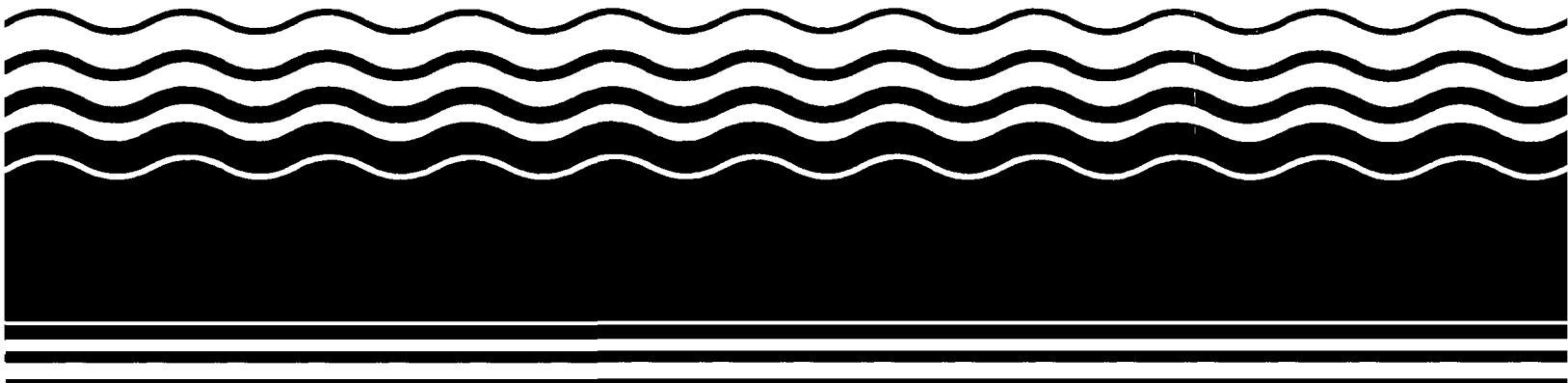




# **Superfund Record of Decision:**

North U Drive  
Well Contamination, MO



<b>REPORT DOCUMENTATION PAGE</b>		1. REPORT NO. EPA/ROD/R07-93/062	2	3. Recipient's Accession No.	
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				14.	
15. Supplementary Notes PB94-964306					
16. Abstract (Limit: 200 words)  The North U Drive Well Contamination site is an area of ground water contamination located approximately 1.25 miles north of Springfield, Greene County, Missouri. Land use in the area is predominantly residential, with woodlands and manufacturing/commercial businesses that include a few abandoned service stations and the Montgomery Metal Craft Plant. Approximately 200 to 300 residents live within the area of ground water contamination. Another Superfund site, the Fulbright Landfill, is located one-quarter mile to the north of the site. As part of its site operations, the Montgomery Metal Craft plant handled, stored, and cleaned used underground petroleum storage tanks, and utilized as many as three underground tanks on the property. The North U Drive Well Contamination site was first identified as a potential hazard in late 1983 when, citizens using private wells complained of a chemical taste and odor in their drinking water that resembled gasoline or petroleum. Subsequent sampling by the State identified 12 onsite wells that were contaminated by gasoline constituents, including benzene, toluene, ethylbenzene, xylenes, and methyl tertiary-butyl ether (MTBE), which are constituents of gasoline. MTBE is used exclusively as an additive in gasoline and was not commercially available until 1979. Therefore, MTBE contamination is indicative of contaminant release since 1979. Meta contamination also was detected in the soil  (See Attached Page)					
17. Document Analysis      a. Descriptors Record of Decision - North U Drive Well Contamination, MO First Remedial Action - Final Contaminated Medium: None Key Contaminants: None  b. Identifiers/Open-Ended Terms   c. COSATI Field/Group					
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Abstract (Continued)

and ground water, but most was within the range concentrations naturally found in the area. In 1985, as part of a removal action, municipal water lines were installed to provide an alternate water supply to affected residents, and 62 wells were plugged to control the spread of contamination and prevent human consumption. Later in 1985, in an unrelated action, PCB capacitors and PCB-contaminated soil were removed offsite from the former Curtis Service Station, located near the site. This ROD addresses the contaminated ground water at the site. EPA determined that it lacks jurisdiction in this case, and the RI demonstrated that the site does not pose a significant threat to human health and the environment; therefore, there are no contaminants of concern affecting this site.

The selected remedial action for this site is no further action because EPA, in consultation with the State, has determined that it lacks jurisdiction to undertake or require additional response actions to address the release of petroleum products. Additional response activities are precluded under CERCLA authority because:

- (1) petroleum-related contaminants are excluded from CERCLA response activities; and
- (2) substances found naturally at a site are excluded from CERCLA response activities.

Additionally, the risk assessment conducted as part of the RI demonstrated that the contaminant releases do not pose a significant threat to human health, or the environment. There are no present worth or O&M costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

RECORD OF DECISION  
NORTH U DRIVE WELL CONTAMINATION

DECLARATION

FINAL REMEDY SELECTION

SITE NAME AND LOCATION

North U Drive Well Contamination  
Springfield, Missouri

STATEMENT OF BASIS AND PURPOSE

This decision document presents the final remedy selected for the North U Drive Well Contamination site in Springfield, Missouri. The U.S. Environmental Protection Agency (EPA), in consultation with the Missouri Department of Natural Resources (MDNR), selected the final remedy in accordance with the requirements of 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 Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. The EPA bases this decision upon the documents and information contained in the Administrative Record for this site. Copies of the Administrative Record are available for review during normal business hours in the Docket Room at EPA Region VII Office, 726 Minnesota Avenue, Kansas City, Kansas; at MDNR's Hazardous Waste Program File Room, 205 Jefferson Street, Jefferson City, Missouri; and at the Kearney Street Branch Library, 630 West Kearney, Springfield, Missouri.

The State of Missouri (MDNR) has been the lead agency on this site and conducted the Remedial Investigation (RI). The State and EPA jointly recommended the preferred or recommended alternative identified in the Proposed Plan, which is selected as the remedial action for this site in this Record of Decision (ROD).

DESCRIPTION OF THE SELECTED REMEDY

The EPA, in consultation with the State of Missouri, has determined that it lacks jurisdiction to undertake or require additional response or remedial actions under CERCLA for the petroleum-related releases and the elevated levels of metals in groundwater at the site. Therefore, the final remedy for the site is "No Further Action." Since no remedial action is necessary at this site, EPA has determined that its response at this site is complete. Therefore, the site now qualifies for inclusion on the Construction Completion List. It should be noted that in 1985, the EPA conducted a removal action at this site. As part of the removal, municipal drinking water lines were extended to provide drinking water to users of well which were contaminated. Contaminated wells were then plugged in accordance with state requirements.

## DECLARATION

Under Section 104 of CERCLA, the governmental response authority is limited to addressing a release of a "hazardous substance," "pollutant," or "contaminant."

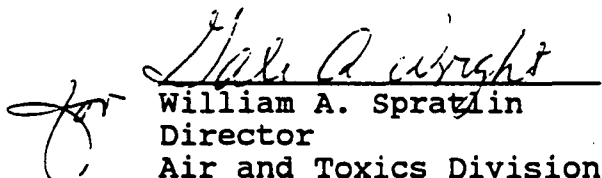
The term "hazardous substances" is defined in Section 101(14) CERCLA to include approximately 714 toxic substances listed under five environmental statutes, including CERCLA. The definition of a hazardous substance excludes "petroleum including crude oil or any fraction thereof," unless specifically listed under one of the five statutes. Hazardous substances found at levels which exceed those normally found in such petroleum fractions, as well as substances not normally found in petroleum products, are not excluded from CERCLA response actions.

In addition, Section 104(a)(3)(A) of CERCLA does not allow for a response activity where there is a "release or threat of release of a naturally occurring substance in its unaltered form, or altered solely through naturally occurring processes or phenomena, from a location where it is naturally found."

Additional response activities are therefore precluded under CERCLA authority because (1) petroleum-related contaminants are excluded from CERCLA response activities; and (2) substances found naturally at a site are excluded from CERCLA response activities. Therefore, no further action is selected as the final remedy for the North U Drive Well contamination site. Additionally, a Risk Assessment on the site was conducted a part of the RI and demonstrated that the contaminant releases do not pose a significant threat to human health, welfare, or the environment. Since no remedial action is necessary at this site, it now qualifies for inclusion in the "sites awaiting deletion" subcategory of the Construction Completion category of the National Priorities List.

Date

3/31/93

  
William A. Spratlin  
Director  
Air and Toxics Division

RECORD OF DECISION

NORTH U DRIVE WELL CONTAMINATION SITE

SPRINGFIELD, MISSOURI

Prepared by:

Missouri Department of Natural Resources (MDNR)

and

United States Environmental Protection Agency (EPA)

Region VII

March 1993

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RECORD OF DECISION  
NORTH U DRIVE WELL CONTAMINATION SITE

DECISION SUMMARY

SECTION 1, SITE BACKGROUND

1.1 Site Location and Description

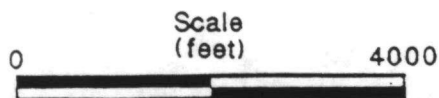
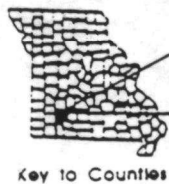
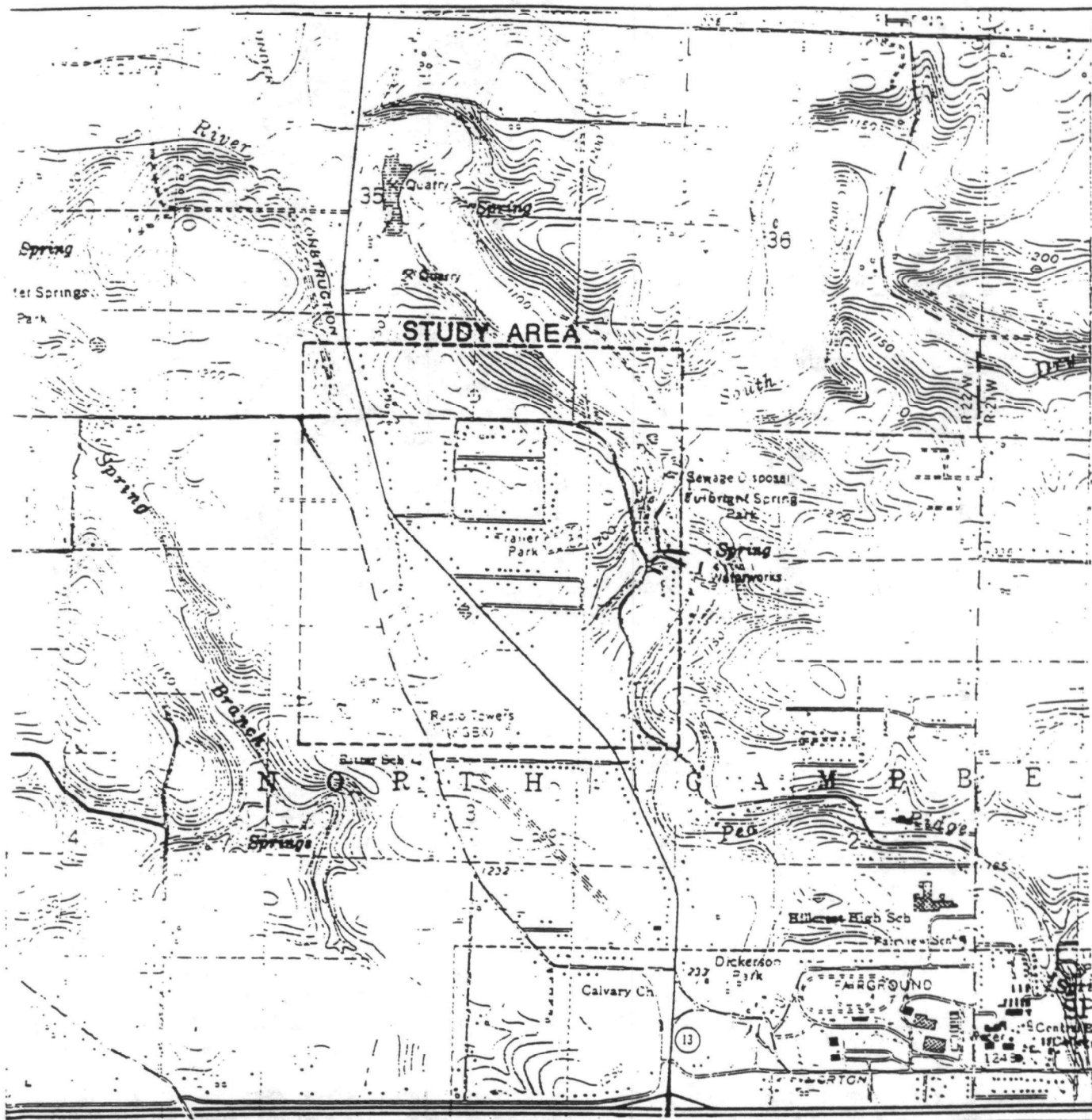
The North U Drive Well Contamination site is located approximately 1.25 miles north of Springfield, Greene County, Missouri (Figure Number 1). The site is bounded on the north by North Stage Coach Road, on the east by Pea Ridge Creek, on the west by New Missouri Highway 13, and the south by the south property line of the Montgomery Metal Craft facility (Figure Number 2). The site and its surroundings consist of a rural/residential neighborhood, woodlands, and manufacturing and commercial businesses. The topography consists of low hills and some sinkholes. The area is in a karst setting. Karst refers to solution features such as caves, sinkholes, and springs. Approximately 200-300 people live in the area of groundwater contamination. The former Fulbright Landfill, also a Superfund site, is located less than 1/4 mile north of the site. The Fulbright Pump Station and Municipal Water Plant is located less than 1/4 mile east of the site.

1.2 Site History

The North U Drive Well Contamination site was first identified as a potentially hazardous waste site in October 1983, when citizens complained of a chemical taste and odor in their drinking water. Complaining residents, all of whom used private drinking water wells, consistently described a petroleum or gasoline-type odor in their wells. Twelve wells were found to be contaminated. One of the wells contained 470 ug/l benzene, which exceeds EPA's Suggested No Adverse Response Level (SNARL) ten day limit of 350 ug/l.

Sampling by MDNR identified benzene, toluene, ethylbenzene, xylene, and methyl tertiary butyl ether (MTBE) as the primary contaminants in the groundwater. These compounds are constituents of gasoline. MTBE is exclusively used as an additive in gasoline, and was not commercially available until 1979. Therefore, MTBE contamination is indicative of contaminant release since 1979.

Water lines were installed in 1985 to provide Springfield city water to all affected residents. In addition, 62 wells were plugged to control the spread of contamination and to prevent residents from drinking contaminated water. These activities were conducted by the EPA Removal Program. The EPA conducted a separate, unrelated removal of PCB capacitors and PCB contaminated soil at the former Curtis Service Station in September 1985.



## NORTH U DRIVE SPRINGFIELD, MISSOURI

Prepared by Mark Mayo  
Ecology & Environment, Inc. January 1992  
Source: USGS 7.5' Ebenez, MO Quad. rev. 1978

Figure 1 - Location of North U Drive Well Contamination Site

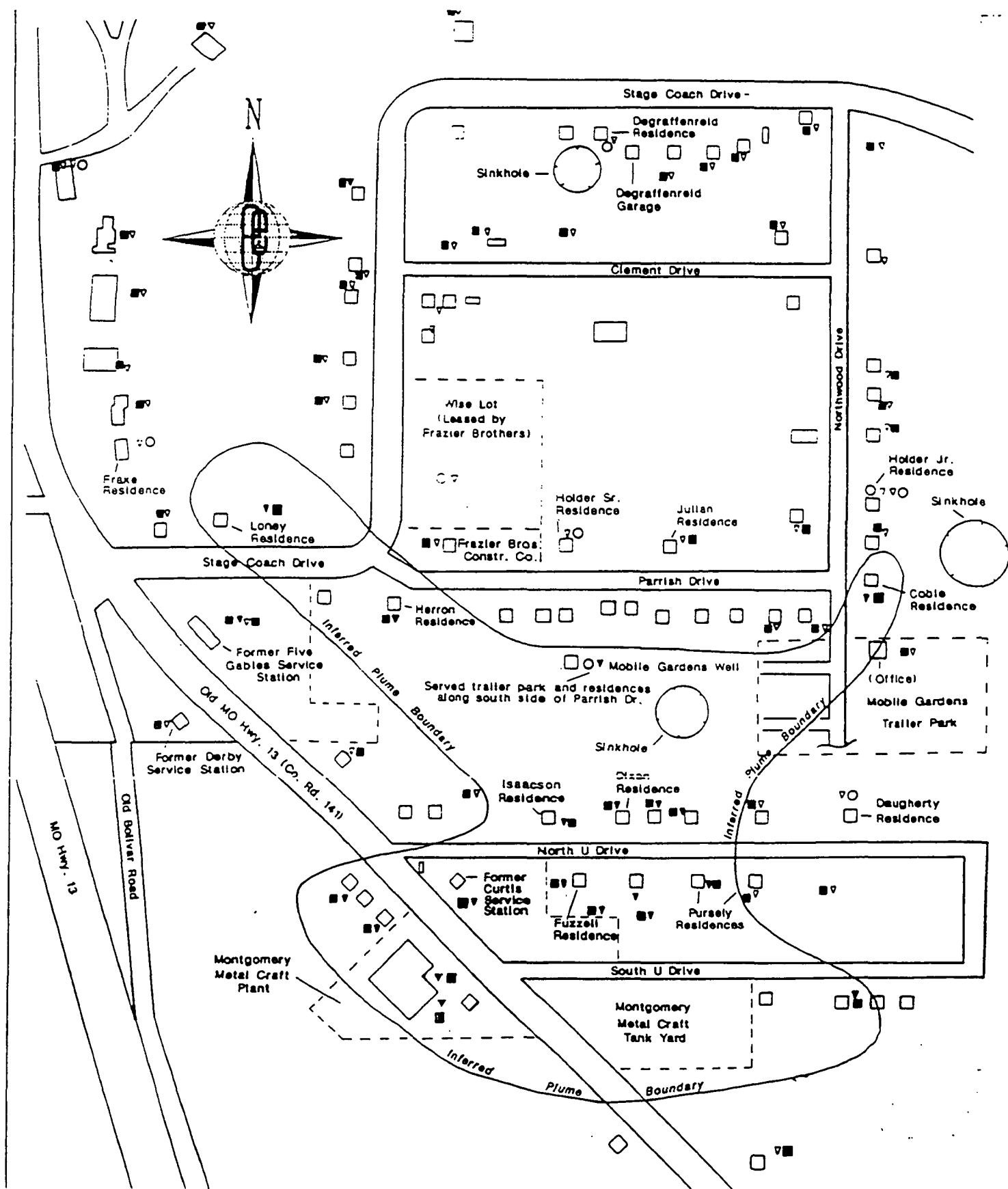


Figure 2 - Site features, North U Drive Well Contamination site

The source of contamination was not known at the time the site was listed on the National Priorities List (NPL) in June 1986. The release appeared to have originated in the vicinity of the Montgomery Metal Craft Plant. This finding was based on the configuration of the plume and the direction of groundwater flow. The fact that the contaminants are petroleum-related is also consistent with operations at the Montgomery Metal Craft Facility. Montgomery Metal Craft has, as part of its operation, handled, stored, and cleaned used underground petroleum storage tanks. They also have had as many as three underground storage tanks in use on their property. An automobile service station (former Curtis Service Station) operated immediately northeast of the Montgomery Metal Craft property until 1960. The extended period of time since the service station closed, together with the presence of MTBE (not available until 1979), made the former Curtis Service Station an unlikely source.

## SECTION 2, COMMUNITY PARTICIPATION

The RI and Proposed Plan for the North U Drive Well Contamination site were released to the public on February 24, 1993. These two documents were included in the administrative record file maintained at MDNR's Hazardous Waste Program File Room (205 Jefferson Street) in Jefferson City, Missouri; at EPA's Region VII Office (726 Minnesota Avenue) in Kansas City, Kansas; and at the Kearney Street Branch Library (630 West Kearney) in Springfield, Missouri.

The notice of availability for these two documents was published in the Springfield News-Leader on February 24 and 28, 1993. A public comment period was held from February 24, 1993 through March 25, 1993. In addition, a public hearing was held on March 9, 1993. At this meeting, representatives from MDNR, the Missouri Department of Health, and EPA explained the results of the RI, presented the Proposed Plan, and answered questions regarding the RI and Proposed Plan. A response to the comments received during this period is included in the Responsiveness Summary, which is part of this Record of Decision.

As lead agency, MDNR conducted community relations for the North U Drive Well Contamination site. Prior to initiation of the RI, MDNR developed a Community Relations Plan. The document lists contacts and interested parties throughout government and the local community. It also identifies community relations activities which were conducted during the RI. Several fact sheets were issued during the RI to apprise the community of significant developments or of the status of work at the site. On October 2, 1991, an availability session was held to answer questions from the public and to solicit information from any citizen who may have information on the release of contaminants at the site. This event was advertised in the Springfield News-Leader, and was covered by the local print and television media.

### SECTION 3, SCOPE OF RESPONSE ACTIONS

The Proposed Plan applies to the entire North U Drive Well Contamination site, including all affected media (surface and groundwater, soil, bedrock, and air). A separate removal of polychlorinated biphenyl (PCB) contaminated soil was conducted by EPA at the North U Drive PCB site. This is considered a separate site and not relevant to this decision or the North U Drive Well Contamination site. The remedial action selected for this site in this ROD is the final site remedy.

As stated previously, available data and information indicate that the original contamination at the site apparently was related to a release of gasoline. Therefore, Superfund's response activities are precluded because of the lack of jurisdiction under the petroleum exclusion. Additionally, as will be presented in Section 5, risks posed by all manmade contaminants at this site, including petroleum contaminants, do not warrant further cleanup.

Elevated concentrations of some metals were recognized in some wells during the RI and are considered a natural phenomenon resulting from natural metals in soils at the site. As such, the metals are not eligible for CERCLA response actions under this scenario.

Very low concentrations of a few organic contaminants which do not appear petroleum-related were found in soils and groundwater. None of these contaminants are present in sufficient concentrations to pose a significant threat to human health or the environment. Also, they are not widespread, but generally are found only in isolated samples. Non-petroleum-related contaminants are probably a result of small-scale spills, leaks, or other minor releases.

### SECTION 4, SITE CHARACTERISTICS

The RI at the site identified three main types of contaminants:

- \* Petroleum-related contaminants, primarily benzene, toluene, ethylbenzene, and xylene (BTEX). BTEX compounds are constituents of, or additives to, gasoline. These compounds were detected in both groundwater and soils during the RI, except for ethylbenzene, which was not detected in groundwater. Other minor petroleum-related contaminants were detected in trace quantities. MTBE was not detected during the RI.
- \* Metals. Several metals were detected in significant quantities in total metals analyses of groundwater. Generally, these same metals were either not detected, or were present only in trace amounts in dissolved metals analyses. In soil samples, the same suite of metals were also detected. However, most were within the range of concentrations naturally found in Greene County soils.
- \* Non-petroleum-related organic contaminants. In general, these compounds were detected at or near the limit of laboratory detection or in trace quantities in both groundwater and soil samples. None pose a significant threat to human health or the environment.

Contaminant concentrations in the groundwater changed significantly between the time of initial site activities and the time of the RI. In general, overall contaminant concentrations decreased markedly during this period, with some contaminants not being detected at all during the RI. MTBE, one of the original five primary contaminants, was not detected in the RI, and ethylbenzene was not detected in any groundwater samples. Additionally, the areal extent of contamination did not expand, but appeared to decrease.

This overall reduction in the extent of contamination is probably a result of two factors: (1) groundwater beneath the site moves very rapidly, which is consistent with the karst setting of the site. Three dye traces were conducted as part of the RI, and in two cases, dye injected near the suspected point of release was detected at North U Spring, approximately 1/4 mile from the point of injection in less than 3 weeks (Figure Number 3). (The third dye was not detected, probably due to masking by a previously injected dye.) North U Spring is a discharge point for the upper aquifer. This rapid groundwater flow may have flushed contaminants from the site or diluted the contaminated groundwater. (2) the primary contaminants are lighter than water, allowing them to "float." This probably enhanced their ability to be transported through the hydrologic system. These two factors probably worked to dilute contaminant levels below detection limits over much of the site.

A good example of the reduction in the concentrations of groundwater contamination is the groundwater beneath the Curtis Service Station. In 1984, approximately one foot of petroleum was observed floating at the top of the water table beneath this property. However, during the RI, not only was free-floating petroleum absent, but dissolved BTEX compounds were present only in trace quantities. Moreover, BTEX compounds were detected in only the first of two sampling rounds during the RI. In addition, this property was the only location where BTEX compounds were detected in wells during the RI.

Another important change was that the concentrations of MTBE and ethylbenzene decreased more significantly than the other contaminants. This is probably explained by the physical and chemical properties of these two compounds. MTBE is much more soluble than the other primary contaminants (BTEX). Therefore, most or all MTBE has probably solubilized and subsequently left the site through the fast-moving hydrologic system. Ethylbenzene commonly degrades into other compounds, such as benzene and toluene. The amount of time elapsed since the release may have been sufficient to allow most or all ethylbenzene to break down into other compounds.

Metals were not included as contaminants of concern at the site at the time the site was listed on the NPL. During the RI, however, it became apparent that metals concentrations were elevated in some water samples.

The RI concluded that this was a natural phenomenon. First, no evidence exists to suggest a release of metals has occurred at the site, and the types of metals found are inconsistent with industrial/commercial activities at the site.



Also, it was documented that the phenomenon was restricted to relatively turbid samples. Metals in Greene County soils are generally present in sufficient concentrations to cause the observed phenomenon if entrained in a water sample. This is supported by the fact that the phenomenon is restricted to wells which are not in use. Wells which are not pumped regularly accumulate sediment in the borehole and fractures around the well. When purged and sampled, the sediment is entrained, causing turbidity.

Non-petroleum organic contaminants generally were found only in isolated locations. Since the contaminants are not distributed in a pattern suggestive of a significant spill or plume, they probably represent small-scale spills or leaks. Many of these compounds are polycyclic aromatic hydrocarbons (PAHs). PAHs are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances. They can be manmade or occur naturally. PAHs may be found in the heavy, tarry fraction of petroleum products. It therefore is possible that the PAHs at the site are related to a petroleum release.

## SECTION 5, SUMMARY OF SITE RISKS

Because CERCLA lacks authority for addressing releases of contaminants of concern at the North U Drive Well Contamination site, an assessment of site risks was not required. Nonetheless, a Risk Assessment was conducted to provide the public with information on potential health concerns, and for the use by any other agencies which may have regulatory authority over the site. The Risk Assessment considered only manmade contaminants, and did not assess risks associated with naturally occurring metals.

### 5.1 Definition of the Reasonable Maximum Exposure (RME)

Information and data indicate that the site currently does not pose any potentially significant threat to the environment. The baseline Risk Assessment therefore focused on the carcinogenic and noncarcinogenic risk to human health, which could result from both current and future land uses and exposures at the site.

Pursuant to the National Contingency Plan, 40 C.F.R., Part 300, in evaluating risks at the site, the potential health risk for a reasonable maximum exposed individual (RME) was used. RME exposures are used to determine if remedial actions are required at sites where CERCLA authority exists. RME exposures generally include not only current exposures given existing land uses, but also exposures which might reasonably be predicted based upon expected or logical future land uses.

The RME for this site includes certain exposures which may not currently exist. MDNR and EPA believes it is reasonable to expect such exposures could occur in the future.

MDNR and EPA identified two likely current and future RME scenarios, residential and industrial/commercial. This is consistent with the current makeup of the site. Because land use is not likely to change in the future, they are also considered appropriate for future exposure scenarios. Contaminant concentrations were assumed to remain constant overtime. This may be a conservative assumption, however, because BTEX contaminant levels in the shallow aquifer have dropped dramatically since the time of the original release, and may drop further.

The residential scenario assumes an adult lives on the site 365 days per year over a 30 year period, ingesting groundwater, incidentally ingesting contaminated soil, and directly contacting contaminated soil. The occupational scenario consists of an adult employee working on the Montgomery Metal Craft property 250 days per year over a 25 year period. The adult employee incidentally ingests and directly contacts contaminated soil on the Montgomery Metal Craft property at the site.

Excessively turbid water samples were not considered in the Risk Assessment. As indicated previously, turbidity was caused by entrained natural sediments, which in turn contained metals in sufficient concentrations to cause the observed levels. Water containing excessive turbidity is generally aesthetically unacceptable for drinking. Public surface water supplies can have no more than 1.0 nephelometric turbidity units (NTU), because excessive turbidity can mask the presence of bacteria. 10 NTU was selected as a criterion of the suitability of well water or groundwater at this site for drinking. Therefore, samples with turbidity exceeding 10 NTU were not considered in the Risk Assessment. It should be noted that none of the wells exhibiting excessive turbidity were in current use as a water source. In soil samples, only metals present in concentrations above background concentrations for Greene County were considered in the Risk Assessment.

## 5.2 Noncarcinogenic Risks for the RME

The Total Hazard Index for the residential and industrial/commercial exposure scenarios are 1.0 and 0.013, respectively. Human health risks may exist if the Total Hazard Index exceeds 1.0. Therefore, health risks for noncarcinogenic contaminants at the site are considered unlikely.

## 5.3 Carcinogenic Risk for the RME

The Excess Lifetime Cancer Risk for the residential exposure scenario is 7.3 in 1,000,000 in the RME's lifetime risk of cancer. The Excess Lifetime Cancer Risk for the occupational exposure scenario is 9.5 in 10,000,000. Both are well below the level (carcinogenic risk of one in ten thousand) at which the National Contingency Plan suggests that remedial actions under Superfund are warranted.

#### 5.4 Environmental Risk

Past releases of contaminants at this site do not appear to present a current or future threat to the environment. Throughout the history of this site, the only significant contamination was found in the groundwater. Furthermore, concentrations of contaminants in groundwater dropped dramatically between the time of site discovery and the RI, indicating that natural processes are attenuating contaminant levels.

#### SECTION 6, STATUTORY AUTHORITY FINDING

Under Section 104 of CERCLA, Superfund response authority is dependent upon a release, or potential release, of a hazardous substance, pollutant, or contaminant.

The term "hazardous substances" is defined under CERCLA Section 101(14) to include 714 toxic substances listed under CERCLA and four other environmental statutes. The definition of a hazardous substance excludes "petroleum, including crude oil or any fraction thereof," unless specifically listed under one of the five statutes. Furthermore, as defined by case law, hazardous substances normally found in refined petroleum fractions are excluded from CERCLA response actions. Hazardous substances found at levels which exceed those normally found in such petroleum fractions, as well as substances not normally found in petroleum products, are not excluded from CERCLA response actions.

With respect to some of the elevated concentrations of metals in unfiltered and excessively turbid groundwater samples, Section 104(a)(3)(A) of CERCLA does not allow for a response activity where there is a "release or threat of release of a naturally occurring substance in its unaltered form, or altered solely through naturally occurring processes or phenomena, from a location where it is naturally found."

Therefore, because of the lack of jurisdiction to address petroleum-related contamination and natural substances under CERCLA, no further action will be taken under the Superfund Program to address the North U Drive Well Contamination site. Additionally, an assessment of site risks determined that, even if authority existed, no action would be required based on an absence of significant potential human health and environmental risk.

## RESPONSIVENESS SUMMARY

### Record of Decision for the North U Drive Well Contamination Site

This Responsiveness Summary presents the responses of the Missouri Department of Natural Resources (MDNR) and the Environmental Protection Agency (EPA) to public comments received regarding the Superfund Proposed Plan at the North U Drive Superfund site near Springfield, Missouri. This document addresses all comments received by MDNR and EPA during the public comment period conducted as part of the remedy selection process.

A Remedial Investigation (RI) was conducted at the site by MDNR. A Risk Assessment was conducted as part of the RI by the Missouri Department of Health (MDOH). A Proposed Plan was developed by MDNR and EPA, which recommended that no further action be performed at the site using CERCLA authority. The RI and Proposed Plan were released for public review and comment for a 30-day period which began on February 24, 1993 with a public notice in the Springfield News Leader. A public meeting was held in Springfield at the Northview Multipurpose Center on March 9, 1993 at 7 p.m. A few comments were received by MDNR and EPA during that public meeting. Also, a few comments were received by letter and telephone following the public meeting.

The following are the substantive public comments, and MDNR and EPA's response to the RI and the Proposed Plan:

Comment: A commenter asked if MDNR and EPA have given up hope for finding the source of contamination in the North U Drive neighborhood.

MDNR and EPA Response: Nine potential sources were initially identified in the RI. Many of these were ruled out in the review of the RI data, which included dye trace studies, geophysical investigation techniques, and the collection and analysis of soil, soil gas, and groundwater samples. A full discussion of all of the potential contaminant sources is beyond the scope of a Responsiveness Summary, and readers are referred to the RI Report which does provide this discussion.

In summary though, the MDNR and EPA have concluded that the Montgomery Metal Craft (MMC) facility is probably a source of the organic contaminants in the groundwater. This is based upon soil samples taken from the MMC facility which contain some of the same contaminants found in groundwater beneath the site, the site hydrogeology, the direction of groundwater flow, the movement history of the groundwater plume, and upon the nature of operations and materials handled at the MMC facility and other facilities at or near the site.

Of the nine source areas originally identified at the beginning of the RI, one of the more likely was thought to be the former Curtis Service Station. Many of the early citizen complaints with respect to contaminated well water occurred near this facility. In addition, there were visual observations of a product (probably gasoline or other petroleum product) layer on top of the water table in a well located at this facility. However, EPA and MDNR have concluded that the Curtis Service Station appears unlikely to have been a significant source of the groundwater contamination. Specific reasons for this conclusion are given in the last comment of this Responsiveness Summary.

Comment: The same commenter asked if chemicals sprayed on animals at the Dickerson Park Zoo, and/or chemicals used in cleaning the zoo grounds, could have been the source of contamination. He also asked what chemicals are used at the zoo, and whether or not a dye trace was performed at the zoo.

MDNR and EPA Response: The Dickerson Park Zoo was not considered a probable source of contamination because we had no evidence of a contaminant release from the zoo, and because the zoo is over 1 mile away from the site. MDNR and EPA has no information regarding the use of chemicals, if any, at the subject zoo; but the regional hydrogeology indicates that it is very unlikely that the zoo could have been a source of contaminants found at the North U Drive well contamination site. MDNR's Division of Geology and Land Survey performed a dye trace near the zoo, as part of an unrelated investigation. Dye was injected into a losing stream downstream of the zoo, near Pea Ridge Creek. The dye reappeared in Ritter Spring, which is west of the zoo. This demonstrates that any contaminants which might originate at the zoo, and be introduced into the shallow aquifer, would not travel to the North U Drive neighborhood but would travel to Ritter Spring instead.

Comment: A commenter asked if the water in the North U Drive neighborhood is suitable for drinking.

MDNR and EPA Response: The Risk Assessment conducted by MDOH concluded that little or no risk is associated with the current consumption of groundwater beneath the North U Drive site. However, it is recommended that residents continue to use the public drinking water system rather than private wells. The quality of water from the public drinking water system is constantly maintained and monitored and provides a greater assurance that contaminants will not be ingested. Nonetheless, should a site resident still wish to consume well water, it is recommended that their well (if not in current use) be thoroughly flushed before being used for drinking. Proper flushing should remove most metal-containing sediment.

Comment: The same commenter expressed dismay that EPA plugged most of the private drinking water wells in the North U Drive neighborhood. He considers the wells a loss since the "water is not contaminated."

MDNR and EPA Response: The plugging of wells was a prudent measure regardless of the reduction in contaminant levels in the shallow aquifer. First, a primary reason for plugging wells was to protect the deep aquifer, the primary water source for Springfield, from contamination. The original contamination was, for the most part, limited to the shallow groundwater aquifer. The numerous open, uncased wells presented a situation where contaminants could travel downward from the shallow to the deep aquifer. Second, because a public drinking water source was being provided, the wells were considered unnecessary. Plugging them was the only way to ensure they would no longer be used, especially by persons unaware of the site history (e.g., new residents).

Comment: A commenter indicated he witnessed a release of gasoline at the old Curtis Service Station (corner of North U Drive and Old Bolivar Road) in 1953 or 1954. The commenter said a pipe from an aboveground storage tank released gasoline for several years. The commenter said analysis of a water sample from the commenter's well was confirmed to have gasoline in it. The commenter expressed concern that Montgomery Metal Craft is being wrongly blamed for the problem.

MDNR and EPA Response: During the RI, several residents said that groundwater contamination problems have been a recurring problem in the neighborhood since at least the 1950's. Also, MDNR and EPA have received similar accounts of past petroleum releases, most of which occurred prior to 1960 at the Curtis Service Station. MDNR and EPA do not believe these events caused the most recent problem, which arose in 1983, for the following reasons: One of the contaminants detected after the 1983-85 event was Methyl Tertiary Butyl Ether (MTBE). MTBE is used almost exclusively as an additive in gasoline, but was not commercially available until 1979. The Curtis Service Station closed in 1960. Therefore, any MTBE-containing gasoline could not have been released at the site prior to 1979 and could not be related to the old Curtis Service Station. Since water complaints were not received until 1983, some twenty-three years after the Curtis Service Station closed, the Curtis Service Station is not likely to have been the source of the groundwater contamination, given the relatively rapid speed at which groundwater flows at this site. After the first well became contaminated in 1983, the problem spread to several others within a few months. This is consistent with a large, discreet release of petroleum into a fast-moving hydrologic system. Such behavior is supported by the dye traces conducted during the RI. The dye traces demonstrated that even a small quantity of "contaminant" (dye) moves extremely quickly at the site. Dye introduced in the suspected source area travelled over 1/4 mile in less than three weeks. It is therefore unlikely that a release from the service station, which in 1983 had been closed for 23 years, could have caused such a sudden and large groundwater problem.