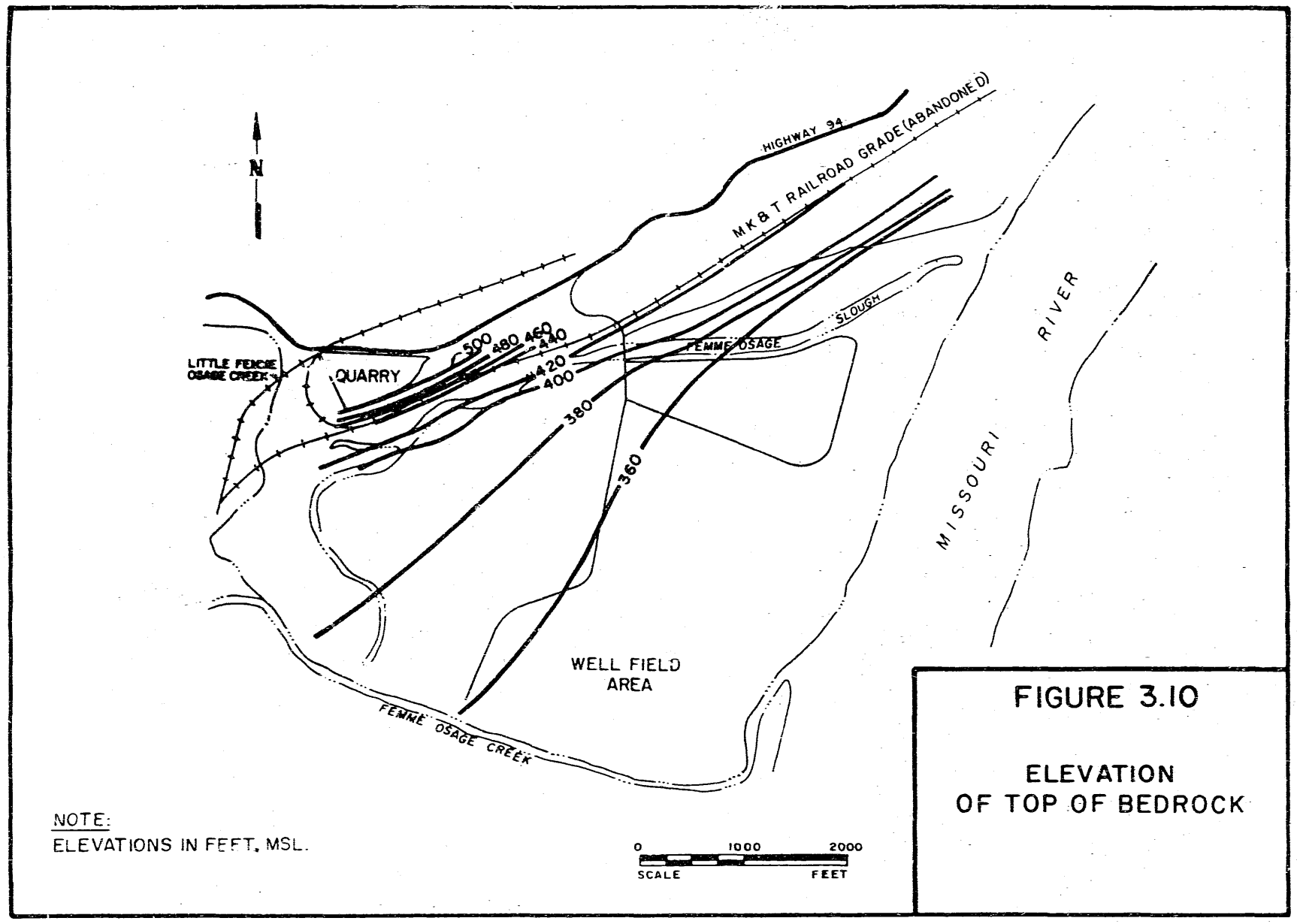


FIGURE 3.10

ELEVATION
OF TOP OF BEDROCK

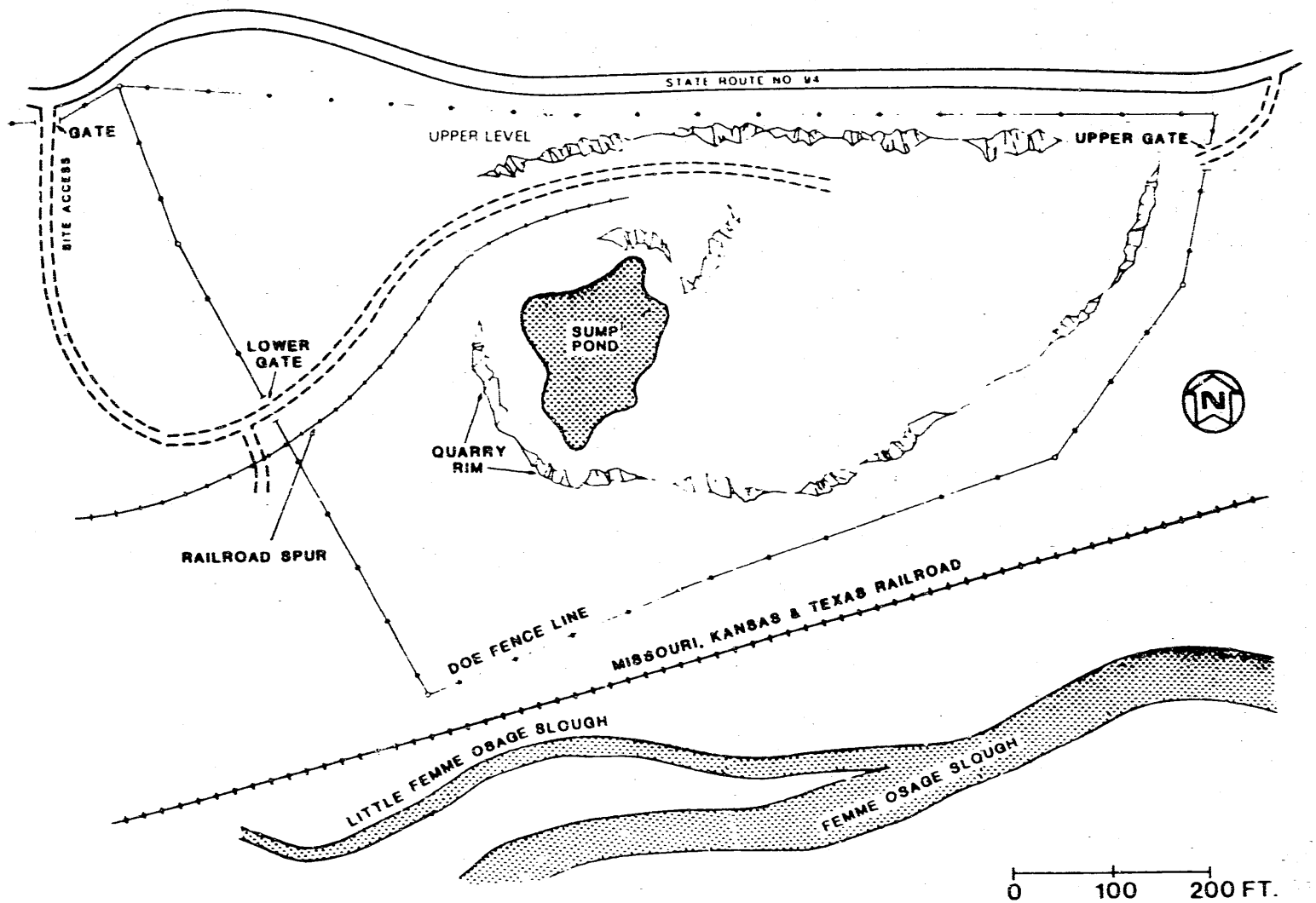


Figure 1.3. Plan View of the Weldon Spring Quarry. Conversion Factor: To convert feet (ft) to meters (m), multiply by 0.3048. Source: Modified from Bechtel National (1985b).

FIGURE 2.2 Topographic Map of the Weldon Spring Quarry and Vicinity

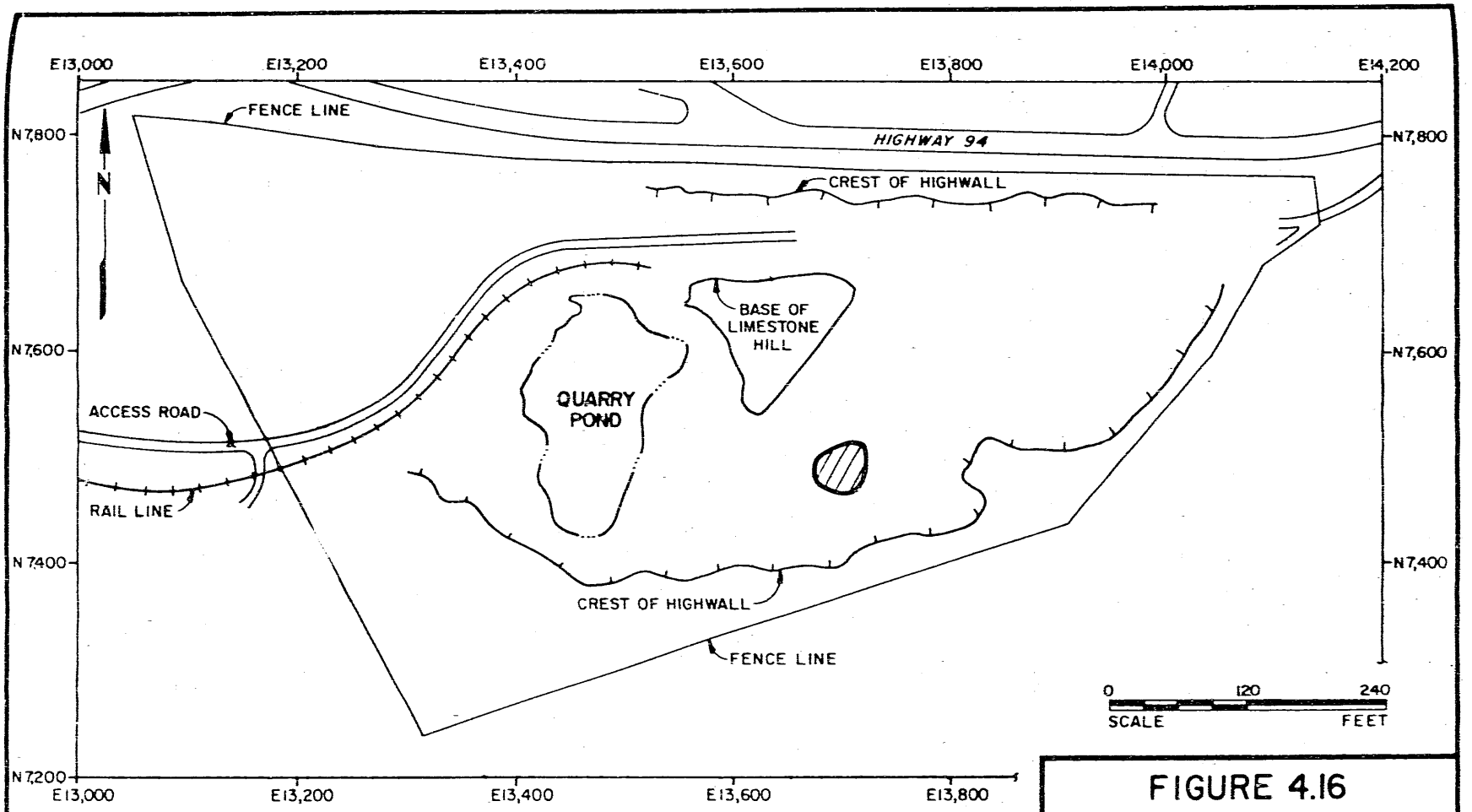
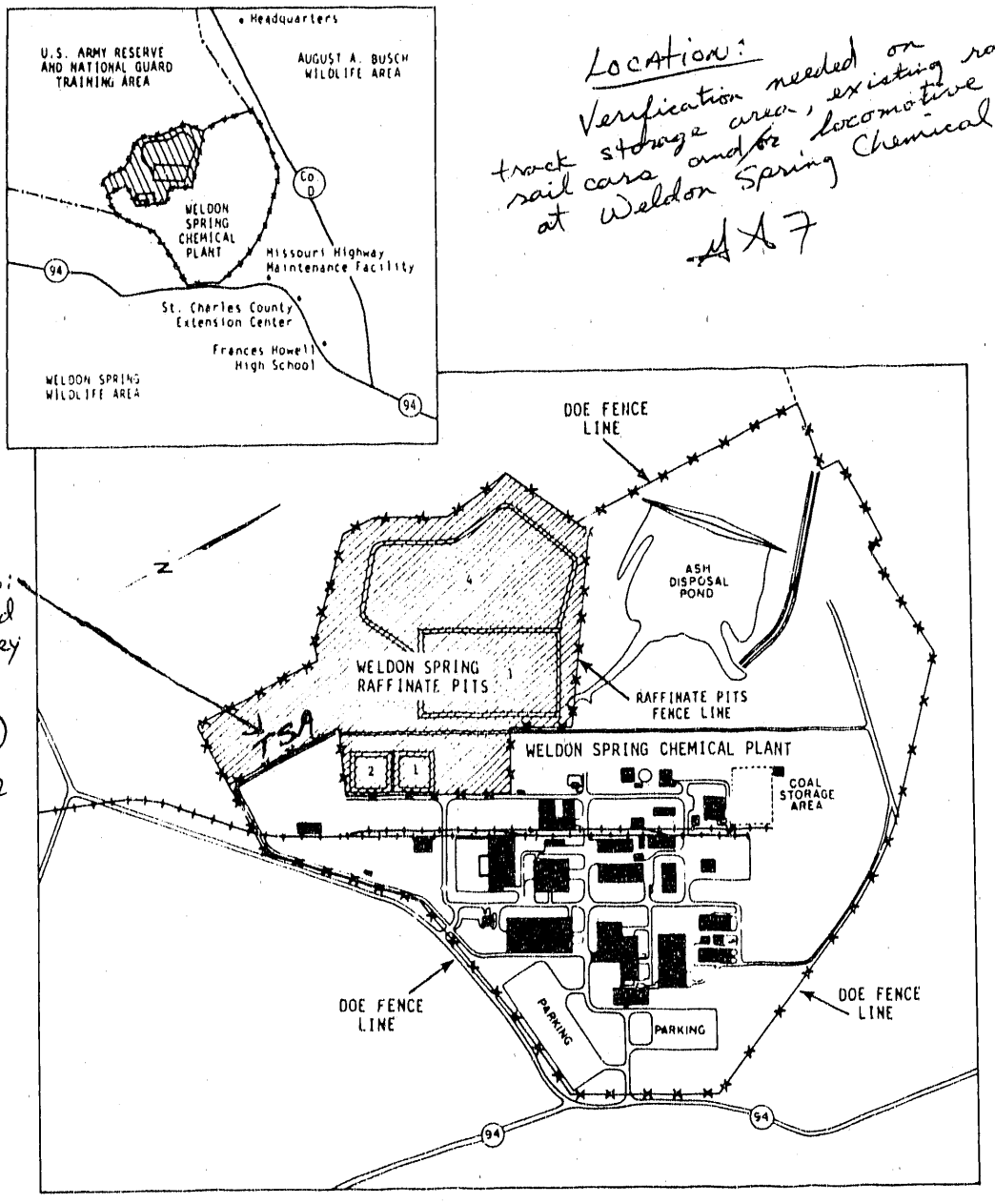


FIGURE 4.16

CONFIRMED SUBSURFACE RADIOLOGICAL CONTAMINATION 35 TO 40 FOOT DEPTH



Location: Verification needed on track storage area, existing rail, rail cars and/or locomotive at Weldon Spring Chemical Plant
AA7

Location: Proposed TEMPORARY STORAGE AREA (TSA)
AA7

Figure 1.2. Location and Layout of the Weldon Spring Raffinate Pits and Chemical Plant. Source: Modified from National Lead Company of Ohio (1977).

* AA7, shows writers notes added to Figure 1.2

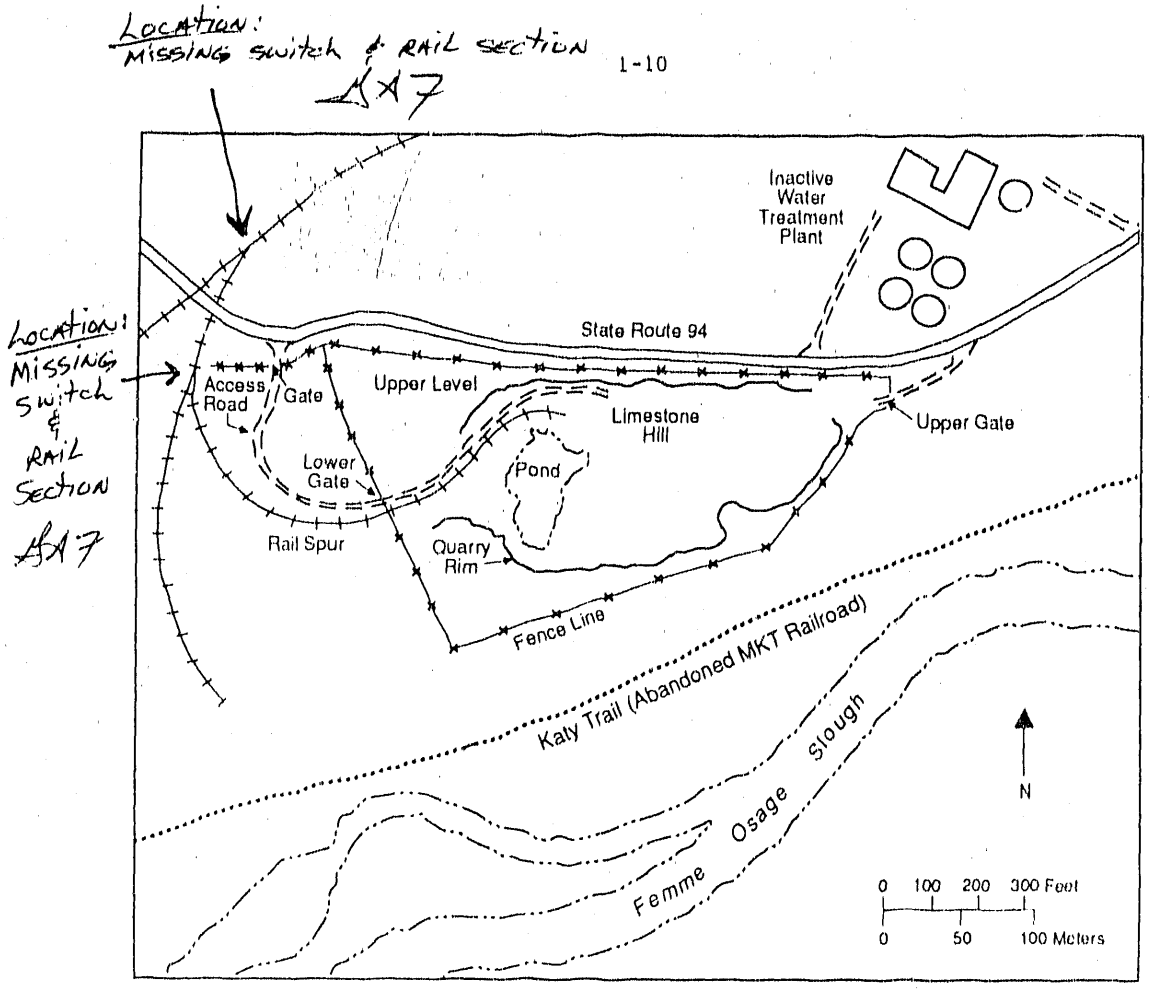
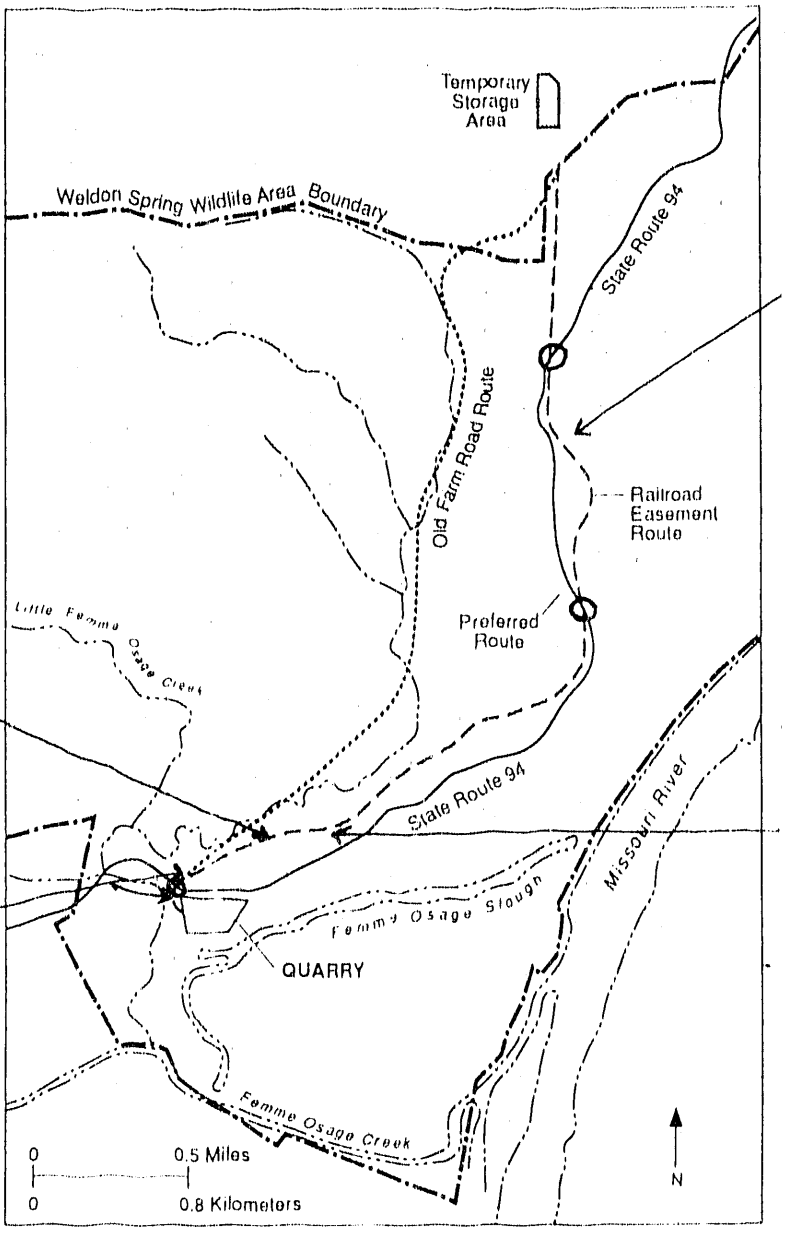


FIGURE 1.6 Layout of the Weldon Spring Quarry

810 ha (2,000 acres) had been transferred to the state of Missouri (August A. Busch Memorial Wildlife Area) and the University of Missouri (agricultural land). Much of the land transferred to the University of Missouri was subsequently developed into the Weldon Spring Wildlife Area. Except for several small parcels transferred to St. Charles County, the remaining property became the U.S. Army Reserve and National Guard Training Area.

The U.S. Atomic Energy Commission (AEC, a predecessor of DOE) acquired 83 ha (205 acres) of the former ordnance works property from the Army by permit in May 1955, and the property transfer was approved by Congress in August 1956. An additional 6 ha (15 acres) was later transferred to the AEC for expansion of waste storage capacity. The AEC constructed a feed materials plant -- now referred to as the chemical plant -- on the property for the purpose of processing uranium and thorium ore concentrates. The quarry, which had been used by the Army since the early 1940s for disposal of chemically

* GA7, shows writers notes added to Figure 1.6



AA7

Location:
O=SHOWS 3. ROAD CROSSING ON Hwy 94 (PAVED OVER OR HAS BEEN REMOVED.

Location:
34' x 12' WASHOUT AREA
AA7

Location:
2 switches AND RAIL SECTIONS MISSING
AA7

Location:
50' MISSING RAIL SECTION & ties
AA7

Location:
BAD switch AT WATER TREATMENT PLANT #1
AA7

FIGURE 8.7 Preferred and Alternate Haul Routes to the TSA

* AA7, shows writers notes Added to map Figure 8.7

APPENDIX B:

ANALYSIS OF POTENTIAL AIR QUALITY IMPACTS

The approach used to predict air quality impacts of the bulk waste remedial action is presented in this appendix. Section B.1 describes the methodology used to prepare both the long-term (annual) and short-term (daily) uncontrolled PM-10 particulate emission inventories and to convert the results into appropriate input for the predictive air quality models. Section B.1.1 identifies fugitive dust sources. Sections B.1.2 and B.1.3 address the annual uncontrolled inventory and the worst-case daily uncontrolled inventory of PM-10 emissions, respectively. Section B.2 identifies representative strategies for fugitive dust control assumed in the analysis, and Section B.3 summarizes both the uncontrolled and controlled PM-10 emission inventories. For simplicity of presentation, most units in this appendix are given in English units only; conversion factors are provided in Appendix D. Those data originally measured in metric units (i.e., meteorological data) are expressed in metric units.

The air quality analysis was based on the following specific assumptions concerning how the bulk waste remedial action would be conducted:

1. The daily number of haul trips averaged over all workdays during the project would be 40 (Ferguson 1989).
2. The daily maximum number of haul trucks would be 48 (Ferguson 1989; MK-Ferguson Company and Jacobs Engineering Group 1990).
3. The number of hours of heavy equipment use would be limited to 8 hours per day and 5 days per week, i.e., no overtime would be employed.
4. A loaded truck would weigh no more than 40 tons; the maximum bulk waste load would be about 21 tons based on manufacturer ratios of capacity to tare weight.
5. Assuming an average bulk waste density of 2 tons per banked cubic yard (bcy) and a potential 124,000 bcy of material to be moved (MK-Ferguson Company and Jacobs Engineering Group 1990), 248,000 tons of materials would be moved in about 11,800 trips.
6. The average volume of materials hauled from the quarry would be 10.5 bcy or 11.9 loose cubic yards (lcy), assuming a 21-ton capacity truck, an average density of 2 tons/bcy, and an estimated 1.13 lcy/bcy (MK-Ferguson Company and Jacobs Engineering Group 1990).

800 TON PER DAY CAPACITY EQUALS 8 CARLOAD TRAIN

310 TRAIN TRIPS EQUALS SAME TONNAGE TOTAL

A.A.7.

* A.A.7, shows writers notes added to appendix B

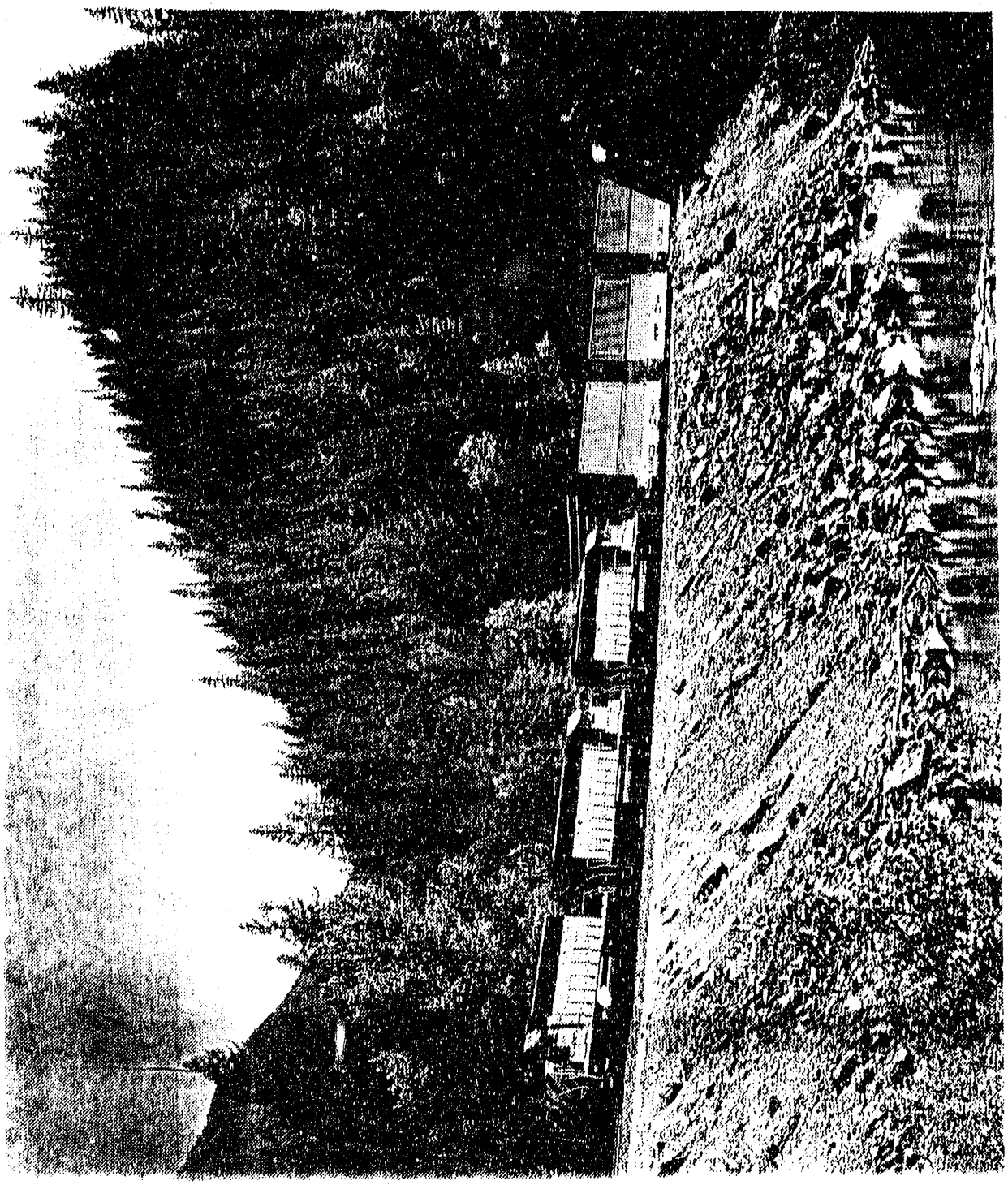


Figure 9

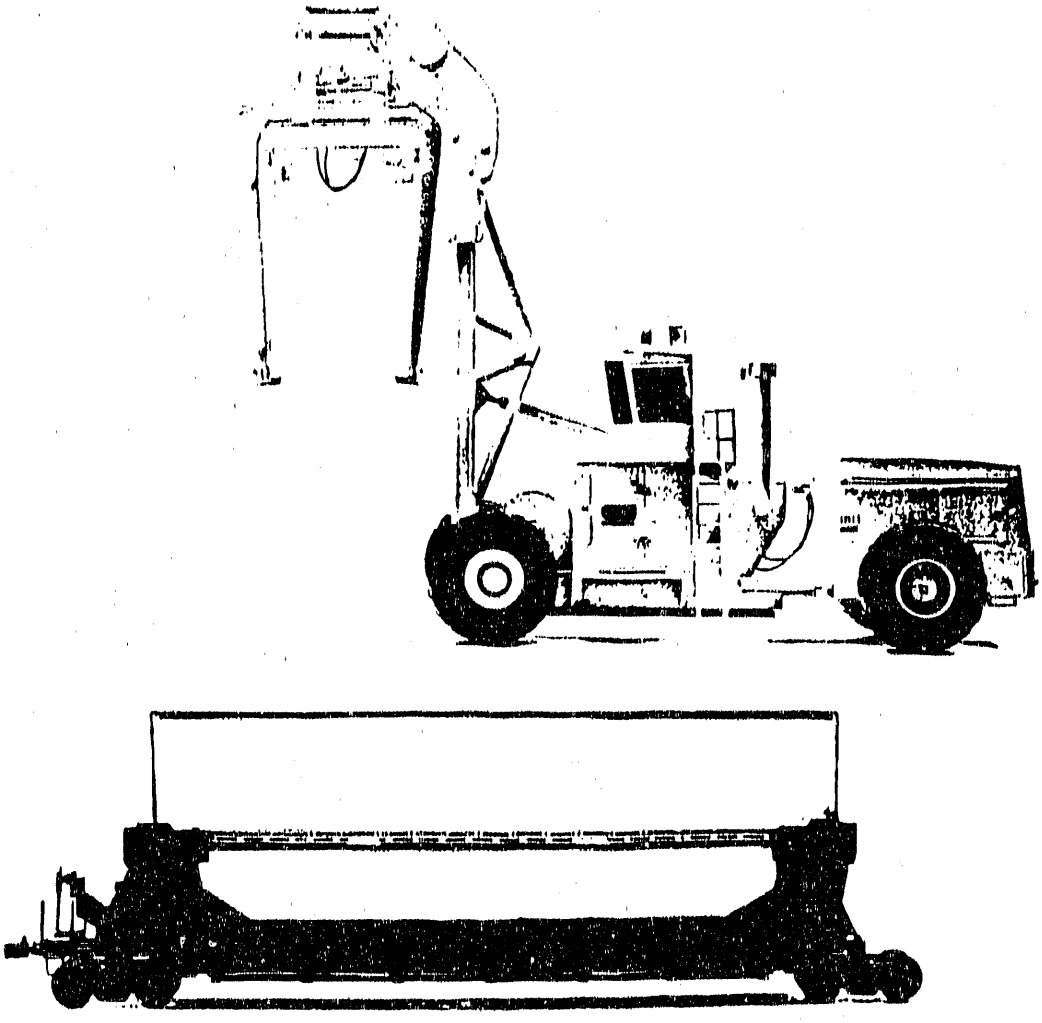


Figure 10

A) 50' rail & tie section missing South of first road crossing from Weldon Spring Chemical Plant

C) Sod switch at WATER PLANT #1

B) WASHOUT AREA 34' Length x 12' Depth North of ABANDONED WATER PLANT.

Railroad Spur: 4-7-90

Weldon Spring Quarry Site

Railroad Spur: 4-7-90
Weldon Spring Quarry Site

D.) Missing rail section, "FROG", North of Quarry road crossing at Hwy 94 South

D) Missing switch North of Quarry road crossing at Hwy 94 South

Railroad Spur: 4-7-90
Weldon Spring Quarry Site

D.) Missing rail section, "FROG", South of Quarry road crossing at Hwy 94 South.

D) Missing Switch South of road Crossing at Hwy 94 S at Quarry.

First Second Third

Railroad Spur: 4-7-90
Weldon Spring Quarry Site
E) Road crossings paved over rail line south of Weldon Spring Chemical Plant on Hwy 94.

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