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MCRCO KANSAS CITY
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NO FURTHER RESPONSE ACTION PLANNED DECISION DOCUMENT FOR SITE SS003
OIL SATURATED AREA MCRCO KANSAS CITY MO
12/1/1996
CH2M HILL

No Further Response Action Planned (NFRAP)

Decision Document

for:

Site SS003 – Oil Saturated Area

Prepared for:

Air Force Base Conversion Agency (AFBCA)

Washington D.C.

1. Declaration Summary

1.1 SITE NAME AND INSTALLATION

Site SS003 - Oil Saturated Area. The site is part of :
Richards-Gebaur Air Force Base - Operating Location Q, Kansas City, Missouri.

1.2 SITE LOCATION AND DESCRIPTION

Site SS003 is located southwest of Building 704, at the edge of the tarmac pavement.

The site is classified by the Air Force as an Installation Restoration Program (IRP) Site. From the mid-1950s to the late 1980s this area was used to store waste oil products generated by maintenance of the Motor Pool vehicles (USAF, 1994). The site is paved and flat lying.

1.3 STATEMENT OF BASIS

The NFRAP Decision Document is based on the results of a Records Search (CH2M HILL, 1983); a Phase II Confirmation/Quantification Study (Ecology & Environment, 1988); a Remedial Investigation (O'Brien & Gere, 1991); an Interim Remedial Action (Burns & McDonnell, 1992); and a Preliminary Groundwater Assessment (Versar, Inc., 1996). The site investigation data show that a limited amount of contamination had occurred at the site as a result of waste storage activities. The results of the Interim Remedial Action indicate that the contaminated soil was successfully removed in accordance with applicable Missouri Department of Natural Resources (MDNR) guidelines, as set forth in How Clean is Clean? Uniform Cleanup Standards for the State of Missouri (MDNR, 1995) and the Underground Storage Tank Closure Guidance Document (MDNR, 1996). Therefore, Site SS003 - Oil Saturated Area - is an Area Below Action Levels (ABAL) and does not pose a significant risk to human health or the environment.

1.4 DESCRIPTION OF SELECTED REMEDY

Site SS003 is an ABAL. All actions necessary to protect human health and the environment have been implemented and completed. Therefore, no further response action is planned (NFRAP) and the site satisfies the criteria for a Category IV NFRAP Decision.

1.5 DECLARATION

The selected action for Site SS003 – Oil Saturated Area - is consistent with CERCLA, SARA, and the NCP. The selected remedy attains Federal and State ARARs, and the site does not pose an unacceptable risk to human health and the environment.

Signatures and Dates

Mr. Bob Koke, P.E.
U.S. Environmental Protection Agency,
Region VII

Date

Mr. Guy Frazier
Missouri Department of Natural Resources

Date

Mr. John Fringer, P.E.
BRAC Environmental Coordinator
Richards-Gebaur AFB

Date

2. Decision Summary

2.1 Introduction

The following sections describe the site setting, surrounding land use, and site history, including the sequence of environmental activities carried out at the site. Regulatory involvement and community relations efforts are identified. The scope and role of the response action are summarized. Technical information and analytical data are not discussed at this time; the material is presented later in Section 2.2 – Site Characteristics.

Site Name, Location, and Description

Site SS003 is located on Richards-Gebaur Air Force Base south of 155th Street, southwest of Building 704 (Figure 1). The southwest corner of the lot was used to store waste oil products generated by routine maintenance of the Motor Pool vehicles (USAF, 1994). The oil saturated area was adjacent to the waste oil storage area and originally covered approximately 1600 square feet (Versar, 1996). The site is paved and flat. A grassy swale runs parallel to the west and south fencelines. The site is on a small hill and is not located in or near a floodplain.

Land Use and Nearest Populations

The land use immediately surrounding Site SS003 is light-industrial, primarily small workshops, offices and warehouses. To the south of the site the land becomes wooded. The nearest residential populations are military personnel located on the Air Force Base in the Billeting Complex, about one-half mile southeast of the site. Non-military residential populations exist about one mile east and one mile south east of SS003 and Building 704. The towns closest to the Base include Belton, with a population of 18,150, and Grandview, with a population of 24,967 (USAF, 1995a).

Surface Water and Groundwater Resources

The nearest surface water body is Scope Creek. Scope Creek runs southwest to northeast, generally parallel to Andrews Road, and forms the southern boundary of the Base. It passes about 700 feet south and east of Building 704. Surface water from the area of Building 704 can enter drainage swales west and south of the site and eventually run downhill into Scope Creek. Scope Creek is an intermittent stream that carries water most of the year. It is a tributary of the Little Blue River.

Groundwater aquifers beneath the site are classified within the Osage-Salt Plains area of the Central Nonglaciaded Plains groundwater region. The groundwater is known to be highly saline and generally non-potable. Shallow lenses of perched groundwater occur locally but are not used for drinking water (Jacobs Engineering, 1995). There are no natural springs on the Base, and, reportedly, no major springs in the vicinity. Drinking water is supplied to the base and surrounding communities by the Kansas City Water and Pollution Control Department. The source of the water is the Missouri River, upstream of the Base (USAF, 1994).

INSTALLATION
BOUNDARY

POND

ANDREWS RD

SCOPE CREEK

155th

POND

SS003

SCOPE CREEK

BALES AVE

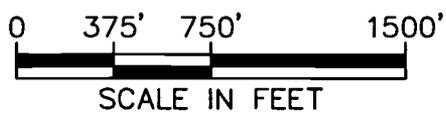


Figure 1

GENERAL SITE PLAN:
SITE LOCATION SS003
Richards-Gebaur A.F.B.
Kansas City, Missouri



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Site History

Site SS003 is in the Air Force Motor Pool yard. It is part of Richards-Gebaur Air Force Base which has occupied the present location since 1953. Between 1941 and 1953 Kansas City owned and operated the property as Grandview Airport. Before 1941, the area was farmland.

Site SS003 was used as a waste oil storage area from the mid-1950s to the late 1980s (USAF, 1994). During its operation, it is likely that small spills or leaks occurred that contributed to contamination of the adjacent ground surface.

The site was initially identified during a Phase I Records Search of the Air Force Base (CH2M HILL, 1983). The site was recognized as being oil stained. It was investigated again three years later when soil and surface water samples were collected and analyzed (Ecology and Environment, 1988). Two additional field samples were collected in 1989 as part of a Remedial Investigation (O'Brien and Gere, 1991). In 1991, approximately 42 cubic yards of contaminated soil were removed from Site SS003 (Burns and McDonnell, 1992). In 1996, a groundwater assessment was conducted at the site (Versar, 1996).

Enforcement Activities

Richards-Gebaur AFB is not on the National Priority List, and the ongoing Installation Restoration Program is not subject to a Federal Facility Agreement with the U.S. EPA Region VII. The Department of Defense has entered into a cooperative agreement known as the Department of Defense and State Memorandum of Agreement with the Missouri Department of Natural Resources (MDNR) for oversight and guidance of site restoration activities (USAF, 1994). Richards-Gebaur AFB has worked closely with the MDNR and the EPA through frequent correspondence and regularly scheduled meetings.

Community Participation

The Restoration Advisory Board (RAB) was formed in February of 1994 and held its first meeting on March 1, 1994. The RAB ensures that the community is aware of and has a voice in environmental restoration issues at the Base. The group meets quarterly and assists the BRAC Cleanup Team (BCT) by providing community input on cleanup priorities (USAF, 1994). Information regarding work at Site SS003 and other environmental issues is regularly available through the RAB process. In addition to the ongoing RAB meetings, a Community Relations Plan for the Air Force Base is available to the public (USAF, 1995a).

Scope of Response Action

Site SS003 was used as a storage area for waste oil products generated during routine automotive maintenance and repair. Several site investigations confirmed that spills of petroleum products had occurred at the site. Based on the shallow depth of contamination, it was determined that the most reasonable response action included the excavation and offsite disposal of contaminated soils; post-excavation soil sampling to verify that the removal was satisfactory; and groundwater sampling to evaluate the potential that petroleum constituents had not migrated to greater depths and affected groundwater quality.

2.2 SITE CHARACTERISTICS

The purpose of this section is to describe the pertinent physical and chemical characteristics of the SS003 site, together with an assessment of potentially exposed populations. Where available, site-specific information is used; however, much of the information is regional in scope. Environmental sampling data is used to illustrate the nature of the contamination and the results of the response action, as appropriate. Details of the sampling episodes are provided in the referenced reports, as listed at the end of the Decision Document.

Physiography and Climate

Richards-Gebaur AFB is located within the Osage Plains region of the Central Lowlands physiographic province. The Osage Plains are characterized by low relief, wide, maturely dissected uplands, and relatively steep valley slopes carved on sedimentary rocks of Pennsylvanian age. The topography of the Base is gently rolling, with relief between 960 feet and 1060 feet above mean sea level (Versar, 1996). Site SS003 is situated in the southern part of the Base south of 155th Street and east of Bales Avenue.

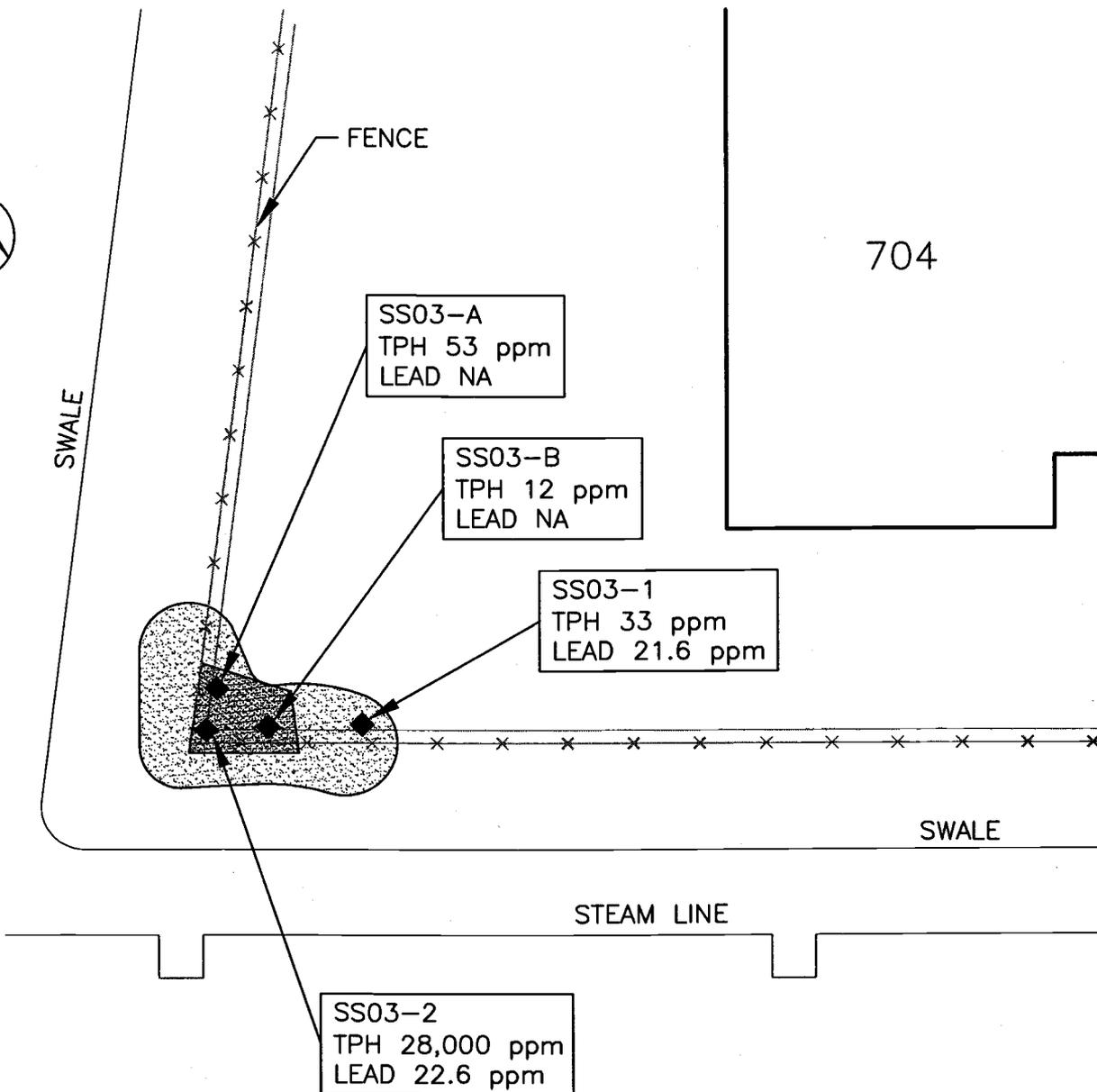
The average temperature at the site ranges from 26° F in January to 78° F in July. The average annual precipitation is 37 inches with the majority falling in the late spring and early autumn (CH2M HILL, 1983). The average seasonal snowfall is 21.6 inches.

Geology

Richards-Gebaur Air Force Base is underlain by thick sedimentary deposits of Pennsylvanian age limestones and shales. The bedrock is overlain by hard residual clays derived from in situ weathering of the carbonate bedrock. The residual clays are in turn overlain by wind-blown loess deposits. The unconsolidated materials overlying the bedrock range in thickness from 1 foot to 20 feet thick (Gentile, 1991). The soils belong to the Macksburg-Urban Series and are characterized as poorly drained silt and silt-clay loams (Versar, 1996).

Based on previous studies at the Base, the upper underlying formations are of the Pennsylvanian System, Kansas City Group. This group consists of the following strata (from the surface downward): the Wyandotte, Lane, Iola, Chanute, Drum, and Cherryvale Formations. Reportedly, the Kansas City Group is about 120-feet thick at the site (Gentile, 1991). The Wyandotte, Lane, Iola, and Chanute formations are most common at the Base.

The Argentine Member of the Wyandotte Formation outcrops at higher elevations on the Base. It consists of a light gray limestone characterized by thin, wavy bedding, and is approximately 40 feet thick. A calcareous shale, about three feet thick, known as the Quindaro Shale Member, exists at the base of the Argentine Limestone. The Lane Formation, ranging from 25 feet to 40 feet in thickness at Richards-Gebaur, is a medium-gray to bluish-gray shale that is commonly silty to sandy in the upper portion. These shales are impermeable and form a barrier to vertical groundwater flow (Gentile, 1991). The Raytown Limestone Member of the Iola Formation is generally a massive bluish-gray, wavy bedded limestone ranging from 5 feet to 10 feet in thickness. This member also locally contains interbedded lenses of shale that are approximately 3 inches thick (Versar, 1996). The Chanute Formation is a maroon and green claystone and shale with local occurrences of cross-bedded sandstone and conglomerate. The formation ranges from 10 feet to 15 feet



LEGEND

-  LIMIT OF 1991 EXCAVATION
-  LIMIT OF 1992 EXCAVATION
-  POST-EXCAVATION SOIL SAMPLE
- NA NOT ANALYZED

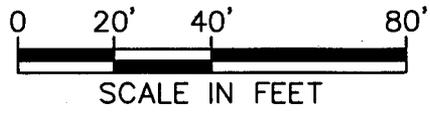


Figure 2

SITE SS003
POST-EXCAVATION SAMPLE RESULTS
 Richards-Gebaur A.F.B.
 Belton, Missouri



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in thickness, and is interbedded with thin nodular limestone near the middle of the formation. The high percentage of shale and claystone prevents the Chanute from transmitting significant amounts of fluids (Gentile, 1991).

Based upon the available site data, it is likely that Site SS003 is underlain by the middle Lane Formation (Gentile, 1991). Bedrock was encountered at 16 feet to 25 feet below grade during a groundwater investigation (Versar, 1996).

Structural Geology

The Kansas City Group sediments underlying Richards-Gebaur belong to the Upper Pennsylvanian System. They have been gently folded into a series of synclines, domes, and anticlines that, taken overall, dip north-northwest. The regional joint pattern consists of two major sets that trend NE-SW and NW-SE and are essentially vertical, oriented at right angles to one another (Gentile, 1991).

Hydrogeology

Richards-Gebaur is located in the Osage-Salt Plains groundwater area of the Central Nonglaciaded Plains region. The Osage-Salt Plains, characterized by Pennsylvanian and Mississippian age sedimentary aquifers, consist of low permeability strata that tend to impede vertical groundwater movement. Groundwater quality in the Pennsylvanian aquifers is generally non-potable (Jacobs, 1995). Wells deeper than 400 feet yield non-potable mineralized water (MDNR, 1986). The shale and claystone that help comprise the Kansas City Group have very low permeability, effectively acting as confining layers to the lower limestone units (Versar, 1996).

In general, groundwater yields from wells completed in the shallow bedrock aquifers are poor and erratic, generally less than 20 gallons per minute, and appear to be seasonal. The water is mineralized and of poor quality (Ecology and Environment, 1988). Groundwater from deeper aquifers is known to be highly saline, reportedly exceeding 40,000 parts per million (ppm) total dissolved solids in some areas (USAF, 1994b). The federal Secondary Maximum Contaminant Level for TDS is 500 ppm. For these reasons the groundwater at and in the vicinity of the Base is considered non-potable (Gentile, 1991; Versar, 1996). A recent well survey found 12 water wells within a mile of the Base. All were either inactive, abandoned, or unlocatable (Jacobs, 1995). A 1998 well search reported no drinking water wells within 1 mile of the site (CH2M HILL, 1998).

During the subsurface investigation at Site SS003 in 1986, one temporary piezometer and three monitoring wells were installed. Groundwater was encountered inconsistently and, when present, at disparate depths, between 7 feet and 31 feet below ground surface. The erratic occurrence of subsurface water is caused by the perched water conditions that are prevalent at the site. Such conditions would tend to reflect seasonal precipitation, local geologic discontinuities, surface drainage features, and topography. It is likely that shallow groundwater flow, if present, would be controlled to a degree by the orientation and dip of the upper bedrock surface (Versar, 1996).

Extent and Distribution of Chemicals in Soils

In this section, concentrations of the standard petroleum indicator chemicals (total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, and xylenes) are compared to the *Underground Storage Tank Closure Guidance Document* (MDNR, 1996) action levels (e.g., TPH at 50 ppm). Cleanup levels are stated only for the UST petroleum indicator chemicals, and are calculated following the MDNR-recommended matrix given in Table 4, LUST Soil Cleanup Guidelines for Undisturbed Soil. In accordance with MDNR guidance set forth in *How Clean is Clean? Uniform Cleanup Standards for Contaminated Sites in Missouri* (MDNR, 1995), other chemicals are compared to Any-Use Soil Levels (ASLs) published by the Missouri Department of Health (MDOH, 1996).

During the original site investigation six surface soil samples and three subsurface soil samples were collected from Site SS003. Three of the surface soil samples were collected from the nearby drainage swales. The samples were analyzed for total petroleum hydrocarbons (TPH), volatile organic chemicals (VOCs), and metals (Ecology & Environment, 1988). The three surface samples had concentrations of hydrocarbon constituents above the conservative MDNR action level of 50 ppm, with a maximum TPH value of 3,800 ppm. Lead was detected at a concentration exceeding the applicable MDNR action level of 240 ppm in one surface soil sample, with a concentration of 343 ppm. VOCs were not detected in any of the soil samples.

In a second site investigation in 1989, three surface soil samples were collected adjacent to the drainage swale. The samples were analyzed for VOCs, semi-volatile organic chemicals (SVOCs), and metals (O'Brien & Gere, 1991). None of the samples had chemical concentrations that exceeded their respective MDNR action levels.

In November 1991, 27 cubic yards of soil were excavated from the oil-saturated area SS003 (Figure 2). The soil was removed in layers to a depth of two feet and was continuously screened for volatile organic chemicals using a photoionization detector. Following excavation, two soil samples were collected from the excavation base to confirm that the affected soils had been successfully removed. The samples were analyzed for TPH constituents and lead. Sample SS03-2 exceeded the MDNR action level for TPH of 50 ppm, indicating that further excavation was required at this location.

In February 1992, an additional 15 cubic yards were excavated from Site SS003 (Figure 2). Two post-excavation soil samples were taken from the undisturbed subgrade. The laboratory analytical results showed that residual soil concentrations of TPH constituents and lead were below the respective MDNR action levels of 50 ppm for TPH and 240 ppm for lead, with the exception of one sample at a concentration of 53 ppm TPH (Burns & McDonnell, 1992).

The following table summarizes the post-excavation sampling analytical data.

Sample I.D.	Sample Date	TPH <i>[Cleanup Level = 500 ppm]</i>	Lead <i>[Cleanup Level = 240 ppm]</i>
<i>Phase 1 Post-excavation Samples</i>			
SS03-1	11-19-91	33	21.2
SS03-1D*	11-19-91	22	20.6
SS03-2	11-19-91	28,000	22.6
<i>Phase 2 Post-excavation Samples</i>			
SS03-A	02-06-92	53	NA
SS03-B	02-06-92	12	NA
SS03-C**	02-06-92	ND	NA

Note: * = Duplicate of sample SS03-1; ** = Duplicate of sample SS03-B; ND = non-detect; NA = not analyzed

Applying the LUST Soil Cleanup Guidelines for undisturbed soil, as directed in the MDNR UST Guidance, the site was scored using the recommended site characterization matrix. The calculated score for Site SS003 equates to a Soil Cleanup Level for TPH of 500 ppm. The cleanup level calculation is provided as Attachment A.

Extent and Distribution of Chemicals in Groundwater

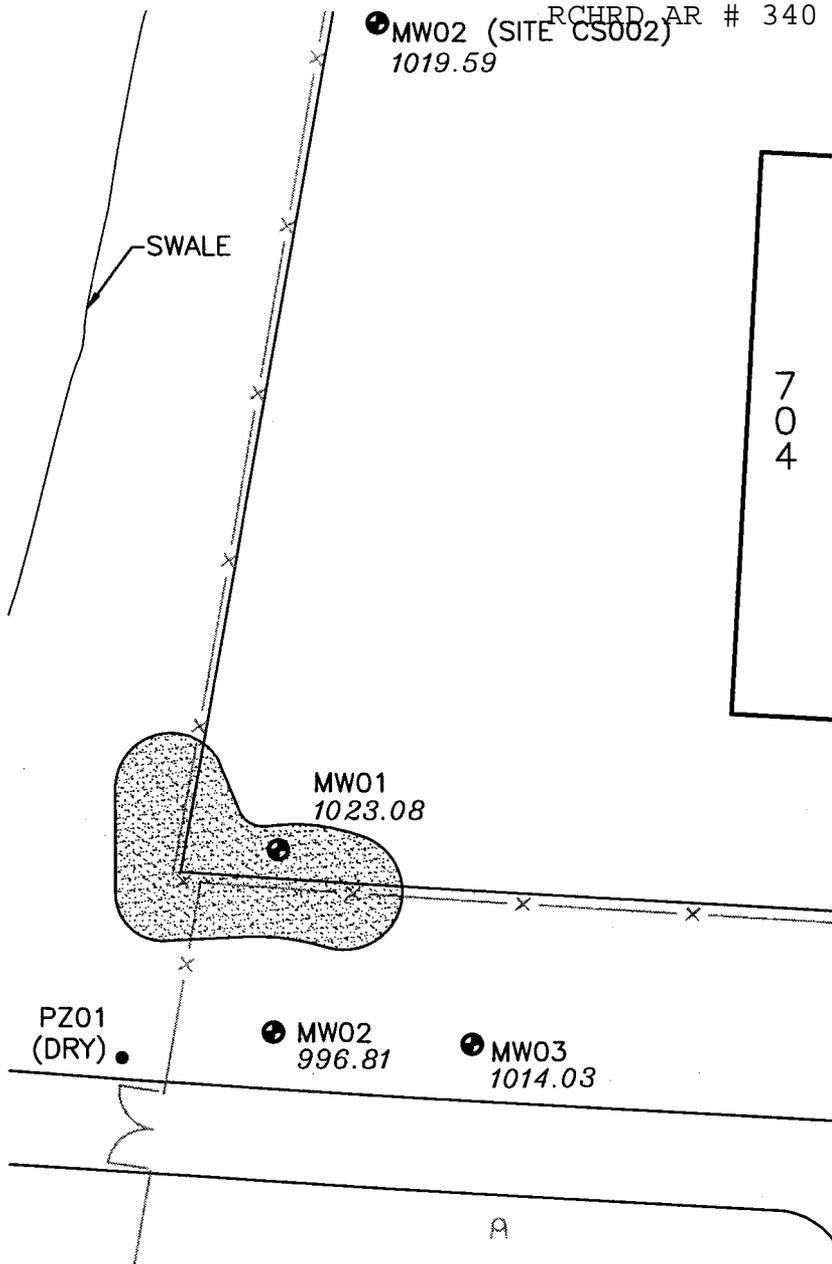
A preliminary groundwater assessment was conducted at Site SS003 in 1996 to determine if the petroleum constituents found at SS003 had affected groundwater quality (Versar, 1996). Three groundwater monitoring wells were installed to depths of 20 feet, 32 feet, and 34 feet below ground surface. One well was located in the center of the excavation and two wells were placed in the drainage swale south and downgradient of the site (Figure 3). A piezometer was installed also (depth 18 feet), but was dry after an elapsed time of 48 hours and was abandoned in accordance with applicable MDNR procedures.

Groundwater samples were collected from each well and analyzed for TPH constituents, VOCs, and metals. No TPH constituents were detected and none of the analyzed compounds were detected at concentrations that exceeded Maximum Contaminant Levels (Versar, 1996).

Extent and Distribution of Chemicals in Surface Water and Sediments

One surface water sample was collected during the 1986 site investigation and analyzed for TPH, VOCs, and metals (Ecology & Environment, 1988). The sample was collected from the stormwater runoff drainage swale. No constituents were detected above applicable action levels. No sediment samples were collected, because the drainage swales were covered with grass and no sediment was present. Surface soil samples collected from the drainage swales have been discussed above.

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LEGEND



LIMITS OF EXCAVATION

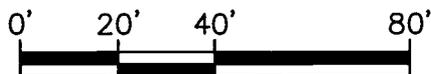


GROUNDWATER MONITORING WELL



DIRECT-PUSH BORING/
TEMPORARY WELL LOCATION

996.81 GROUNDWATER ELEVATION
(FEET ABOVE MEAN SEA LEVEL)



SCALE IN FEET

Figure 3

SITE SS003
 MONITORING WELL LOCATIONS
 Richards-Gebaur A.F.B.
 Belton, Missouri



PLOT DATE: 04-09-98
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Potentially Exposed Populations

A complete exposure pathway must have a contaminant source, a transport medium for the contaminant, a point of contact for the receptor with the contaminant, and a route of uptake of the contaminant by the potential receptor.

The source of the contamination at Site SS003, petroleum contaminated soils, has been successfully removed. Based upon sampling results from the site, the source has not affected groundwater or surface water quality. Therefore, there are no potentially exposed populations at Site SS003 because there are no current or future complete exposure pathways associated with the site.

2.3 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs) and TO-BE-CONSIDERED GUIDANCE (TBCs)

The following regulations and laws were identified and applied as ARARs or TBCs for Site SS003 – Oil Saturated Area:

- | | | |
|----|--------------|---|
| 1. | 10 CSR 20-7 | Water Quality Standards |
| 2. | 10 CSR 20-10 | Underground Storage Tanks - Technical Regulations |
| 3. | 40 CFR 131 | Water Quality Standards |
| 4. | Guidance | How Clean is Clean? Uniform Cleanup Standards for the State of Missouri |
| 5. | CSR 20-9.020 | Proposed Rule – Any-use Soil Levels for Residential Settings |

2.4 SUMMARY OF REMEDIAL RESPONSE

Remedial Response Design Criteria

The primary remedial response design criterion was to restore the site to a condition that poses no significant risk to human health or the environment. The secondary response criterion was to restore the site to allow unrestricted land use in the future. These goals were accomplished through the removal of soils with petroleum hydrocarbon and lead concentrations above applicable state cleanup levels. Groundwater monitoring results demonstrated that no impacts to local groundwater had occurred as a result of past practices associated with waste oil storage at Site SS003.

Remedial Response Implementation

On two separate occasions, one in 1991 and one in 1992, a total of 42 cubic yards of contaminated soil was excavated from site SS003. The depth of excavation ranged from approximately one and a half feet at the exterior portion to three feet inside the excavation. The limits of the excavation were determined by observation and standard field screening techniques. After each phase of soil removal, two post-excavation soil samples were collected at the base of the excavation to verify the effectiveness of the removal action. The analytical results from the post-excavation samples are given in Table 1.

Post-excavation sample results following the first excavation indicated that some residual contamination remained. Therefore, a second soil removal was conducted at the site. Post-excavation samples were again collected following the second excavation. The results showed that the sample concentrations of chemicals of concern did not exceed applicable MDNR cleanup levels and that the site, therefore, required no further soil removal. The excavated area was backfilled with clean fill material and the site was restored to its original grade (Burns & McDonnell, 1992).

QA/QC Demonstration

Field sampling methods were conducted in accordance with standard U.S. EPA operating procedures. Laboratory analyses were performed by an accredited laboratory using standard U.S. EPA analytical protocols.

Site Monitoring Results Summary

The response action at the site was completed successfully, as demonstrated by the sampling results provided in Table 1 above, and the lack of impacts to groundwater (Versar, 1996). Therefore no long-term monitoring was performed at the site.

Operation and Maintenance (O & M) Records Summary

Because no long-term remedial actions or post-remediation monitoring took place at the site, there are no records available to summarize.

2.5 RISK CHARACTERIZATION

Site SS003 was a waste oil storage area that had not been used since the late 1980s. Stained surface soils indicated that contamination from spills had occurred at the site. The affected soil was excavated and disposed of offsite at an appropriately permitted facility. Post-excavation soil sampling and groundwater sampling demonstrated that the site contamination had been successfully removed and that residual soil concentrations for the chemicals of concern, TPH constituents and lead, were below applicable State of Missouri cleanup levels.

Because there is no source of contamination remaining at Site SS003, and because groundwater has been shown free of contamination, no complete exposure pathways exist at the site. Therefore, the site does not pose a significant threat to health or the environment.

2.6 RATIONALE FOR NFRAP DECISION

The chosen decision for the Oil Saturated Area is No Further Response Action Planned. This decision is consistent with CERCLA and the NCP, and complies with Federal and State ARARs. The rationale for this decision is that the contamination characterized at SS003 was of limited extent and has been successfully removed. Groundwater quality has not been affected. Therefore, the site does not pose a significant threat to health and the environment.

3. Responsiveness Summary

Once the BCT approves the NFRAP Decision Document, the NFRAP report and all supporting documents listed below in the References will be provided for public review and comments at the administrative record public repository at the City of Belton Public Library. After the 60-day comment period, the BCT will address the comments. Once the comments have been adequately addressed, the NFRAP will be amended to reflect the comments.

3.1 Public Comments

(A list of public comments concerning the environmental issues at this site will be provided together with the agreed upon responses).

3.2 Administrative Record Index

Appendix A presents the list of references that were used as the basis for the Decision Document. The Administrative Record Index for the Base is also available at the City of Belton Public Library. The Administrative Record will include date, title, author, recipient of document, number of pages, and a short description of the document.

Appendix A: List of References

- Burns & McDonnell, 1992. *Interim Remedial Action for SS003, Oil Saturated Area & SS004, Hazardous Waste Drum Storage, Final Closure Report.*
- CH2M HILL, 1983. *Installation Restoration Program Records Search for Richards-Gebaur Air Force Base, Kansas City, Missouri.*
- Ecology and Environment, Inc., 1988. *Installation Restoration Program, Phase II, Confirmation/Quantification, Stage 2, Richards-Gebaur Air Force Base, Kansas City, Missouri - Final Report. Vol I-II and Supplement.*
- Gentile, R.J., et.al. 1991. *Unpublished Paper for Richards-Gebaur Air Force Base, Kansas City, Missouri.*
- Jacobs Engineering Group, Inc., 1995. *Groundwater Evaluation Report (Revised), Richards-Gebaur Air Force Base, Kansas City, Missouri.*
- Missouri Department of Health, 1996. *Proposed Rule - Any Use Soil Levels for Residential Setting.*
- MDNR, 1986. *Missouri Water Atlas.*
- MDNR, 1995. *How Clean is Clean? Uniform Cleanup Standards for Contaminated Sites in Missouri.*
- MDNR, 1996. *Underground Storage Tank Closure Guidance Document.*
- O'Brien & Gere Engineers, Inc., 1991. *Remedial Investigation (RI) at R-G AFB, Belton, MO for FT002 - North Burn Pit, SS003 - Oil Saturated Area, SS004 - Hazardous Waste Drum Storage, ST005 - POL Storage Yard.*
- U.S Air Force, 1993. *Basewide Environmental Baseline Survey, Richards-Gebaur Air Force Base, Missouri.*
- U.S Air Force, 1994. *BRAC Cleanup Plan (BCP), Richards-Gebaur Air Force Base, Kansas City, Missouri.*
- U.S Air Force, 1994b. *Final Environmental Impact Statement, Richards-Gebaur Air Force Base, Kansas City, Missouri.*
- U.S. Air Force, 1995a. *Community Relations Plan, Richards-Gebaur Air Force Base Kansas City, Missouri.*
- U.S. Air Force, 1995b. *Installation Restoration Program (IRP), Preliminary Assessment of IRP*

Site SS009, Draft Technical Report, Richards-Gebaur Air Force Base, Kansas City, Missouri.

Versar, 1996 (Nov). Final - Preliminary Groundwater Assessment SS003, SS004, SS006, SS009.

Attachment A

Matrix Score for Site SS003

(Based on: LUST Soil Cleanup Guidelines for Undisturbed Soil, MDNR 1995)

LUST Soil Cleanup Guidelines for Undisturbed Soil

Site Features	Score 15		Score 10		Score 5		Score 0	
Depth to Groundwater	>100 ft.		100-51		50-25		<25	0
Groundwater Potable	No	15					Yes	
Drinking Water Supply	>1,000 ft.	15	1,000-501		500-100		<100	
Distance to Surface Water	>5,000 ft.		5,000-2,501		2,500-1,000		<1,000	0
Geologic Features Present	>2,000 ft.	15	2,000-1,001		1,000-500		<500	
Manmade Vertical Conduit	>500 ft.	15	500-251		250-100		<100	
Manmade Horizontal Conduit	>250 ft.		250-101		100-50		<50	0
Soil Permeability	Low	15	Low-Mod		Mod-High		High	
Soil Thickness	>50 ft.		50-41		40-20		<20	0
Sensitive Receptors	>5,000 ft.	15	5,000-2,501		2,500-1,000		<1,000	
Surrounding Land Use	>1,000 ft.	15	1,000-501		500-100		<100	
Future Land Use	Industrial	15	Commercial				Residential	
Off-Site Impact	No	15					Yes	
Subtotals	135		0		0		0	
Total Score =							135	

Soil Cleanup Levels (ppm)

Total Score	195-150	149-120	119-80	79-50	49 or less
BTEX	4/20/100/100	2/10/50/50	1/5/10/10	0.5/1/2/2	B+T+E+X<2
TPH	1,000	500	200	100	50
MTBE	280		140		60

Note: This table is reproduced from the Missouri Department of Natural Resources Underground Storage Tank Closure Guidance Document, Table 4 – LUST Soil Cleanup Guidelines for Undisturbed Soil.

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE