

**EPA Superfund
Record of Decision:**

**TIMES BEACH
EPA ID: MOD980685226
OU 02
TIMES BEACH, MO
09/29/1988**

(1) THE DIOXIN CONTAMINATED SOIL WOULD BE CONSOLIDATED SOMEWHERE IN THE SOUTHERN PORTION OF THE SITE. (2) THE NORTHERN PORTION OF TIMES BEACH WOULD BE EXCAVATED, PRESUMABLY TO THE DEPTH OF THE WATER LEVEL IN THE MERAMEC RIVER, AND PILED ON TOP OF THE SOUTHERN HALF OF THE SITE. THIS WOULD RAISE HALF THE SITE OUT OF THE FLOODPLAIN, WITHOUT DECREASING THE CAPACITY OF EITHER THE FLOODPLAIN OR THE FLOODWAY. IT WOULD ALSO RESULT IN THE DIOXIN BEING BURIED UNDER ABOUT TEN TO FIFTEEN FEET OF SOIL. (3) THE ELEVATED PORTION OF TIMES BEACH WOULD BE DEEDED TO THE INDUSTRIAL DEVELOPMENT CORPORATION OF EUREKA, MISSOURI.

THERE ARE REGULATORY, TECHNICAL, AND COST CONSIDERATIONS WHICH MAKE IMPLEMENTATION OF THIS ALTERNATIVE UNFEASIBLE.

THE MAJOR REGULATORY REQUIREMENTS WOULD BE THOSE UNDER THE RESOURCE CONSERVATION AND RECOVERY ACT. THOSE REGULATIONS WOULD REQUIRE THAT THE SOIL BE PLACED IN AN ENGINEERED FACILITY THAT WOULD CONTAIN THE DIOXIN. ONCE THE SOIL WAS CONTAINED IN SUCH A FACILITY, THERE WOULD BE NO JUSTIFICATION FOR EXCAVATING HALF THE SITE AND PLACING IT ON TOP OF THE FACILITY. THE ADDITIONAL EXCAVATION WOULD NOT REPRESENT A JUSTIFIABLE CERCLA EXPENSE. OTHER LESS EXPENSIVE LAND DISPOSAL ALTERNATIVES WERE EVALUATED IN THE FEASIBILITY STUDY AND PROPOSED PLAN WHICH OFFER AN EQUIVALENT DEGREE OF PROTECTION.

SEVERAL PEOPLE EXPRESSED A CONCERN THAT AN INCINERATOR WOULD CONTAMINATE THE MERAMEC RIVER WITH SALT.

WATER USED FOR COOLING AND AIR POLLUTION CONTROL WOULD BE TREATED, TESTED, AND STORED PENDING VERIFICATION THAT STATE REQUIREMENTS FOR LAND APPLICATION ARE ACHIEVED. NO DIRECT DISCHARGE OF ANY MATERIAL INTO THE MERAMEC RIVER IS BEING PROPOSED BY EPA.

SOME PEOPLE STATED THAT INCINERATION IS TOO EXPENSIVE WHEN COMPARED WITH THE OTHER ALTERNATIVES IN THE FEASIBILITY STUDY.

WHILE IT IS TRUE THAT INCINERATION IS MORE EXPENSIVE, EPA BELIEVES THAT THE ADDITIONAL BENEFITS OFFERED BY THERMAL TREATMENT, INCLUDING PERMANENT DESTRUCTION OF THE CONTAMINATION, JUSTIFY THE ADDITIONAL EXPENSE. IN OTHER TERMS, EPA HAS DECIDED THAT THERMAL TREATMENT REPRESENTS THE MOST COST-EFFECTIVE ALTERNATIVE. THIS DETERMINATION IS DOCUMENTED IN THE PROPOSED PLAN AND RECORD OF DECISION.

TWO PEOPLE SUGGESTED BUILDING A LAKE AT TIMES BEACH.

THE AMOUNT OF SOIL THAT WOULD BE EXCAVATED AT TIMES BEACH IS NOT SUFFICIENT TO PROVIDE A BASIN FOR A LAKE. DIOXIN HAS NOT PENETRATED THE SOIL VERY DEEPLY AT TIMES BEACH. THE SAMPLES EPA HAS COLLECTED AT TIMES BEACH INDICATE THAT THE CONTAMINATION IS ALMOST ENTIRELY LIMITED TO THE UPPER 6 TO 12 INCHES, AND THAT IT IS PRIMARILY UNDER THE ROADS WHICH WERE SPRAYED WITH CONTAMINATED OIL. WHILE THE VOLUME OF CONTAMINATED SOIL IS LARGE BY SOME MEASURES, IT IS LESS THAN THE VOLUME OF EVEN A SMALL LAKE. THE ADDITIONAL COST TO EXCAVATE A BASIN FOR A LAKE IS NOT A JUSTIFIABLE CERCLA EXPENSE.

MANY PEOPLE EXPRESSED A DESIRE TO HAVE THE DEBRIS AND ABANDONED HOUSES AT TIMES BEACH CLEANED UP.

EPA IS SENSITIVE TO THE NEED TO ADDRESS THE DEBRIS AND STRUCTURES AT THE SITE. EPA HAS EVALUATED REMEDIAL ALTERNATIVES FOR THIS MATERIAL IN THE FEASIBILITY STUDY AND PROPOSED PLAN. THE PROPOSED PLAN INCLUDES DEMOLITION AND ONSITE LAND DISPOSAL OF STRUCTURES AND DEBRIS.

SOME PEOPLE EXPRESSED CONCERN THAT AN ACCIDENT MIGHT OCCUR WITH THE INCINERATOR, RESULTING IN DIOXIN CONTAMINATION BEING EMITTED TO THE ENVIRONMENT.

AS WITH ANY LARGE PIECE OF MACHINERY, IT IS NECESSARY TO RECOGNIZE THAT THERE IS SOME POTENTIAL FOR OPERATIONAL PROBLEMS. EPA BELIEVES THAT A CAREFUL AND CONSERVATIVE DESIGN, TOGETHER WITH CAREFUL OPERATION AND OVERSIGHT, CAN ENSURE SAFE OPERATION.

SOME THERMAL TREATMENT TECHNOLOGIES ARE LESS PRONE TO OPERATIONAL PROBLEMS, OR TO RELEASE OF CONTAMINANTS IN THE EVENT SUCH PROBLEMS, THAN ARE OTHERS. EPA IS AWARE OF THESE DIFFERENCES, AND WILL TAKE THEM INTO ACCOUNT IN SELECTING THE PROPOSAL AND BIDDER TO CONSTRUCT AND OPERATE THE THERMAL TREATMENT UNIT AT TIMES BEACH.

MANY PEOPLE ARGUED IN FAVOR OF CAPPING THE CONTAMINATED SOIL IN-PLACE, RATHER THAN ANY MORE AGGRESSIVE CLEANUP EFFORT. THE CITY OF EUREKA HAS EXPRESSED A WILLINGNESS TO CONSIDER RESPONSIBILITY FOR THE LONG-TERM CARE AND MONITORING THAT WOULD BE REQUIRED IF THE SOIL IS CAPPED IN PLACE.

EPA HAS EVALUATED IN-PLACE CONTAINMENT ALTERNATIVES IN THE FEASIBILITY STUDY AND PROPOSED PLAN. DISADVANTAGES OF THIS ALTERNATIVE INCLUDE THE NEED FOR LONG-TERM ACCESS RESTRICTIONS, LONG-TERM OPERATION AND MAINTENANCE COSTS, AND THE POTENTIAL FOR FUTURE RELEASE AND EXPOSURE. A DETAILED EVALUATION OF THIS ALTERNATIVE IS PROVIDED IN THE PROPOSED PLAN.

ONE PERSON, REPRESENTING THE EUREKA FIRE PROTECTION DISTRICT, EXPRESSED SAFETY CONCERNS REGARDING THE CURRENT SITUATION AT TIMES BEACH AND REGARDING AN INCINERATOR. SPECIFICALLY, THE PERSON IS CONCERNED WITH THE AMOUNT OF COMBUSTIBLE MATERIALS AT TIMES BEACH, AND WITH THE POSSIBILITY THAT THE EUREKA FIRE PROTECTION DISTRICT WOULD BE RESPONSIBLE FOR RESPONDING TO ANY FIRES THAT MIGHT OCCUR IF AN INCINERATOR IS INSTALLED AT TIMES BEACH.

ALL REMEDIAL ACTIVITIES UNDERTAKEN AT THE SITE WILL BE IN ACCORDANCE WITH AN APPROVED HEALTH AND SAFETY PLAN. ONE OBJECTIVE OF THIS PLAN WILL BE TO MINIMIZE THE POTENTIAL FOR FIRES DURING IMPLEMENTATION OF THE REMEDY. ALL AREAS WITHIN THE SITE WILL REMAIN ACCESSIBLE BY EMERGENCY VEHICLES AT ALL TIMES DURING THE CLEANUP OF THE STRUCTURES AND DEBRIS. ALL REMEDIAL ACTIVITIES WILL BE SCHEDULED AND CARRIED OUT IN COORDINATION WITH LOCAL EMERGENCY SERVICES SO THAT SERVICE IS NOT INTERRUPTED, AND EMERGENCY WORKERS ARE AWARE OF ANY SPECIAL CONSIDERATIONS FOR RESPONDING TO A SITUATION AT TIMES BEACH.

SEVERAL PEOPLE EXPRESSED CONCERN ABOUT LOCATING A THERMAL TREATMENT UNIT CLOSE TO A HIGHWAY.

EPA BELIEVES THAT LOCATING THE INCINERATOR NEAR A HIGHWAY IS ADVANTAGEOUS. THE PRIMARY ADVANTAGE IS THAT TRUCK TRAFFIC ON SECONDARY ROADS ASSOCIATED WITH THE CLEANUP WILL BE MINIMIZED. THE INTERSTATE HIGHWAY SYSTEM IS DESIGNED FOR THE LOADS THAT WILL BE INVOLVED, AND THE DIRECT ACCESS WHICH INTERSTATE 44 PROVIDES TO TIMES BEACH WILL ENSURE GREATER SAFETY FOR THE PEOPLE IN THE AREA.

SEVERAL PEOPLE EXPRESSED CONCERN ABOUT THE STEAM THAT WILL BE PRODUCED BY THE INCINERATOR, SPECIFICALLY THAT THE STEAM WILL INCREASE THE HUMIDITY IN THE AREA.

THE AMOUNT OF WATER THAT WILL BE ADDED TO THE AIR BY THE INCINERATOR WILL NOT MEASURABLY AFFECT THE HUMIDITY. THE AMOUNT OF WATER PRODUCED BY THE INCINERATOR WILL BE TOO SMALL, COMPARED TO THE AMOUNT OF WATER THAT IS NATURALLY IN THE AIR, FOR THIS TO BE A CONCERN.

SEVERAL PEOPLE OPPOSED BRINGING DIOXIN CONTAMINATED SOIL FROM OTHER EASTERN MISSOURI SITES TO TIMES BEACH.

WHILE EPA UNDERSTANDS THE CONCERN, ANOTHER IMPLEMENTABLE ALTERNATIVE FOR THE SOILS AT THESE SITES HAS NOT BEEN IDENTIFIED. MANY OF THE DIOXIN SITES IN EASTERN MISSOURI ARE TOO SMALL TO ERECT ONSITE TREATMENT UNITS. ALSO, UNLIKE TIMES BEACH, MANY OTHER SITES ARE CURRENTLY OCCUPIED, WHICH WOULD RESULT IN SAFETY PROBLEMS DERIVING FROM THE TRUCK TRAFFIC AND ADDITIONAL SITE SECURITY CONSIDERATIONS. THESE PROBLEMS WOULD BE MINIMIZED BY BRINGING THE SOIL TO TIMES BEACH. ANOTHER PRIMARY CONCERN IS THE COST OF SETTING UP A THERMAL TREATMENT UNIT AT EACH SITE WHICH WOULD GREATLY INCREASE THE TOTAL COSTS AND DELAY THE CLEANUPS.

SOME PEOPLE EXPRESSED CONCERN ABOUT THE RISKS POSED FOR SITE WORKERS IN EXCAVATING AND INCINERATING THE DIOXIN CONTAMINATED SOIL.

SHORT-TERM PROTECTION OF WORKERS DURING IMPLEMENTATION IS AN IMPORTANT CONSIDERATION IN SELECTING AN ALTERNATIVE. EPA HAS DEVELOPED EXTENSIVE AND DETAILED REQUIREMENTS FOR ITS WORKERS AT CONTAMINATED SITES. SIMILAR REQUIREMENTS HAVE RECENTLY BEEN ESTABLISHED BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND ARE NOW NATIONAL STANDARDS FOR ALL CLEANUP WORKERS AT CONTAMINATED SITES. EPA WILL REQUIRE THE CLEANUP CONTRACTOR (WHO HAS NOT BEEN SELECTED YET) TO FOLLOW THESE RULES WHICH INCLUDE DEVELOPMENT OF AN AGENCY-APPROVED SITE-SPECIFIC HEALTH AND SAFETY PLAN IN ORDER TO ENSURE THAT THE WORKERS ARE NOT EXPOSED TO ANY UNDUE RISKS.

SEVERAL PEOPLE, INCLUDING THE CITY OF EUREKA, MISSOURI, RECOMMENDED CAPPING THE CONTAMINATED SOIL WITH AN IMPERMEABLE CAP.

IT WAS NOT EPA'S INTENTION IN THE FEASIBILITY STUDY TO RECOMMEND A PERMEABLE CAP OVER AN IMPERMEABLE ONE. THE STUDY ADDRESSES BOTH, AND CONCLUDES THAT EITHER ONE IS TECHNICALLY FEASIBLE. BOTH TYPES OF CAPS OFFER ADVANTAGES AND PROVIDE SOME DEGREE OF LONG-TERM PROTECTION. THE PERMEABLE CAP WAS USED FOR THE COST CALCULATIONS, BUT EPA HAS EXPRESSED NO PREFERENCE FOR ONE PARTICULAR TYPE.

SEVERAL PEOPLE EXPRESSED CONCERN REGARDING THE ASSUMPTION MADE IN THE FEASIBILITY STUDY THAT THE SITE MIGHT SOMEDAY BE USED AGAIN AS A RESIDENTIAL AREA. THE PEOPLE COMMENTING WERE PARTICULARLY CONCERNED THAT RESIDENTIAL CLEANUP STANDARDS WOULD BE USED FOR THE SITE.

DURING PREPARATION OF THE FEASIBILITY STUDY, RISK ASSESSMENTS WERE PERFORMED FOR SEVERAL FUTURE LAND USE SCENARIOS, INCLUDING RESIDENTIAL USAGE. A RESIDENTIAL SCENARIO MAY BE MORE CONSERVATIVE THAN THE ACTUAL FUTURE USE OF THE SITE, BUT EPA BELIEVES THAT IT WAS APPROPRIATE FOR THE PURPOSES OF THE FEASIBILITY STUDY TO MAKE THIS ASSUMPTION, WHICH ALLOWED A VALID COMPARISON OF REMEDIAL ALTERNATIVES TO BE PERFORMED.

ONE PERSON SUGGESTED THAT A COMMERCIAL SETTING ALONG LEWIS ROAD IS A MORE LIKELY SCENARIO FOR THE FUTURE USE OF THE SITE THAN A RESIDENTIAL SCENARIO.

FUTURE COMMERCIAL DEVELOPMENT AT THE SITE WAS CONSIDERED IN THE FEASIBILITY STUDY AND RISKS WERE CALCULATED FOR SUCH A SCENARIO.

SEVERAL PEOPLE EXPRESSED CONCERN THAT THE RISKS TO PUBLIC HEALTH WERE ESTIMATED TOO CONSERVATIVELY IN THE FEASIBILITY STUDY. THESE PEOPLE SUGGEST THAT THE RISKS POSED BY THE SITE ARE MUCH LESS THAN INDICATED BY THE ESTIMATES IN THE FEASIBILITY STUDY.

THE FEASIBILITY STUDY EVALUATED PUBLIC HEALTH RISK IN ACCORDANCE WITH EPA'S SUPERFUND PUBLIC HEALTH EVALUATION MANUAL. THIS PROCEDURE RESULTS IN A CONSERVATIVE ESTIMATE OF THE RISK REPRESENTED UNDER VARIOUS EXPOSURE SCENARIOS. EPA BELIEVES THAT IT IS APPROPRIATE TO CONSIDER THIS PUBLIC HEALTH EVALUATION IN THE REMEDY SELECTION PROCESS FOR TIMES BEACH.

SEVERAL PEOPLE SUGGESTED THAT LEVELS OF CONCERN DIFFERENT THAN THE 1 PPB STANDARD USED IN THE FEASIBILITY STUDY WOULD BE APPROPRIATE FOR CLEANUP OF THE SITE. IN PARTICULAR, IT WAS NOTED THAT HIGHER LEVELS SHOULD BE USED.

IN 1984, KIMBROUGH, ET AL., RECOMMENDED 1 PPB AS A LEVEL OF CONCERN IN RESIDENTIAL SOILS IN "HEALTH IMPLICATIONS OF 2,3,7,8-TETRACHLORODIBENZODIOXIN (TCDD) CONTAMINATION OF RESIDENTIAL SOILS". THIS ASSESSMENT CONCLUDED THAT DIFFERENT CLEANUP LEVELS MAY BE APPROPRIATE IN AREAS WHERE RESIDENTIAL EXPOSURE DOES NOT OCCUR. EPA HAS ACKNOWLEDGED THIS AND HAS PROPOSED A CLEANUP LEVEL OF 20 PPB AT TIMES BEACH ON THE BASIS OF RECOMMENDATIONS FROM HEALTH AGENCIES. CLEANUP LEVELS FOR TIMES BEACH ARE FURTHER DISCUSSED IN THE PROPOSED PLAN.

ONE PERSON NOTED THAT SARA EXPRESSES A PREFERENCE (IN SECTION 121 (B)) FOR TREATMENT ALTERNATIVES THAT PERMANENTLY AND SIGNIFICANTLY REDUCE THE VOLUME, TOXICITY, OR MOBILITY OF THE HAZARDOUS SUBSTANCE, POLLUTANTS, AND CONTAMINANTS. THE PERSON SUGGESTS THAT CAPPING OF THE SITE WOULD PERMANENTLY REDUCE THE MOBILITY OF THE SITE CONTAMINANTS, AND IS THEREFORE ENTITLED TO PREFERENCE.

THE PREFERENCE EXPRESSED IN SARA IS FOR TREATMENT OF HAZARDOUS SUBSTANCES. THE CAPPING ALTERNATIVE, WHICH DOES NOT INVOLVE ANY TREATMENT AND WHICH LEAVES THE CONTAMINANTS SUSCEPTIBLE TO MIGRATION AND EXPOSURE, IS AN EXAMPLE OF THE TYPES OF APPROACHES WHICH ARE LEAST PREFERABLE UNDER SARA.

ONE PERSON SUGGESTED THAT THE REMOVAL AND TREATMENT ALTERNATIVES WOULD RENDER THE TIMES BEACH SITE WORTHLESS.

EPA BELIEVES THAT FOLLOWING IMPLEMENTATION OF THE PROPOSED REMEDIAL ACTION, TIMES BEACH CAN BE RETURNED TO BENEFICIAL USE INCLUDING POTENTIAL PARK AREAS, GREEN SPACE, OR COMMERCIAL DEVELOPMENT.

SEVERAL PEOPLE SUGGESTED THAT INCINERATION WAS A RELATIVELY SPECULATIVE TECHNOLOGY. IT WAS FURTHER SUGGESTED THAT THE COSTS FOR INCINERATION THAT WERE DEVELOPED IN THE FEASIBILITY STUDY WERE TOO OPTIMISTIC AND WOULD LIKELY BE MUCH HIGHER, PARTICULARLY IN LIGHT OF THE COSTS THAT WERE INCURRED DURING INCINERATION PERFORMED AT THE DENNEY FARM SITE.

EPA BELIEVES THAT INCINERATION IS A WELL-DEVELOPED TECHNOLOGY FOR TREATMENT OF CONTAMINATED MATERIAL. THE TECHNOLOGY HAS BEEN USED FOR MANY YEARS AND WAS SUCCESSFULLY APPLIED AT THE DENNEY FARM SITE FOR DESTRUCTION OF DIOXIN IN SOILS AND LIQUIDS. THE EPA MOBILE INCINERATOR OPERATED AT THE DENNEY FARM SITE WAS NOT ORIGINALLY DESIGNED OR CONSTRUCTED TO HANDLE SOILS. THE DESIGN LIMITED THE CAPACITY WHICH RESULTED IN INCREASED UNIT TREATMENT COSTS. THE EPA MOBILE INCINERATOR HAS BEEN RETROFITTED WITH EQUIPMENT WHICH IS INTENDED TO INCREASE THE CAPACITY AND LOWER THE UNIT TREATMENT COST. THE COST TO OPERATE AN INCINERATOR DESIGNED AND CONSTRUCTED SPECIFICALLY FOR DIOXIN-CONTAMINATED SOILS AT TIMES BEACH WOULD BE SUBSTANTIALLY LOWER. EPA BELIEVES THAT THE COST ESTIMATES PRESENTED IN THE FEASIBILITY STUDY AND PROPOSED PLAN ARE REPRESENTATIVE OF THE COSTS LIKELY TO BE ENCOUNTERED FOR REMEDIATION AT TIMES BEACH.

POLICY ISSUES

THE EPA RECEIVED MANY COMMENTS REGARDING POLICY ISSUES ADDRESSED IN THE FEASIBILITY STUDY.

ONE COMMENTOR REFUTED THE LOGIC OF THE ASSUMPTION MADE IN THE FEASIBILITY STUDY THAT THE SITE WOULD ONE DAY BE RETURNED TO RESIDENTIAL USAGE. THE COMMENTOR STATED THAT SINCE THE SITE WOULD NOT BE RETURNED TO RESIDENTIAL USAGE, THE APPLICATION OF A ONE PART PER BILLION (PPB) ACTION LEVEL IS NOT APPROPRIATE.

THE FEASIBILITY STUDY ACKNOWLEDGES THAT FUTURE RESIDENTIAL USE OF TIMES BEACH IS UNLIKELY. THE EPA BELIEVES THAT IT IS UNLIKELY THAT TIMES BEACH WILL BE RETURNED TO RESIDENTIAL USAGE DUE TO A COMBINATION OF DE-FACTO INSTITUTIONAL CONTROLS AND PRACTICAL CONSIDERATIONS DISCUSSED IN THE PROPOSED PLAN.

FUTURE LAND USE WILL BE CONTROLLED BY THE EXTENT OF CLEANUP AT THE SITE. THE REMEDY DESCRIBED IN THE PROPOSED PLAN WILL ALLOW LAND USAGES WHICH INCLUDE PARK OR GREEN SPACE AND POTENTIAL COMMERCIAL DEVELOPMENT. ALL FUTURE LAND USAGE WILL BE IN ACCORDANCE WITH STATE AND FEDERAL HEALTH CRITERIA.

THE ASSUMPTION OF RESIDENTIAL LAND USE IS MADE IN THE TIMES BEACH FEASIBILITY STUDY IN ORDER TO EVALUATE ALTERNATIVES ON AN EQUIVALENT BASIS. THE EPA DOES NOT BELIEVE THAT CHANGING THE ACTION LEVEL WILL AFFECT THE SCREENING OR NON-COST EVALUATION OF ALTERNATIVES IN THE FEASIBILITY STUDY. IF AN ACTION LEVEL DIFFERING FROM 1 PPB IS ESTABLISHED FOR

TIMES BEACH, THE FEASIBILITY STUDY COST EVALUATION WILL REQUIRE ADJUSTMENT. REVISED COST TABLES FOR AN ACTION LEVEL OF 20 PPB APPEAR IN THE PROPOSED PLAN.

THE FEASIBILITY STUDY ACKNOWLEDGES THAT DIFFERENT ACTION LEVELS MAY BE APPROPRIATE FOR OTHER LAND USES. CERCLA, AS AMENDED BY SARA, DOES NOT REQUIRE THAT A SPECIFIC FUTURE LAND USE BE ESTABLISHED PRIOR TO EVALUATION OF REMEDIAL ALTERNATIVES OR REMEDY SELECTION.

ONE COMMENTOR STATED THAT IT WAS UNREASONABLE TO BELIEVE THAT TIMES BEACH WOULD EVER BE DEVELOPED FOR AGRICULTURAL PURPOSES; THEREFORE, IT IS NOT APPROPRIATE TO PERFORM A RISK ASSESSMENT FOR THAT SCENARIO.

RISK ASSESSMENTS WERE PERFORMED IN THE TIMES BEACH FEASIBILITY STUDY FOR SEVERAL DIFFERENT FUTURE LAND USES AT TIMES BEACH INCLUDING AGRICULTURAL, RECREATIONAL, AND OCCUPATIONAL SCENARIOS. THESE RISKS WERE EVALUATED IN ORDER TO CHARACTERIZE THE RISK TO PUBLIC HEALTH IF NO REMEDIATION OF THE DIOXIN-CONTAMINATED MATERIAL AT TIMES BEACH IS PERFORMED AND THE LAND IS PUT TO VARIOUS USES. THE FEASIBILITY STUDY DOES NOT DISCUSS THE LIKELIHOOD OF THE LAND USE AT TIMES BEACH CHANGING TO ANY OF THE PARTICULAR SCENARIOS DEVELOPED.

ONE COMMENTOR REFUTED THE BASIS UPON WHICH 1 PPB ACTION LEVEL IS ESTABLISHED FOR RESIDENTIAL SETTINGS. THE COMMENTOR STATED THAT THE ASSUMPTIONS USED TO DERIVE THE L-PPB ACTION LEVEL WERE OVERLY CONSERVATIVE AND RESULT IN AN ACTION LEVEL WHICH IS MUCH TOO LOW.

THE L-PPB ACTION LEVEL WHICH IS ASSUMED IN THE FEASIBILITY STUDY IS BASED UPON THE 1984 REPORT ENTITLED, "HEALTH IMPLICATIONS OF 2,3,7,8-TETRACHLORODIBENZODIOXIN (TCDD) CONTAMINATION OF RESIDENTIAL SOIL," RENATE D. KIMBROUGH, M.D., ET AL., CENTER FOR ENVIRONMENTAL HEALTH, CENTERS FOR DISEASE CONTROL (CEH/CDC).

THIS ACTION LEVEL HAS BEEN APPLIED DURING EPA REMOVAL ACTIONS AT SEVERAL SITES IN MISSOURI AND AT OTHER SITES NATIONWIDE. THE EPA BELIEVES THAT THE 1984 CENTER FOR ENVIRONMENTAL HEALTH REPORT IS A VALID RISK ASSESSMENT UPON WHICH TO BASE AN ACTION LEVEL. THE CENTER FOR ENVIRONMENTAL HEALTH HAS RECENTLY SUPPORTED THE PAPER STATING THAT NO SCIENTIFIC EVIDENCE HAS BEEN REPORTED IN THE LITERATURE TO DATE WHICH WOULD INVALIDATE THE ASSUMPTIONS UPON WHICH THE 1984 RISK ASSESSMENT IS BASED, OR ITS CONCLUSIONS.

ONE COMMENTOR STATED THAT THE CONSIDERATION OF THE CEH/CDC HEALTH ASSESSMENT TO ESTABLISH AN ACTION LEVEL AT TIMES BEACH IS NOT AUTHORIZED, AND THAT THE L-PPB LEVEL OF CONCERN IS NOT AN APPROPRIATE REGULATORY CRITERION. THE COMMENTOR STATED THAT EPA SHOULD RELY ON A SITE-SPECIFIC HEALTH ASSESSMENT TO ESTABLISH AN APPROPRIATE ACTION LEVEL FOR TIMES BEACH.

THE EPA IS REQUIRED TO ATTAIN ALL APPLICABLE OR RELEVANT AND APPROPRIATE STATE AND FEDERAL ENVIRONMENTAL REQUIREMENTS (ARARS). ALTHOUGH THE 1984 CENTERS FOR DISEASE CONTROL HEALTH ASSESSMENT, UPON WHICH THE L-PPB ACTION LEVEL IS BASED, IS NOT AN ARAR, THE NATIONAL CONTINGENCY PLAN (NCP) ALLOWS SUCH CRITERION TO BE CONSIDERED IN THE SELECTION OF A REMEDY. IN THE ABSENCE OF OTHER REGULATORY CRITERIA FOR DIOXIN, EPA BELIEVES THAT IT IS VALID AND APPROPRIATE TO BASE AN ACTION LEVEL ON THIS ASSESSMENT.

ONE COMMENTOR STATED THAT ACTION LEVELS OTHER THAN 1 PPB ARE APPROPRIATE FOR RESIDENTIAL AND NONRESIDENTIAL LAND USES. THE COMMENTOR STATED THAT AN ACTION LEVEL SHOULD BE ESTABLISHED FOR TIMES BEACH WHICH CORRESPONDS TO THE ANTICIPATED LAND USE OF THE SITE.

THE EPA BELIEVES THAT RESIDENTIAL LAND USE AT TIMES BEACH IS UNLIKELY, AS ACKNOWLEDGED IN THE FEASIBILITY STUDY AND PROPOSED PLAN. THE EPA AGREES THAT IT IS APPROPRIATE TO ESTABLISH AN ACTION LEVEL FOR TIMES BEACH SOILS WHICH CORRESPONDS TO A REALISTIC ANTICIPATED LAND USE FOR THE SITE. IN 1986, EPA INITIATED AN EVALUATION OF AN APPROPRIATE ACTION LEVEL AT TIMES BEACH, IN COORDINATION WITH THE AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY (ATSDR), CENTER FOR ENVIRONMENTAL HEALTH, CENTERS FOR DISEASE CONTROL, THE MISSOURI DEPARTMENT OF NATURAL RESOURCES (MDNR), AND THE MISSOURI DIVISION OF HEALTH

(MDOH). THE RESULT OF THIS EVALUATION WAS THE RECOMMENDATION BY FEDERAL AND STATE HEALTH AGENCIES OF AN APPROPRIATE ACTION LEVEL FOR THE TIMES BEACH SITE. EPA HAS CONSIDERED THIS RECOMMENDATION IN THE ESTABLISHMENT OF A CLEANUP LEVEL AND REMEDY SELECTION FOR THE TIMES BEACH SITE.

ONE COMMENTOR STATED THAT OVERLY CONSERVATIVE ASSUMPTIONS ARE USED TO CALCULATE RISKS FOR THE THREE SCENARIOS DEVELOPED IN THE FEASIBILITY STUDY.

THE PROCEDURES USED IN THE FEASIBILITY STUDY TO CALCULATE INCREMENTAL CANCER RISKS ARE IN ACCORDANCE WITH EPA POLICY AND GUIDELINES. SPECIFICALLY, THE PROCEDURES USED CONFORM TO THE EPA PUBLIC HEALTH EVALUATION MANUAL (1986). THE EPA BELIEVES THAT THE RISK ASSESSMENT PROCEDURES USED IN THE TIMES BEACH FEASIBILITY STUDY ARE VALID AND RESULT IN A REASONABLE ESTIMATION OF ANTICIPATED INCREMENTAL CANCER RISKS DUE TO EXPOSURE IN THE VARIOUS SCENARIOS DEVELOPED.

ONE COMMENTOR STATED THAT THE CANCER POTENCY VALUE USED TO CALCULATE RISKS IN THE FEASIBILITY STUDY IS TOO HIGH.

THE PUBLIC HEALTH EVALUATION PRESENTED IN THE TIMES BEACH FEASIBILITY STUDY IS PERFORMED IN ACCORDANCE WITH AGENCY GUIDELINES AND POLICY. THESE GUIDELINES SPECIFY THAT INCREMENTAL CANCER RISKS WILL BE CALCULATED USING CANCER POTENCY VALUES ADOPTED BY THE EPA CARCINOGENIC ASSESSMENT GROUP (CAG). THE EPA BELIEVES THAT THE CANCER POTENCY VALUE ADOPTED BY THE CAG IS APPROPRIATE AND SUPPORTED BY SCIENTIFIC DATA.

ONE COMMENTOR STATED THAT ADDITIONAL FACTORS AFFECTING THE MOBILITY OF DIOXIN-CONTAMINATED SOIL NEED TO BE CONSIDERED IN THE SELECTION OF REMEDY FOR TIMES BEACH.

THE EPA BELIEVES THAT THE VERTICAL AND AREAL EXTENT OF DIOXIN-CONTAMINATION HAS BEEN ADEQUATELY DEFINED AT TIMES BEACH DURING THE PAST FIELD INVESTIGATIONS INVOLVING THE SAMPLING AND ANALYSIS OF SURFACE AND SUBSURFACE SOILS. SAMPLING AT TIMES BEACH AND AT OTHER MISSOURI DIOXIN SITES HAS INDICATED THAT THE DIOXIN IS TIGHTLY BOUND TO SOIL PARTICLES, AND THAT MIGRATION OF THE DIOXIN IS DIRECTLY RELATED TO THE TRANSPORT OF THE CONTAMINATED SOILS. THE EPA DOES NOT BELIEVE THAT THE DIOXIN CONTAMINATION AT TIMES BEACH REPRESENTS A SIGNIFICANT THREAT TO GROUNDWATER OR AIR QUALITY ON THE BASIS OF SAMPLING CONDUCTED BY EPA AT TIMES BEACH. SAMPLING OF SEDIMENT AND BIOTA IN THE MERAMEC RIVER ADJACENT TO TIMES BEACH DO NOT INDICATE THAT THE SITE IS A SIGNIFICANT SOURCE OF DIOXIN IN SURFACE WATER. THE EPA BELIEVES THAT THIS EMPIRICAL INFORMATION FORMS A VALID BASIS FOR THE SELECTION OF A REMEDY AT TIMES BEACH AND HAS CONSIDERED THE OBSERVED MOBILITY CHARACTERISTICS IN THE REMEDY SELECTION.

ONE COMMENTOR STATED THAT THE HEALTH AND ENVIRONMENTAL RISKS ASSOCIATED WITH DIOXIN ARE LESS THAN GENERALLY ASSUMED.

RISKS IN THE FEASIBILITY STUDY ARE CALCULATED IN ACCORDANCE WITH PROCEDURES SET FORTH IN THE EPA SUPERFUND PUBLIC HEALTH EVALUATION MANUAL. THE RISK MODEL EMPLOYED USES CANCER POTENCY VALUES ADOPTED BY THE EPA CARCINOGENIC ASSESSMENT GROUP. THE EPA BELIEVES THIS IS A VALID PROCEDURE FOR DETERMINING RISKS TO PUBLIC HEALTH FROM KNOWN OR SUSPECTED CARCINOGENS.

IN ADDITION TO THE PUBLIC HEALTH EVALUATION INCLUDED IN THE TIMES BEACH FEASIBILITY STUDY, EPA HAS RELIED ON THE 1984 KIMBROUGH ASSESSMENT, AND AN ADDITIONAL HEALTH ASSESSMENT PERFORMED BY THE ATSDR FOR THE TIMES BEACH SITE IN SELECTING AN APPROPRIATE REMEDY.

THE EPA DOES NOT BELIEVE THAT ENVIRONMENTAL RISKS ARE OVERESTIMATED. TIMES BEACH LIES IN THE 25-YEAR FLOODPLAIN OF THE MERAMEC RIVER. DUE TO BIOACCUMULATION FACTORS AS HIGH AS 30,000 REPORTED IN THE LITERATURE, ANY MIGRATION OF DIOXIN-CONTAMINATED SOIL INTO THE MERAMEC RIVER COULD POTENTIALLY RESULT IN DIOXIN CONCENTRATIONS OF ENVIRONMENTAL CONCERN IN FISH AND OTHER AQUATIC BIOTA. FURTHERMORE, HUMAN CONSUMPTION OF THESE CONTAMINATED FISH OR OTHER BIOTA COULD RESULT IN A RISK TO PUBLIC HEALTH.

ONE COMMENTOR STATED THAT IT IS NOT APPROPRIATE TO CLEAN UP SITES TO A LEVEL WHICH CORRESPONDS TO AN INCREMENTAL CANCER RISK IN THE RANGE OF 10^{-4} TO 10^{-7} .

THE SUPERFUND PUBLIC HEALTH EVALUATION MANUAL STATES THAT A 10^{-4} TO 10^{-7} INCREMENTAL CANCER RISK LEVEL MAY BE USED TO DETERMINE THE APPROPRIATE EXTENT OF CLEANUP AT A SUPERFUND SITE. THE EPA BELIEVES THAT IT IS APPROPRIATE TO REMEDIATE SUPERFUND SITES TO THIS EXTENT.

ONE COMMENTOR STATED THAT THERE IS NO JUSTIFICATION FOR USING CERCLA FUNDS FOR REMEDIATING THE UNCONTAMINATED STRUCTURES AND DEBRIS.

IN 1984, A DECISION WAS MADE BY EPA TO PERMANENTLY RELOCATE RESIDENTS AND BUSINESSES WITHIN THE CITY OF TIMES BEACH DUE TO THE DISCOVERY OF DIOXIN CONTAMINATION. THIS DECISION RESULTED IN EPA ACCEPTING FINAL MANAGEMENT RESPONSIBILITY FOR THE STRUCTURES AND DEBRIS REMAINING IN TIMES BEACH FOLLOWING THE PERMANENT RELOCATION. FINAL MANAGEMENT OF THIS MATERIAL IS JUSTIFIED UNDER CERCLA ON THE SAME BASIS AS THE PERMANENT RELOCATION, WHICH IS THE THREAT WHICH EXISTED IN 1982 DUE TO THE DISCOVERY OF DIOXIN CONTAMINATION ON THE ROADWAYS OF TIMES BEACH. THIS ACTION WILL SERVE AS A COMPLETION OF THE PERMANENT RELOCATION.

ONE COMMENTOR STATED THAT THERE IS NO JUSTIFICATION FOR FURTHER ANALYSIS OF NON-DIOXIN ORGANIC CONTAMINATION FOUND AT THE SITE.

THE EPA DOES NOT BELIEVE THAT THE EXTENT OF CONTAMINATION BY OTHER ORGANICS HAS BEEN ADEQUATELY CHARACTERIZED. PRIOR FIELD INVESTIGATIONS HAVE DETECTED THE PRESENCE OF NON-DIOXIN ORGANIC CONTAMINATION IN SOILS IN THE CITY PARK AREA AT DEPTHS AS GREAT AS 20 FEET AND IN GROUNDWATER. CONCENTRATIONS OF OTHER ORGANICS DETECTED RANGE AS HIGH AS 10 PARTS PER MILLION (PPM) TOLUENE IN GROUNDWATER AND 7.2 PPM ETHYLBENZENE IN SOIL. THE EPA BELIEVES THAT THERE IS SUFFICIENT JUSTIFICATION FOR ADDITIONAL INVESTIGATION OF NON-DIOXIN ORGANIC CONTAMINATION AT TIMES BEACH.

ONE COMMENTOR STATED THAT IT IS NOT APPROPRIATE TO CONSIDER STATE AND FEDERAL WATER QUALITY CRITERIA IN THE SELECTION OF A REMEDY FOR TIMES BEACH.

THE EPA HAS PUBLISHED A PARTIAL LISTING OF POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS WHICH SUPERFUND REMEDIES MUST COMPLY WITH. FEDERAL AND STATE WATER QUALITY CRITERIA ARE INCLUDED IN THIS LISTING. THE EPA BELIEVES THAT FEDERAL AND STATE WATER QUALITY CRITERIA ARE POTENTIALLY RELEVANT AND APPROPRIATE, IF NOT APPLICABLE TO WATERS OF THE MERAMEC RIVER. SARA REQUIRES THAT REMEDIES AT SUPERFUND SITES MUST ATTAIN ALL IDENTIFIED APPLICABLE OR RELEVANT AND APPROPRIATE FEDERAL AND STATE ENVIRONMENTAL REQUIREMENTS. THE EPA BELIEVES THAT FEDERAL AND STATE AMBIENT WATER QUALITY CRITERIA ESTABLISHED UNDER THE CLEAN WATER ACT AND STATE LAW SHOULD BE CONSIDERED IN THE SELECTION OF A REMEDY AT TIMES BEACH.

ONE COMMENTOR STATED THAT WAIVERS FROM APPLICABLE OR RELEVANT AND APPROPRIATE ENVIRONMENTAL REQUIREMENTS (ARARS) UNDER SARA ARE NOT GIVEN DUE CONSIDERATION IN THE TIMES BEACH FEASIBILITY STUDY.

WAIVERS FROM ARARS HAVE BEEN CONSIDERED IN THE SELECTION OF REMEDY AT TIMES BEACH. A DISCUSSION OF THE POTENTIAL WAIVERS CONSIDERED FOR REMEDIAL ALTERNATIVES AT TIMES BEACH ARE ADDRESSED IN THE PROPOSED PLAN. THIS DOCUMENT HAS UNDERGONE PUBLIC REVIEW IN ACCORDANCE WITH CERCLA REQUIREMENTS.

ONE COMMENTOR STATED THAT EPA SHOULD TREAT ALL OF THE DIOXIN SITES IN MISSOURI AS A SINGLE SITE FOR PURPOSES OF REMEDIATION.

THE EPA BELIEVES THAT THERE ARE EFFICIENCIES AND ECONOMIES OF SCALE TO BE GAINED BY CONSIDERING A COMPREHENSIVE REMEDY FOR ALL OF THE DIOXIN SITES LOCATED IN EASTERN MISSOURI. THE EPA HAS CONSIDERED ESTABLISHMENT OF A CENTRALIZED THERMAL TREATMENT FACILITY AT TIMES BEACH FOR TREATMENT OF DIOXIN-CONTAMINATED SOILS FROM OTHER EASTERN

MISSOURI SITES. THIS ALTERNATIVE HAS BEEN DEVELOPED AND PRESENTED FOR PUBLIC COMMENT IN THE PROPOSED PLAN, AND REPRESENTS AN INTEGRATED APPROACH TO RESOLVING THE MISSOURI DIOXIN SITUATION.

ONE COMMENTOR STATED THAT THE RISKS ARE TOO LOW AT TIMES BEACH TO JUSTIFY ANY ALTERNATIVE BEYOND NO ACTION.

FEDERAL AND STATE HEALTH AGENCIES HAVE ADVISED THAT REMOVAL OF SOILS EXCEEDING 20 PPB DIOXIN IS REQUIRED TO REDUCE THE POTENTIAL INCREMENTAL CANCER RISK AT TIMES BEACH TO THE 10(-6) LEVEL. THIS GOAL IS CONSISTENT WITH THE CERCLA POLICY OF REDUCING RISK TO THE 10(-4) TO 10(-7) RANGE. THIS RISK WILL BE FURTHER REDUCED BY PLACEMENT OF A ONE-FOOT CLEAN SOIL LAYER OVER ALL AREAS AT TIMES BEACH EXCEEDING 1 PPB. THE EPA BELIEVES THAT THIS RISK-BASED LEVEL OF CLEANUP IS AN APPROPRIATE GOAL FOR THE REMEDIATION OF DIOXIN-CONTAMINATED SOILS AT TIMES BEACH.

ONE COMMENTOR STATED THAT THE FEASIBILITY STUDY FAILS TO CONSIDER THE CERCLA STATUTORY PREFERENCE FOR PRACTICABLE PERMANENT SOLUTIONS.

SARA ESTABLISHES A STATUTORY PREFERENCE FOR REMEDIES WHICH UTILIZE PERMANENT SOLUTIONS TO THE MAXIMUM EXTENT PRACTICABLE. THE EPA BELIEVES THAT THE THERMAL TREATMENT ALTERNATIVES CONSIDERED IN THE FEASIBILITY STUDY AND IN THE PROPOSED PLAN REPRESENT REMEDIES WHICH UTILIZE PERMANENT SOLUTIONS TO THE MAXIMUM EXTENT PRACTICABLE.

ONE COMMENTOR STATED THAT AN INADEQUATE OPPORTUNITY IS PROVIDED FOR PUBLIC INVOLVEMENT IN THE REMEDY SELECTION PROCESS AT TIMES BEACH.

THE STATUTORY REQUIREMENTS FOR PUBLIC INVOLVEMENT IN THE REMEDY SELECTION PROCESS AT TIMES BEACH HAVE BEEN SATISFIED. THE TIMES BEACH FEASIBILITY STUDY WAS RELEASED FOR PUBLIC COMMENT ON DECEMBER 29, 1986, BEGINNING A 3-MONTH PUBLIC COMMENT PERIOD WHICH ENDED MARCH 27, 1987. A 1-MONTH EXTENSION TO THE PUBLIC COMMENT PERIOD WAS GRANTED AT THE REQUEST OF THIS COMMENTOR. AN ADDITIONAL ONE-MONTH PUBLIC COMMENT PERIOD WAS HELD FOR THE PROPOSED PLAN. DURING THIS ADDITIONAL PUBLIC COMMENT PERIOD, ALL DOCUMENTS CONTAINED IN THE DRAFT ADMINISTRATIVE RECORD, WHICH CONTAINS ALL DOCUMENTS FORMING THE BASIS FOR REMEDY SELECTION AT TIMES BEACH, WERE AVAILABLE FOR PUBLIC REVIEW AND COMMENT. A RESPONSIVENESS SUMMARY HAS BEEN PREPARED WHICH ADDRESSES ALL OF THE ISSUES RAISED DURING THE PUBLIC COMMENT PERIODS. THIS RESPONSIVENESS SUMMARY IS A COMPONENT OF THE RECORD OF DECISION WHICH FORMALLY SELECTS THE REMEDY TO BE IMPLEMENTED AT TIMES BEACH.

ONE COMMENTOR STATED THAT RESTORATION OF THE SITE FOR RESIDENTIAL USE IS OF QUESTIONABLE LEGALITY.

THE PROPOSED REMEDY AT TIMES BEACH DOES NOT INCLUDE OR ALLOW RETURN OF TIMES BEACH TO RESIDENTIAL USE, ALTHOUGH FOLLOWING REMEDIATION SOME AREAS OF THE SITE WILL MEET THE CRITERIA FOR RESIDENTIAL USAGE. THE SELECTION OF REMEDY FOR THE SITE IS BASED ON PROTECTION OF PUBLIC HEALTH AND THE ENVIRONMENT UNDER CURRENT AND ANTICIPATED FUTURE EXPOSURE SCENARIOS. AS STATED PREVIOUSLY, THE EPA BELIEVES IT IS UNLIKELY THAT TIMES BEACH WILL RETURN TO RESIDENTIAL LAND USE DUE TO INSTITUTIONAL AND PRACTICAL CONSIDERATIONS.

ONE COMMENTOR STATED THAT LAND USE RESTRICTIONS EXIST WHICH WOULD ENABLE POTENTIAL EXPOSURE TO DIOXIN-CONTAMINATED SOIL AT TIMES BEACH TO BE LIMITED.

THE EPA DOES NOT BELIEVE THAT INSTITUTIONAL CONTROLS OF THIS TYPE ARE ADEQUATE BY THEMSELVES TO CONTROL POTENTIAL HUMAN AND ENVIRONMENTAL EXPOSURE IN THE FUTURE. THE EPA DOES ACKNOWLEDGE THAT INSTITUTIONAL CONTROLS EXIST FOR TIMES BEACH WHICH, IN COMBINATION WITH THE REMEDY PROPOSED, ARE PROTECTIVE OF PUBLIC HEALTH AND THE ENVIRONMENT. THESE INSTITUTIONAL CONTROLS ARE DISCUSSED IN THE PROPOSED PLAN.

ONE COMMENTOR STATED THAT THE EXCAVATION AND STORAGE OF DIOXIN-CONTAMINATED SOIL AT OTHER SITES WILL AFFECT EPA'S DECISIONS REGARDING REMEDY SELECTION AT TIMES BEACH.

THE FEASIBILITY STUDY ACKNOWLEDGES THE NEED FOR MANAGEMENT CAPACITY FOR DIOXIN-CONTAMINATED SOILS AT OTHER EASTERN MISSOURI DIOXIN SITES. DUE TO THE CURRENT ABSENCE OF MANAGEMENT CAPACITY FOR DIOXIN-CONTAMINATED SOILS, THE REMEDY SELECTED FOR TIMES BEACH WILL IMPACT OTHER EASTERN MISSOURI DIOXIN SITES. THE POTENTIAL NEED FOR CLEANUP OF THESE OTHER EASTERN MISSOURI SITES SHOULD NOT BE DISREGARDED IN THE SELECTION OF REMEDY FOR TIMES BEACH. THE EPA BELIEVES THAT IT IS LOGICAL AND APPROPRIATE TO CONSIDER A COMPREHENSIVE REMEDY FOR EASTERN MISSOURI DIOXIN SITES.

ONE COMMENTOR STATES THAT PERMANENT RELOCATION WAS OFFERED TO BUSINESSES AND RESIDENTS IN TIMES BEACH AS A RESULT OF THE FLOODING AND NOT BECAUSE OF THE DIOXIN CONTAMINATION.

THE DECISION BY EPA TO OFFER PERMANENT RELOCATION AT TIMES BEACH WAS RELATED TO THE DISCOVERY, IN DECEMBER 1982, OF WIDE-SPREAD DIOXIN CONTAMINATION WITHIN TIMES BEACH. FLOODING CONTRIBUTED TO THE EMERGENCY SITUATION. HOWEVER, PERMANENT RELOCATION WAS OFFERED DUE TO THE DISCOVERY OF HAZARDOUS SUBSTANCES AT TIMES BEACH AND RECOMMENDATIONS BY HEALTH AGENCIES TO PREVENT CONTINUED EXPOSURE FROM OCCURRING.

ONE COMMENTOR STATED THAT THERE WAS AN INADEQUATE OPPORTUNITY PROVIDED FOR PUBLIC PARTICIPATION IN THE REMEDY SELECTION PROCESS FOR FLOOD-CONTROL MEASURES AT TIMES BEACH.

THE OPPORTUNITY FOR PUBLIC COMMENT ON THE SPUR LEVEE PROJECT WAS PROVIDED. THE SPUR LEVEE PROJECT WAS DESCRIBED IN THE RECOMMENDATIONS AND SCHEDULE OF THE CENTRAL STORAGE SITE PROJECT FEASIBILITY STUDY--MISSOURI DIOXIN SITES. THIS STUDY WAS RELEASED TO THE PUBLIC DECEMBER 7, 1983, AND A PUBLIC MEETING TO PRESENT AND ACCEPT COMMENTS ON THE RECOMMENDED ALTERNATIVE WAS HELD DECEMBER 13, 1983. ADDITIONAL WRITTEN COMMENTS WERE ACCEPTED THROUGH DECEMBER 27, 1983. THIS PUBLIC COMMENT PERIOD SATISFIES THE STATUTORY PUBLIC PARTICIPATION REQUIREMENT FOR CERCLA REMEDIAL ACTIONS.

AN ENVIRONMENTAL ASSESSMENT WAS PREPARED BY THE U.S. CORPS OF ENGINEERS FOR THE SPUR LEVEE PROJECT. THE PUBLIC WAS NOTIFIED THROUGH LOCAL NEWS MEDIA OF THE OPPORTUNITY TO COMMENT ON THE ENVIRONMENTAL ASSESSMENT PREPARED FOR THE PROPOSED PROJECT AND PROVIDED AN ADDITIONAL 2-WEEK PUBLIC COMMENT PERIOD PRIOR TO IMPLEMENTATION.

DETAILED TECHNICAL COMMENTS ON THE FEASIBILITY STUDY

ONE COMMENTOR OFFERED DETAILED TECHNICAL COMMENTS ON THE FEASIBILITY STUDY. THESE COMMENTS ARE GIVEN BELOW.

ASSUMING FUTURE RESIDENTIAL USE {AT TIMES BEACH} IS UNREASONABLE....THE FEASIBILITY STUDY'S USE OF A RESIDENTIAL CLEANUP STANDARD--FOR A SITE THAT IS UNLIKELY EVER TO BE RESIDENTIAL AGAIN--IS A SERIOUS CONCEPTUAL ERROR...

EPA IS NOT PROPOSING TO RETURN TIMES BEACH TO RESIDENTIAL USAGE. FUTURE RESIDENTIAL USAGE WAS ONE OF THREE EXPOSURE SCENARIOS CONSIDERED IN THE PUBLIC HEALTH EVALUATION PRESENTED IN THE FEASIBILITY STUDY. DUE TO THE UNCERTAINTY IN FUTURE LAND USE DURING PREPARATION OF THE FEASIBILITY STUDY, A RANGE OF EXPOSURE SCENARIOS WAS USED INCLUDING RESIDENTIAL, COMMERCIAL, AND RECREATIONAL. FOR THE PURPOSE OF ESTIMATING A CONTAMINATED SOIL VOLUME, THE MOST CONSERVATIVE FUTURE USE WAS ASSUMED. THE NON-COST COMPARISON OF ALTERNATIVES FOR THE CONTAMINATED SOIL VOLUME CORRESPONDING TO RESIDENTIAL USE IS VALID FOR A RANGE OF SOIL VOLUMES, INCLUDING THE CURRENT ESTIMATE. COST EVALUATIONS WERE REVISED IN THE PROPOSED PLAN TO REFLECT THE CURRENT PROJECTED SOIL VOLUME AT TIMES BEACH. EPA BELIEVES THAT THESE EVALUATIONS REPRESENT A VALID BASIS FOR REMEDY SELECTION AT TIMES BEACH.

ANOTHER MAJOR FLAW IN THE FEASIBILITY STUDY IS THE FAILURE TO CONDUCT A RISK ASSESSMENT IN ORDER TO DEVELOP SITE-SPECIFIC CLEANUP OBJECTIVES....HAVING ASSUMED FUTURE RESIDENTIAL USE, THE FEASIBILITY STUDY SIMPLY ADOPTS A CLEANUP STANDARD EQUAL TO CDC'S GENERIC "REASONABLE LEVEL AT WHICH TO BEGIN CONSIDERATION OF ACTION TO

LIMIT HUMAN EXPOSURE FOR CONTAMINATED SOIL."

DURING RESPONSE ACTIONS PERFORMED AT DIOXIN SITES IN MISSOURI, EPA HAS RELIED UPON THE RECOMMENDATIONS OF FEDERAL AND STATE HEALTH AGENCIES IN DETERMINING APPROPRIATE CLEANUP LEVELS. CDC HAS RECOMMENDED THAT 1 PPB IS A REASONABLE LEVEL AT WHICH TO EXPRESS CONCERN FOR PUBLIC HEALTH IN RESIDENTIAL SETTINGS. DURING PREPARATION OF THE FEASIBILITY STUDY, EPA EVALUATED THE CDC RECOMMENDATION AND DETERMINED THAT 1 PPB WAS AN APPROPRIATE LEVEL OF CONCERN FOR EVALUATION OF ALTERNATIVES. THE FEASIBILITY STUDY NOTES, HOWEVER, THAT DIFFERENT CLEANUP LEVELS MAY BE APPROPRIATE FOR OTHER LAND USES THAN THAT ASSUMED IN THE STUDY.

...THE USE OF OVERLY CONSERVATIVE FACTUAL ASSUMPTIONS, RESULTS IN A GROSS OVERSTATEMENT OF BOTH THE HAZARDS OF TCDD AND THE AMOUNT OF SITE CLEANUP NECESSARY. THE USE OF THE HIGHEST SINGLE SAMPLE VALUE AS A BASIS FOR PLANNING SITE CLEANUP RESULTS IN A DISTORTION OF REMEDIAL STRATEGIES.

THE PUBLIC HEALTH EVALUATION WAS PREPARED FOLLOWING THE GUIDELINES OF THE SUPERFUND PUBLIC HEALTH EVALUATION MANUAL. AS NOTED IN THE MANUAL, "THIS MANUAL ESTABLISHES A FRAMEWORK FOR PUBLIC HEALTH EVALUATION AT SUPERFUND SITES..." THE MANUAL STATES EXPLICITLY THAT A CONSERVATIVE APPROACH MAY BE TAKEN IN MAKING RISK ESTIMATES. IT IS CLEARLY STATED IN THE FEASIBILITY STUDY THAT THIS WAS THE APPROACH TAKEN AND THE ASSUMPTIONS WERE NOTED.

THE RISK, ASSUMING THAT TIMES BEACH IS NOT REDEVELOPED FOR RESIDENTIAL USE, IS TRULY MINIMAL.

EPA HAS CONSIDERED THE RECOMMENDATIONS OF FEDERAL AND STATE HEALTH AGENCIES REGARDING THE RISKS PRESENTED BY THE SITE. THOSE RECOMMENDATIONS INDICATE THAT THE RISKS POSED BY THE SITE REQUIRE RESPONSE TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT.

...THE SAFEST, MOST PROTECTIVE COURSE IS TO LEAVE THE TCDD IN PLACE, WITH, AT MOST, AN APPROPRIATE VEGETATIVE CAP TO PREVENT SOIL EROSION.

COVERING CONTAMINATED AREAS AT TIMES BEACH WITH A VEGETATED CAP WAS EVALUATED IN THE FEASIBILITY STUDY AND PROPOSED PLAN. THIS ALTERNATIVE WAS DETERMINED NOT TO ACHIEVE CERCLA AND NCP REMEDY SELECTION CRITERIA TO THE SAME EXTENT AS THE PROPOSED REMEDY. THE RATIONALE FOR THIS DETERMINATION IS DESCRIBED IN THE PROPOSED PLAN.

THE REASON THAT CAPPING DOES NOT MEET SITE OBJECTIVES IS...THAT THE SITE OBJECTIVES SET FORTH IN THE FEASIBILITY STUDY ARE UNREALISTIC.

EPA DISAGREES THAT THE GOALS SET FORTH IN THE FEASIBILITY STUDY ARE UNREALISTIC. THE GOALS ARE BASED ON RECOMMENDATIONS OF APPROPRIATE STATE AND FEDERAL HEALTH AGENCIES. REMEDIAL ALTERNATIVES WERE DEVELOPED BASED ON THESE GOALS.

...THE FEASIBILITY STUDY INCORRECTLY VIEWS THE PROCEDURES FOR CAPPING AND CLOSURE UNDER THE RESOURCE CONSERVATION RECOVERY ACT (RCRA) AS BEING ARARS. IN FACT, THOSE STANDARDS WERE DEVELOPED FOR LANDFILLS AT WHICH A HETEROGENEOUS YET CONCENTRATED ASSORTMENT OF UNKNOWN WASTES HAVE BEEN BURIED,...

IT IS NOT EPA'S POSITION THAT LANDFILL CLOSURE REQUIREMENTS ARE APPLICABLE ONLY TO LANDFILLS CONTAINING HETEROGENEOUS, CONCENTRATED, AND UNKNOWN WASTES. EPA HAS DETERMINED THAT LANDFILL CLOSURE REGULATIONS ARE APPLICABLE OR RELEVANT AND APPROPRIATE TO SOME REMEDIAL ALTERNATIVES, AS DESCRIBED IN THE PROPOSED PLAN.

EVEN IF THE RCRA STANDARDS ARE APPROPRIATELY VIEWED AS ARARS, THE FEASIBILITY STUDY IMPROPERLY FAILS TO CONSIDER WHETHER WAIVERS ARE APPROPRIATE UNDER THE CIRCUMSTANCES.

A DISCUSSION OF POTENTIAL WAIVERS FROM ARAR'S FOR THE REMEDIAL ALTERNATIVES EVALUATED FOR TIMES BEACH IS PRESENTED IN THE PROPOSED PLAN.

EPA ACKNOWLEDGES THAT IT IS LEGALLY REQUIRED TO EVALUATE THE "NO ACTION" ALTERNATIVE. YET ITS TREATMENT OF THIS OPTION IS PURELY PERFUNCTORY.

EPA DISAGREES THAT THE TREATMENT OF THE NO ACTION ALTERNATIVE IS PERFUNCTORY. THE DEVELOPMENT AND ANALYSIS OF REMEDIAL ALTERNATIVES IS AFFECTED BY THE TECHNICAL COMPLEXITY OF THE ALTERNATIVES. THE NO ACTION ALTERNATIVE IS OF LIMITED COMPLEXITY; THEREFORE, LESS SPACE IS REQUIRED TO DEVELOP AND ANALYZE THE ALTERNATIVE. IN THE FEASIBILITY STUDY, EPA EVALUATES THE NO ACTION ALTERNATIVE AS SERIOUSLY AS THE OTHER ALTERNATIVES.

CERTAIN OF THE OPTIONS RECEIVING DETAILED ANALYSIS-FOR EXAMPLE, EXCAVATION FOLLOWED BY EITHER OFFSITE LAND DISPOSAL OR OFFSITE INCINERATION--SHOULD HAVE BEEN ELIMINATED FROM FURTHER CONSIDERATION AT THE OUTSET BECAUSE OF THEIR EXCESSIVE COST AND THE LACK OF PERMITTED FACILITIES.

OFFSITE LAND DISPOSAL OR INCINERATION ARE CONSIDERED TO BE TECHNICALLY VIABLE OPTIONS THAT WARRANT CONSIDERATION AS REMEDIAL ALTERNATIVES. OFFSITE LAND DISPOSAL OR TREATMENT CAPACITY COULD POTENTIALLY DEVELOP PRIOR TO REMEDY SELECTION.

...THE FEASIBILITY STUDY ENDORSES A SAMPLING AND EXCAVATION APPROACH THAT IS LIKELY TO LEAD TO MASSIVE COST OVERRUNS. AN ALTERNATIVE STRATEGY OF EXTENSIVE INITIAL SAMPLING, FOLLOWED BY SINGLE-LIFT EXCAVATION AND LIMITED CONFIRMATORY SAMPLING, WOULD SAVE SUBSTANTIAL AMOUNTS OF TIME AND MONEY.

A NUMBER OF EXCAVATION STRATEGIES HAVE BEEN EVALUATED BY EPA AND TRIED IN THE FIELD. THE STRATEGY DESCRIBED IN THE FEASIBILITY STUDY IS SIMILAR TO THAT USED AT OTHER TCDD SITES AND IS CONSIDERED TO BE COST-EFFECTIVE AND ACCOMPLISHES REMEDIATION OBJECTIVES. FURTHER DISCUSSION OF THIS POINT IS PROVIDED IN RESPONSES TO COMMENTS REGARDING FINAL ACTIONS AT THE MINKER/STOUT/ROMAINE CREEK SITE.

...STEEL ROLL-OFF BINS, WHICH ARE EXPENSIVE TO PURCHASE, HANDLE, AND DECONTAMINATE, ARE PROPOSED FOR SOIL TRANSPORT. BULK HANDLING TECHNIQUES, BY CONTRAST, WHICH HAVE BEEN SUCCESSFULLY USED BY EPA REGION VII IN SOUTHWEST MISSOURI, WOULD BE EQUALLY SAFE AND MUCH LESS COSTLY.

AS NOTED IN THE FEASIBILITY STUDY, THE DETAILS OF MATERIAL HANDLING WILL BE RE-EVALUATED DURING THE PREDESIGN AND DESIGN OF THE SELECTED REMEDIAL ALTERNATIVE. AIR-TIGHT ROLL-OFF BINS PROVIDE A HIGH DEGREE OF SAFETY DURING TRANSPORT, WHICH MAY BE WARRANTED IN DENSELY POPULATED AREAS.

THE USE OF RELATIVELY SMALL EXCAVATION EQUIPMENT, SUCH AS BACKHOES, SACRIFICES SIGNIFICANT ECONOMIES OF SCALE POSSIBLE WITH USE OF LARGER EQUIPMENT.

THE DETAILS OF AN EXCAVATION STRATEGY WILL BE EVALUATED DURING DESIGN OF THE SELECTED REMEDIAL ALTERNATIVE. THE METHODS DESCRIBED IN THE FEASIBILITY STUDY ARE SIMILAR TO THOSE SUCCESSFULLY USED BY EPA DURING REMOVAL ACTIVITIES AT SIMILAR TCDD-CONTAMINATED SITES IN MISSOURI.

THE DISCUSSION OF WORKER PROTECTIVE CLOTHING APPEARS TO ASSUME THE USE OF "MOON SUITS", WITH THE ATTENDANT EXPENSE AND LOSS OF WORKER PRODUCTIVITY....A SITE-SPECIFIC RISK ANALYSIS SHOULD HAVE BEEN PERFORMED AND WOULD HAVE RESULTED IN A MORE RATIONAL LEVEL OF PROTECTIVE CLOTHING.

IT APPEARS THAT THE COMMENTOR, IN REFERRING TO "MOON SUITS," IS REFERRING TO THE USE OF LEVELS A OR B PROTECTIVE GEAR. THE FEASIBILITY STUDY ASSUMES THAT LEVEL C GEAR WILL BE USED FOR SOIL HANDLING ACTIVITIES, WHICH IS TYPICAL OF PROTECTIVE GEAR USED FOR REMEDIATION AT OTHER MISSOURI TCDD SITES.

FOR TRANSPORTATION OF SOIL FROM OFFSITE, SUCH EXTRAVAGANTLY EXPENSIVE STRATEGIES AS UPGRADING OF LOCAL ROADWAYS, AND USE OF "PILOT CARS" TO ACCOMPANY TRUCKS HAULING SOIL, APPEAR INEXPLICABLY TO HAVE RECEIVED SERIOUS CONSIDERATION.

THE DETAILS OF THE SELECTED REMEDIAL OPTIONS WILL BE EVALUATED MORE CLOSELY DURING THE DESIGN OF THE OPTION. UPGRADING OF ROADS AND USE OF VARIOUS CONTROL DEVICES WILL BE USED AS REQUIRED TO IMPLEMENT THE SELECTED REMEDIAL ALTERNATIVE AND PROTECT THE SAFETY OF WORKERS AND THE PUBLIC.

{THERMAL TREATMENT} TECHNOLOGIES SPECIFICALLY DESIGNED FOR LOW BTU-VALUE SOILS, AND WHICH ARE THEREFORE MUCH LESS COSTLY AND MORE EFFICIENT, ARE NOT ADEQUATELY CONSIDERED. ONE VERY PROMISING TECHNOLOGY RECEIVING SCANT MENTION IS INDIRECT-FIRED THERMAL TREATMENT WITH DRY POLLUTION CONTROL. THIS TECHNOLOGY IS WELL-DEVELOPED AND HAS BEEN TESTED ON TCDD-CONTAMINATED SOIL.

AS NOTED IN THE FEASIBILITY STUDY:

"REMEDIAL ALTERNATIVES EVALUATED IN THIS FEASIBILITY STUDY ARE GENERAL APPROACHES TO REMEDIATION FOR THE SITE. HOWEVER, SPECIFIC CONCEPTUAL DESCRIPTIONS ARE GIVEN FOR EACH ALTERNATIVE FOR PURPOSES OF EVALUATION. EACH DESCRIPTION IS REPRESENTATIVE OF THE ALTERNATIVE AND WAS SELECTED USING GENERAL RATIONALE GIVEN IN THE TEXT."

"IT IS BEYOND THE SCOPE OF THIS STUDY TO MAKE A DEFINITIVE DETERMINATION OF THE PRECISE TECHNOLOGIES USED FOR EACH REMEDIAL ALTERNATIVE. A MORE DEFINITIVE ANALYSIS OF THE SELECTED REMEDIAL ALTERNATIVE WILL BE REQUIRED DURING PREDESIGN OF THE SELECTED ALTERNATIVE. IT IS LIKELY, THEREFORE, THAT THE FINAL REMEDIAL ACTIONS TAKEN AT THE SITE WILL VARY SOMEWHAT FROM THOSE DESCRIBED IN THE STUDY."

IF THERMAL TREATMENT WERE SELECTED FOR SITE REMEDIATION, TECHNOLOGIES SUCH AS THE ONES DESCRIBED BY THE COMMENTOR MAY BE PROPOSED FOR USE AT THE SITE. SUCH PROPOSALS WOULD BE CONSIDERED BY EPA AT THAT STAGE IN THE PROJECT.

DRY POLLUTION CONTROL TECHNIQUES WOULD ELIMINATE THE NEED FOR WASTEWATER TREATMENT AND REDUCE CONTAMINATION OF ADDITIONAL MATERIAL WITH TCDD,...

IF THERMAL TREATMENT WERE SELECTED AS A REMEDIAL ALTERNATIVE, ALTERNATE METHODS OF POLLUTION CONTROL WOULD BE EVALUATED DURING THE DESIGN PHASE OF THE PROJECT. METHODS OF POLLUTION CONTROL DIFFERENT FROM THOSE DESCRIBED IN THE FEASIBILITY STUDY MAY BE OFFERED BY THOSE PROPOSING TO PERFORM THE REMEDIAL ACTIVITIES. THESE ALTERNATE METHODS WILL BE EVALUATED TO ENSURE THAT THE SELECTED METHOD MEETS REQUIRED PERFORMANCE OBJECTIVES.

...THERE IS JUSTIFICATION NEITHER FOR EXTENSIVE RETESTING NOR FOR DISPOSING OF THESE MATERIALS {UNCONTAMINATED STRUCTURES AND DEBRIS} OTHER THAN IN A STANDARD CONSTRUCTION/DEMOLITION LANDFILL ONSITE.

STRUCTURES AND DEBRIS AT TIMES BEACH MUST BE TESTED TO CONFIRM THAT THEY ARE NOT CONTAMINATED AND CAN BE DISPOSED OF AS NON-HAZARDOUS SOLID WASTE. IF CONTAMINATION IS DETECTED, DECONTAMINATION MUST BE PERFORMED PRIOR TO DISPOSAL IN A SOLID WASTE DISPOSAL FACILITY, IN ACCORDANCE WITH PERMITTING REQUIREMENTS.

THERE IS NO APPARENT REASON WHY AN INCINERATOR AT TIMES BEACH COULD NOT BE APPROPRIATELY SIZED TO HANDLE SOIL FROM ANY MISSOURI TCDD SITE WHERE A DETERMINATION HAS BEEN MADE TO EXCAVATE SOIL.

DURING THE DESIGN PHASE, PERFORMANCE STANDARDS WILL BE PREPARED WHICH WILL REQUIRE THAT THE THERMAL TREATMENT UNIT IS CAPABLE OF TREATING A GIVEN VOLUME OF CONTAMINATED SOIL IN A SPECIFIED TIME FRAME. ALTHOUGH DECISIONS HAVE NOT BEEN MADE TO EXCAVATE AND TREAT SOILS FROM THE ADDITIONAL POTENTIAL SITES IDENTIFIED IN THE PROPOSED PLAN, THE THERMAL TREATMENT UNIT DESIGN WILL ALLOW FOR THE POTENTIAL TREATMENT OF SOILS FROM THESE SITES AT TIMES

BEACH.

EACH SITE HAS BEEN TREATED AS A SEPARATE PROBLEM, WITH NO ATTEMPT TO ACHIEVE CONSISTENCY, COORDINATION, OR ECONOMIES OF SCALE. SUCH AN APPROACH HAS BEEN BOTH UNNECESSARY AND UNNECESSARILY COSTLY. GROUPING OF RELATED, NON-CONTIGUOUS SITES IS EXPRESSLY PERMITTED UNDER 42 U.S.C. SECTION 9604(D)(4).

ALTERNATIVES EVALUATED IN THE PROPOSED PLAN INCLUDE POTENTIAL RESPONSES AT ALL IDENTIFIED EASTERN MISSOURI DIOXIN SITES. IT IS NOT APPROPRIATE TO EVALUATE REMEDIAL ALTERNATIVES FOR TIMES BEACH AND THE MINKER/STOUT/ROMAN CREEK SITE IN ISOLATION. THE COST EFFECTIVENESS OF THE REMEDY FOR TIMES BEACH AND THE MINKER/STOUT/ROMAINE CREEK SITE MUST BE EVALUATED IN CONSIDERATION OF THE POTENTIAL NEED FOR RESPONSE AT OTHER NEARBY RELATED SITES. THIS EVALUATION IS PERFORMED IN THE PROPOSED PLAN.

RISK ASSESSMENT

THE USE OF THE SINGLE HIGHEST VALUE FOR TCDD SOIL CONTAMINATION, WITHOUT GIVING DUE WEIGHT TO THE RESULTS OF MORE THAN 500 OTHER SOIL SAMPLES WHICH REFLECT AN AVERAGE TCDD CONCENTRATION OF LESS THAN 2.5 PPB, IS A TOTALLY INAPPROPRIATE AND UNREALISTIC APPROACH....IT WOULD BE MUCH MORE APPROPRIATE TO USE A TCDD SOIL CONCENTRATION VALUE OF 2.5 PPB RATHER THAN 1200 PPB IN THE RISK ANALYSIS.

THE USE OF A MAXIMUM IS COMPATIBLE WITH THE METHODS OUTLINED IN THE SUPERFUND PUBLIC HEALTH EVALUATION MANUAL AND REPRESENTS A CONSERVATIVE ESTIMATE OF RISK. THIS WAS CAREFULLY NOTED IN THE FEASIBILITY STUDY.

BECAUSE THE FEASIBILITY STUDY ERRONEOUSLY CONSIDERS TIMES BEACH A RESIDENTIAL SITE, IT HAS GREATLY OVERESTIMATED THE CONTRIBUTION OF SOIL INGESTION TO THE LIFETIME AVERAGE DAILY DOSE OF TCDD. SOIL INGESTION WILL NOT BE A SIGNIFICANT EXPOSURE PATHWAY AT A NON-RESIDENTIAL TIMES BEACH.

A CLEANUP LEVEL OF 20 PPB HAS BEEN ESTABLISHED FOR TIMES BEACH WHICH IS APPROPRIATE FOR NON-RESIDENTIAL EXPOSURE. THIS CLEANUP LEVEL IS BASED ON RECOMMENDATIONS FROM FEDERAL AND STATE HEALTH AGENCIES, AS DISCUSSED IN THE PROPOSED PLAN, AND CONSIDERS LIMITED INGESTION IN NON-RESIDENTIAL AREAS.

BASED UPON THE CDC APPROACH AND CDC ASSUMPTIONS RELATING TO TCDD RISK TO HUMAN HEALTH, THE LEVEL OF CONCERN FOR TCDD AT A NON-RESIDENTIAL SITE IS 20 PPB.

A CLEANUP LEVEL OF 20 PPB HAS BEEN ESTABLISHED AT TIMES BEACH.

...ANIMALS AT TIMES BEACH WOULD NOT CONSUME SUFFICIENT SOIL TO PRODUCE ADVERSE EFFECTS.

ELEVATED LEVELS OF DIOXIN HAVE BEEN DETECTED IN WILDLIFE AT THE SITE. DUE PARTIALLY TO POTENTIAL BIOACCUMULATION IN WILDLIFE, A ONE CLEAN FOOT SOIL LAYER OF CLEAN SOIL IS A COMPONENT OF THE SELECTED REMEDY AT TIMES BEACH.

EXECUTIVE SUMMARY

THE DEFINITION OF A COST-EFFECTIVE ALTERNATIVE REFERRED TO IN THE EXECUTIVE SUMMARY OF THE FEASIBILITY STUDY APPEARS TO BE THE ONE USED IN THE NATIONAL OIL AND HAZARD SUBSTANCES CONTINGENCY PLAN (NCP) OF 1983 RATHER THAN THAT WHICH APPEARS IN THE 1985 REVISION.

THIS DISCREPANCY HAS BEEN CORRECTED IN THE PROPOSED PLAN AND ROD.

...A PRIMARY INCENTIVE FOR THE EPA BUY OUT OF TIMES BEACH WAS RELATED TO THE NEED FOR A PERMANENT SOLUTION TO THE ROUTINE FLOODING OF THE TOWN. IN SHORT, THE PRIMARY PURPOSE OF THE BUY OUT WAS TO IMPROVE THE SOCIAL GOOD, NOT TO PROTECT INHABITANTS

FROM THE TCDD HAZARD.

MANY CITIES AND TOWNS ARE ROUTINELY FLOODED BUT ARE NOT BOUGHT OUT BY THE FEDERAL GOVERNMENT. THE BUY OUT, AS NOTED BY REFERENCE MATERIAL INCLUDED BY THE COMMENTOR, WAS INITIATED WHEN CDC RECOMMENDED THAT RESIDENTIAL EXPOSURE TO SOILS CONTAINING TCDD EXCEEDING 1 PPB REPRESENTED A LEVEL OF CONCERN, WHICH WAS THE CASE AT TIMES BEACH.

...THESE FIGURES FOR THE VARIOUS SOIL VOLUMES ARE SEVERAL TIMES GREATER THAN THE AMOUNT OF SOIL IN EXCESS OF 1 PPB WHICH ACTUALLY EXISTS IN TIMES BEACH,...

THE VOLUMES OF SOIL PRESENTED IN THE FEASIBILITY STUDY ARE REMEDIATION VOLUMES ESTIMATED FROM AVAILABLE SAMPLING DATA AND ASSUMPTIONS REGARDING THE EXTENT OF EXCAVATION THAT WOULD BE REQUIRED. IT IS EXPECTED THAT THE FINAL EXCAVATED VOLUME WILL DIFFER FROM THE ESTIMATES PRESENTED IN THE FEASIBILITY STUDY.

THE (RISK) ESTIMATES ARE LIKELY TO OVERESTIMATE THE ACTUAL RISKS BY A FACTOR BETWEEN 500 AND 5,000.

AS NOTED IN THE FEASIBILITY STUDY, THE ESTIMATES OF RISK ARE CONSIDERED TO BE CONSERVATIVE ESTIMATES CALCULATED IN ACCORDANCE WITH EPA POLICY GUIDANCE.

...THE SAMPLING WAS BIASED UPWARDS BECAUSE IT FOCUSED ON AREAS OF SUSPECTED CONTAMINATION.

THIS IS A PRIMARY REASON THAT EXISTING SAMPLING DATA COULD NOT BE USED TO DEVELOP AN AVERAGE CONCENTRATION FOR RISK EVALUATION PURPOSES. EPA'S SAMPLING STRATEGY IS TO DEFINE THE SOURCE OF CONTAMINATION, IN THIS CASE THE ROADWAYS, AND EXPAND THE SAMPLING PERIMETER FROM THE SOURCE UNTIL THE AREAL EXTENT OF CONTAMINATION IS DEFINED.

THE FEASIBILITY STUDY SHOULD CONTAIN AN EVALUATION OF THE POTENTIAL HEALTH RISKS ASSOCIATED WITH VARIOUS LEVELS OF TCDD CONTAMINATION OF THE SOIL.

EPA HAS RELIED UPON RECOMMENDATIONS OF FEDERAL AND STATE HEALTH AGENCIES IN DETERMINING THE HEALTH RISKS POSED BY VARIOUS LEVELS OF TCDD CONTAMINATION. FOR THE CASE OF TIMES BEACH THESE HEALTH AGENCIES HAVE RECOMMENDED APPROPRIATE CLEANUP LEVELS FOR DIFFERENT LAND USES.

ALTHOUGH THE USE OF THE SINGLE HIGHEST GROUNDWATER SAMPLE MAY BE APPROPRIATE FOR ESTIMATING ULTIMATE EXPOSURE TO THE COMMUNITY, THIS APPROACH WAS NOT INTENDED, NOR CAN IT BE JUSTIFIED, FOR APPLICATION TO THE RISK ASSESSMENT OF CONTAMINATED SOIL.

THIS COMMENT HAS BEEN RESPONDED TO PREVIOUSLY.

...THE SUPERFUND RISK ASSESSMENT GUIDELINES WERE NOT INTENDED FOR CONTAMINATED SOIL.

THE SUPERFUND PUBLIC HEALTH EVALUATION MANUAL (EPA, 1986) IS CLEARLY INTENDED TO BE USED FOR SOIL AS WELL AS OTHER RELEASE MEDIUMS. FOR EXAMPLE, PAGES 41 TO 46 OF THE MANUAL, WHICH DESCRIBE PROCEDURES FOR IDENTIFYING RELEASE SOURCES AND MEDIA, IDENTIFY SOIL AS WELL AS AIR, SURFACE WATER, AND GROUNDWATER AS SOURCES TO BE EVALUATED.

...THE RELATIVELY FEW HIGH VALUES OF TCDD DETECTED IN TIMES BEACH WERE OBTAINED PRIMARILY FROM BENEATH PAVED ROADS WHERE HUMAN EXPOSURE IS VIRTUALLY IMPOSSIBLE.

THE ROADWAYS THROUGHOUT TIMES BEACH GENERALLY CONSIST OF DETERIORATING MACADAM WHICH CAN NOT BE EXPECTED TO PROVIDE AN EFFECTIVE LONG-TERM BARRIER AGAINST EXPOSURE. THE DIOXIN LEVEL USED FOR THE RISK ASSESSMENT RESULTED FROM ANALYSIS OF A SOIL SAMPLE COLLECTED AT TIMES BEACH IN A NON-PAVED AREA.

A CENTRAL PROBLEM WITH THE CURRENT FEASIBILITY STUDY IS THAT MUCH OF THE DISCUSSION IS PREDICATED UPON A 1 PPB LEVEL OF CONCERN FOR A RESIDENTIAL SITE, WHICH IS NOT ONE

OF THE SETTINGS CONSIDERED IN THE PUBLIC HEALTH ASSESSMENT.

THE PUBLIC HEALTH ASSESSMENT IN THE FEASIBILITY STUDY DID CONSIDER A FUTURE RESIDENTIAL SETTING. FURTHERMORE, THE RISKS POSED BY EXPOSURE TO SOILS CONTAINING TCDD IN EXCESS OF 1 PPB IN A RESIDENTIAL SETTING HAVE BEEN ESTIMATED BY THE CDC. THE INCREASED-CANCER RISKS DUE TO SUCH AN EXPOSURE WERE ESTIMATED TO EXCEED $10(-5)$ TO $10(-8)$.

THE FEASIBILITY STUDY PROPERLY RECOGNIZES THAT IT IS COMPLETELY INAPPROPRIATE TO RETURN TIMES BEACH TO RESIDENTIAL USE. NONETHELESS, THE FEASIBILITY STUDY PROCEEDS TO TREAT TIMES BEACH AS A RESIDENTIAL SITE.

THE FEASIBILITY STUDY DOES NOT CLAIM THAT IT IS "COMPLETELY INAPPROPRIATE" TO RETURN TIMES BEACH TO RESIDENTIAL USE. IT IS NOTED THAT SUCH A USE IS POSSIBLE, ALTHOUGH NOT LIKELY.

...SOIL LEVELS OF TCDD IN EXCESS OF 40 PPB FOR RESIDENTIAL AREAS AND SOIL LEVELS IN EXCESS OF 120 PPB IN NON-RESIDENTIAL AREAS SHOULD BE ACCEPTABLE.

EPA HAS RELIED UPON RECOMMENDATIONS OF FEDERAL AND STATE HEALTH AGENCIES TO DETERMINE AN APPROPRIATE CLEANUP LEVEL. THE LEVELS NOTED BY THE COMMENTOR EXCEED THE LEVEL OF CONCERN RECOMMENDED BY THESE HEALTH AGENCIES.

ANY RISK ASSESSMENT PROCEDURE THAT WOULD SUGGEST THAT 3 OF EVERY 10 PERSONS WHO OCCASIONALLY VISITS TIMES BEACH WILL DEVELOP CANCER AS A RESULT OF EXPOSURE MUST BE GROSSLY OVERESTIMATED.....IT IS PARTICULARLY TROUBLESOME THAT SUCH RISKS WOULD BE IDENTIFIED FOR THIS SETTING IN VIEW OF THE AMPLE EVIDENCE INDICATING THAT, UNTIL EXPOSURES ARE SUFFICIENT TO PRODUCE CHLORACNE, NOT ONLY WOULD AN INCREASE IN CANCER NOT BE EXPECTED, BUT ALSO NO OTHER ADVERSE HEALTH EFFECTS WOULD BE ANTICIPATED.

THE RISK ESTIMATES DEVELOPED IN THE FEASIBILITY STUDY ARE CONSERVATIVE ESTIMATES, AS NOTED PREVIOUSLY AND IN THE FEASIBILITY STUDY. THE ESTIMATES ARE BASED ON THE SPECIFIC ASSUMPTIONS NOTED IN THE TEXT.

TIMES BEACH SHOULD NOT BE RESTORED TO RESIDENTIAL USE.

EPA IS NOT PROPOSING TO RESTORE TIMES BEACH TO RESIDENTIAL USAGE. THE AGENCY'S PREFERRED ALTERNATIVE IS DESCRIBED IN THE PROPOSED PLAN.

IT WOULD BE USEFUL FOR THE REPORT TO PUT THIS LEVEL OF INCREASED RISK INTO PERSPECTIVE.

...IF A 1 PPB CLEAN-UP LEVEL IS IMPLEMENTED, THE NECESSARY DEGREE OF CLEAN-UP IS OVERESTIMATED BY AT LEAST A FACTOR OF 50 TO 100-FOLD.

AS NOTED PREVIOUSLY, EPA HAS RELIED UPON RECOMMENDATIONS OF FEDERAL AND STATE HEALTH AGENCIES IN DETERMINING THE DEGREE OF REMEDIATION THAT IS REQUIRED.

SECTION 2--BACKGROUND

THE FIRST SENTENCE SHOULD BE REVISED TO READ, "TIMES BEACH IS IN SOUTHWEST ST. LOUIS COUNTY, APPROXIMATELY 20 MILES SOUTHWEST OF THE CITY OF ST. LOUIS..."

THE STATEMENT MADE IN THE FEASIBILITY STUDY IS CORRECT. THE DISTANCE FROM TIMES BEACH TO ST. LOUIS WILL DEPEND UPON THE POINTS OF MEASUREMENT, SO DIFFERENT DISTANCES ARE POSSIBLE.

THE FIRST SENTENCE SHOULD BE REVISED TO READ, "... IT IS BELIEVED THAT THE TCDD MAY HAVE BEEN GENERATED AT THE NEPACCO CHEMICAL PLANT IN VERONA, MISSOURI."

THE SENTENCE IS CORRECT AS PRESENTED IN THE FEASIBILITY STUDY.

...SAMPLING EXERCISES ARE SIGNIFICANTLY BIASED BECAUSE SAMPLING EFFORTS HAVE FOCUSED ON SUSPECTED HOTSPOTS WITH MINIMAL EMPHASIS ON ASSESSING THE MOST REPRESENTATIVE LEVEL OF ACTUAL CONTAMINATION AT THE SITE.

EPA AGREES THAT THE ORIGINAL SAMPLING WAS TARGETED TO THE MOST LIKELY AREAS OF CONTAMINATION. THIS SAMPLING PROGRAM IS COST-EFFECTIVE AND SUITABLE FOR FEASIBILITY STUDY ANALYSIS. IT IS EXPECTED THAT ADDITIONAL SAMPLING AND ANALYSES WILL BE REQUIRED PRIOR TO SITE REMEDIATION.

REPLACE THE FIRST PARAGRAPH WITH THE FOLLOWING: ...A NUMBER OF THE STREETS IN THE 1 TO 5 PPB RANGE WERE NOT SPRAYED DIRECTLY; CONTAMINATION IN THESE CASES IS THE RESULT OF VEHICULAR TRACKING."

SOME CONTAMINATED STREETS MAY NOT HAVE BEEN SPRAYED DIRECTLY. IT IS NOT POSSIBLY, ON THE BASIS OF RECORDS OR AVAILABLE DATA, TO DETERMINE PRECISELY WHICH STREETS WERE ORIGINALLY SPRAYED WITH CONTAMINATED WASTE OIL. MANY OF THE STREETS MAY HAVE BECOME CONTAMINATED AS A RESULT OF VEHICULAR TRAFFIC.

VERTICAL MIGRATION WOULD NOT BE EXPECTED IN AREAS OTHER THAN THOSE DIRECTLY SPRAYED WITH WASTE OIL.

THE AVAILABLE DATA AND CHARACTERISTICS OF DIOXIN SUGGEST THAT VERTICAL MIGRATION POTENTIAL IS LESS IN NON-SPRAYED AREAS THAN IN SPRAYED AREAS.

THE FACT THAT ONLY 3 OF 26 YARD SAMPLES YIELD DETECTABLE LEVELS CONFIRMS THE FACT THAT CONTAMINATION IS NOT WIDESPREAD AND IS CONFINED TO ROADWAYS AND SURFACE DRAINAGE WAYS.

THE PROPOSED PLAN NOTES THAT THE AVAILABLE DATA INDICATES THAT CONTAMINATION IS GENERALLY LIMITED TO ROADWAYS THROUGHOUT TIMES BEACH.

...VOLUME ESTIMATES CORRESPOND TO "LOOSE" VOLUMES RATHER THAN "BANK" VOLUMES. CONSEQUENTLY, THE VOLUMES CITED ARE NOT TRUE REMEDIATION VOLUMES.

THE VOLUME ESTIMATES IN THE FEASIBILITY STUDY ARE "LOOSE" VOLUMES. SINCE THE VOLUME ESTIMATES ARE RELEVANT PRIMARILY TO THE ALTERNATIVES THAT INVOLVE REMOVAL, THE LOOSE VOLUMES REPRESENT THE VOLUMES OF MATERIAL THAT WOULD REQUIRE HANDLING.

IN MANY CASES, THE SURFACE CONCENTRATION (WHICH GOVERNS RISK) WAS LESS THAN THAT DETECTED AT 6 INCH DEPTH.

SURFACE CONCENTRATIONS OF DIOXIN HAVE BEEN DETERMINED USING A STATISTICALLY BASED SAMPLING PROTOCOL WHICH DETERMINES AVERAGE CONCENTRATIONS WITHIN INDIVIDUAL PORTIONS OF THE SITE TO THE 95% UPPER CONFIDENCE LEVEL. THIS SAMPLING HAS DEFINED AREAS WITHIN TIMES BEACH REQUIRING RESPONSE.

SECTION 3--SUMMARY OF PUBLIC HEALTH AND ENVIRONMENTAL ASSESSMENT

"FOR THE FUTURE SETTINGS IT IS ASSUMED THAT SITE ACCESS WOULD NOT BE RESTRICTED AND LAND USE IN THE VICINITY OF THE SITE WOULD DIFFER FROM CURRENT LAND USE." THIS STATEMENT IS INCONSISTENT WITH THE FEASIBILITY STUDY INTRODUCTION AND EXECUTIVE SUMMARY,...

THIS ANALYSIS WAS INCLUDED IN THE BASELINE PUBLIC HEALTH EVALUATION TO DETERMINE PRESENT RISK UNDER A NUMBER OF POTENTIAL EXPOSURE SCENARIOS.

THE FEASIBILITY STUDY SHOULD INDICATE THE CRITERIA BY WHICH THESE 12 CONTAMINANTS (OTHER ORGANICS) WERE IDENTIFIED.

THE CRITERIA USED TO IDENTIFY THE 12 OTHER ORGANIC CONTAMINANTS IS DESCRIBED IN APPENDIX B

TO THE FEASIBILITY STUDY.

ALTHOUGH APPENDIX B DOES CONTAIN SOME DISCUSSION OF THESE (OTHER ORGANIC) CHEMICALS, IT IS NOT ADEQUATELY DETAILED.

EPA CONSIDERS THE DISCUSSION OF OTHER ORGANIC CONTAMINANTS TO BE ADEQUATELY DETAILED. THE FOCUS OF THE FEASIBILITY STUDY WAS REMEDIATION OF STRUCTURES AND DEBRIS AND DIOXIN-CONTAMINATED SOILS AT TIMES BEACH. THE PROPOSED PLAN STATES THAT AN ADDITIONAL EVALUATION WILL BE PERFORMED TO CHARACTERIZE AND EVALUATE OTHER NON-DIOXIN CONTAMINATION.

...IT IS AN OVERSTATEMENT TO CLAIM THAT SEVERAL OF THE OTHER ORGANIC CHEMICALS ARE PROBABLE CARCINOGENS.

AMONG THE OTHER ORGANIC CHEMICALS, TRICHLOROETHYLENE AND BIS(2ETHYLHEXYL) PHTHALATE ARE CLASSIFIED BY THE EPA CARCINOGEN ASSESSMENT GROUP AS PROBABLE CARCINOGENS, AND 1,1,2,2-TETRACHLOROETHANE IS CLASSIFIED AS A POSSIBLE CARCINOGEN. THE LISTING OF BIS(2-ETHYLHEXYL) PHTHALATE AS A PROBABLE HUMAN CARCINOGEN WAS MADE AFTER THE FEASIBILITY STUDY WAS RELEASED.

IT IS NOT JUSTIFIED TO REFER TO THOSE PERSONS THAT LIVE WITHIN A HALF MILE OF TIMES BEACH AS "LOCAL RESIDENTS"...

IT WAS STATED EXPLICITLY IN THE FEASIBILITY STUDY THAT THERE ARE NO PEOPLE LIVING AT TIMES BEACH. THE FEASIBILITY STUDY DEFINES LOCAL RESIDENTS AS THOSE LIVING WITHIN A HALF-MILE RADIUS OF TIMES BEACH.

...RETURNING TIMES BEACH TO RESIDENTIAL USE WOULD BE UNLAWFUL UNDER CERCLA. IT IS INCONSISTENT WITH THIS STATUTORY SCHEME FOR EPA FIRST TO RELOCATE A COMMUNITY PERMANENTLY AND THEN TO PERFORM FURTHER REMEDIAL ACTION TO RETURN THE SITE TO RESIDENTIAL USE. THERE IS NO PROVISION OF CERCLA AUTHORIZING EPA TO ENTER INTO A LAND DEVELOPMENT BUSINESS, IN WHICH COMMUNITY RESIDENTS ARE EVICTED AND OTHER INDIVIDUALS ARE RECRUITED TO RESIDE IN A COMMUNITY AFTER IT IS RESTORED.

WHILE IT IS NOT UNLAWFUL UNDER CERCLA TO RETURN TIMES BEACH TO RESIDENTIAL USE, AS DISCUSSED IN THE PROPOSED PLAN, EPA IS NOT PROPOSING TO RETURN TIMES BEACH TO RESIDENTIAL USAGE. CERTAIN NON-RESIDENTIAL USES OF THE SITE WILL BE POSSIBLE FOLLOWING SITE REMEDIATION. TITLE TO THE SITE FOLLOWING THE CLEANUP WILL BE HELD BY THE STATE OF MISSOURI. THROUGH THIS MECHANISM, AND THE MISSOURI REGISTRY OF ABANDONED OR UNCONTROLLED HAZARDOUS WASTE SITES, THE STATE WILL HAVE CONTROL OVER FUTURE LAND USE AT TIMES BEACH. IT IS POSSIBLE THAT LOCAL ZONING ORDINANCES MAY BE INSTITUTED WHICH ALSO CONTROL FUTURE LAND USE AT TIMES BEACH.

...EVEN IF CROPS WERE GROWN ON THE SITE, SCIENTIFIC DATA EXIST THAT PLANTS, IN GENERAL, DO NOT TAKE UP TCDD FROM THE SOIL. MOREOVER, THE TCDD EXPOSURE TO AGRICULTURAL WORKERS WOULD BE DE MINIMUS, IN CONTRAST TO THE CLAIMS IN THE FEASIBILITY STUDY.

AS NOTED IN THE FEASIBILITY STUDY, THERE IS CONFLICTING EVIDENCE REGARDING THE UPTAKE OF TCDD BY PLANTS. ESTIMATES OF PLANT UPTAKE ON TCDD CONCENTRATION WERE NOT USED TO ESTIMATE RISKS TO AGRICULTURAL WORKERS. THE PRIMARY ROUTES OF EXPOSURE FOR AGRICULTURAL WORKERS WERE ASSUMED TO BE DUST INHALATION AND HAND-TO-MOUTH INGESTION OF CONTAMINATED SOIL.

...THESE RISK RANGES ARE NOT TAKEN FROM THE SUPERFUND PUBLIC HEALTH EVALUATION MANUAL (EPA, 1985) AS IMPLIED BY THESE STATEMENTS. IF THERE IS A SOURCE OR A PUBLISHED POLICY POSITION THAT MANDATES THAT RISK BE KEPT WITHIN THIS RANGE, IT SHOULD BE CITED.

AS NOTED ON PAGE 118 OF THE SUPERFUND PUBLIC HEALTH EVALUATION MANUAL (EPA, 1986):
"ACCORDING TO AGENCY POLICY, THE TARGET TOTAL INDIVIDUAL CARCINOGENIC RISK RESULTING-FROM

EXPOSURES AT A SUPERFUND SITE MAY RANGE ANYWHERE BETWEEN 10^{-4} TO 10^{-7} ."

...THESE REPRESENT ONLY DRAFT GUIDELINES AND WERE PRIMARILY INTENDED TO BE APPLIED WHERE POPULATIONS EXPOSED TO THIS DEGREE OF RISK WERE IN EXCESS OF 10,000 PERSONS.

AS NOTED ON PAGE 1 OF THE SUPERFUND PUBLIC HEALTH EVALUATION MANUAL (EPA, 1986):

"THIS MANUAL ESTABLISHES A FRAMEWORK FOR PUBLIC HEALTH EVALUATION AT SUPERFUND SITES AND FOR DEVELOPMENT OF HEALTH-BASED PERFORMANCE GOALS FOR REMEDIAL ALTERNATIVES THAT ARE BASED ON APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS OF OTHER LAWS, WHERE AVAILABLE, OR RISK ANALYSIS TECHNIQUES WHERE THOSE REQUIREMENTS ARE NOT AVAILABLE.

THERE ARE NO LIMITATIONS NOTED IN THE MANUAL ON THE POPULATIONS EXPOSED.

IT IS UNCLEAR HOW SOME OF THE VALUES FOR EXCESS CANCER RISK IN TABLE 3-3 WERE CALCULATED.

THE METHODOLOGY USED TO ESTIMATE EXCESS CANCER RISK IS DETAILED IN ATTACHMENT B-L TO THE RISK ASSESSMENT INCLUDED AS APPENDIX B.

WHILE THE AIRBORNE DUST CONCENTRATION OF 76 MG/M³ MAY BE REASONABLE FOR TOTAL SUSPENDED PARTICULATES (TSP), MUCH OF THE TSP IS NOT RESPIRABLE DUE TO THEIR LARGE SIZE.

IT IS AGREED THAT NOT ALL OF THE AIRBORNE DUST WOULD BE RESPIRABLE. HOWEVER, A SPECIFIC SIZE DISTRIBUTION FOR PARTICULATES AT TIMES BEACH IS NOT AVAILABLE. GENERALLY, 25 TO 90 PERCENT OF AIRBORNE DUST IS RESPIRABLE. IT WAS CONSERVATIVELY ESTIMATED IN THE FEASIBILITY STUDY THAT 100 PERCENT OF THE AIRBORNE DUST WOULD BE RESPIRABLE. IT IS LIKELY THAT THE ACTUAL RESPIRABLE FUNCTION WOULD BE LESS THAN ASSUMED.

FURTHER, NOT ALL AIRBORNE DUST ARISES FROM SOIL OR CRUSTAL MATERIAL.

IT IS TRUE THAT NOT ALL DUST IS OF A SOIL OR CRUSTAL ORIGIN. HOWEVER, AT TIMES BEACH IT IS UNLIKELY THAT VEHICLE OR INDUSTRIAL EMISSIONS WOULD BE SIGNIFICANT CONTRIBUTORS TO AIRBORNE DUST. THE MOST LIKELY SOURCE AT THE SITE WOULD BE SOIL OR CRUSTAL MATERIAL AT THE SITE.

IT IS HIGHLY UNLIKELY THAT THERE WILL BE SECURITY GUARDS PATROLLING TIMES BEACH 8 HOURS PER DAY FOR 40 YEARS.

TIMES BEACH IS CURRENTLY PATROLLED BY SECURITY GUARDS HOURLY, 24 HOURS PER DAY. IT IS ANTICIPATED THAT THIS PRACTICE WILL CONTINUE UNTIL CLEANUP OF THE SITE HAS BEEN COMPLETED. IT IS THEREFORE NOT UNREASONABLE TO ASSUME THAT SECURITY GUARDS WILL REMAIN ONSITE. THE LENGTH OF TIME UNTIL CLEANUP IS COMPLETED IS DEPENDENT UPON REMEDY SELECTION.

WHILE THE FRACTION OF INHALED DUST THAT REACHES THE GASTROINTESTINAL TRACT IS 0.625, ONLY ABOUT 30% OF WHAT GETS THERE IS ABSORBED. IF A GASTROINTESTINAL BIOAVAILABILITY OF 30% IS TAKEN INTO ACCOUNT AND THE ADULT BODY WEIGHT OF 80 KG IS USED (DIEM AND LENTNER, 1973), THEN THE CANCER RISK DECREASES FURTHER TO 1.8×10^{-8} .

BIOAVAILABILITY OF DIOXIN IN MISSOURI SOILS HAS BEEN DETERMINED TO BE HIGHER THAN 30%. BIOAVAILABILITY FACTORS OF DIOXIN IN MISSOURI SOIL AS HIGH AS 60 - 70% HAVE BEEN REPORTED IN THE LITERATURE.

...THE EXPOSURE OF SUCH WORKERS TO AIRBORNE DUST IS SIMILAR TO THE SECURITY GUARD AND IS HERE CALCULATED ON THE BASIS OF UNREASONABLE ASSUMPTIONS.

ISSUES REGARDING AIRBORNE DUST HAVE BEEN PREVIOUSLY ADDRESSED.

...THE MEAN CONTAMINANT CONCENTRATION OF OTHER ORGANIC CONTAMINANTS SHOULD BE AT LEAST 10-FOLD LOWER THAN THE MAXIMUM CONTAMINANT CONCENTRATION.

ALTHOUGH EPA AGREES THAT THE MEAN CONCENTRATION WILL BE LOWER THAN THE MAXIMUM, IT IS NOT POSSIBLE TO ACCURATELY PREDICT MEAN CONCENTRATION ON THE BASIS OF THE MAXIMUM. UPPER BOUND ESTIMATES OF RISK ARE PRESENTED IN THE FEASIBILITY STUDY. IT IS ALSO POSSIBLE THAT SUBSEQUENT SAMPLING WILL DETECT HIGHER MAXIMUM CONCENTRATIONS.

THE AMOUNT OF SOIL ASSUMED TO BE INGESTED IS ALSO UNREALISTIC. THE FIGURE OF 50 OR 100 MG OF SOIL INGESTED PER DAY USED IN THE FEASIBILITY STUDY ARE ON THE HIGH RANGE OF WHAT HAS BEEN USED BY OTHER RISK ASSESSMENTS.

BASED ON A REVIEW OF THE LITERATURE, 50 TO 100 MG PER DAY OF SOIL INGESTED IS A REASONABLE ESTIMATE FOR SOIL INGESTION.

IT IS ALSO UNLIKELY THAT AN INDIVIDUAL WOULD INGEST 100 MG OF DIRT PER DAY DURING THE ENTIRE 185 DAY GROWING SEASON. ONLY ON TILLING DAYS COULD DIRT INGESTION APPROACH 100 MG/DAY.

A RANGE OF 50 TO 100 MG OF SOIL INGESTED PER DAY WAS USED IN THE FEASIBILITY STUDY. THE RANGE USED IS APPROPRIATE FOR THIS ACTIVITY.

...THE ADULT BODY WEIGHT IS CLOSER TO 80 KG THAN 70 KG.

AS NOTED LATER BY THE COMMENTOR, 80 KG IS THE AVERAGE BODY WEIGHT FOR ADULT MALES. SINCE THE EXPOSURE COULD OCCUR FOR BOTH MALES AND FEMALES, AN AVERAGE BODY WEIGHT THAT CONSIDERS BOTH SEXES WOULD BE APPROPRIATE.

THE AVERAGE ADULT BODY WEIGHT IS CLOSER TO 70 KG (155 LB) THAN 80 KG (170 LB).

SECTION 4--SCREENING OF ALTERNATIVES

THE GENERAL DISCUSSION AT PAGES 4-1 TO 4-3 DOES NOT REFLECT MORE RECENT EPA FINAL GUIDANCE SUCH AS THE EPA "INTERIM GUIDANCE ON SUPERFUND SELECTION OF REMEDY," DEC. 24, 1986, REPRINTED IN {CURRENT DEVELOPMENTS} 17 ENV'T REP. (BNA) 1603-7 (JAN. 16, 1987) OR EPA DRAFT GUIDANCE DEVELOPED SUBSEQUENT TO ENACTMENT OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986, ("SARA") P.L. 99-499, 100 STAT. 1613 (1986), E.G., "SUPERFUND SELECTION OF REMEDY STRATEGIES AND OPTIONS," NOVEMBER 12, 1986; "SUPERFUND SELECTION OF REMEDY: DRAFT NCP LANGUAGE (RI/FS SECTION)," FEBRUARY 26, 1987.

THE FEASIBILITY STUDY, WHICH WAS RELEASED FOR PUBLIC COMMENT ON DECEMBER 18, 1986, CAN NOT REFLECT GUIDANCE THAT WAS PUBLISHED SUBSEQUENT TO ITS RELEASE. THE FEASIBILITY STUDY IS CONSIDERED TO BE COMPATIBLE WITH THE REQUIREMENTS OF SARA.

...EPA STATES THAT THE STATE OF MISSOURI HAS NOT DESIGNATED A FINAL USE FOR TIMES BEACH. IT IS LOGICALLY IMPOSSIBLE TO GENERATE A FEASIBILITY STUDY WITHOUT SUCH A DETERMINATION.

RISKS WERE EVALUATED FOR A RANGE OF POTENTIAL FUTURE LAND USES. FEDERAL AND STATE HEALTH AGENCIES HAVE RECOMMENDED APPROPRIATE CLEANUP LEVELS FOR DIFFERENT FUTURE USES. THIS INFORMATION ALLOWS A VALID RISK-BASED REMEDY SELECTION TO BE PERFORMED. THE REVISED COST AND NON-COST EVALUATION OF ALTERNATIVES PASSING FINAL SCREENING IS PRESENTED IN THE PROPOSED PLAN.

ACCORDING TO THE FEASIBILITY STUDY, A VITAL CONCERN FOR A "NO ACTION" ALTERNATIVE IS WIND EROSION OF TCDD CONTAMINATED SOIL. THIS IS NOT, IN FACT, A CONCERN WITH ENHANCED VEGETATION OR THE CURRENT STATE OF VEGETATION AT THE SITE.

WIND EROSION OF CONTAMINATED SOIL IS A CONCERN AT THE SITE. ALL CONTAMINATED SURFACES ARE NOT STABILIZED BY VEGETATION OR PAVEMENT.

...THE NON-RESIDENTIAL REMEDIATION LEVEL OF CONCERN SHOULD BE APPLIED TO A SITE WHICH EXPERIENCES REGULAR AND FREQUENT FLOODING DAMAGE.

EPA IS NOT PROPOSING TO RESTORE TIMES BEACH TO RESIDENTIAL USAGE. THE CLEANUP LEVEL ESTABLISHED FOR TIMES BEACH CORRESPONDS TO NONRESIDENTIAL USAGE.

IN MANY CASES THE "TYPICAL TECHNOLOGIES" COLUMN DOES NOT LIST ALL APPROPRIATE TECHNOLOGIES.

TYPICAL TECHNOLOGIES ARE INTENDED TO BE REPRESENTATIVE EXAMPLES. THE LIST OF TECHNOLOGIES WAS NOT INTENDED TO BE INCLUSIVE.

THE USE OF POSTED FENCING WOULD BE THE MOST COST EFFECTIVE MEANS OF SECURITY AT THE SITE AND WOULD ALLOW THE ELIMINATION OF 24 HOUR GUARD SERVICE.

POSTING OF THE SITE WOULD NOT PROVIDE ADEQUATE SECURITY. SITE INTRUDERS ARE FREQUENTLY APPREHENDED BY SECURITY GUARDS DURING PATROLS. ALL ROADWAYS LEADING TO TIMES BEACH ARE CURRENTLY BARRICADED AND POSTED WITH APPROPRIATE SIGNS.

SEDIMENTATION BASINS, COMBINED WITH A SITE PERIMETER FENCE, REPRESENT A MORE CONSERVATIVE METHOD OF MEETING THE GENERAL OBJECTIVES THAN THE "NO ACTION" RESPONSE.

SEDIMENTATION BASINS AND PERIMETER FENCING DO REPRESENT A MORE CONSERVATIVE REMEDY THAN "NO ACTION".

...THE USE OF APPROPRIATELY SIZED AND SELECTED EXCAVATION EQUIPMENT, COMBINED WITH BULK HANDLING TECHNIQUES, BULK STORAGE, AND ON-SITE DISPOSAL OR TREATMENT WILL PROVIDE SUBSTANTIAL SAVINGS OVER CONDUCTING AN EXCAVATION PROGRAM USING UNDERSIZED, POORLY SELECTED EXCAVATION EQUIPMENT, CONTAINERIZED HANDLING AND TEMPORARY STORAGE PRIOR TO DISPOSAL OR TREATMENT. ENORMOUS COST SAVINGS CAN BE REALIZED BY THE DRAMATIC REDUCTION IN LABOR AND THE ELIMINATION OF THE FOLLOWING: MULTIPLE HANDLING OF THE EXCAVATED MATERIALS; CONTAINER PURCHASE, HANDLING AND DISPOSAL COSTS; TEMPORARY STORAGE COSTS; TRANSPORTATION COSTS; HANDLING AT THE DISPOSAL OR TREATMENT AREA AND THE HUGE COST OF DISPOSAL OR TREATMENT.

THE TECHNIQUES DESCRIBED IN THE FEASIBILITY STUDY ARE TYPICAL OF THOSE USED WITH SUCCESS BY EPA IN VARIOUS REMOVAL EFFORTS IN MISSOURI. THE DETAILS OF THE EXCAVATION AND HANDLING STRATEGY WILL BE FURTHER EVALUATED IN THE PREDESIGN AND DESIGN PHASES OF THE PROJECT.

...THE ONLY KNOWN TREATMENT TECHNOLOGY WHICH IS CURRENTLY AVAILABLE AND WHICH CONSISTENTLY PROVIDES DESTRUCTION EFFICIENCIES THAT MEET REGULATORY REQUIREMENTS IS THERMAL TREATMENT.

THIS STATEMENT IS CONSISTENT WITH THE FEASIBILITY STUDY AND PROPOSED PLAN.

THE MOST COST EFFECTIVE MEANS OF THERMAL TREATMENT OF TCDD-CONTAMINATED SOIL IS THROUGH USE OF INDIRECT-FIRED INCINERATION COMBINED WITH DRY POLLUTION CONTROL.

ROTARY KILN INCINERATION WAS USED AS AN EXAMPLE OF THERMAL TREATMENT TECHNOLOGIES IN THE FEASIBILITY STUDY. ANY THERMAL TREATMENT TECHNOLOGY CAPABLE OF MEETING THE PERFORMANCE STANDARDS WILL BE CONSIDERED.

COSTS OF TREATMENT USING INDIRECT-FIRED TECHNOLOGY ARE IN THE RANGE \$150-\$250 PER TON OF SOIL PROCESSED.

ALTERNATIVE THERMAL TREATMENT TECHNOLOGIES MAY BE PROPOSED DURING THE BIDDING PHASE OF THE PROJECT AND WILL BE EVALUATED AT THAT TIME. IF INDIRECT-FIRED IS COST EFFECTIVE, ONE OR

MORE PROPOSALS INCORPORATING THIS TECHNOLOGY WOULD BE EXPECTED.

OTHER TREATMENT TECHNOLOGIES ARE EXPERIMENTAL IN THEIR LEVEL OF DEVELOPMENT, CREATE ENVIRONMENTAL PROBLEMS GREATER THAN THOSE THEY SOLVE, ARE EXTREMELY COSTLY, OR DO DON'T ATTAIN DESIRED DESTRUCTION OBJECTIVES.

THIS STATEMENT IS CONSISTENT WITH THE FEASIBILITY STUDY AND PROPOSED PLAN.

A METHOD WHICH IS NOT MENTIONED IN THE FEASIBILITY STUDY THAT MAY PROVIDE CONSIDERABLE PROMISE FOR IN SITU TREATMENT OF TCDD-CONTAMINATED SOILS IF "ENHANCED IN SITU PHOTOLYSIS."

IT IS DOUBTFUL THAT THE TECHNOLOGY WOULD ACHIEVE THE SITE-SPECIFIC OBJECTIVES REQUIRED AT THE SITE. THIS PROCESS WAS EVALUATED AND SCREENED DURING THE FEASIBILITY STUDY PROCESS. PHOTO-DEGRADATION HAS NOT RESULTED IN SIGNIFICANT REDUCTIONS IN SURFACE CONCENTRATIONS AT MISSOURI DIOXIN SITES INVESTIGATED.

TEMPORARY STORAGE OF CONTAMINATED MATERIALS SHOULD BE ELIMINATED AS AN OPTION...

THE SPECIFIC MATERIAL HANDLING DETAILS OF THE SELECTED ALTERNATIVE WILL BE DEVELOPED DURING THE PREDESIGN AND DESIGN PHASES OF THE PROJECT. TEMPORARY STORAGE WILL BE USED IF IT IS CONSIDERED TO BE COST-EFFECTIVE AND NECESSARY TO ENSURE THAT PERFORMANCE OBJECTIVES ARE MET, INCLUDING PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT.

IF "DISPOSAL" WERE SELECTED, THE EXCAVATED SOIL SHOULD BE HAULED DIRECTLY TO THE DISPOSAL SITE WITHOUT INTERIM STORAGE.

THE SPECIFIC MATERIAL HANDLING DETAILS OF THE SELECTED ALTERNATIVE WILL BE DEVELOPED DURING THE PREDESIGN AND DESIGN PHASES OF THE PROJECT. TEMPORARY STORAGE WILL BE USED IF IT IS CONSIDERED TO BE COST-EFFECTIVE AND NECESSARY TO ENSURE THAT PERFORMANCE OBJECTIVES ARE MET.

IF "TREATMENT" IS SELECTED, ONLY THAT AMOUNT OF SOIL REQUIRED TO PROVIDE FEED STOCK TO THE TREATMENT SYSTEM SHOULD BE TEMPORARILY STORED ON SITE, NOT TO EXCEED ONE MONTH'S CAPACITY OF THE TREATMENT SYSTEM.

THE AMOUNT OF SOIL STORED WOULD BE SUFFICIENT TO PERMIT COST-EFFECTIVE OPERATION OF THE TREATMENT SYSTEM. IF CAPACITY IS EXCESS OF ONE MONTH CAPACITY WAS REQUIRED, THAT QUANTITY WOULD BE STORED. THE SPECIFIC DETAILS OF SOIL STAGING REQUIREMENTS WOULD BE CONSIDERED FURTHER DURING DESIGN OF THE FACILITY.

STORAGE OF TCDD CONTAMINATED SOIL IS VERY STRAIGHTFORWARD AND DOES NOT REQUIRE RIGOROUS FACILITY DESIGN DUE TO ITS VERY INSOLUBLE AND NON-VOLATILE NATURE.

THE DESIGN OF ANY STORAGE FACILITY WOULD BE SUFFICIENT TO PROTECT THE HEALTH OF WORKERS AND THE PUBLIC DURING REMEDIAL OPERATIONS. THE SPECIFIC DETAILS OF ANY STORAGE FACILITY WOULD BE DEVELOPED DURING THE DESIGN OF THE FACILITY.

THE STORAGE FACILITY SHOULD BE DESIGNED TO PREVENT RUN-OFF CONTAINING CONTAMINATED SEDIMENT FROM REACHING AN UNCONTAMINATED AREA.

THE REMEDIAL DESIGN WILL INCORPORATE APPROPRIATE MEASURES SO THAT CONTAMINANT MIGRATION IS MINIMIZED.

IF THERMAL TREATMENT WERE SELECTED, PRECAUTIONS SHOULD BE TAKEN TO COVER THE STORAGE AREA TO PREVENT EXCESSIVE WETTING OF THE SOIL DUE TO RAINFALL, THUS REDUCING THE WATER EVAPORATION LOAD TO THE THERMAL TREATMENT SYSTEM, THEREBY REDUCING FUEL CONSUMPTION.

THE REMEDIAL DESIGN WILL INCORPORATE APPROPRIATE MEASURES TO ENSURE THAT SOIL MOISTURE OF THE STAGED MATERIAL IS CONTROLLED.

TCDD-CONTAMINATED SOIL SHOULD NOT BE EXCAVATED FOR THE SOLE PURPOSE OF DEPOSITING IT IN ANOTHER DISPOSAL LOCATION BECAUSE THE INHERENT PHYSICAL PROPERTIES OF TCDD-CONTAMINATED SOIL MAKE IT SUCH A LOW RISK TO THE ENVIRONMENT AND GENERAL POPULATION.

THE ISSUES INVOLVED IN DISPOSAL OF TCDD-CONTAMINATED SOIL ARE DISCUSSED IN THE FEASIBILITY STUDY. THE REMEDIAL ALTERNATIVE SELECTED BY EPA IS DESCRIBED IN THE PROPOSED PLAN, AND DOES NOT INVOLVE LAND DISPOSAL OF DIOXIN-CONTAMINATED SOIL.

A SAFE DISPOSAL AREA NEED ONLY PREVENT EXPOSURE BY CONTACT, ELIMINATE EROSION OF THE SOIL AND PREVENT DUST-BORNE MIGRATION OF THE CONTAMINATED MATERIAL. THIS CAN BE ACCOMPLISHED BY CONSTRUCTION OF A MONOFILL USING CONTAMINATED SOIL, COVERING THE FILL WITH CLEAN SOIL, AND PLANTING A VEGETATIVE COVERING OVER THE CLEAN SOIL.

A NUMBER OF OPTIONS FOR DISPOSAL, INCLUDING CONSTRUCTION OF A MONOFILL, ARE DISCUSSED IN THE FEASIBILITY STUDY. THE FEASIBILITY STUDY DOES NOT RULE OUT A MONOFILL AS A STORAGE OPTION. IF LAND DISPOSAL WERE SELECTED, THE DETAILS OF THE STORAGE FACILITY WOULD BE EVALUATED DURING DESIGN AND PREDESIGN OF THE FACILITY.

...NO LEACHATE, COLLECTION IS REQUIRED SINCE WATER MIGRATING THROUGH THE FILL WOULD NOT CONTAIN ANY CONTAMINANTS.

LEACHATE FROM A DISPOSAL FACILITY WOULD LIKELY CONTAIN TCDD-CONTAMINATED PARTICLES THAT WOULD REQUIRE SEPARATION PRIOR TO DISPOSAL OF THE LEACHATE. IN ADDITION, SINCE THERE IS A POSSIBILITY FOR A BREACH OF THE LINERS, A COLLECTION SYSTEM WOULD BE REQUIRED.

...THERE IS NO JUSTIFICATION FOR FLOOD CONTROL RELATED TO TCDD REMEDIATION. NO EVIDENCE TO DATE SUGGESTS THAT TCDD IS MIGRATING OR LEAVING THE SITE DUE TO FLOODING.

FLOOD CONTROL WOULD BE REQUIRED TO PROTECT EQUIPMENT OR WORKERS LOCATED ONSITE DURING IMPLEMENTATION. FLOOD PROTECTION IS REQUIRED FOR SOME ALTERNATIVES IN ORDER TO COMPLY WITH ALL ARARS. THIS IS FURTHER DISCUSSED IN THE PROPOSED PLAN AND RECORD OF DECISION.

THE "NO ACTION" REMEDIAL ALTERNATIVES SHOULD BE AS FULLY EXPLORED AS ALL OF THE OTHER ALTERNATIVES, ESPECIALLY BECAUSE IT REPRESENTS AN ALTERNATIVE WHICH IS SCIENTIFICALLY, TECHNICALLY AND ECONOMICALLY VIABLE.

AS NOTED PREVIOUSLY, EPA BELIEVES THAT THE NO ACTION ALTERNATIVE UNDERGOES THE SAME DEGREE OF EVALUATION AS OTHER ALTERNATIVES IN THE FEASIBILITY STUDY.

...AN IMPERMEABLE BARRIER IS NOT REQUIRED TO STABILIZE AND PREVENT THE MIGRATION OF TCDD CONTAMINATED SOIL.

SEVERAL OPTIONS FOR CAPPING ARE DISCUSSED, BOTH PERMEABLE AND IMPERMEABLE. ALTHOUGH ONE OPTION IS DESCRIBED IN DETAIL, THE FEASIBILITY STUDY DOES NOT RULE OUT THE POSSIBILITY THAT OTHER OPTIONS WOULD BE CONSIDERED IF CAPPING WERE SELECTED FOR THE SITE. THE SPECIFIC METHODS WOULD BE EVALUATED IN GREATER DETAIL DURING PREDESIGN AND DESIGN OF THE PROJECT.

IT IS UNCLEAR WHETHER THE EXISTING SITE SECURITY WILL REMAIN IN EFFECT UNDER THIS (THE NO ACTION) OPTION.

THE NO ACTION ALTERNATIVE IS A REMEDIAL ALTERNATIVE THAT ASSUMES THAT NO ADDITIONAL EMERGENCY OR REMEDIAL ACTIONS ARE TAKEN AT THE SITE. FOR THE FEASIBILITY STUDY, IT IS GENERALLY ASSUMED THAT SECURITY GUARDS WOULD REMAIN, ALTHOUGH RISK ESTIMATES ARE PERFORMED THAT EVALUATE EXPOSURE POTENTIAL IN THE CASE THAT THE GUARDS ARE REMOVED.

THE RISK TO AN UNAUTHORIZED INTRUDER IS NEGLIGIBLE AND DOES NOT MERIT THE EXPENSE OF FULL TIME SECURITY PERSONNEL.

SECURITY GUARDS ARE NECESSARY NOT ONLY TO PROTECT THE HEALTH AND SAFETY OF INTRUDERS, BUT TO ASSURE NO CONTAMINATED SOIL DISTURBANCE AND/OR OFFSITE TRANSPORT OCCURS.

THE ONLY RESPONSE ACTION WHICH WOULD REQUIRE A LEVEL OF FLOOD PROTECTION IS ON-SITE TREATMENT. NO OTHER ON-SITE DISPOSAL OPTION, OR OTHER RESPONSE ACTION, WOULD JUSTIFY THE EXPENSE OF FLOOD CONTROL MEASURES.

THE REQUIREMENTS FOR FLOOD PROTECTION WILL BE EVALUATED FOR THE SELECTED REMEDIAL ALTERNATIVE DURING THE PREDESIGN AND DESIGN PHASES FOR THE ALTERNATIVES. IT IS POSSIBLE THAT OPTIONS, OTHER THAN ONSITE TREATMENT, MAY REQUIRE FLOOD PROTECTION.

...IF TREATMENT OF THESE WATERS IS MANDATED BY EPA, ONLY FILTRATION SHOULD BE USED TO REMOVE THE TCDD CONTAMINATED SOIL PARTICLES. ANY OTHER TYPES OF TREATMENT, INCLUDING USE OF ACTIVATED CARBON OR ACTIVATED SLUDGE, ARE NOT MERITED DUE TO TCDD'S DRAMATIC LACK OF WATER SOLUBILITY.

THE SPECIFIC WATER TREATMENT METHOD SELECTED WILL BE EVALUATED DURING THE PREDESIGN AND DESIGN PHASES OF THE PROJECT AND WOULD BE ADJUSTED AS REQUIRED DURING THE PROJECT. IT IS EXPECTED AT THIS TIME THAT CARBON ADSORPTION TREATMENT WOULD BE USED DURING SITE ACTIVITIES FOR FILTRATION AND REMOVAL OF ORGANICS.

...IF "IN-PLACE CONTAINMENT" WERE SELECTED BY EPA AS REMEDIAL ACTION RESPONSE ACTION, A SOIL AND VEGETATIVE CAP IS THE ONLY TECHNOLOGY THAT SHOULD BE CONSIDERED APPROPRIATE FOR THE TCDD-CONTAMINATED SOIL. IMPERMEABLE OR LOW PERMEABILITY CAPPING TECHNIQUES ARE NOT REQUIRED FOR PREVENTION OF EXPOSURE, DUSTING AN EROSION OF TCDD CONTAMINATED SOIL WHICH IS A HIGHLY INSOLUBLE AND NON-VOLATILE MATERIAL.

IF IN-PLACE CONTAINMENT WERE SELECTED, THE SPECIFIC FEATURES OF THE CAP WOULD BE EVALUATED AND DEVELOPED DURING THE PREDESIGN AND DESIGN PHASES OF THE PROJECT.

...THE PRESENCE OF A CLAY OR IMPERMEABLE BARRIER UNDER A FINAL SOIL AND VEGETATIVE COVER INCREASES THE LIKELIHOOD OF EROSION OF THE FINAL COVER AND GREATLY COMPLICATES THE ESTABLISHMENT AND GROWTH OF THE VEGETATION. SINCE PERCOLATION OF WATER THROUGH THE CAP WILL NOT CAUSE LEACHING OF THE TCDD INTO THE GROUNDWATER, THE ADDITIONAL, CONSERVATIVE, MEASURE OF INSTALLING AN IMPERMEABLE BARRIER IS NOT JUSTIFIED AND IS ACTUALLY DETRIMENTAL TO A LASTING AND AESTHETICALLY PLEASING GRASS COVER AT THE SITE.

IF IN-PLACE CONTAINMENT WERE SELECTED, THE SPECIFIC FEATURES OF THE CAP WOULD BE EVALUATED AND DEVELOPED DURING THE PREDESIGN AND DESIGN PHASES OF THE PROJECT. THE PROPOSED PLAN EVALUATES PLACEMENT OF A SYNTHETIC MEMBER BENEATH THE VEGETATED SOIL COVER.

EXPENSIVE SODDING OR EROSION CONTROL MATS ARE NOT JUSTIFIED IN PREFERENCE TO CONVENTIONAL GRASS SEEDING OPERATIONS SINCE THERE HAS BEEN NO RELEASE OF CONTAMINATED SOILS TO DATE.

THE METHOD USED TO ESTABLISH VEGETATION ON EXPOSED SOIL WOULD BE EVALUATED DURING THE DESIGN PHASE AND SELECTED ACCORDING TO THE REQUIREMENTS OF THE REMEDY. THE REMEDY MUST BE COST-EFFECTIVE IN ADDITION TO PROVIDING PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT.

ONLY DIRECT TREATMENT VIA THERMAL PROCESSING IS CAPABLE OF MEETING DESIRED TARGET GOALS WHILE PROVIDING A RELATIVELY LOW UNIT COST OF TREATMENT.

THERMAL TREATMENT IS THE ONLY TREATMENT METHOD THAT HAS BEEN DEMONSTRATED TO CONSISTENTLY MEET GOALS FOR DESTRUCTION OF TCDD.

INDIRECT FIRED ROTARY KILN THERMAL TREATMENT COMBINED WITH DRY POLLUTION CONTROL DEVICES WILL PRODUCE THE MOST RELIABLE AND LEAST COSTLY TREATMENT RESPONSE IN TERMS OF LABOR AND ENERGY CONSUMPTION.

THIS AND OTHER METHODS OF THERMAL TREATMENT WOULD BE EVALUATED DURING THE PREDESIGN AND DESIGN PHASES OF THE PROJECT. IF PROPOSED BY THOSE OFFERING THERMAL TREATMENT SERVICES DURING THE BIDDING PHASE OF THE PROJECT, THE TECHNOLOGY WOULD RECEIVE CONSIDERATION AT THAT PHASE OF THE PROJECT.

AT THIS POINT IN THE FEASIBILITY STUDY, ONE SHOULD HAVE A FAIRLY ACCURATE ACCOUNTING OF WHAT HAZARDOUS SUBSTANCES ARE TO BE ENCOUNTERED AND AT WHAT CONCENTRATIONS.

SAMPLING AT THE SITE TO DATE HAS BEEN CONCENTRATED IN THE MOST LIKELY AREAS OF CONTAMINATION. THE SAMPLING IS CONSIDERED TO BE SUFFICIENT TO SUPPORT FEASIBILITY STUDY ANALYSIS, BUT ADDITIONAL SAMPLING AND ANALYSIS WILL BE REQUIRED DURING REMEDIATION ACTIVITIES ONSITE.

DIRECT CONTACT OF THE EXISTING TCDD CONTAMINATION IS UNLIKELY DUE TO ITS LOCATION GENERALLY BENEATH PAVED OR COMPOSITION ROADS.

ALTHOUGH SOME OF THE TCDD IS LOCATED BENEATH ROAD SURFACES, CONTAMINATION HAS BEEN DETECTED IN OTHER AREAS WITH NO COVER OR STABILIZATION.

CAPPING WITH AN ADEQUATE VEGETATIVE COVER CAN BE CONSIDERED A FLOOD OR EROSION CONTROL MEASURE.

CAPPING COULD REPRESENT AN EROSION CONTROL MEASURE. SINCE A CAP WOULD NOT PREVENT OR SLOW THE MOVEMENT OF FLOODWATERS AT THE SITE, IT IS NOT CONSIDERED TO BE A FLOOD CONTROL MEASURE.

...CAPPING "WILL" AND NOT "MAY" REDUCE THE POTENTIAL FOR MIGRATION AND CONTACT.

THE PERFORMANCE OF A RESPONSE ACTION WILL DEPEND, IN PART, ON THE SPECIFIC FEATURES OF THE ACTION AND MAINTENANCE ACTIVITIES THAT ARE REQUIRED.

"THE TCDD CONCENTRATIONS MUST BE REDUCED TO BELOW LESS THAN 1 PPB TO MEET THE SITE OBJECTIVES." THE ASH OR TREATED SOIL WILL MORE THAN LIKELY BE LANDFILLED AT THE SITE AND BELOW THE SURFACE. THEREFORE, IF THE DEPTH IS SUFFICIENT, HIGHER CONCENTRATIONS OF RESIDUAL TCDD MAY BE ALLOWABLE.

FINAL DISPOSAL OF TREATMENT RESIDUE WILL BE CONTROLLED BY STATE-ISSUED PERMIT CONDITIONS. THE RESIDUE MUST SUCCESSFULLY PASS A DELISTING PETITION IN ORDER TO BE DISPOSED OF AS NON-HAZARDOUS SOLID WASTE. A PLAN FOR DISPOSAL WILL BE DEVELOPED DURING THE DESIGN PHASE FOR THE PROJECT.

...TECHNOLOGY CONSIDERATIONS FOR PHYSICAL/CHEMICAL TREATMENT AND BIOLOGICAL TREATMENT REFER TO THE THERMAL TREATMENT OF SOIL WHICH IS INAPPROPRIATE FOR THESE TWO TYPES OF TECHNOLOGIES.

THIS ERROR IN THE FEASIBILITY STUDY HAS BEEN NOTED.

IT IS INAPPROPRIATE TO STATE AN ABSOLUTE REQUIREMENT THAT A TECHNOLOGY MUST ACHIEVE A 1 PPB AVERAGE CONCENTRATION. IF THE TECHNOLOGY ACHIEVES SIGNIFICANT RESULTS AND HAS FAVORABLE ECONOMICS, IT MAY BE VIABLE AND DESIRABLE TO PURSUE TO REDUCE THE RISKS TO PUBLIC HEALTH AND THE ENVIRONMENT.

THE SELECTED TECHNOLOGY MUST MEET THE PERFORMANCE OBJECTIVES THAT ARE REQUIRED FOR THE SITE WHICH WILL INCLUDE DELISTING OF TREATMENT RESIDUE AND COMPLIANCE WITH ANY REQUIRED PERMIT CONDITIONS.

...FURTHER TECHNOLOGIES MAY BE DEVELOPED, AND SHOULD NOT THEREFORE BE OMITTED BASED STRICTLY ON AN ARBITRARY SELECTION OF A LEVEL OF CONCERN. THE FEASIBILITY STUDY APPROACH IS NOT CONSISTENT WITH THE NCP REQUIREMENT THAT ALTERNATIVES MUST BE CONSIDERED WHICH "DO NOT ATTAIN APPLICABLE OR RELEVANT AND APPROPRIATE PUBLIC HEALTH OR ENVIRONMENTAL STANDARDS, BUT WHICH WILL REDUCE THE LIKELIHOOD OR PRESENT ANY FURTHER THREAT FROM THE HAZARDOUS SUBSTANCES AND THAT WILL PROVIDE SIGNIFICANT PROTECTION TO THE PUBLIC HEALTH AND WELFARE AND ENVIRONMENT."

THE FEASIBILITY STUDY IS CONSISTENT WITH THE NCP, REMEDIES UNDER CERCLA, AS AMENDED, MUST BE PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT. THOSE ALTERNATIVES DETERMINED NOT TO ACHIEVE PROTECTIVENESS CAN APPROPRIATELY BE ELIMINATED FROM FURTHER CONSIDERATION.

THERE IS NO DESCRIPTION OF WHAT RELEVANT AND APPROPRIATE FEDERAL PUBLIC HEALTH OR ENVIRONMENTAL REQUIREMENTS MUST BE MET BY A CAP, AND WHY THEY ARE NOT SATISFIED.

THE FEASIBILITY STUDY SPECIFICALLY NOTES ON PAGES 7-39 AND 7-51 THE REQUIREMENTS THAT SHOULD BE CONSIDERED. THE LANDFILL STANDARDS AT 40 CFR 265, SUBPART N (LANDFILLS), ARE CITED AS WELL AS THE CLOSURE STANDARD AT 40 CFR 265.310. A FURTHER DISCUSSION OF ARARS IS PRESENTED IN THE PROPOSED PLAN.

"UNKNOWN QUANTITY OF HAZARDOUS SUBSTANCES" UNDER THE HEADING "WASTE CHARACTERISTICS." RARELY WILL A SITE BE AS WELL DEFINED AS TIMES BEACH IN TERMS OF THE HAZARDOUS WASTE CONSTITUENTS AND CONCENTRATION. THE LEVEL OF DATA AVAILABLE FOR EVALUATION CAN HARDLY BE TERMED "UNKNOWN."

THE PRECISE VOLUME OF SOIL REQUIRING REMEDIATION WILL NOT BE KNOWN UNTIL COMPLETION OF THE CLEANUP. THE AVAILABLE DATA ALLOW A REASONABLE ACCURATE PROJECTION OF VOLUME, BUT THERE IS UNCERTAINTY DUE TO THE NON-UNIFORMITY OF THE CONTAMINATION AND PROCEDURES USED TO REMOVE CONTAMINATED SOIL.

THE COMMENTOR STRONGLY AGREES THAT THE TECHNOLOGIES OF "CAPPING" AND "ENHANCED VEGETATION" SHOULD BE RETAINED FOR CONSIDERATION AND THAT THE REMAINING METHODS SHOULD NO LONGER BE CONSIDERED APPROPRIATE.

PLACEMENT OF A VEGETATED CAP OVER CONTAMINATED AREAS AT TIMES BEACH WAS FURTHER EVALUATED IN THE PROPOSED PLAN.

...ONLY ON-SITE (AS OPPOSED TO OFF-SITE) DISPOSAL OR TREATMENT SHOULD BE CONSIDERED. OFF-SITE DISPOSAL OR TREATMENT WOULD REQUIRE LENGTHY AND UNNECESSARY TRANSPORTATION, TEMPORARY STORAGE AND OTHER RELATED EXPENSES.

EPA IS PROPOSING AN ONSITE REMEDY FOR CONTAMINATED SOILS AT TIMES BEACH. OFFSITE DISPOSAL OR TREATMENT ARE CONSIDERED TO BE TECHNICALLY VIABLE OPTIONS THAT MERIT CONSIDERATION IN THE FEASIBILITY STUDY. THE FACT THAT SOME ALTERNATIVES REQUIRE DIFFERENT TRANSPORTATION OR HANDLING EXPENSES THAN OTHER ALTERNATIVES DOES NOT WARRANT THEIR ELIMINATION FROM DETAILED ANALYSIS.

...THE "LIMITED ACTION" AND "IN-PLACE CONTAINMENT" REMEDIAL ALTERNATIVES CITED IN TABLE 4-8 SHOULD BE DESCRIBED UNDER COLUMN "NCP GUIDANCE ALTERNATIVE CATEGORY" AS "ALTERNATIVE THAT ATTAINS OR EXCEEDS APPLICABLE OR RELEVANT AND APPROPRIATE FEDERAL PUBLIC HEALTH OR ENVIRONMENTAL REQUIREMENTS."

LIMITED ACTION AND IN-PLACE CONTAINMENT ALTERNATIVES DO NOT NECESSARILY ATTAIN ALL ARARS, AND IT IS NOT APPROPRIATE TO DESIGNATE THEM AS SUCH.

A CAP DESIGNED TO ADDRESS DIOXIN CONTAMINATED SOIL SHOULD HAVE A TWO-FOLD GOAL OF PREVENTING PHYSICAL CONTACT WITH THE CONTAMINATED SOIL AND THE PREVENTION OF EROSION OF THAT SOIL.

THIS POINT IS CONSISTENT WITH THE FEASIBILITY STUDY.

CAPPING IS A CONSERVATIVE AND SCIENTIFICALLY DEFENSIBLE REMEDIATION TECHNIQUE.

THE USEFULNESS OF CAPPING AS A REMEDIATION TECHNIQUE DEPENDS HIGHLY ON THE MATERIAL BEING CAPPED, THE SITE WHERE CAPPING IS TAKING PLACE, THE TYPE OF CAP THAT IS INSTALLED, AND THE MAINTENANCE THAT IS PERFORMED SUBSEQUENT TO INSTALLATION OF THE CAP. ALTERNATIVES INVOLVING CAPPING ARE EVALUATED IN THE FEASIBILITY STUDY AND PROPOSED PLAN.

...WATER PERCOLATION THROUGH THE CAP IS ACCEPTABLE AND THE CAP SHOULD PROVIDE A PHYSICAL BARRIER RATHER THAN A HYDRAULIC BARRIER.

SPECIFIC FEATURES OF THE DESIGN OF A CAP WOULD BE CONSIDERED DURING DESIGN OF THE REMEDIAL ALTERNATIVE.

SEVERAL COMMENTS WERE MADE REGARDING CAP LOCATION, DESIGN AND MONITORING.

AS NOTED PREVIOUSLY, THE DETAILS OF A CAP, IF SELECTED AS A REMEDIAL ALTERNATIVE, WOULD BE WORKED OUT DURING THE DESIGN AND PREDESIGN PHASES OF THE PROJECT. ISSUES RAISED BY THE COMMENTOR WOULD BE CONSIDERED AT THAT TIME.

SITES SHOULD BE REMEDIATED IN THE MOST EFFICIENT AND COST EFFECTIVE SEQUENCE.

COST-EFFECTIVENESS IS A REQUIREMENT FOR ALL REMEDIES UNDER CERCLA. THERE ARE OTHER REQUIREMENTS THAT MUST BE MET FOR SITE REMEDIATION INCLUDING PROTECTION OF PUBLIC HEALTH AND THE ENVIRONMENT, COMPLIANCE WITH ARARS, AND USE OF TREATMENT TECHNOLOGIES THAT RESULT IN A REDUCTION IN TOXICITY, MOBILITY, OR VOLUME OF HAZARDOUS SUBSTANCES TO THE MAXIMUM EXTENT PRACTICABLE.

SAMPLING SHOULD BE CONDUCTED AT THE ONSET OF THE PROJECT TO FACILITATE DESIGN OF THE EXCAVATION.

SUBSEQUENT SAMPLING HAS BEEN PERFORMED UTILIZING THE 95% UPPER CONFIDENCE LEVEL PROTOCOL TO MORE ACCURATELY DEFINE THE EXTENT OF CONTAMINATION. THIS HAS ENABLED MORE ACCURATE PROJECTIONS OF CONTAMINATED SOIL VOLUMES TO BE MADE PRIOR TO REMEDY SELECTION. ADDITIONAL SAMPLING WILL BE PERFORMED, AS REQUIRED, TO FULLY DEFINE THE AREAL EXTENT OF CONTAMINATION PRIOR TO SOIL REMOVAL.

THE PRIMARY FUNCTION OF THE SAMPLING SHOULD BE TO DEFINE THE LATERAL LIMIT OF THE TARGET SURFACE CONTAMINANT CONCENTRATION. A SECONDARY FUNCTION OF THE SAMPLING SHOULD BE TO VALIDATE OR ADJUST THE DESIGN DEPTH OF EXCAVATION (GENERALLY ONE FOOT IN CONTAMINANT SOURCE AREAS AND SIX INCHES IN CONTAMINANT DISPERSAL AREAS).

THE PRIMARY PURPOSE OF SOIL SAMPLING AT TIMES BEACH HAS BEEN TO DEFINE THE AREAL EXTENT OF CONTAMINATION. MORE LABOR-INTENSIVE AND COSTLY SAMPLING PROCEDURES ARE REQUIRED TO DETERMINE THE VERTICAL EXTENT OF CONTAMINATION.

...DEPTH SAMPLING SHOULD CONSIST OF INCREMENTAL SAMPLES TO VERIFY THE DEPTH OF EXCAVATION NECESSARY TO ACCOMMODATE THE TARGET SUBSURFACE CONTAMINANT CONCENTRATION.

EPA HAS DETERMINED THAT IT IS MORE COST-EFFECTIVE TO REMOVE SOIL IN SUCCESSIVE LIFTS FOLLOWED BY ADDITIONAL SAMPLING TO DETERMINE RESIDUAL CONTAMINANT LEVELS, THAN TO ATTEMPT TO DEFINE THE VERTICAL EXTENT PRIOR TO EXCAVATION. THE THICKNESS OF THE INITIAL LIFT OF SOIL REMOVED IS ADJUSTED ACCORDING TO THE CONTAMINANT LEVEL DETECTED AT THE SURFACE.

EQUIPMENT WHICH MAY BE UTILIZED INCLUDES BACKHOES, MOTOR GRADER, WHEEL LOADERS, BELT LOADERS, SCRAPERS, PROFILERS AND VACUUMS. EACH HAS DISTINCT CAPABILITIES... MINIMAL HAND EXCAVATION SHOULD BE ANTICIPATED.

THE SPECIFIC TECHNIQUES REQUIRED FOR EXCAVATION WILL BE ESTABLISHED DURING THE DESIGN AND PLANNING PHASES OF THE PROJECT.

...EXCAVATION SHOULD PROCEED TO THE FULL DEPTH OF CONTAMINATION IN AN UNINTERRUPTED SERIES OF LIFTS. EXCAVATION SHOULD COMMENCE AT THE UPGRADIENT (HYDRAULIC) END OF THE SITE AND PROGRESS GENERALLY AS A SINGLE WORKING FACE. MATERIAL SHOULD BE REMOVED IN DISCRETE LIFTS, RATHER THAN A SINGLE CUT TO TOTAL DEPTH, TO PRECLUDE THE POSSIBILITY OF CROSS CONTAMINATION.

IT IS NOT POSSIBLE TO DETERMINE THE PRECISE VERTICAL EXTENT OF CONTAMINATION IN A COST-EFFECTIVE MANNER WHICH WOULD ASSURE CONFIDENCE THAT CLEANUP LEVELS ARE ACHIEVED FOLLOWING EXCAVATION TO A PRE-DETERMINED DEPTH. EXCAVATION OF THE SITE WILL PROCEED FROM UPGRADIENT TO DOWNGRADIENT AREAS. REMOVAL OF SOIL IN MULTIPLE LIFTS MINIMIZES CROSS CONTAMINATION DUE TO SPILLAGE.

BACKFILL OPERATIONS SHOULD PARALLEL, AND CLOSELY FOLLOW, THE EXCAVATION OPERATIONS. NO DAILY COVER OF EXCAVATED AREAS SHOULD BE REQUIRED.

A TEMPORARY COVER IS REQUIRED PRIOR TO BACKFILLING TO PREVENT THE SPREADING OF CONTAMINATED SOIL WHILE AWAITING SAMPLE RESULTS WHICH WILL DETERMINE IF ADDITIONAL EXCAVATION IS REQUIRED. BACKFILLING FOLLOWS EXCAVATION WHEN IT IS ESTABLISHED THAT CLEANUP OBJECTIVES HAVE BEEN MET.

BACKFILL PROCEDURES ARE UNNECESSARY.

BACKFILLING IS NECESSARY TO SAFELY CLOSE THE SITE AND ESTABLISH DRAINAGE.

BACKFILL MATERIAL SHOULD BE OBTAINED FROM BORROW PITS TO BE DEVELOPED IN THE IMMEDIATE VICINITY OF TIMES BEACH. SUITABLE BORROW MATERIALS WERE LOCATED IN INVESTIGATIONS CONDUCTED BY THE U.S. ARMY CORPS OF ENGINEERS...

SUITABLE BACKFILL MATERIAL HAS BEEN IDENTIFIED IN THE IMMEDIATE VICINITY OF TIMES BEACH.

THE BORROW PIT MAY BE DEVELOPED AT A RATE TO MATCH BACKFILL REQUIREMENTS, DEPENDING ON DESIGN OF THE REMEDY.

THE RATE OF DEVELOPMENT OF THE BORROW PIT SHOULD BE ADJUSTED SO THAT THE OVERALL PROJECT IMPLEMENTATION CAN PROCEED IN A COST-EFFECTIVE MANNER.

...AN EXCAVATION/BACKFILL CYCLE IS DETAILED IN THE FOLLOWING:

1. A CLEAN DUMP TRUCK ENTERS THE EXCAVATION STAGING AREA.
2. THE TRUCK ENTERS THE UNEXCAVATED CONTAMINATED ZONE AND EXCAVATED MATERIAL IS PLACED IN THE BED. FILL HEIGHT REMAINS BELOW THE PLANE OF THE BED LIP.
3. THE TRUCK EXITS THE CONTAMINATED AREA AND RECEIVES AN EXTERIOR RINSE.
4. A CANVAS TARP IS SECURED OVER THE DUMP TRUCK BED AND THE TRUCK PROCEEDS TO THE DISPOSAL OR TREATMENT AREA AT TIMES BEACH.
5. THE CANVAS TARP IS REMOVED AND THE TRUCK DUMPS THE CONTENTS AT THE STORAGE AREA. THE TRUCK BED IS CLEANED AS NECESSARY TO REMOVE RESIDUAL SOIL USING PRESSURE WATER SPRAY OR MANUAL SCRAPERS. THE TRUCK IS GIVEN AN EXTERIOR RINSE AT THIS TIME.
6. THE DUMP TRUCK PROCEEDS TO THE BORROW PIT AND RECEIVES A LOAD OF BACKFILL MATERIAL IN THE BARE BED. THE CANVAS TARP IS REPLACED AND THE TRUCK RETURNS TO THE REMEDIATION SITE.

7. THE TRUCK ENTERS ON THE CLEAN SIDE OF THE SITE AND BACKS ACROSS COMPACTED BACKFILL TO THE WORKING FACE AND DUMPS LOAD.

8. THE BED IS SCRAPED CLEAN OF SOIL.

9. THE TRUCK RETURNS TO THE EXCAVATION STAGING AREA AS IN 1 ABOVE AND THE CYCLE REPEATED.

THE PROCEDURES OUTLINED BY THE COMMENTOR WILL BE CONSIDERED DURING DESIGN OF THE SELECTED REMEDIAL ALTERNATIVE.

GROUNDWATER MONITORING IS NOT REQUIRED DUE TO THE INSIGNIFICANT CONCENTRATIONS OF SOLVENTS AND EXTREMELY INSOLUBLE NATURE OF TCDD.

GROUNDWATER MONITORING MAY BE REQUIRED IN ORDER TO OBTAIN A STATE-ISSUED PERMIT FOR SOLID WASTE DISPOSAL AND/OR TREATMENT OF THE CONTAMINATED SOIL. ALL SUBSTANTIVE REQUIREMENTS OF PERMITTING PROCESS MUST BE MET.

AIR MONITORING IS NOT REQUIRED SINCE NO PREVIOUS AIR MONITORING RESULTS HAVE INDICATED ANY MIGRATION OF TCDD-CONTAMINATED SOIL FROM THE SITE.

PREVIOUS AIR MONITORING AT TIMES BEACH WAS NOT PERFORMED WHEN REMEDIAL ACTIVITIES WERE TAKING PLACE. AIR MONITORING HAS BEEN USED DURING REMOVAL OPERATIONS AT OTHER DIOXIN SITES IN MISSOURI AND WOULD BE PERFORMED AT TIMES BEACH.

LONG-TERM MONITORING OF THE SITE IS ACCOMPLISHED THROUGH VISUAL ON-SITE INSPECTIONS PERFORMED BY A QUALIFIED TECHNICIAN.

ADDITIONAL MONITORING WOULD BE PERFORMED AS REQUIRED TO MEET LONG-TERM SITE OBJECTIVES.

THE VEGETATIVE CAPS SHOULD REQUIRE VERY LITTLE MAINTENANCE AFTER THE VEGETATION HAS BEEN ESTABLISHED.

SURVEILLANCE AND MAINTENANCE WOULD BE REQUIRED TO ENSURE THAT THE INTEGRITY OF THE CAP WAS MAINTAINED. THE SPECIFIC PROGRAM WOULD BE DEVELOPED DURING DESIGN OF THE CAP AND WOULD BE COORDINATED BY THE STATE.

SECTION 5--DEVELOPMENT OF ALTERNATIVES

ALTERNATIVE 6B SHOULD BE BROADENED TO INCLUDE SOIL FROM ANY TCDD SITE IN MISSOURI WHICH REQUIRES EXCAVATION.

EPA CONSIDERED PUBLIC COMMENTS ON BRINGING ADDITIONAL MATERIAL TO TIMES BEACH AND CONCLUDED THAT CONTAMINATED MATERIALS FROM OTHER LOCATIONS NOT IDENTIFIED IN THE PROPOSED PLAN WOULD NOT BE BROUGHT TO TIMES BEACH FOR INCINERATION. THE LOCAL COMMUNITY HAS EXPRESSED OPPOSITION TO MATERIAL BEING TRANSPORTED TO TIMES BEACH FOR TREATMENT FROM OTHER STATES, OR OTHER PORTIONS OF MISSOURI. EPA HAS CONSIDERED THE POSITION OF THE LOCAL COMMUNITY IN PROPOSING AND SELECTING A REMEDIAL ALTERNATIVE.

THE SITES IDENTIFIED IN THE PROPOSED PLAN ARE RELATED TO WASTE OIL SPRAYING CONDUCTED BY THE BLISS WASTE OIL COMPANY IN THE EARLY 1970'S. IT IS APPROPRIATE TO CONSIDER A COMPREHENSIVE REMEDY FOR A GROUP OF SITES LOCATED IN CLOSE PROXIMITY TO EACH OTHER.

THE DIOXIN SITES LOCATED IN SOUTHWEST MISSOURI ARE BEING ADDRESSED UTILIZING THE EPA MOBILE INCINERATOR LOCATED AT THE DENNEY FARM SITE.

THE COMMENTOR STRONGLY BELIEVES THAT EPA SHOULD EXAMINE THE "NO ACTION" ALTERNATIVE AS COMPREHENSIVELY AS IT REVIEWS ALL OTHER REMEDIATION ALTERNATIVES.

AS NOTED PREVIOUSLY, EPA BELIEVES THAT THE NO ACTION ALTERNATIVE IS EXAMINED AS SERIOUSLY AS OTHER ALTERNATIVES. THE LIMITED TECHNICAL COMPLEXITY OF THE NO ACTION ALTERNATIVE LIMITS THE AMOUNT OF DISCUSSION THAT CAN BE DEVOTED TO THE ALTERNATIVE.

...AUTOMATIC SAMPLING OF SURFACE RUN-OFF SAMPLES IS DESCRIBED. THESE AUTOMATIC SURFACE MONITOR MUST BE PROTECTED FROM FLOOD EVENTS.

MONITORING EQUIPMENT WOULD REQUIRE PROTECTION FROM FLOOD EVENTS.

"ONCE SUFFICIENT AIR SAMPLING DATA ESTABLISH A RECORD OF NO RELEASE, ALL AIR MONITORING WOULD CEASE UNLESS SIGNIFICANT CIRCUMSTANCES DEVELOP WHICH WOULD CHANGE THE SITE CHARACTERISTICS."

THE SPECIFIC FEATURES OF A SITE MONITORING PROGRAM WOULD BE ESTABLISHED DURING PREDESIGN AND DESIGN OF THE SELECTED ALTERNATIVE. CONTINUOUS AMBIENT AIR MONITORING WOULD BE REQUIRED DURING SITE ACTIVITY TO ASSURE THE SAFETY OF WORKERS AND THE LOCAL COMMUNITY.

...SAMPLES WOULD BE FILTERED AND THE SEDIMENTS ANALYZED USING HIGH RESOLUTION ANALYSIS FOR TCDD CONCENTRATION."

THIS COULD BE A FEATURE OF A SAMPLING AND ANALYSIS PROGRAM. SUCH ITEMS WOULD BE DEVELOPED IN GREATER DETAIL DURING THE DESIGN OF THE SELECTED REMEDIAL ALTERNATIVES. DETECTION LIMITS IN THE LOW PARTS PER TRILLION RANGE CAN BE ACHIEVED WITHOUT THE USE OF HIGH RESOLUTION ANALYSIS.

IF DATA INDICATE THAT NO CONTAMINATED SEDIMENT IS LEAVING THE SITE, MONITORING FREQUENCY WILL BE REDUCED AND EVENTUALLY PHASED OUT UNLESS SITE CHARACTERISTICS ARE SIGNIFICANTLY MODIFIED."

THE FEASIBILITY STUDY DESCRIBES A TWO-PHASE MONITORING PROGRAM WITH THE FIRST PHASE USED TO DEFINE THE REQUIREMENTS WILL BE DETERMINED DURING DESIGN.

...ONLY TWO LOCATIONS WOULD REQUIRE MONITORING OF SITE RUN-OFF. ALL OTHER LOCATIONS OF MAJOR SURFACE UNCONTAMINATED AREAS.

THE SPECIFIC FEATURES OF A MONITORING PROGRAM WOULD BE DEVELOPED DURING PREDESIGN AND DESIGN OF THE SELECTED ALTERNATIVE.

THE NEED FOR BOTH GUARDS AND FENCING IS UNNECESSARY DUE TO THE MINIMAL RISK OF EXPOSURE TO SITE INTRUDERS WHO VIOLATE THE FENCE BARRIER AND WARNING SIGNS.

THE USE OF FENCING SHOULD REDUCE THE REQUIREMENTS FOR FULL-TIME SECURITIES AT THE SITE. HOWEVER, SOME LIMITED SECURITY WOULD STILL BE REQUIRED. THE SPECIFIC SECURITY REQUIREMENTS TO BE IMPLEMENTED WOULD BE DETERMINED DURING SELECTION OF THE REMEDY.

...SPECIAL SEEDING TECHNIQUES OR EXPENSIVE STABILIZING MATERIALS ARE UNWARRANTED DURING THE VEGETATION PROCESS BECAUSE THERE HAS BEEN NO INDICATION THAT THERE IS MIGRATION OF CONTAMINATED MATERIALS...

SPECIAL SEEDING OR STABILIZING METHODS WOULD BE USED AS REQUIRED TO ENSURE THAT A VEGETATIVE COVER WERE PROPERLY ESTABLISHED, IF SUCH AN ALTERNATIVE WERE SELECTED. THE SPECIFIC TECHNIQUES TO BE USED WOULD BE EVALUATED MORE CLOSELY DURING THE PREDESIGN AND DESIGN PHASES OF THE PROJECT.

EPA SHOULD IDENTIFY IN THE FEASIBILITY STUDY THE TCDD CONCENTRATIONS OR LEVEL OF CONTAMINATION THAT WILL TRIGGER THE IMPLEMENTATION OF SUCH CONTINGENCY PLANS.

IT IS BEYOND THE SCOPE OF THE FEASIBILITY STUDY TO IDENTIFY SUCH CONCENTRATIONS. IF A LIMITED ACTION ALTERNATIVE WERE SELECTED, STATE AND FEDERAL HEALTH AGENCIES WOULD BE CONSULTED TO DETERMINE THE SPECIFIC SITUATIONS THAT WOULD DETERMINE THE NEED FOR

CONTINGENCY PLANS.

...OFFSITE DRAINAGE MONITORING SHOULD BE FOR SEDIMENT ONLY AND NOT WATER SINCE TCDD IS ATTACHED TO THE SEDIMENT AND NOT DISSOLVED IN THE WATER.

SINCE THE SEDIMENT WOULD BE CARRIED BY WATER, IT WOULD BE NECESSARY TO COLLECT BOTH. SEDIMENT SAMPLES WOULD BE DEWATERED PRIOR TO ANALYSIS.

"MONITORING OF PARTICULATE AND SEDIMENT FROM THE SURFACE DRAINAGE OF THE SITE WOULD ESTABLISH A DATA BASE WHICH MAY DICTATE REDUCED FREQUENCY OR ELIMINATION OF SITE MONITORING, OR THE NEED TO EVALUATE WHETHER ADDITIONAL REMEDIATION IS REQUIRED.

THE FEASIBILITY STUDY DESCRIBES A TWO-PHASE MONITORING PROGRAM WITH THE FIRST PHASE USED TO ESTABLISH THE SPECIFIC REQUIREMENTS WOULD BE DEVELOPED DURING DESIGN.

...RCRA REQUIREMENTS WHICH REDUCE OR MINIMIZE MIGRATION OF LIQUIDS THROUGH TCDD CONTAMINATED SOIL ARE NOT NECESSARY.

IF REQUIREMENTS FOR A CAP OR COVER UNDER RCRA ARE DETERMINED TO BE APPLICABLE OR RELEVANT AND APPROPRIATE OR ARE OTHERWISE NECESSARY TO PROVIDE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT, THESE REQUIREMENTS MUST BE MET. A WAIVER FROM A POTENTIAL ARAR IS POSSIBLE IF THE REMEDY ACHIEVES AN EQUIVALENT DEGREE OF CONTROL.

ANY IN-PLACE CONTAINMENT ALTERNATIVE SHOULD BE DESIGNED SUCH THAT ITS IMPLEMENTATION WILL NOT INCREASE THE LIKELIHOOD OF EROSION BEYOND THAT WHICH CURRENTLY EXISTS. THEREFORE, SPECIAL AND COSTLY MEASURES TO CONTROL EROSION WOULD NOT NEED TO BE IMPLEMENTED FOR THIS TYPE OF CONSTRUCTION ACTIVITY.

IT IS POSSIBLE THAT THE IMPLEMENTATION OF AN IN-PLACE CONTAINMENT ALTERNATIVE WOULD INHERENTLY REQUIRE SOIL SCARIFICATION, PREPARATION OF ANCHOR TRENCHES, OR OTHER ACTIVITIES THAT MAY TEMPORARILY EXPOSE CONTAMINATED SOIL. EROSION CONTROL MAY BE REQUIRED FOR THESE ALTERNATIVES. THE SPECIFIC APPROACH WOULD BE DEVELOPED DURING DESIGN OF THE ALTERNATIVE.

HYDRO-SEEDING IS DISCUSSED EXCLUSIVELY AS THE SEEDING TECHNOLOGY OF CHOICE, HOWEVER, ANY CONVENTIONAL METHOD OF GRASS SEED APPLICATION SHOULD BE SATISFACTORY.

OTHER METHODS OF SEEDING MAY BE ACCEPTABLE. AS NOTED IN THE FEASIBILITY STUDY, APPROACHES THAT DIFFER FROM THOSE DESCRIBED IN THE FEASIBILITY STUDY MAY BE SELECTED DURING PREDESIGN AND DESIGN.

ALTHOUGH A POROUS STABILIZING MAT SHOULD REDUCE LOSS OF CLEAN TOPSOIL BY EROSION, ONLY IN RARE CASES WOULD THIS EXPENSE BE JUSTIFIED. IN MOST CASES, A MINIMAL AMOUNT OF REPLACEMENT TOPSOIL, FOLLOWED BY DEEDING, WILL REPAIR ANY PROBLEM AREAS...

SPECIAL STABILIZING METHODS WOULD BE USED AS REQUIRED TO ENSURE THAT THE INTEGRITY OF THE CAP IS MAINTAINED, IF THIS ALTERNATIVE WERE SELECTED. THE SPECIFIC TECHNIQUE USED TO REPAIR ERODED AREAS WOULD DEPEND ON THE LOCATION OF THE AREA OF CONCERN.

THE ASPHALT OPTION OR SYNTHETIC MEMBRANE SHOULD BE DROPPED FROM CONSIDERATION. AN IMPERMEABLE CAP IS NO REQUIRED...

IF IN-PLACE CONTAINMENT WERE SELECTED, OPTIONS SUCH AS ASPHALT OR SYNTHETIC MEMBRANE WOULD BE EVALUATED FURTHER DURING THE PREDESIGN AND DESIGN PHASES.

THIS ASPHALT MEMBRANE WILL BE UNATTRACTIVE, BE VERY SUSCEPTIBLE TO MECHANICAL DAMAGE, REQUIRE EXTENSIVE MAINTENANCE, BE VERY SUSCEPTIBLE TO ULTRAVIOLET ATTACK AND BE VERY EXPENSIVE WHILE PROVIDING NO BETTER PROTECTION THAN THE SOIL AND VEGETATIVE CAP. ANY SYNTHETIC MEMBRANE WHICH IS SUFFICIENTLY THICK TO PROVIDE ADEQUATE MECHANICAL STRENGTH TO WITHSTAND A GRAVEL COVER IS EXTREMELY EXPENSIVE. SOME OF THE DISADVANTAGES ASSOCIATED WITH SYNTHETIC MEMBRANES ARE THAT THEY LEAK AT THE JOINTS.

AS A RESULT OF FIELD DAMAGE, THEY REQUIRE PERIODIC REPLACEMENT, ARE VERY DIFFICULT TO INSPECT WITHOUT TOTAL REMOVAL OF THE GRAVEL COVER, ARE UNATTRACTIVE AND ARE ORDERS OF MAGNITUDE MORE COSTLY THAN A SOIL AND VEGETATIVE CAP.

WHERE ACCESS ROADS ARE REQUIRED, A CAP USING CONVENTIONAL ASPHALT PAVING TECHNIQUES WOULD PROVIDE A VERY ACCEPTABLE CAP.

ISSUES REGARDING THE SELECTION OF A SPECIFIC MATERIAL FOR CAPPING THE SITE WOULD BE CONSIDERED FURTHER DURING THE PREDESIGN PHASE, IF THIS ALTERNATIVE WERE SELECTED. THE ITEMS DESCRIBED BY THE COMMENTOR WILL BE CONSIDERED.

BECAUSE IN ALL CASES THE CONTAMINATION IS LOCATED ALONG ROADS AND IN THE ADJACENT DITCHES, THE NEED FOR CLEARING OF BRUSH AND DEBRIS SHOULD BE MINIMAL.

THE AMOUNT OF BRUSH AND DEBRIS THAT WOULD BE CLEARED WOULD BE SUFFICIENT TO IMPLEMENT THE ALTERNATIVE AND MAINTAIN ITS INTEGRITY.

PULVERIZING EXISTING ASPHALT AND GRAVEL ROAD SHOULD NOT BE REQUIRED TO ALLOW GRASS GROWTH TO OCCUR ON 1 FOOT OF TOPSOIL.

ROADS WOULD BE PULVERIZED AS REQUIRED TO ENSURE THE STABILITY AND INTEGRITY OF THE CAP MATERIAL. THE SPECIFIC TECHNIQUES USED WOULD BE DETERMINED DURING THE PREDESIGN AND DESIGN PHASES. THE PROPOSED PLAN DESCRIBES LEAVING EXISTING PAVEMENT IN PLACE IN SOME AREAS AS AN ADDITIONAL BARRIER AND WOULD PROVIDE ADDITIONAL PROTECTIVENESS RELATIVE TO THE REMEDY DESCRIBED IN JANUARY 16, 1987 EPA CORRESPONDENCE TO RENATE KIMBROUGH ATTACHED TO THE PROPOSED PLAN.

MOST CULVERTS CAN BE ELIMINATED AND GRADING OF THE SITE CAN ACCOMMODATE MOST SITE DRAINAGE PROBLEMS. CULVERTS AND GRADING WOULD BE USED AS REQUIRED TO MAINTAIN PROPER DRAINAGE AT THE SITE, IF AN IN-PLACE CONTAINMENT ALTERNATIVE WERE SELECTED.

THE REQUIREMENTS FOR SITE DRAINAGE FOLLOWING IMPLEMENTATION OF THE REMEDY WILL BE DETERMINED DURING DESIGN. GRADING OF THE SITE MAY NOT BE COMPATIBLE WITH THE SELECTED REMEDY.

...IT SHOULD NOT BE NECESSARY TO MOW THE SITE MORE THAN TWICE PER YEAR.

MOWING WILL BE PERFORMED AS REQUIRED TO MAINTAIN THE INTEGRITY OF THE COVER AND PREVENT DAMAGE DUE TO FACTORS SUCH AS FIRE. THE SPECIFIC AMOUNT OF MOWING THAT WOULD BE PERFORMED WOULD BE ADJUSTED AS REQUIRED.

BECAUSE IT IS CLEAN SOIL THAT IS THE FOCUS OF THE SOIL HANDLING AND SURFACE PREPARATION REQUIRED BY THIS OPTION, THESE MEASURES CAN BE PERFORMED WITH LARGE SCALE AND VERY EFFICIENT EQUIPMENT.

IT WAS ASSUMED IN THE FEASIBILITY STUDY THAT SUCH EQUIPMENT WOULD BE USED. THE SPECIFIC TECHNIQUES WILL BE EVALUATED FURTHER DURING DESIGN IF THIS ALTERNATIVE WERE SELECTED.

ONCE THE VEGETATION IS ESTABLISHED, THIS METHOD OF CAPPING PROVIDES ONE OF THE MOST MAINTENANCE FREE AND LOW COST OF MAINTENANCE REMEDIATION OPTIONS AVAILABLE.

THE ADVANTAGES AND DISADVANTAGES OF A VEGETATIVE CAP WOULD BE CONSIDERED FURTHER DURING DESIGN IF AN IN-PLACE CONTAINMENT ALTERNATIVE WERE SELECTED.

...A VERY LIMITED AMOUNT OF VEHICULAR TRAFFIC WOULD BE REQUIRED. WHERE IT IS REQUIRED, ASPHALT PAVED ACCESS ROADS SHOULD BE PROVIDED.

THIS WOULD BE CONSIDERED FURTHER DURING DESIGN IN CONSIDERATION OF THE REQUIREMENTS OF THE SELECTED REMEDY.

DUST CONTROL DURING SURFACE PREPARATION SHOULD NOT BE ANY GREATER THAN THAT REQUIRED BY ANY OTHER FARMING OR EXCAVATION PROJECT.

SPECIAL PRECAUTIONS MUST BE TAKEN BECAUSE OF THE TCDD PRESENT IN THE SOIL, WHICH WOULD NOT BE THE CASE FOR MOST FARMING OR EXCAVATION PROJECTS.

THE SPRAY-ON TYPE ASPHALT MEMBRANE WILL BE RELATIVELY DELICATE. WHEN THE VEHICLES USED TO APPLY THE SAND TOPPING DRIVE OVER THE MEMBRANE IT WILL BE DAMAGED. ADDITIONALLY, SAND IS EXTREMELY SUSCEPTIBLE TO EROSION AND WILL REQUIRE CONTINUAL MAINTENANCE.

THE ADVANTAGES AND DISADVANTAGES OF SUCH A MATERIAL WOULD BE CONSIDERED MORE CLOSELY, IF APPLICABLE, DURING DESIGN OF THE REMEDY.

...THE SAND COVERING WILL REQUIRE SIGNIFICANT REPAIR AFTER EACH STORM EVENT. THE NECESSITY FOR FREQUENT REPAIRS WILL IN TURN CAUSE FURTHER DAMAGE TO THE MEMBRANE AS A RESULT OF HEAVY VEHICULAR TRAFFIC IN THE FORM OF FRONT-LOADERS AND OTHER SAND PLACEMENT AND GRADING EQUIPMENT.

ISSUES SUCH AS THESE WOULD BE CONSIDERED DURING PREDESIGN, WHEN A SPECIFIC METHOD WOULD BE CHOSEN, IF SUCH AN ALTERNATIVE WERE SELECTED.

INSPECTION OF THE MEMBRANE WILL BE VERY DIFFICULT DUE TO THE SAND COVERING.

THE ADVANTAGES AND DISADVANTAGES OF VARIOUS CONTAINMENT METHODS WOULD BE CONSIDERED FURTHER DURING THE PREDESIGN OF THE SELECTED ALTERNATIVE.

THIS TECHNOLOGY IS IN NO RESPECT MORE DURABLE THAN A SOIL AND VEGETATIVE COVER.

THE ADVANTAGES AND DISADVANTAGES OF VARIOUS CONTAINMENT METHODS WOULD BE CONSIDERED FURTHER DURING THE PREDESIGN OF THE SELECTED ALTERNATIVE, IF APPLICABLE TO THE REMEDY.

...THERE IS A GREAT DEAL OF HAND WORK REQUIRED TO PREPARE THE AREA PRIOR TO THE APPLICATION OF THE MEMBRANE.

...ENORMOUS AMOUNTS OF SITE DISTURBANCE AND LABOR ARE REQUIRED TO PREPARE FOR THE MEMBRANE APPLICATION.

THE AMOUNT OF SITE PREPARATION USED TO IMPLEMENT A REMEDIAL ALTERNATIVE SUCH AS IN-PLACE CONTAINMENT WOULD BE SUFFICIENT TO ENSURE THAT THE TECHNOLOGY WAS PROPERLY APPLIED AND INTEGRITY MAINTAINED. THESE ISSUES WOULD BE CONSIDERED DURING DESIGN.

THIS REMEDIAL OPTION IS DISADVANTAGEOUS BECAUSE OF THE EXTENSIVE LABOR (PARTICULARLY HAND LABOR) REQUIREMENTS,...

EPA AGREES THAT THERE ARE ADVANTAGES AND DISADVANTAGES TO THE VARIOUS TECHNOLOGIES DESCRIBED FOR IN-PLACE CONTAINMENT. THESE ISSUES WOULD BE FURTHER CONSIDERED DURING DESIGN IF IN-PLACE CONTAINMENT IS A COMPONENT OF THE SELECTED REMEDY.

THE UNKNOWN "DURABILITY" (OF ASPHALT MEMBRANES) IS A RESULT OF MISAPPLYING THIS TECHNOLOGY TO A PROBLEM IT WAS NEVER INTENDED TO ADDRESS.

THE TECHNOLOGY, AS WITH OTHERS, WAS NOT INTENDED SPECIFICALLY TO BE USED FOR REMEDIATION AT A SITE SUCH AS THIS. A KEY PART OF THE EVALUATION PROCESS WILL BE TO EVALUATE THE SUITABILITY OF SUCH TECHNOLOGIES FOR SUCH AN APPLICATION.

THE REQUIREMENT TO CLEAR BRUSH AND DEBRIS SHOULD BE LIMITED (FOR A SYNTHETIC MEMBRANE).

BRUSH AND DEBRIS WOULD BE CLEARED AS REQUIRED TO IMPLEMENT THE SELECTED ALTERNATIVE.

BY NOT COVERING THE SYNTHETIC MEMBRANE WITH SOIL, SAND OR GRAVEL THE LINER IS
SUBJECTED TO SEVERE ULTRA VIOLET ATTACK AND THE POTENTIAL FOR MECHANICAL DAMAGE.
(PP. 8-9 AND 8-10)

THE SUSCEPTIBILITY OF SUCH A LINER WOULD BE A FUNCTION OF THE MATERIAL THAT IS USED. IT
WAS NOTED IN THE FEASIBILITY STUDY THAT SUCH MATERIALS WOULD BE SUSCEPTIBLE TO DAMAGE FROM
SUNLIGHT AND ARE FRAGILE. SUCH ISSUES WOULD BE CONSIDERED FURTHER DURING PREDESIGN WHEN A
SPECIFIC OPTION WOULD BE CHOSEN FOR THE SELECTED REMEDIAL ALTERNATIVE.

MEMBRANE REPAIR AND REPLACEMENT WILL BE SIGNIFICANT SINCE THE LINER HAS NO
PROTECTIVE OVERFILL.

A CONCERN FOR THE DESIGN OF AN IN-PLACE CONTAINMENT OPTION WOULD BE TO MINIMIZE THE REPAIR
AND REPLACEMENT REQUIREMENTS FOR SUCH AN OPTION. ISSUES SUCH AS THIS WOULD BE EVALUATED
DURING THE PREDESIGN AND DESIGN PHASES FOR THE PROJECT.

...SURFACE PREPARATION FOR INSTALLATION OF A SYNTHETIC MEMBRANE IS EXTRAORDINARY.
THE SITE GRADE MUST BE PERFECTLY SMOOTH, AND THE APPLICATION OF A SAND BED PRIOR TO
MEMBRANE PLACEMENT IS THE PREFERRED TECHNIQUE OF INSTALLATION. ALL THIS REQUIRES A
GREAT DEAL OF SURFACE DISTURBANCE AND HAND LABOR.

ISSUES REGARDING THE IMPLEMENTATION OF AN IN-PLACE CONTAINMENT ALTERNATIVE WOULD BE
CONSIDERED FURTHER DURING PREDESIGN. EPA AGREES THAT EXISTING SURFACE PREPARATION WOULD
BE REQUIRED FOR INSTALLATION OF A SYNTHETIC LINER. THE AMOUNT OF SURFACE PREPARATION THAT
WOULD BE REQUIRED WOULD BE SUITABLE FOR ENSURING THE INTEGRITY OF THE CONTAINMENT
MATERIAL.

WITHOUT SUBSTANTIAL COVER OVER THE MEMBRANE, WIND, FLOOD AND ULTRAVIOLET DAMAGE WILL
BE SIGNIFICANT. LABOR FOR SURFACE PREPARATION WILL BE ENORMOUS. DURABILITY IS VERY
POOR AND REPLACEMENT AFTER 5 YEARS OF SIGNIFICANT PORTIONS OF THE LINER WOULD NOT BE
SURPRISING.

IT WAS NOTED IN THE FEASIBILITY STUDY THAT THESE WOULD BE CONCERNS FOR A SYNTHETIC LINER
USED IN THIS APPLICATION.

THE SINGLE MOST GLARING DISADVANTAGE WHICH WAS NOT MENTIONED IS THE VERY HIGH
INSTALLED COST OF MEMBRANE MATERIAL AND HENCE THE VERY HIGH REPLACEMENT AND
MAINTENANCE COST.

A HIGH INSTALLED COST OF AN OPTION DOES NOT NECESSARILY MEAN THAT MAINTENANCE COSTS WILL
ALSO BE HIGH. AS NOTED IN THE FEASIBILITY STUDY, INSTALLATION OF SUCH AN OPTION WOULD
REQUIRE A SUBSTANTIAL AMOUNT OF HAND LABOR. SUCH ISSUES WOULD BE CONSIDERED FURTHER
DURING PREDESIGN OF THE SELECTED REMEDIAL ALTERNATIVE. IT WOULD BE AT THAT TIME THAT A
SPECIFIC PROCESS OPTION WOULD BE SELECTED.

THE REQUIREMENTS OF THE RCRA HAZARDOUS WASTE LANDFILL SHOULD ONLY BE ADDRESSED AS
THEY APPLY TO THE SPECIFIC CASE OF TCDD CONTAMINATED SOIL AT TIMES BEACH. EVEN THE
MOST RIGOROUSLY DESIGNED TCDD CONTAMINATED SOIL DISPOSAL FACILITY SHOULD ONLY
ADDRESS THE POTENTIAL PROBLEM AREAS OF EROSION, DUSTING AND EXPOSURE TO THE SOIL.

THE RCRA HAZARDOUS WASTE LANDFILL REGULATIONS FOR DIOXIN WASTES ARE CLEARLY LAID OUT IN
THE "DIOXIN RULE (50 FR 1978) AND THE PERMITTED FACILITIES REGULATIONS (40 CFR 264). THE
REQUIREMENTS FOR A HAZARDOUS WASTE LANDFILL ARE RELATIVELY INVARIANT REGARDLESS OF
SPECIFIC WASTE. THE REGULATIONS ARE NOT APPLIED SELECTIVELY, BUT ARE APPLIED TO ALL
HAZARDOUS WASTE LANDFILLS WHICH ACCEPT RCRA WASTES FOR DISPOSAL.

...PROBLEM AREAS CAN BE AVOIDED BY DEPOSITING THE CONTAMINATED SOIL ON GRADE, OR
PARTIALLY OR TOTALLY BURYING THAN SOIL, AND THEN COVERING THE CONTAMINATED SOIL WITH
A LAYER OF CLEAN SOIL FOLLOWED BY A VEGETATIVE COVER IN A "MONOFILL DESIGN.

AS NOTED IN THE FEASIBILITY STUDY, A MONOFILL DESIGN WOULD BE AN OPTION IF LAND DISPOSAL WERE SELECTED AS THE REMEDIAL ALTERNATIVE TO BE IMPLEMENTED.

THE PHYSICAL PROPERTIES OF TCDD CLEARLY MANDATE THE APPLICATION OF "IN-PLACE CONTAINMENT" BY MEANS OF SOIL AND VEGETATIVE CAP IN LIEU OF THE USE OF LINERS, LEAK DETECTION AND LEACHATE COLLECTION SYSTEMS, AND IMPERVIOUS COVERS WHICH ARE MORE EXPENSIVE AND SCIENTIFICALLY UNJUSTIFIED.

THE RECENT CERCLA AMENDMENTS REQUIRE REMEDIAL ACTIONS TO ACHIEVE ALL ARARS. IF A LEVEL OF CONTROL OF THE CONTAMINANTS EQUIVALENT TO AN ARAR CAN BE ACHIEVED BY ALTERNATIVE MEANS, A WAIVER FROM THE POTENTIAL ARAR WILL BE CONSIDERED AND DOCUMENTED IN THE RECORD OF DECISION. IF A SOIL AND VEGETATIVE CAP ACHIEVES AN EQUIVALENT DEGREE OF CONTROL AS A CAP REQUIRED BY AN ARAR, THEN A WAIVER FROM THE ARAR MAY APPLY. THIS DETERMINATION WOULD BE DOCUMENTED IN THE PROPOSED PLAN AND RECORD OF DECISION IF AN IN-PLACE CONTAINMENT ALTERNATIVE WERE SELECTED FOR IMPLEMENTATION.

SITING OF ANY DISPOSAL FACILITY CONSIDERED FOR TIMES BEACH SHOULD BE BASED ON A FLOODING STUDY OF THE TIMES BEACH SITE USING THE HEC COMPUTER MODEL DEVELOPED BY THE ARMY CORPS OF ENGINEERS. TO MINIMIZE THE IMPACT OF THE DISPOSAL FACILITY'S EFFECT ON THE FLOOD LEVEL, THE FACILITY COULD BE PARTIALLY BURIED.

THE IMPACT OF VARIOUS LAND DISPOSAL OPTIONS AND LOCATIONS ON FLOOD HEIGHTS HAS BEEN EVALUATED BY COE USING THE HEC 2 COMPUTER MODEL. IT IS EXPECTED THAT THE DESIGN OF SUCH A FACILITY WOULD BE PREPARED IN CLOSE CONSULTATION WITH COE. PARTIAL BURIAL OF SUCH A FACILITY WOULD BE AN OPTION, ALTHOUGH MANY FACTORS WOULD BE CONSIDERED DURING DESIGN OF SUCH A FACILITY.

IT IS STATED THAT CONSTRUCTION OF AN ON-SITE DISPOSAL FACILITY IN THE NORTHWEST CORNER OF TIMES BEACH (A CONTAMINATED AREA) WOULD REQUIRE THAT CONSTRUCTION WORK BE DONE IN MODIFIED LEVEL C PROTECTIVE EQUIPMENT. NO RISK ASSESSMENT EXISTS WHICH JUSTIFIES THIS LEVEL OF PROTECTION.

MODIFIED LEVEL C EQUIPMENT IS RECOMMENDED BY FEDERAL HEALTH AGENCIES DURING PERFORMANCE OF CERTAIN ACTIVITIES DURING DIOXIN SITE CLEANUPS. THIS LEVEL OF PERSONAL PROTECTION IS TYPICAL OF REMOVAL WORK THAT HAS BEEN PERFORMED BY EPA AT NUMEROUS MISSOURI TCDD SITES.

"...MOST SAMPLES HAVE SHOWN TODD CONTAMINATION IN ONLY THE UPPER 12 INCHES" AND IN FACT NEARLY ALL SAMPLES AT CONCENTRATIONS ABOVE A NON-RESIDENTIAL LEVEL OF CONCERN ARE IN THE TOP 12 INCHES OF ROADWAYS AND SHOULDERS. THE CONTAMINATION AT DEPTHS OF 4 FEET AT QUAIL RUN WERE DUE TO A UTILITY LINE INSTALLATION WHICH CAUSED SURFACE CONTAMINATION TO BE INTRODUCED TO THESE DEPTHS. EVEN CONSIDERING ROAD GRADING AND RUTTING OF THE STREETS, THE MATERIAL WOULD NOT BE EXPECTED AT A DEPTH BELOW THE 12 INCHES, WHICH IS WHAT HAS BEEN OBSERVED.

EPA HAS DISCUSSED ISSUES REGARDING CLEANUP LEVELS FOR REMEDIATION AT TIMES BEACH IN PREVIOUS COMMENTS. THE DEGREE OF REMEDIATION REQUIRED WOULD BE CONSISTENT WITH GUIDELINES RECOMMENDED BY STATE AND FEDERAL AGENCIES.

...RCRA REGULATIONS FOR CONVENTIONAL HAZARDOUS WASTES SHOULD NOT BE ARBITRARILY APPLIED TO TCDD CONTAMINATED SOIL, MUCH LESS THE EXTREMELY CONSERVATIVE "ACUTE HAZARDOUS WASTE PROVISIONS."

THE DIOXIN WASTES F020-F027 ARE LISTED AT 40 CFR 261.31 AS ACUTE HAZARDOUS WASTES. THIS LISTING WAS PROMULGATED UPON CAREFUL CONSIDERATION AND OPPORTUNITY FOR PUBLIC COMMENT.

...EPA'S NOVEMBER 7, 1986 FINAL LAND DISPOSAL REGULATIONS (51 FED. REG. 40572, 40634) INDICATES THAT NINETY-FIVE PERCENT OF THE TCDD CONTAMINATED SOIL IN MISSOURI CAN BE LAND DISPOSED WITHOUT RESTRICTIONS.

THE "LAND BAN" REGULATIONS THE COMMENTOR REFERS TO DO INDICATE THAT MOST OF THE

DIOXIN-CONTAMINATED SOILS EPA IS AWARE OF WILL MEET THE TREATMENT STANDARD (40 CFR 268.41) AND CAN BE LAND DISPOSED IN RCRA PERMITTED LANDFILL. THE STATEMENT QUOTED BY THE COMMENTOR DOES NOT IMPLY THAT THE SUBJECT SOILS ARE NOT HAZARDOUS WASTE. NOR DOES IT MEAN THAT SOILS MEETING THE TREATMENT STANDARD CAN BE LAND DISPOSED AT ORDINARY MUNICIPAL LANDFILLS OR OTHER NON-RCRA-PERMITTED LANDFILLS.

SHOULD ANY WATER BE COLLECTED FOR DISPOSAL, THE ONLY NECESSARY METHOD OF TREATMENT IS TO REMOVE ALL PARTICULATES BELOW 5 MICRONS. CARBON ADSORPTION IS NOT NECESSARY,...

THE PRECISE METHOD FOR TREATMENT OF COLLECTED WATER WOULD BE EVALUATED DURING PREDESIGN AND DESIGN OF SITE OPERATIONS. EPA ANTICIPATES THAT CARBON ADSORPTION TREATMENT WOULD BE REQUIRED FOR SUCH WATER.

DELISTING SHOULD BE A VERY STRAIGHTFORWARD PROCESS...

DELISTING REQUIREMENTS ARE DISCUSSED IN THE NON-COST EVALUATION OF ALTERNATIVES PORTION OF THE FEASIBILITY STUDY REPORT.

THE CONTINGENCY PLAN CITED IN THE REPORT REQUIRED THE PLACEMENT OF A DAILY COVER OVER EXCAVATED AREAS WHICH ARE NOT YET SHOWN TO BE FREE OF CONTAMINATION. THIS IS AN UNNECESSARY, INEFFICIENT AND OVERLY COSTLY PROCEDURE BECAUSE CURRENTLY EXPOSED AREAS OF TIMES BEACH HAVE SHOWN NO MIGRATION DUE TO FLOODING.

A CONCERN DURING EXCAVATION WOULD BE POSSIBLE EROSION OF CONTAMINATED SOIL BY WIND OR RAIN. REDUCING THE SPREAD OF CONTAMINATED SOIL FROM THE EXCAVATED AREAS WOULD BE COST-EFFECTIVE SINCE IT WOULD MINIMIZE THE TOTAL VOLUME OF MATERIAL TO BE REMEDIATED. SUCH ISSUES WOULD BE FURTHER EVALUATED DURING DESIGN OF THE SELECTED ALTERNATIVE.

THE DOUBLE LINED CONCRETE OR MONOFILL FACILITIES ARE MORE APPROPRIATELY APPLIED TO A CONVENTIONAL HAZARDOUS WASTE FACILITY FOR HIGHLY LEACHABLE WASTES. THE CONTAINERIZED STORAGE TECHNIQUE SHOULD NOT BE USED FOR ANY TYPE OF HAZARDOUS WASTE PROBLEM.

VARIOUS OPTIONS ARE AVAILABLE FOR DISPOSAL OF CONTAMINATED SOIL, AS NOTED IN THE FEASIBILITY STUDY. THESE OPTIONS WOULD BE EVALUATED IN GREATER DETAIL IF LAND DISPOSAL WERE SELECTED AS THE REMEDIAL ALTERNATIVE TO BE IMPLEMENTED.

THE POLYPROPYLENE BAGS MENTIONED IN THE FEASIBILITY STUDY ARE DIFFICULT TO FILL, HANDLE, STACK, ARE VERY SUSCEPTIBLE TO MECHANICAL DAMAGE, AND HAVE A LIMITED LIFE WHEN CONSIDERED AS A PERMANENT DISPOSAL CONTAINER.

SEMI-BULK SACKS HAVE LIMITED POTENTIAL FOR PERMANENT DISPOSAL. SEMI-BULK SACKS ARE PRESENTLY USED FOR INTERIM STORAGE PRIOR TO TREATMENT OR DISPOSAL OF THE CONTAINERIZED MATERIAL. THE SACKS HAVE BEEN USED WITH SUCCESS FOR DIOXIN-CONTAMINATED REMOVAL OPERATIONS AT DIOXIN-CONTAMINATED SITES IN MISSOURI.

...A MORE REALISTIC DEPTH OF EXCAVATION WOULD BE SIX INCHES OR AT MOST APPROXIMATELY 1 FOOT, AND THE 1 PPB TCDD LEVEL SHOULD BE MODIFIED TO REFLECT REVISED AND MORE SCIENTIFICALLY JUSTIFIED SURFACE AND SUBSURFACE TCDD LEVELS OF CONCERN...

AS NOTED PREVIOUSLY, THE EXCAVATION APPROACH THAT WOULD BE PERFORMED WOULD BE CONSISTENT WITH RECOMMENDATIONS OF STATE AND FEDERAL PUBLIC HEALTH AGENCIES.

THE USE OF BACKHOES FOR A PROJECT THE SCALE OF A TIMES BEACH EXCAVATION IS A VERY INEFFICIENT UTILIZATION OF MANPOWER AND EQUIPMENT.

THE APPROACH AND EQUIPMENT DESCRIBED IN THE FEASIBILITY STUDY IS SIMILAR TO THAT USED BY EPA IN SUCCESSFUL REMOVAL OPERATIONS AT TCDD SITES IN MISSOURI. OTHER APPROACHES MAY BE CONSIDERED DURING PREDESIGN AND DESIGN OF THE SELECTED ALTERNATIVE.

STRONG OPPOSITION WILL BE ENCOUNTERED IF MISSOURI TCDD CONTAMINATED SOILS ARE SHIPPED TO A DISPOSAL SITE IN ANOTHER STATE. ADDITIONALLY, THERE ARE NO PERMITTED OFFSITE DISPOSAL FACILITIES AVAILABLE AT THIS TIME. THESE PROBLEMS COMBINED WITH THE TREMENDOUS COST TO TRANSPORT THIS MATERIAL TO AN OFFSITE FACILITY SHOULD PRECLUDE FURTHER CONSIDERATION OF THIS APPROACH.

ALTERNATIVES FOR REMEDIATION OF DIOXIN-CONTAMINATED SOIL ARE EVALUATED IN THE FEASIBILITY STUDY ON THE BASIS OF BOTH COST AND NON-COST FACTORS. THE COSTS TO TRANSPORT THE SOIL WERE INCLUDED IN THE COST ESTIMATES. CONCERNS REGARDING THE AVAILABILITY OF FACILITIES WERE NOTED IN THE FEASIBILITY STUDY.

EPA PROPOSES TO REQUIRE THAT THE OFFSITE LAND DISPOSAL FACILITY BE PERMITTED UNDER RCRA. THE COMMENTOR CONSIDERS THESE REQUIREMENTS TO BE OVERLY RESTRICTIVE...

USE OF A FULLY PERMITTED FACILITY FOR OFFSITE LAND DISPOSAL IS CLEARLY REQUIRED BY THE PROVISIONS OF SARA, AND THE RCRA REGULATIONS.

CONTAINERS OF ANY SORT ARE UNNECESSARY TO AN EFFICIENTLY DESIGNED DISPOSAL OR TREATMENT SCHEME. ALL HANDLING OR EXCAVATED SOIL SHOULD BE PERFORMED IN BULK. ANY TRANSPORT OR STORAGE CAN BE PERFORMED IN BULK AT A MUCH LOWER COST AND WITH LESS POTENTIAL EXPOSURE TO REMEDIATION WORKERS. ...ALL CONTAINER PURCHASE, HANDLING EXPENSES, DECONTAMINATION COSTS AND DISPOSAL COSTS ARE ELIMINATED.

CONTAINERS WOULD BE USED AS REQUIRED TO IMPLEMENT DISPOSAL OR TREATMENT OPERATIONS. THE USE OF CONTAINERIZED VERSUS BULK HANDLING WOULD BE EVALUATED IN DETAIL DURING THE DESIGN OF THE SELECTED ALTERNATIVE. THERE ARE MANY ISSUES INVOLVED WITH SOIL HANDLING, INCLUDING RISKS OF EXPOSURE TO DIOXIN-CONTAMINATED SOIL BY SITE WORKERS AND THE PUBLIC.

SEMI-BULK SACKS HAVE A RELATIVELY SHORT USEFUL LIFE. WHEN USED IN THIS STORAGE MODE, THEY COULD NOT BE EXPECTED TO LAST MORE THAN A FEW YEARS WITHOUT SEAM FAILURES.

SEMI-BULK SACKS HAVE BEEN USED WITH SUCCESS BY EPA IN REMOVAL OPERATIONS AT DIOXIN SITES IN MISSOURI. SEAM FAILURES HAVE NOT BEEN A SIGNIFICANT PROBLEM TO DATE WITH STORED MATERIAL, ARE NOT EXPECTED TO BE A PROBLEM DURING THE INTERIM PERIOD THAT THE MATERIAL IS BEING STORED. VARIOUS METHODS OF INTERIM STORAGE WOULD BE CONSIDERED DURING THE PREDESIGN OF THE SELECTED ALTERNATIVE FOR TIMES BEACH.

APPENDIX A--SITE BACKGROUND INFORMATION

...EXISTING SAMPLING DATA IS NOT SUFFICIENT TO SERVE AS A BASIS FOR REMEDIATION. SINCE THE GOAL OF THE SAMPLING WAS TO "DETECT," RATHER THAN CHARACTERIZE OR REPRESENT, THE CONTAMINATION ON SITE, SAMPLE LOCATIONS WERE SELECTED WITH CONSIDERABLE BIAS....ADDITIONAL SAMPLING WOULD BE NECESSARY TO DEFINE THE EXTENT OF EXCAVATION NECESSARY.

ADDITIONAL SAMPLING AND ANALYSIS WILL BE REQUIRED PRIOR TO SITE REMEDIATION.

...SOIL SAMPLES "REPRESENTING" AN ENTIRE CITY BLOCK WERE COMPOSITED FROM MATERIALS TAKEN FROM BOTH SIDES OF THE ROAD, ALONG THE SHOULDERS AND IN DRAINAGE DITCHES. THE USAGE OF THE TERM "REPRESENTING" IS INAPPROPRIATE BECAUSE SAMPLING WAS "DETECTIVE" IN NATURE...

THE OVERALL SAMPLING PROGRAM WAS DETECTIVE IN NATURE. HOWEVER, THE SAMPLING FOR SPECIFIC AREAS WAS CONSIDERED TO BE REPRESENTATIVE OF THAT AREA.

...NEGATIVE RESULTS SHOULD BE GIVEN AS MUCH CREDENCE AS THE FEW POSITIVE ANALYSES AND SHOULD GENERALLY DEMONSTRATE THAT STORM WATER RUN-OFF IS NOT A CONCERN.

...SEVEN SEDIMENT SAMPLES WERE COLLECTED. OF THESE, ONLY THREE WERE FOUND TO CONTAIN TCDD AND THESE WERE VERY LOW LEVELS (0.42 PPB TO 0.79 PPB). THESE DATA FURTHER SUBSTANTIATE THAT EROSION AND STORM WATER RUN-OFF IS NOT A SIGNIFICANT CONCERN.

STORMWATER IS OF CONCERN, PARTICULARLY WHEN POSITIVE DIOXIN RESULTS HAVE BEEN ENCOUNTERED IN SEVERAL STORM WATER SEDIMENT SAMPLES. HIGHER DIOXIN LEVELS HAVE BEEN DETECTED IN SUBSEQUENT STORM WATER SEDIMENT SAMPLING, AND RESULTS ARE PRESENTED IN THE FEASIBILITY STUDY.

...MOST OF THE CONTAMINATION IS CONFINED ABOVE ONE FOOT DEPTH. THESE SUPPORT THE CONCEPT THAT LIMITED EXCAVATION, NOT EXCEEDING ONE FOOT DEPTH, IS ENTIRELY RESPONSIVE TO THE NCP REQUIREMENTS...

THE DEGREE OF REMEDIATION REQUIRED MUST BE COMPATIBLE WITH THE CLEANUP REQUIREMENTS ESTABLISHED ON THE BASIS OF RECOMMENDATIONS OF APPROPRIATE GOVERNMENTAL HEALTH AGENCIES.

THE REPORT STATES THAT THE SOURCES OF TCDD IN THE MERAMEC RIVER ARE BELIEVED TO BE RUN-OFF FROM TIMES BEACH, CASTLEWOOD, AND ROMAINE CREEK, AND POSSIBLE LEACHATE FROM THE REDBIRE-SIMPSON LANDFILL. THE REPORT ALSO STATES THAT NO TCDD WAS DETECTED IN ANY OF THE MERAMEC RIVER TRIBUTARY SEDIMENTS EXCEPT THOSE FROM ROMAINE CREEK (0.3 TO 0.5 PPT). THE REPORT FAILS TO RECOGNIZE THAT THE MERMAEC RIVER DRAINS A SIGNIFICANT PORTION OF METROPOLITAN ST. LOUIS....A NUMBER OF OTHER CONTAMINANT SOURCES WOULD BE EXPECTED.

THE CITED REPORT, "FOLLOW-UP INVESTIGATION OF THE MERAMEC RIVER", DOES NOT SUPPORT THAT TIMES BEACH IS A SIGNIFICANT SOURCE OF DIOXIN INTO THE MERAMEC RIVER. OTHER DIOXIN SITES IN THE MERAMEC RIVER WATERSHED ARE CLEARLY CONTRIBUTING TO CONTAMINANT LEVELS DETECTED. ELEVATED DIOXIN LEVELS HAVE BEEN DETECTED IN BIOTA AT CONSIDERABLE DISTANCE UPSTREAM OF THE ST. LOUIS METROPOLITAN AREA.

...THE CORPS OF ENGINEERS CONCLUDED THAT 24 TO 48 HOURS IS THE MINIMUM TIME NORMALLY AVAILABLE FOR PREDICTING FLOWS EXCEEDING FLOOD STAGE. THIS STATEMENT SEEMS TO IMPLY THAT NO KNOWLEDGE OF FLOODING POTENTIAL EXISTS PRIOR TO THE ACTUAL FLOOD. THIS IS AN ERRONEOUS INFERENCE, ...THE PROBABILITY OF A GIVEN FLOOD MAY BE ASSESSED AT ANY POINT IN TIME.

ALTHOUGH THE POTENTIAL FOR FLOODING CAN BE ESTIMATED FOR REMEDIAL PURPOSES AND PREDICTED RUING THE OCCURRENCE OF STORM EVENTS, SUFFICIENT WARNING IS NOT AVAILABLE TO ALLOW ELIMINATION OF FLOOD PROTECTION MEASURES.

INTERIM ACTIONS TAKEN BY EPA IN 1983 (SURFACING OF UNPAVED CONTAMINATED ROAD SHOULDERS AND PARKING LOTS WITH ASPHALT PAVEMENT) WERE OVERLY COSTLY AND GENERALLY UNNECESSARY. SIMPLY FENCING MANY SITES WOULD HAVE BEEN ADEQUATE TO PREVENT EXPOSURE AND THEREBY ELIMINATE RISK.

RESPONSE ACTIONS TAKEN BY EPA IN 1983 WERE DETERMINED TO BE NECESSARY TO PROVIDE SHORT-TERM PROTECTION OF PUBLIC HEALTH. THESE ACTIONS WERE JUSTIFIED AT THE TIME OF IMPLEMENTATION ON THE BASIS OF AVAILABLE DATA AND RECOMMENDATIONS FROM FEDERAL AND STATE HEALTH AGENCIES.

IT IS STATED THAT VERTICAL MOVEMENT OF THE SURFACE WATER WITH SOIL PARTICLES FROM THE MINKER SITE INTO THE LIMESTONE IS CONCEIVABLE, BUT CITES NO RATIONALE REGARDING WHY THIS IS BELIEVED TO BE SO. IN THE ABSENCE OF WELL DEFINED SWALLOW HOLES IN THE CREEK BED, THIS TYPE OF MOVEMENT WOULD NOT BE EXPECTED TO OCCUR.

PREVIOUS HYDROGEOLOGIC STUDIES OF ROMAINE CREEK HAVE DETERMINED THAT SURFACE AND GROUND WATER IN THE AREA ARE HYDRAULICALLY CONNECTED. A DYE STUDY PERFORMED HAS IDENTIFIED A TRACER COMPOUND INTRODUCED INTO ROMAINE CREEK EMERGING AT A DISTANT SPRING.

BONTAG ROAD WOULD REQUIRE SOME UPGRADING TO ACCOMMODATE THE TRUCK TRAFFIC. THE RECOMMENDED MODIFICATION IS 2 ½ TO 3 INCHES OF ASPHALT OVERLAY. IT IS VERY INEFFICIENT TO OVERLAY THE ACTUAL AREA TO BE REMEDIATED FOR USE AS A HAUL ROAD. A MUCH BETTER SOLUTION WOULD BE TO CONSTRUCT A PARALLEL HAUL ROAD TO ACCOMMODATE TRUCK TRAFFIC.

UPGRADING OF COUNTY ROADS...WITH 3 TO 4 INCHES OF ASPHALT OVERLAY TO ACCOMMODATE THE ANTICIPATED TRUCK TRAFFIC IS EXCESSIVE...ARBITRARILY UPGRADING ROADS TO A MUCH IMPROVED CONDITION IS IMPROPER USE OF CERCLA FUNDING. A BETTER PROCEDURE WOULD BE TO SPLIT TRAFFIC BETWEEN THE ALTERNATE ROUTES IN ORDER TO MINIMIZE DAMAGE TO ANY ONE ROUTE.

SUCH ALTERNATIVES WOULD BE MORE CLOSELY CONSIDERED DURING THE DESIGN PHASE OF THE PROJECT. IF PAVING IS REQUIRED AND COST-EFFECTIVE, IT WOULD BE USED AS REQUIRED TO IMPLEMENT THE SELECTED REMEDIAL ALTERNATIVE.

APPENDIX B--PUBLIC HEALTH AND ENVIRONMENTAL ASSESSMENT

THE LITERATURE PUBLISHED WITHIN THE LAST TWO TO THREE YEARS, MOST OF WHICH HAS BEEN REFERENCED IN THIS FEASIBILITY STUDY, SHOULD HAVE A DRAMATIC IMPACT ON THE ULTIMATE CONCLUSION TO THIS REPORT AND THE HEALTH RISKS PRESUMABLY ASSOCIATED WITH EACH OF THE VARIOUS CLEANUP ALTERNATIVES. ALL PERTINENT AVAILABLE INFORMATION ON TCDD SHOULD BE CONSIDERED IN DEVELOPING AN APPROPRIATE ASSESSMENT. A NUMBER OF KEY ARTICLES, NOT ONLY ON TCDD, BUT ON THE OTHER CHEMICALS WHICH ARE REPORTEDLY OF CONCERN IN TIMES BEACH, HAVE BEEN OVERLOOKED.

IT IS SUGGESTED THAT MOST OF THE LITERATURE PUBLISHED IN THE LAST SEVERAL YEARS HAS BEEN REFERENCED IN THE FEASIBILITY STUDY, YET A NUMBER OF KEY ARTICLES HAVE BEEN OVERLOOKED. THE INFORMATION PERTINENT TO DIOXIN WAS THOROUGHLY REVIEWED DURING PREPARATION OF THE FEASIBILITY STUDY, AND IS REFERENCED IN THE FEASIBILITY STUDY. ADDITIONAL PUBLICATIONS PROVIDED BY THE COMMENTOR HAVE BEEN CONSIDERED PRIOR TO FINAL REMEDY SELECTION.

THE COMMENTOR STATED THAT THE FOLLOWING STATEMENT SHOULD BE SUBSTITUTED FOR A STATEMENT IN THE FEASIBILITY STUDY REGARDING SITE GEOLOGY: "THE ALLUVIUM BENEATH TIMES BEACH RANGES UP TO 60 FEET IN THICKNESS. ALLUVIUM CONSISTS OF UNCONSOLIDATED MATERIAL DEPOSITED BY FLOODWATERS. MATERIAL DIRECTLY BENEATH THE SURFACE AT TIMES BEACH ARE YOUNGER ALLUVIAL SEDIMENTS RANGING IN THICKNESS FROM 18 TO 40 FEET AND COMPOSED PRIMARILY OF SILTS AND CLAYS."

THE STATEMENT MADE IN THE FEASIBILITY STUDY IS ACCURATE.

IT IS INAPPROPRIATE TO BASE THE RISK ASSESSMENT CONCLUSIONS ON CALCULATIONS WHICH USE A SINGLE POSITIVE VALUE AS THE ANTICIPATED AVERAGE HUMAN EXPOSURE.

AS NOTED IN THE FEASIBILITY STUDY THE RESULTS OF CALCULATIONS IN THE FEASIBILITY STUDY REPRESENT CONSERVATIVE ESTIMATES OF RISK. THIS APPROACH IS CONSISTENT WITH THE GUIDELINES OF THE SUPERFUND PUBLIC HEALTH EVALUATION MANUAL.

INSERT THE FOLLOWING DIRECTLY AFTER THE WORD "DEPTH": "THE 0 TO 2 INCH SURFACE SAMPLE CORRESPONDING TO THIS HIGHEST CONCENTRATION, HOWEVER, YIELDED A CONCENTRATION OF 4.6 UG/KG. CONSEQUENTLY, EVEN THE HIGHEST VALUE DETECTED ON SITE PRESENTS NO DIRECT THREAT TO PUBLIC HEALTH OR THE ENVIRONMENT SINCE PRESENT EXPOSURE IS LIMITED TO SURFICIAL MATERIALS." THE FACT THAT THE AVERAGE DEPTH OF HIGHEST TCDD LEVELS WAS APPROXIMATELY 6 INCHES SUGGESTS THAT THE INTENT OF THE NATIONAL CONTINGENCY PLAN (I.E. REDUCING OF THE THREAT, IF ANY EXISTS, TO PUBLIC HEALTH AND THE ENVIRONMENT TO AN ACCEPTABLE LEVEL) COULD BE ACCOMPLISHED BY MINIMAL SOIL EXCAVATION, ALTHOUGH THIS IS NOT THE EXCLUSIVE REMEDY.

AS NOTED PREVIOUSLY, EPA HAS RELIED UPON THE RECOMMENDATIONS OF APPROPRIATE STATE AND FEDERAL HEALTH AGENCIES IN ESTABLISHING THE DEGREE OF REMEDIATION REQUIRED FOR TIMES

BEACH. OTHER AVAILABLE INFORMATION REGARDING ACCEPTABLE CLEANUP LEVELS, INCLUDING THE MATERIAL RECEIVED BY THE AGENCY DURING THE PUBLIC COMMENT PERIOD, HAS BEEN CONSIDERED IN MAKING THIS DETERMINATION.

THE DISTINCTION BETWEEN ALLUVIAL GROUNDWATER AND DEEP GROUNDWATER SHOULD BE DRAWN. VERY FEW, IF ANY, PERSONS IN THIS AREA ACTUALLY DRINK FROM THE SHALLOW AQUIFERS, WHEREAS MANY MORE PERSONS SURELY DRANK FROM THE LOWER AQUIFERS WHICH APPARENTLY WERE NOT CONTAMINATED.

THIS DISTINCTION WAS IDENTIFIED IN THE FEASIBILITY STUDY. ALTHOUGH THE POINTS MADE BY THE COMMENTOR ARE ACCURATE, SINCE THE SHALLOW AQUIFER COULD BE USED FOR DRINKING WATER PURPOSES, IT IS APPROPRIATE TO EVALUATE THE HEALTH EFFECTS RESULTING FROM SUCH USE.

THE LIST OF CHEMICAL PROPERTIES AFFECTING MOBILITY, ETC., IS INCOMPLETE AND CONFUSING.

THE CHEMICAL PROPERTIES RELEVANT TO THE MOBILITY OF THE CONTAMINANTS AND CRITICAL TO THE EVALUATION OF THE MOST IMPORTANT TRANSPORT ISSUES ARE ADEQUATELY ADDRESSED IN THE FEASIBILITY STUDY.

THE AVAILABLE DATA INDICATE THAT TCDD MAY BE DEGRADED RATHER RAPIDLY WHEN PRESENT AT THE SOIL SURFACE.

SAMPLING CONDUCTED PRIOR TO AND DURING RESPONSE ACTIONS IMPLEMENTED AT OTHER MISSOURI DIOXIN SITES DOES NOT INDICATE THAT DEGRADATION OF SURFICIAL DIOXIN CONTAMINATION IS EFFECTIVE AT ENSURING THE SHORT-OR LONG-TERM PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT.

IT APPEARS THAT THERE MAY BE A "NOT" MISSING, SINCE ONE WOULD NOT EXPECT THESE COMPOUNDS TO BIOACCUMULATE OR ADSORB TO ORGANIC COMPOUNDS.

THIS ERROR HAS BEEN NOTED.

THE FEASIBILITY STUDY SHOULD DEFINE EPA'S TERMINOLOGY FOR ACCEPTABLE INTAKE LEVEL (SHORT-TERM), *AIFI, AND ACCEPTABLE INTAKE LEVEL (CHRONIC), AIC.

THE DEFINITIONS ARE AS FOLLOWS:

AIS AND AIC VALUES ARE DERIVED FROM QUANTITATIVE INFORMATION AVAILABLE FROM STUDIES IN ANIMALS (OR OBSERVATIONS MADE IN HUMAN EPIDEMIOLOGIC STUDIES) ON THE RELATIONSHIP BETWEEN INTAKE AND NONCARCINOGENIC TOXIC EFFECTS. THEY ARE DESIGNED TO BE PROTECTIVE OF SENSITIVE POPULATIONS. THE UNITS FOR THE AIS AND AIC ARE THE SAME AS THOSE DEVELOPED FOR SDI AND CDI IN THE HUMAN EXPOSURE PHASE OF THE PUBLIC HEALTH EVALUATION--MG/KG BODY WEIGHT/DAY. FOR TERATOGENIC CHEMICALS, AIS VALUES ARE GENERALLY DERIVED FOR THE TERATOGENIC EFFECTS.

AIS VALUES ARE DETERMINED BY A PROCESS SIMILAR TO THE PROCEDURE USED TO DEVELOP REFERENCE DOSE VALUES, EXCEPT THAT SUB-CHRONIC EFFECTS ARE THE BASIS OF THE VALUES INSTEAD OF CHRONIC EFFECTS. MOST AIS VALUES ARE BASED ON SUB-CHRONIC (10-TO 90-DAY) ANIMAL STUDIES, ALTHOUGH SOME ARE DERIVED FROM HUMAN EXPOSURE DATA. FOR CHEMICALS WITHOUT APPROPRIATE HUMAN DATA, THE HIGHEST SUB-CHRONIC EXPOSURE LEVEL NOT CAUSING ADVERSE EFFECTS, OR NO-OBSERVED-ADVERSE-EFFECT LEVEL (NOAEL), IS DETERMINED FOR ALL VALID ANIMAL STUDIES AVAILABLE IN THE LITERATURE. THE NOAEL IS THEN DIVIDED BY APPROPRIATE UNCERTAINTY FACTORS TO GIVE THE ASS. UNCERTAINTY FACTORS USUALLY INCLUDE A FACTOR OF 10 TO ACCOUNT FOR EXTRAPOLATION FROM ANIMAL EXPERIMENTS TO HUMAN EFFECTS AND A FACTOR OF 10 FOR INTRA-SPECIES VARIABILITY (I.E., TO ACCOUNT FOR THE FACT THAT TWO INDIVIDUALS OF THE SAME SPECIES MAY NOT REACT TO THE SAME QUANTITY OF A CHEMICAL WITH THE SAME LEVEL OF RESPONSE).

IN GENERAL, AIC VALUES ARE BASED ON LONG-TERM ANIMAL STUDIES. FOR A FEW CHEMICALS, HOWEVER, ADEQUATE HUMAN DATA ARE AVAILABLE AND ARE USED. THE HIGHEST CHRONIC EXPOSURE LEVEL NOT CAUSING AN ADVERSE EFFECT (NOAEL) IS DETERMINED BY EXAMINING LITERATURE VALUES

FROM ALL APPROPRIATE ANIMAL STUDIES. THE NOAEL VALUE IS THEN DIVIDED BY UNCERTAINTY FACTORS AS IN AIS DEVELOPMENT. AGAIN, A FACTOR OF 10 IS USED FOR EXTRAPOLATION FROM ANIMAL EFFECTS TO HUMAN EFFECTS, AND A FACTOR OF 10 IS USED TO ACCOUNT FOR INTRA SPECIES VARIABILITY. IF CHRONIC STUDIES ARE NOT AVAILABLE, SUB-CHRONIC NOAEL'S ARE USED AND DIVIDED BY AN ADDITIONAL FACTOR OF 10 TO ACCOUNT FOR UNCERTAINTIES IN EXTRAPOLATING FROM SUB-CHRONIC TO CHRONIC EXPOSURES.

IT IS UNCLEAR WHETHER EITHER OF THESE COMPOUNDS (1,1,2,2-TETRACHLOROETHANE OR TRICHLOROETHYLENE) POSES A SIGNIFICANT CANCER HAZARD TO HUMANS AT CONCENTRATIONS TYPICALLY ENCOUNTERED IN CONTAMINATED SOIL, WATER, OR AIR.

THE PURPOSE OF THE RISK ASSESSMENT PROCESS IS TO CONSIDER THE PATHWAYS OF MIGRATION AND THE PROPERTIES OF THE CHEMICAL OF CONCERN TO DETERMINE IF A SIGNIFICANT CANCER RISK IS PRESENTED BY THE CHEMICALS IN THE SITUATION PRESENTED. SUCH A DETERMINATION CANNOT BE MADE BY EVALUATING THE CANCER POTENCIES ALONE.

THIS REVIEW OF ACETONE'S ACUTE AND CHRONIC TOXICITY IS VERY SPARSE IN THAT IT IS BASED ON ONLY AN LD-50 AND LC-50 IN RODENTS.

IT IS NOTED IN THE FEASIBILITY STUDY THAT THE TOXICITY OF ACETONE IS RELATIVELY LOW.

ALTHOUGH TCDD HAS HIGH ACUTE TOXICITY (POTENCY), LITTLE TCDD HAS BEEN PRODUCED AND THERE ARE LIMITED OPPORTUNITIES FOR EXPOSURE. IN SHORT, THE RISK OF HARM IS LOW SINCE EXPOSURE IS LOW.

THE COMMENTS MADE BY THE COMMENTOR ARE NOT RELEVANT TO THE POINTS ADDRESSED IN THE FEASIBILITY STUDY REGARDING THE STABILITY OF TCDD. TCDD DOES HAVE A HIGH CANCER POTENCY. THE OPPORTUNITIES FOR EXPOSURE DEPEND ON THE SITE WHERE EXPOSURE MAY OCCUR.

IT IS IMPORTANT THAT THE PHENOMENON OF DERMAL ABSORPTION BE CONSIDERED IN RISK CALCULATIONS.

DERMAL ABSORPTION MAY BE AN IMPORTANT PHENOMENON IN SOME SITUATIONS. THE RISK ESTIMATES FOR THE TIMES BEACH SITE PRESENTED IN THE FEASIBILITY STUDY ASSUME HOWEVER THAT THE POTENTIAL FOR DERMAL ABSORPTION OF DIOXIN WOULD BE LIMITED.

"ANIMAL STUDIES HAVE ALSO DEMONSTRATED THAT TCDD IS TERATOGENIC (CAUSES MALFORMALITIES) AND FETOTOXIC (TOXIC TO FETUS) IN MICE, RATS, RABBITS, AND FERRETS. IT IS FETOTOXIC IN MONKEYS."

ALTHOUGH THIS STATEMENT IS TECHNICALLY TRUE, IT IS UNDULY ALARMING, SINCE MOST CHEMICALS HAVE BEEN SHOWN TO CAUSE DEVELOPMENTAL EFFECTS IN NUMEROUS ANIMAL SPECIES WHEN SUFFICIENTLY HIGH DOSES ARE ADMINISTERED.

THE STATEMENT IN THE FEASIBILITY STUDY IS TECHNICALLY CORRECT, AND SHOULD NOT BE CONSIDERED UNDULY ALARMING.

THE FEASIBILITY STUDY STATES THAT TCDD IS THE MOST POTENT ANIMAL CARCINOGEN EVALUATED TO DATE BY THE EPA CARCINOGEN ASSESSMENT GROUP. THIS STATEMENT IS MISLEADING AND INAPPROPRIATE. TCDD IS NOT A POTENT CARCINOGEN IF ONE CONSIDERS ITS CARCINOGENICITY RELATIVE TO ITS ACUTE TOXICITY.

THE STATEMENT MADE IN THE FEASIBILITY STUDY IS TECHNICALLY CORRECT. WHEN CONSIDERED ON A UNIT RISK BASIS, THE CANCER POTENCIES OF DIFFERENT CHEMICALS CAN BE COMPARED. ON THE BASIS OF A RELATIVE POTENCY INDEX OF THE 55 CHEMICALS THAT CAG HAS EVALUATED, TCDD IS THE MOST POTENT CARCINOGEN.

THE FACT THAT TCDD IS 50 TIMES AS POTENT AS BCME IS IRRELEVANT SINCE EXPOSURE TO BCME AT ONE POINT WAS RELATIVELY COMMON IN SEVERAL OF THE CHEMICAL INDUSTRIES YET EXPOSURE TO TCDD IS RARE. THERE STILL IS NO EVIDENCE THAT TCDD IS A HUMAN

CARCINOGEN AFTER 40 YEARS OF WORK PLACE EXPERIENCE WITH IT.

IT IS SUGGESTED BY THE COMMENTOR THAT THERE IS NO EVIDENCE THAT TCDD IS A HUMAN CARCINOGEN AFTER 40 YEARS OF WORK PLACE EXPERIENCE, BUT ALSO ACKNOWLEDGED THAT EXPOSURE TO TCDD IN THE WORK PLACE IS RARE. THE POTENCY OF TCDD RELATIVE TO BCME IS RELEVANT AND TECHNICALLY CORRECT.

UNDER THE CURRENT EPA CLASSIFICATION SCHEME TCDD MIGHT BE REGARDED TECHNICALLY AS A PROBABLE HUMAN CARCINOGEN AT SUFFICIENTLY HIGH DOSES AND WITH SUFFICIENT DURATION OF EXPOSURE HOWEVER, IT IS ALSO IMPORTANT TO NOTE THAT THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER HAS CONCLUDED THAT THERE IS INSUFFICIENT DATA TO SUGGEST THAT TCDD IS A HUMAN CARCINOGEN. IT IS LIKELY WHEN THE IARC RE-EVALUATES THE RELEVANT DATA ON TCDD, IT WILL CONCLUDE THAT THE DATA CONTINUE TO BE INSUFFICIENT TO SUGGEST THAT TCDD IS CARCINOGENIC TO HUMANS.

THE CURRENT EPA CLASSIFICATION SCHEME IS USED TO ASSESS THE RISKS INVOLVED WITH DIOXIN EXPOSURE. IT IS INAPPROPRIATE TO CONJECTURE ABOUT FUTURE DECISIONS THAT MIGHT BE MADE BY IARC REGARDING CANCER POTENCY.

THE DOSES TO WHICH PEOPLE HAVE BEEN EXPOSED IN NUMEROUS INDUSTRIAL ACCIDENTS, AND IN SEVESO, ARE FAR HIGHER THAN THOSE OCCURRING IN TIMES BEACH.

THIS MAY BE TRUE FOR SOME INSTANCES OF ACUTE EXPOSURE TO DIOXIN.

FUNDAMENTALLY, 1,1,2,2-TETRACHLOROETHANE, AND THE OTHER CHLORINATED CHEMICALS OBSERVED AT THIS SITE POSE VIRTUALLY NO HAZARD TO MAN OR THE ENVIRONMENT AT THE CONCENTRATIONS PRESENT. THE FEASIBILITY STUDY INCORRECTLY REVIEWS THE HAZARDS ASSOCIATED WITH EXPOSURE TO THESE CHEMICALS IN THE CONTEXT OF DOSES THAT ARE ORDERS OF MAGNITUDE HIGHER THAN WHAT WOULD BE ENCOUNTERED AT TIMES BEACH. THE FEASIBILITY STUDY SHOULD GIVE A BALANCED OVERVIEW OF THE TOXICOLOGICAL HAZARDS THAT HAVE BEEN OBSERVED FOR THE CHEMICAL FOUND AT TIMES BEACH AND TO IDENTIFY ANY CHEMICALS WHICH MAY MERIT SPECIAL CONSIDERATIONS.

OTHER NON-DIOXIN CONTAMINANTS HAVE BEEN DETECTED IN SOILS IN AN ISOLATED PORTION OF THE CITY PARK, AND IN A PORTION OF THE GROUNDWATER SAMPLES COLLECTED ONSITE. AS INDICATED IN THE PROPOSED PLAN, THESE CONTAMINANTS WILL BE EVALUATED INDEPENDENT OF THE CLEANUP OF DIOXIN-CONTAMINATED SOILS. IT IS APPROPRIATE FOR THIS INVESTIGATION TO OCCUR INDEPENDENTLY, DUE TO THE RELATIVE MAGNITUDE OF THE DIOXIN PROBLEM, AND SINCE CLEANUP OF THE DIOXIN-CONTAMINATED SOIL SHOULD NOT BE DELAYED PENDING AN EVALUATION OF THE CITY PARK SOILS. EXISTING DATA INDICATES THAT NON-DIOXIN CONTAMINATION IS LIMITED TO A RELATIVELY SMALL QUANTITY OF SOIL IN THE CITY PARK AREA, AND THAT GROUND WATER CONTAMINANTS MAY BE LIMITED TO A THIN LAYER OF ORGANICS ON THE SURFACE OF THE ALLUVIAL AQUIFER.

IT IS BEYOND THE SCOPE FOR THE FEASIBILITY STUDY TO DEVELOP DETAILED TOXICOLOGICAL PROFILES FOR OTHER CONTAMINANTS PRESENT ONSITE SINCE TCDD WAS THE PRIMARY CONTAMINANT OF CONCERN. EPA RELIES ON OTHER HEALTH ASSESSMENT EVALUATIONS TO DETERMINE THE TOXICOLOGICAL PROFILES FOR SUCH DEVELOPMENT. THESE DOCUMENTS, WHICH THEMSELVES REFERENCE OTHER HEALTH ASSESSMENT DOCUMENTS, WERE REFERENCED IN THE FEASIBILITY STUDY AND SHOULD BE CONSULTED FOR ADDITIONAL INFORMATION.

THE FEASIBILITY STUDY PROPERLY IDENTIFIED THE CHEMICALS THAT MERITED ADDITIONAL CONSIDERATION. THE RATIONALE FOR SELECTION OF CHEMICALS FOR ADDITIONAL CONSIDERATION IS EXPLAINED IN THE FEASIBILITY STUDY.

A WELL-DESIGNED REMEDIATION PLAN NEEDS TO TAKE INTO CONSIDERATION THE PHYSICAL PROPERTIES OF THE CHEMICAL CONTAMINANT, ESPECIALLY WHEN SUCH PROPERTIES ARE IMPORTANT TO DESIGNING A COST-EFFECTIVE CLEANUP.

THESE TYPES OF PLANS WILL BE DEVELOPED DURING THE DESIGN PHASE PRIOR TO IMPLEMENTATION.

THE FEASIBILITY STUDY STATES: "ORGANIC CONTAMINATION WAS FOUND IN SEVERAL ALLUVIAL GROUNDWATER SAMPLES ON THE SITE. THEREFORE, IF THE ALLUVIAL GROUNDWATER WERE USED AS A POTABLE WATER SUPPLY, THERE IS A POTENTIAL FOR USERS TO BE EXPOSED TO CONTAMINANTS THROUGH INGESTION, INHALATION OF VOLATILES (FROM USE DURING BATHING OR COOKING), AND DERMAL ABSORPTION (DURING DIRECT CONTACT ACTIVITIES SUCH AS BATHING)."

THIS OBSERVATION IS ACCURATE ONLY IF THE ALLUVIAL GROUNDWATER WERE A POTABLE DRINKING WATER SUPPLY FOR A RESIDENTIAL COMMUNITY. HOWEVER, AS DISCUSSED EARLY IN THE FEASIBILITY STUDY, THERE ARE NO PLANS FOR THIS SITE TO BE USED AS A RESIDENTIAL AREA. FURTHER, VIRTUALLY NO ONE IN AMERICA CURRENTLY TAKES THEIR DRINKING WATER FROM SHALLOW WATER AQUIFERS DUE TO QUALITY AND SEASONAL VARIATIONS IN AVAILABILITY.

COMMENTS REGARDING THE ASSUMPTION THAT TIMES BEACH COULD BE USED AS A RESIDENTIAL AREA IN THE FUTURE HAVE BEEN RESPONDED TO PREVIOUSLY. EPA DISAGREES WITH THE STATEMENT THAT VIRTUALLY NO ONE IN AMERICA CURRENTLY TAKES THEIR DRINKING WATER FROM SHALLOW AQUIFERS.

BECAUSE OF THE LOW QUANTITIES OF ORGANICS PRESENT UNDER THE ROAD BED AND IN THE CITY PARK (THE SOURCE OF THE SAMPLES), THE EFFECT ON SURROUNDING DRINKING WATER ALLUVIUM WOULD BE NEGLIGIBLE.

AS NOTED IN THE FEASIBILITY STUDY, REMEDIAL INVESTIGATIONS HAVE NOT CLEARLY IDENTIFIED THE DEGREE OF CONTAMINATION BY OTHER CONTAMINANTS.

SINCE QUANTITIES AND CONCENTRATIONS OF TCDD AT THE SITE WILL NOT INCREASE IN THE FUTURE, IT IS UNLIKELY THAT FISH FROM THE MERAMEC RIVER WILL EVER EXCEED THE ADVISORY LEVEL.

EXISTING DATA DO NOT INDICATE THAT EXCESSIVE DIOXIN LEVELS IN BIOTA ARE OCCURRING DUE TO RELEASE INTO THE MERAMEC FROM TIMES BEACH. HOWEVER, IT IS REASONABLE TO EXPECT THAT SOME DEGREE OF CONTAMINATED SEDIMENT MAY BE RELEASED TO THE MERAMEC RIVER DURING STORM EVENTS, PARTICULARLY DURING FLOOD CONDITIONS. DUE TO BIOACCUMULATION RATES AS HIGH AS 30,000 REPORTED IN THE LITERATURE, ANY RELEASE OF DIOXIN INTO THE MERAMEC RIVER WOULD WARRANT CONCERN.

DERMAL CONTACT WITH CONTAMINATED SOILS OR SEDIMENTS THAT HAVE MOVED OFFSITE DUE TO FLOODING OR EROSION WOULD BE NEGLIGIBLE. CONSEQUENTLY, THE COMBINED EXPOSURE PATHWAYS WOULD NOT BE EXPECTED TO POSE A HUMAN HEALTH CONCERN.

DERMAL CONTACT WITH CONTAMINATED SOILS OR SEDIMENTS THAT HAVE MOVED OFFSITE DUE TO MIGRATION WAS NOT EVALUATED IN THE FEASIBILITY STUDY AS A SIGNIFICANT PATHWAY OF EXPOSURE.

THE MINIMAL AMOUNT OF ORGANICS THAT COULD BE LEACHED FROM UNDER ROAD BEDS AND THE CITY PARK IS MARKEDLY LIMITED BY THE ADSORPTION OF THE ORGANICS TO THE SOIL. AS NOTED IN OTHER PLACES IN THE FEASIBILITY STUDY, THESE CHEMICALS ARE RAPIDLY VOLATILIZED OR PHOTO-DEGRADED IN WATER AND THEREFORE WOULD NOT POSE A HAZARD TO FISH THROUGH BIOACCUMULATION. THESE CHEMICALS ARE NOT BIOACCUMULATED TO A LARGE EXTENT DUE TO THE ABILITY OF THE FISH AND AQUATIC MICROBES TO METABOLIZE THEM.

AS NOTED IN THE FEASIBILITY STUDY, EXPOSURE TO OTHER ORGANIC CONTAMINANTS FROM THE SITE VIA THE MERAMEC RIVER IS NOT CONSIDERED TO BE A SIGNIFICANT EXPOSURE PATHWAY.

WHILE EXPOSURE COULD POTENTIALLY OCCUR OFFSITE, THIS CONCERN IS NEGLIGIBLE. CONSIDERING THAT THE TCDD CONCENTRATION IN SOIL WHICH HAS THE POTENTIAL TO MIGRATE OFFSITE (SURFACE SOIL) IS EXTREMELY LOW DUE TO RAPID LOSSES FROM VOLATILIZATION AND PHOTO-DEGRADATION, THE POSSIBILITY OF TCDD EXPOSURE OFFSITE IS REMOTE.

IT WAS CONCLUDED IN THE FEASIBILITY STUDY THAT OFFSITE MIGRATION OF DIOXIN DOES NOT PRESENT A SIGNIFICANT EXPOSURE PATHWAY. HOWEVER, VOLATIZATION AND PHOTO-DEGRADATION HAVE NOT BEEN DETERMINED TO EFFECTIVELY REDUCE SURFACE DIOXIN CONCENTRATIONS TO AN ACCEPTABLE DEGREE.

IT IS UNCLEAR WHY THE INHALATION EXPOSURE PATHWAY NEEDS TO BE REVIEWED IN EACH OF THE VARIOUS SECTIONS OF THE REPORT SINCE IT HAS ALREADY BEEN ESTABLISHED THAT INHALATION IS NOT A SIGNIFICANT ROUTE OF ENTRY. TCDD IS NOT VERY VOLATILE. THE PARTICLES TO WHICH IT IS BOUND ARE NOT READILY AIRBORNE. MOREOVER, ADSORPTION ONTO PARTICLES IMPEDES TCDD'S BIOAVAILABILITY. THUS, ALL THE DATA INDICATE THAT THE CONCERN FOR THE INHALATION PATHWAY SHOULD BE NEGLIGIBLE.

IT WAS CONCLUDED IN THE FEASIBILITY STUDY THAT OFFSITE MIGRATION OF TCDD DOES NOT PRESENT A SIGNIFICANT EXPOSURE PATHWAY. IT IS NOT ACCURATE TO STATE THAT THE PARTICLES TO WHICH DIOXIN IS BOUND ARE NOT READILY AIRBORNE. THE ANALYSIS PRESENTED IN THE FEASIBILITY STUDY ESTIMATES THE RISKS POSED BY INHALATION OF DIOXIN-CONTAMINATED PARTICULATES.

THE CONVERSION OF TIMES BEACH TO AN AGRICULTURAL SETTING IS INAPPROPRIATE. MOREOVER, EXPOSURE ASSESSMENTS PRESENTED HEREIN INDICATE THAT THE RISK TO FARM WORKERS WOULD BE LOW.

EPA IS NOT RECOMMENDING THAT THE SITE BE CONVERTED TO AGRICULTURAL USE. SINCE MUCH OF THE SURROUNDING AREA IS AGRICULTURAL, IT IS CONSIDERED APPROPRIATE TO EVALUATE THE RISKS POSED BY SUCH A USE OF THE SITE.

THE COMMENTOR AGREES THAT THE LIKELIHOOD THAT TIMES BEACH WILL BECOME A FUTURE RESIDENTIAL AREA IS VERY REMOTE.

AS NOTED PREVIOUSLY, EPA DOES NOT BELIEVE THAT FUTURE RESIDENTIAL USE OF THE SITE IS LIKELY.

THE FEASIBILITY STUDY STATES: "THIS ASSESSMENT ASSUMES THAT ANY EXPOSURE TO A CARCINOGEN COULD RESULT IN CANCER."

THIS STATEMENT REFERS TO THE ASSUMPTION OF LINEARITY FOR LOW LEVELS OF EXPOSURE TO DIOXIN. AS NOTED, EPA BELIEVES THAT ANY EXPOSURE TO A CARCINOGEN COULD RESULT IN AN INCREASED RISK OF CANCER.

SEVERAL HUNDRED SOIL AND WATER SAMPLES HAVE BEEN COLLECTED AT TIMES BEACH. IT IS INCONCEIVABLE THAT THE HIGHEST SAMPLES WOULD BE USED TO ESTIMATE A FEASIBILITY WORST-CASE LEVEL OF EXPOSURE AT THE SITE. CERTAINLY A MORE REPRESENTATIVE TCDD SURFACE CONCENTRATION THAT PEOPLE MAY BE EXPOSED TO WOULD BE THE AVERAGE TCDD CONCENTRATION OF LESS THAN 5 PPB RATHER THAN THE SINGLE HIGHEST VALUE MEASURED UNDER PAVEMENT IN TIMES BEACH.

THE MOST REASONABLE AND SCIENTIFIC APPROACH TO THE ASSESSMENT WOULD BE TO TAKE THE GEOMETRIC MEAN VALUE OF THE TCDD CONTAMINATION AT THE SOIL SURFACE, SINCE IT IS THE AVERAGE CONCENTRATION WHICH WILL DICTATE THE POTENTIAL AVERAGE HUMAN UPTAKE VIA THE THREE ROUTES OF ENTRY.

THIS COMMENT HAS BEEN RESPONDED TO PREVIOUSLY. THE FEASIBILITY STUDY EVALUATES UPPER BOUND ESTIMATES OF RISK AND NOTES THIS ASSUMPTION IN THE FEASIBILITY STUDY. THIS APPROACH IS CONSISTENT, WITH THE GUIDELINES OF THE SUPERFUND PUBLIC HEALTH EVALUATION MANUAL. IT IS INAPPROPRIATE TO PORTRAY GEOMETRIC MEAN DIOXIN CONCENTRATIONS AS ACTUAL AVERAGE CONCENTRATIONS THAT WOULD BE ENCOUNTERED. THE AVERAGE CONCENTRATIONS THAT WOULD CONTRIBUTE TO THE ESTIMATES OF RISK ARE UNKNOWN.

IT IS UNCLEAR WHY A METHOD WHICH RESULTS IN AN OVERESTIMATE OF THE CONTAMINANT CONCENTRATION IN AIR WOULD BE USED WHEN INHALATION IS PROBABLY THE BEST UNDERSTOOD OF ALL THE ROUTES OF ENTRY.

THE METHODS USED IN THE FEASIBILITY STUDY TO MAKE A CONSERVATIVE ESTIMATE OF RISK DUE TO INHALATION ARE APPROPRIATE.

THROUGHOUT THE FEASIBILITY STUDY, IT IS UNCLEAR WHAT CONCENTRATION OF DUST IN AIR WAS USED IN THE CALCULATIONS.

IT IS STATED EXPLICITLY IN THE FEASIBILITY STUDY THAT AN ASSUMED AIRBORNE DUST CONCENTRATION IS 75 MICROGRAM/CUBIC METERS.

A NUMBER OF COMMENTS WERE MADE REGARDING AMBIENT LEVELS OF DUST THAT COULD BE EXPECTED, BIOAVAILABILITY, INHALATION, AND HALF-LIFE.

THESE POINTS ARE IRRELEVANT TO THE CALCULATIONS THAT WERE MADE SINCE THE UPPER BOUND ESTIMATES WERE BASED ON THE MAXIMUM CONCENTRATION OF DIOXIN AT THE SITE THAT HAS BEEN DETECTED.

THESE ASSUMPTIONS ARE TOO CONSERVATIVE FOR THIS SETTING. FOR EXAMPLE, EVEN IF AN INDUSTRIAL USE WERE TO BE ASSUMED FOR THIS PROPERTY (WHICH THE FEASIBILITY STUDY IS NOT CONSIDERING AS AN ALTERNATIVE), THE WATER SUPPLY WOULD NOT BE FROM THE SHALLOW ALLUVIAL WATER TABLE. ANY WATER SUPPLY THAT WOULD BE USED BY AN INDUSTRY WOULD SURELY COME FROM THE DEEP AQUIFER WHICH HAS NOT BEEN SHOWN TO BE CONTAMINATED WITH ANY OF THESE CHEMICALS.

THE RISKS THAT WERE ESTIMATED WERE BASED ON THE ASSUMPTIONS NOTED IN THE TEXT. THE RISKS WERE CONSERVATIVELY ESTIMATED FOR A CASE WHERE THE SHALLOW AQUIFER WAS USED FOR DRINKING WATER.

THE TERM "CARCINOGEN" DOES NOT APPLY, IN A STRICT SENSE, TO TRICHLOROETHENE (TRICHLOROETHYLENE) AND 1,1,2,2-TETRACHLOROETHANE.

THE USE OF THE TERM "CARCINOGEN" IS CONSISTENT WITH CAG'S ASSESSMENT OF THE CHEMICALS.

IT SHOULD NOT BE ASSUMED THAT ALL WORKERS INVOLVED IN AGRICULTURAL ACTIVITIES WILL BE EXPOSED TO AIRBORNE DUST DERIVED FROM CONTAMINATED SOIL. SUCH PROCEDURE WOULD SERIOUSLY OVERESTIMATE ACTUAL EXPOSURE.

IT WAS ASSUMED IN THE ASSESSMENT PRESENTED IN THE FEASIBILITY STUDY THAT ALL ACTIVITIES COULD RESULT IN THE GENERATION OF DUST, BUT NOT THAT ALL WORKERS WOULD NECESSARILY BE EXPOSED TO THESE CONCENTRATIONS.

THE FEASIBILITY STUDY STATES: "DUE TO THE NATURE OF THE WORK, IT IS ASSUMED THAT THE WORKERS WILL INGEST 0.05 TO 0.1 G/DAY OF SOIL THROUGH HAND-TO-MOUTH ACTIVITIES."

ALTHOUGH THESE VALUES MAY BE ACCURATE, WHEN THEY ARE MULTIPLIED BY THE INDEFENSIBLE 1200 PPB VALUE, THEY YIELD A GROSSLY EXAGGERATED ESTIMATE OF THE HAZARD.

AS STATED PREVIOUSLY, THE PUBLIC HEALTH EVALUATION PRESENTED IN THE FEASIBILITY STUDY PROVIDES A CONSERVATIVE ESTIMATE OF RISK IN ACCORDANCE WITH AGENCY POLICY AND GUIDELINES.

THIS APPROACH TO ESTIMATING THE POTENTIAL HAZARD PRESENTED BY RECREATIONAL SETTINGS DRAMATICALLY OVERESTIMATES THE LIKELY RISK. ALTHOUGH IT IS POSSIBLE THAT PERSONS MIGHT RECREATIONALLY USE THE SITE 31 DAYS OF THE YEAR (AS SUGGESTED IN THE FEASIBILITY STUDY), THIS IS HIGHLY UNLIKELY. IT IS EVER MORE UNLIKELY THAT ON EACH OF THE DAYS A CHILD VISITS THE SITE, HE WOULD INGEST AN AVERAGE OF 0.1 G/DAY OF SOIL DUE TO HAND-TO-MOUTH ACTIVITY.

THE RISKS THAT WERE ESTIMATED WERE BASED ON THE ASSUMPTIONS NOTED IN THE TEXT. AS NOTED IN THE FEASIBILITY STUDY, THE RISKS ESTIMATED ARE CONSIDERED TO BE CONSERVATIVE ESTIMATES OF RISK.

WE WOULD SUGGEST THAT THE VALUE IN THE FEASIBILITY STUDY BE REVISITED WITH AN EMPHASIS ON CHANGING THE 1200 PPB FIGURE TO 2.5 PPB, WHICH IS THE AVERAGE SURFACE SOIL CONCENTRATION OF TCDD AT TIMES BEACH.

THE ACTUAL AVERAGE SURFACE SOIL CONCENTRATION IS NOT KNOWN. THE STATEMENT MADE BY THE COMMENTOR CONTRADICTS POINTS MADE THAT THE SAMPLING DONE AT TIMES BEACH WAS INTENDED TO FIND THE MOST LIKELY AREAS OF CONTAMINATION AND DOES NOT REPRESENT A TRUE AVERAGE.

THE FEASIBILITY STUDY STATES: "TCDD IS TOXIC TO A WIDE VARIETY OF ANIMALS". THIS STATEMENT IS MISLEADING IN LIGHT OF THE LEVELS OF TCDD AT TIMES BEACH.

THE STATEMENTS MADE IN THE FEASIBILITY STUDY ARE TECHNICALLY ACCURATE.

THE COMMENTOR MADE SEVERAL COMMENTS REGARDING THE EXPOSURE OF ANIMALS AND PLANTS TO TCDD.

AS NOTED IN THE FEASIBILITY STUDY, RISKS CANNOT BE ACCURATELY ESTIMATED FOR PLANTS AND ANIMALS. CALCULATIONS WERE NOT PERFORMED FOR THE RISK TO PLANTS AND ANIMALS. A QUALITATIVE DISCUSSION WAS PROVIDED.

THE FEASIBILITY STUDY STATES: "THE CANCER POTENCY VALUE (USED IN THIS FEASIBILITY STUDY) IS DEFINED AS THE UPPER 95 PERCENT CONFIDENCE LIMIT ON THE RESPONSE PER UNIT INTAKE OF A CHEMICAL OVER A LIFETIME (I.E., IT IS THE SLOPE OF THE DOSE RESPONSE AND IT REPRESENTS ONLY A 5 PERCENT CHANCE THAT THE PROBABILITY OF A RESPONSE COULD BE GREATER THAN THE ESTIMATED VALUE FOR THE EXPERIMENTAL DATA USED). THIS IS A CONSERVATIVE APPROACH AND MAY OVERESTIMATE THE ACTUAL RISK."

THE FEASIBILITY STUDY USES THE CAG CANCER POTENCY VALUES FOR ESTIMATING RISKS DUE TO DIOXIN EXPOSURE. IT WAS NOTED IN THE FEASIBILITY STUDY THAT THE USE OF THE CAG CANCER POTENCY WAS A CONSERVATIVE APPROACH AND MAY OVERESTIMATE THE RISK.

A MAJOR DIFFICULTY WITH THE USE OF THE CANCER POTENCY VALUE IN THE FEASIBILITY STUDY IS THAT IT CONCLUDES WITH A SINGLE NUMBER WITHOUT INDICATING ITS EXTRAORDINARILY CONSERVATIVE NATURE.

THE FEASIBILITY STUDY STATES: "POTENTIAL RISKS WERE DEVELOPED USING MAXIMUM CONTAMINANT LEVELS AT THE SITE; THEREFORE, THEY REPRESENT WORSE-CASE RISK ESTIMATES."

THE FEASIBILITY STUDY STATES: "CARCINOGEN RISKS FROM INHALATION OF DUSTS POTENTIALLY CONTAMINATED WITH TCDD CANNOT BE CALCULATED BECAUSE TCDD HAS NO CANCER POTENCY VALUE THROUGH THE INHALATION ROUTE."

CARCINOGENIC RISKS DUE TO INHALATION WERE ESTIMATED BASED ON THE SUBSEQUENT INGESTION OF PARTICLES FOLLOWING INHALATION. ESTIMATES DUE TO INHALATION ALONE COULD NOT BE MADE BECAUSE CANCER POTENCY VALUES DUE TO INHALATION ARE NOT AVAILABLE FROM CAG.

THE RISK ESTIMATED FOR THESE GUARDS IS EXCESSIVE. IT SHOULD BE CORRECTED FOR ONLY TWO HOURS OF EXPOSURE PER DAY. IT CAN BE DETERMINED HOW MANY MINUTES PER DAY THEY SPEND IN THE CAR, AND OUTSIDE THE CAR, AND IF THE VARIOUS GUARDS ROTATE THE PATROL DUTY OF THE TIMES BEACH AREA.

THE ASSUMPTIONS NOTED IN THE FEASIBILITY STUDY ARE APPROPRIATE FOR A CONSERVATIVE ESTIMATE OF RISK.

.... THE GENERALIZED FORM OF THE CALCULATIONS PRESENTED ON PAGE B-6-4 IS INSUFFICIENT TO ALLOW A COMPLETE SCIENTIFIC REVIEW OF THE APPROPRIATENESS OF THE MATHEMATICS . FOR INSTANCE, IT IS NOT CLEAR WHAT DUST CONCENTRATION IN AIR WAS USED IN THESE CALCULATIONS.

THE METHODOLOGY USED TO ESTIMATE RISKS IS PRESENTED IN THE FEASIBILITY STUDY. DUST LEVELS ASSUMED HAVE BEEN PREVIOUSLY DEFINED, AND ARE NOTED IN THE FEASIBILITY STUDY.

THE QUESTION IS WHAT LEVEL OF CLEAN-UP IS NEEDED TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT. THIS QUESTION CAN BE ANSWERED ONLY BY THE APPLICATION OF CLEAR, OBJECTIVE SCIENTIFIC ANALYSIS.

EPA HAS RELIED UPON THE JUDGMENT OF APPROPRIATE STATE AND FEDERAL HEALTH AGENCIES INCLUDING THE CENTERS FOR DISEASE CONTROL AND THE MISSOURI DIVISION OF HEALTH IN DETERMINING THE LEVEL OF CLEAN-UP THAT IS REQUIRED FOR SITES SUCH AS TIMES BEACH. THESE AGENCIES USE SCIENTIFIC ANALYSIS TO DETERMINE APPROPRIATE CLEANUP LEVELS.

THE CURRENT HEADINGS OF THE THREE COLUMNS REGARDING THE CONSERVATISM OR THE LACK OF CONSERVATISM OF THE VARIOUS ASSUMPTIONS ARE TOO GROSS TO BE OF MUCH BENEFIT TO THE RISK ASSESSMENT IN ULTIMATELY DECIDING WHETHER THE RESULTS ARE MORE LIKELY THAN NOT TO BE OVERSTATED.

THE INFORMATION PRESENTED IN THE FEASIBILITY STUDY IS APPROPRIATE TO EVALUATE THE RESULTS OF THE RISK ASSESSMENT. THE APPROACH IS CONSISTENT WITH THE GUIDELINES OF THE SUPERFUND PUBLIC HEALTH EVALUATION MANUAL FOR EVALUATING SUCH INFORMATION.

THE BOUNDING PROCEDURE ON THE MULTI-STAGE MODEL WILL ALMOST CERTAINLY OVERESTIMATE THE RISKS. THE OVERESTIMATION IS NO LESS THAN A FACTOR OF 10 AND MAY BE AS HIGH AS 10,000.

THE FEASIBILITY STUDY NOTES THAT THE CANCER POTENCIES THAT WERE USED WOULD TEND TO OVERESTIMATE THE RISKS.

"CALCULATION FOR CHEMICAL INGESTION ASSUMES 100% ABSORPTION INTO THE BODY. THE ACTUAL PERCENTAGE ABSORBED MAY BE LESS."

THE FEASIBILITY STUDY SHOULD STATE THAT THIS WILL, BY DEFINITION, OVERESTIMATE THE RISKS.

THE ASSUMPTION OF 100 PERCENT ABSORPTION WOULD CONSERVATIVELY OVERESTIMATE THE RISK.

THIS FEASIBILITY STUDY STATES: "THE EXPOSURE TO AND CONCENTRATION OF CONTAMINANTS AT EXPOSURE POINTS IS HELD CONSTANT OVER A 70-YEAR LIFETIME. CHEMICAL FATE AND TRANSPORT MECHANISMS MAY ALTER ACTUAL CONCENTRATIONS WHICH MAY VARY WITH TIME." THIS UNCERTAINTY GREATLY OVERESTIMATES RISK.

THE RISK IDENTIFIED IN THE FEASIBILITY STUDY WOULD MORE LIKELY BE CONSERVATIVELY OVERESTIMATED THAN UNDERESTIMATED.

THE FEASIBILITY STUDY STATES: "CANCER POTENCIES AND ACCEPTABLE INTAKE LEVELS ARE PRIMARILY DERIVED USING LABORATORY ANIMALS STUDIES AND, WHEN AVAILABLE, HUMAN OCCUPATIONAL STUDIES. EXTRAPOLATION OF DATA FROM HIGH TO LOW DOSE, FROM ONE SPECIES TO ANOTHER, AND FROM ONE EXPOSURE ROUTE TO ANOTHER INTRODUCES UNCERTAINTY."

IT IS NOT ACCURATE TO ASSUME THAT UNCERTAINTY CAN ONLY INTRODUCE BIAS WHICH WOULD RESULT IN OVERESTIMATION OF THE RISK. THE STATEMENT MADE IN THE FEASIBILITY STUDY IS CORRECT.

THERE IS NO MORE CONSERVATIVE APPROACH TO THE ASSESSMENT OF CARCINOGENIC RISKS THAN THAT WHICH HAS ALREADY BEEN APPLIED. IT WOULD THUS SEEM THAT THESE PROCEDURES CAN ONLY OVERESTIMATE THE ACTUAL RISKS.

ALTHOUGH NOT ALL THE CHEMICALS FOUND ONSITE HAVE BEEN ASSIGNED CANCER POTENCIES OR ACCEPTABLE INTAKE VALUES, THESE SAME CHEMICALS ARE NOT PRESENT AT LEVELS OF CONCERN. SINCE THE PRESENCE OF THESE CHEMICALS POSES A DE MINIMUS RISK, IT IS INAPPROPRIATE TO STATE THAT THIS UNCERTAINTY WOULD MARKEDLY UNDERESTIMATE THE RISK.

THE STATEMENTS APPEARING IN THE FEASIBILITY STUDY ARE CORRECT. THE RISKS PRESENTED MAY BE OVERESTIMATED OR UNDERESTIMATED. IT IS THE POSITION OF EPA THAT A CONSERVATIVE APPROACH SHOULD BE APPLIED TO THE DETERMINATION OF RISK IN ORDER TO ASSURE THE PROTECTION OF HUMAN HEALTH WITH A HIGH DEGREE OF CONFIDENCE.

THE FEASIBILITY STUDY INDICATES THAT THE METHODOLOGY FOR THE EXPOSURE ASSESSMENT INVOLVES CONSIDERABLE UNCERTAINTIES. IN ORDER TO ASSESS THE VALIDITY OF THE METHODOLOGY, AT LEAST THE RANGE OF UNCERTAINTY SHOULD BE INDICATED.

THE APPROACH IS CONSISTENT WITH THE GUIDELINES OF THE SUPERFUND PUBLIC HEALTH EVALUATION MANUAL FOR PRESENTING THE RESULTS OF THE RISK ASSESSMENT.

IF THE CAG CARCINOGENICITY POTENCY FACTORS ARE TO BE USED IN ESTIMATING CANCER RISKS, A DISCUSSION OF THE UNDERLYING RATIONALE WHICH EXPLAINS THE DERIVATION OF THESE FACTORS SHOULD BE INCLUDED.

A DISCUSSION OF SUCH RATIONALE IS BEYOND THE SCOPE OF THE FEASIBILITY STUDY.

THE FEASIBILITY STUDY INDICATES THAT CHILDREN INGEST 0.1 GRAM OF SOIL PER DAY. THERE ARE NO REFERENCES SUPPORTING THIS VALUE.

THIS VALUE IS BASED ON A THOROUGH REVIEW OF THE LITERATURE. REFERENCES WILL BE PROVIDED TO THE COMMENTOR.

WHILE ON P. B-5-21 THE FEASIBILITY STUDY INDICATES THAT ADULTS INGEST 50 MG/DAY, LINE 16 OF ATTACHMENT B-1-2 FEASIBILITY STUDY INDICATES THAT ADULTS INGEST 100 MG/DAY. WHICHEVER VALUE IS USED, IT SHOULD BE CONSISTENT THROUGHOUT THE DOCUMENT.

AS NOTED IN THE FEASIBILITY STUDY, BOTH VALUES WERE USED TO ESTIMATE A RANGE OF RISK. THE EXAMPLE IN THE APPENDIX ASSUMED 100 MG/DAY.

FINALLY, THE BODY WEIGHT OF ADULT MALES FROM AGES 19 TO 60 IS CLOSER TO 80 KG THAN 70 KG.

EXPOSURE TO DIOXIN CONTAMINATED SOIL WOULD NOT BE LIMITED TO MALES. THEREFORE, USING AN AVERAGE BODY WEIGHT THAT ASSUMED SUCH EXPOSURE WOULD BE INAPPROPRIATE SINCE IT WOULD NOT TAKE INTO ACCOUNT A SIGNIFICANT GROUP OF POTENTIALLY EXPOSED PERSONS. THE ASSUMPTION USED IN THE FEASIBILITY STUDY IS APPROPRIATE.

IT IS HIGHLY UNLIKELY THAT INDIVIDUALS WILL BE VISITING TIMES BEACH ON SUCH A REGULAR BASIS FROM AGES 5 TO 60.

THE ASSUMPTIONS NOTED IN THE FEASIBILITY STUDY ARE APPROPRIATE FOR A CONSERVATIVE ESTIMATE OF RISK.

ACCORDING TO TABLE B-5-2 (AND ELSEWHERE IN THE FEASIBILITY STUDY), THE ESTIMATED AIRBORNE TCDD CONCENTRATION IS 0.00009 MG/M(3). THIS IS BASED UPON THE USE OF A TCDD SOIL CONCENTRATION OF 1200 PPB (THE MAXIMUM LEVEL MEASURED ANYWHERE IN TIMES BEACH) AND AN AIRBORNE DUST CONCENTRATION OF 75 MG/M(3).

THE 75 MG DUST/M(3) IS A REASONABLE VALUE FOR TOTAL SUSPENDED PARTICULATES (TSP) IN URBAN AREAS.

THE COMMENTOR HAS CLEARLY IDENTIFIED THE ASSUMPTIONS IN THIS COMMENT. EPA, THEREFORE, BELIEVES THAT THE NUMBER WAS CLEARLY IDENTIFIED.

THE FEASIBILITY STUDY REPORTED LIFETIME AVERAGE INHALATION RATE (LAIR) FOR THE OCCUPATIONAL SETTING OF 0.014 G/KG/DAY. THIS VALUE IS BASED ON AN INHALATION RATE OF 20 M(3) /DAY. IT SHOULD BE BASED ON AN 8-HOUR DAY RATHER THAN A 24-HOUR DAY.

THE HOURLY RATE FOR LIFETIME AVERAGE INHALATION WAS USED FOR CALCULATION PURPOSES. THAT RATE WAS BASED ON AN ADJUSTED VALUE FOR THE DAILY INHALATION RATE. THE VALUE OF 0.014 G/KG/DAY WAS INCORRECTLY REPORTED AND HAS BEEN NOTED. THE VALUES THAT WERE USED IN THE CALCULATIONS WERE OTHERWISE CORRECTLY CITED IN THE TEXT.

THIS SECTION DEALS WITH INTAKE FROM INHALATION EXPOSURE. SINCE ONLY A PORTION OF INHALED DUST IS ULTIMATELY INGESTED AND THE G.I. ABSORPTION COEFFICIENT IS NOT 100%, A TERM SHOULD BE INTRODUCED INTO THE EQUATION TO ESTIMATE THE FRACTION OF CONTAMINANT WHICH IS ABSORBED VIA THE G.I. AFTER INHALATION EXPOSURE.

THE ASSUMPTION OF 30 PERCENT ABSORPTION WAS CITED IN THE SECTION CITED BY THE COMMENTOR. AS NOTED PREVIOUSLY, SUBSTANTIALLY HIGHER ABSORPTION RATES HAVE BEEN DETERMINED FOR DIOXIN IN MISSOURI SOILS. THE FEASIBILITY STUDY CALCULATIONS PROVIDE A CONSERVATIVE ESTIMATE OF RISK.

A TERM FOR GASTROINTESTINAL ABSORPTION OF NONCARCINOGENS FOUND IN INGESTED SOIL IS PRESENT IN THE PROPOSED EQUATION. UNLESS ABSORPTION IS 100%, A TERM SHOULD BE INTRODUCED INTO THE EQUATION TO REFLECT THAT FRACTION OF INGESTED CONTAMINANT WHICH IS ULTIMATELY ABSORBED.

IT SHOULD BE NOTED THAT, EVEN ASSUMING 100 PERCENT ABSORPTION, THE CALCULATED CONCENTRATIONS DID NOT EXCEED ACCEPTABLE INTAKES.

IN THE PRESENCE OF A MIXTURE OF NONCARCINOGENS AT THE CONCENTRATIONS FOUND AT TIMES BEACH, THE HAZARD INDEX CONCEPT DOES NOT APPLY. THUS, THE OVERLY CONSERVATIVE APPROACH OF ESTIMATING EXPOSURE TO EACH CHEMICAL IS COMPOUNDED FURTHER BY THE USE OF THE HAZARD INDEX CONCEPT.

THE USE OF HAZARD INDEX IS NOT AFFECTED BY THE CONCENTRATION OF CHEMICALS THAT ARE PRESENT.

APPENDIX C--REVIEW OF RESEARCH AND TCDD TREATMENT TECHNOLOGY

..TCDD DOES NOT HAVE AN AFFINITY FOR WATER.

IT IS CORRECT THAT DIOXIN HAS A LIMITED AFFINITY FOR WATER.

...THE POSSIBILITY OF CO-SOLVENTS EXISTING IN HIGH ENOUGH CONCENTRATIONS IN THE GROUNDWATER TO INCREASE TCDD MOBILITY IS VERY REMOTE.

THE ISSUE DISCUSSED IN THIS PARAGRAPH WAS THE PRESENCE OF CO-SOLVENTS IN SOIL. THEIR PRESENCE IN GROUNDWATER IS NOT RELEVANT TO THE DISCUSSION PRESENTED IN THE FEASIBILITY STUDY. THE MOBILITY OF DIOXIN IN SOIL IS AFFECTED BY THE PRESENCE OF CO-SOLVENTS THAT WILL INCREASE MOBILITY.

THE OBJECTIVE OF FIELD TESTS CONDUCTED DURING THE SECOND HALF OF 1985. WAS TO DEMONSTRATE WHETHER THE {INCINERATION} PROCESS HAS ANY LONG TERM OPERATIONAL LIMITATIONS AND PROVIDE INFORMATION ON THE COST OF THE PROCESS ...UNIT TREATMENT COSTS WERE IN EXCESS OF \$1,000 PER YD(3) AND THE ON-LINE TIME WAS LESS THAN 50 PERCENT. THESE FIGURES CALL INTO QUESTION THE COMMERCIAL VIABILITY OF THIS TECHNOLOGY FOR THIS APPLICATION. SUBSEQUENT FIELD WORK WAS PERFORMED DURING 1986 AND DEMONSTRATED THAT SUBSTANTIAL OPERATIONAL PROBLEMS WERE ENCOUNTERED.

THE DENNEY FARM WORK WAS A TRIAL, THUS MANY COSTS THAT WERE ENCOUNTERED WOULD NOT BE EXPECTED FOR A REMEDIAL OPERATION. AS PREVIOUSLY DISCUSSED, THE EPA MOBILE INCINERATOR WAS NOT ORIGINALLY DESIGNED OR CONSTRUCTED FOR TREATMENT OF SOILS. OPERATIONAL PROBLEMS THAT WERE ENCOUNTERED WERE TYPICAL OF THE START UP OF ANY NEW PROCESS AND HAVE BEEN CORRECTED THROUGH SEVERAL MODIFICATIONS BEING MADE TO THE UNIT.

IT CORPORATION'S WORK PROVES THAT TCDD CAN BE VOLATILIZED FROM SOIL BY INDIRECTLY HEATING THE SOIL TO AN OPTIMUM TEMPERATURE.

IT CORPORATION'S WORK INDICATES THAT DIOXIN CAN BE VOLATILIZED FROM SOME SOILS, BUT DOES NOT INDICATE THAT THIS WILL BE GENERALLY TRUE FOR ALL SOILS OR TO THE DEGREE THAT IS NECESSARY FOR REMEDIATION.

THE EPA MOBILE INCINERATOR STUDIES DEMONSTRATE THAT VOLATILIZED TCDD VAPORS CAN BE DESTROYED IN A SECONDARY COMBUSTION CHAMBER.

IT SHOULD BE NOTED THAT THE SECONDARY COMBUSTION CHAMBER MUST BE PROPERLY DESIGNED AND OPERATED FOR THIS TO OCCUR.

THE CAPITAL AND OPERATING COSTS OF THIS THERMAL PROCESSOR ARE SUBSTANTIALLY LOWER THAN THE ROTARY KILN TECHNOLOGY DESCRIBED IN THE FEASIBILITY STUDY, YET THE SHIRCO INFRARED APPROACH WAS INAPPROPRIATELY ELIMINATED FROM FURTHER CONSIDERATION.

AS NOTED IN THE TEXT, THE SHIRCO UNIT WAS NOT "ELIMINATED FROM CONSIDERATION." SUCH A UNIT COULD BE PROPOSED AND EVALUATED FOR USE AT TIMES BEACH.

A BETTER AIR POLLUTION CONTROL DEVICE (APCD) IS A HIGH TEMPERATURE BAG HOUSE AS DESCRIBED IN THE NORRIS REPORT. FOR THE TCDD--CONTAMINATED SOIL FOUND IN MISSOURI, THIS IS AN ACCEPTABLE APCD IN REGARDS TO THE 4 LB/HR HCL EMISSION RATE THAT WOULD BE ALLOWABLE IF RCRA APPLIES.

A HIGH-TEMPERATURE BAGHOUSE COULD BE PROPOSED BY THERMAL TREATMENT SERVICE COMPANIES AND EVALUATED FOR USE AT TIMES BEACH DURING THE DESIGN PHASE OF THE PROJECT.

A TRANSPORTABLE MODULAR UNIT COULD INCORPORATE SIGNIFICANT DESIGN IMPROVEMENTS SUCH AS PARTICULATE REMOVAL BETWEEN THE INCINERATOR AND AFTERBURNER AND STILL SATISFY THE TRANSPORTABLE (SHIPPABLE) REQUIREMENT. INSTALLATION AND DISMANTLING TIMES WILL NOT BE SIGNIFICANTLY DIFFERENT THAN FOR A MOBILE UNIT.

THIS IS AN ACCURATE STATEMENT. SELECTION OF SPECIFIC THERMAL TREATMENT EQUIPMENT WILL BE THE RESPONSIBILITY OF THE COMPANIES SUBMITTING PROPOSALS FOR THE PROJECT.

THE FIRST SENTENCE IN THIS SUB-HEADING STATES, "THE RKL IS HIGHLY SUITABLE FOR TREATING TCDD-CONTAMINATED SOIL." THE COMMENTOR DISAGREES. IN FACT, THE SPECIFIC NATURE OF THE CONTAMINATION AT THIS SITE REQUIRES A UNIT DESIGNED TO HANDLE LOW BTU SOILS AT MAXIMUM EFFICIENCY, WHICH THE RKL DOES NOT.

THE RKL HAS BEEN DEMONSTRATED ON DIOXIN-CONTAMINATED SOILS. IT HAS BEEN DEMONSTRATED THAT THE RKL IS CAPABLE OF ACHIEVING DRE'S EXCEEDING 99.9999 PERCENT. THIS WOULD INDICATE THAT THE TECHNOLOGY IS HIGHLY SUITABLE FOR TREATING DIOXIN-CONTAMINATED SOILS.

TOTALLY OMITTED FROM THE DISCUSSION IS AN EVALUATION OF COMPARATIVE THERMAL TREATMENT COSTS, WHICH ARE REQUIRED TO BE CONSIDERED UNDER THE NCP

THE NCP DOES NOT REQUIRE THAT ALL OF THE VARIATIONS OF A PARTICULAR TREATMENT TECHNOLOGY BE COMPARED IN THE FEASIBILITY STUDY. IT IS ONLY NECESSARY TO COMPARE THE COSTS OF DIFFERENT REMEDIAL ALTERNATIVES.

THE SECOND SENTENCE UNDER THIS SUB-HEADING STATES, "LOW BTU WASTES, SUCH AS SOIL, CAN BE SPRAYED WITH FUEL OIL WHILE BEING FED INTO THE INCINERATOR TO PRODUCE A HEATING VALUE OF 500 TO 2,500 BTU PER POUND AND TO INCREASE THE THROUGHPUT RATE." FUEL OIL USED IN THIS MANNER WILL INCREASE PURGE GAS FLOWS THROUGH THE PRIMARY CHAMBER, REQUIRING A LARGER AFTERBURNER AND PROBABLY PARTICULATE REMOVAL BETWEEN THE PRIMARY CHAMBER AND AFTER BURNER.

PURGE GAS RATES COULD BE INCREASED RESULTING IN ADDITIONAL REQUIREMENTS SUCH AS THESE MENTIONED. AN ANALYSIS OF THE COST-EFFECTIVENESS OF SUPPLEMENTING THE PRIMARY SOURCE OF COMBUSTION MUST CONSIDER THE ENTIRE PROCESS.

WITH ITS ANTICIPATED UNIT COST, WHICH IS SUBSTANTIALLY LOWER THAN THE \$400 TO \$600/YD(3) THAT THE FEASIBILITY STUDY PRESENTS AS AN ESTIMATE OF THE RKI COST, AND ITS SUCCESSFUL TRIAL RUN AT TIMES BEACH, THE EII SYSTEM MERITS GREATER CONSIDERATION THAN RECEIVED IN THE FEASIBILITY STUDY.

ALTERNATE THERMAL TREATMENT TECHNOLOGY WILL BE CONSIDERED DURING THE DESIGN PHASE OF THE PROJECT IF PROPOSED BY SERVICE COMPANIES. THE FEASIBILITY STUDY DOES NOT RULE OUT THE USE OF EII TECHNOLOGY.

"A 1-TON-PER-HOUR PILOT UNIT WAS TESTED EXTENSIVELY ON SURROGATE PCB AND DIOXIN WASTES..., ACHIEVING `SIX 9'S DRE FROM FRR ALONE." THIS SUGGESTS THAT THE OPERATING TEMPERATURES WHICH ARE CURRENTLY BEING USED (1800 F IN THE ROTARY KILN AND 2200 F IN THE AFTER BURNER) ARE EXCESSIVE AND CAN BE SAFELY REDUCED...

THIS INDICATES THAT SURROGATE PCB AND DIOXIN WASTES MAY BE THERMALLY TREATED, BUT DOES NOT INDICATE THAT THE OPERATING TEMPERATURES CURRENTLY BEING USED FOR TREATMENT OF DIOXIN-CONTAMINATED SITES IN MISSOURI ARE EXCESSIVE.

REFERENCE IS MADE TO IT CORPORATION'S WORK AT GULFPORT, MISS. WHERE AN INDIRECT-FIRED ROTARY KILN REDUCED SOIL CONCENTRATIONS OF TCDD FROM 250 PPB TO LESS THAN 1 PPB. THE TEST BY SHIRCO INFRARED SYSTEMS AT TIMES BEACH IS FURTHER EVIDENCE ON A SMALL SCALE THAT INDIRECT HEATING SUCCESSFULLY VOLATILIZES TCDD FROM SOIL. ...THESE EXPERIENCES INDICATE THAT THE INDIRECT-FIRED ROTARY KILN TECHNOLOGY IS A VIABLE ALTERNATIVE FOR ANY SOIL VOLUME THAT MUST BE INCINERATED.

THE TESTS BY SHIRCO INDICATE THAT INFRARED TECHNOLOGY MAY BE A VIABLE TECHNOLOGY FOR THERMAL TREATMENT OF DIOXIN-CONTAMINATED SOIL.

THE BIGGEST ADVANTAGE FOR THE INDIRECT-FIRED ROTARY KILN IS THE LOW PURGE GAS FLOW THROUGH THE UNIT. THIS REDUCES, NOT INCREASES, CAPITAL COSTS AS STATED IN THE FEASIBILITY STUDY...

ONE POTENTIAL ADVANTAGE OF AN INDIRECT-FIRED SYSTEM WOULD BE LOW PURGE GAS FLOWS.

...THE COMBUSTION GASES EXHAUSTING FROM THE INDIRECT-FIRED ROTARY KILN'S JACKET ARE CLEAN AND AVAILABLE FOR USE TO PREHEAT SOIL AND COMBUSTION AIR, OR FOR ENERGY RECOVERY.

THIS REPRESENTS ANOTHER POTENTIAL FEATURE OF THE TECHNOLOGY DESCRIBED.

PREVIOUS WORK BY IT CORPORATION AT GULFPORT, MISS. (PAGES C-8, C-9) HAS PROVEN THE CONCEPT OF TCDD VOLATILIZATION FROM SOIL.

ALTHOUGH IT CORPORATION'S WORK IS PROMISING, THE SPECIFIC CONDITIONS AT THE TIMES BEACH SITE MUST BE CONSIDERED TO EVALUATE FULLY THE CONCEPT OF DIOXIN VOLATILIZATION.

...LOWER VOLATILIZATION AND DECOMPOSITION TEMPERATURES CAN ASSURE TCDD DESTRUCTION. THEREFORE, PERMITTING (IF NECESSARY) SHOULD NOT BE ANY MORE DIFFICULT THAN FOR OTHER SYSTEMS.

PERFORMANCE-BASED SPECIFICATIONS WILL BE DEVELOPED DURING DESIGN WHICH ASSURE THAT ALL PERMITTING AND OTHER REGULATORY REQUIREMENTS ARE ACHIEVED BY THE REMEDY.

AVAILABLE SCIENTIFIC LITERATURE DOES NOT SUPPORT THE NEED TO CLEAN ITEMS WHICH ARE CONTAMINATED UP TO LEVELS OF 1000 PICOGRAMS PER SQUARE METER.

THE LEVEL OF CLEANUP REQUIRED WOULD BE DETERMINED THROUGH THE RECOMMENDATIONS OF STATE AND FEDERAL HEALTH AGENCIES.

NO SAMPLING OR CLEAN-UP IS NECESSARY FOR ANY STRUCTURES WHICH ARE TO BE PLACED IN A DEMOLITION LANDFILL.

AS PREVIOUSLY STATED, TESTING OF STRUCTURES AND DEBRIS WOULD BE REQUIRED PRIOR TO DISPOSAL TO CONFIRM THAT THIS MATERIAL CAN BE DISPOSED OF AS NON-HAZARDOUS SOLID WASTE. DECONTAMINATION WOULD BE REQUIRED IF TESTING DETERMINES THAT THE STRUCTURES ARE CONTAMINATED.

A COST BENEFIT ANALYSIS SHOULD BE PERFORMED TO DETERMINE WHETHER THE SALVAGE VALUE JUSTIFIES THE EXPENSE OF DECONTAMINATION. DECONTAMINATION SHOULD TAKE PLACE ONLY WHERE SALVAGE VALUE SIGNIFICANTLY EXCEEDS DECONTAMINATION COST.

PREVIOUS TESTING AT TIMES BEACH HAS INDICATED THAT STRUCTURES AND DEBRIS LOCATED ONSITE ARE NOT CONTAMINATED AND CAN BE SALVAGED OR DISPOSED OF AS NON-HAZARDOUS SOLID WASTE. IF IT IS FOUND THAT A PORTION OF THIS MATERIAL IS CONTAMINATED, THE ECONOMIES OF PERFORMING DECONTAMINATION WOULD BE EVALUATED TO DETERMINE IF SALVAGE OPERATIONS ARE COST-EFFECTIVE. SUCH AN ANALYSIS WOULD BE PERFORMED AT THE PREDESIGN STAGE OF THE SITE REMEDIATION OPERATIONS.

AVAILABLE DATA DO NOT INDICATE THAT LEVEL C PERSONAL PROTECTION WILL BE REQUIRED AT TIMES BEACH.

THE LEVEL OF PROTECTION DESCRIBED IN THE FEASIBILITY STUDY IS SIMILAR TO THAT USED FOR REMOVAL OPERATIONS AT OTHER TCDD SITES IN MISSOURI AND IS BASED ON THE RECOMMENDATIONS FROM FEDERAL AND STATE HEALTH AGENCIES.

THE FEASIBILITY STUDY HAS DRAMATICALLY OVERSTATED THE DECREASED EFFICIENCY FROM THE USE OF THIS LEVEL OF PERSONAL PROTECTIVE EQUIPMENT AND THIS OVERSTATEMENT HAS GREATLY INFLATED EPA'S COST ESTIMATES FOR THIS WORK.

THE DECREASED EFFICIENCY DUE TO THE USE OF PERSONAL PROTECTIVE GEAR, WHICH IS A RESULT OF FREQUENT REST PERIODS, THE NECESSITY FOR DECONTAMINATION AND SUITING UP, AND THE CUMBERSOME NATURE OF THE EQUIPMENT IS DOCUMENTED. THE ESTIMATES USED IN THE STUDY ARE BASED ON OBSERVATIONS DURING ACTUAL REMEDIAL OPERATIONS.

WHEN PERSONAL PROTECTIVE EQUIPMENT IS NOT NECESSARY, IT SHOULD NOT BE USED SINCE IT MAY UNDULY STRESS THE CARDIOPULMONARY SYSTEM AS WELL AS INCREASE THE LIKELIHOOD OF HEAT STRESS. THE CUMBERSOMENESS TO EMPLOYEES OF UNNECESSARILY RESTRICTIVE EQUIPMENT SHOULD BE AVOIDED TO PRESERVE GOOD EMPLOYEE MORALE.

THE LEVEL OF PROTECTION REQUIRED WOULD BE DETERMINED THROUGH CONSULTATION WITH APPROPRIATE STATE AND FEDERAL HEALTH AGENCIES THE LEVEL OF PROTECTION THAT WOULD BE USED WOULD PROTECT AGAINST EXPOSURE TO DIOXIN AT LEVELS THAT WOULD PRESENT A RISK TO THE HEALTH OF THE WORKER.

SECTION 6--TIMES BEACH FEASIBILITY STUDY

SAMPLING TO DATE AT SITES WHERE REMEDIAL EXCAVATION ACTIVITIES ARE PROGRESSING INDICATES NO OFFSITE TCDD MIGRATION OF AIRBORNE DUST. SIMILAR SAMPLING AT IDLE SITES DUPLICATES THESE RESULTS, OBTAINING THE NEED FOR AN EXTENSIVE PARTICULATE SAMPLING PROGRAM.

A SINGLE PHASE PARTICULATE AND SEDIMENT MONITORING APPROACH SHOULD BE ADEQUATE.

THE DETAILS OF THE AIR MONITORING PROGRAM WOULD BE ARRANGED DURING DESIGN OF THE SELECTED ALTERNATIVE. AS NOTED BY THE COMMENTOR, AIR MONITORING IS BEING PERFORMED AT OTHER TCDD REMOVAL SITES. THIS SAMPLING HAS VERIFIED THAT DUST MANAGEMENT PROGRAMS HAVE BEEN

EFFECTIVE. SIMILAR PROGRAMS WOULD BE USED AT TIMES BEACH TO ENSURE THAT DUST MIGRATION WAS SIMILARLY CONTROLLED. CONTINUOUS AIR MONITORING WOULD BE NECESSARY TO ASSURE THE SAFETY OF WORKERS AND LOCAL COMMUNITY.

AIR MONITORS, IF ABSOLUTELY REQUIRED, SHOULD BE LOCATED DOWNWIND IN THE PREVAILING WIND DIRECTION AND/OR AT THE BOUNDARY OF THE CLOSEST POINT OF ROUTINE PUBLIC HABITATION. SEDIMENT MONITORS SHOULD BE LOCATED IN DRAINAGE DITCHES WHICH DRAIN OFFSITE FROM CONTAMINATED AREAS.

THE DETAILS OF AIR AND SEDIMENT MONITORING PROGRAMS WOULD BE ADDRESSED DURING THE DESIGN OF THE PROGRAM FOR THE SELECTED ALTERNATIVE. ISSUES ADDRESSED BY THE COMMENTOR WOULD RECEIVE GREATER CONSIDERATION AT THAT TIME.

PROPOSALS TO ERECT ADDITIONAL FENCING, POST WARNING SIGNS AND ELIMINATE THE SERVICES OF THE 24-HOUR SITE SECURITY PERSONNEL ARE COST EFFECTIVE AND SENSIBLE MEASURES....COST ESTIMATES FOR IMPLEMENTING THESE MEASURES HAVE INCLUDED MAINTENANCE AND REPAIR OF THE FENCE.

MEASURES TO REDUCE THE LONG-TERM COSTS ASSOCIATED WITH ONSITE SECURITY COULD BE COST-EFFECTIVE. THE NEED FOR CONTINUED SECURITY WILL BE DETERMINED IN CONSIDERATION OF THE SELECTED REMEDY.

(IT IS PROPOSED THAT) SEDIMENT BARRIERS BE PLACED IN THE MAJOR DRAINAGE DITCHES TO PROVIDE ROUGH SEDIMENT DEPOSITION. IT WOULD BE MORE REASONABLE TO MONITOR INITIALLY THE SEDIMENT IN EXISTING DRAINAGE DITCHES AND ONLY INSTALL SEDIMENT BARRIERS IN THE UNLIKELY EVENT THAT THE SEDIMENT IS DEMONSTRATED TO BE CONTAMINATED. THE TRIGGER POINT FOR THE INSTALLATION OF THE BARRIERS NEEDS TO BE DEFINED BY A REASONABLE ASSESSMENT OF THE RISK TO HEALTH AND THE ENVIRONMENT.

SEDIMENT BARRIERS WOULD BE INSTALLED AS REQUIRED TO PREVENT CONTAMINATED SEDIMENTS FOR LEAVING THE SITE AT LEVELS CONSIDERED BY FEDERAL AND STATE HEALTH AGENCIES TO PRESENT A PUBLIC HEALTH OR ENVIRONMENTAL RISK.

THE CONSTRUCTION OF TEMPORARY EQUIPMENT STORAGE FACILITIES WHICH MUST UNDERGO EXPENSIVE DECONTAMINATION PROCEDURES FOLLOWING COMPLETION OF THE PROJECT SEEMS EXTRAVAGANT AND NOT JUSTIFIED. ONLY THE MINIMUM AMOUNT OF EQUIPMENT AND PERSONNEL SHOULD BE EMPLOYED TO COMPLETE INSTALLATION OF THE CAPS.

TEMPORARY EQUIPMENT STORAGE FACILITIES WOULD BE CONSTRUCTED AS REQUIRED TO PROTECT EQUIPMENT USED AT THE SITE. THE AMOUNT OF EQUIPMENT AND PERSONNEL USED WOULD BE ADEQUATE TO IMPLEMENT THE SELECTED ALTERNATIVE IN THE TIME REQUIRED TO COMPLETE THE PROJECT WORK.

STUDIES HAVE SHOWN THAT VEGETATION DOES NOT NORMALLY ABSORB TCDD, SO THAT IF THE VEGETATION IS SIMPLY MULCHED AND LEFT IN PLACE, THE TCDD CONCENTRATION, IF ANY, WOULD NOT BE INCREASED BY ANY DETECTABLE LEVEL... THE ESTABLISHED VEGETATIVE TOPSOIL COVER WOULD ADEQUATELY PREVENT ANY TCDD MIGRATION FROM THIS SITE. SURFACE DEBRIS, SUCH AS STICKS AND LEAVES SHOULD BE LEFT IN PLACE, AND NOT CONSOLIDATED AND CONTAINERIZED SEPARATELY.

SURFACE DEBRIS SUCH AS STICKS AND LEAVES WOULD BE REMOVED AS REQUIRED TO IMPLEMENT THE SELECTED ALTERNATIVE. IF IMPLEMENTATION OF THE CLEANUP WOULD NOT BE AFFECTED BY THE PRESENCE OF A PORTION OF THIS MATERIAL, IT WILL BE LEFT IN PLACE PENDING SITE RESTORATION. THIS MATERIAL MAY BE REMOVED DURING RESTORATION, DEPENDING ON DESIGN CRITERIA. THE NEED FOR CONSOLIDATION AND CONTAINERIZATION OF THIS MATERIAL TO FACILITATE HANDLING WILL BE EVALUATED DURING DESIGN.

THERE IS NO JUSTIFICATION FOR PULVERIZATION OF THE PAVEMENT AS DISCUSSED IN THE FIFTH PARAGRAPH. WITH A ONE FOOT SOIL CAP THERE IS SUFFICIENT DEPTH OF SOIL FOR ESTABLISHMENT AND MAINTENANCE OF A DENSE GRASS COVER.

PULVERIZATION WOULD BE PERFORMED AS REQUIRED TO ENSURE THAT A SOIL CAP WAS FIRMLY ESTABLISHED ON THE AREAS TO BE COVERED, IF SUCH AN ALTERNATIVE WERE SELECTED FOR REMEDIATION. EXISTING PAVEMENT IS LEFT IN PLACE IN SOME AREAS IN THE PROPOSED PLAN TO PROVIDE AN ADDITIONAL BARRIER. THIS BARRIER PROVIDES AN ADDITIONAL MEASURE OF PROTECTION FOR PUBLIC HEALTH AND THE ENVIRONMENT, EXCEEDING THE RECOMMENDATIONS OF FEDERAL AND STATE HEALTH AGENCIES, AT A LOWER COST.

THE NEED FOR NEW CULVERTS CAN BE HELD TO A MINIMUM BY THE DEVELOPMENT OF A WELL DESIGNED SITE GRADING AND DRAINAGE PLAN PRIOR TO IMPLEMENTATION OF THE CAPPING PROGRAM.

NEW CULVERTS, AS WELL AS SITE GRADING, MAY BE REQUIRED FOR IMPLEMENTATION OF ANY SELECTED REMEDY. SUCH MEASURES WOULD BE UNDERTAKEN AS REQUIRED TO CONTROL SITE DRAINAGE. THE NEED FOR CULVERTS COULD BE AFFECTED BY OTHER MEASURES SUCH AS GRADING. SUCH ISSUES WOULD BE CONSIDERED IN GREATER DETAIL DURING THE DESIGN OF THE SELECTED ALTERNATIVE.

THE NEED FOR AN EXTREMELY EXPENSIVE PERMANENT IRRIGATION SYSTEM CAN BE AVOIDED BY SELECTING APPROPRIATE DENSE GRASS MIXES OR OTHER VEGETATION THAT WILL WITHSTAND THE LACK OF SUMMER RAINFALL, AND WILL CONTROL EROSION ONCE ESTABLISHED. IF WATERING IS NECESSARY TO ESTABLISH INITIALLY THE VEGETATIVE COVER, THIS CAN BE ACCOMPLISHED AT A REDUCED COST BY MORE TEMPORARY SYSTEMS.

SINCE THE ALTERNATIVE IS A FINAL REMEDIAL MEASURE, METHODS WOULD BE IMPLEMENTED TO PERMANENTLY ENSURE THAT THE INTEGRITY OF REMEDIAL MEASURES IS MAINTAINED. EPA AGREES THAT MIXES OF GROUND COVER SHOULD BE SELECTED THAT WOULD BE ABLE TO WITHSTAND THE LACK OF SUMMER RAINFALL AND WOULD CONTROL EROSION. IF SUCH MATERIALS COULD BE FOUND THAT WOULD MEET THE SITE OBJECTIVES, THE NEED FOR PERMANENT IRRIGATION MAY BE REDUCED.

DISPOSAL COSTS FOR PROTECTIVE EQUIPMENT CAN BE ELIMINATED IF UNIFORMS ARE USED THAT CAN BE WASHED ON A DAILY BASIS.

THE LEVEL OF PROTECTIVE GEAR ASSUMED IN THE FEASIBILITY STUDY IS SIMILAR TO THAT USED FOR REMOVAL ACTIVITIES BY EPA AT OTHER TCDD SITES IN MISSOURI BASED UPON RECOMMENDATIONS OF FEDERAL AND STATE HEALTH AGENCIES. IF OTHER TYPES OF PROTECTIVE EQUIPMENT IS DEEMED APPROPRIATE BY HEALTH AGENCIES, IT MAY BE CONSIDERED FOR USE DURING REMEDIAL ACTIVITIES AT TIMES BEACH. SUCH ISSUES WOULD BE ADDRESSED DURING DESIGN OF THE SELECTED REMEDIAL ALTERNATIVE.

...A MORE COST EFFECTIVE METHOD OF DISPOSING OF THE DECONTAMINATION RINSE WATER IS TO UTILIZE IT FOR DUST CONTROL AT ALREADY-CONTAMINATED REMEDIATION WORK AREAS.

THIS POSSIBILITY WILL BE EVALUATED FURTHER DURING DESIGN AND PREDESIGN OF THE SELECTED ALTERNATIVE.

IN THE EVENT THAT EPA DETERMINES THAT THE SAND AND CARBON FILTERS ARE NEVERTHELESS REQUIRED, THE FILTER MATERIALS SHOULD BE DISPOSED OF BENEATH THE CLEAN TOPSOIL COVER IN AN AREA OF CONFIRMED TCDD CONTAMINATION.

THIS OPTION FOR DISPOSAL OF THE FILTER MATERIAL WILL BE EVALUATED IN GREATER DETAIL DURING THE PREDESIGN AND DESIGN PHASES OF THE PROJECT.

...THE DITCHES SHOULD BE FILLED AND A SMOOTH, GENTLY TAPERED SOIL COVERING PLACED OVER THE ROAD AND ROAD SHOULDERS.

FILLING OF DITCHES WITH CLEAN SOIL WOULD DISTURB SITE DRAINAGE CHARACTERISTICS. THIS POSSIBILITY WILL BE INVESTIGATED, IF APPROPRIATE, DURING THE DESIGN PHASE. THE FEASIBILITY STUDY AND PROPOSED PLAN EVALUATE SEVERAL IN-PLACE CONTAINMENT ALTERNATIVES. ALTERNATIVE DESIGNS WOULD BE CONSIDERED IF THIS REMEDY IS SELECTED.

THERE IS NO NEED TO RESAMPLE STREETS AND DITCHES HAVING COMPOSITE TCDD CONCENTRATIONS BELOW THE LEVEL OF CONCERN UNLESS THE ORIGINAL SAMPLES AND ANALYSES WERE SUSPECT. SAMPLING OF TIMES BEACH APPEARS ADEQUATE.

ADDITIONAL SAMPLING HAS BEEN PERFORMED TO PROPERLY DEFINE THE CONTAMINATED AREAS AND ENSURE THAT THE OBJECTIVES ESTABLISHED BY STATE AND FEDERAL HEALTH AGENCIES ARE MET. SAMPLING WILL BE CONDUCTED, AS NECESSARY, TO IMPLEMENT THE SELECTED REMEDY.

AFTER THE IMPLEMENTATION OF "IN-PLACE CONTAINMENT" MEASURES, THERE WILL BE NO NEED FOR LONG-TERM MAINTENANCE ACTIVITIES, DECONTAMINATION FACILITIES OR EQUIPMENT STORAGE. ON OCCASION, IF NECESSARY, A MOWING MACHINE CAN BE TRAILER TOWED TO THE SITE TO MOW THE GRASS CAP. PURCHASING AND STORING EQUIPMENT ON SITE INCREASES THE RISK OF THEFT OR VANDALISM AND THUS SHOULD BE AVOIDED.

THIS IS AN OPTION FOR THE HANDLING OF MAINTENANCE ACTIVITIES. THE STORAGE OF EQUIPMENT WOULD BE SPECIFIED DURING DESIGN.

...THAT AFTER THE VEGETATIVE COVERS ARE ESTABLISHED, ADDITIONAL INSPECTIONS (FOLLOWING STORMS, WINDS, OR FLOODS) WILL NOT BE REQUIRED BECAUSE THIS COVER WILL EFFECTIVELY PROTECT THE TOPSOIL FROM SUCH EVENTS.

THERE IS A POTENTIAL FOR EROSION TO A VEGETATIVE CAP. EPA BELIEVES THAT IT WOULD BE NECESSARY TO INSPECT THE CAP FOLLOWING STORM, WIND, AND FLOOD EVENTS TO ENSURE THAT THE INTEGRITY OF THE CAP IS MAINTAINED. REPAIRS WOULD BE MADE AS SOON AS POSSIBLE TO ENDURE THAT DAMAGE TO THE CAP, IF IT OCCURRED, DID NOT WORSEN DUE TO NEGLECT.

EPA WOULD REQUIRE THE USE OF LEVEL D PROTECTIVE EQUIPMENT FOR SITE PREPARATION EVEN THOUGH THE FACILITY WOULD BE SITED IN THE UNCONTAMINATED TRAILER PARK AREA. THE COMMENTOR BELIEVES THAT NO PROTECTIVE EQUIPMENT BEYOND HARD HATS AND SAFETY BOOTS WOULD BE REQUIRED FOR THIS WORK.

THE GEAR DESCRIBED BY THE COMMENTOR IS LEVEL D GEAR. LEVEL D PROTECTIVE GEAR IS PRIMARILY A WORK UNIFORM THAT PROVIDES A MINIMAL LEVEL OF PROTECTION. THE REQUIRED EQUIPMENT IS COVERALLS AND STEEL-TOED LEATHER OR CHEMICAL-RESISTANT BOOTS OR SHOES. HARD HATS WOULD BE OPTIONAL EQUIPMENT.

NO ADDITIONAL FENCING WOULD BE REQUIRED AROUND THE SITE PERIMETER BECAUSE THE ASSIGNED SECURITY GUARDS COULD ADEQUATELY PROTECT THE SITE.

ADDITIONAL FENCING WOULD BE INSTALLED AS REQUIRED TO ENSURE THAT EQUIPMENT IS PROTECTED AND INTRUDERS PREVENTED FROM CONTACTING THE CONTAMINATED AREAS.

TCDD DOES NOT MIGRATE IN RESPONSE TO WATER PERCOLATING THROUGH THE SOIL.. AS A CONSEQUENCE, THE DISPOSAL FACILITY AND ELABORATE LEACHATE TREATMENT SYSTEM DESCRIBED IN THE FEASIBILITY STUDY {FOR THE LAND DISPOSAL FACILITY} IS NOT SCIENTIFICALLY OR TECHNICALLY JUSTIFIED. SUCH A SYSTEM IS ENORMOUSLY EXPENSIVE AND REQUIRES OPERATING COSTS IN PERPETUITY.

AS NOTED PREVIOUSLY, A COLLECTION AND TREATMENT SYSTEM WOULD BE REQUIRED FOR THE LAND DISPOSAL FACILITY. THE SYSTEM WOULD BE EXPECTED TO OPERATE PRIMARILY DURING THE EARLY PORTION OF THE PROJECT WHEN THE FACILITY WAS OPEN AND BEING FILLED. AFTER THE FACILITY HAD BEEN CLOSED, LEACHATE GENERATION WOULD BE EXPECTED TO BECOME NEGLIGIBLE, EXCEPT FOR THE UNUSUAL OCCURRENCE OF A BREACH IN THE COVER FOR THE FACILITY. IT WOULD BE NECESSARY TO MAINTAIN THE EQUIPMENT IN GOOD WORKING ORDER IN CASE SUCH AN OCCURRENCE DID OCCUR.

...THE TOP OF THE CONCRETE WALLS OF ANY ONSITE LAND DISPOSAL STRUCTURE, IF CONSTRUCTED NEED ONLY BE ONE FOOT ABOVE THE 100 YEAR FLOOD ELEVATION. THIS REDUCES THE AMOUNT OF BORROW AND BACKFILL PRIOR TO CONSTRUCTION, AND THE AMOUNT OF BORROW AND BACKFILL TO COVER COMPLETELY THE CONTAINER.

THE SPECIFIC HEIGHT OF THE DISPOSAL FACILITIES' WALLS WOULD BE SELECTED TO MINIMIZE THE POTENTIAL FOR FLOODWATER OVERRUNNING THE TOP OF THE WALL.

THE COMMENTOR RECOMMENDS ELIMINATION OF THE "POLYMERIC ASPHALT COATING OR SYNTHETIC LINER" INTENDED BY EPA TO SERVE AS AN IMPERMEABLE COATING FOR THE CONCRETE. THESE LINERS OR COATINGS LEAK IMMEDIATELY AFTER INSTALLATION, REDUCING THEIR EFFECTIVENESS AS AN IMPERMEABLE BARRIER. IN ADDITION, THE CONCRETE CAN BE DESIGNED TO BE AS IMPERMEABLE TO SEDIMENT TRANSPORT AS A LINER OR COATING....A SECONDARY LEACHATE COLLECTION SYSTEM WILL BE AVAILABLE AS A BACK-UP SYSTEM, THEREBY REDUCING THE NEED FOR THE LINER OR COATING.

COATINGS OR LINERS WOULD BE REQUIRED FOR A PERMANENT DISPOSAL FACILITY. THE SPECIFIC COATINGS THAT WOULD BE REQUIRED WOULD BE SELECTED FOLLOWING ADDITIONAL EVALUATION DURING THE DESIGN PHASES OF THE PROJECT.

..."LEACHATE COLLECTED IN THE LEAK-DETECTION SYSTEM WOULD BE PUMPED TO THE LEACHATE TREATMENT SYSTEM." THE COMMENTOR DOES NOT ANTICIPATE THAT THIS MEASURE WILL BE REQUIRED BECAUSE IT IS UNLIKELY THAT THE GROUNDWATER OR FLOODWATER BENEATH THE CONCRETE CONTAINER WILL BE CONTAMINATED. IT WOULD BE MORE ADVISABLE TO SAMPLE THIS WATER PRIOR TO TREATMENT TO DETERMINE IF TREATMENT WERE NECESSARY.

IN THE EVENT OF A FLOOD, IT IS UNLIKELY THAT TIME WOULD PERMIT SAMPLING AND ANALYSIS OF GROUNDWATER OR FLOODWATER BENEATH THE FACILITY. ONE PURPOSE OF COLLECTION AND TREATMENT WOULD BE TO MINIMIZE THE POTENTIAL FOR UPLIFT THAT COULD DAMAGE THE FACILITY.

THE COMMENTOR DISAGREES WITH EPA THAT A FUNCTION OF THE CAP THAT COVERS THE FILLED CONCRETE DISPOSAL FACILITY IS TO PREVENT PERCOLATION OF RAINWATER INTO THE CONTAMINATED SOIL....THE MAJOR FUNCTION OF THIS CAP IS TO PREVENT PUBLIC EXPOSURE TO THE CONTAMINATED SOILS.

ALTHOUGH A FUNCTION OF A CAP IS TO PREVENT PUBLIC EXPOSURE TO CONTAMINATED SOILS, A CAP IS ALSO INTENDED TO PREVENT PERCOLATION OF RAINWATER.

THE LEACHATE TREATMENT SYSTEM ENVISIONED BY EPA WOULD BE CAPABLE OF HANDLING FLOWS FROM A 24-HOUR-LONG, 25-YEAR STORM....A SYSTEM SIZED TO HANDLE THIS VOLUME OF RAINFALL IS NOT REQUIRED..

AS NOTED PREVIOUSLY, EPA BELIEVES THAT SUCH SIZING IS REQUIRED TO PREVENT DAMAGE TO CONTAINMENT FACILITY. THE SPECIFIC SIZING OF THE EQUIPMENT WOULD BE DETERMINED DURING DESIGN OF SUCH A FACILITY, IF INCLUDED IN THE SELECTED REMEDIAL ALTERNATIVE. THE PROPOSED REMEDY DOES NOT INCLUDE THE NEED FOR A LEACHATE COLLECTION SYSTEM. WATER TREATMENT REQUIREMENTS WILL BE DEPENDENT UPON THE DESIGN OF THE REMEDY.

...THE COMMENTOR RECOMMENDS THAT THE TCDD REMOVAL EFFICIENCY OF 99.9% OF TOTAL TCDD BE EXPRESSED AS A DISCHARGE CRITERIA FOR THE TREATED WATER, SUCH AS THE 10-PPT LIMIT WHICH EPA USES AT THE DENNEY FARM SITE.

DISCHARGE OF TREATED WATER WILL BE IN ACCORDANCE WITH FEDERAL AND STATE WATER QUALITY LAWS AND REGULATIONS WHICH ARE DETERMINED TO BE APPLICABLE OR RELEVANT AND APPROPRIATE.

LEVEL C PROTECTION AS DESCRIBED...WOULD BE EXCESSIVE FOR MOST REMEDIATION ACTIVITIES. EPA LEVEL D PROTECTION IS MORE SUITABLE FOR MOST OF THE REMEDIAL TASKS AND PROVIDES ENHANCED WORKER COMFORT AND EFFICIENCY.

THE LEVEL OF PROTECTION DESCRIBED IN THE FEASIBILITY STUDY IS TYPICAL OF THAT USED DURING REMOVAL OPERATIONS AT OTHER DIOXIN SITES IN MISSOURI. ALTERNATIVE LEVELS WOULD BE CONSIDERED IF THEIR USE WAS APPROVED BY APPROPRIATE STATE AND FEDERAL HEALTH AGENCIES. THESE ISSUES WOULD RECEIVE ADDITIONAL CONSIDERATION DURING THE DESIGN OF THE SELECTED ALTERNATIVE.

...NO ADVANTAGE IS GAINED BY EMPLOYING STEAM CLEANING OF CONTAINERS AND TRUCKS VERSUS HIGH PRESSURE WATER SPRAY OR WATER SPRAY COMBINED WITH DETERGENTS. STEAM CLEANING IS DANGEROUS AND EXPENSIVE AND DOES NOT REMOVE TCDD MORE EFFICIENTLY THAN THESE OTHER METHODS.

THE SPECIFIC CLEANING METHOD EMPLOYED WOULD RECEIVE ADDITIONAL CONSIDERATION DURING THE DESIGN OF THE SELECTED ALTERNATIVE. STEAM CLEANING WOULD MINIMIZE THE AMOUNT OF DECONTAMINATION WATER REQUIRING LATER TREATMENT. STEAM CLEANING, AS WELL AS THE OTHER METHODS SUGGESTED BY THE COMMENTOR, WOULD BE EVALUATED FOR COST-EFFECTIVENESS.

THE COMMENTOR REJECTS EPA'S CONCLUSION THAT LONG-TERM GROUNDWATER MONITORING IS REQUIRED AFTER CLOSURE.

GROUND WATER MONITORING WILL BE PERFORMED, IF REQUIRED BY STATE-ISSUED PERMIT CONDITIONS.

EPA WILL BE REQUIRING "...PERIODIC INSPECTION OF THE DISPOSAL FACILITY WALLS FOR LEAKS, CRACKS, AND DISTORTION." SINCE THESE WALLS ARE BURIED, THESE INSPECTIONS WOULD REQUIRE TOTAL EXCAVATION OF THE SOIL FILL AROUND THE CONCRETE FACILITY. THIS IS BOTH ABSURD AND TOTALLY COST PROHIBITIVE. NO INSPECTIONS SHOULD BE PERFORMED UNLESS A SIGNIFICANT SHIFT IN THE SOIL MOUND COVERING THE CONTAINER OCCURS.

THE PASSAGE REFERS TO GENERAL RCRA REQUIREMENTS. THE COST OF OPERATION AND MAINTENANCE IS INCLUDED IN THE DETERMINATION OF COST-EFFECTIVENESS FOR EACH OF THE REMEDIAL ALTERNATIVES.

THE ONLY ASPECTS OF THE OUTLINED OPERATION AND MAINTENANCE ACTIVITIES WHICH SHOULD BE UNDERTAKEN ARE THOSE ACTIVITIES WHICH INVOLVE MAINTENANCE OF THE SECURITY SYSTEM AND OF THE CULVERTS AND DITCHES. LEACHATE COLLECTION AND TREATMENT ARE UNNECESSARY AND CONSEQUENTLY THERE WILL BE NO ASSOCIATED MAINTENANCE REQUIRED.

LEACHATE COLLECTION AND TREATMENT WOULD BE NECESSARY FOR A LAND DISPOSAL FACILITY, FOR REASONS NOTED PREVIOUSLY.

THIS OPTION REQUIRES THAT A COMMERCIAL LANDFILL FACILITY BE LOCATED IN THE VICINITY OF TIMES BEACH, OR THAT AN UPGRADED SANITARY LANDFILL BE CONSTRUCTED AND PERMITTED. NEITHER OF THESE CURRENTLY EXIST, NOR IS THE PROBABILITY VERY HIGH THAT SUCH A FACILITY WILL BE CONSTRUCTED IN THE NEAR FUTURE.

IT WAS NOT ASSUMED IN THE FEASIBILITY STUDY THAT A COMMERCIAL LANDFILL FACILITY WOULD BE CONSTRUCTED IN THE VICINITY OF TIMES BEACH. IT WAS NOTED IN THE FEASIBILITY STUDY THAT SUCH A FACILITY COULD BE A CONSIDERABLE DISTANCE FROM TIMES BEACH.

EPA PROPOSES TO CONSTRUCT AN 8 FOOT HIGH PERIMETER FENCE AROUND THE TIMES BEACH SITE. THIS IS AN ECONOMICALLY UNJUSTIFIED USE OF CERCLA FUNDS BECAUSE THE SECURITY GUARDS DETAILED TO THE PROJECT CAN ADEQUATELY PROTECT THE SITE, AND BECAUSE THE FENCING WILL HAVE TO BE REMOVED FOLLOWING REMEDIATION EFFORTS.

EPA WILL CONSTRUCT FENCES AS REQUIRED TO IMPLEMENT THE REMEDIAL ALTERNATIVES. THE LEVEL OF SECURITY THAT WOULD BE REQUIRED SHOULD BE ADEQUATE TO PREVENT INTRUDERS FROM ENTERING THE SITE AND CONTACTING CONTAMINATED MATERIAL AND ALSO PREVENT VANDALISM. SECURITY REQUIREMENTS WILL BE ADJUSTED IN CONSIDERATION OF THE SELECTED REMEDY.

...THE MAXIMUM EQUIPMENT REQUIRED TO PROTECT WORKERS FROM EXPOSURE TO TCDD IS DISPOSABLE DUST MASKS AND WASHABLE CLOTHING.

AS NOTED PREVIOUSLY, THE LEVEL OF PROTECTION DESCRIBED IN THE FEASIBILITY STUDY IS TYPICAL OF THAT USED DURING REMOVAL OPERATIONS AT OTHER TCDD SITES IN MISSOURI BASED UPON RECOMMENDATIONS OF STATE AND FEDERAL HEALTH AGENCIES. ALTERNATIVE LEVELS WOULD BE CONSIDERED IF THEIR USE WAS APPROVED BY HEALTH AGENCIES. THESE ISSUES WOULD RECEIVE ADDITIONAL CONSIDERATION DURING THE DESIGN OF THE SELECTED ALTERNATIVE.

AN INDIRECT-FIRED ROTARY KILN WITH DRY POLLUTION CONTROL IS A MUCH PREFERRED METHOD OF TREATING LOW LEVEL CONTAMINATED SOIL. THIS TECHNOLOGY IS LESS COSTLY, MORE RELIABLE THAN OTHER THERMAL TREATMENT TECHNIQUES, AND IT CAN MEET ALL FEDERAL, STATE AND LOCAL PERFORMANCE REQUIREMENTS.

IF THE PROPOSED TECHNOLOGY IS COST-EFFECTIVE, EPA WOULD ANTICIPATE RECEIVING PROPOSALS FOR THE PROJECT INCORPORATING ITS USE.

EPA WOULD REQUIRE THE INSTALLATION OF AN 8-FOOT PERIMETER FENCE AROUND THE ENTIRE SITE. THE COMMENTOR RECOMMENDS THAT EPA ONLY INSTALL SUCH A FENCE AROUND THE THERMAL TREATMENT FACILITY BECAUSE THE SECURITY GUARDS CAN ADEQUATELY PREVENT UNAUTHORIZED PERSONNEL FROM ENTERING THE SITE.

FENCING WOULD BE INSTALLED AS REQUIRED TO PREVENT CONTACT WITH CONTAMINATED SOIL AND PREVENT VANDALISM OF EQUIPMENT.

EPA INDICATES THAT THE INCINERATORS AND ANCILLARY EQUIPMENT WOULD REQUIRE A POWER SUPPLY OF APPROXIMATELY 800 KW....MUCH LESS POWER SHOULD BE REQUIRED TO OPERATE THE INCINERATORS.

THE LEVEL OF POWER NOTED IN THE FEASIBILITY STUDY IS SIMILAR TO THAT NOTED BY SERVICE COMPANIES OPERATING FULL-SCALE MOBILE INCINERATORS. THE POWER REQUIREMENTS WOULD BE DETERMINED BY THE TECHNOLOGY UTILIZED BY THE SUCCESSFUL BIDDER.

EPA ESTIMATES THAT APPROXIMATELY 28 ACRES WOULD BE REQUIRED FOR THE THERMAL TREATMENT FACILITY. A 28-ACRE SITE IS UNREASONABLY LARGE DUE TO THE 4 MONTH SOIL STORAGE REQUIREMENT, AND THE REQUIREMENTS FOR ELABORATE AND UNNECESSARY WATER TREATMENT OF THE SCRUBBER BLOWDOWN.

EPA BELIEVES THAT 4 MONTHS OF STORAGE WOULD BE APPROXIMATELY CORRECT FOR TREATMENT OF TIMES BEACH SOILS ONLY. THE FLOOD-PROTECTED ACREAGE ASSUMED ON THE PROPOSED PLAN WAS SUBSTANTIALLY REDUCED. ACTUAL REQUIREMENTS WOULD BE DETERMINED DURING DESIGN.

...THERE IS NO NEED TO GRAVEL THE ENTIRE INCINERATOR SITE.

THE SITE WOULD ONLY BE GRAVELED AS REQUIRED TO SUPPORT EQUIPMENT, STORAGE AREAS, AND ROADS.

...DESIGN OF THE FACILITY TO PROVIDE PROTECTION FROM A 100 YEAR FLOOD EVENT IS INAPPROPRIATE FOR A TEMPORARY FACILITY PROJECTED TO HAVE A RELATIVELY SHORT LIFE.

THE FACILITY WILL NEED TO BE FLOOD-PROTECTED TO PREVENT DAMAGE TO FACILITIES IN THE EVENT OF A FLOOD. THE INCINERATOR, WHICH WOULD REQUIRE A MINIMUM OF 6 WEEKS FOR DISMANTLING, COULD NOT BE REMOVED QUICKLY ENOUGH TO PREVENT FLOOD DAMAGE IF A FLOOD OCCURRED. HENCE, EVEN THOUGH THE FACILITY WOULD BE RELATIVELY SHORT-LIVED, GIVEN THE NATURE OF FLOODING AT THE SITE, THE FACILITY WOULD NEED TO BE THOROUGHLY FLOOD PROTECTED.

EPA PROPOSES TO CONSTRUCT DIKED TANK AREAS....LIQUID STORAGE TANKS AND DIKES WILL NOT BE NECESSARY IF A DRY AIR POLLUTION CONTROL IS UTILIZED.

CHEMICALS ARE LIKELY TO BE REQUIRED, EVEN FOR A DRY SCRUBBING SYSTEM, SO THE COMPLETE ELIMINATION OF DIKED TANK AREAS IS UNLIKELY. A DRY SCRUBBING SYSTEM, IF OFFERED BY THERMAL TREATMENT SERVICE COMPANIES PROPOSING TO WORK ON THE PROJECT, WOULD BE CAREFULLY CONSIDERED DURING THE DESIGN PHASE FOR THE PROJECT.

BECAUSE THERE IS SO LITTLE CHLORINATED MATERIAL IN THE SOIL AT TIMES BEACH, HCL GENERATION WOULD NOT SURPASS THE FOUR POUNDS PER HOUR ALLOWED BY RCRA. THEREFORE THE REFERENCE TO CAUSTIC STORAGE OR NEUTRALIZATION OF RCI SHOULD BE DELETED.

CAUSTIC WOULD LIKELY BE REQUIRED FOR THE QUENCH PROCESS THAT WOULD BE REQUIRED FOR A DRY PROCESS, SO IT IS UNLIKELY THAT ITS USE WOULD BE DISCONTINUED. IF ITS USE WAS NOT REQUIRED, IT WOULD NOT BE USED.

EPA WOULD CONSTRUCT A WELL PRODUCING AT LEAST 70 GPM OF WATER TO BE USED FOR SCRUBBING EXHAUST AIR FROM THE SECONDARY COMBUSTION CHAMBER. IF A DRY POLLUTION CONTROL SYSTEM WERE UTILIZED, THIS VOLUME OF WATER WOULD NOT BE REQUIRED. THE WELL WOULD ONLY NEED TO SUPPLY THAT VOLUME OF WATER NECESSARY TO SUPPORT THE WASTE HEAT BOILER SYSTEM....ONLY 40 GPM FOR BOTH UNITS WOULD BE REQUIRED...

THE VOLUME OF WELL WATER REQUIRED MAY INDEED BE REDUCED WITH A DRY SCRUBBING SYSTEM OVER A WET SCRUBBING SYSTEM.

...THERE ARE THREE FORMER MUNICIPAL WELLS AND A WATER STORAGE TANK WHICH COULD BE BROUGHT BACK INTO SERVICE INSTEAD OF DRILLING A NEW 70 GPM WELL AT A COST OF MORE THAN \$200,000.

IF THE EXISTING WELLS COULD BE BROUGHT INTO SERVICE, SUPPLY THE WATER NEEDED, AND BE SET UP AT A LOWER COST THAN INSTALLING A NEW WELL, THE EXISTING WELLS WOULD BE USED.

A SUMP TO STORE RUN-OFF FROM A 25-YEAR RAINFALL IS UNNECESSARY {TO CONTAIN STORMWATER WITHIN THE RING LEVEE} BECAUSE EPA PROPOSES TO CONTAINERIZE THE SOIL....A SUMP TO HOLD 932,000 GALLONS OF WATER IS REQUIRED, WHICH APPEARS TO BE EXCESSIVELY LARGE.

EPA BELIEVES THAT THE ASSUMPTIONS NOTED IN THE FEASIBILITY STUDY ARE JUSTIFIED. ADDITIONAL CONSIDERATION WOULD BE GIVEN TO THIS ISSUE DURING PROJECT DESIGN.

THE INCINERATOR SET-UP TIME OF SIX WEEKS IS UNREALISTICALLY SHORT, AND THE USE OF A SECOND SHIFT OF SET-UP WORKERS HAS LIMITED EFFECTIVENESS AND CAN BE VERY COSTLY.

THE INCINERATOR SETUP TIME IS THAT SUGGESTED BY SEVERAL THERMAL TREATMENT SERVICE COMPANIES THAT OFFER ONSITE MOBILE INCINERATION SERVICES. SIX WEEKS IS NOT CONSIDERED TO BE UNREALISTIC. SCHEDULING OF SHIFTS WILL BE THE RESPONSIBILITY OF THE CONSTRUCTION CONTRACTOR.

EPA NOTES THAT THE TRIAL BURN PLAN IS TO BE SUBMITTED AFTER THE PRELIMINARY SHAKEDOWN OF THE THERMAL TREATMENT UNIT. A PREFERRED APPROACH WHICH WOULD MINIMIZE DELAY AND DOWNTIME FOR THE UNIT WOULD BE TO SUBMIT THE TRIAL BURN PLAN FOR APPROVAL DURING THE DESIGN AND CONSTRUCTION OF THE UNIT.

DELAYS WOULD BE MINIMIZED IF THE PLAN COULD BE OFFERED PRIOR TO PRELIMINARY SHAKEDOWN OF THE UNIT.

THERE IS NO NEED TO LOAD THE EXCAVATED MATERIAL INTO 15 CUBIC YARD BINS WHICH ARE ESTIMATED TO COST OVER \$9,000,000 TO PURCHASE....BINS ARE HARD TO FILL, REQUIRE VERY AWKWARD AND EXPENSIVE EQUIPMENT TO MOVE THEM AND DO NOT PROVIDE ANY OPERATIONAL IMPROVEMENTS.

THERE ARE SEVERAL ADVANTAGES TO THE USE OF BINS FOR SUCH AN OPERATION THE SPECIFIC HANDLING METHOD MAY DIFFER FROM THAT DESCRIBED, HOWEVER, AND WOULD BE DETERMINED DURING DESIGN OF THE SELECTED ALTERNATIVES.

A STRAIGHT LINE CONFIGURATION OF THE ROTARY KILN AND THE AFTERBURNER HAS PROVEN TO BE UNFEASIBLE AT THE DENNEY FARM DUE TO PARTICULATE CARRY-OVER INTO THE AFTERBURNER. A DESIGN TO FACILITATE PARTICULATE REMOVAL MUST BE EMPLOYED.

MODIFICATIONS HAVE BEEN MADE TO THE EPA MOBILE INCINERATOR SINCE THE DENNEY FARM TRIAL THAT WILL REDUCE THE PARTICULATE CARRY-OVER INTO THE AFTERBURNER. SIMILAR MODIFICATIONS HAVE BEEN MADE TO COMMERCIALY AVAILABLE ROTARY KILNS. A STRAIGHT-LINE CONFIGURATION

COULD, THEREFORE, BE USED SUCCESSFULLY.

THE UNITS SHOULD NOT REMAIN MOUNTED ON TRAILERS BECAUSE THIS OVERLY COMPLICATES THEIR OPERATION. THEY COULD BE MADE TRANSPORTABLE...

THE DECISION TO KEEP THE THERMAL TREATMENT UNITS TRAILER-MOUNTED WOULD BE LEFT TO THOSE PROPOSING TO PERFORM THE ONSITE THERMAL TREATMENT SERVICES.

...A MOBILE SYSTEM VERSUS A TRANSPORTABLE COMPONENT SYSTEM CONSTRUCTED ON-SITE IS NOT JUSTIFIED DUE TO THE VERY LARGE MAGNITUDE OF THE PROJECT. THE ADDITIONAL COSTS TO CONSTRUCT A MOBILE INCINERATOR (TRAILER CHASSIS, QUICK CONNECT ELECTRIC SYSTEMS, ETC.) INSTEAD OF A SKID MOUNTED TRANSPORTABLE SYSTEM ARE NOT MERITED FOR A PROJECT WHICH WILL EXTEND OVER SEVERAL YEARS AND NOT SEVERAL MONTHS.

MOBILE INCINERATORS HAVE ALREADY BEEN CONSTRUCTED AND ARE IN OPERATION. SINCE A NEW MOBILE INCINERATOR WOULD NOT NECESSARILY HAVE TO BE BUILT, CONSTRUCTION OF SUCH A UNIT WOULD NOT NECESSARILY BE AN ISSUE FOR THE SITE. ANY TRANSPORTABLE THERMAL TREATMENT UNIT CAPABLE OF SATISFYING THE PERFORMANCE OBJECTIVES, INCLUDING MOBILE UNITS, WOULD BE CONSIDERED IF PROPOSED.

THE WET SCRUBBER UNIT SHOULD BE REPLACED WITH A HIGH TEMPERATURE BAGHOUSE FOR FINAL PARTICULATE CONTROL.

THIS IS A POSSIBILITY, BUT WOULD BE LEFT UP TO THOSE PROPOSING TO OFFER THERMAL TREATMENT SERVICES. SUCH A UNIT WOULD BE REQUIRED TO MEET REQUIRED PERFORMANCE OBJECTIVES.

ADDITIONAL EFFICIENCY, REDUCED MAINTENANCE AND SPACE REQUIREMENTS CAN BE GAINED BY USING ONE LARGER INCINERATOR INSTEAD OF TWO SMALLER UNITS.

THERE MAY BE SOME BENEFIT TO OPERATING A LARGER INCINERATOR OVER SEVERAL SMALLER ONES. TWO UNITS WERE ASSUMED IN THE FEASIBILITY STUDY TO INCREASE CAPACITY. IF IT IS COST EFFECTIVE TO OPERATE A SINGLE LARGER UNIT, PROPOSALS SHOULD REFLECT THIS.

ANY EXCESSIVE DOWNTIME DUE TO HAVING ONLY ONE TREATMENT UNIT CAN BE AVOIDED BY AN EFFECTIVE PREVENTIVE MAINTENANCE PROGRAM WHICH IS SCHEDULED IN ADVANCE.

A PREVENTIVE MAINTENANCE PROGRAM WOULD HELP REDUCE UNSCHEDULED DOWNTIME FOR THE THERMAL TREATMENT UNIT. SOME UNSCHEDULED DOWNTIME WOULD BE UNAVOIDABLE.

...THE CONTAMINATED SOILS FEED RATE IS LISTED AS 8.5 CUBIC YARDS/HOUR.. .YET THE FOOTNOTE INDICATES THAT THE MASS FLOWS GIVEN ARE TOTAL VALUES TYPICAL FOR 6 CUBIC YARDS/HOUR CONTAMINATED SOIL FEED.

THE CONTAMINATED FEED RATE FOR TWO MOBILE INCINERATORS, BASED ON THE ASSUMPTIONS NOTED IN THE TEXT, WOULD BE APPROXIMATELY 8.5 CUBIC YARDS/HOUR. THIS ERROR HAS BEEN NOTED.

THE STEAM GENERATED BY THE WASTE HEAT BOILER SHOULD BE USED TO PREHEAT COMBUSTION AIR OR TO PREHEAT THE FEED SOIL.

THE USE OF WASTE HEAT WOULD BE DETERMINED BY THE COMPANY PROPOSING TO OFFER THE INCINERATION SERVICES.

HIGHER HEAT INPUTS WOULD BE EXPECTED IN THE ROTARY KILN INCINERATOR THAN IN THE AFTERBURNER. EPA SHOULD RE-EXAMINE THESE NUMBERS WHICH WILL AFFECT THE SOIL TREATING CAPACITY OF THE UNIT.

THE THROUGHPUT OF THE INCINERATOR WAS ESTIMATED THROUGH HEAT AND MATERIAL BALANCE CALCULATIONS USING THE ASSUMPTIONS NOTED IN THE TEXT. THE THERMAL LIMITATIONS IN THE INCINERATOR ARE THE SAME AS FOR COMMERCIALY AVAILABLE UNITS. AS NOTED IN THE TEXT, THE THROUGHPUT IS AFFECTED BY THE MOISTURE CONTENT OF THE SOIL THAT IS ASSUMED. THE RATES

THAT WERE ESTIMATED ARE SIMILAR TO THOSE ACTUALLY EXPERIENCED IN THE FIELD ON LOW-BTU CONTENT SOILS. EPA EXPECTS THAT THE RATES EXPERIENCED WITH SIMILAR SOIL USING A SIMILAR INCINERATOR WOULD BE CLOSE TO THOSE ESTIMATED THROUGH THE RIGOROUS HEAT AND MATERIAL BALANCE CALCULATIONS.

...AN EFFECTIVE THROUGHPUT OF 8.5 CUBIC YARDS/HOUR IS ASSUMED...THIS EFFECTIVE RATE IS NOT FOUND ANYWHERE IN APPENDIX E OF THE FEASIBILITY STUDY WHERE COSTS ARE ESTIMATED.

IN APPENDIX E, THE OPERATING COST PER CUBIC YARD OF MATERIAL OF ONE INCINERATOR IS ESTIMATED. THIS COST IS ESTIMATED AT A RANGE OF THROUGHPUTS, INCLUDING 4.25 CUBIC YARDS PER HOUR, WHICH IS THE RATE ESTIMATED THROUGH A RIGOROUS HEAT AND MATERIAL BALANCE. IF TWO INCINERATORS WERE USED, EACH OPERATING AT 4.25 CUBIC YARDS PER HOURS, THE COMBINED THROUGHPUT WOULD BE 8.5 CUBIC YARDS PER HOUR. THE UNIT COST PER CUBIC YARD FOR THE TWO INCINERATORS WOULD BE THE SAME AS FOR ONE, AND THE COST PER HOUR WOULD APPROXIMATELY DOUBLE.

...THE KILN EXIT TEMPERATURE OF 1600 DEGREES FHAS BEEN PROVEN AT THE DENNEY FARM SITE BUT SUBSTANTIAL FUEL SAVINGS MAY BE REALIZED IF THIS TEMPERATURE COULD BE REDUCED. EXPERIMENTATION WITH THIS VARIABLE COULD DRASTICALLY REDUCE FUEL COSTS, BY AS MUCH AS \$500,000 FOR ONLY A 7% REDUCTION IN FUEL USAGE. THE SAME REASONING APPLIES TO THE AFTERBURNER TEMPERATURE OF 2200 DEGREES F.

FUEL REDUCTIONS WOULD BE POSSIBLE IF THE INCINERATOR COULD BE OPERATED AT LOWER TEMPERATURES. SUCH OPERATION WOULD NOT BE CONTEMPLATED UNLESS IT COULD BE DEMONSTRATED THAT REQUIRED DIOXIN DESTRUCTION WOULD BE MAINTAINED AND PERFORMANCE OBJECTIVES MET AT LOWER TEMPERATURES

IN THE NETHERLANDS...A DIRECT SPRAY COOLING SYSTEM HAS BEEN EMPLOYED WHICH USES WATER TO COOL THE ASH AS WELL AS TO RE-HUMIDIFY THE ASH. THIS RE-HUMIDIFICATION ALLOWS THE ASH TO BE MORE READILY LAND APPLIED.

DIFFERENT OPTIONS FOR COOLING THE ASH WOULD BE PROPOSED BY THE THERMAL TREATMENT SERVICES COMPANIES PROPOSING TO WORK ON THE PROJECT. IT IS POSSIBLE THAT A SYSTEM SIMILAR TO THAT SUGGESTED BY THE COMMENTOR COULD BE PROPOSED.

...ASH WILL BE TRANSFERRED FROM THE THERMAL TREATMENT UNIT TO THE LAND APPLICATION AREA IN THE 15 CUBIC YARD, ROLL-OFF BINS. BULK HANDLING OF THIS NOW CONTAMINATION-FREE ASH IS SIMPLER AND MORE COST EFFECTIVE.

BULK HANDLING MAY BE POSSIBLE, ALTHOUGH ONSITE INCINERATOR OPERATIONS AT OTHER SITES HAVE CONTAINERIZED THE ASH AS IT WAS CONVEYED FROM THE INCINERATOR. ISSUES REGARDING THE HANDLING OF THE ASH WOULD BE CONSIDERED DURING THE DESIGN PHASE FOR THE PROJECT.

...REDUNDANT POWER SUPPLIES ARE NOT NECESSARY. SAFETY IS ENSURED WITHOUT A REDUNDANT POWER SUPPLY BY IMPLEMENTING A PROCESS WHEREBY SOIL FEEDING MECHANISMS ARE INTERLOCKED TO STOP FEEDING SOIL ON FLAME-OUT IN EITHER COMBUSTION CHAMBER. IF THERE IS A POWER FAILURE, THE SOIL FEEDING EQUIPMENT CEASES OPERATION. THE HEAT STORED IN THE REFRACTORIES OF THE COMBUSTION CHAMBERS IS ADEQUATE TO KEEP THE GAS TEMPERATURES SUFFICIENTLY HIGH TO DESTROY THE VAPORIZED TCDD WITHIN THE UNIT.

REDUNDANT POWER SUPPLIES WOULD BE USED AS REQUIRED TO ENSURE THAT THE INCINERATOR COULD BE SAFELY OPERATED AND RISKS MINIMIZED. ISSUES REGARDING THE USE OF POWER SUPPLIES WOULD BE EVALUATED FURTHER DURING THE PREDESIGN AND DESIGN PHASES OF THE PROJECT.

THE NEED FOR UPGRADING OF ROADS, PILOT CARS AND OTHER COSTLY MEASURES TO TRANSPORT THE BAGGED SOIL FROM THESE SITES IS NOT JUSTIFIED BY THE SCALE OR RISK ASSOCIATED WITH EACH TRANSPORT PROJECT.

ROAD UPGRADING AND OTHER TRANSPORTATION CONTROL MEASURES WOULD BE USED AS REQUIRED TO ENSURE THAT THE SOIL COULD BE SAFELY TRANSPORTED.

SECTION 7--NON-COST ANALYSIS OF ALTERNATIVES

...THE LAST PARAGRAPH ON THE PAGE STATES THAT "...THE NO-ACTION ALTERNATIVE WOULD PROVIDE NO ACCESS RESTRICTIONS...", THIS IS INCONSISTENT WITH DESCRIPTIONS OF THE NO ACTION ALTERNATIVE IN SECTIONS 4 AND 5. ..THE NO ACTION ALTERNATIVE WOULD BE A VIABLE ALTERNATIVE IF APPROPRIATE SITE SECURITY MEASURES WERE IMPLEMENTED.

BY DEFINITION, THE NO ACTION ALTERNATIVE WOULD NOT INCLUDE ACCESS RESTRICTIONS. SUCH MEASURES WOULD, HOWEVER, BE REQUIRED TO CONTROL POTENTIAL EXPOSURE IF NO FURTHER MEASURES WERE IMPLEMENTED.

...THE INSTALLATION OF RING LEVEES OR OTHER FLOOD CONTROL MEASURES IS NOT JUSTIFIED BY THE SITE CHARACTERISTICS, AND THIS WORK SHOULD BE HALTED IMMEDIATELY.

THE TIMES BEACH SITE HAS ENCOUNTERED REPEATED FLOODING. THIS IS A CHARACTERISTIC OF THE SITE. THE USE OF FLOOD CONTROL MEASURES ARE CLEARLY NEEDED TO REDUCE THE EFFECTS OF SUCH OCCURRENCES. THE SPUR LEVEES ARE BEING CONSTRUCTED TO REDUCE WATER VELOCITY DURING FLOOD EVENTS TO MINIMIZE SCOUR AND EROSION. THE RING LEVEE IS REQUIRED TO FLOOD PROTECT THE THERMAL TREATMENT UNIT DURING IMPLEMENTATION.

...THE RELIABILITY OF ENHANCED VEGETATION AND SEDIMENT BARRIERS IS VERY HIGH FOR A CONTAMINANT SUCH AS TCDD.

AS NOTED IN THE FEASIBILITY STUDY, RELIABILITY INCLUDES OPERATION AND MAINTENANCE REQUIREMENTS AND DEMONSTRATED AND EXPECTED RELIABILITY. PERIODIC OPERATION AND MAINTENANCE WOULD BE REQUIRED TO MAINTAIN THE EFFECTIVENESS OF ENHANCED VEGETATION AND SEDIMENT BARRIERS.

WHILE SOME LIMITED CONFIRMATORY MONITORING MAY BE DESIRABLE, IT IS CERTAINLY NOT NECESSARY, IN LIGHT OF WHAT IS KNOWN ABOUT THE CHARACTERISTICS OF TCDD AND OF THE TIMES BEACH SITE.

A MONITORING PLAN WILL BE DEVELOPED DURING THE DESIGN PHASE OF THE PROJECT.

THE MINIMAL CONCERNS OF MAINTAINING GRASS COVER {FOR IN-PLACE CONTAINMENT}, ETC. ARE INSIGNIFICANT AND NO MORE DIFFICULT THAN GROWING GRASS IN A RESIDENTIAL YARD. INSPECTION OF THE SITE IN ITS CURRENT STATE INDICATES THAT THERE WILL BE LITTLE DIFFICULTY IN PROVIDING A SUBSTANTIAL VEGETATIVE COVER.

THE DIFFICULTIES OF MAINTAINING GRASS COVER WOULD CERTAINLY BE MORE DIFFICULT THAN GROWING GRASS IN A RESIDENTIAL YARD. THE SUBSTANTIAL AREA INVOLVED, THE LACK OF CONTINUAL CARE AS WOULD BE TYPICAL FOR A RESIDENTIAL AREA, THE POTENTIAL FOR FLOODING, THE PRESENCE OF TCDD BELOW THE COVER AND NEED TO PREVENT EXPOSURE TO THE MATERIAL, AND THE CONTOUR OF THE SOIL COVER WOULD ALL CONTRIBUTE TO MAKING MAINTENANCE MORE DIFFICULT THAN FOR A TYPICAL RESIDENTIAL YARD.

THE CONCERN EXPRESSED BY EPA THAT TRANSPORTATION OF LARGE QUANTITIES OF OFFSITE BORROW TO TIMES BEACH POSES A RISK OF AUTOMOBILE ACCIDENTS DURING IMPLEMENTATION OF ALTERNATIVE 3 IS GROUNDLESS. THERE IS A BORROW SITE ON THE SOUTH SIDE OF INTERSTATE HIGHWAY INTERSTATE " SUFFICIENTLY LARGE FOR THIS PROJECT WHICH WILL NOT IMPACT LOCAL TRAFFIC FLOW.

THE SPECIFIC LOCATION WHERE BORROW WOULD BE OBTAINED HAS NOT BEEN DETERMINED. IF THE LOCATION ON THE SOUTH SIDE OF INTERSTATE 44 WERE USED, TRAFFIC DIFFICULTIES WOULD BE MINIMIZED.

...THERE IS NO NEED FOR LEACHATE COLLECTION OR TREATMENT IF LEACHATE IS NOT GENERATED.

LEACHATE WOULD ALMOST CERTAINLY BE GENERATED DURING THE PERIOD WHEN THE LAND DISPOSAL FACILITY WAS BEING FILLED AND A COVER CONSTRUCTED.

CONSTRUCTABILITY OF A SUITABLE MONOFILL IN THE TIMES BEACH FLOODPLAIN IS NOT A MAJOR PROBLEM. PLACEMENT OF A PROTECTIVE COVER CAN PROCEED CONCURRENTLY WITH PLACEMENT OF THE CONTAMINATED FILL MATERIAL.

CONSTRUCTION OF A LAND DISPOSAL FACILITY IN A FLOOD PLAIN WOULD REQUIRE THE USE OF MANY SPECIALLY ENGINEERED FEATURES NOT REQUIRED FOR A SIMILAR FACILITY NOT CONSTRUCTED IN A FLOOD PLAIN. SOME WORK ON THE COVER OF SUCH A FACILITY MAY BE PERFORMED DURING FILLING OPERATIONS FOR THE FACILITY.

THE USE OF THE TERM "LEACHING" WITH RESPECT TO SEDIMENT IS IMPROPER. LEACHING GENERALLY REFERS TO THE MOBILIZATION AND TRANSPORT OF CONTAMINANTS IN SOLUTION.

AS USED IN THE FEASIBILITY STUDY, LEACHING REFERS TO THE MOVEMENT OF WATER THROUGH STORED TCDD-CONTAMINATED SOIL. THE USE OF THIS TERM IS CONSISTENT WITH ACCEPTED USE OF THE WORD, WHICH MEANS TO CAUSE A LIQUID TO FILTER DOWN THROUGH SOME MATERIAL.

A MONOFILL, MINUS THE NECESSARY LINERS, LEACHATE COLLECTION, AND LEAK DETECTION SYSTEMS, WOULD PROVIDE NO POTENTIAL FOR EROSION OF TCDD CONTAMINATED SEDIMENT OTHER THAN FROM THE SURFACE.

EROSION OF MATERIAL IS TYPICALLY A SURFACE PHENOMENON, THUS IF EROSION WERE TO OCCUR FROM ANY CONTAMINANT FACILITY, IT WOULD LIKELY OCCUR AT THE EXPOSED SURFACE. THE FACT THAT SURFACE EROSION COULD OCCUR FROM A MONOFILL AFFECTS THE SUITABILITY OF SUCH A METHOD FOR DISPOSAL OF DIOXIN-CONTAMINATED SOIL.

TRAFFIC ACCIDENTS ARE A RISK ASSOCIATED WITH ALL OF THE ALTERNATIVES, AS WELL AS ANY HEAVY CONSTRUCTION PROJECT. THESE RISKS ARE MINIMIZED BY PROPER CONSTRUCTION MANAGEMENT.

IT SHOULD BE NOTED THAT ALTERNATIVES THAT REQUIRE MORE TRANSPORT THAN OTHERS HAVE A HIGHER RISK OF ACCIDENTS. PRECAUTIONS WILL BE TAKEN TO MINIMIZE THE POTENTIAL FOR ACCIDENTS.

EPA INDICATES THAT SOME MINIMAL RISKS OF EXPOSURE WOULD REMAIN FROM POTENTIAL LEACHING OF TCDD FROM THE DISPOSAL FACILITY. THIS CONCLUSION IS MUCH MORE RELEVANT TO A COMMERCIAL FACILITY THAN IT IS TO ONSITE LAND DISPOSAL AT TIMES BEACH.

THIS IS CONSISTENT WITH THE FEASIBILITY STUDY.

...ON-SITE LAND DISPOSAL IS A MUCH MORE ENVIRONMENTALLY SOUND SOLUTION THAN OFF-SITE LAND DISPOSAL AT A COMMERCIAL FACILITY.

OFF-SITE LAND DISPOSAL WOULD PRESENT SOME ENVIRONMENTAL RISK DUE TO THE TRANSPORT OF CONTAMINATED SOIL, AND INCREASED POTENTIAL FOR LEACHATE GENERATION.

THE FACT THAT NO LANDFILL DISPOSAL FACILITIES HAVE OBTAINED THE NECESSARY PERMITS TO STORE TCDD-CONTAMINATED MATERIAL, AND APPARENTLY HAVE SHOWN LITTLE INTEREST IN ACCEPTING DIOXIN CONTAMINATED MATERIAL, CONFIRMS THE OBVIOUS INFEASIBILITY OF THIS ALTERNATIVE.

THERE ARE IMPLEMENTABILITY ISSUES INVOLVED WITH THE OFF-SITE LAND DISPOSAL ALTERNATIVE.

THE RELIABILITY OF THE INCINERATOR IS A FUNCTION OF PROPER DESIGN AND PROPER PROJECT MANAGEMENT.

PROPER DESIGN, CONSTRUCTION, AND OPERATION SHOULD ASSURE THE RELIABILITY OF THE THERMAL TREATMENT UNIT.

...CONSTRUCTABILITY OF THE INCINERATOR FACILITY IN THE FLOODPLAIN AT TIMES BEACH, PRESENTS NO MAJOR PROBLEM.

A THERMAL TREATMENT FACILITY COULD BE DESIGNED AND CONSTRUCTED FOR USE IN THE TIMES BEACH FLOODPLAIN. SUCH A FACILITY WOULD INCLUDE SPECIALLY ENGINEERED FEATURES TO MINIMIZE THE EFFECTS OF A FLOOD IF IT WERE TO OCCUR.

THE COMMENTOR STATES THAT THE USE OF DELISTABLE RESIDUES AS BACKFILL IN EXCAVATED AREAS SHOULD BE INTEGRAL TO THE INCINERATION PROJECT.

THIS OPTION SHOULD BE CONSIDERED DURING DESIGN. RESIDUES MUST BE DISPOSED OF IN ACCORDANCE WITH FEDERAL AND STATE LAWS, REGULATIONS, AND STANDARDS THAT ARE DETERMINED TO BE APPLICABLE OR RELEVANT AND APPROPRIATE.

...THE PROBLEMS CITED AT THE DENNEY FARM MOBILE INCINERATOR RELATE TO A SMALL, EXPERIMENTAL, DIRECT-FIRED INCINERATOR. AN INDIRECT-FIRED ROTARY KILN, SPECIFICALLY DESIGNED TO PROCESS LARGE QUANTITIES OF TIMES BEACH SOILS, WOULD NOT BE EXPECTED TO EXPERIENCE THESE PROBLEMS.

MANY OF THE OPERATIONAL PROBLEMS ENCOUNTERED AT DENNEY FARM WERE SOLVED DURING THE OPERATIONS THERE. ALTHOUGH AN INDIRECT-FIRED KILN MAY INDEED NOT EXPERIENCE THE SAME TYPES OF PROBLEMS, IT IS EXPECTED THAT THE EXPERIENCE GAINED AT DENNEY FARM SHOULD HELP PREVENT SIMILAR PROBLEMS FOR THE MANY TYPES OF THERMAL TREATMENT EQUIPMENT THAT COULD BE USED AT TIMES BEACH.

EPA NOTES THAT TRANSPORTATION OF MATERIALS TO AND FROM THE SITE COULD BE DIFFICULT IN THE WINTER DUE TO ADVERSE DRIVING CONDITIONS ...DEALING WITH SUCH PROBLEMS REPRESENTS ANOTHER ROUTINE ELEMENT OF PROPER PROJECT MANAGEMENT. SIMILARLY, PROPER PROJECT MANAGEMENT ENSURES THAT A COMPETENT STAFF WILL BE MAINTAINED FOR THE DURATION OF THE PROJECT.

THESE ARE AMONG THE IMPORTANT ISSUES THAT MUST BE CONSIDERED DURING THE DESIGN AND SELECTION PROCESS FOR A THERMAL TREATMENT PROJECT.

...THIS ALTERNATIVE (OFFSITE TREATMENT) IS NOT PRACTICAL DUE TO THE EXCESSIVE COSTS ASSOCIATED WITH LAND ACQUISITION AND MATERIAL TRANSPORTATION.

COSTS FOR LAND ACQUISITION AND TRANSPORTATION ARE IMPORTANT FACTORS FOR THIS ALTERNATIVE WHICH WILL BE CONSIDERED IN MAKING THE FINAL SELECTION OF THE REMEDY.

IT IS HIGHLY UNLIKELY THAT ANY REMEDIAL ACTION AT TIMES BEACH WOULD HAVE ANY EFFECT ON THE CONCENTRATION OF DIOXIN IN THE MERAMEC RIVER. IN ADDITION, THE CONCEPT OF A "DISCHARGE" INTO DRAINAGE DITCHES USED IN THE FEASIBILITY STUDY IS FOREIGN TO THE CLEAN WATER ACT. FOR THESE REASONS, AMONG OTHERS, USE OF WATER QUALITY CRITERIA AS A "RELEVANT AND APPROPRIATE" REQUIREMENT FOR VARIOUS TIMES BEACH ALTERNATIVES CONSIDERED IS NOT JUSTIFIED.

THERE DOES EXIST A SMALL POTENTIAL FOR FURTHER CONTAMINATING THE MERAMEC. CONTAMINATION CAN BE AVOIDED BY USE OF PROPER TECHNIQUES DURING THE REMEDIAL ACTIONS. LACK OF PROPER CARE COULD RESULT IN DISCHARGE TO THE RIVER.

IN DISCUSSING THE WATER QUALITY CRITERIA IN THE FEASIBILITY STUDY, IT WAS NOT EPA'S INTENTION TO IMPLY THAT A DISCHARGE REGULATED UNDER THE CLEAN WATER ACT WOULD DEFINITELY BE INVOLVED IN IMPLEMENTING THE ALTERNATIVES EXAMINED. RATHER, IT WAS THE AGENCY'S PURPOSE TO EXAMINE REGULATIONS WHICH ADDRESS DIOXIN CONTAMINATION AND TO EXPLORE THEIR APPLICABILITY TO THE SITUATION AT TIMES BEACH AND TO THE REMEDIAL ALTERNATIVES CONSIDERED IN THE FEASIBILITY STUDY.

IT APPEARS TO HAVE EXCLUDED FROM CONSIDERATION A LIMITED ACTION "CAPPING" ALTERNATIVE THAT ATTAINS OR EXCEEDS ANY ARGUABLY RELEVANT AND APPROPRIATE RCRA CLOSURE REQUIREMENTS ...EPA'S CHOICE OF MATERIALS FOR ITS PROPOSED CAP CAUSED ITS LIMITED ACTION ALTERNATIVE TO FAIL TO MEET THE RCRA REQUIREMENTS.

THE ALTERNATIVES EXAMINED ARE INTENDED ONLY TO PRESENT A RANGE OF ALTERNATIVES AND COSTS. ALTERNATIVES NOT SPECIFICALLY DESCRIBED IN THE FEASIBILITY STUDY (INCLUDING USE OF AN IMPERMEABLE CAP) ARE NOT ELIMINATED FROM CONSIDERATION OR SELECTION. THE NCP DECISION PROCESS ALLOWS SELECTION OF REMEDIES WHICH DIFFER IN DETAIL FROM THOSE IN THE FEASIBILITY STUDY. THUS, ALTERNATIVES UTILIZING AN IMPERMEABLE CAP HAVE NOT BEEN ELIMINATED FROM THE RANGE OF ALTERNATIVES BEING CONSIDERED BY EPA. PLACEMENT OF A CAP MEETING RCRA REQUIREMENTS WAS EVALUATED IN THE PROPOSED PLAN.

EPA ALSO FAILS TO EXPLAIN WHY IT DID NOT RULE OUT THE MORE COSTLY INCINERATION AND OFFSITE DISPOSAL ALTERNATIVES UNDER 40 CFR. 300.68(G) (3), WHICH STATES, "IF AN ALTERNATIVE HAS SIGNIFICANT ADVERSE EFFECTS, AND VERY LIMITED ENVIRONMENTAL BENEFITS, IT SHALL ALSO BE EXCLUDED FROM FURTHER CONSIDERATION."

INCINERATION AND OFFSITE DISPOSAL DO NOT HAVE SIGNIFICANT ADVERSE EFFECTS. THE POTENTIAL FOR ADVERSE EFFECTS FROM BOTH ALTERNATIVES CAN BE ADDRESSED WITH PROPER ENGINEERING AND PROCEDURES. THE BENEFITS OF PERMANENTLY REMOVING THE DIOXIN FROM THE ENVIRONMENT MUST BE CONSIDERED IN EVALUATING THE INCINERATION ALTERNATIVE.

EPA CORRECTLY NOTES... THAT ARARS NEED NOT BE ATTAINED "UNDER ONE OF SIX EXEMPTIONS." ...THE FEASIBILITY STUDY STATES, "NO ATTEMPT IS MADE TO DETERMINE WHICH, IF ANY, OF THE REQUIREMENTS MIGHT FIT ONE OR MORE OF THE EXCEPTIONS IN THE NCP OR SARA. THAT IS A DECISION THAT MUST BE MADE BY EPA AND PUBLISHED AS A FINDING OF THE ADMINISTRATOR, PRESUMABLY AFTER PUBLIC COMMENT." EPA, HOWEVER, IMPLIES THAT FURTHER OPPORTUNITY FOR PUBLIC COMMENT MAY NOT OCCUR...

THE FEASIBILITY STUDY WAS PREPARED BY AN EPA CONTRACTOR. IT IS AN ENGINEERING STUDY PREPARED FOR EPA AND AVOIDS MAKING AGENCY DECISIONS. OPPORTUNITY FOR FURTHER PUBLIC COMMENT WAS PROVIDED IN RESPONSE TO THE PROPOSED PLAN, WHICH DISCUSSED POTENTIAL WAIVERS FROM ARARS.

THE FEASIBILITY STUDY IS DEFICIENT IN FAILING TO SET FORTH "FINDINGS, TOGETHER WITH AN EXPLANATION AND APPROPRIATE DOCUMENTATION" FOR THE EXERCISE (OR NON-EXERCISE) OF EACH OF THESE WAIVERS.

THE LANGUAGE OF SARA IS VERY CLEAR IN REQUIRING THE PRESIDENT TO PUBLISH FINDINGS, ETC., IN CASES IN WHICH HE DECIDES TO EXERCISE ONE OR MORE THE SIX EXEMPTIONS. AT THE TIME OF THE PUBLICATION OF THE FEASIBILITY STUDY, NO DECISION HAD BEEN MADE BY EPA REGARDING THE APPLICABILITY OF POTENTIAL WAIVERS FROM ARARS. THUS, NO "FINDINGS," "EXPLANATIONS," OR "DOCUMENTATION" WERE REQUIRED.

...THERE IS NO LAW, REGULATION, POLICY OR STANDARD UNDER EITHER FEDERAL OR STATE LAW WHICH PURPORTS TO ESTABLISH THIS 1 PPB LEVEL OF CONCERN CRITERION FOR TCDD.

THE WORDING OF SARA REFERS TO "ANY STANDARD, REQUIREMENT, CRITERIA, OR LIMITATION..." NOT "LAW, REGULATION, POLICY, OR STANDARD." EPA BELIEVES THE L-PPB STANDARD FOR RESIDENTIAL SOIL CAN BE APPROPRIATELY CONSIDERED TO FALL INTO ONE OR MORE OF THE CATEGORIES MENTIONED BY SARA. IN CASES WHERE LAWS, REGULATIONS, AND STANDARDS DO NOT EXIST, THE EPA CAN RELY UPON RECOMMENDATIONS FROM FEDERAL AND STATE HEALTH AGENCIES TO DETERMINE APPROPRIATE LEVELS OF CONCERN FOR PROTECTION OF PUBLIC HEALTH AND THE ENVIRONMENT.

...THE SUPERFUND GUIDELINE STATES THAT A 10(-4) TO 10(-7) RISK MAY BE USED. MORE IMPORTANTLY, THE GUIDELINES RECOMMEND INCORPORATION OF SITE SPECIFIC FACTORS.

THESE GUIDELINES MAY BE USED FOR CONSIDERATION OF HEALTH RISKS POSED BY THE SITE.

THE FEASIBILITY STUDY ASSUMES THAT ONSITE CLEANUPS RETIRE PERMITS. THE STUDY ALSO ASSUMES THAT THE ABSENCE OF PERMITTING REQUIREMENTS FOR A TECHNOLOGY PRECLUDE THE USE OF THAT TECHNOLOGY IN AN ONSITE CERCLA ACTION. THESE STATEMENTS ARE WRONG.

SARA CLEARLY ELIMINATES THE REQUIREMENT FOR PERMITS FOR THOSE PORTIONS OF A REMEDIAL ACTION THAT OCCUR ENTIRELY ONSITE. FURTHER, THE DISCUSSION OF THE ABSENCE OF PERMITTING REQUIREMENTS FOR CERTAIN TECHNOLOGIES DOES NOT IMPLY THAT THIS USE AT TIMES BEACH IS PRECLUDED. A NEW OFFSITE UNIT COULD BE PERMITTED FOR USE IN THE TIMES BEACH REMEDIATION IF APPROPRIATE PERMITTING REGULATIONS WERE DEVELOPED OR IDENTIFIED.

THE FEASIBILITY STUDY ALSO FAILS TO CONSIDER CERCLA'S EXPRESS PREFERENCE FOR ALTERNATIVE TREATMENT TECHNOLOGIES,... THE FAILURE BY THE FEASIBILITY STUDY TO ADEQUATELY CONSIDER ALTERNATIVE THERMAL TREATMENT TECHNOLOGIES, PARTICULARLY INDIRECT FIRED THERMAL TREATMENT TECHNOLOGIES...AND THE "PERMIT" ASSUMPTION CAUSE THE FEASIBILITY STUDY TO OVERSTATE THE COSTS OF PERMANENTLY DESTROYING TCDD IN SOILS AT TIMES BEACH.

SARA CLEARLY STATES A PREFERENCE FOR PERMANENT REMEDIES AND EXPRESSLY ALLOWS FOR USE OF TECHNOLOGIES THAT HAVE NOT BEEN UTILIZED AT SIMILAR SITES. NOTHING IN THE FEASIBILITY STUDY ELIMINATES INDIRECT-FIRED THERMAL TREATMENT FROM SPECIFIC CONSIDERATION FOR THE PROJECT, IF ADVANTAGES EXIST THAT WARRANT ITS USE.

IT IS UNLIKELY THAT A TIMES BEACH GUARD HIRED TO PATROL A SO-CALLED HAZARDOUS AREA WOULD ACCIDENTALLY INGEST SIGNIFICANT QUANTITIES OF DIRT BY SMOKING OR EATING WHILE DRIVING IN A POLICE CAR THROUGH THE SITE DURING PERHAPS 2 HR OF EVERY 8 HR DAY. FURTHER, THERE IS NO REASON TO BELIEVE THAT THE AIRBORNE LEVELS OF DUST TO WHICH HE OR SHE IS EXPOSED ARE ANY GREATER THAN THE AMBIENT DUST LEVELS FOR THAT AREA...

AS NOTED IN THE FEASIBILITY STUDY, A CONSERVATIVE APPROACH WAS USED TO ESTIMATE RISKS POSED BY THE SITE. THIS APPROACH IS COMPATIBLE WITH THE REQUIREMENTS OF THE SUPERFUND PUBLIC HEALTH EVALUATION MANUAL.

IT IS NOT ENOUGH TO SAY THAT SINCE EXPOSURE IS REDUCED, SO MUST BE THE RISK. ALTERNATIVES II, III, IV, V AND VI DO NOT CLEARLY QUANTITATE HOW THE LEVEL OF RISK WILL BE REDUCED IF AND WHEN THESE ALTERNATIVES ARE ADOPTED.

EPA BELIEVES THAT THE SELECTED ALTERNATIVE MUST MEET CLEANUP LEVELS ESTABLISHED BY EPA ON THE BASIS OF THE RECOMMENDATIONS OF APPROPRIATE GOVERNMENTAL HEALTH AGENCIES FOR PROTECTION OF PUBLIC HEALTH AND THE ENVIRONMENT.

SECTION 8--COST ANALYSIS OF ALTERNATIVES

...MORE ACCURATE COST ESTIMATES THAN THE "ORDER OF MAGNITUDE ESTIMATES" CAN BE MADE. NOT ONLY CAN THE ESTIMATES BE MORE ACCURATE BUT THEY WILL BE DRASTICALLY REDUCED FROM THE ELEVATED FORECASTS WHICH HAVE BEEN PRESENTED IN THE FEASIBILITY STUDY. THERE IS NO REASON TO BELIEVE THAT AN ORDER OF MAGNITUDE ESTIMATION PROCEDURE IS NECESSARY OR APPROPRIATE FOR THIS FEASIBILITY STUDY. INSTEAD, A COST ESTIMATE WITH NO MORE THAN 10-20% LEEWAY WOULD BE CONSIDERED MORE APPROPRIATE... ...THE CURRENT SITE INFORMATION AVAILABLE IS MORE THAN ADEQUATE TO RE-ESTIMATE THE REMEDIAL COSTS WITH A BETTER ACCURACY THAN +50%/-30%.

AS DEFINED BY THE AMERICAN ASSOCIATION OF COST ENGINEERS, AN ORDER OF MAGNITUDE COST ESTIMATE IS AN ESTIMATE PRODUCED WITHOUT DETAILED ENGINEERING DATA. MORE ACCURATE ESTIMATES (BUDGETARY OR DESIGN ESTIMATES) REQUIRE THE USE OF LAYOUTS, FLOW DIAGRAMS, ETC., OF THE ACTUAL PROCESS TO BE INSTALLED. THIS TYPE OF INFORMATION IS CLEARLY NOT AVAILABLE AT THE FEASIBILITY STUDY STAGE. EPA GUIDANCE RECOGNIZES THAT STUDY-LEVEL ESTIMATES WILL HAVE AN ACCURACY OF +50 PERCENT TO -30 PERCENT AND THAT MORE ACCURATE ESTIMATES ARE NOT NECESSARY AT THE STUDY STAGE.

SCOPE CONTINGENCIES OF BETWEEN 15% AND 25% ARE USED IN THE FEASIBILITY STUDY. IF CHANGES OF SCOPE OF THIS MAGNITUDE ARE ALLOWED, A TOTAL RE-EVALUATION AND SUBSEQUENT RE-ESTIMATION IS IN ORDER.

THE USE OF SCOPE AND BID CONTINGENCIES ARE AN ACCEPTED PART OF COST ESTIMATING. IT IS EXPECTED THAT THERE WILL BE DEVIATIONS FROM THE ASSUMPTIONS NOTED AND THAT CONTINGENCIES ARE NEEDED FOR ACCOUNTING FOR THOSE UNFORESEEN ITEMS.

... MOBILIZATION AND DEMOBILIZATION CAPITAL COSTS ARE CALCULATED AT 8% OF THE ESTIMATED CAPITAL COSTS. ... FURTHER INCINERATOR DEMOBILIZATION COSTS OF \$250,000 ARE LISTED. IT SEEMS THAT THE DEMOBILIZATION COSTS ARE OVERSTATED IN THESE ALTERNATIVES BY AT LEAST \$250,000.

THE 8-PERCENT DEMOBILIZATION CHARGE IS BASED ON INSTALLED CAPITAL, WHICH DOES NOT INCLUDE THE INCINERATOR. THE AMORTIZED COST OF THE INCINERATOR IS INCLUDED IN THE OPERATING COST FOR THE INCINERATOR. THUS, A SEPARATE MOBILIZATION AND DEMOBILIZATION CHARGE MUST BE ADDED FOR THE INCINERATORS.

...THE EXPECTED DEPTH OF EXCAVATION AVERAGES 2.18 FEET. AT THAT DEPTH, IT IS EXPECTED THAT THE CONCENTRATIONS OF TCDD CONTAMINATION WILL BE 1 PPB OR LESS.

INDEPENDENT CALCULATIONS INDICATE THAT THE EXCAVATION AREA IS ONLY 181,300 SQUARE YARDS WHICH CONVERTS TO 60,400 CUBIC YARDS AT AN AVERAGE DEPTH OF EXCAVATION OF 1 FOOT. ...IF EPA SHOULD NEVERTHELESS DETERMINE TO UNDERTAKE EXCAVATION, THEN EXCAVATION SHOULD ONLY EXTEND TO A 1 FOOT MAXIMUM DEPTH AND THEN BE BACKFILLED WITH CLEAN SOIL.

EXCAVATION WILL BE UNDERTAKEN TO A LEVEL DETERMINED BY THE AGENCY BASED UPON RECOMMENDATIONS OF FEDERAL AND STATE HEALTH AGENCIES TO REPRESENT AN ACCEPTABLE RISK. FOR EVALUATION PURPOSES, IT IS ASSUMED IN THE FEASIBILITY STUDY THAT THE EXCAVATION TO A DEPTH OF 2 FEET IS NECESSARY TO ACHIEVE A 1 PPB RESIDUAL LEVEL, ALTHOUGH THE ACTUAL DEPTH WILL VARY ACCORDING TO THE CONTAMINATION THAT IS DETECTED.

COTTON COVERALLS, WORK GLOVES, DISPOSABLE DUST MASKS, AND GOOD HYGIENE MORE THAN ADEQUATELY PROTECT PERSONNEL PERFORMING SOIL HANDLING ACTIVITIES.

THE LEVEL OF PROTECTION DESCRIBED IN THE FEASIBILITY STUDY IS SIMILAR TO THAT USED FOR REMOVAL ACTIVITIES AT OTHER MISSOURI DIOXIN SITES AND DURING WORK AT THE DENNEY FARM INCINERATOR TRIALS. THIS LEVEL OF PROTECTION IS RECOMMENDED BY APPROPRIATE HEALTH AGENCIES TO ADEQUATELY PROTECT PERSONNEL.

...LEVEL D PROTECTIVE EQUIPMENT IS SPECIFIED FOR EQUIPMENT OPERATORS IN TOTALLY ENCLOSED CABS. ...NO PROTECTION IS REQUIRED IF THE CAB HAS BEEN FITTED WITH THE PROPER FILTRATION SYSTEM FOR ITS AIR CONDITIONING/HEATING CONTROLS.

SINCE IT MAY BE NECESSARY FOR PERSONNEL OPERATING EQUIPMENT TO LEAVE THEIR EQUIPMENT OR COMMUNICATE WITH PERSONNEL IN THE CONTAMINATED ZONE, LEVEL D PROTECTIVE EQUIPMENT IS CONSIDERED TO BE NECESSARY. THIS LEVEL OF PROTECTION CONSISTS OF COVERALLS AND STEEL-TOED WORK BOOTS, WHICH IS CONSIDERED TO BE A REASONABLE LEVEL OF PROTECTION OF THE EQUIPMENT OPERATORS.

DUAL RESPONSIBILITIES OF REMEDIAL PERSONNEL ADDRESS THE AREAS OF DECONTAMINATION PERSONNEL AND ONSITE SAFETY OFFICERS. AN ONSITE, REGISTERED NURSE IS NOT MERITED BY THE MINIMAL RISKS OF THESE ACTIVITIES....REMEDIAL ACTIVITIES HAVE SUCCESSFULLY PROCEEDED WITHOUT THIS SERVICE.

ONSITE NURSES HAVE BEEN USED DURING ONSITE EXCAVATION ACTIVITIES TO CLOSELY MONITOR PERSONNEL INVOLVED IN HAND LABOR AND WEARING PROTECTIVE GEAR. NURSES WILL BE USED AS REQUIRED TO PROTECT WORKERS. DUAL RESPONSIBILITIES WILL ALSO BE USED WHERE SUCH USE IS CONSIDERED APPROPRIATE.

ADDITIONAL SAMPLING PRIOR TO THE INITIATION OF REMEDIAL ACTIVITIES AT TIMES BEACH IS UNNECESSARY.

EPA BELIEVES THAT THE DATA AVAILABLE AT THE TIME OF PUBLICATION OF THE TIMES BEACH FEASIBILITY STUDY IS INSUFFICIENT UPON WHICH TO DESIGN A REMEDIAL ACTION. ADDITIONAL SAMPLING WILL BE REQUIRED TO DETERMINE THE EXTENT OF CONTAMINATION PRIOR TO IMPLEMENTATION.

CRITERIA SHOULD BE ESTABLISHED TO DETERMINE WHEN DUST CONTROL WOULD BE NECESSARY. UNLESS NEEDED, THE USE OF WATER SPRAY SHOULD BE DISCOURAGED, SINCE IT DRAMATICALLY INCREASES THE LABOR INTENSIVE NATURE OF THE CLEAN-UP AS WELL AS THE ULTIMATE COST OF INCINERATING THIS WET SOIL.

LIMITED USE OF WATER SPRAY AS A DUST CONTROL MEASURE IS UNLIKELY TO "DRAMATICALLY INCREASE" THE LABOR INTENSIVE NATURE OF THE CLEANUP. DUST CONTROL WILL BE USED AS REQUIRED TO PREVENT GENERATION OF UNDESIRABLE QUANTITIES OF FUGITIVE DUST DURING EXCAVATION AND HANDLING OPERATIONS, AND TO ENSURE THE SAFETY OF SITE WORKERS AND LOCAL COMMUNITY.

...GUARDS WILL NOT BE REQUIRED AFTER THE FENCE INSTALLATION....THE FIRST CONSTRUCTION ACTIVITY FOR THESE ALTERNATIVES SHOULD BE THE INSTALLATION OF THE FENCE, THEN THE GUARDS WOULD ONLY BE NEEDED FOR THE FIRST SIX MONTHS MAXIMUM...

GUARDS WOULD BE USED NOT ONLY TO PREVENT INTRUDERS FROM CONTACTING CONTAMINATED SOIL, BUT ALSO TO PREVENT VANDALISM OF EQUIPMENT USED AT THE SITE.

...AUTOMATIC SAMPLING SYSTEMS ARE SPECIFIED FOR INSTALLATION IN SEVERAL DRAINAGE DITCHES....TWO, AND AT MOST THREE, DRAINAGE DITCHES SHOULD BE CHOSEN FOR MONITORING SURFACE RUN-OFF.

THE PRECISE NUMBER OF SAMPLING MONITORS AND THEIR LOCATIONS WOULD BE DETERMINED DURING PREDESIGN, DESIGN, AND THE INITIAL PHASES OF A SAMPLING PROGRAM.

PERIMETER AIR MONITORING IS SPECIFIED. PREVIOUS AIR MONITORING SAMPLES HAVE SHOWN NO DETECTABLE LEVELS OF TCDD MIGRATING OFFSITE. WITH NO CHANGE IN THE STATUS OF THE SITE, ADDITIONAL AIR MONITORING IS AN UNNECESSARY EXPENSE...

CONTINUOUS ONSITE AND OFFSITE AMBIENT AIR MONITORING WOULD BE PROVIDED TO ASSURE THE SAFETY OF ONSITE WORKERS AND THE LOCAL COMMUNITY.

...LEVEL C PROTECTIVE GEAR IS SPECIFIED FOR EXCAVATION AND LEVEL D PROTECTIVE GEAR IS SPECIFIED FOR CONSTRUCTION WORKERS BUILDING THE CONCRETE FACILITY. SUCH PROTECTIVE EQUIPMENT IS UNNECESSARY SINCE THE CONSTRUCTION IS PROPOSED WITHIN AN UNCONTAMINATED AREA. TYPICAL CONSTRUCTION CLOTHING IS ADEQUATE..

THE LEVEL OF PROTECTION DESCRIBED IN THE FEASIBILITY STUDY IS SIMILAR TO THAT USED DURING REMOVAL OPERATIONS AT OTHER MISSOURI DIOXIN SITES BASED UPON RECOMMENDATIONS OF FEDERAL AND STATE HEALTH AGENCIES. LEVEL D PROTECTION CONSISTS OF COVERALLS AND WORK BOOTS, WHICH IS TYPICAL FOR CONSTRUCTION SITES.

...THE SIZE OF THE WATER TREATMENT SYSTEM FOR ALTERNATIVE 4 IS TO BE CAPABLE OF TREATING A 24 HOUR, 25 YEAR STORM. IN ADDITION, A 20% CAPACITY ALLOWANCE IS ADDED. THIS CAPACITY IS EXCESSIVE BECAUSE:

1. LEACHATE CAN BE SAFELY STORED IN THE CONCRETE FACILITY...
2. EXCAVATION WILL NOT PROCEED DURING THE STORM EVENT AND FOR SEVERAL DAYS THEREAFTER...
3. WATER IN EXCAVATED AREAS SHOULD NOT BE CONSIDERED CONTAMINATED...

THE SIZE OF THE LEACHATE TREATMENT SYSTEMS MUST BE SUFFICIENT TO PROTECT THE LAND DISPOSAL FACILITY. THE TREATMENT SYSTEM MUST PREVENT WATER FROM ACCUMULATING TO THE POINT WHERE THE LINERS OR UNDERDRAIN SYSTEM COULD BE DAMAGED. THE PRIMARY CONSIDERATION IN THE SIZING OF THE SYSTEM WOULD BE THE PREVENTION OF UNACCEPTABLE QUANTITIES OF RAINFALL BUILD-UP IN THE STORAGE FACILITY. THIS WILL BE PARTICULARLY CRITICAL DURING EXCAVATION OPERATIONS WHEN THE FACILITY WOULD BE OPEN AND RAINFALL COULD NOT BE PREVENTED FROM ENTERING THE FACILITY.

...OPERATING COSTS CAN BE ACCURATELY CALCULATED (WITHIN 20% OR LESS) FOR A GIVEN SET OF ASSUMPTIONS. IF THE ASSUMPTIONS CHANGE (MOST IMPORTANTLY SOIL VOLUMES OR MOISTURE CONTENT), THEN THE ESTIMATES MUST BE RECALCULATED.

THE ACCURACY OF THE COST ESTIMATES PRESENTED IN THE FEASIBILITY STUDY IS TYPICAL OF THAT REQUIRED FOR FEASIBILITY STUDIES. THE ACCURACY IS CONSIDERED TO BE SUITABLE FOR DECISION MAKING. IT IS EXPECTED THAT ACTUAL SITE REMEDIAL ALTERNATIVES WILL VARY SOMEWHAT FROM THOSE DESCRIBED IN THE FEASIBILITY STUDY. MORE ACCURATE ESTIMATES WILL BE PRODUCED DURING THE PREDESIGN AND DESIGN OF THE SELECTED REMEDIAL ALTERNATIVE.

TO MAKE THE FOLLOWING STATEMENT (PAGE 8-8, FEASIBILITY STUDY): "IT IS DOUBTFUL THAT PRESENT OR FUTURE COSTS TO OPERATE AN ONSITE INCINERATOR FOR DESTROYING TCDD FROM CONTAMINATED SOIL CAN BE ESTIMATED ACCURATELY.", CONVEYS THE INCORRECT IMPRESSION THAT INCINERATION TECHNIQUES AND PROCESSES ARE NOT WELL-DEFINED.

INCINERATION TECHNIQUES AND PROCESSES ARE REASONABLY WELL-DEFINED, BUT, AS THE OPTIONS DESCRIBED BY THE COMMENTOR SHOW, MANY VARIATIONS ARE POSSIBLE. IN ADDITION, THERE ARE A LARGE NUMBER OF ITEMS THAT WOULD INFLUENCE THE PRICES OFFERED BY AN INCINERATION SERVICE COMPANY, BEYOND THE TECHNIQUES AND PROCESSES. AT THE FEASIBILITY STUDY LEVEL, IT IS NOT POSSIBLE TO FORECAST PRECISELY THE PRICES CHARGED AND APPROACH THAT WILL BE TAKEN BY ALL THE COMPANIES THAT MIGHT OFFER THEIR SERVICES ON SUCH A PROJECT.

...THE \$400/CUBIC YARD ASSUMED UNIT COST FOR INCINERATION IS EXCESSIVE AND THE COST ESTIMATES IN THE FEASIBILITY STUDY SHOULD BE MODIFIED TO REFLECT THIS INFORMATION.

THE BASIS FOR THE \$400/CUBIC YARD COST ESTIMATE IS INCLUDED WITH THE DETAILED COSTS PRESENTED IN THE FEASIBILITY STUDY. THIS COST, WHICH IS CONSIDERED TO PRESENT THE FULL SCOPE OF COSTS LIKELY TO BE ENCOUNTERED BY AN ONSITE INCINERATION SERVICES COMPANY, IS CONSIDERED TO BE A REASONABLE ESTIMATE OF THE CHARGES REQUIRED BASED ON THE ASSUMPTIONS NOTED IN THE TEXT.

...LEVEL AREA OF 28 ACRES IS REQUIRED FOR THE INCINERATOR FACILITY. IN THE NORRIS REPORT ON AREA OF ONLY 3.5 ACRES WAS SPECIFIED. ALSO IN THE NORRIS REPORT, THE ENTIRE 3.5 ACRES WAS PROPOSED TO BE RAISED ABOVE THE 100 YEAR FLOOD PLAIN WITH OFFSITE BORROW FOR AN ESTIMATED COST OF \$575,000.

IN THE FEASIBILITY STUDY THE RING LEVEE AND OTHER NECESSARY SITE PREPARATION PROJECTS ARE ESTIMATED TO COST APPROXIMATELY \$4,000,000 AFTER BID AND SCOPE CONTINGENCIES ARE INCLUDED.

THE PRECISE AREA REQUIRED FOR AN INCINERATION FACILITY WILL DEPEND STRONGLY ON THE REQUIREMENTS FOR STORAGE OF EXCAVATED MATERIAL AND ASH, AS WELL AS THE REQUIREMENTS FOR THE INCINERATOR AND ACCESS AND SUPPORT FACILITIES. THESE REQUIREMENTS WILL BE EXAMINED IN GREATER DETAIL DURING THE DESIGN PHASE FOR THE PROJECT. IT IS DOUBTFUL THAT THE ENTIRE FACILITIES, INCLUDING INCINERATORS AND ADEQUATE SUPPLY OF FEED MATERIAL AND FLOOD PROTECTION, CAN BE LOCATED WITHIN A 3.5-ACRE AREA.

...DIKED TANK AREAS (ARE NOTED) FOR SCRUBBER WATER AND CAUSTIC STORAGE TANKS. WITH A DRY POLLUTION

CONTROL SYSTEM INSTALLED DOWNSTREAM OF THE SECONDARY COMBUSTION CHAMBER...INSTEAD OF THE WET SCRUBBING SYSTEM SPECIFIED IN THE FEASIBILITY STUDY, THE \$1,500,000 IN THE FEASIBILITY STUDY ESTIMATES CAN BE ELIMINATED.

THE SPECIFIC AIR POLLUTION CONTROL SYSTEM TO BE USED WOULD DEPEND ON THE SYSTEMS PROPOSED BY SERVICE COMPANIES SUBMITTING PROPOSALS ON THE PROJECT. A WET SYSTEM IS ASSUMED, BUT NOT "SPECIFIED" BY THE FEASIBILITY STUDY. A DRY SCRUBBING SYSTEM MAY BE PROPOSED, ALTHOUGH SUCH A SYSTEM IS PRESENTLY GENERALLY NOT USED BY INCINERATION SERVICE COMPANIES. EVEN WITH SUCH A SYSTEM, A QUENCHING OPERATION WOULD BE REQUIRED TO REDUCE THE TEMPERATURE OF GASES GOING TO THE DRY EQUIPMENT. SUCH A SYSTEM WOULD RETIRE THE USE OF CAUSTIC.

...THE FEED STORAGE (OR CONTAMINATED SOIL STORAGE) FACILITY FOR THE INCINERATOR SYSTEM. A BETTER SYSTEM IS DESCRIBED IN THE NORRIS REPORT WHICH PROVIDES MORE STORAGE AT REDUCED COSTS.

ALTERNATE METHODS FOR STORAGE OF MATERIAL WOULD BE CONSIDERED DURING THE PREDESIGN AND DESIGN PHASES OF THE PROJECT. IT IS NOTED IN THE FEASIBILITY STUDY THAT SYSTEMS THAT DIFFER FROM THOSE DESCRIBED CONCEPTUALLY IN THE REPORT MAY BE USED.

COOLING WATER WILL BE NEEDED FOR THE WASTE HEAT BOILER BUT NOT AT THE OVERALL WATER SUPPLY RATES NOTED IN THE FEASIBILITY STUDY.

COOLING WATER RATES MAY VARY FROM THOSE DESCRIBED IN THE REPORT. THE RATES DESCRIBED IN THE FEASIBILITY STUDY ARE BASED ON INFORMATION FROM INCINERATION SERVICE COMPANIES THAT ARE ACTUALLY INVOLVED IN SITE REMEDIATION USING INCINERATION.

OPERATORS OF THE INCINERATOR SHOULD ONLY BE REQUIRED TO OBSERVED GOOD HYGIENE PRACTICES SINCE A TOTALLY ENCLOSED INCINERATOR SYSTEM CAN BE SPECIFIED. OPERATORS FEEDING SOIL INTO THE GRINDING AND FEED SECTION OF THE INCINERATOR MAY REQUIRE DISPOSABLE DUST MASKS AND COTTON COVERALLS IN ADDITION TO PRACTICING GOOD HYGIENE.

THE LEVEL OF PROTECTION DESCRIBED IN THE FEASIBILITY STUDY IS SIMILAR TO THAT USED DURING THE MISSOURI DIOXIN REMOVAL AND INCINERATION ACTIVITIES AT THE DENNEY FARM SITE. THE LEVEL OF PROTECTION REQUIRED FOR THE INCINERATION OPERATOR WILL DEPEND, IN PART, ON THE SYSTEM OFFERED BY COMPANIES PROPOSING TO PERFORM SITE INCINERATION SERVICES.

OPERATING EFFICIENCIES OF 70.8% WERE ASSUMED. THIS WOULD NOT BE ACCEPTABLE IN AN INDUSTRIAL SETTING WHERE ON 80%-85% OPERATING EFFICIENCIES OR HIGHER ARE TYPICAL.

OPERATING EFFICIENCIES WERE ASSUMED TO BE TYPICAL OF THOSE ENCOUNTERED AFTER EXTENDED OPERATION AT SITES WHERE ONSITE INCINERATION HAS BEEN PERFORMED. THE SETTING ASSUMED FOR SITE REMEDIATION IS CLEARLY NOT AN INDUSTRIAL SETTING.

...THE CAPACITY OF EACH UNIT WILL BE 4.25 CUBIC YARDS PER HOUR...THIS CAPACITY IS LIMITED BY THE "MOBILE" RESTRICTIONS IN EARLY COMMENTS. THIS CAPACITY COULD BE INCREASED TO 5.56 CUBIC YARDS PER HOUR (+30%) WITH A TRANSPORTABLE, MODULAR UNIT.

THE OPERATING RATE USED IN THE FEASIBILITY STUDY IS BASED ON THE TYPICAL SIZE OF MOBILE OR TRANSPORTABLE INCINERATORS CURRENTLY IN OPERATION FOR ONSITE HAZARDOUS WASTE REMEDIATION. IT IS POSSIBLE THAT A LARGER INCINERATOR COULD BE CONSTRUCTED AND OFFERED BY AN INCINERATION SERVICE COMPANY.

...IT IS CUSTOMARY TO WORK FROM MARCH THROUGH NOVEMBER WHICH ADDS AT LEAST TWO MONTHS TO THE EXCAVATION SEASON. ALSO, BETWEEN DECEMBER AND FEBRUARY, DAYS WILL BE AVAILABLE WHICH ALLOW EXCAVATION AND BACKFILL TO PROCEED. THE ESTIMATED PROJECT LIFE COULD BE SHORTENED BY OVER 8 MONTHS WITH THESE CONSIDERATIONS AND SOIL STORAGE FACILITIES, RING LEVEE, AND OVERALL SITE AREA FOR THE INCINERATOR CAN BE REDUCED IN SIZE BY 8 TIMES OVER THE 28 ACRES PROPOSED IN THE FEASIBILITY STUDY.

A NUMBER OF EXPENSES WILL BE INCURRED WHILE HOLDING AN EXCAVATION TEAM ON STANDBY DURING THE PERIODS WHEN EXCAVATION CANNOT BE PERFORMED. SINCE THE ACTUAL PROJECT LIFE IS DETERMINED PRIMARILY BY THE OPERATING RATE OF THE INCINERATOR, THE PROJECT LIFE WOULD NOT BE SIGNIFICANTLY AFFECTED BY A DIFFERENT EXCAVATION SCHEDULE. FACTORS SUCH AS THESE WOULD BE EVALUATED DURING PREDESIGN AND DESIGN OF THE SELECTED ALTERNATIVE.

THE MATERIAL WHICH HAS ALREADY BEEN PLACED IN BAGS WILL CREATE SIGNIFICANT AND COSTLY HANDLING DIFFICULTIES IN THEIR REMOVAL FROM THEIR STORAGE BARNs, MOVING THEM TO ANY INCINERATOR, AND HANDLING THEM AT ANY INCINERATOR. THE BAGS WILL ALSO REQUIRE ANOTHER DISPOSAL ALTERNATIVE SINCE THEY CANNOT BE EASILY INCINERATED.

HANDLING OF THE EXISTING MATERIAL WILL NOT PRESENT UNDUE HANDLING DIFFICULTIES. THESE CONTAINERS CAN BE HANDLED WITH CONVENTIONAL HANDLING EQUIPMENT, AS THEY HAVE IN THE PAST. IT HAS BEEN DEMONSTRATED AT THE DENNEY FARM SITE THAT THESE CONTAINERS CAN BE INCINERATED.

SECTION 3

FEASIBILITY STUDY OF FINAL REMEDIAL ACTIONS FOR THE MINKER/STOUT/ROMAINE CREEK SITE

INTRODUCTION

IN JULY, 1986, THE U.S. ENVIRONMENTAL PROTECTION AGENCY RELEASED A STUDY ENTITLED FEASIBILITY STUDY OF FINAL REMEDIAL ACTIONS FOR THE MINKER/STOUT/ROMAINE CREEK SITE FOR PUBLIC REVIEW. THIS STUDY EVALUATED REMEDIAL ALTERNATIVES FOR FINAL MANAGEMENT OF DIOXIN-CONTAMINATED SOIL AT ALL PORTIONS OF THE MINKER/STOUT/ROMAINE CREEK SITE, INCLUDING THE SULLINS AND CASHEL PROPERTIES. A PUBLIC COMMENT PERIOD WAS HELD FROM AUGUST 8, 1986 THROUGH SEPTEMBER 5, 1986, AND INCLUDED A PUBLIC MEETING CONDUCTED AUGUST 25, 1986 TO DISCUSS THE STUDY.

THIS RESPONSIVENESS SUMMARY PRESENTS THE AGENCY'S RESPONSE TO PUBLIC COMMENTS RECEIVED BY THE OFFICE OF PUBLIC AFFAIRS, ENVIRONMENTAL PROTECTION AGENCY, REGION VII, KANSAS CITY, KANSAS, CONCERNING THE FEASIBILITY STUDY OF FINAL REMEDIAL ACTIONS FOR THE MINKER/STOUT/ROMAINE CREEK SITE. THIS RESPONSIVENESS SUMMARY CONSTITUTES A COMPONENT OF THE RECORD OF DECISION WHICH DOCUMENTS THE REMEDIAL ACTION SELECTION.

THIS RESPONSIVENESS SUMMARY DOCUMENTS FOR THE PUBLIC RECORD:

CONCERNS AND ISSUES RAISED DURING THE AUGUST 25, 1985 PUBLIC MEETING CONCERNING THE MINKER/STOUT/ROMAINE CREEK SITE.

WRITTEN COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD FOR THE FEASIBILITY STUDY OF FINAL REMEDIAL ACTIONS FOR THE MINKER/STOUT/ROMAINE CREEK SITE.

HOW EPA HAS CONSIDERED AND RESPONDED TO THESE COMMENTS IN SELECTING A FINAL MANAGEMENT ALTERNATIVE FOR THE DIOXIN-CONTAMINATED MATERIAL AT THE SITE.

THE COMMENTS ARE GROUPED INTO SEVERAL CATEGORIES, ACCORDING TO THE TOPIC THAT THEY ADDRESS. THE TOPICS INCLUDE COMMENTS RECEIVED DURING THE PUBLIC MEETING, PROCEDURAL COMMENTS, COMMENTS REGARDING THE SCHEDULE FOR THE DECISION-MAKING PROCESS, COMMENTS REGARDING THE TENTATIVELY SELECTED ALTERNATIVE OR ALTERNATIVES NOT SELECTED, AND TECHNICAL QUESTIONS AND COMMENTS. THIS RESPONSIVENESS SUMMARY IS ORGANIZED ACCORDING TO THESE CATEGORIES.

COMMENTS RECEIVED DURING THE PUBLIC MEETING

AT THE PUBLIC MEETING, THERE WERE SEVERAL QUESTIONS REGARDING THE CLEANUP AND THE PROPOSED ALTERNATIVE.

EPA WAS ASKED IF THE INCINERATOR CURRENTLY IN SOUTHWEST MISSOURI WOULD BE USED TO THERMALLY TREAT THE SOIL FROM THE MINKER/STOUT/ROMAINE CREEK (M/S/RC) SITE.

THE EPA MOBILE INCINERATOR IN SOUTHWEST MISSOURI IS A RESEARCH UNIT. THIS INCINERATOR HAS BEEN ISSUED A RESEARCH PERMIT FOR TREATMENT OF SPECIFIC MATERIAL, WHICH DOES NOT INCLUDE DIOXIN-CONTAMINATED SOIL FROM THE M/S/RC SITE. THEREFORE, THE EPA MOBIL INCINERATOR IS NOT CURRENTLY AVAILABLE FOR THE TREATMENT OF THIS MATERIAL.

THE UNIT IN SOUTHWEST MISSOURI WILL NOT BE CONSIDERED FOR TREATMENT OF MATERIAL FROM THE M/S/RC SITE DUE TO ITS LIMITED CAPACITY WHICH WOULD RESULT IN AN EXCESSIVE COST AND PERIOD OF TIME REQUIRED TO TREAT ALL OF THE MATERIAL FROM THE SITE.

EPA WAS ASKED WHY THEY WERE PROPOSING OFFSITE THERMAL TREATMENT WHEN NO SUCH CAPACITY CURRENTLY EXISTS.

WITH THE EXCEPTION OF THE EPA MOBILE INCINERATOR LOCATED IN SOUTHWEST MISSOURI, NO THERMAL TREATMENT UNIT HAS BEEN ISSUED A PERMIT BY EPA TO TREAT DIOXIN WASTES. ALTHOUGH THERE ARE CURRENTLY NO PERMITTED THERMAL TREATMENT UNITS AVAILABLE FOR TREATMENT OF THE CONTAMINATED SOIL FROM THE M/S/RC SITE, SEVERAL COMPANIES HAVE SUCH EQUIPMENT OR THE CAPABILITY OF CONSTRUCTING SUCH A DEVICE. SEVERAL FIRMS OPERATE TRANSPORTABLE THERMAL TREATMENT UNITS WHICH CAN BE ASSEMBLED AT AN OFFSITE LOCATION AND DESIGNED TO HANDLE THE SOIL AND OTHER CONTAMINATED MATERIALS FROM THE M/S/RC SITE. EPA ANTICIPATES THAT A NUMBER OF QUALIFIED BIDDERS WILL RESPOND TO A REQUEST FOR PROPOSALS (RFP) FOR OFFSITE THERMAL TREATMENT OF THE DIOXIN-CONTAMINATED MATERIAL FROM THIS SITE.

A QUESTION WAS ASKED REGARDING THE AVAILABILITY OF FUNDING TO CARRY OUT THE CLEANUP.

THE PROPOSED REMEDY WOULD BE CARRIED OUT USING FUNDS GENERATED BY THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (CERCLA), AS AMENDED BY THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA). THIS ACT ESTABLISHES A TRUST FUND TO FINANCE RESPONSE ACTIONS AT UNCONTROLLED OR ABANDONED HAZARDOUS WASTE SITES (SUPERFUND). SUFFICIENT FUNDS ARE AVAILABLE IN THIS FUND TO IMPLEMENT THE PROPOSED REMEDY.

NINETY PERCENT OF THE COST OF THE PROJECT WOULD BE FUNDED BY SUPERFUND. THE STATE WOULD BE REQUIRED TO PROVIDE A 10 PERCENT COST SHARE FOR THE PROJECT. THE STATE HAS INDICATED THEIR ABILITY TO GENERATE THE NECESSARY FUNDS, SHOULD THIS REMEDY BE SELECTED.

EPA WAS ASKED HOW MUCH THE OFFSITE THERMAL TREATMENT ALTERNATIVE WILL COST.

THE FEASIBILITY STUDY OF FINAL REMEDIAL ACTIONS AT THE MINKER/STOUT/ROMAINE CREEK SITE INCLUDES WHAT IS REFERRED TO AS AN ORDER OF MAGNITUDE COST ESTIMATE. SUCH ESTIMATES ARE EXPECTED TO BE ACCURATE TO WITHIN +50 PERCENT AND -30 PERCENT. THE COST ESTIMATE PRESENTED IN THE FEASIBILITY STUDY FOR OFFSITE INCINERATION OF 20,000 CUBIC YARDS OF CONTAMINATED SOIL IS \$25,000,000. THUS, THE ACTUAL COST IS EXPECTED TO FALL BETWEEN \$17,500,000 AND \$37,500,000. UNCERTAINTIES INVOLVED IN MAKING THE ESTIMATE RESULT IN THE RANGE OF VALUES.

SINCE THE FEASIBILITY STUDY WAS RELEASED IN 1986, THE AGENCY HAS GAINED INFORMATION WHICH ENABLES A MORE ACCURATE COST ESTIMATE TO BE PREPARED. THE BEST INFORMATION AVAILABLE TO THE AGENCY INDICATES THAT THE UNIT COST FOR OPERATION OF A THERMAL TREATMENT UNIT IS EXPECTED TO BE APPROXIMATELY \$400 PER CUBIC YARD, AS COMPARED TO \$700 PER CUBIC YARD PRESENTED IN THE 1986 FEASIBILITY STUDY. THE TOTAL VOLUME OF SOIL TO BE TREATED FROM THE M/S/RC SITE IS CURRENTLY ESTIMATED AT 12,000 CUBIC YARDS, COMPARED TO THE FEASIBILITY STUDY ESTIMATE OF 20,000 CUBIC YARDS. THIS RESULTS IN A REDUCTION OF THE ESTIMATED COST OF OFFSITE THERMAL TREATMENT FOR THE MATERIAL FROM THE M/S/RC SITE TO APPROXIMATELY \$15 MILLION.

ONCE THE REMEDY IS SELECTED, A DETAILED DESIGN OF THE ALTERNATIVE WILL BE DEVELOPED. AT THAT TIME, IT WILL BE POSSIBLE TO PREPARE A MUCH MORE PRECISE ESTIMATE OF THE FINAL COST.

ONE COMMENTOR NOTED THAT A PREVIOUS PROPOSAL TO LOCATE A CENTRAL FACILITY AT TIMES BEACH HAD NOT BEEN RECEIVED FAVORABLY. EPA WAS ASKED IF SIMILAR OPPOSITION WAS EXPECTED FOR THE PROPOSAL TO LOCATE A THERMAL TREATMENT UNIT AT TIMES BEACH.

IN 1984, A RECORD OF DECISION WAS SIGNED FOR CONSTRUCTION OF AN INTERIM CENTRAL STORAGE FACILITY (ICSF) AT TIMES BEACH. THIS UNIT WAS DESIGNED TO STORE DIOXIN CONTAMINATED SOILS FROM THE NEARBY CASTLEWOOD, QUAIL RUN, AND MINKER/STOUT/ROMAINE CREEK SITES. THE PROJECT

DID NOT INVOLVE MANAGEMENT OF CONTAMINATED SOIL OR STRUCTURES AND DEBRIS FROM TIMES BEACH.

A PRIMARY REASON THAT THE PUBLIC WAS OPPOSED TO THIS PROJECT AT THAT TIME WAS BECAUSE NO FINAL MANAGEMENT CAPACITY FOR THE STORED SOILS WAS IDENTIFIED. NEARBY RESIDENTS WERE CONCERNED THAT THE SOIL WOULD REMAIN IN STORAGE FOR AN INDEFINITE PERIOD OF TIME IN THE ABSENCE OF SUCH A FINAL MANAGEMENT ALTERNATIVE. THE SURROUNDING COMMUNITY EXPRESSED OPPOSITION TO THE PERMANENT MANAGEMENT OF HAZARDOUS MATERIALS AT TIMES BEACH. IN ADDITION, THE PROPOSED ICSF DID NOT ADDRESS CONTAMINATED SOILS OR THE DETERIORATING STRUCTURES AND DEBRIS AT TIMES BEACH. MANAGEMENT OF OFFSITE SOILS DID NOT BENEFIT THE NEARBY COMMUNITY. OF OFFSITE SOILS DID NOT BENEFIT THE NEARBY COMMUNITY. EPA BELIEVES THAT A THERMAL TREATMENT UNIT WILL BE RECEIVED MORE FAVORABLY THAN THE PREVIOUS PROPOSAL TO BUILD A STORAGE FACILITY AT TIMES BEACH. THERMAL TREATMENT AT TIMES BEACH WOULD REPRESENT A FINAL REMEDY FOR CONTAMINATED SOILS LOCATED AT BOTH M/S/RC AND TIMES BEACH, RATHER THAN AN INTERIM STEP INVOLVING THE POTENTIAL LONG-TERM MANAGEMENT OF HAZARDOUS MATERIALS. ONCE THE DIOXIN IS DESTROYED BY THERMAL TREATMENT AND DELISTED, THE SOIL WOULD NO LONGER BE HAZARDOUS, AND THE THREAT TO PUBLIC HEALTH AND THE ENVIRONMENT WOULD BE ELIMINATED. FOLLOWING THERMAL TREATMENT, THE UNIT WOULD BE DISMANTLED AND REMOVED, LEAVING TIMES BEACH FREE OF ANY HAZARDOUS WASTE MANAGEMENT ACTIVITY.

THE PROPOSED REMEDY AT TIMES BEACH ALSO INVOLVES FINAL MANAGEMENT OF THE DETERIORATING STRUCTURES AND DEBRIS AT TIMES BEACH, WHICH HAS BEEN ANOTHER PRIMARY CONCERN OF THE NEARBY COMMUNITY. THE SOUTH OUTER ROAD TO INTERSTATE 44, WHICH PROVIDES ALTERNATE ACCESS TO THE ADJACENT CITY OF EUREKA, HAS BEEN CLOSED SINCE IMPLEMENTATION OF THE PERMANENT RELOCATION IN 1983. THIS HAS RESULTED IN AN INCREASE IN TRAFFIC CONGESTION AT THE EUREKA INTERCHANGE. FOLLOWING COMPLETION OF THE PROPOSED REMEDIAL ACTION AT TIMES BEACH, REOPENING OF THE SOUTH OUTER ROAD WOULD BE POSSIBLE. THIS ACTION IS STRONGLY SUPPORTED BY THE RESIDENTS OF EUREKA.

EPA WAS ASKED WHETHER OR NOT OTHER SITES, BESIDES TIMES BEACH, ARE BEING CONSIDERED FOR THERMAL TREATMENT OF CONTAMINATED MATERIALS FROM THE M/S/RC SITE.

TIMES BEACH IS THE ONLY LOCATION WHICH HAS BEEN IDENTIFIED BY THE STATE AND EPA THAT IS SUITABLE FOR IMPLEMENTATION OF THE PROPOSED REMEDY. NO OTHER SITES ARE ACTIVELY BEING REVIEWED AT THIS TIME. EPA AND THE STATE WILL EVALUATE OTHER FEASIBLE SITES TO LOCATE THE UNIT, IF RECOMMENDED.

THE STATE WAS ASKED WHETHER OR NOT THE PROPERTY DEEDS OF THE HOUSES AT THE M/S/RC SITE WOULD ALWAYS INCLUDE A NOTATION THAT THE PROPERTY HAD ONCE BEEN CONTAMINATED.

DEED RESTRICTIONS ARE IMPLEMENTED BY THE STATE. STATE LAW REQUIRES THAT THE NOTATION ALWAYS REMAIN ON THE PROPERTY RECORDS. HOWEVER, ONCE THE PROPERTY IS CLEANED UP, AND THE DEPARTMENT OF HEALTH CERTIFIES THE CLEANUP, THE PROPERTY RECORDS ARE UPDATED TO INDICATE THAT THE PROPERTY IS ONCE AGAIN SAFE FOR HABITATION AND UNRESTRICTED USE.

EPA WAS ASKED WHY THE OPTION OF A BUYOUT WAS NOT ADDRESSED IN THE FEASIBILITY STUDY.

THE ISSUE OF PUBLIC HEALTH RISK AND THE NEED FOR PERMANENT RELOCATION WAS ADDRESSED IN 1983 IMMEDIATELY FOLLOWING THE DISCOVERY OF DIOXIN CONTAMINATION AT THE SITE. THOSE RESIDENTS DETERMINED TO BE AT RISK HAVE BEEN PROVIDED EITHER TEMPORARY OR PERMANENT RELOCATION, AS APPROPRIATE.

A QUESTION WAS ASKED REGARDING THE SCHEDULE FOR REMOVING THE CONTAMINATED SOIL CURRENTLY IN TEMPORARY STORAGE AT THE MINKER AREA.

THE FEASIBILITY STUDY OF FINAL REMEDIAL ACTIONS FOR THE MINKER/STOUT/ROMAINE CREEK SITE INCLUDES A SCHEDULE FOR THE PREFERRED ALTERNATIVE WHICH INDICATES THAT THE ENTIRE OPERATION SHOULD REQUIRE LESS THAN 5 YEARS FROM PROJECT INITIATION, WITH ALL OF THE SOIL REMOVED FROM THE SITE IN SLIGHTLY MORE THAN 4 YEARS. IF THE PROPOSED REMEDY IS SELECTED IN A RECORD OF DECISION, EPA IS CONFIDENT THAT THIS SCHEDULE IS REASONABLE AND CAN BE MET.

EPA WAS ASKED WHETHER A MITIGATION PLAN WAS PREPARED FOR THE WORK THAT WAS UNDERWAY A FEW DAYS PRECEDING THE AUGUST 25, 1986 PUBLIC MEETING.

A MITIGATION PLAN WAS PREPARED FOR THE REMOVAL ACTION WHICH COMMENCED AT THE ABRAHAMSON AND PAYNE PROPERTIES PRIOR TO THE MEETING. AS EXPLAINED AT THE PUBLIC MEETING, THIS MITIGATION PLAN WAS AVAILABLE PRIOR TO AND DURING THE REMOVAL ACTION AT THE EPA PUBLIC INFORMATION CENTER LOCATED AT THE MINKER PORTION OF THE SITE.

EPA WAS ASKED WHETHER OR NOT IT HAD ACTUALLY BEEN DEMONSTRATED THAT THE SOIL FROM THE SITE COULD BE INCINERATED AND ALSO IF INCINERATION WOULD BE FEASIBLE FOR ASPHALT AND CONCRETE.

THE INCINERATION DEMONSTRATION THAT EPA HAS CARRIED OUT IN SOUTHWEST MISSOURI HAS SUCCESSFULLY DEMONSTRATED THAT THERMAL TREATMENT IS CAPABLE OF DESTROYING DIOXIN IN SOIL TO UNDETECTABLE LEVELS. NO DIOXIN CONTAMINATION HAS BEEN DETECTED IN THE RESIDUE (ASH) OR ANY EMISSIONS FROM THE UNIT. THE DESTRUCTION AND REMOVAL EFFICIENCY IS HIGH ENOUGH TO MEET PERMIT REQUIREMENTS UNDER THE RESOURCE CONSERVATION AND RECOVERY ACT, AS AMENDED (RCRA). RESIDUE FROM THE PROCESS HAS BEEN SUCCESSFULLY DELISTED AND DISPOSED OF AS A SOLID WASTE. THUS, EPA HAS DEMONSTRATED THAT THE DIOXIN CONTAMINATION IN MISSOURI SOILS CAN BE SAFELY DESTROYED BY INCINERATION.

THE INCINERATOR IN SOUTHWEST MISSOURI IS CAPABLE OF PROCESSING CONCRETE AND ASPHALT. THE THERMAL TREATMENT UNIT THAT IS PROPOSED TO TREAT THE SOIL FROM THE M/S/RC SITE WILL ALSO BE ABLE TO PROCESS ASPHALT AND CONCRETE. HOWEVER, STEAM CLEANING HAS BEEN DEMONSTRATED TO BE AN EFFECTIVE MEANS OF DECONTAMINATING CONCRETE, AND IS LIKELY TO BE MORE COST-EFFECTIVE THAN THERMAL TREATMENT.

A QUESTION WAS ASKED REGARDING THE AMOUNT OF TIME THAT THE EPA INCINERATOR HAS BEEN OUT OF SERVICE DURING THE DEMONSTRATION IN SOUTHWEST MISSOURI.

THE EPA INCINERATOR IS A RESEARCH UNIT, ORIGINALLY INTENDED FOR HANDLING LIQUIDS, AND NOT DESIGNED TO HANDLE LARGE VOLUMES OF SOIL EFFICIENTLY. EPA EXPERIENCED SOME INITIAL DIFFICULTIES IN THE OPERATION OF THE INCINERATOR, RESULTING IN CONSIDERABLE DOWN-TIME FOR MAINTENANCE. HOWEVER, AS NOTED IN THE PREVIOUS RESPONSE, THE INCINERATOR WAS SUCCESSFUL AT DESTROYING DIOXIN IN SOILS TO UNDETECTABLE LEVELS.

THE EPA MOBILE INCINERATOR HAS BEEN RETROFITTED WITH BETTER MATERIALS HANDLING EQUIPMENT, WHICH HAS ENABLED PROCESSING SEVERAL TIMES THE AMOUNT OF SOIL PER HOUR THAT IT WAS INITIALLY CAPABLE OF, AND HAS SIGNIFICANTLY REDUCED THE AMOUNT OF DOWN-TIME REQUIRED FOR MAINTENANCE.

A QUESTION WAS ASKED ABOUT THE CAPACITY OF THE EPA MOBILE INCINERATOR.

AS NOTED IN A PREVIOUS RESPONSE, THE CAPACITY OF THE MOBILE INCINERATOR IS LIMITED BY ITS ORIGINAL DESIGN AND PURPOSE. THE NEW UNIT THAT WOULD BE BUILT TO TREAT THE SOIL FROM THE MINKER/STOUT/ROMAINE CREEK SITE WOULD BE CAPABLE OF HANDLING LARGER VOLUMES OF SOIL THAN THE INCINERATOR EPA IS CURRENTLY OPERATING.

A QUESTION WAS ASKED REGARDING THE DISPOSAL OF THE RESIDUE FROM THE THERMAL TREATMENT PROCESS.

RCRA DESIGNATES LISTS OF SPECIFIC HAZARDOUS WASTES WHICH ARE REGULATED BY EPA UNDER RCRA AUTHORITY. RESIDUE FROM THE THERMAL TREATMENT OF DIOXIN-CONTAMINATED SOIL AT THE M/S/RC SITE IS LISTED AS A HAZARDOUS WASTE UNDER RCRA, AND SUBJECT TO THE REQUIREMENTS FOR THE MANAGEMENT OF A HAZARDOUS WASTE. IF IT CAN BE DETERMINED THAT THE RESIDUE IS FREE OF THE HAZARDOUS CONSTITUENTS OR CHARACTERISTICS FOR WHICH IT WAS CONSIDERED A HAZARDOUS WASTE, THE RESIDUE CAN BE DISPOSED OF AS A NON-HAZARDOUS SOLID WASTE. THIS DETERMINATION IS REFERRED TO AS A DELISTING PROCEDURE. THE RESIDUE FROM THE EPA MOBILE INCINERATOR HAS BEEN DEMONSTRATED TO MEET DELISTING CRITERIA AND HAS BEEN DELISTED AS A HAZARDOUS WASTE. EPA BELIEVES THAT THE RESIDUE FROM THERMAL TREATMENT OF THE SOIL FROM THE M/S/RC SITE CAN

BE DELISTED AND DISPOSED OF AS A SOLID WASTE.

THE PROPOSED METHOD OF DISPOSAL OF RESIDUE FROM THE THERMAL TREATMENT UNIT IS ONSITE DISPOSAL IN A UNIT OR UNITS DESIGNED AND CONSTRUCTED TO MEET SOLID WASTE MANAGEMENT REQUIREMENTS. ANOTHER OPTION WOULD BE TO TRANSPORT THE ASH TO AN OFFSITE SOLID WASTE LANDFILL FOR DISPOSAL. THIS OPTION RESULTS IN THE USE OF VALUABLE SPACE IN A SANITARY LANDFILL. THE COST OF TRANSPORTATION AND THE FEE FOR DISPOSAL IS LIKELY TO MAKE OFFSITE DISPOSAL LESS COST-EFFECTIVE. THEREFORE, ONSITE DISPOSAL OF THE RESIDUE IS THE PREFERRED ALTERNATIVE.

A QUESTION WAS ASKED REGARDING THE DISPOSITION OF THE HOUSES THAT ARE CURRENTLY UNOCCUPIED AT THE M/S/RC SITE.

THE HOUSES AT THE SITE HAVE BEEN RESTORED, FOLLOWING REMOVAL AND STORAGE OF CONTAMINATED SOIL, TO A SAFE, HABITABLE CONDITION. THE TITLES TO THE HOUSES WERE TRANSFERRED TO THE STATE FOLLOWING THE PERMANENT RELOCATION. FOLLOWING REMOVAL OF THE CONTAMINATED SOIL CURRENTLY IN STORAGE FROM THE SITE, THE TEMPORARY STORAGE STRUCTURES WILL BE DISMANTLED AND REMOVED. THE HOUSES CAN THEN BE SOLD, AND REVENUE GENERATED FROM THE SALE RETURNED TO SUPERFUND FOR FUTURE CLEANUPS AT OTHER SITES. SALE OF THE HOMES HAS THE ADVANTAGE OF RETURNING THE NEIGHBORHOOD TO THE LEVEL OF HOUSING DENSITY THAT EXISTED BEFORE THE CONTAMINATION WAS DISCOVERED, AND THUS COMPLETES THE RESTORATION OF THE AREA TO ITS ORIGINAL CONDITION.

EPA WAS ASKED ABOUT THE VOLUME OF SOIL TO BE REMOVED FROM THE MINKER/STOUT/ROMAINE CREEK SITE.

REMOVAL ACTIONS HAVE BEEN COMPLETED AT THE SULLINS, CASHEL, AND MINKER PORTIONS OF THE M/S/RC SITE. A TOTAL OF 5,800 CUBIC YARDS OF SOIL WAS EXCAVATED FROM THESE AREAS AND PLACED IN INTERIM ONSITE STORAGE AT THE MINKER AREA. THE TWO REMAINING PORTIONS OF THE SITE TO BE CLEANED UP INCLUDE THE STOUT AREA AND ROMAINE CREEK. THESE CLEANUPS ARE SCHEDULED TO BE COMPLETED IN THE 1988 CONSTRUCTION SEASON. IT IS ESTIMATED THAT 1,900 CUBIC YARDS OF SOIL WILL BE REMOVED AT THE STOUT AREA, AND 4,300 CUBIC YARDS OF SOIL AND SEDIMENT FROM ROMAINE CREEK WILL BE REMOVED TO MEET CLEANUP CRITERIA.

EPA BELIEVES THAT THESE SOIL VOLUME PROJECTIONS ARE AS ACCURATE AS POSSIBLE PRIOR TO ACTUALLY PERFORMING THE SOIL REMOVAL. THE LATERAL EXTENT OF CONTAMINATION AT THE STOUT AREA HAS BEEN DETERMINED USING A STATISTICAL SAMPLING PROCEDURE WHICH DETERMINES AVERAGE DIOXIN CONCENTRATIONS TO THE 95 PERCENTILE UPPER CONFIDENCE LEVEL. THIS SAMPLING PROCEDURE IS IDENTICAL TO THE PROCEDURE WHICH IS USED DURING THE ACTUAL REMOVAL OF CONTAMINATED SOIL.

THE SOIL AND SEDIMENT VOLUME REQUIRING REMOVAL FROM ROMAINE CREEK IS ALSO KNOWN WITH A HIGH DEGREE OF CONFIDENCE. DIOXIN CONTAMINATION HAS BEEN DETECTED IN THE UPPER 6,000 FEET OF ROMAINE CREEK. DURING PREPARATION OF THE ROMAINE CREEK OPERABLE UNIT FEASIBILITY STUDY STREAM SEDIMENT PROFILES WERE DETERMINED AT INTERVALS RANGING FROM 100 TO 300 FEET IN THE UPPER 6000 FEET OF ROMAINE CREEK. IN A SUBSEQUENT INVESTIGATION, AREAS OF SEDIMENT DEPOSITION WERE TARGETED FOR SEDIMENT DEPTH MEASUREMENTS ALONG THE ENTIRE LENGTH OF ROMAINE CREEK. THIS INFORMATION HAS ENABLED AN ACCURATE ESTIMATE OF THE CONTAMINATED SOIL AND SEDIMENT VOLUME TO BE PREPARED.

AN ESTIMATED SOIL VOLUME OF 20,000 CUBIC YARDS WAS ASSUMED IN THE FEASIBILITY STUDY FOR THE PURPOSE OF COSTING AND COMPARING REMEDIAL ALTERNATIVES. THIS ESTIMATE WAS PREPARED PRIOR TO THE AVAILABILITY OF STATISTICAL SAMPLING DATA AT THE STOUT AREA, SEDIMENT VOLUME MEASUREMENTS AT ROMAINE CREEK, OR COMPLETION OF THE REMOVAL ACTION AT THE MINKER AREA. THE FEASIBILITY STUDY EVALUATION PROCESS ALLOWS FOR A VALID COMPARISON OF ALTERNATIVES FOR A RANGE OF CONTAMINATED SOIL VOLUMES. EPA BELIEVES THAT THE VOLUME OF SOIL ASSUMED IN THE FEASIBILITY STUDY IS A REASONABLY ACCURATE VOLUME UPON WHICH TO BASE A REMEDY SELECTION. IN ADDITION, THE COST EVALUATION OF THE PREFERRED ALTERNATIVE HAS BEEN FURTHER DEVELOPED IN THE PROPOSED PLAN FOR FINAL MANAGEMENT OF DIOXIN-CONTAMINATED SOIL AND FINAL DISPOSITION OF STRUCTURES AND DEBRIS AT TIMES BEACH, MISSOURI. AND THE MINKER/STOUT/

ROMAINE CREEK SITE, MISSOURI (PROPOSED PLAN). THE ACTUAL COST OF THE REMEDY WILL DEPEND ON INDUSTRY CONDITIONS WHEN THE CONTRACT IS COMPETITIVELY AWARDED.

EPA WAS ASKED A QUESTION ABOUT THE LEVEL OF SITE RESTORATION THAT IS INTENDED FOR THE SITE. SPECIFICALLY, WHETHER OR NOT EVERYTHING WOULD BE RESTORED TO ITS ORIGINAL CONDITION OR, IF NECESSARY, REPLACED.

TO THE DEGREE POSSIBLE, EVERYTHING AT THE SITE WILL BE RESTORED TO ITS ORIGINAL CONDITION FOLLOWING COMPLETION OF RESPONSE ACTIONS AT THE SITE. IN CASES WHERE RESTORATION TO THE ORIGINAL CONDITION IS NOT POSSIBLE, OR NOT COST-EFFECTIVE, ITEMS WILL BE REPLACED WITH EQUIVALENT NEW ITEMS.

WRITTEN COMMENTS

PROCEDURAL

ONE COMMENTOR STATED THAT EPA HAD NOT FOLLOWED THE REQUIREMENTS OF THE NATIONAL CONTINGENCY PLAN BECAUSE IT HAD NOT SOLICITED OR EVALUATED COMMENTS ON THE SOIL EXCAVATION AND STORAGE ACTIVITIES THAT HAVE ALREADY BEEN IMPLEMENTED.

THE EXCAVATIONS AT THE SULLINS, CASHEL, ABRAHAMSON, AND PAYNE PROPERTIES WERE CARRIED OUT UNDER EPA'S "REMOVAL" AUTHORITY UNDER THE NATIONAL CONTINGENCY PLAN. THE NATIONAL CONTINGENCY PLAN DOES NOT REQUIRE A PUBLIC COMMENT PERIOD PRIOR TO IMPLEMENTATION OF REMOVAL ACTIONS. NEVERTHELESS, MITIGATION PLANS DESCRIBING THESE REMOVAL ACTIONS WERE MADE AVAILABLE TO THE PUBLIC PRIOR TO IMPLEMENTATION. EPA HAS NOT FAILED TO FOLLOW PROPER PROCEDURES IN CARRYING OUT THESE REMOVAL ACTIVITIES. (THE ACTIONS DISCUSSED IN THE FEASIBILITY STUDY AND PROPOSED PLAN ARE TO BE CARRIED OUT UNDER THE "REMEDIAL" AUTHORITY. THE NATIONAL CONTINGENCY PLAN DOES REQUIRE A PUBLIC COMMENT PERIOD FOR REMEDIAL ACTIONS.)

ONE COMMENTOR STATED THAT EPA HAS NOT MET THE NATIONAL CONTINGENCY PLAN REQUIREMENT THAT REMEDIAL ACTIONS SHOULD BE COST-EFFECTIVE BECAUSE INTERIM STORAGE IN THE FLEXIBLE CONTAINERS IS A MORE EXPENSIVE APPROACH THAN BULK HANDLING. THE COMMENTOR SUGGESTS THAT THE SOIL SHOULD BE LEFT IN PLACE AND EXCAVATED ONLY WHEN THE THERMAL TREATMENT UNIT IS READY TO RECEIVE IT, AND THEN LEFT IT BE MOVED BY BULK TRANSPORT.

EPA HAS CONSIDERED ALLOWING THE CONTAMINATED SOIL TO REMAIN IN PLACE UNTIL FINAL MANAGEMENT CAPACITY IS AVAILABLE. ALTHOUGH IT IS INITIALLY MORE EXPENSIVE TO CONTAINERIZE THE CONTAMINATED SOIL THAN TO HANDLE IN BULK, EPA BELIEVES THAT THE CONTAINER STORAGE OPTION THAT IT HAS BEEN IMPLEMENTING IS PART OF A COST-EFFECTIVE OVERALL REMEDY WHICH ASSURES THE SHORT-TERM AND LONG-TERM PROTECTION OF PUBLIC HEALTH AND THE ENVIRONMENT.

IF CONTAMINATED SOIL IS ALLOWED TO REMAIN IN PLACE, EXPOSURE TO DIOXIN WOULD CONTINUE TO OCCUR ABOVE A LEVEL OF CONCERN FOR PROTECTION OF HUMAN HEALTH. ENVIRONMENTAL EXPOSURE WOULD ALSO CONTINUE AT AN UNACCEPTABLE LEVEL. CONTAINMENT OF THE CONTAMINATED SOIL SUBSTANTIALLY REDUCES THE POTENTIAL FOR EXPOSURE, PROVIDING A HIGH DEGREE OF SHORT-TERM PROTECTION OF PUBLIC HEALTH AND THE ENVIRONMENT. SOIL CONTAINMENT ALSO PROVIDES GREATER PROTECTION TO WORKERS DURING FUTURE SOIL-HANDLING ACTIVITIES.

IN ADDITION TO THE CONTINUED EXPOSURE, THE CONTAMINATED SOIL COULD CONTINUE TO ERODE AND MIGRATE FROM THE SITE. THIS RESULTS IN THE EXPANSION OF SITE BOUNDARIES AND INCREASES THE AMOUNT OF SOIL THAT WILL EVENTUALLY HAVE TO BE EXCAVATED, TRANSPORTED, AND MANAGED. THESE ADDITIONAL COSTS MUST BE INCLUDED IN COMPARING IMMEDIATE WITH DELAYED EXCAVATION. EPA HAS DETERMINED THAT EXCAVATING THE SOIL NOW WILL REDUCE THE TOTAL OVERALL COST OF THE REMEDY.

ONE COMMENTOR STATED THAT THE NO-ACTION ALTERNATIVE SHOULD HAVE BEEN GIVEN MORE CONSIDERATION. THE BASIS FOR THIS CONTENTION IS THAT RECENT ASSESSMENTS OF THE RISKS PRESENTED BY DIOXIN CONTAMINATION DO NOT SUPPORT A NEED TO CLEAN UP SITES TO THE ONE PART PER BILLION LEVEL, AND THAT IT MIGHT THEREFORE BE REASONABLE FOR THE CONTAMINATION TO REMAIN IN-PLACE.

AS NOTED IN A PREVIOUS RESPONSE, EPA BELIEVES THAT UNCONTROLLED CONTAMINATION AT THE M/S/RC SITE REPRESENTS AN UNACCEPTABLE RISK TO PUBLIC HEALTH AND THE ENVIRONMENT. REMOVAL ACTIONS INVOLVING THE EXCAVATION AND ONSITE INTERIM STORAGE OF CONTAMINATED SOIL HAVE BEEN PERFORMED AT THE SULLINS, CASHEL, AND MINKER PORTIONS OF THE SITE. EPA DETERMINED, ON THE BASIS OF ADVICE FROM THE CENTERS FOR DISEASE CONTROL (CDC), THAT THESE ACTIONS WERE NECESSARY TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT IN RESIDENTIAL SETTINGS SUCH AS THE M/S/RC SITE. EPA HAS ASSESSED THE THREAT POSED BY DIOXIN CONTAMINATION AT THE STOUT AND ROMAINE CREEK PORTIONS OF THE SITE, AND HAS DETERMINED THAT RESPONSE IS NECESSARY TO ACHIEVE PROTECTIVENESS.

IT SHOULD BE POINTED OUT THAT THE NO-ACTION ALTERNATIVE IN THE FEASIBILITY STUDY IS NOT AN ALTERNATIVE TO LEAVE THE CONTAMINATED SOIL IN PLACE. THE FEASIBILITY STUDY IS BASED ON AN ASSUMPTION THAT THE CONTAMINATED SOIL HAS, OR WILL BE, EXCAVATED AND PLACED IN INTERIM STORAGE. THE NO-ACTION ALTERNATIVE IN THE FEASIBILITY STUDY INVOLVES LEAVING THE EXCAVATED SOIL IN THE TEMPORARY STORAGE STRUCTURES. THE STORAGE STRUCTURES ARE NOT DESIGNED FOR PERMANENT MANAGEMENT OF THE CONTAMINATED SOIL. AN UNACCEPTABLE RISK OF FUTURE CONTAMINANT RELEASE WOULD RESULT IF THE TEMPORARY STORAGE STRUCTURES WERE USED FOR PERMANENT DISPOSAL. THEREFORE, THE NO-ACTION ALTERNATIVE WAS FOUND TO BE UNACCEPTABLE.

SCHEDULE

ONE COMMENTOR STATED THAT IT WOULD BE INAPPROPRIATE TO DEVELOP AND SIGN A RECORD OF DECISION FOR THE MINKER/STOUT/ROMAINE CREEK SITE UNTIL THE LOCATION FOR THE THERMAL TREATMENT UNIT IS ESTABLISHED.

IN THE PROPOSED PLAN, EPA HAS IDENTIFIED TIMES BEACH AS THE PREFERRED LOCATION FOR THE THERMAL TREATMENT UNIT THAT WOULD BE USED TO TREAT DIOXIN-CONTAMINATED MATERIAL FROM THE M/S/RC SITE. IF THE PREFERRED REMEDY IS SELECTED, THE RECORD OF DECISION FOR M/S/RC AND TIMES BEACH WILL ESTABLISH TIMES BEACH AS THE LOCATION FOR OFFSITE THERMAL TREATMENT OF CONTAMINATED SOILS AT THE M/S/RC SITE.

THREE ADVANTAGES OF DELAYING A DECISION FOR FINAL MANAGEMENT OF DIOXIN-CONTAMINATED MATERIAL AT THE M/S/RC SITE WERE SUGGESTED: (1) DELAY WOULD PROVIDE TIME FOR FURTHER DEVELOPMENT AND ANALYSIS OF CHEMICAL AND BIODEGRADATION TECHNOLOGIES AS WELL AS DEVELOPMENT AND DEMONSTRATION OF ADDITIONAL THERMAL TREATMENT TECHNOLOGIES; (2) NO ADVERSE CONSEQUENCES WOULD RESULT FROM DELAY, SINCE THE STORAGE BUILDINGS ARE DESIGNED TO LAST FOR SEVERAL YEARS; AND (3) MORE PRECISE ESTIMATES OF THE COSTS OF INCINERATION WILL BE POSSIBLE.

EPA HAS POSTPONED A FINAL MANAGEMENT DECISION FOR MORE THAN FIVE YEARS, INCLUDING APPROXIMATELY ONE AND ONE-HALF YEARS SINCE PUBLIC RELEASE OF THE FEASIBILITY STUDY OF FINAL REMEDIAL ACTIONS FOR THE MINKER/STOUT/ROMAINE CREEK SITE. DURING THIS TIME, EPA HAS STUDIED THE DEVELOPMENT OF ALTERNATIVE TECHNOLOGIES AND HAS FUNDED RESEARCH EFFORTS TO ANALYZE ALTERNATIVE TECHNOLOGIES AS A PART OF THE NATIONAL DIOXIN STRATEGY AND SITE (SUPERFUND INNOVATIVE TECHNOLOGY EVALUATION) PROGRAM. TO DATE, THERMAL TREATMENT IS THE ONLY ALTERNATIVE TECHNOLOGY THAT HAS DEMONSTRATED, ON A LARGE SCALE, REMOVAL EFFICIENCIES FOR DIOXIN IN SOIL WHICH ENABLE DELISTING AND ACHIEVE PROTECTIVENESS.

IN THE LAST FEW YEARS, SEVERAL THERMAL TREATMENT TECHNOLOGIES HAVE BEEN SUFFICIENTLY DEVELOPED THAT THEY COULD POTENTIALLY BE APPLIED TO THE CONTAMINATED SOILS AT THE M/S/RC SITE. EPA BELIEVES THAT THE COMPETITIVE BIDDING PROCESS WILL ALLOW THE MOST COST-EFFECTIVE THERMAL TREATMENT TECHNOLOGY TO BE SELECTED FOR THE PROJECT. EPA DOES NOT BELIEVE THAT NEW THERMAL TREATMENT TECHNOLOGIES WILL BE DEVELOPED IN THE NEAR FUTURE WHICH WILL BE MORE COST-EFFECTIVE THAN THE TECHNOLOGIES CURRENTLY AVAILABLE. EPA HAS MADE A COMMITMENT TO REMOVE THIS SOIL AS EXPEDITIOUSLY AS POSSIBLE, WITHIN 10 YEARS AT THE LATEST. GIVEN THE LEAD TIMES REQUIRED TO ESTABLISH AND PERMIT A TREATMENT UNIT, EPA BELIEVES THAT IT IS NECESSARY TO MAKE A DECISION AT THIS TIME AND TO BEGIN WORK ON IMPLEMENTING THE SOLUTION.

INFORMATION REGARDING THE COST OF THERMAL TREATMENT HAS GREATLY IMPROVED SINCE THE RELEASE OF THE FEASIBILITY STUDY DUE TO EXPERIENCE WITH TREATMENT OF HAZARDOUS MATERIALS BOTH WITHIN AND OUTSIDE THE AGENCY. EPA BELIEVES THAT THE TECHNOLOGY HAS BEEN DEVELOPED AND DEMONSTRATED TO THE DEGREE NECESSARY TO PREPARE ACCURATE COST PROJECTIONS. THE ACTUAL COST TO THERMALLY TREAT THE SOIL WILL BE DETERMINED BY INDUSTRY AND MARKET CONDITIONS AT THE TIME THAT A CONTRACT IS AWARDED FOR THE WORK.

ALTERNATIVE SELECTED

SEVERAL COMMENTS EITHER ADDRESSED THE ALTERNATIVE EPA HAS TENTATIVELY SELECTED OR RECOMMENDED THAT EPA CONSIDER OR CHOOSE A DIFFERENT ALTERNATIVE.

TWO COMMENTS SUPPORTED THE OFFSITE THERMAL TREATMENT ALTERNATIVE AND THE PROPOSAL OF THE STATE TO LOCATE A THERMAL TREATMENT UNIT IN TIMES BEACH AS A LOGICAL CHOICE.

AS INDICATED IN THE PROPOSED PLAN, EPA IS PROPOSING TO USE TIMES BEACH AS THE SITE FOR A TEMPORARY THERMAL TREATMENT UNIT.

ONE COMMENT SUGGESTED THAT EPA LET THE SUN DESTROY THE DIOXIN. THE SUGGESTION IS BASED ON EVIDENCE THAT DIOXIN ON SOIL CAN BE DESTROYED BY THE ACTION OF SUNLIGHT.

EPA HAS EVALUATED THE EVIDENCE THAT SUNLIGHT DESTROYS DIOXIN ON CONTAMINATED SOIL AT SITES IN MISSOURI AND FINDS THAT THERE IS MUCH STRONGER EVIDENCE THAT THE PROCESS OF DESTRUCTION, IF IT OCCURS AT ALL, IS TOO SLOW AND MUCH TOO INEFFICIENT TO TAKE ADVANTAGE OF IN CLEANING UP CONTAMINATED SITES.

SOME OF THE MOST COMPELLING EVIDENCE COMES FROM EPA'S OWN SAMPLING EFFORTS IN MISSOURI. AT THE CASTLEWOOD SITE AS AN EXAMPLE, THERE WAS CONTAMINATION AT VERY SHALLOW DEPTHS, INCLUDING CONTAMINATED DUST ON THE SURFACE OF PAVED ROADS, THAT HAD NOT BEEN DESTROYED BY THE SUN OVER A PERIOD OF SEVERAL YEARS. EPA SAMPLED EXTENSIVELY ALONG THE ROADWAYS IN THE CASTLEWOOD AREA, AND DETECTED DIOXIN CONTAMINATION UP TO 60 PARTS PER BILLION AT THE SURFACE. EPA BELIEVES THIS DEMONSTRATES THAT THE ACTION OF SUNLIGHT IS EITHER INSUFFICIENT OR TOO SLOW TO BE UTILIZED AS AN IN-SITU METHOD TO DECONTAMINATE SITES.

EPA HAS RESPONDED TO THIS SUGGESTION AT GREATER LENGTH IN A LETTER TO THE PERSON MAKING THE COMMENT AT THE PUBLIC MEETING.

ONE COMMENTOR STATED THAT EPA SHOULD NOT ELIMINATE THE MINE STORAGE ALTERNATIVE ONLY DUE TO THE LACK OF PERMITTING STANDARDS FOR THIS TYPE OF A FACILITY. THE COMMENTOR RECOMMENDED THAT EPA SELECT MINE STORAGE AS THE REMEDY BECAUSE THERMAL TREATMENT WOULD BE MORE EXPENSIVE, LESS PROTECTIVE OF HUMAN HEALTH, AND NO MORE PROTECTIVE OF THE ENVIRONMENT.

AS DISCUSSED IN THE FEASIBILITY STUDY, THERMAL TREATMENT OF CONTAMINATED SOILS PROVIDES A HIGHER DEGREE OF LONG-TERM PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT THAN MINE DISPOSAL. THERMAL TREATMENT ELIMINATES THE POTENTIAL FOR FUTURE EXPOSURE TO THE TREATED MATERIAL. THERE IS A RISK OF FUTURE RELEASE FROM ANY TYPE OF LAND DISPOSAL UNIT, INCLUDING UNDERGROUND MINES. CATASTROPHIC FAILURE OF A MINE USED FOR STORAGE OF CONTAMINATED MATERIAL COULD RESULT IN A TREMENDOUS ADDITIONAL COST TO CONTROL POTENTIAL RELEASE OF CONTAMINANTS INTO THE ENVIRONMENT.

THERE ARE SHORT-TERM RISKS ASSOCIATED WITH THERMAL TREATMENT INCLUDING THE POTENTIAL FOR AIRBORNE RELEASE OF PRODUCTS OF INCOMPLETE COMBUSTION (PICS). THESE RISKS CAN BE CONTROLLED BY PROPER OPERATING CONDITIONS, AIR POLLUTION CONTROL EQUIPMENT, AND SAFETY DEVICES. THERE ARE SHORT-TERM RISKS ASSOCIATED WITH BOTH TREATMENT AND MINE DISPOSAL DURING TRANSPORT OF CONTAMINATED MATERIAL OVER PUBLIC ROADWAYS AND ASSOCIATED SOIL HANDLING ACTIVITIES.

EPA IS REQUIRED TO SELECT THE MOST COST-EFFECTIVE REMEDIAL ALTERNATIVE, NOT SIMPLY THE LOWEST COST. THE ADDITIONAL BENEFIT THAT THERMAL TREATMENT OFFERS, I.E. PERMANENT

DESTRUCTION OF THE CONTAMINATION, JUSTIFIES THE ADDITIONAL EXPENSE. NO OTHER ALTERNATIVE OFFERS THIS DEGREE OF SHORT- AND LONG-TERM PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT AT A LOWER COST. THERMAL TREATMENT IS THEREFORE THE MOST COST-EFFECTIVE ALTERNATIVE.

EPA IS REQUIRED TO SELECT A REMEDIAL ALTERNATIVE WHICH ATTAINS ALL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR THE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT. THE RESOURCE CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED (RCRA) IS APPLICABLE TO THE DISPOSAL OF DIOXIN-CONTAMINATED SOIL FROM THE M/S/RC SITE IN UNDERGROUND MINES. THE IMPLEMENTING REGULATIONS OF RCRA SPECIFICALLY STATE THAT DIOXIN WASTE CAN NOT BE DISPOSED OF IN UNDERGROUND MINES PRIOR TO THE DEVELOPMENT OF APPROPRIATE REGULATIONS. AN EXEMPTION FROM THIS REGULATION UNDER SARA HAS NOT BEEN IDENTIFIED. EPA THEREFORE CAN NOT SELECT DISPOSAL IN UNDERGROUND MINES FOR THE DIOXIN-CONTAMINATED SOIL AT THE M/S/RC SITE.

ONE COMMENTOR SUGGESTED THAT EPA SHOULD DEVELOP AN INTEGRATED SOLUTION FOR ALL OF THE DIOXIN SITES IN EASTERN MISSOURI. IF ANALYZED IN THIS WAY, A MORE EFFICIENT THERMAL TREATMENT UNIT COULD BE JUSTIFIED, WHICH WOULD SUBSTANTIALLY REDUCE OVERALL COSTS.

THE TIMES BEACH FEASIBILITY STUDY EVALUATED LOCATING A TEMPORARY THERMAL TREATMENT UNIT AT TIMES BEACH THAT WOULD BE USED TO DECONTAMINATE THE SOIL FROM TIMES BEACH AND THREE OTHER IDENTIFIED SITES, INCLUDING CASTLEWOOD, QUAIL RUN, AND THE M/S/RC SITE. THE PROPOSED PLAN HAS EXPANDED THIS CONCEPT TO INCLUDE A TOTAL OF 26 IDENTIFIED POTENTIAL SITES FOR CENTRALIZED THERMAL TREATMENT AT TIMES BEACH. A SINGLE CENTRALIZED FACILITY IS MORE COST-EFFECTIVE THAN MANY INDIVIDUAL ONSITE UNITS SINCE MULTIPLE ONE-TIME COSTS ARE ELIMINATED (MOBILIZATION, DEMOBILIZATION, ETC.), AND ECONOMIES OF SCALE RESULT FROM DESIGN OF A LARGER UNIT CAPABLE OF TREATING LARGE QUANTITIES OF SOIL MORE EFFICIENTLY.

TECHNICAL

EPA RECEIVED MANY COMMENTS THAT ADDRESSED TECHNICAL ISSUES OR QUESTIONS.

ONE COMMENT SUGGESTED THAT EPA UNDERTAKE A MUCH LARGER SAMPLING EFFORT IN ORDER TO ESTABLISH THE EXACT AREAL AND VERTICAL EXTENT OF THE CONTAMINATION. THIS, THE COMMENTOR STATED, WOULD ALLOW EPA TO ESTABLISH BEFOREHAND THE DEPTH TO ENABLE EPA TO EXCAVATE THE PROPER AMOUNT OF SOIL IN A SINGLE PASS. THE COMMENTOR SUGGESTED THAT THIS WOULD BE MORE EFFICIENT THAN THE ITERATIVE EXCAVATION AND SAMPLING METHOD EPA HAS BEEN USING BECAUSE IT WOULD NOT INVOLVE LONG DELAYS DURING EXCAVATION WHILE WAITING FOR RESULTS OF THE SAMPLING.

THE FEASIBILITY STUDY OF FINAL REMEDIAL ACTIONS FOR THE MINKER/STOUT/ROMAINE CREEK SITE DOES NOT ADDRESS THE PROCEDURE USED FOR EXCAVATION OF CONTAMINATED SOIL. THE FEASIBILITY STUDY ASSUMES THAT THE CONTAMINATED SOIL FROM THE SITE HAS BEEN PREVIOUSLY EXCAVATED AND PLACED IN INTERIM ONSITE STORAGE. A DISCUSSION OF THE EXCAVATION PROCEDURE FOLLOWS, ALTHOUGH THE COMMENT IS NOT INCLUDED IN THE SCOPE OF THIS RESPONSIVENESS SUMMARY.

THE EXCAVATION PROCEDURE CURRENTLY UTILIZED BY EPA DURING REMOVAL OF CONTAMINATED SOIL IS COST-EFFECTIVE AND NECESSARY TO PROVIDE ASSURANCE THAT CLEANUP CRITERIA ARE BEING ACHIEVED, WHILE MINIMIZING THE AMOUNT OF SOIL THAT IS EXCAVATED. EPA REGION VII HAS GAINED CONSIDERABLE EXPERIENCE WITH SOIL SAMPLING DURING INVESTIGATION OF THE MISSOURI DIOXIN SITES. A NUMBER OF STUDIES HAVE BEEN PERFORMED TO COMPARE THE RELIABILITY OF VARIOUS SAMPLING TECHNIQUES. EPA HAS DETERMINED THAT SPECIAL SAMPLE COLLECTION PROCEDURES INVOLVING TRENCHING AND LATERAL SAMPLING ARE REQUIRED IN ORDER TO OBTAIN REPRESENTATIVE SOIL SAMPLES AT DEPTH BELOW THE SURFACE FOR DIOXIN ANALYSIS IN THE PARTS PER BILLION RANGE. TRENCHING AND LATERAL SAMPLING ARE REQUIRED DUE TO CONTAMINATION OF THE SAMPLE WHICH OCCURS FROM MORE HIGHLY CONTAMINATED SOIL AT SHALLOWER DEPTHS USING CONVENTIONAL SAMPLING PROCEDURES. TRENCHING AND LATERAL SAMPLING IS VERY LABOR-INTENSIVE AND COSTLY RELATIVE TO THE COLLECTION OF SAMPLES FROM THE SURFACE USING CONVENTIONAL METHODS.

THE SAMPLING PROTOCOL WHICH IS CURRENTLY UTILIZED DURING THE REMOVAL OF DIOXIN-CONTAMINATED SITES IN MISSOURI WAS DEVELOPED BY EPA AND OTHER STATE AND FEDERAL

AGENCIES INVOLVED, INCLUDING THE CENTERS FOR DISEASE CONTROL, MISSOURI DEPARTMENT OF NATURAL RESOURCES, AND MISSOURI DIVISION OF HEALTH. THE CLEANUP CRITERIA ESTABLISHED BY THESE HEALTH AGENCIES IS BASED UPON DETERMINATION OF DIOXIN CONCENTRATIONS USING THIS PROCEDURE. THIS SAMPLING PROTOCOL DETERMINES THE AVERAGE DIOXIN CONCENTRATION WITHIN INDIVIDUAL CLEANUP SECTIONS AT A SITE TO THE 95% UPPER CONFIDENCE LEVEL, AND REQUIRES THE COLLECTION OF INDIVIDUAL SOIL SAMPLES FROM AT LEAST 150 LOCATIONS WITHIN EACH 5,000 SQUARE FOOT PORTION OF A SITE. THIS SAMPLING IS PERFORMED PRIOR TO EXCAVATION AND DEFINES THE AREAL EXTENT OF CONTAMINATION.

IN CONSIDERATION OF THE NUMBER OF SAMPLES THAT ARE REQUIRED TO DETERMINE IF CLEANUP CRITERIA ARE ACHIEVED, IT IS MORE COST-EFFECTIVE TO DETERMINE DIOXIN CONCENTRATIONS AT THE SURFACE, EXCAVATE, AND RESAMPLE, THAN TO ATTEMPT TO DEFINE THE VERTICAL EXTENT OF CONTAMINATION PRIOR TO EXCAVATION USING THE LABOR-INTENSIVE TRENCHING METHOD. IF A SINGLE-PASS APPROACH TO EXCAVATION WAS EMPLOYED, AS SUGGESTED BY THE COMMENTOR, THE SAME DEGREE OF VERIFICATION SAMPLING PERFORMED FOLLOWING EXCAVATION WOULD STILL BE REQUIRED TO DETERMINE IF CLEANUP CRITERIA ARE MET. THE ONLY COST SAVINGS RESULTING FROM A SINGLE-PASS APPROACH WOULD BE A REDUCED LIKELIHOOD THAT ADDITIONAL EXCAVATION WOULD BE REQUIRED TO MEET CLEANUP CRITERIA. THIS COST SAVINGS WOULD BE SURPASSED BY THE INCREASED COST FOR THE INITIAL DETERMINATION OF THE VERTICAL EXTENT OF CONTAMINATION.

THE SAMPLING AND EXCAVATION PROCEDURE CURRENTLY EMPLOYED BY EPA IS DESIGNED TO MINIMIZE THE NUMBER OF SAMPLING/EXCAVATION ITERATIONS WHICH ARE NECESSARY TO ACHIEVE CLEANUP CRITERIA. THIS IS DONE BY RECOGNIZING THE CORRELATION BETWEEN THE INITIAL SURFACE CONCENTRATION AND THE REQUIRED DEPTH OF EXCAVATION. THE INITIAL DEPTH OF SOIL EXCAVATED IN EACH CLEANUP SECTION IS ADJUSTED ACCORDING TO THE SURFACE CONCENTRATION DETERMINED PRIOR TO EXCAVATION.

IN ADDITION, THE EXCAVATION CREW IS NOT DELAYED WHILE AWAITING SAMPLING RESULTS. THE SITE IS DIVIDED INTO SECTIONS WHICH ARE EXCAVATED AND SAMPLED INDEPENDENTLY. WHILE WAITING FOR ANALYTICAL RESULTS FROM ONE SECTION, EXCAVATION PROCEEDS ON OTHER SECTIONS. ANALYTICAL RESULTS ARE AVAILABLE WITHIN 24 HOURS OF SUBMITTING THE SAMPLES TO THE LABORATORY.

A QUESTION WAS ASKED REGARDING THE ESTIMATE OF 20,000 CUBIC YARDS FOR THE AMOUNT OF SOIL TO BE EXCAVATED. THE COMMENTOR WAS CONCERNED THAT THE FIGURE MIGHT BE MUCH HIGHER THAN NECESSARY.

NOTED IN RESPONSE TO A QUESTION AT THE PUBLIC MEETING, THERE IS UNCERTAINTY IN THE VOLUME OF CONTAMINATED SOIL AT A SITE UNTIL SOIL REMOVAL HAS BEEN COMPLETED. THE ESTIMATE OF 20,000 CUBIC YARDS IN THE FEASIBILITY STUDY REPRESENTS AN UPPER-BOUND ESTIMATE WHICH WAS DERIVED TO MAKE IT POSSIBLE TO COMPARE COSTS OF ALTERNATIVES. THE ESTIMATE WAS SUFFICIENTLY ACCURATE, ON THE BASIS OF THE DATA AVAILABLE AT THE TIME OF PREPARATION OF THE FEASIBILITY STUDY, TO ALLOW A VALID COMPARISON OF ALTERNATIVES. SINCE THE COMPLETION OF THE FEASIBILITY STUDY, THE REMOVAL OF SOIL AT THE MINKER AREA HAS BEEN COMPLETED, AND ADDITIONAL SAMPLING HAS BEEN PERFORMED AT THE ROMAINE CREEK AND STOUT PORTIONS OF THE SITE. THE CURRENT ESTIMATE FOR THE TOTAL VOLUME OF DIOXIN-CONTAMINATED MATERIAL AT ALL PORTIONS OF THE SITE IS 12,000 CUBIC YARDS. EPA BELIEVES THAT THE COMPARISON OF ALTERNATIVES PERFORMED IN THE FEASIBILITY STUDY IS VALID FOR THIS CONTAMINATED SOIL VOLUME. EPA HAS UPDATED THE COST ESTIMATE FOR OFFSITE THERMAL TREATMENT IN CONSIDERATION OF THIS REVISED SOIL VOLUME ESTIMATE AND OTHER EXPERIENCE GAINED SINCE PREPARATION OF THE FEASIBILITY STUDY. THIS EVALUATION IS PRESENTED IN THE PROPOSED PLAN.

ONE COMMENTOR AGREED THAT THERMAL TREATMENT REPRESENTS A PERMANENT AND TECHNICALLY FEASIBLE ALTERNATIVE, BUT TOOK EXCEPTION TO SOME ASSUMPTIONS IN THE STUDY REGARDING THE VARIOUS INCINERATION ALTERNATIVES. SPECIFICALLY, AN OFFSITE INDIRECT-FIRED THERMAL TREATMENT UNIT WAS RECOMMENDED AS MORE COST-EFFECTIVE DUE TO THE SMALLER GAS HANDLING EQUIPMENT REQUIRED AND LOWER FUEL CONSUMPTION.

THE PROPOSED PLAN IDENTIFIES THERMAL TREATMENT AS A COMPONENT OF THE PREFERRED ALTERNATIVE. THERMAL TREATMENT REPRESENTS A NUMBER OF RELATED TECHNOLOGIES, INCLUDING INCINERATION. ROTARY KILN INCINERATION WAS ASSUMED IN THE FEASIBILITY STUDY FOR THE

PURPOSE OF EVALUATING COSTS, DUE TO THE AMOUNT OF INFORMATION REGARDING THIS PARTICULAR TECHNOLOGY WHICH IS AVAILABLE IN THE LITERATURE, AND INDUSTRY AND AGENCY EXPERIENCE WITH IT USE.

THE TYPE OF THERMAL TREATMENT TO BE IMPLEMENTED IS NOT SPECIFIED IN THE PROPOSED PLAN, AND WILL NOT BE SELECTED IN THE RECORD OF DECISION. EPA EXPECTS TO ADVERTISE PERFORMANCE-BASED BID SPECIFICATIONS TO PROVIDE THERMAL TREATMENT SERVICES FOR THE CONTAMINATED MATERIALS. EPA WILL SPECIFY PERFORMANCE REQUIREMENTS WHICH MUST BE MET BY THE THERMAL TREATMENT UNIT.

IT HAS BEEN THE AGENCY'S EXPERIENCE THAT THE COST OF LABOR REPRESENTS THE PRIMARY COST OF THERMAL TREATMENT. ENERGY COSTS COMPRISE A SMALLER PORTION OF THE TOTAL COST OF OPERATING AN INCINERATOR. IF THIS HOLDS TRUE FOR OTHER TYPES OF THERMAL TREATMENT UNITS, THE ENERGY COST SAVINGS OF INDIRECT-FIRED THERMAL TREATMENT MIGHT NOT REPRESENT A SIGNIFICANT FRACTION OF THE TOTAL COSTS.

ONE COMMENTOR QUESTIONED THE APPROPRIATENESS OF THE ONE PART PER BILLION CLEANUP LEVEL IN CONSIDERATION OF RECENT IMPROVEMENTS IN THE EXPOSURE AND RISK ESTIMATING METHODS USED FOR ASSESSING THE POTENTIAL HEALTH EFFECTS OF DIOXIN. THE COMMENTOR RECOMMENDS THAT EPA REASSESS THE EXPOSURE ASSUMPTIONS AND HEALTH RISK FACTORS USED IN THE PREVIOUS RISK ASSESSMENTS.

THE CLEANUP LEVEL IS NOT AN ISSUE IN THIS FEASIBILITY STUDY. THIS STUDY AND THE DECISION PROCESS THAT EPA IS INITIATING, ASSUMES THAT THE CONTAMINATED SOIL HAS BEEN EXCAVATED AND PLACED IN STORAGE. AN EXPLANATION OF THE CLEANUP LEVELS ESTABLISHED FOR THE SITE IS PROVIDED, ALTHOUGH THIS ISSUE IS NOT INCLUDED IN THE SCOPE OF THE FEASIBILITY STUDY OR THIS RESPONSIVENESS SUMMARY.

AS EXPLAINED IN THE PROPOSED PLAN, A PAPER WAS PUBLISHED IN 1984 BY RENATE D. KIMBROUGH, M.D., ET AL., OF THE CENTER FOR ENVIRONMENTAL HEALTH, CENTERS FOR DISEASE CONTROL, WHICH EVALUATED ACCEPTABLE CONCENTRATIONS OF DIOXIN IN SOIL FOR RESIDENTIAL SETTINGS. A RISK ASSESSMENT WAS PERFORMED IN THIS PAPER WHICH CONCLUDED THAT DIOXIN CONCENTRATIONS EXCEEDING 1 PART PER BILLION (PPB) IN RESIDENTIAL SOILS POSE A LEVEL OF CONCERN FOR HUMAN HEALTH. THIS RECOMMENDATION HAS FORMED THE BASIS FOR THE CRITERION OF 1 PPB WHICH HAS BEEN APPLIED DURING THE CLEANUP OF ALL RESIDENTIAL SITES IN MISSOURI, TO DATE, INCLUDING THE M/S/RC SITE. THE CENTERS FOR DISEASE CONTROL HAS RECENTLY AFFIRMED THAT THE RISK ASSESSMENT PRESENTED IN THE 1984 PAPER REMAINS VALID IN CONSIDERATION OF ALL SCIENTIFIC EVIDENCE CURRENTLY AVAILABLE.