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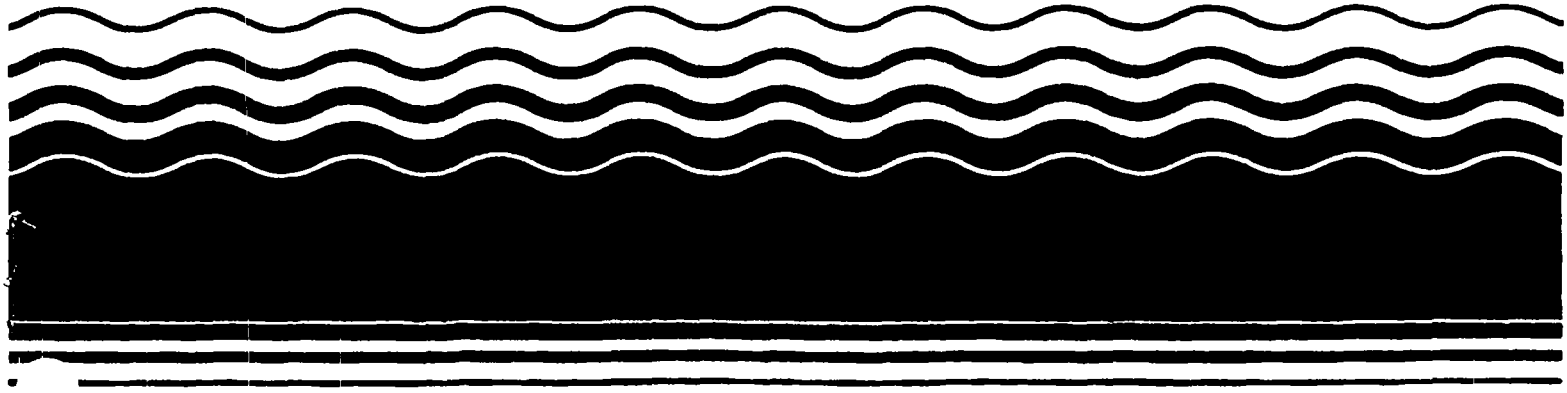
March 1999

EPA Superfund
Record of Decision Amendment:

Moss-American
(Kerr-McGee Oil Co.)
Milwaukee, WI
9/30/1998



Declaration for an Amendment to the Record of Decision

Purpose

The purpose of this decision document is to present an amendment to the Record of Decision (ROD) for the Moss-American Site, which is located in Milwaukee, Wisconsin. This decision was reached in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and the National Contingency Plan (NCP).

Basis

The decision to amend the ROD is based upon the administrative record. The index attached to the amended ROD identifies the items that comprise the administrative record upon which the selection of the amended portion of the remedial action is based.

Description of the Amendment

The ROD amendment for the Moss-American site has three principal components: 1) changes in soil treatment technology, 2) potential changes in cleanup standards, and 3) changes in cover design and requirements.

Soil Treatment Technology

First, the ROD is amended to replace the biodegradation treatment system with low temperature thermal desorption. As described in the ROD originally developed for this site, areas of more highly contaminated soils were to undergo treatment utilizing biodegradation in the form of a bioslurry technique prior to consolidation and containment with less contaminated soil areas.

Cleanup standards

Second, the ROD amendment allows for the utilization of new cleanup standards for the portion of the site referred to as the "former wood preserving facility" owned by the Union Pacific Railroad and Milwaukee County, provided certain conditions are met. The ROD amendment recognizes that it may be appropriate to adopt industrial or recreational exposure scenarios for site users exposed to contaminants of concern in surface soils. Portions of the site owned by Union Pacific Railroad, and upland site areas of the former wood preserving facility owned by Milwaukee County could utilize an industrial usage risk exposure scenario if deed restrictions are signed and recorded which limit the use of the property. If appropriate land use restriction are obtained, then Union Pacific site property and upland areas of Milwaukee County site property can use the industrial soil cleanup standards established in Wisconsin Administrative Code NR 720 for direct contact and for the protection of groundwater. For Milwaukee County property which is part of the former wood preserving facility and which is located in the floodplain of the Little Menomonee River, a recreational exposure scenario may be appropriate if deed restrictions are signed and recorded which limit the use of the property to recreational uses. If this type of

land use restriction is effectuated, then soil cleanup standards established under ch. NR 720, for recreational land use can be utilized. Control measures attendant to appropriate soil erosion and runoff protection shall also be employed so that contaminants associated with those soils do not pose an undue threat to sediment quality in the nearby Little Menomonee River. U.S. EPA expects that it would take no longer than 180 days after the date of issuance of this decision to secure necessary deed restrictions. If the appropriate land use restrictions and maintenance agreements can not be obtained for any given portion of the former wood preserving facility within this 180- day timeframe, then soil cleanup standards established under Wisconsin Administrative Code NR 720 for residential land use, or the soil cleanup standards set forth in the 1990 ROD must be attained for that portion of the Site. Soils exceeding those standards shall be excavated, and if necessary, treated, prior to consolidation in a new disposal unit established pursuant to Hazardous Waste Corrective Action Management Unit (CAMU) requirements.

Cover

Finally, reconsideration is also given herein to the appropriate means of containing treated residuals, from the more highly contaminated soils and sediments, as well as soils with low levels of contamination. Given the nature of the primary contaminants of concern, a waiver was considered and granted in the original ROD so as to allow usage of a relatively permeable soil cover. The theory behind this decision was that the flushing action allowed by such a cover would drive the remaining relatively low levels of contaminants out of the soil mass and into the groundwater, such that groundwater cleanup goals could be attained in a relatively short time span, on the order of five to ten years. However, predesign field work at the site indicated not only that free product creosote was present near the soil/groundwater interface, but also that it was present in relatively large extractable quantities. Creosote associated with groundwater is a subset of those contaminants known as dense nonaqueous phase liquids (DNAPLs). The presence of such materials complicates groundwater management.

Beginning in 1995, efforts began at the site to extract such DNAPLs, and arrange for their off-site shipment. Some soil zones selected for thermal desorption treatment were chosen because of their association with free-product creosote. Hence, DNAPL control efforts have been/will be conducted. In 1997, an Explanation of Significant Differences (ESD) was issued to revise the groundwater remedy to include containment components utilizing sheet walls and in-situ treatment of groundwater. This will effectively minimize the spread of contaminants and DNAPL materials in the soils and groundwater regardless of the amount of infiltration into the contamination zone. Therefore, the need for flushing is minimized, and the groundwater restoration should be relatively unaffected by the amount of infiltration allowed through a cover system. The design of any cover system should be based on what is protective of human health and the environment, given the nature of the material to be covered, and what meets applicable and relevant and appropriate requirements (ARARs). As set forth in the section of this document concerning soil cover and Corrective Action Management Unit (CAMU), depending on the level of soil treatment provided, a clay cap topped with a suitable frost-protection soil layer or a simple soil cover may be used to replace the soil cover originally selected. A new disposal unit will be established pursuant to CAMU requirements under Wisconsin Chapter NR 636. CAMU allows consolidation and placement of certain hazardous remediation wastes without triggering new disposal events which would otherwise require application of land disposal requirements, and

liner and leachate collection systems, provided that the activity is protective of human health and the environment. Given the expected level of soil treatment efficiency, a CAMU can be utilized, without the subsurface synthetic membrane and leachate collection system that would constitute a hazardous waste containment cell.

Statutory Determinations

The selected remedy in this amendment is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. The 1990 ROD justified a waiver pursuant to Section 121(d)(4)(B) for a Subtitle C cap and for the State double-liner/leachate collection system requirement on the basis that an impermeable cap and liner would pose a greater risk to health and the environment by prolonging groundwater treatment and time needed to achieve groundwater goals. Given the greater presence of DNAPLs found since that time, waiver of a relatively impermeable cap is no longer justified. However, given the source control measures to be taken regarding soils, and the establishment of a CAMU, a double-liner /leachate collection system is not required. The remedy satisfies the statutory preference for treatment as a principal element. Because this remedy will result in hazardous substances remaining on site above health-based levels, a review will be conducted within five years after the commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment. The State of Wisconsin has indicated it will provide conditional concurrence with this Record of Decision Amendment. The State of Wisconsin's letter indicating this position will be included in the Administrative Record for the site.

9/30/99
DATE

William E. Muno, Director
Superfund Division

Table of Contents

Introduction

The eighty-eight acre Moss-American site includes the former location of the Moss-American creosoteing facility, several miles of the Little Menomonee River - a portion of which flows through the eastern half of the site - and adjacent flood plain soils (see Figures 1 and 2). The site is located in the northwestern section of the City of Milwaukee, County of Milwaukee, State of Wisconsin, at the southeast corner of the intersection of Brown Deer and Granville Roads, at 8716 Granville Road. Approximately 65 acres of the site are undeveloped Milwaukee County park land. Approximately 23 acres are owned by the Union Pacific Railroad, and are used as an automobile and other light vehicle transport, loading/unloading, and storage area.

The original ROD for the site was signed on September 27, 1990. The ROD addressed the collection and treatment of contaminated groundwater, excavation and treatment by soil washing/bioslurry techniques of more highly contaminated soils and sediments, consolidation of the treatment residuals with and containment of other contaminated soils, and the creation of a new river channel with subsequent filling in of the existing channel. Exposure scenarios used to evaluate health risks associated with the Moss-American site were site trespass scenario, river recreational use scenario, and a residential development scenario.

This document amends the original ROD in three limited ways.

Based upon site-specific pre-design treatability work, technical literature, and developments at certain other creosote sites being addressed under CERCLA, it appears unlikely that the bioslurry technique can attain soil cleanup standards and that selection of a new combination of treatment/containment measures so as to attain such standards is warranted. The remedy is amended to replace the bioslurry reactor with low temperature thermal desorption.

The Risk Assessment scenarios allow for the adoption of removal cleanup standards based on more realistic site use assumptions with the consequent application of new State ARARs for such uses. Since a portion of the site is in fact owned by an industrial entity, and since the United States Environmental Protection Agency (U.S. EPA) has received information indicating that such land usage classification is apt to continue, it appears appropriate to consider adoption of an industrial usage exposure scenario for that portion of the site now owned by the Union Pacific Railroad, provided that the necessary deed restrictions are obtained. There has been industrial development near this portion of the County property, located on the former wood preserving facility. Hence, for upland areas of Milwaukee County land which are part of the former creosote site and which are generally adjacent to Union Pacific property, the removal cleanup standards may be based on an industrial exposure scenario, if certain deed restrictions and assurances are secured within 180 days. (If requested, U.S. EPA - after consultation with WDNR

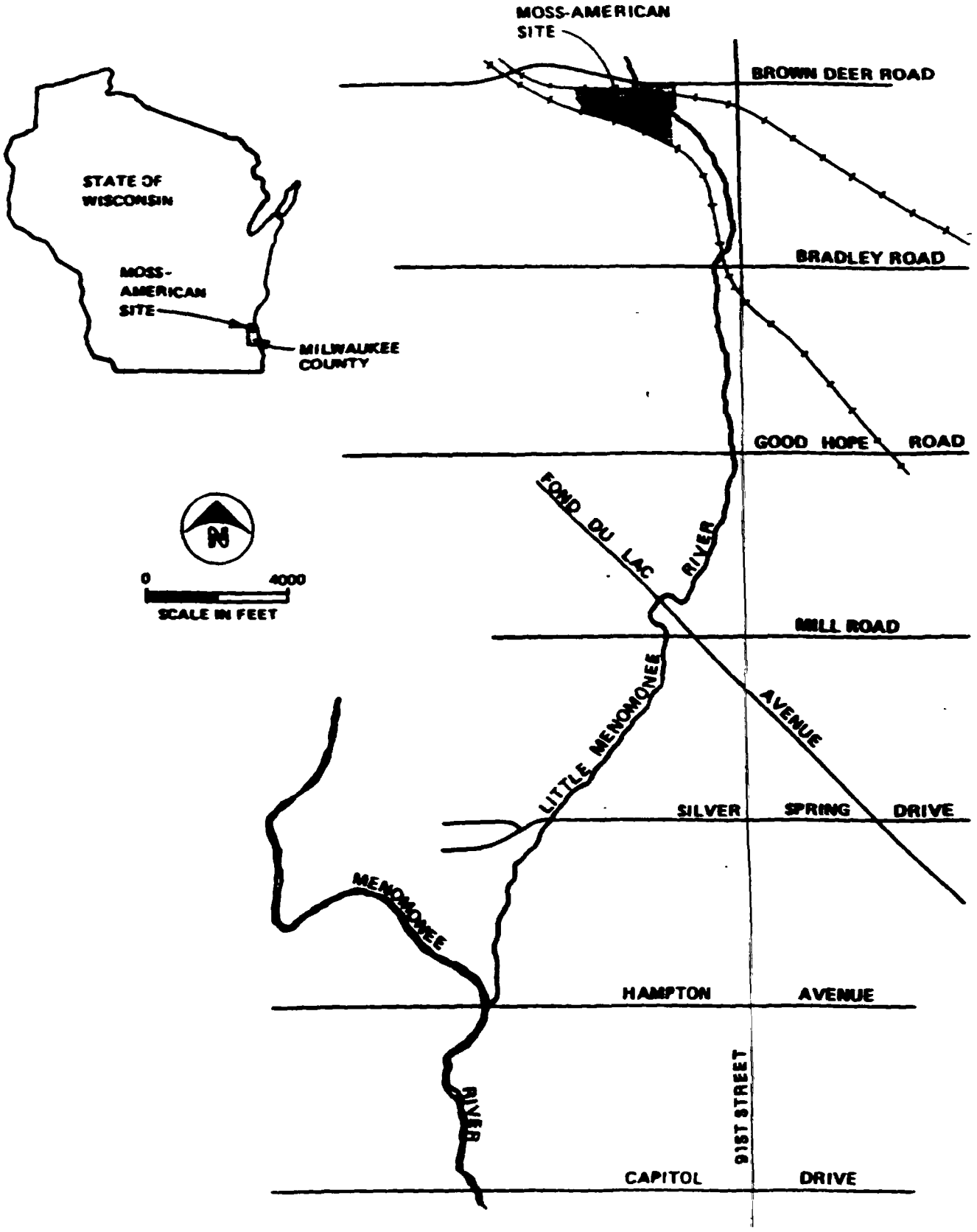


FIGURE 1
LOCATION MAP
MOSS-AMERICAN

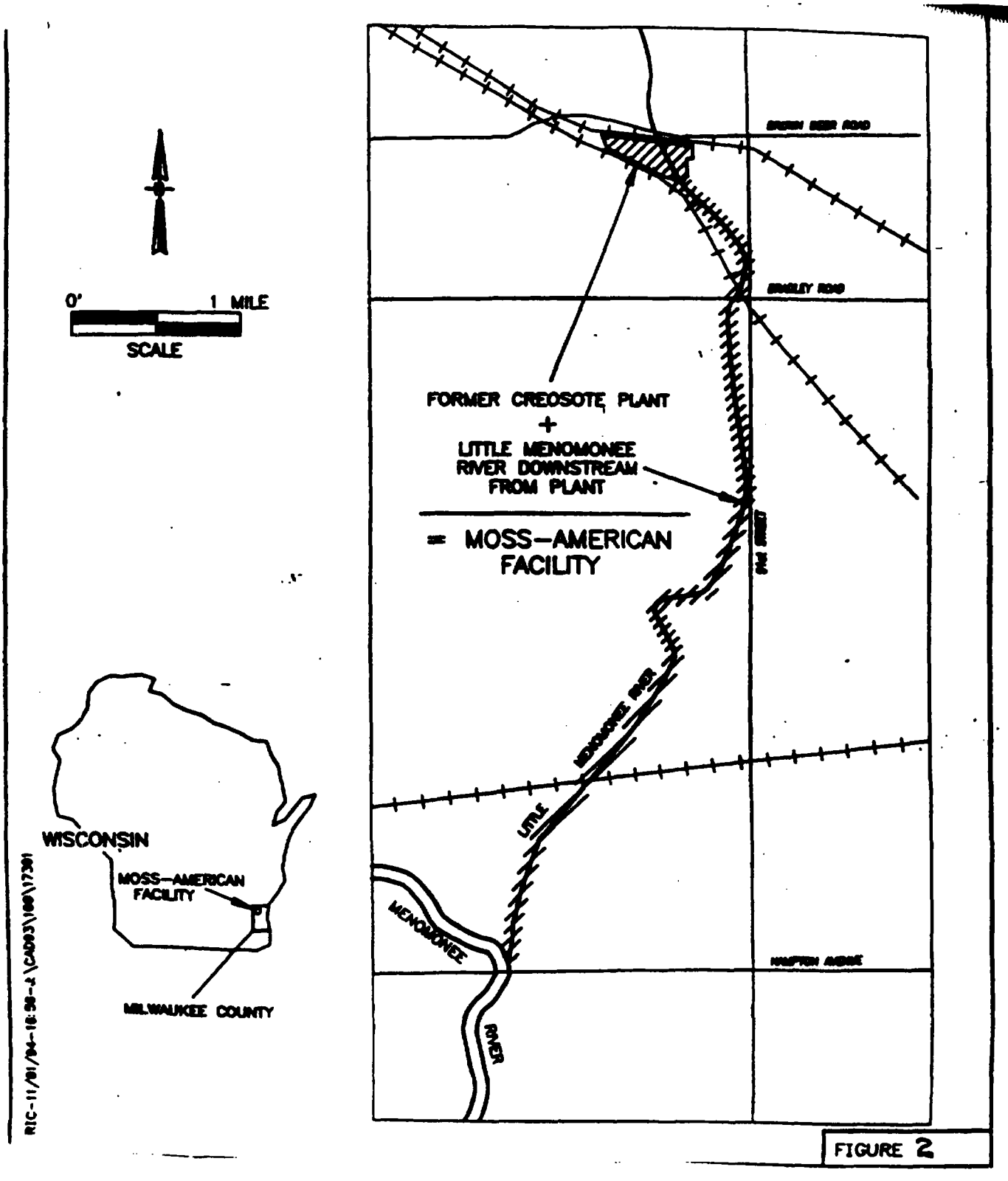

0'
1 MILE
SCALE
FORMER CREOSOTE PLANT
+
LITTLE MENOMONEE RIVER DOWNSTREAM FROM PLANT
= MOSS-AMERICAN FACILITY
BRADLEY ROAD
HAMPTON AVENUE
MENOMONEE RIVER
LITTLE
MENOMONEE
RIVER
WISCONSIN
MOSS-AMERICAN FACILITY
MILWAUKEE COUNTY

FIGURE 2

- may consider a brief extension of this timeframe). Within the former wood preserving facility, those Milwaukee County lands falling within the floodplain of the Little Menomonee River may be governed by soil removal cleanup standards based on recreational usage, if certain deed restrictions are secured. This is consistent with the system of parklands and trails maintained by Milwaukee County downstream of the former wood preserving facility and as discussed more fully in the Park and Open Space plan adopted by Milwaukee County in 1991. If necessary deed restrictions for a given portion of the site can not be obtained within 180 days from the date of this ROD Amendment, then the soil removal cleanup standard shall be the residential cleanup standard as established by NR 720, or the original 1990 ROD remedy shall be carried out.

Due to findings of free product and DNAPLs in the groundwater, U.S. EPA has reconsidered the appropriate means of containment for treated residuals, from more highly contaminated soils and sediments, as well as soils with lower levels of contamination. As flushing is no longer desirable, both the appropriate cover and the manner of addressing State liner and leachate collection system requirements have been reconsidered.

The lead agency for the remedial action at this site is the U.S. EPA. The State of Wisconsin's Department of Natural Resources (WDNR) is the support agency. This ROD amendment will become part of the Administrative Record file established for the Moss-American site.

These changes were precipitated by a more realistic assessment of Site conditions and treatment effectiveness gained from predesign findings. The treatment technology is being changed to thermal desorption because the innovative technology selected in the original ROD did not achieve cleanup standards in predesign tests. Although the topic of thermal desorption was noted briefly in the Moss-American Feasibility Study, thermal desorption treatment was not considered in detail in either the Proposed Plan developed in 1990, nor discussed in the original ROD. U.S. EPA concluded that the public could not have logically foreseen that the Agency might select this treatment technique in lieu of those previously discussed. In reviewing the soil treatment, U.S.EPA will consider more realistic risk assessment scenarios, consistent with current policy, provided new State ARARS can be met. The soil containment system also had to be reconsidered due to findings of DNAPLs and free product in the groundwater. Predesign field work at the site verified not only the presence of free-product creosote near the soil/groundwater interface, but also indicated that such materials are present in relatively large extractable quantities. Creosote associated with groundwater is a subset of those contaminants known as DNAPLs. The presence of such materials complicates groundwater management. Groundwater management has already been directed at efforts to enhance DNAPL removal since 1995 via the utilization of extraction wells and collection tanks. DNAPL management will continue through the selection of certain soil zones associated with the presence of free-product creosote for treatment. Since the degree of subsurface contamination has been found to be considerably larger than originally envisioned, the permeable cover selected in 1990 will be replaced by an impermeable cover constructed consistent with ARARs.

Therefore, in keeping with CERCLA section 117, 42 U.S.C. § 9617, and section 300.435(c)(2)(ii) of the NCP, 40 C.F.R. § 300.435(c)(2)(ii), the lead agency proposed an amendment to the ROD and allowed the public opportunity to comment on the proposed changes if such changes alter basic features of the ROD. For the original ROD, a public comment period was initiated on June 4, 1990 and extended to August 6, 1990. For the proposed ROD amendments, a public comment period was initiated on March 9, 1998 and was extended to May 8, 1998. A public meeting to consider the proposed plan and possible ROD amendments was held at Vincent High School near the site on March 18, 1998. Approximately 45 members of the public attended this meeting.

A response to the comments received during this period is included in the Responsiveness Summary, which is a part of this ROD amendment.

The information repository and administrative record are available locally for this site at the Mill Road Library, which is located at 6431 North 76th Street, Milwaukee, Wisconsin.

Site History

In 1921, the T. J. Moss Tie Company established a wood preserving facility west of the Little Menomonee River. The plant preserved railroad ties, poles, and fence posts with creosote, a mixture of numerous chemical compounds, derived from coal tar. While No. 6 fuel oil was also used, no evidence of pentachlorophenol usage was noted at the Moss-American site. Operations at a creosote plant often involve storage facilities for both creosote and fuels, a boiler used to make steam to heat the creosote and aid in application to the wood through usage of heat and pressure, incoming timber unloading/storage, transportation of timber to the creosote application facility by rail car, and subsequent storage in a drying area. After these processes were complete, the treated timbers could be shipped to customers. Potential for release of materials exists throughout the storage, application, and drying processes. See Figure 3 for an approximate location on site of where these processes were conducted.

Kerr-McGee purchased the facility in 1963 and changed the facility's name to Moss-American. The name was changed again in 1974 to Kerr-McGee Chemical Corporation - Forest Products Division. In 1998, the name of this company changed to Kerr-McGee Chemical LLC; it shall be referred to as KMC throughout the rest of this document.

From 1921 to 1971, the facility discharged wastes to settling ponds that ultimately discharged to the Little Menomonee River. These discharges ceased when the plant diverted its process water discharge to the Milwaukee sanitary sewerage system. Production at the facility ceased in 1976.

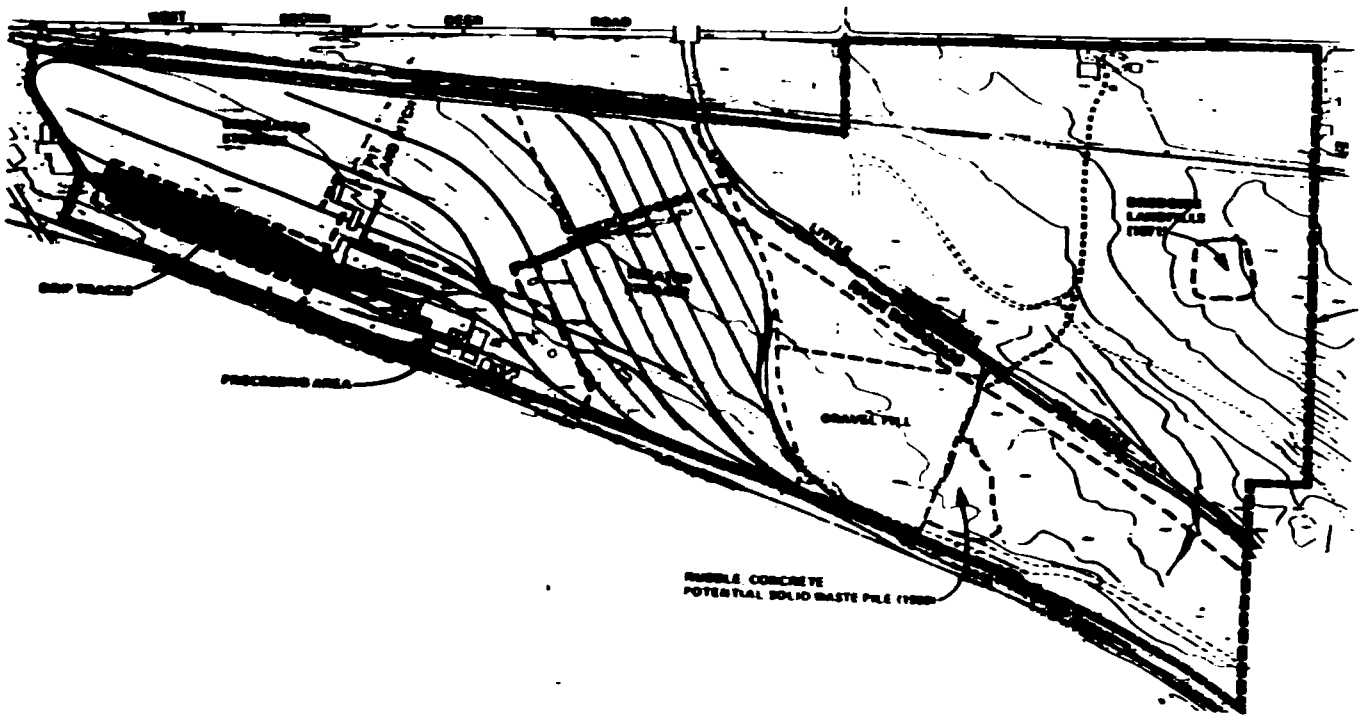


FIGURE 3
PAST PROCESS OPERATION AREAS

Under WDNR order, KMC cleaned out eight former settling ponds and dredged about 1,700 feet of river to remove creosote-contaminated soil and sediment. During 1972 to 1973, three different dredging efforts were conducted in the Little Menomonee River within the first mile downstream of the facility.

In 1983, the facility was placed on the National Priorities List (NPL) pursuant to Section 105 of CERCLA. U.S. EPA initiated a negotiation period with potentially responsible parties (PRPs) associated with the site to determine if the performance of a Remedial Investigation/Feasibility Study (RI/FS) would be privately conducted. However, such discussions did not result in settlement of this matter. Therefore, U.S. EPA determined in 1987 that it would conduct the RI/FS.

Following development of the 1990 ROD, U.S. EPA again entered into discussions with potentially responsible parties. On December 30, 1991, the United States lodged a consent decree with the Federal District Court for the Eastern District of Wisconsin in Milwaukee. This Consent Decree, which was signed by U.S. EPA, the State of Wisconsin and KMC, calls for implementation of the Remedial Design and Remedial Action set forth in the ROD by KMC. The County of Milwaukee and the Chicago and Northwester Railroad (later the Union Pacific Railroad) submitted comments on the Consent Decree. The County of Milwaukee filed objections to the Consent Decree and sought to intervene in the proceeding in 1992. U.S. EPA responded to the comments and objections in its 1993 Motion to Enter. The County withdrew its objections in February 1996, after reaching an agreement with U.S. EPA on past costs. The decree was entered by the Court in March 1996. See Figure 4 for an indication of current property ownership at the former creosote plant.

Despite limited site access during the 1991-1996 time frame, KMC has moved on with the accomplishment of certain tasks called for in the Statement of Work made a part of the decree. These include certain treatability study and predesign tasks examining issues related to verifying the presence and extent of free-product residues of creosote associated with soils just above the groundwater table, or as "pools" collecting at the soil/groundwater interface; refining estimates on the extent of contaminated sediment in the Little Menomonee River; refining estimates on the extent of contaminated soil on site; and further investigating and evaluating groundwater conditions on site, notably on the east side of the Little Menomonee River.

Based on the predesign results, U.S. EPA issued correspondence to KMC requesting that initial priority be given to removing the free product. Design, construction and installationof a removal system featuring use of extraction wells, conductivity probes to distinguish between creosote and groundwater, and supplementary storage tanks was undertaken in 1995. In 1997, U.S. EPA developed and WDNR concurred with issuance of an Explanation of Significant Differences (ESD) which would allow KMC to utilize an in-situ form of groundwater treatment known as a funnel and gate system. This involves placement of more porous soils to preferentially direct

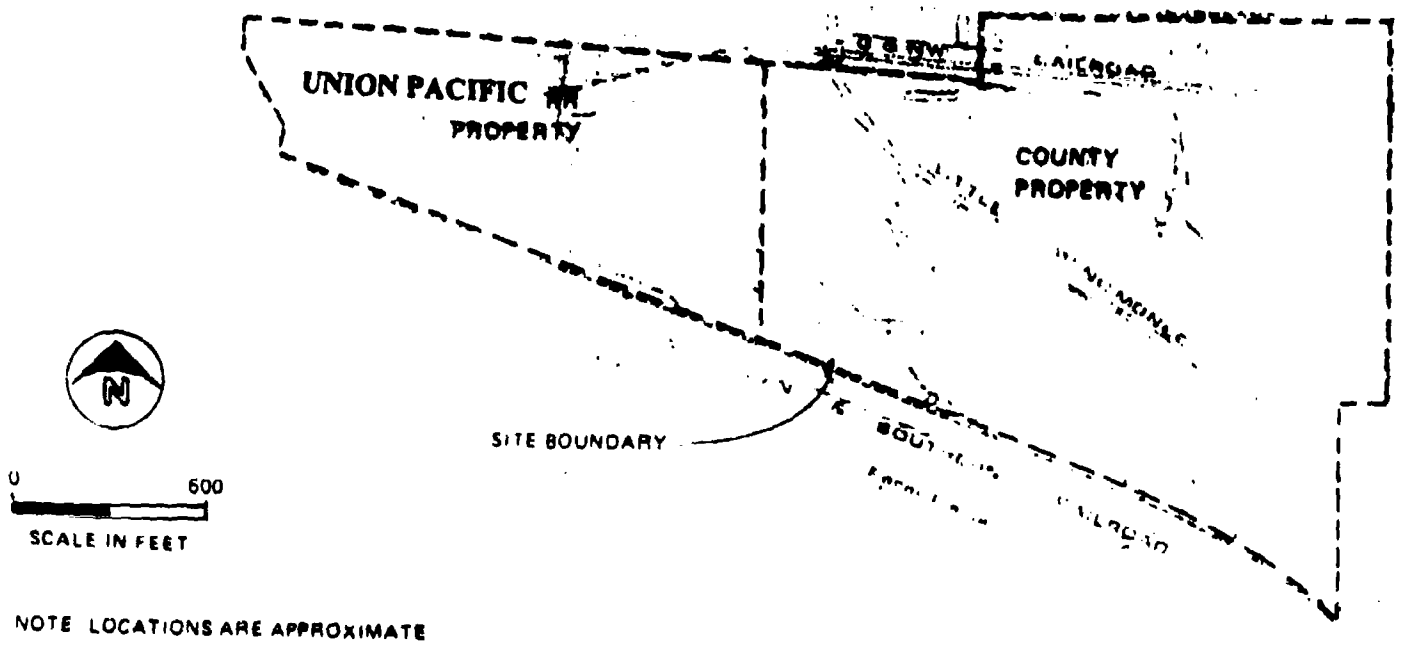


FIGURE 4
PROPERTY OWNERSHIP at FORMER CREOSOTE PLANT

groundwater flow, and introduction of air/oxygen, microbes and nutrients, if necessary, so as to enhance biological degradation of organic contaminants within groundwater. Groundwater polycyclic aromatic hydrocarbon (PAH) content appears to be mostly the 2-3 ring variety which may be successfully treated by a biological approach. In contrast, more complex 4-6 ring PAH compounds are more strongly associated with site soil. Such heavier compounds tend to resist biological attack. The funnel and gate concept is considered innovative and as such, treatment results will be monitored by U.S. EPA to gauge treatment efficiency. Design calls for three tiers of two gates each at which treatment will be provided. Steel sheet piling will be driven into the ground near the Little Menomonee River as a further containment aid. Should results indicate that supplementary groundwater control measures may be necessary, U.S. EPA will require KMC to conduct further action. The funnel and gate system and in-situ treatment may have an operation and maintenance cost advantage compared to other more conventional approaches.

Given that the presence of free-product creosote may lengthen the time needed to accomplish groundwater management goals, which remain unchanged from the 1990 ROD, U.S. EPA believes it is fair to allow an innovative approach in this circumstance. Design is now final for groundwater collection/treatment portions of the cleanup project and, in April 1998, U.S. EPA indicated conditional approval of such design.

If there are discharges to surface water from the remedy, appropriate discharge standards for all contaminants of concern must be met. These standards are currently being developed.

Additional information was required concerning stockpile base pad construction materials and associated geomembrane liners and protective layers to assure appropriate interim storage of excavated soils should groundwater construction commence ahead of soils treatment portions of the remedy. U.S. EPA and WDNR have worked with KMC concerning such details, and upon receipt of further details submitted in June-July 1998, U.S. EPA indicated approval of temporary stockpile design on July 27, 1998.

Changes to the Remedy

Thermal Desorption and Bioslurry Consideration

The soil treatment technology is being changed because the bioslurry technique may not be able to achieve the treatment cleanup levels set forth in the ROD.

The treatability study concerning the projected removal efficiency of the bioslurry technique indicates, for samples analyzed, that total PAHs were reduced from levels of 1100-1600 mg/kg to around 320 mg/kg, and that carcinogenic PAHs (CPAH) were reduced from a range of 390-550 mg/kg to around 170 mg/kg. This means that there could be considerable difficulty in attaining

the performance goal of 6.1 mg/kg CPAH established in the 1990 ROD. The administrative record indicates (see notes of Brown Wood Preserving discussion) that other creosote sites have had difficulty achieving single-digit part per million CPAH levels with biodegradation techniques. Qualitatively, treatment techniques such as biodegradation for creosote contaminated soils tend to most successfully attack the 2 and 3 ring member, and to some degree the 4-ring PAH compounds, while being far less successful with the 5 and 6-ring PAH compounds.

A portion of the PRP data (see site bioslurry treatability pilot report, administrative record update #5 document # 37, August 1993) seems to support this pattern. There occurred a marked drop off in removal efficiency in dealing with the more complex PAH ring compound benzo(k)fluoranthene, as opposed to the simpler ring compounds noted elsewhere in that report. U.S. EPA has made similar findings at other wood preservative sites. (see administrative record notes concerning the sites L.A. Clarke & Sons - Virginia and American Creosote Works - Florida)

Some reports obtained from the Gas Research Institute discuss thermal desorption processes used to treat contaminants at manufactured gas plant sites. Because of the similarity of contaminants between such sites and creosote facilities, adoption of such treatment techniques at creosote sites such as Moss-American may be warranted. These reports also contained references which indicated that a possible limiting factor in the application of water-based biodegradation techniques to PAHs is the inadequacy of the process in desorbing PAH contaminants from soil particles into solution where they can be metabolized by the biological process.

In 1992, U.S. EPA first began to issue policy papers regarding a concept known as presumptive remedy. In 1995, U.S. EPA's Office of Research and Development developed a paper indicating that thermal desorption was regarded as one of the presumptive remedies for a wood preserving Superfund site such as Moss-American. As the U.S. EPA's experience has grown, noticeable patterns have begun to emerge with regard to pollutants found at certain types of sites, concerning expected similar contaminant effects, and relative degrees of success in dealing with such contaminants. Presumptive remedies build on this experience, and represent approaches which can be chosen with a fair degree of confidence regarding their application at a given class of site. One advantage in utilizing the presumptive remedy approach is that it can shorten and simplify site investigation, feasibility study, and remedy selection efforts.

In October 1997, U.S. EPA issued a document entitled "Treatment Technology Performance Data for Remediation at Wood Preserving Sites." This document examined removal efficiencies realized by a wide variety of treatment technologies at wood preservative sites in both the U.S. and Canada. Of particular interest was an examination of the results of bioslurry treatment of creosote contaminated soils at a site in Mississippi compared to the treatment efficiency results utilizing thermal desorption technology at a Canadian creosote site. Results indicated that for the

more complex CPAH compounds of indeno(1,2,3-cd)pyrene, benzofluoranthene (two varieties), and benzo(a)pyrene, bioslurry treatment yielded a removal efficiency of from 33-39 percent. In comparison, thermal desorption removal efficiencies were at 99.9 percent for these same compounds. These compounds are of interest because they constitute four of the eight carcinogenic PAH compounds of concern identified at the Moss-American Site.

KMC has had experience utilizing the thermal desorption technique at other creosote sites where waste management has been required. KMC has submitted results concerning the degree of contaminant removal efficiency to U.S. EPA. These results indicate a range of 95-98 percent removal efficiency predicted. Hence, while all site conditions are not replicable, there is a basis by which U.S. EPA may predict that employment of the thermal desorption technique has a reasonable opportunity for a successful outcome.

The amended remedy will utilize the technique of thermal desorption for on-site treatment of contaminated soils/sediments. To differentiate this treatment technique from conventional incineration, thermal desorption has as its objective the driving off of contaminants from the waste mass, rather than the destruction of such contaminants. There is no combustion in the primary unit of the waste itself. Instead some portion of the organic contaminants are volatilized and then the gases driven off undergo further treatment, such as through an afterburner, condenser, or sorption unit. It should be noted that if the influent contaminated soil could be classified as a hazardous waste, and if the resultant contaminant-containing gases are managed via flare or afterburner, then that flare or afterburner must achieve the removal efficiency of 99.99 percent as would be expected of appropriate emission control involving hazardous waste combustion. In thermal desorption, the temperature 600 degrees Fahrenheit (F) is seen as something of a "breakpoint." Below this temperature, it is assumed that the main application is for volatiles. From 600-1150 degrees F, semivolatiles, PAHs, and PCBs are being attacked, also. At the Canadian site discussed previously, the operating temperature was 900 degrees F at 85 minutes retention time. 1150 degrees F is considered about the upper range for thermal desorption application. At these lower temperatures, compared to the temperatures of some 2200-2300 degrees F realized in a full incineration unit, metals such as lead do not volatilize, making an easier emissions control situation. After thermal desorption treatment, the residuals are soils, not ash. Unfavorable site characteristics include excessive clay/silt content in the soil, many large diameter rocks, and excessive moisture content - since energy is wasted driving away water.

One possible solution to deal with soils with higher than desirable clay/silt content is to mix in coarser soils prior to treatment. Thermal desorption is best applied when the organic contaminants do not make up more than 10 percent of the soil matrix. After treatment, dust generation may become a problem, so water is added to dampen the treated material. To prevent combustion, sometimes an inert gas such as nitrogen is injected countercurrent to the flow of treated material. Following treatment at projected removal efficiencies, the residual soils shall be

suitable for replacement on site. Prior to commencing operation, treatability study or predesign work may be necessary to define optimum operating conditions.

Cost data gathered with regard to thermal desorption application at the Moss-American site indicates a range of approximately $75-100 per cubic yard. Some 20-30,000 cubic yards of the more highly contaminated site soils and sediments are expected to undergo treatment using this technique. In comparison, the cost of a bioslurry treatment system for the site was recently estimated at $150-200 per cubic yard.

Areas to Undergo Thermal Desorption

Site soil areas to undergo thermal desorption treatment would be selected for one of three reasons: 1) Direct contact "hot spots" (> 78 mg/kg CPAHs (approximately 78 parts per million (ppm)), 2) groundwater contaminant source areas having the presence of free-product creosote, and 3) soils containing contaminants exceeding Wisconsin generic residual contaminant levels (RCLs) for benzene/toluene/ethyl benzene/xylene (BTEX) and PAHs in soils which pose a source threat in attaining groundwater cleanup goals. It should be noted that these BTEX compounds occur less frequently and at levels well below CPAH compounds. However, such compounds will be considered in an effort to comply with soil cleanup standards developed since the original ROD. Residual contaminant levels (RCLs) in soils of 1.5 ppm for toluene, 2.9 ppm for ethyl benzene, 4.1 ppm for xylene , 5.5 ppb for benzene and for three PAH compounds: 0.4 ppm for naphthalene, 100 ppm for fluorene, and 48 ppm for benzo(a)pyrene are considered to pose no further threat as a source of contaminants to groundwater. Accordingly, U.S. EPA hereby adopts these RCLs for this Site. More darkly shaded areas depicted in Figure 5 indicate areas which may undergo thermal desorption treatment according to discussion in this paragraph, however, this figure may not represent the full aerial extent accurately, so further discrete soil sampling will be necessary to define these areas prior to excavation.

Additionally, it is also appropriate to consider the implications of groundwater monitoring results now being conducted quarterly since the commencement of remedial action work at the site. Results received in June 1998 indicate that while many groundwater monitoring wells at the Moss-American site are relatively free of significant contaminant levels, three wells indicated notable groundwater contamination. These wells are MW-4S, MW-7S, and TW-09. Under NR 140, preventive action limits (PALs) have been established for three PAH compounds - naphthalene (PAL of 8 ppb), fluorene (PAL of 80 ppb), and benzo(a)pyrene (PAL of 0.02 ppb). Naphthalene levels at these three monitoring wells were particularly high, with concentrations of 2080 ppb at MW-4S, 6470 ppb at MW-7S, and 3080 ppb at TW-09. Residual contaminant levels of 0.4 ppm, 100 ppm, and 48 ppm have been established for groundwater protection for naphthalene, fluorene, and benzo(a)pyrene, respectively. U.S. EPA also adopts these RCLs at the Site. In addition to the areas discussed in the previous paragraph as requiring thermal treatment, U.S. EPA makes note of the following points from Remedial Investigation sampling

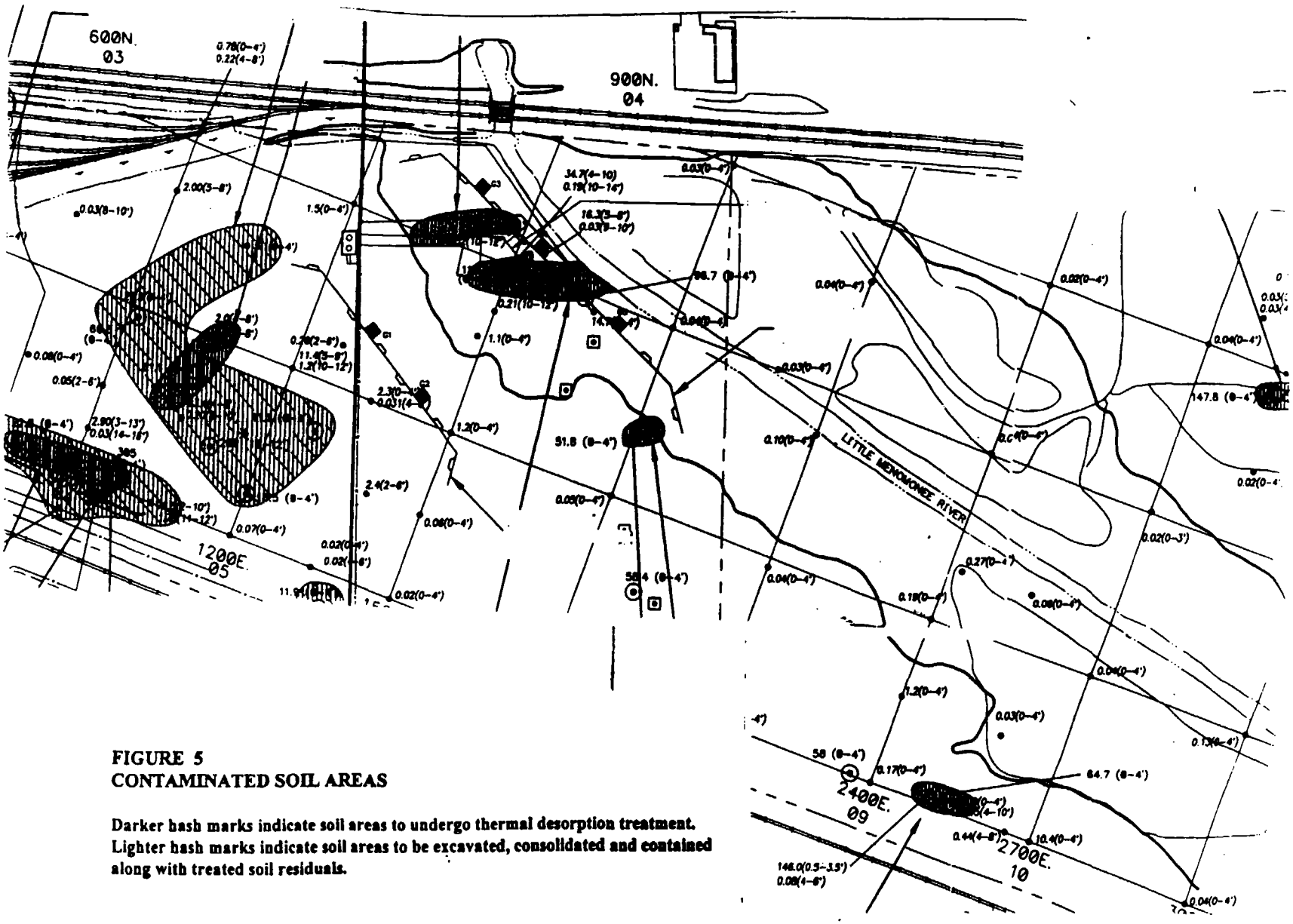


FIGURE 5
CONTAMINATED SOIL AREAS

Darker hash marks indicate soil areas to undergo thermal desorption treatment. Lighter hash marks indicate soil areas to be excavated, consolidated and contained along with treated soil residuals.

for surface soils where levels of PAHs discussed in this paragraph pose a threat of further groundwater contamination:

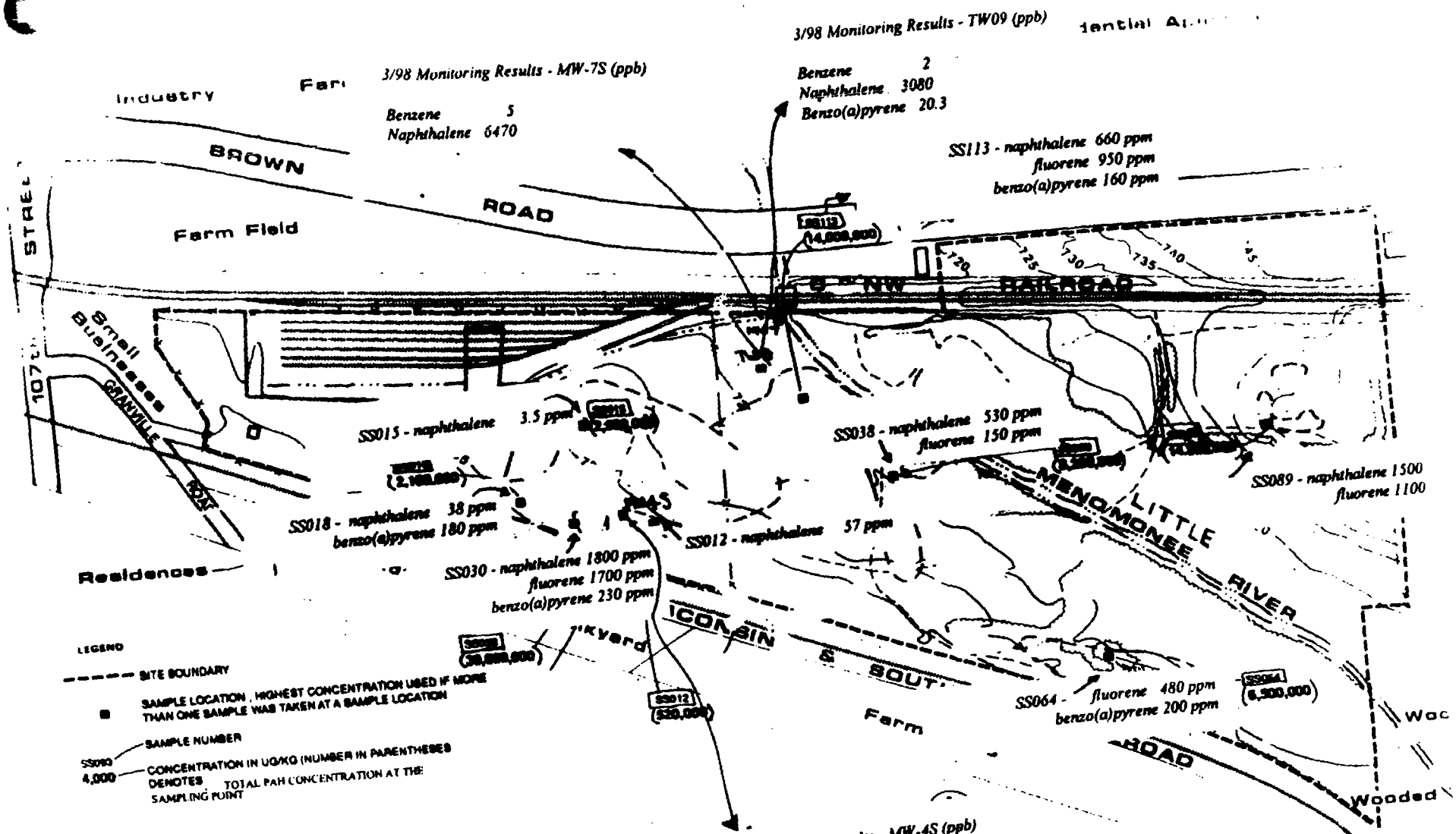
SS012 - naphthalene	57 ppm			
SS015 - naphthalene	3.5 ppm			
SS018 - naphthalene	38 ppm			benzo(a)pyrene 180 ppm
SS030 - naphthalene	1800 ppm	fluorene	1700 ppm	benzo(a)pyrene 230 ppm
SS038 - naphthalene	530 ppm	fluorene	150 ppm	
SS064 -		fluorene	480 ppm	benzo(a)pyrene 200 ppm
SS089 - naphthalene	1500 ppm	fluorene	1100 ppm	
SS113 - naphthalene	660 ppm	fluorene	950 ppm	benzo(a)pyrene 160 ppm

There were exceedances of RCLs for groundwater involving two volatile organic compounds at two of the points just discussed. At SS089, xylene(s) were found at a concentration of 14 ppm compared to the groundwater RCL of 4.1 ppm. At SS030, benzene was detected at a concentration of 100 ppb, compared to the groundwater RCL of 5.5 ppb.

Approximate location of these points is provided in Figure 6. U.S. EPA notes that there may indeed be some overlap of areas to undergo thermal desorption between Figures 5 and 6. However, further discrete soil sampling should be conducted before treatment occurs in areas of the site that may not have been adequately characterized by past sampling efforts to determine if groundwater RCLs are currently exceeded and after treatment in the excavated areas to ensure that unacceptable threats to groundwater have been successfully addressed through attainment of the groundwater RCL.

U.S. EPA observes that successful thermal desorption treatment is a two-step process where first treatment must attain either the appropriate contaminant range or the pertinent reduction removal efficiency depending on the initial threshold value for the contaminant type in question. Achieving this degree of treatment ensures successful compliance with the treatability variance values as further discussed in the "Treatability Variance Adjustment" section of this document. A second step involves comparison to the residual contaminant level for compounds promulgated under NR 140. Attainment of the groundwater RCL allows designation of a CAMU, whereby soils can be disposed without a liner and leachate collection system.

Because of the linkage between certain RCLs and PALs, U.S. EPA hereby adopts promulgated PALs for naphthalene, fluorene, and benzo(a)pyrene as supplementary groundwater restoration ARARs in addition to the BTEX compounds previously cited.



Residual Contaminant Levels - Groundwater Protection Component (ppm)

Naphthalene	0 4
Fluorene	100
Benzo(a)pyrene	48
Toluene	1 5
Xylene(s)	4 1
Ethylbenzene	2 9
Benzene	0 0055

3/98 Monitoring Results - MW-4S (ppb)

Benzene	10
Naphthalene	2080
Fluorene	368
Benzo(a)pyrene	25.3

PALs (ppb)

Benzene	0.5	Naphthalene	8
Toluene	68 6	Fluorene	80
Ethylbenzene	140	Benzo(a)pyrene	0 02
Xylene(s)	124		

FIGURE 6
AREAS in EXCESS of GROUNDWATER RCLS/PALS

Allowance for Adoption of Industrial or Recreational Exposure Scenarios for Soils Risk Consideration

If requisite deed restrictions are secured within 180 days of the date of this ROD, EPA will allow residual levels based upon nonresidential scenarios. If requested, U.S. EPA - after consultation with WDNR - may consider a brief extension of this timeframe.

At the time of development of the original ROD for the Moss-American site, exposure scenarios were developed so as to describe potential human exposures for current and potential site uses and conditions. These scenarios considered degree of risk posed through exposure to site contaminants via site trespassing, river recreational usage of the site, and the possibility of residential development of the site.

Industrial Usage

A risk scenario that was not explored during development of the original ROD was the risk posed to an industrial worker at the site, and what the level of cleanup appropriate to protect such a user.

Since about 1980-1981, and continuing to the present time, the Union Pacific Railroad has utilized the western 23 acres of the site for an automobile and other light vehicle transport, loading/unloading, and storage area. Much of the Union Pacific property has been paved with asphalt.

Since the time of the original ROD development, U.S. EPA has instituted a series of administrative reforms associated with Superfund sites designed to make remediation more fair. In October 1995, U.S. EPA announced certain administrative reforms intended to ensure that risk assessments are grounded in reality and make use of "real world" information about the site. Since a portion of the site is in fact owned by an industrial entity, and since the Agency has received information indicating that such land usage classification is apt to continue, it is appropriate to consider adoption of an industrial usage exposure scenario for that portion of the site now owned by the Union Pacific Railroad. In correspondence received from the Railroad, that entity has indicated its willingness to enter into written deed restrictions so as to preclude residential development of lands it owns, and limit its usage to an industrial use. Chapter NR 700, Wis. Adm. Code, series requires the use of deed instruments where soil contaminants above levels that would be acceptable for residential use remain at a site so the remedy is protective of human health. U.S. EPA therefore expects KMC to pursue such deed restrictions from Union Pacific, which would have the effect of limiting future land development on this site parcel to industrial usage. If applicable restrictions are secured, the Union Pacific property can be considered as industrial. If such deed restrictions are not secured within the expected 180 days timeframe after the effective date of this amendment, then the residential scenario and cleanup

standards for direct contact user protection established by NR 720 shall be obtained or the original 1990 ROD standards shall be met.

The other major site property owner is Milwaukee County. For purposes of this ROD amendment, U.S. EPA will categorize Milwaukee County property associated with the site into two portions as noted in the site consent decree between the United States and Milwaukee County. Appendix 2 of that decree denotes the former creosote plant and the Little Menomonee River and its floodplain downstream from the plant as comprising the Moss-American facility. This ROD amendment will deal only with that portion of Milwaukee County property that is part of the former creosote plant. U.S. EPA may make a determination on land usage along the Little Menomonee River and its floodplain downstream from the plant at a later date.

The County property at the former creosoteing plant is located adjacent to the Union Pacific property. U.S. EPA is aware that in 1997 an easement was sought concerning a portion of Milwaukee County property on the "former creosote plant" area for which industrial development was projected. In addition, the decree between the United States and Milwaukee County provided that there would be no residential use of the former wood preserving plant property during the implementation of the remedy. A Park and Open Space plan adopted by the County in 1991 calls for enhanced recreational opportunity in river corridor settings such as the Little Menomonee. Hence, for the former creosote plant, U.S. EPA considered industrial and recreational scenarios. For non-floodplain areas on Milwaukee County property located on the former creosote plant, U.S. EPA believes an industrial exposure cleanup scenario is appropriate, providing necessary deed restrictions are obtained in accordance with ch. NR 720 within 180 days. This is consistent with nearby uses and potential development. A worker engaged in industrial activity on the site would be most likely to be affected by the direct contact pathway for contaminants associated with site soils. As noted above for Union Pacific deed restriction discussion, U.S. EPA would therefore expect KMC to pursue such deed restrictions from Milwaukee County as well. If KMC obtains such deed restrictions consistent with NR 720, U.S. EPA will adopt an industrial scenario for this property. If execution of such deed restriction is not possible within the expected 180 days timeframe after the effective date of this amendment, then the residential scenario and cleanup standards for direct contact user protection established by NR 720 shall be obtained or the original 1990 ROD remedy shall be carried out. A deed restriction limiting future land use to recreational use would be required under ch. NR 720. U.S. EPA would also insist that deed restriction as a part of appropriate institutional control under CERCLA for the floodplain portion of the former creosote plant in order to protect users of this portion of the site from an unacceptable direct contact risk.

Remediation Levels - Industrial

In considering a new exposure scenario, it is also appropriate to consider developments in pertinent soil cleanup levels which have been promulgated since the original ROD. Effective April 1, 1995, the State of Wisconsin promulgated Chapter NR 720 concerning soil cleanup standards. The purpose of this particular chapter is to establish soil cleanup standards for the remediation of soil contamination. Chapter NR 720 requires that all soil contaminant pathways be addressed, which include air, groundwater, surface water, and direct contact.

Calculations done under Chapter NR 720 indicate soil cleanup must be performed to the level of 3.1 mg/kg (or ppm) of total carcinogenic PAHs for an industrial usage scenario so as to minimize any excessive direct contact threat posed to such a site user. Interim Guidance as noted in WDNR Publication RR-519-97 indicates alternatives to the direct use of generic RCLs for individual PAHs may be appropriate and acceptable in some cases, such as establishing RCLs for the direct contact pathway. Hence, U.S. EPA believes it is appropriate to utilize an overall total PAH approach, rather than listing individual direct contact RCLs in this instance. If obtaining a deed restriction from a given property owner is not possible within the expected 180 days timeframe after the effective date of this amendment, then the direct contact total CPAH value considered protective for residential usage is 1.9 ppm. Discussion has already been provided in the section on Thermal Desorption and Bioslurry Consideration as to U.S. EPA's expectations regarding pertinent compounds and levels to be attained such that potential source threat to groundwater is properly managed.

Background Considerations - Soil and Sediment

Amendment of the original residential cleanup value for direct contact threat, calculated at 0.061 ppm for the site at the time of the original ROD, is appropriate for another reason. Since that time, U.S. EPA has received information (see administrative record WDNR information on soil/sediments) that there is a notable distinction between background CPAH levels which may be expected in urban versus non-urban areas. Literature sources indicate that in general a range of 1-4 ppm CPAH represents background soil conditions for an urban area such as Milwaukee. On a site specific basis, Predesign Task # 2 indicates that the background soil CPAH range for the Moss-American site is from 0.46-3.5 ppm. Hence, it is not realistic to expect cleanup to a level which in all likelihood cannot be attained or sustained in such a setting. This ROD amendment views that all discussions herein concerning exposure assumptions, soil standards and management schemes outlined apply to a site area designated as the "Northeast Landfill" as well as other site areas.

At the time of the 1990 ROD, a "to be considered" value of 3 ppm as a sediment quality criterion for CPAH in sediments was derived. However, both the ROD and the consent decree noted that this value could be subject to change pending investigation of what might constitute a maximum probable background (MPB) value, and to utilize the higher of those values. Considering the

urban setting of the Little Menomonee River in the vicinity of the site and the sampling and analysis work done to establish the MPB, the WDNR has informed U.S. EPA (see March 4, 1998 correspondence) that it now believes a value of 15 ppm CPAH represents a reasonable sediment MPB for the Little Menomonee River.

U.S. EPA believes that a dynamic situation exists between the Little Menomonee River and its floodplain. This means that surface soils having excessive CPAH concentrations could be viewed as a possible threat to attainment of sediment quality goals. In the same way, deposition from the river could contaminate the floodplain, and consideration of realistic expectation of post- sediment management remediation must be made concerning any further floodplain remediation. U.S. EPA notes that only a very small portion of the site floodplain is likely to be affected by the current ROD amendment - namely that portion which is also a part of the former wood preservative facility. See Figure 7 in contrast to Figure 2. For this portion of the floodplain, EPA will adopt a removal cleanup level of 15 ppm CPAH if appropriate deed restrictions are secured within 180 days of the effective date of this ROD amendment.

Recreational usage of the Site

As noted above, a Park and Open Space plan adopted by the County in 1991 which calls for enhanced recreational opportunity in river corridor settings such as the Little Menomonee. For Milwaukee County property which is located in the floodplain of the Little Menomonee River and is a part of the former creosote plant, U.S. EPA believes that a recreational exposure scenario may be applied. This is consistent with the system of parklands and trails maintained by Milwaukee County downstream of the former wood preserving facility. Industrial development is not likely within the floodplain. Applying the procedures in NR 720 to determine a site-specific RCL, a cleanup level of approximately 49 ppm CPAH provides sufficient direct contact protection for the recreational user. However, U.S. EPA will not adopt 49 ppm CPAH as the cleanup value for County-owned floodplain land on the former creosote plant. Chapter NR 720 series requires the soil to surface water pathway be addressed. After considering needed erosion control measures and sediment remediation values, U.S. EPA adopts a figure of 15 ppm CPAH to be the surface water RCL for the entire former creosote plant and the recreational cleanup value for the County owned portion of the site in the floodplain.

NR 216 substantive requirements, including the development of an erosion control plan, would apply during construction stages of the work. To be considered after construction would be suitable measures to control soil erosion to prevent transport of contaminated soil from all disturbed areas on the entire site. For all disturbed areas that will not be covered to prevent direct contact exposures, such measures may include, but are not limited to, placement of 6" of topsoil and the establishment of a good vegetated cover and/or the collection and management of all runoff from those areas in units such as sedimentation basins.

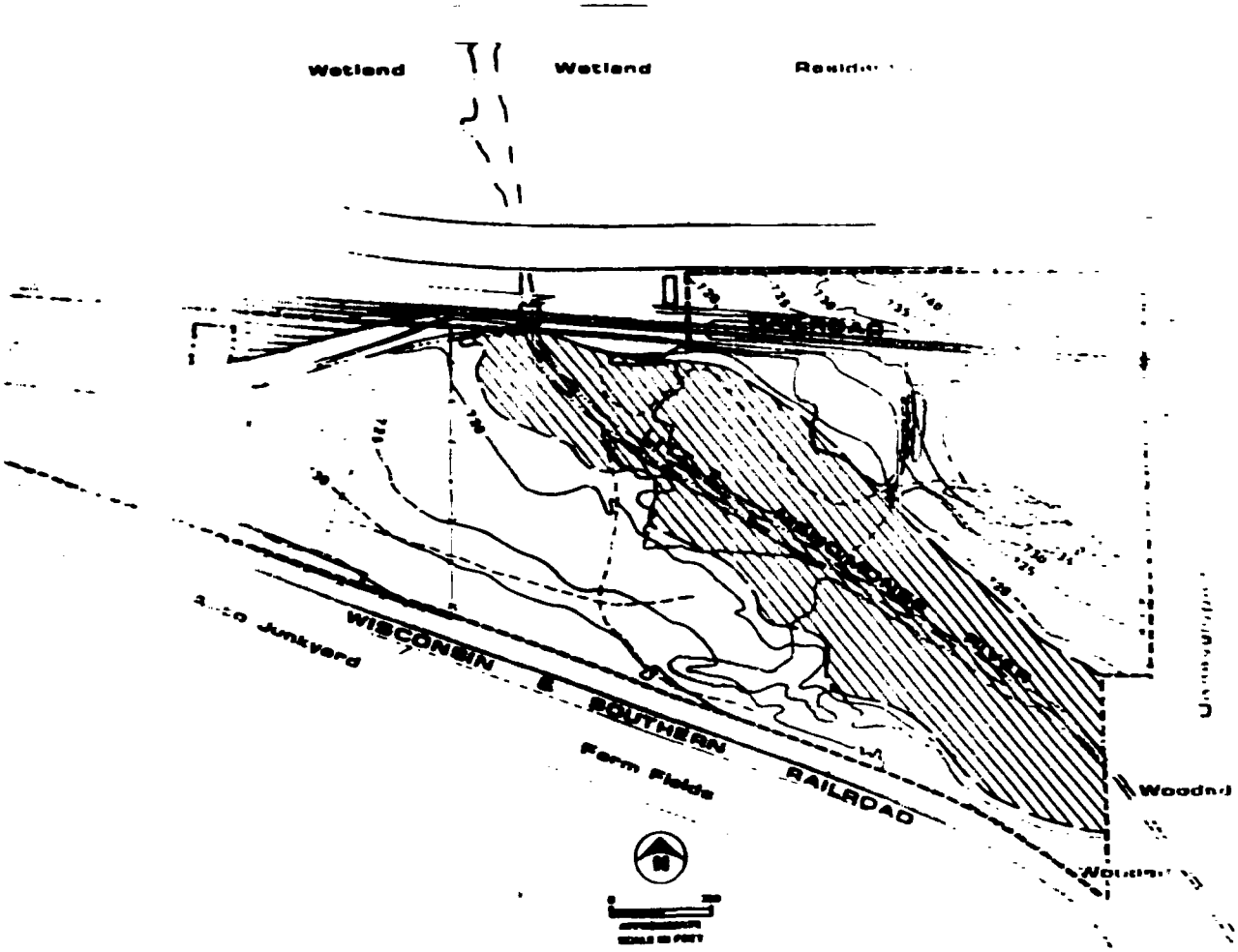


FIGURE 7
FLOODPLAIN PORTION
COUNTY PROPERTY on
FORMER CREOSOTE SITE

As was previously discussed for needed deed restrictions for industrial land usage, U.S. EPA would expect KMC to pursue recreational deed restrictions from Milwaukee County as well. If execution of such deed restriction is not possible within 180 days after the effective date of this amendment, then the residential scenario and cleanup standards for direct contact user protection established by NR 720 shall be obtained or the original 1990 ROD remedy shall be carried out.

Permeable Soil Cover - Waiver Withdrawal and Establishment of a CAMU

At the time of original development of the remedy, a waiver under Section 121(d)(4)(B) of CERCLA 42 U.S.C. was invoked for State requirements dealing with design, operation, and closure of hazardous waste landfills. The State of Wisconsin concurred with that waiver. The reasoning behind the waiver in the 1990 ROD was that placement of an impermeable cap over the mass of treated/untreated soil, sediment and debris would result in greater risk to health and the environment by significantly prolonging the time it would take to achieve groundwater management objectives. In such a situation, the remedial action's effectiveness in reducing risk would be in question. It was reasoned that a permeable cover would enhance groundwater remediation by encouraging a flushing action.

However, predesign field work at the site in 1994 verified not only the presence of free-product creosote near the soil/groundwater interface, but also indicated that such materials were present in relatively large extractable quantities. The presence of such materials complicates groundwater management.

At the Moss-American site, the greatest concentrations of free-product creosote are located near monitoring wells MW-8S and TW-07. The area between these two wells is approximately 1 acre in size. Predesign sampling done in 1994 indicated that free-product creosote was present at depths between 6 and 12 feet below the ground surface. The free product recovery system installed by KMC in 1995 has recovered approximately 10,000 gallons of concentrated creosote plus oily wastewater thus far. It has also been explained earlier in this document that one of the primary reasons for selecting a given soil area for thermal desorption treatment is that soil's association with free-product creosote. Soil areas to undergo treatment for reasons other than the presence of free-product are expected to undergo excavation to a working depth of four feet. However, those soil areas associated with free product will be excavated to a depth of about 9-10 feet, unless there is obvious indication of a "hot spot" free-product area extending below the groundwater table in which case efforts to remove free-product will continue. Verification sampling after initial excavation and treatment will refine final excavation depths. A revision to the groundwater remedy under an Explanation of Significant Differences (ESD) was adopted in 1997 that includes containment components utilizing sheet wall with in-situ treatment of the groundwater. This will effectively minimize the spread of contaminants and DNAPL materials in the soils and groundwater regardless of the amount of infiltration into the contamination zone. Therefore, the need for allowing flushing is minimized, the groundwater restoration should be

relatively unaffected by the amount of infiltration allowed through a cover system and the design of any cover system should be based on what is protective of human health and the environment given the nature of the material to be covered and complies with ARARs. Therefore, the following cover designs shall be utilized:

A. Soils picked up for treatment, which include soils that exceed the NR 720 groundwater RCLs for the BTEX and PAH contaminants, >78 mg/kg CPAHs, to be contained after treatment to at least groundwater RCL levels for all contaminants or less, provided appropriate deed restrictions and maintenance agreements are obtained within the expected 180 days timeframe after the effective date of this amendment:

Section NR 504.07 cover (CAMU reconsolidation disposal unit)

B. Soils left in place that do not exceed the criteria under A, but exceed NR 720 direct contact RCLs for the land use at that portion of the site, provided appropriate deed restrictions and maintenance agreements are obtained within the expected 180 days timeframe after the effective date of this amendment (There is also an option to pick up, and, if necessary, treat these soils and consolidate them in the CAMU reconsolidation area):

Existing (as of the effective date of this amendment) asphalt pavement or 2 feet of clean soil and 6 inches of vegetated topsoil (NR 720 performance standard covers for in place soils)

Soils in the floodplain under B. that remain in place and exceed the direct contact RCL for recreational usage shall be covered with 2 feet of clean soil and 6 inches of vegetated topsoil, provided appropriate deed restrictions and maintenance agreements are obtained within 180 days after the effective date of this amendment, and provided that the necessary floodplain easements are obtained for filling in the floodplain. If the floodplain easements cannot be obtained, these soils shall be removed so that the remaining soils may not exceed the NR 720 residential direct contact RCL values for all the contaminants of concern. This timeframe may be extended upon the approval of U.S. EPA in consultation with the WDNR.

C. (Alternative to A only) Soils under A, which would all be picked up and treated to at least direct contact levels and groundwater RCLs specified in this amendment for all contaminants or less provided appropriate deed restrictions and maintenance agreements are obtained within the expected 180 days timeframe after the effective date of this amendment:

Six inches of vegetated topsoil (CAMU reconsolidation disposal unit)

D. Soils under A and soils under B are required to all be picked up and treated to at least direct contact levels specified in this amendment for all contaminants or less if appropriate deed

restrictions and maintenance agreements are not obtained within the expected 180 timeframe days after the effective date of this amendment:

Six inches of vegetated topsoil (CAMU reconsolidation disposal unit)

The design of the s. NR 504.07 cover system includes a clay cap (approximately 24 inches thick) topped with a suitable frost-protection soil layer (approximately 18 inches thick) A cross-section of such cover is depicted in Figure 8.

While Section 3004(o) of RCRA, 42 U.S.C. 6924(o), only requires a double-liner and leachate collection system for new, replacement or expanded landfills, the authorized State requirements at Wis. Admin. Code. s. NR660.13(10) (formerly 181.44(10)(4), 42(8) and 44(13)) also require a double liner and leachate collection system for existing landfills.

U.S. EPA and WDNR have previously determined that certain wastes on the Moss-American site are listed under the Resource Conservation and Recovery Act as hazardous wastes K001 and U051. RCRA requirements are considered applicable if, as established in the WDNR NR 600 rule series, activities being considered as part of the remedy constitute treatment, storage, or disposal as defined by RCRA. Excavation and disposal activities will require compliance with RCRA waste management standards.

The CAMU rule within RCRA, at 40 CFR 264 Subpart S [264.552], however, allows movement of contaminated material within an area of contamination without triggering requirements for "generated" hazardous waste. In essence, this allows consolidation of contaminated soils and sediments containing listed or characteristic waste without triggering the land disposal restriction or minimum technology requirements (MTRs) of RCRA. This concept is needed for an alternative such as that featured in this ROD amendment where consolidation from several points around a site is expected to occur followed by containment under a cover.

Wisconsin has adopted the CAMU rule in NR 636. A key criterion for establishing a CAMU in NR 636.40(3)(b) states that for waste management activities associated with the CAMU, there may not be the creation of unacceptable risk to humans and the environment from exposure to hazardous waste or its constituents. Contaminated soil and sediment areas depicted on Figures 5 and 6 constitute a CAMU for the site. Should the s. NR 504.07 cover be used (A., above), the CAMU reconsolidation disposal unit would be designed to be as small as possible to minimize the cost of a new cover system, so the disposal unit should be located within the CAMU, but will be considerably smaller than the areas depicted on these figures.

U.S. EPA observes that while the thermal desorption treatment technique may be successfully employed as a means of dealing with PAH materials in sediments, it will be necessary to determine if other potential contaminants such as heavy metals and organics are present and

MOSS

Cover Descriptions

Amendment Featuring Thermal Desorption Treatment

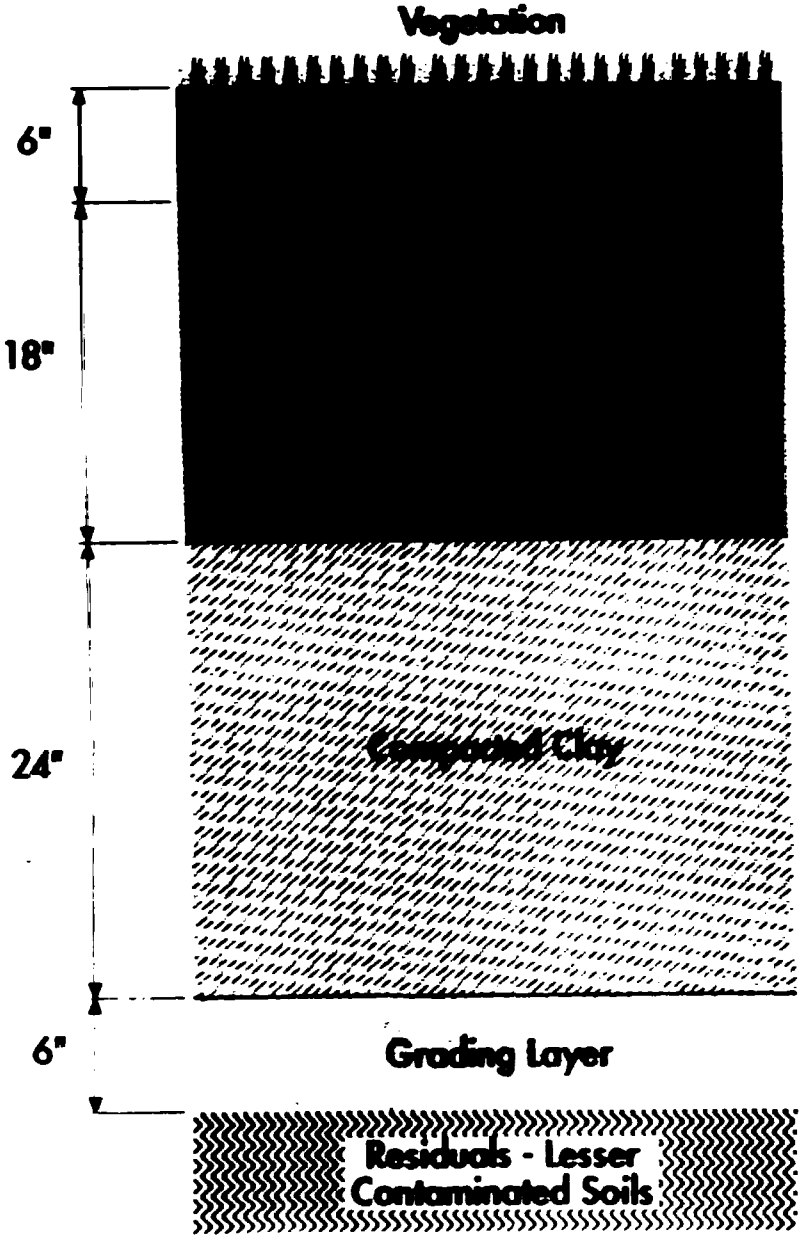


FIGURE 8

would require attainment of RCLs pertaining to such compounds before containment could occur. If it is not possible to achieve the RCLs for these contaminants, then the sediments will have to be managed off-site at a permitted or licensed hazardous waste facility or U.S. EPA may consider issuing an ESD to change the design of the CAMU redisposal unit to include a liner and leachate collection system.

In summary, the original underlying premise of invoking a waiver for what normally would have been installation of an impermeable cap is no longer valid. The theory that promoting a flushing action so that groundwater management may only be required for a relatively few years is no longer correct. In utilizing the CAMU as allowed under federal and State law, a liner and leachate collection system is not necessary. Provided the groundwater component of the RCL for the BTEX compounds, naphthalene, fluorene, and benzo(a)pyrene are attained, a CAMU is appropriate for this Site. Treated sediment may contain other contaminants that would also need to meet groundwater RCLs or the sediment will have to be managed off-site unless an ESD is issued for changing the design of the CAMU disposal unit to include a liner and leachate collection system.

Unlike some materials which undergo relatively rapid decomposition and which may be disposed through the technique of land disposal, more complex PAH compounds may undergo degradation slowly unless specific steps are taken to hasten the process. Hence, U.S. EPA will require cover maintenance to extend into perpetuity.

Treatability Variance Adjustment

The 1990 ROD contained Table 3, which discussed treatability variance concepts. In order to be acceptable for land disposal, threshold concentrations for certain constituents of concern were established. If the concentration of a given contaminant exceeded that threshold value, then it had to be treated so as to achieve an appropriate removal efficiency range. If the initial concentration were below the threshold value, then an acceptable post-treatment concentration range may be specified. Table 3 listed various contaminants of concern, and provided expected reduction efficiencies or post-treatment concentrations viewed as acceptable for land disposal. Based on subsequent guidance, "Obtaining a Soil and Debris Treatability Variance for Remedial Actions", Superfund Publication # 9347-3-06FS, as well as further insight as to what should be considered contaminants of concern at the site, U.S. EPA modifies the table as follows:

- Benzene and ethylbenzene were not previously listed. U.S. EPA adds these constituents, and notes that like toluene/xylene previously listed, land disposal is appropriate if treatment reduces concentration by 90% or to below 10 ppm, pending initial contaminant status regarding a threshold value of 100 ppm. Utilizing the CAMU concept discussed elsewhere in this document, in order for these volatile compounds to undergo land disposal without further aid of liner or leachate collection system, the groundwater RCL of 1.5 ppm for toluene, 4.1 ppm for xylene(s),

2.9 ppm for ethylbenzene, and 5.5 ppb for benzene must be attained. Upon review of soil concentrations found in the Remedial Investigation for these substances, and given the expected reduction efficiency of the thermal desorption technology, U.S. EPA believes these values may be achieved.

- No threshold value was provided for carcinogenic PAH. The guidance document cited above lists 400 ppm for PAHs as the threshold value. A reduction efficiency of 90% was cited previously. The guidance document now cites 95% removal efficiency for substances exceeding the threshold value, and an acceptable range of 0.5-20 ppm for substances falling below the threshold value. This will replace the 6.1 ppm figure cited in Table 3.

- Fluorene had not been previously listed as a contaminant of concern. U.S. EPA is hereby adding fluorene as a contaminant of concern.

- Utilizing the CAMU concept discussed elsewhere in this document, for the PAH compounds naphthalene, fluorene, and benzo(a)pyrene, these compounds may undergo land disposal without further aid of liner or leachate collection system provided that they fall below their respective groundwater RCLs of 0.4 ppm, 100 ppm, and 48 ppm. Upon review of soil concentrations found in the Remedial Investigation for these substances, and given the expected reduction efficiency of the thermal desorption technology, U.S. EPA believes these values may be achieved.

Evaluation of Alternatives

The following section outlines the nine decision criteria that were used to evaluate the original selected remedy and the amended remedy. Based on current information, the amended remedy provides the best balance of benefits measured against these decision criteria. This section discusses the anticipated performance of the amended remedy compared to the decision criteria.

1) Overall protection of human health and the environment

This criterion addresses whether or not an alternative provides adequate protection of human health and the environment and describes how risks are eliminated, reduced or controlled through treatment, engineering controls, or institutional controls.

Comparative Analysis

a. Change in Soil Cleanup Level for Portions of the Site

Information in the Administrative Record indicates that employment of an industrial or

recreational usage scenario for respective portions of the site is justified, because of indications that such usage is likely or will continue into the foreseeable future. Appropriate deed restrictions will be required to ensure that the land usage remains industrial or recreational. Compared to residential usage, industrial and recreational usages involve less frequent number of instances of exposure per unit time. Hence, risk assessment involving an industrial/recreational exposure scenario will result in calculation of an acceptable contaminant concentration higher than a residential scenario. Adoption of such scenario for the site seems justified in this instance, since the amended remedy still maintains overall protection to human health and the environment. If necessary deed restrictions for a given portion of the site can not be obtained within 180 days from the date of this ROD Amendment, then the soil removal cleanup standard shall be the residential cleanup standard as established by NR 720, or the original 1990 ROD remedy shall be carried out.

b. Means of Soil Treatment

The overall remedy involves a combination of treatment/containment methods so as to achieve performance standards. The amended remedy employs a different means of soil treatment, i.e., thermal desorption versus bioslurry, than the originally selected remedy. The expected reduction in contaminant levels to be brought about by usage of thermal desorption, coupled with other remedy provisions, should ensure that the criterion of protection of human health and the environment is maintained.

c. Revoking of the Waiver of RCRA Subtitle C Cap Requirements Regarding Treated Soils/Sediments Residuals and Less Contaminated Soils

A waiver of the need to utilize RCRA Subtitle C cap requirements was invoked at the time of original ROD development. At that time it was reasoned that placement of an impermeable cap over the mass of treated/untreated soil, sediment and debris would result in greater risk to health and the environment by significantly prolonging the time it would take to achieve groundwater management objectives. It was reasoned that a permeable cover would enhance protectiveness by the relatively prompt groundwater remediation which might be encouraged through a flushing action.

However, predesign field work at the site in 1994 verified not only the presence of free-product creosote near the soil/groundwater interface, but also indicated that such materials are present in relatively large extractable quantities.

The presence of such free-product creosote in quantities significantly larger than contemplated in the original ROD makes relatively prompt attainment of groundwater remediation goals doubtful. The revised groundwater remedy will effectively minimize the spread of contaminants and DNAPL materials in the soils and groundwater regardless of the amount of infiltration into

the contamination zone. Therefore, the need for allowing flushing is minimized, the groundwater restoration should be relatively unaffected by the amount of infiltration allowed through a cover system and the design of any cover system should be based on ARARs and what is protective of human health and the environment given the nature of the material to be covered.

2) **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)**

This criterion addresses whether or not an alternative will meet all of the ARARs pertaining to federal and state environmental laws and regulations and/or justifies the invoking of a waiver of such ARARs. ARARs are considered frozen at the time of remedy selection. However, in considering ROD amendments, newer pertinent regulations developed since the original remedy are to be analyzed. The following paragraphs consider ARARS of note since the original ROD.

Comparative Analysis

Air emission treatment requirements, Wisconsin Administrative Code Chapter NR 445, were considered in the original ROD. A thermal desorption unit is denoted as a miscellaneous hazardous waste treatment unit under either federal or state hazardous waste management regulations. With regard to WDNR regulations, such unit is denoted in Chapter NR 670, which will now be added to appropriate site ARARs. Air emissions from such a unit are regulated under Chapter NR 665. Of particular note is the instance where the thermal desorption unit utilizes an afterburner or a flare as a means of controlling volatilized contaminants that have been driven off the soil mass. In this case, since the soil being put into the unit constitutes a hazardous waste, then the degree of removal efficiency using a flare must attain 99.99 percent, the same as would be expected for hazardous waste incineration. Since thermal desorption operates by driving contaminants off soil, appropriate emission control of soil dusts must be met.

By a combination of treatment and containment, site soils must attain both 1) direct contact protection levels as established for site users under Chapter NR 720, this value being 3.1 ppm for direct contact for industrial usage and 1.9 ppm for residential usage, and 2) levels established pursuant to Chapter NR 720 so that the treated soils will not become a source of groundwater contamination under NR 140 standards. Since recent groundwater monitoring has indicated exceedances of three PAH compounds for which PALs have been promulgated under NR 140, PALs for naphthalene, fluorene, and benzo(a)pyrene are adopted in this ROD amendment. As noted previously in this document, these values are respectively 8, 80, and 0.02 ppb, respectively. It is appropriate to do so because of the concept of connection between these PALs and the groundwater source protection component of the residual contaminant level in NR 720.
U.S. EPA also adjusts the PAL originally set for benzene. At the time of the 1990 ROD, the PAL value was 0.067 ppb. Since that time, WDNR has now established that a PAL of 0.5 ppb as protective. In situations where an industrial RCL is to be used, Section NR 720.11(1)(c), Wis. Adm. Code, requires that a deed restriction be recorded to prevent future non-industrial land

uses. A deed restriction will also be required by U.S. EPA under CERCLA as appropriate institutional control for adoption of recreational usage and cleanup to such standards for a portion of the site property.

The asphalt cover over portions of Union Pacific property would not constitute a cover complying with either federal or state solid or hazardous waste management rules. However, U.S. EPA is mindful of administrative reforms which seek to promote productive future site utilization. Provided that this material is not excavated and adequate maintenance/repair of asphalt paving can be assured , U.S. EPA will not seek further cover of this material. See Figure 9 for the approximate location of this area. Section NR 720.19(2), Wis. Adm. Code, allows a soil performance standard remedy to be selected in place of a level which complies with an approved RCL. One such example of compliance would be in arranging for permanent engineering control, such as defined asphalt inspection and maintenance schedules, to be established. Should a performance standard for a portion of the site be invoked, a deed restriction must be recorded to prevent activity that would compromise the performance standard, such as excavation. A maintenance agreement is required to assure continuing adequate protectiveness. Section NR 720.19 seems especially pertinent to necessary asphalt maintenance scheduling and to measures which may be taken to control erosion and undue runoff which may interfere with subsequent sediment management goals.

Unlike regulations in Chapters NR 720, 670 and 665, Chapter NR 216 may not necessarily be directly applicable to the Moss-American situation. For one thing, Chapter NR 216 concerning soil erosion/runoff protection measures has a threshold value of 5 acres of construction activity disturbance, which may or may not occur at the site. For another, Subchapter III is defined in the "applicability" section as being intended for construction sites with a "point source" discharge of storm water. Excavation and treatment of "hot spot" areas for thermal desorption may constitute only sheet runoff if soils are successfully treated. It is appropriate to seek good drainage around a containment cap, however, and such runoff could be construed as a point source pending its configuration. Remaining surface soils, particularly on County land, should not serve as future sources of sediment contamination. Therefore, the control measure concepts within Chapter NR 216 must be followed in site planning efforts.

The Moss-American site is relatively complex, with facets of the remedy addressing various environmental media. It was presumed at the time of the 1990 ROD and in the Consent Decree calling for remedial design/construction activity that it might be necessary to handle, stage and store soils and sediments. For example, predesign task #17 included in the Statement of Work attached to the Decree notes that "...The staging and storage methods may include open piles and/or covered piles and enclosed areas..." in managing soils and sediments. It may also have been presumed that most site remediation work would proceed concurrently, in which case pile storage of soils or sediments for a lengthy time would not have been a major consideration. However, U.S. EPA believes it is important to recognize the possibility that site remediation may

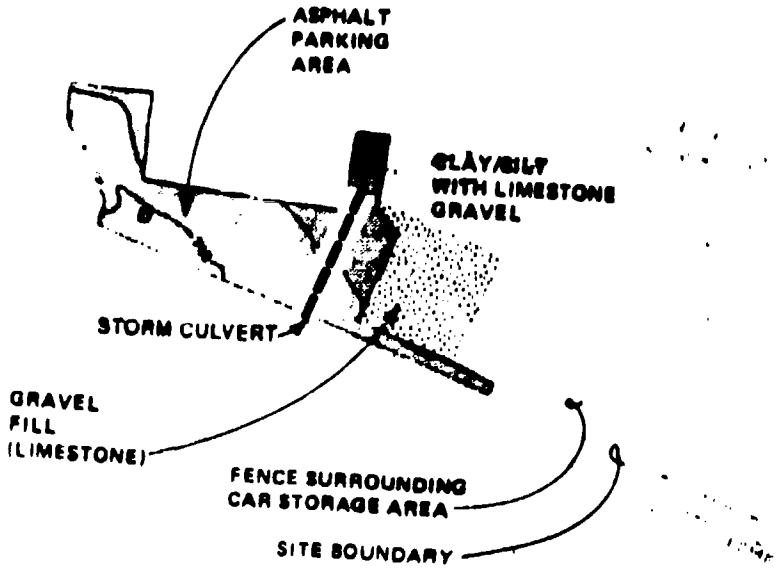


FIGURE 9
ASPHALT PAVED PORTION OF SITE

proceed in a phased fashion. In that case, excavation done for the purpose of installing hardware for one phase of site work may be held for a lengthier period of time until other soils (or sediments) management can be completed. Portions of some highly contaminated soil areas intended to undergo thermal desorption treatment may require excavation and storage for other phases of the remedy, such as groundwater management. However, if such stockpile may also be classified as a hazardous "waste pile" for waste management purposes, then the waste pile needs to have adequate foundation, leachate control, liner, and wind dispersal safeguards as may be called for in federal and state regulation. "Waste piles" are addressed in Subpart L of the hazardous waste section of the federal Resource Conservation and Recovery Act (RCRA), and in Chapter NR 655 of Wisconsin hazardous waste management rules. Federal RCRA regulations, at 40 C.F.R. § 264.251(b) allow exemption from certain waste pile design and operating requirements provided that the pile owner/operator sufficiently justifies an alternate design and operating practice, and the State waiver provision at Wisc. Admin. Code § NR 680.04 can be exercised accordingly. U.S. EPA believes such justification has been provided in this instance. In recent correspondence concerning approval of temporary stockpiling procedures, U.S. EPA and WDNR have indicated that soil treatment capabilities shall be on-line in no more than two construction seasons from July 1998. U.S. EPA notes that the 1990 ROD indicated that soil, debris, and sediment undergoing extraction, treatment or redeposition may trigger RCRA requirements in placement and disposal of such material. In that case, the remedy is expected to comply with standards contained in the State authorized RCRA program and in the self-implementing Federal RCRA requirements.

U.S. EPA notes that ch. 636 of the Wisconsin hazardous waste management rules, which justifies conditions under which a CAMU may be utilized, becomes an ARAR when a CAMU is invoked. A CAMU is invoked to allow consolidation of contaminated soils from different portions of the site, as well as the picking up and treatment - and subsequent placement - of contaminated soils in units with alternative designs. With a CAMU, liners and leachate collection systems are not required. U.S. EPA and the State have determined that CAMU is appropriate at this Site provided that the groundwater RCL component is achieved for all the BTEX compounds, naphthalene, fluorene, and benzo(a)pyrene. Treated sediment may contain other contaminants that would also need to meet groundwater RCLs or the sediment will have to be managed off-site or an ESD issued for changing the design of the CAMU disposal unit to include a liner and leachate collection system.

3) Long-Term Effectiveness and Permanence

This criterion refers to the expected residual risk and the ability of an alternative to maintain reliable protection of human health and the environment over time, once cleanup objectives have been met.

Comparative Analysis

By invoking concepts of treatment of free-product creosote soil areas, seeking further means of potential groundwater contaminant control, and seeking erosion protection measures that avoid future sediment contamination problems, the amended remedy would appear to offer enhanced long-term effectiveness and permanence in comparison to the original remedy. The original remedy also did not contemplate the attainment of the groundwater component of the residual contaminant level. Given the soil contaminants present at the site, the original treatment technique of bioslurry would appear to have relatively little chance of achieving desired treatability variance ranges/efficiencies. In comparison, the thermal desorption technique appears to have a greater opportunity to achieve not only the desired treatability variance ranges/efficiencies, but also the pertinent groundwater RCLs. Employment of the thermal desorption technique so as to attain groundwater RCLs therefore justifies no usage of liners/leachate collection facilities.

4) Reduction of Toxicity, Mobility, or Volume through Treatment

This criterion is the anticipated performance of the treatment technologies an alternative may employ.

Comparative Analysis

Comparison of Bioslurry Treatment with Thermal Desorption:

All alternatives featuring an element of treatment will achieve reductions in toxicity, compared to approaches which feature only containment or imposition of institutional controls.
The technique of thermal desorption appears to have the potential to yield significantly superior treatment results compared to that of a bioslurry approach for management of highly contaminated soils and sediments. As noted, the bioslurry approach should effectively address that subset of PAHs composed of 2 and 3-ring compounds. Such compounds may comprise the more mobile PAHs, such as naphthalene. Treatment effectiveness utilizing the bioslurry technique diminishes with increasing PAH molecular weight. While these heavier compounds are not relatively mobile, they present toxicity concerns. The literature indicates that the more complex PAH compounds also tend to be the more carcinogenic compounds. The thermal desorption process may therefore help to achieve superior results in terms of reducing toxicity in comparison to a bioslurry approach. Also, by amending the remedy to consider additional compounds and thereby protecting groundwater from further contaminant sources, the amended remedy is superior in terms of reduction of contaminant mobility.

5) **Short-term Effectiveness**

This criterion involves the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup objectives are achieved.

Comparative Analysis

Comparison of Bioslurry Treatment with Thermal Desorption:

At the time of development of the original ROD, it was projected that a 15-day retention time in the bioslurry treatment unit would be necessary for a given batch of contaminated soil or sediment to attain the desired cleanup goal of 6.1 ppm carcinogenic PAHs. It was noted further that biological treatment is temperature dependent, and that treatment might not continue through the winter months. In comparison, the retention time for batch treatment within a thermal desorption unit would be on the order of hours. Hence the time to learn if effective treatment is being provided will be reduced. Furthermore, as noted within pilot work conducted on site soils using the bioslurry approach, it is doubtful that the cleanup goal of 6.1 ppm carcinogenic PAHs can be attained using the bioslurry approach.

Change in removal cleanup standards based on risk assessment scenarios:

Elsewhere in this document, U.S. EPA has indicated that it believes it is reasonable from an administrative standpoint to accomplish the obtainment of all necessary deed restrictions within an expected 180 days timeframe. However, in conjunction with discussion in the ARARs decision criterion above, it is also important from a technical standpoint that obtaining necessary deed restrictions be accomplished within the expected 180 days timeframe. As was noted in ARARs discussion, U.S. EPA's approval concerning temporary stockpiling procedures was predicated on the basis that it would take no more than two construction seasons from July 1998 to bring soil treatment capabilities on-line. Therefore, U.S. EPA believes it is important to secure deed restriction in a timely fashion.

6) **Implementability**

This criterion is the technical and administrative feasibility of an alternative, including the availability of materials and services needed to implement the given option.

Comparative Analysis

Comparison of Bioslurry Treatment with Thermal Desorption:

In designing a bioslurry approach to soils and sediments treatment, consideration of site-specific sizing concerns would be an important design component. Materials of construction and site-specific pumping and valving considerations must be considered. The bioslurry treatment unit would be, in essence, a permanently constructed site feature. In contrast, thermal desorption units are not normally built "from scratch." Rather, it is presumed that vendor-developed mobile equipment would be utilized for thermal desorption remedial action. Remedial design efforts in implementing such alternative may be less rigorous than for a bioslurry approach. Design for a thermal desorption unit would focus not so much on what the individual components of a desorption system are and how they need to be fitted together, but rather on operating experiences from other pertinent sites, such as removal efficiencies realized and degree of emission control brought about, as well as necessary verification sample planning. As noted, the thermal desorption equipment is expected to be a vendor supplied mobile unit. Vendor capacity and availability are therefore prime considerations regarding implementability. Current indications are that vendor availability should not pose undue difficulty. Expediency in design of a soils treatment unit is an important consideration. Final groundwater design management plans have now been received. Construction of the groundwater funnel and gate in-situ treatment system is to some degree contingent on progress in remediating those site soil areas associated with the presence of free-product creosote. Adoption of the thermal desorption approach would appear to hold an implementability advantage with regard to groundwater treatment progress as well.

Cover Systems

In discussion of withdrawal of the waiver extended in the previous ROD, and in CAMU discussion (see pp. 14-15 of this document), U.S. EPA established a "tiered" system of containment under the CAMU intended to encourage more efficient soil treatment in exchange for less complex containment measures. Covers range from clay with a frost protection layer to soil to relatively simple erosion control measures when total attainment is realized of all groundwater RCLs and pertinent direct contact protection measures. Materials needed for construction of various cover types are all considered commercially available.

7) Cost

This criterion includes estimated capital costs, as well as operation and maintenance costs.

Comparative Analysis

In comparison to the bioslurry treatment approach estimated to cost about $150-200 per cubic yard of soil treated, the thermal desorption approach is estimated to cost approximately $75-100 per cubic yard. Additionally, if groundwater RCLs are met then it will not be necessary to add a

subsurface synthetic membrane and leachate collection system as a means of containing treated soil residuals plus lesser areas of contaminated soils. As noted in the discussion of Implementability above, ultimate cost of appropriate containment measures is dependent on the degree of efficiency realized in thermal desorption.

8) **State Acceptance**

This criterion indicates aspects of the recommended alternative and other alternatives to which the state support agency (WDNR) favors or objects, and comments regarding state ARARs or the proposed use of waivers. While WDNR indicated general agreement with the broad concepts noted in the proposed plan - usage of thermal desorption and consideration of industrial or recreational usage scenarios - WDNR did not concur with the proposed plan issued by U.S. EPA which solicited public comment concerning the potential ROD amendment. WDNR requested a 30 day extension of the public comment period. U.S. EPA did in fact extend the public comment period. Within the Responsiveness Summary, U.S. EPA believes it has satisfactorily provided a reply to WDNR concerns. U.S. EPA has included certain details in the ROD amendment not included in the proposed plan so as to indicate its intention of conducting the remedy in accordance with pertinent ARARS. The State of Wisconsin has indicated it will provide conditional concurrence with this Record of Decision Amendment. The State of Wisconsin's letter indicating this position will be included in the Administrative Record for the site.

9) **Community Acceptance**

This criterion indicates the public support of a given alternative. This criterion is discussed in the Responsiveness Summary. Numerous oral and written comments were received at the March 18, 1998 public meeting. Written comments were also received both before and after the meeting. The majority of comments indicated that U.S. EPA should adopt the changes discussed in this amendment. Union Pacific appears to favor usage of an industrial usage scenario to guide cleanup on its property. Milwaukee County does not appear to favor at this time any change in exposure scenario with regard to its property. There will be opportunity for discussion between the property owners and KMC to determine what deed restrictions can be developed concerning respective property.

Statutory Determinations

The amended remedy complies with the requirements of CERCLA Section 121 by considering and controlling site risks associated with direct contact with soil contaminants, and has beneficial

impact with regard to associated contaminated groundwater and sediment measures. The action will not cause unacceptable short-term risk or cross-media impacts. There are no chemical, action or location-specific ARARs identified for this action that were not previously considered in the administrative record. The amended remedy is cost effective. The amended remedy also considers Superfund administrative reforms and presumptive remedy information not available at the time of the original ROD. The amended remedy should also significantly reduce treatment costs compared to the original means of soils treatment specified.

The 1990 ROD justified a waiver pursuant to Section 121(d)(4)(B) for a Subtitle C cap and for the State double-liner/leachate collection system requirement on the basis that an impermeable cap and liner would pose a greater risk to health and the environment by prolonging groundwater treatment and time needed to achieve groundwater goals. Given change in the groundwater remedy under the 1997 ESD, waiver of a relatively impermeable cap is no longer justified. However, in making usage of alternative reconsolidation unit designs, U.S. EPA invokes the CAMU concept. U.S. EPA notes that ch. 636 of the Wisconsin hazardous waste management rules, which justifies conditions under which a CAMU may be utilized, is a means of meeting this ARAR. A CAMU is invoked to allow consolidation of contaminated soils from different portions of the site, as well as the picking up and treatment - and subsequent placement - of contaminated soils in units with alternative designs. With a CAMU, liners and leachate collection systems are not required. Pursuant to ch. 636, the condition which should exist such that an unacceptable risk is not created is attainment of pertinent RCLs prior to containment efforts.

The amended remedy provides the best balance of tradeoffs with respect to the evaluation criteria. The amended remedy satisfies the preference for treatment as a principal element of the remedy.

Documentation of Significant Changes

The Proposed Plan for consideration of substitution of thermal desorption technology, allowance for adoption of industrial or recreational exposure scenarios, and difference in relatively permeable versus non-permeable capping materials at the Moss-American site was issued for public comment on March 9, 1998. The Proposed Plan identified Alternative 2 - usage of thermal desorption technology, adoption of industrial or recreational exposure scenarios, usage of impermeable capping materials - as the recommended alternative. U.S. EPA has reviewed all written and verbal comments submitted during the public comment period. Upon review of these comments, it was determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary.

Responsiveness Summary
Moss-American Site
Milwaukee, Wisconsin

This Responsiveness Summary has been prepared to meet the requirements of Sections 113(k)(2)(B)(iv) and 117(b) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), which requires the United States Environmental Protection Agency (U.S. EPA) to respond to "...to each of the significant comments, criticisms, and new data submitted in written or oral presentations" on a proposed plan for remedial action. The Responsiveness Summary addresses concerns expressed by the public, potentially responsible parties (PRPs), and governmental bodies in the comments received by U.S. EPA regarding the proposed plan for remedial action at the Moss-American site.

Background on Community Involvement

Following signature and issuance of the September 1990 Record of Decision (ROD) concerning the site, U.S. EPA prepared and released to the public a series of fact sheets regarding site developments and progress. These fact sheets have been developed approximately semi-annually. In April 1997, U.S. EPA issued an Explanation of Significant Differences (ESD) with regard to how groundwater management strategy was to be conducted at the site. Concurrence was obtained on this document from the Wisconsin Department of Natural Resources (WDNR). The ESD allowed the Settling Defendant (Kerr-McGee Chemical LLC, or KMC) to develop an innovative funnel and gate collection and treatment approach. The ESD and an accompanying fact sheet were released to the public.

Beginning on March 9, 1998 U.S. EPA initiated a public comment period concerning a proposed plan which suggested amendment of the 1990 ROD in two important areas. These are: whether to adopt non-residential exposure scenarios to guide the degree of contaminated soils cleanup, and whether to adopt the treatment technique of thermal desorption as a means of treating more highly contaminated soil areas, rather than use the bioslurry treatment approach originally selected. The comment period lasted until May 8, 1998, after U.S. EPA extended the initial 30-day comment period by an additional 30 days in response to a request received from the WDNR. On March 18, 1998 U.S. EPA conducted a public meeting at Vincent High School in Milwaukee to discuss the proposed plan concerning the ROD amendment. Also during this meeting, oral comments were received.

Comment on the Proposed Plan for the ROD Amendment

Written Comment:

from the Wisconsin Department of Natural Resources - dated March 11, 1998

This letter provides our comments on the above-referenced document. As you know, we provided comments on drafts of the PP Fact Sheet that were not addressed in the final document. Hence, our concurrence with the PP is being withheld (the PP correctly states this). Most of our previously unaddressed comments are provided here again.

There are several important topics we expect you will address in a subsequent ROD amendment that are unclear, improperly presented or not presented at all in this fact sheet. Therefore, we suggest that you issue a revised PP or corrections/revisions to the fact sheet document before the public meeting and, if necessary, extend the PP comment period appropriately. If you do, we would likely be willing to provide our concurrence with the PP proposal.

Response - Given the timing of the receipt of this letter in connection with the scheduled date for the public meeting, it was not possible to issue a new or revised fact sheet.

We suggest that the issuance of any subsequent ROD amendment be withheld until an agreement is reached between the Agencies and Kerr-McGee on revisions to the existing Consent Decree (CD) for the remedy revision contemplated under this PP, or the ROD state that it would not be effective until that occurs. This will avoid the possibility of having a final, effective ROD in place that conflicts with the existing CD.

Response - U.S. EPA strongly believes the focus should be on the selection of the remedy. Section 113(j)(2) of CERCLA, 42 U.S.C. § 9613(j)(2), provides that the courts shall uphold the response action selection decisions unless the objecting party can demonstrate on the administrative record, that decision was arbitrary and capricious or otherwise not in accordance with law. Section 113 and Section 117 also discuss public participation procedures concerning remedial action once the administrative record is established. These procedures provide that U.S. EPA is to base selection of remedial action on the record after providing for notice to the public and a brief analysis of alternatives considered, reasonable opportunity to comment and provide information regarding the plan to the public, provide opportunity for a public meeting, respond to each significant comment or new data submitted, and provide a statement for the basis and purpose of the selected action.

If U.S. EPA fails to sign any ROD amendment which may prove warranted pending comment receipt and evaluation, and the Court is then approached to modify the Decree, the basis for Decree modification would seem incomplete. Opportunity to conduct site remediation would be hindered. This comment also would appear to involve a larger discussion than the Moss-American Site. If U.S. EPA were to adopt the point of view advocated, it would find it necessary to approach the Court before proposing modifications where the Agency had entered a Decree. Until the ROD Amendment is signed, there is no decision by the Agency to change the remedy. Moreover, proceeding with the Consent Decree modification before issuance of the ROD would undercut public participation in the ROD amendment process. Before U.S. EPA would seek to amend the decree concerning the direction of significant site work, U.S. EPA would have to reach a decision as to how to amend the remedy pursuant to the process and delegation of CERCLA, including the public participation process.

It should also be noted that the actual Consent Decree modification entailed by this ROD Amendment would be limited. The current Consent Decree already contemplates a change in the treatment technology, after a ROD amendment, if the bioslurry reactor cannot achieve cleanup standards. Risk assessment scenarios and discussions on how to attain new or existing requirements are a means at arriving at the remedy decision and, while part of the record, would not be discussed in the Consent Decree. It is the resulting cleanup standards and cover specifications which would be addressed in the Consent Decree. The changes to these involved in this ROD amendment are limited.

We are in general agreement with the concepts of changing the direct contact route soil exposure scenario assumptions to be consistent with ch. NR 720, Wis. Adm. Code, and the substitution of low temperature thermal desorption (LTTD) for slurry bioremediation treatment, provided our concerns are addressed.

Specific comments:

1. Second ¶, third sentence, states: "Those contaminated sediment areas where sediment is removed by dredging techniques near bridges or are particularly highly contaminated may also undergo thermal desorption treatment." We are unsure what the intent of this statement is, so it should be clarified. What does "highly contaminated" mean? We believe your intent is to state that the PP preferred alternative is to treat, using low temperature thermal desorption (LTTD), sediments removed from the old channel of the Little Menomonee River (LMR) after a new channel is constructed, per the original 1990 ROD. If so, the PP should have stated that, and gone on to indicate that those sediments and include all visibly contaminated sediments and sediments with a CPAH content above 388 mg/kg in the old channel and all sediments located where the new channel crosses the old, such as bridge crossings.

Response - The current ROD and the Statement of Work accompanying the remedial

design/action Consent Decree both recognize that some portion of contaminated sediments may be subject to treatment efforts, rather than containment. Hence, if U.S. EPA proposes in the plan that thermal desorption be substituted for bioslurry treatment, then it should note all current instances where such treatment would be expected. On page 9 of the Statement of Work, it is noted that "...in the portions of the channel of the Little Menomonee River which are not rechannelled, e.g., under bridges, Settling Defendant shall remove sediment...in excess of the sediment quality criteria or sediment background...treat sediment in excess of 6.1 ppm CPAHs using the treatment system..." If any further amendments were considered involving sediment management, this concept could be changed. However, for now, U.S. EPA feels the plan should note that some treatment of sediments is expected and that any modified treatment method should consider this point.

2. Figure 1 is very confusing. What is the purpose of this figure? Is it a site map, as the title states, or a representation of a portion of the preferred plan? Why are areas going to be covered with asphalt or soil? That covering activity is not described in the PP. What is the difference between BTEX areas and other areas? What do BTEX areas represent?

Response - Figure 1 was intended to show the reader/commenter that some areas of the site are intended to undergo excavation and treatment for different reasons. The original ROD basically wanted areas to undergo treatment solely because of perceived excessive CPAH content. In this plan, there could be one of three reasons why a given contaminated soil area should undergo treatment: it has excessive CPAH concentration such that toxicity is a problem (the Agency's working definition of "hotspot"), it has excessive free-product creosote below the ground's surface which must be addressed to aid in managing site groundwater, or it has certain more mobile contaminants - the volatile benzene/toluene/ethyl benzene/xylene (BTEX) compounds - which need to be controlled so that they will not pose a problem as a groundwater contamination source under State rules. Other areas indicated for further cover are to show that there may be excavation and consolidation of other soils not requiring treatment. "Soil" describes the current means of cover, which as the plan notes is also subject to change to a more rigorous form. The term "asphalt" is archaic; however were the topic to come up we could inform the public that at one point in time the Decree signatory parties had discussed asphalt usage when extractable quantities of free-product creosote were first made obvious. However, the relatively fine nature of the soils and the limited amount of free-product creosote made that concept impracticable.

3. Figure 2 only shows the "condenser" type operation and so the figure should be labeled as such, e.g., "Figure 2 Thermal Treatment with Condenser Sorption Unit (Afterburner not shown)".

Response - The drawing in question was taken directly from a U.S. EPA paper on the topic of thermal desorption. The drawing in that paper made no specific reference to emission control system in its caption; hence U.S. EPA did not feel that was necessary for this plan. However, in the text which refers the reader to Figure 2, the three main types of emission

control are noted.

4. Page 3, second ¶, fifth sentence, states: "This process would be regulated by Wisconsin state air emission and hazardous waste standards for "miscellaneous treatment units." This sentence is misleading, as the reader may get the impression that both our Air Management and Hazardous Waste Programs would regulate the unit only as a "miscellaneous treatment unit", which is incorrect. The Air Management Program would regulate it as an emission source subject to their emission limits. The Hazardous Waste Program would regulate the thermal desorption portion of the unit as a "miscellaneous treatment unit", but would regulate an afterburner as a hazardous waste incinerator.

Response - Having received unofficial comment from other persons regarding plan contents which noted that the text was becoming complex enough, U.S. EPA did not feel it necessary to insert this level of detail. The plan does refer the reader to the administrative record for additional information. Further discussion of this point is noted in the ROD amendment.

5. Page 2, fourth and fifth ¶s: It is stated in both ¶s that the original soil cleanup goal for the site is 0.061 ppm CPAHs. This is incorrect, as this goal only applied to a portion of the site under the 1990 ROD, e.g., soils in the floodplain at the wood treating property and the Northeast Landfill. The cleanup goal for other soils, including soils on the wood treating site outside of the floodplain and soils in the floodplain downstream from the wood treating property under the original 1990 ROD is 6.1 mg/kg (ppm) CPAHs. It should be noted that soils in the floodplain downstream of the wood treating property are not addressed in this PP.

Response - Table 3 of the current ROD states that 6.1 ppm CPAH represents a 10-4 risk level. In describing the cover system to be used for Alternative 3A, the selected alternative, page 21 of the ROD states in part: "...treatment residue from the slurry bioreactor, and on-site contaminated soil exceeding the 1 x 10-6 target concentrations, a total of 210,000 cubic yards, will be contained in the Area of Contamination (AOC), covered with 2' of clean soil and 6" of topsoil..." This text makes no distinction as to "only" floodplain soils, and indeed could be interpreted to mean all site soils above 6.1/100, or 0.061 ppm CPAHs, are to be contained. In any event, given the new state of knowledge of background PAH levels in urban areas, 0.061 ppm CPAH is not a realistic goal and should be changed.

6. The PP does not describe our ch. NR 720, Wis. Adm. Code, soil standards for protection of the groundwater (groundwater soil remedial contaminant goals, or RCLs) and how they would be achieved. This is a significant omission. In place soils that exceed groundwater RCLs for all contaminants of concern must be addressed directly or through a performance standard (we understand that Kerr-McGee's last proposal to the Agencies on this was to directly address these soils), and all treated soils that are returned to the site for redisposal must meet those RCLs if replaced in an unlined unit.

Response - U.S. EPA disagrees. The plan notes (page 3) that cleanup goals will be developed to attain Wisconsin state soil cleanup standards. Since those standards include a groundwater component, such groundwater protection is inferred. Again on page 4, the plan notes that cleanup standards are to attain direct contact and ground-water protection. U.S. EPA discusses this point further regarding oral comments made on this subject.

7. The PP should indicate that the preferred alternative includes removal of highly contaminated soils from below the water table.

Response - Figure 1 indicates that some soil areas are to be excavated and treated because they are associated with potential free-product in the subsurface soils. Some means of verification sampling will need to take place to know if sufficient quantity of soil management has occurred. U.S. EPA cannot say what the verification sampling will indicate; hence it cannot stipulate that excavation will occur below the water table. However, U.S. EPA believes that the signatory parties to the RD/RA Decree are agreed in principle that should there be obvious indication of free-product material extending below the water table that this will be pursued to the degree possible.

8. The PP does not adequately describe how our ch. NR 720, Wis. Adm. Code, RCLs for direct contact would be achieved. Again, soils exceeding direct contact RCLs for all contaminants of concern must be addressed directly or through a performance standard. We understand that Kerr-McGee's last proposal to the Agencies was to address any in place soil that is not treated through a performance standard cover of soil or asphalt. The soil and asphalt cover areas mentioned in figure 1 are without any context or proper details. The mention of a "less-extensive containment system for...less contaminated soils" in the description of Alternative 2 may refer to this, but this is unclear. The general design of the performance standard cover systems proposed should be provided, preferably with figures showing the design of the elements and their location.

To allow a performance standard remedy under ch. NR 700, Wis. Adm. Code, appropriate deed restrictions and adequate maintenance assurances/agreements are required. The maintenance assurances/agreements are not mentioned in the PP.

Response - The Settling Defendant performed multiple sets of calculations to indicate that a direct contact cleanup level of 3.1 ppm CPAH would be the appropriate value if an industrial exposure scenario were adopted. This is noted on page 4 of the plan. The value of 49 ppm CPAH is also noted, in case a recreational exposure scenario is adopted. At the public meeting, U.S. EPA discussed different cross-section cover descriptions, for which WDNR assisted with preparation of unit dimensions. However, U.S. EPA did not put such cross sections in the plan since, as noted earlier, having received comment from other persons regarding plan contents which noted that the text was becoming complex enough, U.S. EPA did not feel it necessary to insert this level of detail. This matter is also discussed in the ROD amendment. Upon review of recently received groundwater monitoring results, U.S. EPA does note that while many monitoring wells at the site are relatively free

of contamination, three wells (MW-4S, MW-7S, and TW-09) standout in terms of naphthalene content in the part per million range whereas the protective action limit (PAL) is in terms of parts per billion. Other excesses at these wells also occurred for fluorene and benzo(a)pyrene. These three compounds are promulgated under NR 140. Hence, in the ROD amendment, U.S. EPA does adopt the RCLs for groundwater protection pertinent to these three compounds, and cites areas shown from the Remedial Investigation to be above the groundwater RCL for these compounds as requiring verification and/or soils treatment before containment steps are undertaken.

9. The PP should indicate that the free product recovery system would be shut down and removed from the site when the preferred alternative is implemented.

Response - U.S. EPA does not believe the plan needs to state this. U.S. EPA wrote the Proposed Plan so that the general public plan reader would concentrate on the big picture and direct comment to the main issues of "shall thermal desorption substitute for bioslurry treatment, and is it appropriate to consider non-residential exposure scenario(s) for portions of the site"? Subsequent developments in groundwater design and temporary stockpile concepts indicate that there may be a phasing of work regarding both groundwater management and soils remediation. Hence, there may need to be flexibility in shutting down the free product recovery system as well.

10. The PP does not adequately describe the redisposal unit for LTTD treated soil and sediment. All that is stated is that a "less-extensive containment system would be needed for soil residuals..." in the description of Alternative 2. It is unclear what "soil residuals" are. The general design of this unit, including its cover, should be provided, preferably with figures showing the design of the unit and its location.

Response - Again, U.S. EPA believed it was best to write the plan such that the general public plan reader would concentrate on the big picture and direct comment to the main issues of "shall thermal desorption substitute for bioslurry treatment, and is it appropriate to consider non-residential exposure scenario(s) for portions of the site"? Soil residuals are those soils which have undergone treatment. U.S. EPA sees two primary options: a,) Following treatment, the soil attains all direct contact, ground-water protection, and surface runoff protection goals. At that point, the soil has basically dropped out of the system, and could be returned to its place of origin needing only simple erosion control measures. b.) The soil shows marked improvement in terms of contaminant content, but does not attain "walk-away" goals. In that case, the soil is consolidated with other materials needing cover using compacted clay with the soil-frost protection layer. U.S. EPA adds, in the ROD amendment, that the question of attainment of appropriate concentration range or reduction efficiency, as well as pertinent groundwater RCLs also arises. Full attainment of these conditions, and employment of a Corrective Action Management Unit (CAMU) concept would allow utilization of a cover only. If such conditions cannot be met, then liner usage may also be necessary. Both U.S. EPA and

WDNR expect that thermal desorption treatment can attain pertinent removal efficiencies and RCLs.

11. The untreated soil and sediment that are planned to be treated contain a listed hazardous waste. We have recently learned that treated soil and sediment may have to meet hazardous waste land disposal restriction (LDR) standards before redisposal on the site. The LDRs may be more stringent than the groundwater RCLs. This requirement, or a justified proposal for an LDR treatability variance, should be discussed in the PP. We are willing to work with our Hazardous Waste Program, and, if necessary, your RCRA Program contacts to resolve this issue.

Response - If any more stringent level of treatment is required, then that would seem to be reason to adopt Alternative 2 in the plan, since it may be capable of achieving greater removal efficiency. The 1990 ROD already lists Table 3, which provides an account of "Treatment Levels to be Obtained to Comply with LDR Treatability Variance". It appears that direction is to achieve the LDR treatability variance or the RCL, whichever is the lesser value. U.S. EPA will review Table 3, and update this as necessary to reflect current reduction efficiencies for types of compounds, desired concentration ranges, and threshold values. U.S. EPA is listing in the ROD amendment the pertinent RCLs for groundwater for the compounds benzene, xylene(s), ethylbenzene, toluene, naphthalene, fluorene, and benzo(a)pyrene. However, the direct contact pathway, as opposed to probability of aquifer usage, appears to be of more day-to-day concern for the average site user.

12. The note on the bottom of page 4 describes a proposal for a CERCLA equivalent standard of performance waiver for, presumably, the LTTD treated redisposal unit. In order to grant such a waiver, there must be a basis for doing so. We are not aware of any information developed by the agencies or by Kerr-McGee to justify such a waiver. Our opinion is an unlined unit, even for soils treated to meet appropriate RCLs (and LDRs, as necessary) would not perform in an equivalent way to a lined unit, because it may be possible for some contaminants to leak out of the waste. However, there may be a basis for allowing an unlined unit (e.g., not meet the RCRA minimum technology requirements or MTRs) under our CAMU authority, ch. NR 636, Wis. Adm. Code, or an exemption under s. NR 680.04, Wis. Adm. Code, if it can be shown that the unlined unit would be as protective as a lined unit. Again, there would need to be basis for using CAMU or granting such a waiver. We would normally expect the persons who propose the unit to provide such justification. For this site, we would expect Kerr-McGee to provide it.

Response - In making a pro-active determination to waive an ARAR, U.S. EPA is limited to six situations. Clearly, equivalent standard of performance is the most applicable justification in this instance. The main point is to describe for the general public plan reader why the original choice of a permeable cap is no longer valid, and if that is the case, what replaces it. Moreover, U.S. EPA disagrees with WDNR's contention that there is no basis to justify a waiver, or that soils in this situation will present a leachate problem if they attain RCLs. In considering the matter of whether an unlined unit might yield an equivalent standard of performance for this site, U.S. EPA makes note of NR 720.11(2)(b)

and the note which follows which says: "...For example, at a site where soils are contaminated with diesel fuel, polynuclear aromatic hydrocarbons (PAH) compounds are present and may be considered contaminants of concern. With the exception of naphthalene, PAH compounds are generally only of concern for direct contact due to their relatively low migration potential..." The materials used at the site consisted of creosote and fuel oil. Hence, U.S. EPA believes this passage in NR 720 is pertinent to the site situation. Naphthalene is not one of the primary CPAHs. Rather, it is a 2-ring member PAH compound having a lower boiling point than the more complex CPAH compounds. If the more complex CPAH compounds are treated efficiently, then soil napthalene should undergo at least as high if not higher level of removal efficiency. As is explained in the ROD amendment, U.S. EPA does endorse CAMU utilization for this site as may be allowed both under federal regulation and NR 636. An important concept within NR 636 is that such CAMU inclusion will enhance implementation of effective, protective and reliable remedial actions for the facility. Utilizing the CAMU encourages treatment of contaminated soil areas. Utilizing the flexibility within CAMU in managing remediation wastes, U.S. EPA can then offer a "tiered" approach to subsequent containment methods, such that a higher degree of removal efficiency realized may result in less rigorous containment efforts. Without utilizing the CAMU concept, difficulty would be encountered in managing soils at the Moss-American site since there are several subareas requiring excavation, treatment, or other consolidation. The act of "placing" treated residuals might also trigger the need under the Resource and Conservation and Recovery Act to utilize minimum technology requirements in containing hazardous waste regardless of removal efficiency realized. Usage of the CAMU appears to allow for greater flexibility in materials management while still providing for protectiveness.

from R. Zachow - Milwaukee - received March 16, 1998

I feel that Alternative 2 is the procedure to follow based on the Figure 3 evaluation table. I would find it very hard to understand why proceeding with the clean up should be delayed for more than one year. I have lived along the Little Menomonee River [Pkwy] for more than 20 years, and my children 20 years ago received burns from the contaminants and [till] this date I still can not see aquatic life existing in this section of the river. Fix it.

Response - U.S. EPA notes that Alternative 2 calls for site management using low-temperature thermal desoprtion (LTTD), adoption of an industrial-use scenario for Union Pacific owned site land, and adoption of a recreational-use scenario for Milwaukee County owned land. U.S. EPA concurs with the comment that Alternative 2 is the procedure to follow. U.S. EPA notes that final groundwater management design plans have been received. In approving supplementary temporary stockpiling concepts, U.S. EPA believes it is appropriate to strive for opportunity to conduct phases of the remedy as soon as possible. U.S. EPA sees no hindrance to the implementation of certain necessary

groundwater management steps. In its approval conditions, both U.S. EPA and WDNR have indicated their desire to see on-line soil treatment capability in no more than two construction seasons, and preferably by next spring's construction season. U.S. EPA shares the commenter's concern about contaminated sediment management. As noted in the proposed plan, should natural resource trustee discussions result in recommendations to alter current sediment management features of the cleanup, U.S. EPA will develop another proposed plan.

from R. Vesely - Milwaukee - received March 16, 1998

I suggest Alternative 2. My house is on the Little Menomonee River. Being down river about 5 or 6 miles I would like to know more about the river bed sediment clean up. You did not state how far down by locality. I'm between Silver Spring Drive and Hampton Ave. Did the big flood last spring spread these contaminants?

Response - U.S. EPA concurs with the comment that Alternative 2 is the procedure to follow. As noted in the proposed plan, should natural resource trustee discussions result in recommendations to alter current sediment management features of the cleanup, U.S. EPA will develop another proposed plan. The commenter lives next to what has been termed segment 5 of the Little Menomonee River, as noted in Figure 6 of the 1990 ROD. Since WDNR has recommended - and U.S. EPA concurs with - an overall sediment cleanup value of 15 ppm CPAH (which accounts for background conditions in an urban stream setting), it would appear that remedial action is warranted in the vicinity of the commenter's location. Figure 6 indicates that remedial investigation sampling points 1 and 6 both exceed the 15 ppm CPAH cleanup recommendation. U.S. EPA presumes that the commenter is referring to a rainfall of approximately 5 inches that occurred in the Milwaukee area in June 1997. It is possible that a storm of this magnitude could have caused a shift in location of contaminated sediments.

from R. Salcedo, PhD. - Milwaukee - received March 16, 1998

1. What is the "most nasty" PAH constituent in the soil that will be treated with a low-temperature desorption unit?

Response - U.S. EPA believes that benzo(a)pyrene, would likely be the most carcinogenic of the CPAHs identified on the site.

2. Any metals in the soil that will be part of the "treatment mix"?

Response - No doubt commonly occurring metals as would be found in soils would occur. However, metals as hazardous substances were not identified as contaminants of concern at the site.

3. At what temperature (minimum/maximum) range, and residence time will the unit operate?

Response - According to the literature, the Pacific Place site realized excellent CPAH removal efficiency at 900 deg. F at a residence time of 85 minutes. This would likely be the maximum range. It is possible that such operating conditions could be reduced when dealing with a soil area having predominantly more volatile BTEX compounds.

4. Will there be post-treatment sampling/analysis of the soil before being put back into the site?

Response - Yes, U.S. EPA would expect such sampling/analysis to be part of standard operating practice.

5. Any air sampling and analysis to be done before release into the environment?

Response - Yes, U.S. EPA would expect such sampling/analysis to be part of standard operating practice.

6. How does this treatment method complement the "funnel and gates" system, especially with the inclusion of some sediments?

Response - U.S. EPA would foresee that contaminated soils would be managed first, with sediments awaiting natural resource trustee developments/recommendations. Thermal desorption should strongly complement funnel and gate groundwater management. Certain soil areas believed to be contaminated with free-product creosote need to be addressed before groundwater management efforts could be expected to be efficient.

7. What are the expected residuals of the treatment (recommended), relative to the original input?

Response - Again, with regard to the Pacific Place site, removal efficiencies of 99.9% were realized. Information submitted by the Settling Defendant, KMC, in this matter, indicated removal efficiencies of 95-98% utilizing the thermal desorption technology.

8. Is this same technology (low-temperature thermal desorption) also applicable for treating contaminated sediments in our local rivers...and the Milwaukee Harbor estuary and Lake Michigan?

Response - U.S. EPA notes that the technique was used successfully at the Waukegon (IL) harbor situation involving high levels (>500 ppm) of PCB contaminated sediments. Less contaminated sediments were contained. Whether or not the technique could be successfully used at other Milwaukee area river/harbor areas would depend on the nature of the contaminants of concern for those areas. The technique would appear to be best suited for situations involving organic contaminants not cross-contaminated with dioxins. Logistics involving the length of the area or time needed to accomplish dredging might also

be a factor.

from A.K. Watson - Kerr-McGee Chemical LLC - March 17, 1998

I am writing regarding the fact sheet "Proposed Plan - Moss American Superfund Site"... dated March 1998. In this document, ...U.S. EPA has proposed several changes to the Record of Decision for the ...site. We at Kerr-McGee Chemical LLC have reviewed your proposal and believe it to be a significant step in the right direction. We support remedy changes along general lines of your proposal. If we have any questions or comments, I will submit these to you during the 30-day comment period.

Response - U.S. EPA concurs with the comment.

from J. Brengosz - Milwaukee - submitted at the public meeting - March 18, 1998

I endorse the use of Alternate #2 amended ROD for the Moss American site, and would encourage prompt approval by the government agencies involved so that remediation can proceed as soon as possible.

Response - U.S. EPA concurs with the comment.

from S. Brengosz - Milwaukee - submitted at the public meeting - March 18, 1998

With the lower cost of desorption can we (Kerr-McGee) afford to treat more soil with the funds available.

Response - That is possible, although the need to perform additional excavation and treatment will be dependent on verification sampling results.

Is the 15 ppm in river sediment a safe level for the intense use it can receive with children, pets, etc.

Response - In correspondence dated March 4, 1998 WDNR informed U.S. EPA that "...we subsequently accept the 15 mg/kg [ppm] value as the river-wide maximum probable background (MPB) value to drive sediment and bank soil cleanup in all segments of the Little Menomonee River (LMR). The main reason we accept it is that it appears to be a reasonable value and consistent with the tributary-specific and upstream reach sampling of the LMR..." Hence, U.S. EPA believes the value to represent a safe cleanup level.

I agree with WDNR that some floodplain soil sampling should be done to determine if any movement of sediments with recent flood events has occurred.

Response - The proposed plan under consideration deals primarily with means of soils

treatment and possible adoption of non-residential exposure scenarios. Discussions among natural resource trustees are on going concerning issues more closely related to sediments management. Pending resolution of such discussions, as noted in the proposed plan, U.S. EPA would be prepared to discuss sediment management issues further in a subsequent proposed plan if such development is warranted.

Seems to me erosion control should be used no matter what size - you mention 5 acres - construction is done.

Response - Erosion control planning and control measures are discussed in WDNR Chapter NR 216, Subchapter III. NR 216.42 discusses applicability. It notes "...Except as provided in subs. (2) to (4), a notice of intent shall be filed by any landowner who intends to create a point source discharge of storm water associated with a construction site activity to the waters of the state..." The definition of "construction site" given in NR 216.002 notes "construction site" means "...a site upon which land disturbing activities affecting 5 or more acres of land are occurring..." This same section of definitions later defines "point source" as meaning "...a discernible, confined and discrete conveyance of storm water..." Hence, U.S. EPA believes there are clear limitations put on rule applications.

I agree with all the WDNR comments..

Response - Please refer to U.S. EPA's specific responses to WDNR comments provided elsewhere in this document.

Feasibility seems to be very good for desorption and this is something I would support.

Response - U.S. EPA concurs with the comment.

Realistically, residential use will probably never happen @ this site, but recreational use will always occur.

Response - U.S. EPA concurs with the comment.

from the Wisconsin Department of Natural Resources - dated March 31, 1998

This letter provides additional comments on the above-referenced document, supplementing our previous comments. We request that the PP be amended to account for a hazardous waste pile storage unit at the site for soil and debris excavated for the groundwater remedy. This unit was proposed for the first time in the final groundwater design, which we received on March 11, 1998. We believe this type of longer term hazardous waste pile storage unit was not envisioned in the current ROD and Consent Decree.

Response - U.S. EPA incorporates the April 14, 1998 response signed by the site's Community Involvement Coordinator into the Responsiveness Summary as the primary vehicle providing response to the March 31, 1998 WDNR comments. U.S. EPA provides other details as stated further. The 1990 ROD notes on page 40 that "...Waste on the site is listed under RCRA as Hazardous Waste, K001 and U051..." The 1990 ROD continues on page 41 "...Because soil, debris, and sediment containing listed hazardous waste will be extracted, treated and redeposited... placement and disposal will occur triggering RCRA requirements... The selected remedy will comply with standards contained in the State authorized RCRA program and in the self-implementing Federal requirements..." Attached to, and made part of the Consent Decree, is a Statement of Work listing numerous predesign tasks to be accomplished. Two of these are predesign tasks #17 and 18, which discuss respectively "Define Handling, Staging, and Storage Systems for Soil and Sediments" and "Define Handling, Staging, Storage and Placement Systems for Treated Soils and Sediments". Predesign Task #17 says in part "...The staging and storage methods may include open piles and/or covered piles and enclosed areas..." Predesign Task #18 says in part "...Storage methods may include open piles, covered piles, or enclosed areas..." In describing remedy components for features other than groundwater control, the ROD, in discussing Alternative 3A, the alternative selected, notes that time to implement would take 3-4 years.

As noted in the Proposed Plan, a 15-day treatment period is anticipated per batch of soil/sediment treated via the bioslurry approach. Several tens of thousands of cubic yards of soils/sediments were to be treated in this fashion. Since creosote is a listed hazardous waste for RCRA purposes, these areas of soils/sediments posing greater than acceptable user or environmental risks would be considered hazardous waste piles if excavated and subsequently placed. U.S. EPA notes that in its judgement, it is more likely to expect the Settling Defendant to accomplish as much excavation as possible via a given contractor, and to place excess materials in some manner of storage until they can be worked off, rather than calling upon an excavation contractor to re-visit the site every couple of weeks. U.S. EPA notes that the existence of these clauses in Predesign Tasks # 17 and 18 was pointed out by the assigned Remedial Project Manager in correspondence with the WDNR Project Manager, and that such clauses were acknowledged by WDNR.

What the existing ROD and Consent Decree may have presumed was that all remediation work would be done concurrently. However, the Moss-American site is relatively complex with several different facets of work. It may be prudent to have a given piece of work conducted ahead of others. In essence, that is what the Settling Defendant was suggesting in a portion of the groundwater design; that groundwater construction could move ahead of soils remediation and sediment management. Of course, any such stockpiling must be managed in a sufficiently protective fashion.

On April 22, 1998 representatives of U.S. EPA, WDNR, KMCC and their consultant engaged in a conference call to explore what options there may be to minimize soil

excavation necessary to accomplish groundwater treatment system installation, and options concerning soil stockpile management that would result in acceptable protection. On July 27, 1998, U.S. EPA, with input from WDNR, was able to indicate approval of stockpile management concepts from KMCC provided - among other things - that the parties understood such stockpiling was to be of a temporary nature with the ability to treat stockpiled and other necessary areas within no more than two construction seasons. Also, the parties understand that portions of some highly contaminated soils areas not immediately excavated due to the desire to minimize volume in the stockpile will be revisited and excavated as soil treatment capability comes on line.

We request that the PP be amended to account for our comment letter to you of March 11, 1998, our comment fact sheet presented at the public meeting and our statement at the meeting.

Response - U.S. EPA believes that this Responsiveness Summary adequately addresses all comments submitted by WDNR.

We request that the PP revisions or amendment be mailed to your site community relations mailing list and the comment period be extended by 30 days past the date of mailing or 30 days past the current deadline to allow the public to review these changes and comment on them.

Response - U.S. EPA extended the public comment period by 30 days, and advised the public of this through a newspaper advertisement, voice mail advisement to callers concerning the Moss-American comment period, and notice on U.S. EPA's Region 5 Home Page.

If you do not intend to honor these requests, we ask that you reply directly in writing to this letter and provide an explanation as to why you will not honor them.

Response - As noted above, the April 14, 1998 correspondence from U.S. EPA constituted such reply.

Regardless, we ask that the comment period be extended by 30 days to allow this matter to be resolved.

Response - U.S. EPA extended the public comment period by 30 days, and advised the public of this through a newspaper advertisement, voice mail advisement to callers concerning the Moss-American comment period, and notice on U.S. EPA's Region 5 Home Page.

from S. W. Thornton - Milwaukee - dated April 3, 1998
(Note - Due to the length of the correspondence, U.S. EPA presents excerpts of what appear to be the most significant comments)

Although the 65 acres of land owned by Milwaukee County are currently undeveloped recreational land, there is no permanent absolute that this land will remain undeveloped or that the zoning will not be changed to residential.

Response - U.S. EPA appreciates the citizen observation that site land owned by Milwaukee County appears to be for recreational usage. U.S. EPA infers from commenter's statement that current zoning for County land is other than residential, but will make further inquiry on this matter. Per terms of the existing RD/RA Consent Decree, U.S. EPA would expect the Settling Defendant in this matter to seek other deed restriction or limitation as may be pertinent from the property owner. If this cannot be arranged, then cleanup to the residential scenario would be necessary, which would appear to be most pertinent to the direct contact component regarding needed remediation. U.S. EPA believes it is prudent to await pertinent recommendations as may develop from natural resource trustee and Settling Defendant discussion before addressing the County owned portion of the floodplain as a whole, i.e., for floodplain located outside of the former wood preserving plant.

Furthermore, there is no long term certainty that direct exposure hazards and any contamination containment caps will be adequately maintained of funded by future generations.

Response - In the remedial action consent decree, now entered by the Court, it has been determined that the prohibition of excavation of the final cover of the landfill as set forth in Wisconsin Administrative Code NR 504.07(8) is necessary to implement the remedial action for the facility to protect the public health and environment. The Settling Defendant in this matter, the KMC, has provided per terms of the Decree financial assurance for the work, which includes not only capital construction but also necessary operation and maintenance. Also, the Decree provides for the periodic review by U.S. EPA of the remedial action to assure that human health and the environment are being protected by the action so implemented. There is some ambiguity between the Consent Decree and its Statement of Work as to how long cover maintenance should be provided. U.S. EPA believes, as stated in the ROD amendment, that because of the slow rate of decomposition which might be expected from more complex PAHs, that it would be prudent to provide for financial arrangement such that the cover may be maintained in perpetuity.

There has already been several reported incidence's of direct exposure skin irritations and various degrees of skin burning in and around the area, including various areas nearby and down stream of the Little Menomonee River.

Response - U.S. EPA is concerned with such findings. The issues under consideration in the Proposed Plan will help to alleviate such condition, though a discussion of sediment management strategy, which U.S. EPA feels is warranted in the near future, will focus attention on this area.

Many people are not aware of the dangers of this site, thereby allowing their children to play in these fields, streams and at other areas, including around rail road tracks and the Union Pacific site when it is unattended/under supervised.

Response - Through the issuance of several fact sheets concerning site status which have been issued since the 1990 ROD, U.S. EPA has attempted to inform the public about the site. The great majority of Union Pacific property at the site is fenced. (Certain frequently utilized train tracks are not fenced, of course.) Union Pacific representatives inform U.S. EPA that contracted personnel conduct business on Union Pacific property during normal working hours, and that a security guard is on duty 24 hours per day.

People take their pets through this waterway and often raft the river. Furthermore, pets and wildlife drink out of the river.

Response - U.S. EPA has received groundwater treatment system design plans from KMC and its consultant. U.S. EPA has indicated conditional approval thereof, and is hopeful that the groundwater collection and treatment system will aid in preventing a significant portion of potential contamination from the site from entering the stream. Ensuring proper erosion control measures are taken, as proposed in the plan, will also help. Sediment management will aid further. Of course, the remedy is considering the Moss-American site in particular. U.S. EPA cannot guarantee that the introduction of some objectionable item into the Little Menomonee River, unrelated to the site, cannot occur at some point. One must also consider the frequency with which exposure of pets to site conditions occurs. A residential exposure scenario would assume daily exposure; a recreational scenario occasional exposure to the site.

Proposing that the area used by Union Pacific remains zoned as industrial with the hopes that it will remain industrial...is no sure way to assure that goal..... The less chance...is still too great

Response - One of the important instructions of administrative reform is to consider more realistic land usage patterns. The argument that a given piece of property may not always stay industrial, and that there is no absolute certainty could be used anytime, anywhere to negate any exposure scenario other than residential. But the Union Pacific portion of the site has been used for more than 18 years in an industrial fashion, as was indeed the site as a whole since the early 1920s. The public has a right to expect a protective cleanup. But U.S. EPA is urged, via the administrative reforms, to think more realistically concerning site usage patterns. Should a set of circumstances arise when industrial usage of at least a portion of the site does not seem a realistic assumption, U.S. EPA would reserve the right to seek modification of the remedy at some future time to reflect more up-to-date exposure scenarios. Should, for some unforeseen reason Union Pacific not be willing to incorporate industrial deed restrictions upon their site property, despite their indication of willingness to do so, then U.S. EPA has stated in the ROD amendment that cleanup to residential

exposure would occur.

The 3.1 ppm standard should be the only one minimum standard considered here for the entire 88 acres.

Response - U.S. EPA disagrees. The entire 88 acres includes the corridor of the Little Menomonee River and the river's floodplain. It would seem unrealistic to assume industrial development in the floodplain, especially when biking/hiking trails predominate in County lands further downstream.

Considering the recreational use exposure scenario of Alternative 2 is absolutely out of the question.

Response - As set forth in the ROD, a change in the risk scenario is contingent upon securing appropriate deed restrictions. As noted in the previous response, industrial development in this floodplain is highly unlikely. Furthermore, given recent activity concerning an easement on County land to accommodate a prospective industrial user, and the existence of the hiking/biking trails adjacent to the river farther downstream, plus the existence of the Park and Open Space plan as endorsed in 1991 by the Milwaukee County Board of Supervisors, there seems ample reason to consider recreational usage for a portion of the site.

In addition, it is important to assure the emissions collection meets all Wisconsin regulatory standards.

Response - U.S. EPA concurs.

The possibility that this land could be used in the future as a residential site presents favorably that the entire area be treated as residential for all exposure levels.

Response - U.S. EPA disagrees. The railroad has indicated its willingness to restrict residential usage on its land. Recent development on County land involving the former wood preserving facility was to seek easement for industrial usage, not residential. The Park and Open Space plan adopted by the County in 1991 clearly calls for enhancement of recreational opportunity in the river corridor.

In addition, current owners must be held responsible for disruption of any original contamination remaining following the completion of the remediation which may cause reoccurrence.

Response - U.S. EPA believes there should be flexibility in the interpretation of which person may be responsible for operation and maintenance duties concerning remedy implementation. U.S. EPA believes that the likelihood of either Union Pacific or Milwaukee County engaging in some disruption of the completed remedy would be very

remote, but U.S. EPA would in such event strive to prevent reoccurrence of contamination problems.

According to Mr. Edelstein, many of the alternatives being considered...were not fully disclosed in writing within the revised remedial action plan and/or Record of Decision (ROD). I insist that all changes to the original ROD be clearly identified in writing. I strongly suggest that, despite whatever is entailed in the original ROD, that the maximum protection or no less than 3.1 exposure levels be implemented for the entire 88 acres and placed in writing. This must be done before the acceptance of the remedial action plan by the WDNR.

Response - The term "alternatives" has specific meaning within the context of proposed plan presentation. U.S. EPA checked with WDNR on this matter. WDNR clarified that it would have been more accurate to say that there was concern over lack of certain details, as opposed to entire alternatives being omitted. The term "maximum protection" could also be construed to mean only a residential exposure scenario. Again, WDNR clarified that provided other concerns it raised were addressed satisfactorily, that a non-residential exposure scenario could be adopted for at least portions of the site. U.S. EPA will indeed put any changes to the ROD in writing. The original ROD called for residential exposure assumptions regarding the site. A key purpose of the current proposed plan is to reevaluate this position. Given the continued industrial usage at a portion of the site, and the condition imposed in the remedial action decree which stipulates that the site is not to be used for residential usage, U.S. EPA believes a change is prudent.

Although cost effective planning is critical, above all else, the protection of human and environmental health and safety must be assured foremost. Economics and politics are all too often primary at the expense of human and environmental health and safety... Hence, "Band-Aid" solutions will only pass on additional hazards and shift costs to future generations. Short term, low cost solutions will not provide long term human, wildlife, and natural resource protection! Wisconsin residents, recreational visitors, and especially those of us who live within the boundaries of risk due to this area, need to be certain that this site and the surrounding risk assessed areas, for what ever degree of risk is present, is as safe as it can be! The remedial action plan must be specific and conclusive in resolving these issues... Let those who contaminated the site pay for its cleanup and not through addition taxes.

Response - U.S. EPA is expected to conduct remediation of Superfund sites in a manner conforming to the National Contingency Plan (NCP). When remediation is required, the NCP has an expectation that excessive carcinogenic risk to site users will be within the one in ten thousand to one in one million range. Soil cleanup numbers discussed in the plan represent a one in one million source of additional carcinogenic risk to a given class of site user. The proposed plan discusses remediation which would provide for both treatment and containment of site soils. Through treatment of more highly contaminated soils areas, U.S. EPA expects the remedy to provide long-term effectiveness and permanence. U.S. EPA does not therefore expect to be passing a problem along to future generations. Other

elements of the remedy for which a need for remediation has been determined include groundwater and sediments management. The estimated net present worth of the cost of undertaking needed capital construction and long-term operation and maintenance efforts was placed at $26 million at the time of the 1990 ROD. While U.S. EPA is hopeful that changes in treatment technique may help to reduce that figure, the effort to conduct remediation at the Moss-American site is expected to remain considerable. U.S. EPA does not view a multi-faceted approach such as this, which features treatment as an important component, to the lower end of the acceptable risk range to represent a "Band Aid" effort at remediation. If U.S. EPA were to advocate a remedial measure featuring a more stringent cleanup than called for by the NCP, then citizens, as opposed to "those who contaminated the site," could very well be called upon to pay for extra cleanup costs taken which arguably were not in conformance with the NCP.

from G. J. Deigan - Libertyville, Illinois - dated April 6, 1998
(Note - Due to the length of the correspondence, U.S. EPA presents excerpts of what appear to be the most significant comments)

I understand that U.S. EPA and WDNR support the use of risk-based clean-up standards that are protective of human health under two land use scenarios at the site; industrial land use on the parcel owned and operated by the Union Pacific Railroad; recreational/trespasser land use on the parcels owned by Milwaukee County. These standards should be approved by U.S. EPA and WDNR and incorporated into the revised remedy. Union Pacific (UP) apparently endorses these standards and recognizes the adequacy and protectiveness afforded by these industrial land use standards... it is probable that the remedy can be implemented on and adjacent to the UP property without shutting down or appreciably impacting the active rail car unloading operation...

Response - U.S. EPA offers this clarification. From correspondence received from UP, there appears to be endorsement by that entity of usage of industrial exposure scenario risk evaluation on its land. Because of the land usage pattern on UP property, and the apparent willingness of UP to enter into appropriate deed restriction, U.S. EPA advocates the industrial exposure scenario for this portion of the site. U.S. EPA does not necessarily advocate recreational usage for all Milwaukee County site property. Per terms of Consent Decree restrictions, County site property consisting of the former wood preserving facility cannot be construed as for residential usage. Given recent attempt to grant an easement to a prospective industrial landowner on an uplands area of County property within the former wood preserving facility, U.S. EPA takes the position that non-floodplain portions of County property on the site should be industrial, so as to be consistent with the UP portion. Because of the obvious recreational usage of County property farther to the south along the river corridor, U.S. EPA believes floodplain portions of County property should be protected so as to meet a recreational exposure scenario. This is consistent with Tables 1-b/1-e of the 1990 ROD, which viewed the Little Menomonee River corridor as recreational. However, U.S. EPA will address the river corridor outside of the former

wood preserving facility prior to more active sediments management work involving the site. Should arrangement to provide for needed deed restriction or other limitation fail to occur with a given property owner, then default to the residential scenario would be necessary.

Based on comments made by a Milwaukee County representative at the March 18, 1998 public hearing, however, it does not appear that Milwaukee County will support the use of a recreational land use clean-up standard on its parcels of the Moss American site. I believe the County is not adequately informed on this matter, and as a result may be taking an improper political position on this issue... More stringent residential or industrial cleanup standards applied to the County Parcel will only further damage the emerging and mature habitats that have developed on the inactive wood treating site and the Little Menomonee River's riparian buffer zone... The imposition of deed restrictions that recognize future recreational/open space is consistent with the County Department of parks mission and charter and is not unreasonable. The County's unwillingness to support this alternate cleanup standard is a disservice to the public...

Response - U.S. EPA is not aware that any action has been taken by the County Board of Supervisors to withdraw endorsement of the 1991 Park and Open Space plan. Such plan clearly calls for recreational usage and development within the Little Menomonee corridor. However, the comment concerning "emerging and mature habitats" would appear to be more pertinent to the riparian zone, rather than upland areas. As indicated earlier, the adoption of different exposure scenarios is contingent upon obtaining appropriate deed restrictions.

WDNR and U.S. EPA have had a history of continued technical and regulatory disagreements and conflicting agendas at this Superfund site. This dissension among the two Agencies has unnecessarily delayed the remedial action progress at the Moss American Site, and resulted in excessive administration, engineering and communication costs that should have otherwise been beneficially spent on remediation or restoration of the site. U.S. EPA and WDNR should allow the responsible party to develop its technical plans and implement its proposed remedy... As a first step in addressing this issue, U.S. EPA should amend the existing Consent Decree to incorporate a revised statement of work and eliminate the three party Consent Decree. A two party Decree should be executed between U.S. EPA and the settling defendant for the revised remedy.

Response - While U.S. EPA cannot predict future matters, up until the present U.S. EPA and WDNR have officially disagreed only on the matter of appropriate management of concentrated recovered free-product creosote. U.S. EPA does not believe that this imposed an undue burden upon the settling defendant. The primary source of delay in conduct of the remedy was the filing of objections to entry of the Decree calling for remedial action. These objections, filed in 1991 by major site property owners, were not withdrawn until 1996/7. It could be argued that the settling defendant benefited substantially from the

standpoint of cost avoidance during this period. By the time that period ended, the concept of administrative reforms was in place, causing U.S. EPA to consider their logical application on this site which may have the effect of cost savings in the conduct of the remedy. U.S. EPA and WDNR did concur on the matter of letting groundwater design proceed utilizing the relatively innovative funnel and gate concept. Successful operation could yield significant savings to the settling defendant. The agencies also concurred on the matter of temporary soils stockpiling, which provides further flexibility in ability to begin groundwater management development providing good effort is made to get soils treatment capability on-line quickly, defined as no more than two construction seasons. As regards to the comment that the agencies should let the settling defendant develop technical plans and proceed, U.S. EPA recalls that when documents were submitted concerning another look at soils alternatives that in many cases the covers proposed for utilization bore no resemblance to dimensions specified by either ARARs or the 1990 ROD.

During the March 18, 1998 public meeting, several questions were asked by members of the public regarding the safety of the site to the public and children in the event they were to play in or near the river, walk their dogs, etc. Responses by the U.S. EPA and WDNR during the public meeting did not allay these concerns and in fact seemed to leave the public with the impression that there was an imminent and substantial threat by the current pre-remedial conditions of the site and the river...

Response - U.S. EPA does indeed believe that the site poses an imminent and substantial endangerment to human health and the environment. While some of the sources of the contamination have been removed, significant risks remain as evidenced by the administrative record and recent groundwater monitoring data.

U.S. EPA and WDNR unveiled proposed cross-sectional plans for a multi-layer engineered soil cover system that consisted of approximately 54" of cover soil. This cover soil is intended to preclude direct contact by humans... This cover system is excessive for its intended purpose... This thickness of cover will require that a substantial volume of fill soil be imported and placed on the site... such quantity of fill will adversely impact the community, the site and the surrounding environment by: raising the elevation of the site and altering the drainage patterns of the localized watershed..., increasing the potential for erosion and sediment loads in the river..., disturbing emerging and maturing habitats and land features...that have developed since the cessation of wood treating operations, including ephemeral ponds, emerging wetlands, scrub-shrub habitats, and compatible riparian land features, creating an elevated land fill that reduces potential future beneficial development..., increasing the disturbances to the surrounding community by short term construction impacts..., decreasing the usability of the railroad property... Infiltration of precipitation is viewed as an unnecessary objective of the cover system since soils will be treated to levels that are protective of groundwater (i.e., groundwater RCLs) and the site wide "funnel and gate" groundwater treatment system will provide containment and treatment of any migrating residual contaminants.

Response - U.S. EPA disagrees that control of infiltration is unnecessary. The 1990 ROD envisioned flushing of the soils as beneficial in carrying along perceived slight contaminant loads to the groundwater such that groundwater restoration objectives could be accomplished quickly. The finding in the pre-design sampling of more extensive deposits of free-product creosote changed that earlier presumption. Most Superfund remediation strives to limit infiltration; modifying this concept on the Moss-American site would bring site management more in line with most other remedial efforts. Moreover, as was explained in the proposed plan and meeting, the cover system now proposed is not by any means the most rigorous form of containment that could be imposed given the hazardous substances encountered. U.S. EPA is not advocating a liner and leachate collection system, providing that soils treatment efficiency can attain pertinent treatability variance values and pertinent groundwater residual contaminant values for the three compounds which are promulgated under WDNR rules and are of obvious groundwater concern at the site and in need of further source control efforts. Furthermore, the adverse consequences the comments foresee regarding emerging wetlands, ephemeral ponds, etc., are more pertinent to floodplain site locations. Consolidation of contaminated soils and the covering thereof is not expected to be placed within the floodplain, but rather on upland areas of the site.

U.S. EPA's proposed plan calls for potential thermal desorption of sediments from the Little Menomonee River. This approach should be reconsidered by U.S. EPA for a variety of ... reasons, including: the criteria for soils treatment by thermal desorption is to treat those highly contaminated soils having BAP-equivalent concentrations greater than 78 ppm for CPAHs. The sediments in the river do not contain these levels of CPAHs...; the sediment dredging and river remediation will likely not be conducted in a similar timeframe as the on-site soil remedy. Thus, the thermal desorption unit will have to be re-mobilized and/or operated at the site for an extended period of time... This is an unnecessary burden...without appreciable environmental benefit; The contaminants in the river sediment may include non-point source and non-site related contaminants that may not be fully characterized or appropriate for thermal desorption treatment and air emission controls... [such as]... heavy metals, PCBs, and other compounds... These contaminants are more appropriately managed by ...a soil cover system...

Response - Page 9 of the Statement of Work (SOW) for the remedial design and remedial action work plan which is a part of the Consent Decree states in part... "in the portions of the channel of the Little Menomonee River which are not rechanneled...Settling defendant shall...treat sediment containing in excess of..." Hence, to be consistent with the Consent Decree, U.S. EPA must advocate treatment of sediments as appropriate. U.S. EPA also points out that the reason for excavating and treating a certain soils "hot spot" is not only its CPAH concentration, but also whether a given area may be associated with free-product creosote. Such reasoning should apply to the stream as well. It is speculative at this time to judge whether dredging might ever play a more prominent role in sediments management at this site than what is now envisioned, but if such instance arose it might be prudent to at least allow for sediments treatment such that design for sediments containment might be more in line with design for treated soils. Were dredged sediments untreated, and

containing listed hazardous wastes, containment would necessitate liner and leachate collection (or solidification measures) utilization. The presence of PCBs would still appear to be compatible with thermal desorption usage. The presence of excessive levels of heavy metals in the sediments could interfere with either a bioslurry or thermal desorption treatment approach. Further sampling to determine the presence of heavy metals may be warranted.

I am concerned, however, that the Trustees, particularly WDNR, will promote a level of river remediation that is far beyond that required for protection of human health and the environment, and beyond the scale of impacts caused by the former wood treating operation. WDNR continues to advocate for a complete rerouting and development of a new river channel despite credible studies that indicate substantial environmental damage...from such an action... In lieu of a complete re-routing of the Little Menomonee River, WDNR continues to advocate for excessive dredging, unrealistic sediment quality standards, and restoration measures that are highly destructive to the existing emerging and mature habitats that have developed along... the river... In this case, the less destructive remediation plan should prevail in the interest of benefit to the environment and the community...

Response - The proposed plan does not address possible modification of sediment management approaches at the site. The 1990 ROD calls for river reroute. That is unaltered by the proposed plan. U.S. EPA has discussed possible dredging techniques which may be of interest on this site with remedial action signatory parties. However, concerning certain key logistical matters, for example, U.S. EPA never received assurance that appropriate containment steps would be used for dredging spoils, or that verification analysis would be an integral component of any dredging technique utilized. As such, U.S. EPA could not advocate a plan to significantly modify sediments management. It is possible, after examining areas of environmental injury, that the federal/state natural resource damage trustees may have some ideas or recommendations as to bring together concepts of remediation and restoration. U.S. EPA is not a natural resource trustee. CERCLA discusses resource liability as well as remediation efforts. To resolve all CERCLA liability, it may be in the interest of the Settling Defendant to consider approaches which if undertaken at one time might resolve remediation and restoration matters. U.S. EPA will note with interest trustee recommendations. If warranted, U.S. EPA would be the agency to prepare a proposed plan to consider implementation of trustee concepts should these relate to an alteration to sediment management concepts for which public comment is sought.

U.S. EPA and WDNR made some very recognizable mistakes in their 1990 remedy selection - I trust that federal, state, and county politics will not result in a repeat of this history during revised remedy selection some 8 years later.

Response - The key alterations which U.S. EPA advocates in this proposed plan are to consider adoption of non-residential usage scenarios for at least portions of the site, and to

adopt a different soils and sediments treatment technique. The first change comes about through consideration of administrative reforms adopted in the period 1993-1995; the 1990 ROD did not have the benefit of this guidance. The suggested treatment method change comes about after reviewing data results for wood preservative sites which has been amassed over the 1990s, which indicates that thermal desorption may be a better choice in instances where more complex forms of CPAHs, unencumbered by dioxin/furan complications, predominate. U.S. EPA did not have this information in 1990, either. However, U.S. EPA has attempted to be fair in its consideration of application of this newer information to site management.

from E. H. Bryan, Ph.D. - National Science Foundation - Arlington, Virginia - dated April 24, 1998

Thank you for your E-mail note regarding Moss American and the Little Menomonee River... My interest in that project relates to having been involved in discovery of the problem as a member of the Citizens for the Menomonee River Restoration (CMRR) and then its President and Principal Investigator of the EPA contract that led to the production of the film "Once a River". This film documented the process by which the problem was discovered and two research/demonstration projects conducted in 1972 on methods to decontaminate the sediments... I was in contact with your Bonnie Eleder in June of 1993 and sent her a video copy of that film... I'd like very much to be informed of items such as those I've been able to retrieve from the web relating to our progress toward cleaning up this site...

Response - U.S. EPA appreciates the efforts made by concerned citizens in this matter. U.S. EPA does have the video copy of the film to which the commenter refers. U.S. EPA will indeed attempt to keep interested citizens informed of progress concerning the site.

from T. P. Graan, Ph.D. - Roy F. Weston, Inc. - on behalf of Kerr-McGee Chemical LLC (KMC) - dated May 8, 1998 (Note - Due to the length of the correspondence, U.S. EPA presents excerpts of what appear to be the most significant comments)

"...As indicated by our past submissions to U.S. EPA, the bioslurry treatment technique recommended in the 1990 ROD is not effective. Moreover, guided by current EPA policy as implemented at other CERCLA sites, it is also appropriate to adopt significantly larger cleanup standards for the Site. We thus strongly endorse EPA recognition of these facts in the Proposed Plan..."

Response - In general, U.S. EPA concurs with the comment. U.S. EPA would add that the bioslurry treatment technique does not seem to be effective at this site. U.S. EPA also adds that cleanup standards for this site should consider non-residential usage exposure scenarios.

Comments on the Proposed Plan

1. "...far more extensive alterations of the remedy are required than those now being considered by U.S. EPA... very significant modification of the remedy for sediments in the Little Menomonee River is necessary. It is now apparent that the 1990 ROD remedy for sediments would create significant adverse ecological impacts throughout 5 miles of river corridor. U.S. EPA suggests... that a revision of this aspect of the remedy may be undertaken in the future. Although KMC is of the view that the available information shows that the river remedy must now be changed, KMC is prepared to support a limited modification of the ROD along the lines of the Plan... with the understanding that such a change will be without prejudice to subsequent further modifications of the ROD..."

Response - The Proposed Plan did not address any recommended changes in sediment management. As noted in the Proposed Plan, U.S. EPA is hopeful that discussions involving natural resource trustees, and which may eventually involve parties to the remedial action consent decree, will examine means by which remediation and restoration concepts can be best integrated into sediment management at the site.

2. "...While U.S. EPA has stated its intention under Alternative 2 to adopt an industrial use exposure scenario for the railroad property, it states only that it will consider a change to a recreational use scenario for the County property. We believe that the KMC submissions establish that a change in the exposure scenarios for both the railroad and the County land is now appropriate and we urge to U.S. EPA to establish the revised cleanup standards for both properties now. If EPA fails to act with respect to both properties, there will be a need in the future to revise the ROD yet again...

...the Plan fails to mention that the cleanup standards are expressed as benzo(a)pyrene equivalent concentrations, an approach that is consistent with both U.S. EPA and WDNR guidance... We recognize that EPA may understand and intend this interpretation of the cleanup standard, but we urge clarity on this point in the revised ROD..."

Response - Because of the land usage pattern on Union Pacific (UP) property, and the apparent willingness of UP to enter into appropriate deed restriction, U.S. EPA advocates the industrial exposure scenario for this portion of the site. U.S. EPA does not necessarily advocate recreational usage for all Milwaukee County site property. Per terms of Consent Decree restrictions, County site property comprising the former wood preserving facility cannot be construed as for residential usage during the performance of the work. Regarding the former wood preserving facility, and being mindful of recent effort to seek easement for an industrial facility on an upland section of this facility, U.S. EPA takes the position that non-floodplain portions of the former wood preserving facility should be industrial, so as to be consistent with the UP portion. U.S. EPA will defer classification of County property along the river corridor to a later time so that it is consistent with sediment management objectives. It may be argued that because of the obvious recreational usage of County property farther to the south along the river corridor, floodplain portions of County property should be protected so as to meet a recreational

exposure scenario. This would be consistent with Tables 1-b/1-e of the 1990 ROD, which viewed the Little Menomonee River corridor as recreational. The revised ROD (ROD amendment) notes the concept of benzo(a)pyrene equivalent, *which is appropriate when considering the direct contact exposure pathway*. However, with regard to groundwater management, it is more appropriate to consider the specific compound(s) shown to be of concern, and to manage the remedy such that these particular compounds no longer pose a continuing source threat. Upon review of monitoring data for the Moss-American site, naphthalene, fluorene, and benzo(a)pyrene appear to warrant such management.

3. "...The Proposed Plan states that contaminated soil will be treated in a low-temperature thermal desorber, but does not clearly specify that only highly contaminated soil will undergo treatment... In its discussions with U.S. EPA and WDNR, KMC has agreed to treat soils exceeding 78 ppm CPAHs (BAP-equivalent), and soils identified in the RI as containing BTEX compounds in excess of NR 720 generic migration-to-groundwater values... The revision of the ROD should clearly state these limits, however, so that there will be no confusion as to the soils that will be treated..."

Response - In its discussion of the "Recommended Alternative", the proposed plan notes that "...U.S. EPA sees potential benefit in adopting thermal desorption (Alternative 2) as a treatment approach for highly contaminated soil/sediment at the Moss-American site..." U.S. EPA concurs that CPAH is noted in terms of benzo(a)pyrene (BAP) equivalent, and believes that the areas KMC/Weston have elected correspond well with the agency's working definition of "hot spot" from a standpoint of toxicity protection. U.S. EPA would add that another reason to treat soils is to further attempt to manage those areas which may be associated with free-product creosote. As noted in the proposed plan in Recommended Alternative discussion, plus Figure 1, U.S. EPA expects thermal desorption treatment would be extended to soils areas having more highly contaminated CPAH levels (78 ppm), are associated with free-product creosote, and/or contain BTEX compounds posing a threat under NR 720 generic migration-to-groundwater values. Additionally, as discussed in the ROD amendment, U.S. EPA has added the compounds naphthalene, fluorene, and benzo(a)pyrene and points encountered from the RI which indicated high areas of such compounds. This is because of the presence of these compounds in monitoring wells in excess of PALs and the need to control nearby soil areas.

4. "The Plan states that some contaminated sediments may undergo treatment in the LTTD... More importantly, in contrast to soils, LTTD treatment of contaminated sediments is not appropriate from a practical and logistical standpoint. Site soils requiring LTTD treatment could be excavated, temporarily stockpiled, treated, and placed back on site within one field season. The treatment of soils would thus require only one mobilization/operation/demobilization of the LTTD unit. On the other hand, sediment removal from the Little Menomonee River is expected to occur over several years. Sediments requiring treatment might be encountered at various locations throughout the river during the entire time period of sediment dredging, thus requiring either: (1) multiple-year temporary storage of untreated contaminated sediments at the site

followed by LTTD treatment after all sediments are excavated, or (2) multiple mobilization/operation/demobilization sequences for the LTTD unit. Neither of these options is cost-effective or environmentally desirable. In addition, KMC is puzzled at the statement that "contaminated sediment areas where sediment is removed by dredging techniques near bridges may also undergo thermal desorption treatment." There appears to be no logical or practical reason why the location of sediment should govern the determination of whether to treat that sediment..."

Response - In considering the logistics of the matter, U.S. EPA is not necessarily convinced of a main premise put forward by the commenter; namely that there will be a considerable disparity between time needed to accomplish soil treatment objectives (one field season) versus time needed to accomplish sediment management objectives if dredging were featured on a larger scale than now envisioned (several years). U.S. EPA recalls discussion on the matter of dredging where KMC representatives estimated four years if work were done mainly in the spring and summer. However, U.S. EPA noted that many sediments management projects might be best conducted during all seasons except spring, when siltation control aspects of the work might be most difficult. A more aggressive program, if dredging were featured more prominently than now envisioned, might be accomplished in two years. Hence, if time estimates to accomplish soils and sediments work are brought closer together, there is less concern over multiple LTTD mobilizations and extensive storage periods. It is speculative at this time to judge whether dredging might ever play a more prominent role in sediments management at this site than what is now envisioned, but if such instance arose it might be prudent to at least allow for sediments treatment such that design for sediments containment might be more in line with design for treated soils. Were dredged sediments untreated, and containing listed hazardous wastes, containment would necessitate liner and leachate collection (or solidification measures) utilization. Page 9 of the Statement of Work for the remedial design and remedial action work plan which is a part of the Consent Decree states in part... "in the portions of the channel of the Little Menomonee River which are not rechanneled...Settling Defendant shall...treat sediment containing in excess of..." Hence, to be consistent with the Consent Decree, U.S. EPA must advocate treatment of sediments as appropriate. U.S. EPA also points out that the reason for excavating and treating a certain soils "hot spot" is not only its CPAH concentration, but also whether a given area may be associated with free-product creosote. Such reasoning should apply to the stream as well.

Comments on the 18 March 1998 Public Meeting

1. "...During the course of the meeting, U.S. EPA presented diagrams of three cover/liner designs that were portrayed as the options U.S. EPA is considering for LTTD-treated soil... KMC was startled to learn at the meeting that U.S. EPA is considering cover/liner designs that differ so significantly from those that have been the subject of our discussions... the proposed liner/cover designs are troublesome because U.S. EPA seems to have made the unfounded assumption that treated soils somehow pose a greater environmental threat than untreated soils... KMC believes

that post-treatment analytical results should be the guide as to how the treated soil should be managed at the site..."

Response - U.S. EPA believes that reasoning behind the thinking in the 1990 ROD to deliberately employ a permeable cover that promotes water infiltration so as to enhance the flushing of soil contaminants into groundwater as a means of hastening groundwater remediation time is no longer valid, given the finding of more free-product creosote at the site than was envisioned at the time of the 1990 ROD. Hence, a permeable soil cover is no longer warranted. A containment unit for a hazardous waste should logically provide for subsurface management in the form of a liner and leachate control system. However, U.S. EPA adopts the view that if treatment is provided first, and RCLs for groundwater are attained, only cover measures need be employed provided as is explained in the ROD amendment a CAMU is used and the appropriate degree of protectiveness is reached as may be stipulated under federal or State rule pertaining to its usage, e.g., ch. NR 636. This assumes that treatment efficiencies in Land Disposal Restrictions or treatability variances thereto are attained. However, U.S. EPA does believe that post-treatment analytical results should help guide subsequent soils containment efforts. If indeed all excess direct contact, runoff, and groundwater migration threats are brought to satisfactory levels, then the residuals could be managed in very simple fashion, and protection from undue erosion would be the only foreseeable management concern.

2. U.S. EPA stated that the LTTD unit would operate at temperatures between 500-900F. Most LTTD contractors have suggested an operating temperature of 1,000-1,200F for the specific conditions at the Site.

Response - The example given was to show a typical working range for the low temperature thermal desorption technology as contrasted to incineration, which is conducted at approximately 2200F. (See page 21 of the transcript of the public meeting). Later on in the meeting, (see page 33 of the transcript) U.S. EPA noted that particularly efficient CPAH removal efficiency had been realized using LTTD at one creosote site at an operating temperature of 900F. This is not greatly different from the operating temperature suggested by the commenter, and U.S. EPA appreciates this information.

3. "...U.S. EPA stated at the meeting that sediment cleanup would extend through mile 5 of the Little Menomonee River. We were startled by this statement because we thought that the parties had reached a common understanding that sediment cleanup would involve only the first three miles plus approximately one half of mile 4... the data suggest that even this cleanup - to which KMC acceded only to achieve compromise - is far more extensive than the circumstances warrant... We also understand that the current revisions of the ROD will not cover this matter and that a further revision will take place in the future on this and related subjects. Nonetheless, we hope that the U.S. EPA's comments do not reflect a retreat from the compromise that had been obtained in our discussions..."

Response - As of discussions among the remedial action signatory parties through March 1997, conceptually the parties were indeed thinking in terms of sediment cleanup extending through segment 3 and including about half of segment 4. This was based on segment by segment comparison of sediment CPAH content with maximum probable background (MPB) values as calculated per segment by WDNR. That U.S. EPA should express a different view as to linear stream distance requiring remediation should not startle Weston/KMC, since after all it was a proposal presented by Weston/KMC which caused the change. In August 1997, both in a meeting with the signatory parties and in a subsequent conference call, Weston/KMC proposed that WDNR adopt one overall average value MPB for the stream, rather than utilize a segment by segment approach. Weston/KMC suggested the value be approximately 15 ppm CPAH, representing an overall average of the segment values. WDNR subsequently adopted this value, and it serves as a measure of what should necessitate runoff protection as well. However, once that was done, the view of what should happen with segment 5 changes. The "per segment" MPB approach yielded an MPB of about 26 ppm for segment 5, and it was arguable given the Remedial Investigation (RI) and pre-design sediment data that segment 5 could be a no-action zone. However, when the value of 15 ppm CPAH is applied, segment 5 should be remediated.

4. "...The Milwaukee County Supervisor made statements that reflect a misunderstanding of the terms of the Consent Decree... In particular, KMC has not agreed to spend $ 26M for remediation... Although KMC... provided U.S. EPA with financial assurances demonstrating that KMC could fund a remedy with a cost of that magnitude, KMC is under no obligation to spend $ 26M at this site...

The Plan, as modified to reflect these comments, takes U.S. EPA part of the way along the path that it is required to follow... We would appreciate it if you would include these comments in the administrative record that you maintain for this Site..."

Response - U.S. EPA concurs with theWeston/KMC interpretation of this matter, namely that KMC did provide financial assurance of its ability to conduct a remedy having a net worth of $26 million. However, KMC is not obligated to spend that amount if the remedial goals can be accomplished in a manner incurring less cost. U.S. EPA will indeed include these comments in the administrative record. U.S. EPA notes briefly that its actions in reviewing conduct of the remedy are driven in large part by administrative reforms pertinent to certain subject matters concerning the Moss-American site. While U.S. EPA strives to implement such reforms, they are not actually a matter enacted into law and as such U.S. EPA may not necessarily be "required" to implement such review of the remedy.

Oral Comment - Compiled from the transcript prepared of the March 18, 1998 public meeting held in room 180 of Vincent High School, Milwaukee, Wisconsin.

from J. McGuigan - I'm County Supervisor, Milwaukee County. You commented about recreational use of the site in the park and open space plan which, by the way, is from the SEWRPC [Southeastern Wisconsin Regional Planning Commission] that was passed five years ago, and while there may have been approval from...the supervisor at the time, we have a new man in town who doesn't approve. Also, I wanted to make a correction. The consent decree between the County, Moss-American, and Kerr-McGee says that...says that the parks will be off limits indefinitely, so we're not looking at any recreational use for this plan or for this area.

Response - U.S. EPA has received a copy of a June 20, 1991 resolution adopted by the Milwaukee County Board of Supervisors. This states in part "...Whereas, the Park Plan builds upon an unprecedented level of related park and recreation facility planning efforts to preserve river lands, stabilize the Lake Michigan shoreline, coordinate development and ... protect invaluable natural areas, maintain the high quality parks infrastructure, and program needed recreational facilities..." and also "Be it resolved, that the Milwaukee County Board of Supervisors approves in principle the SEWRPC... Report No. 132, "A Park and Open Space Plan for Milwaukee County". U.S. EPA has also obtained a copy of this report. Map 8 on p. 25 indicates a bike tour trail along the corridor of the Little Menomonee River. Map 9 designates the Little Menomonee River from Brown Deer Road to the confluence with the Menomonee River as a primary environmental corridor. Map 10 also indicates that this same corridor is designated as flood land within Milwaukee County. Hence, U.S. EPA might conclude that residential development within this corridor is unlikely. At the current time, this resolution is still in place. Moreover, the change in risk assessment scenarios is contingent upon securing appropriate deed restrictions.

from Mr. S. Millir

My name is Scott Millir. I just live around here and I agree with using the elevated cleanup [values] for the different land uses, and the thermal desorption sounds like the better plan of the two.

Response - U.S. EPA concurs with the comment.

from Mr. D. Michaud

Dave Michaud, a neighbor. I'd like to go on record similar to the gentleman just prior to me.

Response - U.S. EPA concurs with the comment.

from Alderman Tom Nardelli

I represent this area and I support the ab[de]sorption method. It looks like it might be a better one than that which was previously discussed.

Response - U.S. EPA concurs with the comment.

from Mr. C. Theel

I was going to say that perhaps the use of some presumptive techniques could...help shorten the time that it takes to approve of such methods, along with the...recommended desorption technique, which seems far superior than the bioslurry.

Response - U.S. EPA concurs with the comment.

from Mr. J. Brengosz

I would endorse that alternative number 2. My name is Jim Brengosz. I live along the Little Menomonee River.

Response - U.S. EPA concurs with the comment.

from Mr. S. Brengosz

And I'd like to just comment, too, Steve Brengosz, I live down the street from him, that I think if the lower cost maybe we could treat more soil or treat the soil better for the same amount of money that's budgeted, so to speak, for this project.

Response - U.S. EPA concurs with the comment.

from Ms. Rose

My name is Cathy Rose. I would like to conditionally say that the TDU sounds like a better method, but I have some question about raising from 3.1 parts per million to 47 parts per million as acceptable. With the deed restrictions, deed restrictions can also be revoked, so 20 years down the road once...this is forgotten, deed restrictions can be revoked, so I have some hesitations about that.

Response - U.S. EPA basically concurs with the comment, but would like to note that while an acceptable cleanup level for CPAHs on land to be used for recreational purposes would be 49 ppm for direct contact protection and 48 ppm for groundwater protection, those values would in all likelihood be tempered by the need to also provide protection against excessive surface soil runoff which would contribute more than the level of 15 ppm necessary to avoid future river sediment contamination problems. Also, as further explained in the ROD amendment, U.S. EPA is adopting usage of a groundwater RCL not

only for benzo(a)pyrene, which is indeed 48 ppm, but also for fluorene (100 ppm) and naphthalene (0.4 ppm).

from Mr. McGuigan

I'll just add a clarification. Kerr-McGee is on the hook, I believe, for at least $ 29 million, so to one of the questions that...was indicated before...it's not taxpayer dollars. I think that if Kerr-McGee screwed it up, they should clean it up.

Response - The 1990 ROD provided an estimated present net worth of approximately $ 26 million to perform the work needed to accomplish the ROD objectives. If soils treatment can be accomplished for less with a change in technology, that figure may be reduced somewhat. It is true that KMC has entered into a consent decree calling for private expenditure of remedial design, action, construction and operation efforts necessary to carry out remedy decision objectives. KMC has also provided financial assurance of its ability to finance $26 million of work. However, U.S. EPA believes it is more accurate to say that KMC is obligated by the decree to perform the necessary work, not necessarily to expend a set amount of money.

from Mr. J. Woida

My name is John Woida, and I think that the recommendation to change the proposal looks very feasible and less money, less time, greater cleanup, and I think that it's very good that we have this many people from the community coming that were able to get people interested and representatives from all the parties that have a stake in resolving this issue.

However, I think that it's still important that we keep our focus on cleaning up the sediments in the groundwater which remain probably the most threatening of the situations to the residents in the community five miles up and downstream, and particularly since students here at Vincent High School use the river as a resource in education, we would like to feel safe in using that and hope that this can be remediated very soon.

Response - U.S. EPA concurs with the speaker's comment concerning proposed change in soil-related facets of the remedy. U.S. EPA also is pleased with the significant degree of participation at the meeting, especially taking into account the rather inclement weather that evening.

As noted in earlier discussion during the meeting, U.S. EPA is aware that sediment management is an important aspect of the remedy. Given the more liberal change from utilization of a sediment quality criterion of 3 ppm CPAH compared to the more recently derived value of 15 ppm, U.S. EPA discussed that dredging technology once dismissed for sediment management such as wet or dry excavation might indeed be feasible. However, were dredging as a sediment management tool allowed on a greater scope than is now

envisioned, some logistics as to its usage must be further developed. One focus of on going discussions of natural resource trustees is how to consider the integration of site restoration aspects with remediation. This mainly involves sediment management questions. U.S. EPA is not a natural resource trustee. U.S. EPA expects to be apprised of discussion recommendations, and pending outcome would, if necessary, develop a separate proposed plan to further consider any proposed change to the means of sediment management.

from Ms. L. Dahlke

Lori Dahlke. I think the ab[de]sorption does sound good.

Response - U.S. EPA concurs with the comment.

from Mr. G. Edelstein - WDNR

...We have, for the time being, if you read closely that proposed plan, withheld our formal concurrence with this plan, but I want to emphasize that we generally do agree with the main thrust of the plan, the two main thrusts. One, to change the land use exposure assumptions to those that are being proposed, and the other to substitute low temperature thermal desorption for slurry biotreatment...

Response - U.S. EPA concurs with the comment.

...In general, we felt that the document was confusing and incomplete. One of the big omissions, and Russ did talk about this, but it wasn't in the proposed plan, was that soils at the site are going to have to meet a standard that will be protective of the groundwater, and that will have to be done either with - by picking the[m] up and treating them or through some method to make sure that the soils that are left behind do not cause a problem, and that has not really been discussed clearly in this document...

Response - The plan states that for soil cleanup, cleanup is to be governed by pertinent standards from the Wisconsin administrative code, and that these cleanup standards cover both direct contact and groundwater protection. U.S. EPA is aware that some contributors to the plan felt that even earlier versions were of a complex nature. Consequently, when further details were sought, U.S. EPA took the position of trying not to "overload" the reader, and referred the reader to the administrative record for more details. Therefore, U.S. EPA emphasized more quantitative information in the plan regarding direct contact soil cleanup goals. The reason is that U.S. EPA felt these would be of more interest to the citizen living near the site since direct contact with soils presents a more likely pathway for exposure than groundwater consumption since the aquifer in the vicinity of the site is not used for such purpose.

...Performance standard cap, e.g., simple soil layer a few inches and some asphalt, but it wasn't

discussed in there where it was, how much, and how that would be done. It wasn't really discussed in any kind of detail about these things we talked about called deed restrictions and maintenance agreements. Real important if you want to work in the long-term. Wasn't talked about very much in there...

Response - The plan notes that runoff problems may be avoided either through attaining certain levels of CPAHs in soils, or by adopting related control measures or performance standards. U.S. EPA did not emphasize reliance on performance standards because it is one tool of many that could be invoked. The control measures to be considered in NR 216 Subchapter III include interim and permanent stabilization practices, structural practices to divert flow, trapping of sediment in channelized flow, staging construction to limit bare areas subject to erosion, stabilization of drainage ways, etc. Hence, U.S. EPA did not wish to limit subsequent design flexibility by overemphasizing performance standard using a simple soil cover. Indeed, U.S. EPA can foresee there may be instances where insistence on such performance standard, i.e., a simple soil cover, might conflict with other site recommendations later on. For example, it is possible that one recommendation from the natural resource trustees could be to advocate usage of siltation ponds in sediment management, and then not to abandon such ponds but rather use them as future sources of stream sinuosity. If a performance standard adopted for site usage gave instruction to fill in such a pond with soil, that could present a conflict with better usage. Regarding deed restrictions, U.S. EPA did note in the plan that such restriction would need to be used in adopting non-residential site usage. The CERCLA statute does not grant significant enforcement powers to U.S. EPA regarding institutional control measures, a deed restriction being one such example. Hence, U.S. EPA believes it is sufficient that the plan called for usage of such restrictions, though greater enforcement powers regarding their usage may have been granted to other units of government. U.S. EPA agrees that maintenance arrangements regarding currently paved areas of the site, notably on Union Pacific property, are important, and U.S. EPA would expect that suitable arrangement would be one area of discussion between KMC and Union Pacific as they discuss an overall industrial usage deed restriction.

...There's a little footnote in the plan that talks about using what's called the Superfund waiver or CERCLA waiver for doing that, and our feeling is that that mechanism is not appropriate for allowing that unit to be designed without a liner. If the soil's treated right, we don't have a problem with the design, but that particular provision of the law is not appropriate for allowing that type of unit...

Response - The primary focus at this point of the plan is to note to the reader that the original reason for selecting a relatively permeable soil cap instead of the more customary impermeable cap is no longer valid. U.S. EPA also wishes to inform the plan reader that what is to replace a permeable soil cover is not necessarily a full-fledged hazardous waste containment cell. As is further explained in the ROD amendment, the preferred means of approach in this instance is via CAMU utilization, which provides needed protectiveness

for measures noted in ch. NR 636. This appears to offer the best overall approach for flexibility in dealing with areas to be consolidated, placement of soils after treatment, and promotion of incentive for enhanced treatment efficiency, etc.