

To: Mr. John B. Askew Ms. Cecilia Tapia, Director January 18, 2008
Regional Administrator Superfund Division
US Environmental Protection Agency --- Region VII

Thank you very much for your time on January 14. It was reassuring to know that, as the top people in our region's EPA office responsible for decisions about West Lake Landfill, you are both giving your personal attention to this essential and complex cleanup challenge.

As you know, we hope the highly radioactive wastes at West Lake will be excavated and removed from the Missouri River floodplain, next to Earth City, in Bridgeton.

We hope that our Missouri/St. Louis Congressional delegation will work to get this one final St. Louis nuclear weapons site designated as a part of the Army Corps of Engineers' **Formerly Utilized** [Manhattan Project/Atomic Energy Commission] **Sites Remedial Action Program** (FUSRAP). The Corps expects to be remediating the St. Louis City and County FUSRAP sites that contain Mallinckrodt Chemical Works residues identical to those at West Lake until at least 2013. We believe it would be fiscally and environmentally prudent for West Lake to be included in the FUSRAP cleanup now, before the trained and experienced personnel are dispersed to other cities.

We realize that West Lake was never a nuclear weapons "production site," typically a requisite criterion for FUSRAP designation. But as you know, the Latty Avenue FUSRAP site in Hazelwood was also never a production site.

Latty had merely been used to kiln-dry some of the valuable Airport Site residues in order to reduce their weight and thus the cost of shipping them by rail to the Cotter Mining Company in Colorado, for reprocessing. The Latty drying project had been abruptly abandoned in 1970 after the AEC discovered dangerous work conditions. Then, in 1973, when the AEC found that large amounts of the highly radioactive residues remained at Latty, the agency immediately mandated that Cotter clean up the site. That is when some of the Latty residues were transported to West Lake, a municipal waste landfill -- not a federally-licensed radioactive waste storage facility. Latty was ultimately designated a FUSRAP site, initially under the Department of Energy, and since 1998, under the Corps. The Corps is shipping the FUSRAP wastes to licensed facilities in Idaho and Utah.

I am enclosing some West Lake soil charts that I believe support the following:

High concentrations of radioactive wastes ("hot spots") exist throughout West Lake's Operable Unit One -- in both Areas One and Two.

Therefore, these materials can and should be safely removed from the Missouri River floodplain, immediately upstream from major drinking water intakes for St. Louis City and County, and for the many Mississippi River communities that lie farther downstream from the Missouri-Mississippi rivers' confluence.

Sincerely,

Kay

cc: the Missouri/St. Louis Congressional delegation.

West Lake Landfill -- Operable Unit One: "Hot Spot" Charts.

St. Louis County, MO. January 2008 --- from Kay Drey. 515 West Point Ave., University City MO 63130.

Data in the attached charts on the radioactively contaminated Operable Unit One are located in the following reports:

- (1) Remedial Investigation Report (RIR). Prepared for the West Lake OU-1 Respondents Group, by Engineering Management Support, Inc. April 10, 2000.
- (2) Feasibility Study/West Lake OU-1 (FS). Prepared for the West Lake OU-1 Respondents Group, by EMSI. [The respondents or Potentially Responsible Parties, as per the Superfund Act, are: the Cotter Corp., Bridgeton Landfill (formerly Laidlaw Waste Systems), Rock Road Industries, and the U.S. Department of Energy]. May 8, 2006.
- (3) Radiological Survey of the West Lake Landfill: St. Louis County, MO. Prepared for the U.S. Nuclear Regulatory Commission, by Radiation Management Corporation. NUREG/CR-2722. May 1982.

Half-lives of the primary isotopes: Uranium-238 = 4.56 billion years; U-235 = 704 million yrs.; U-234 = 245,000 yrs. Thorium-230 = 75,380 yrs.; Th-234 = 24 days. Radium-226 = 1600 yrs.; Ra-223 = 11 days. Lead-210 = 22 yrs.; Pb-214 = 27 mins. Bismuth-214 = 20 mins. Actinium-227 = 21.77 yrs. Protactinium-231 = 32,760 yrs.

In order to estimate the hazardous life of a radioisotope, the half-life has to be multiplied by at least ten.

Some comparisons to background radiation levels:

1. In nature, thorium-230 is typically found at from 0.2 to one picocurie per gram of soil.
2. Since West Lake's gamma rate (in counts per minute or CPM) is not reported in the above references, and may not have been determined, several scientists suggested that the lowest CPM measurement in RIR Table 6-1 can be assumed to be the background rate --- namely, 6000 CPM. Therefore, for example, the 1,104,000 CPM rate reported in Soil Boring WL-234 (at 7 feet deep) is **165 times background**, which is significantly high.
3. Uranium-235 and its daughter products are normally not detected in residues from mines and mills at which U.S. ore was processed. (U.S. ore averages one percent uranium.) Because Mallinckrodt Chemical Works (MCW) processed the highly rich Belgian Congo ore (60 to 65% pure), the rare uranium-235 isotope and its highly toxic daughters are found in MCW residues and wastes, such as those that were dumped at West Lake in 1973.
For example, see the RIR Table 6-1 footnote regarding the lack of detectable U-235 daughters in nature: "NE = Not established; all background samples [are] below minimum detectable activity."

Isotope concentrations are listed in picocuries per gram. A pCi (trillionth of a curie) emits two radioactive particles/rays per minute. The following data are found in the Remedial Investigation Report, April 2000.

(1) Soil Boring Number: WL-106. Area One (Figure 6-4)

Uranium-238 and its daughter products:

Depth	U-238	Th-234	U-234	Th-230	Ra-226	Pb-214	Bi-214	Pb-210	RIR page
Surface	105	--	105	9700	906	650	908	1040	Table B-1
5 ft.	6.69	--	11.5	731	18.8	19.1	18.1	47.5	Table B-1

Uranium-235 and its daughter products:

Depth	U-235	Pa-231	Ac-227	Ra-223	RIR page
Split samples --- surface:					
Quanterra	75.5	544	305	939	Table B-11
Accu-Labs	56	610	--	130	Table B-11

(2) Soil Boring Number: WL-114. Area One (Figure 6-4)

Uranium-238 and its daughter-products:

Depth	U-238	Th-234	U-234	Th-230	Ra-226	Pb-214	Bi-214	Pb-210	RIR pages
Surface	147	55.9	154	7850	109	108	110	206	Tables 7-2, B-1; and p.106

Uranium-235 and its daughter products:

Depth	U-235	Pa-231	Ac-227	Ra-223	RIR page
Surface	17.6	156	118	113	Table B-3

(3) Soil Boring Number: WL-209 Area Two (Figure 6-6)

Uranium-238 and its daughter-products:

Depth	U-238	Th-234	U-234	Th-230	Ra-226	Pb-214	Bi-214	Pb-210	RIR page
Surface	294	--	575	29,240	3720	3190	3690	--	Table B-2
5 feet	249	--	335	38,280	2970	3000	3000	1170	Table B-2

Uranium-235 and its daughter products:

Depth	U-235	Pa-231	Ac-227	Ra-223	RIR page
Surface	263	2030	1320	1097	Table B-4
5 feet	74.8	1930	1180	900	Table B-4

Downhole Gamma: 2.5 feet deep: 740,000 CPM. Pages: RIR Table 6-9; Figure 6-6; pages 59, 102 and 105.
FS Figures 2-7 and 4-16.

(4) Soil Boring Number: WL-210 Area Two (Figure 6-6)

Uranium-238 and its daughter-products:

Depth	U-238	Th-234	U-234	Th-230	Ra-226	Pb-214	Bi-214	Pb-210	RIR pages
Surface	134	--	216	18,190	2,280	1,450	2,300	1,370	Table B-2
5 feet	65.5	--	145	12,400	520	546	512	--	Table B-2; p.106

Uranium-235 and its daughter products:

Depth	U-235	Pa-231	Ac-227	Ra-223	RIR page
Surface	182	838	732	660	Table B-4
5 feet	--	348	220	171	Table B-4

Downhole Gamma: Surface: 506,000 CPM. Page: RIR Table 6-9

(5) Soil Boring Number: WL-216 Area Two (Figure 6-6)

Uranium-238 and its daughter-products:

Depth	U-238	Th-234	Th-234	U-234	Th-230	Ra-226	Pb-214	Bi-214	Pb-210	RIR pages
5 feet	11.4	--	--	12.5	1131	88.4	85.9	93.2	176	Table B-2

Page 96, re W-216: "subsurface samples that contained radionuclide levels significantly above the reference levels."

Uranium-235 and its daughter products:

Depth	U-235	Pa-231	Ac-227	Ra-223	RIR pages
5 feet	--	39.3	25.8	30.2	Table B-4; Figure 6-6

(6) Soil Boring Number: WL-234 Area Two (Figure 6-6)

Uranium-238 and its daughter-products:

Depth	U-238	Th-234	U-234	Th-230	Ra-226	Pb-214	Bi-214	Pb-210	RIR pages
Split samples --- 10 feet:									
Quanterra	138	24.5	128	57,300	3060	1100	3060	1300	Tables B-2, B-10
Accu-Labs	100	140	83	83,000	1800	2200	2100	500	Table B-10

Uranium-235 and its daughter products:

Depth	U-235	Pa-231	Ac-227	Ra-223	RIR pages
Split samples --- 10 feet:					
Quanterra	774	1050	952	5270	Table B-11
Accu-Labs	110	520	--	88	Table B-11

Downhole Gamma: 7 feet deep: 1,104,000 CPM. RIR: Tables 6-9, 6-11 and p.96.

Some additional Downhole Gamma readings --- from PVC-cased Boreholes.

--- as reported in the RIR and the NRC Radiological Survey of 1982 (NUREG/CR-2722)

AREA ONE: PVC Boring 38 --- 1,298,000 CPM at 10 feet deep. (RIR Tables 6-7 and 6-11, and Figure 6-4.)

AREA TWO: PVC Boring 4 --- 1,290,000 CPM at one foot. (RIR Table 6-9 and Figure 6-6.)

PVC Boring 7 ---- 1,385,000 CPM at 2 feet. (loc. cit.)

PVC Boring 11 --- 2,288,000 CPM at 3 feet. (loc. cit. See also page 96.)

Additional Boring 11 readings from Table 5 of the NRC report, page 62:

U-238	--	2,900 pCi/g
Ra-226	--	13,000 pCi/g
Bi-214	--	13,000 pCi/g

One sample in the NRC Survey contained 19,000 pCi/gram of Bi-214 and **178,000 pCi/g of Th-230** !! (page 58)

Information about "reference levels" from the RIR - pages 88, 89: [for example, see the WL-216 note above]

"EPA's RI/FS (Remedial Investigation/Feasibility Study) Guidance for Municipal Solid Waste landfills should not be focused on large volumes of low levels of contamination but should focus on identifying smaller areas with higher levels of contamination. Consequently, for purposes of Operable Unit (OU)-1, a simple set of numerical levels that have been commonly used at other sites with radiological constituents were identified as a means of describing the extent of higher levels of radionuclide occurrences. These numerical levels are termed 'reference levels' and are used in the RI to segregate areas with negligible levels of radionuclides from those that are clearly greater than background. . . ."

"Reference levels have been derived for OU-1 based upon the EPA Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings' as set forth in [the Code of Federal Regulations] Title 40, Part 192, Sections 12 and 41. These standards state that:

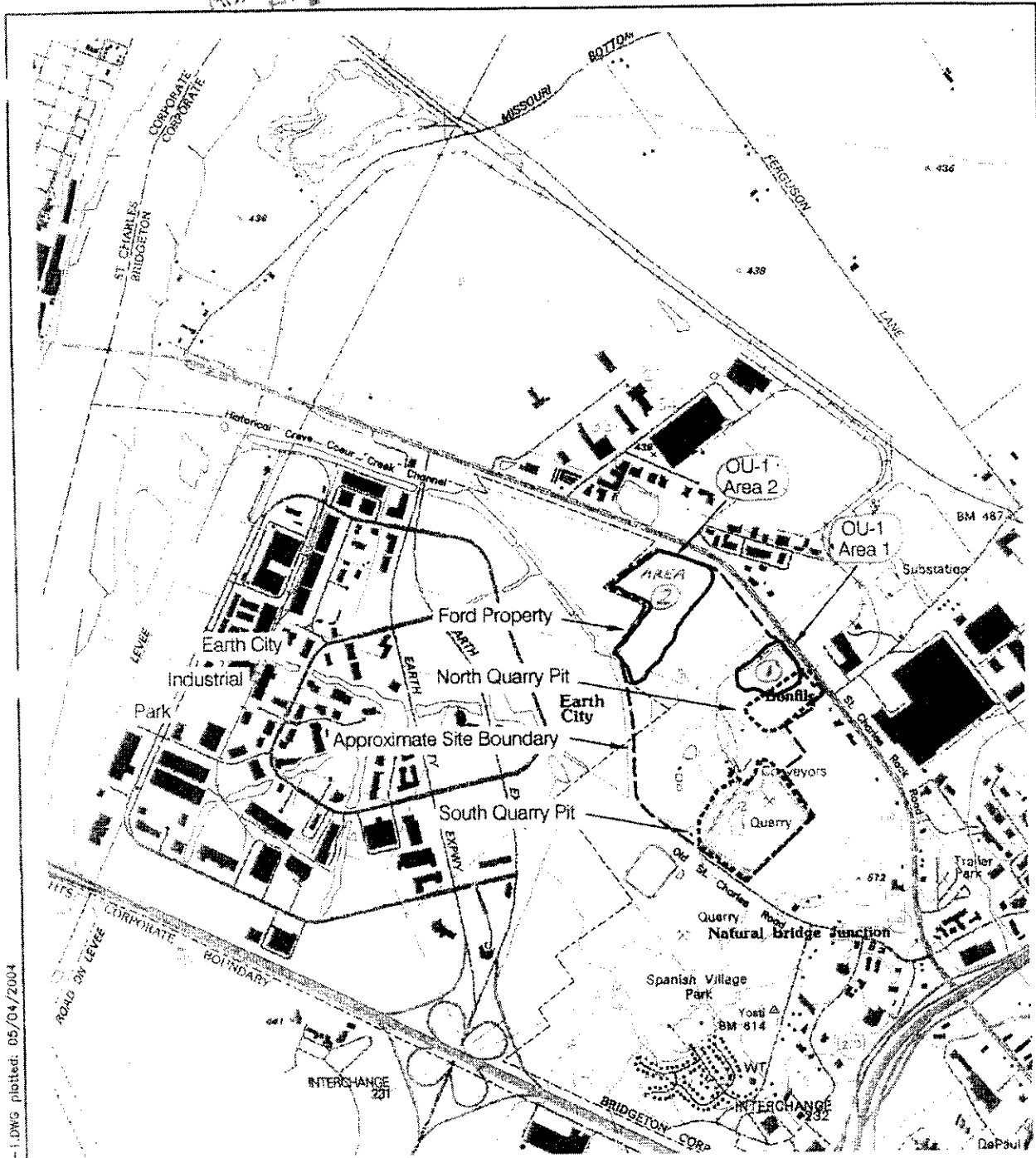
"The concentration of radium-226 (or radium-228) in land averaged over any area of 100 square meters shall not exceed the background level by more than (1) 5 pCi/g, averaged over the first 15 cm of soil below the surface, and (2) 15 pCi/g, averaged over 15 cm thick layers of soil more than 15 cm below the surface. . . ."

"As discussed above, reference levels have been used in the following discussions and associated evaluations to assist in defining the potential sources and extent of the possible source of the radiological materials. Use of reference levels is not and should not be construed to indicate that radionuclide occurrences at concentrations below the reference levels but above background do not represent contamination." (emphases added)

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lake\4-04\fig2-1.DWG plotted: 05/04/2004

M. Vicienta



Source: St. Charles, MO USGS 7.5' Quadrangle, 1994



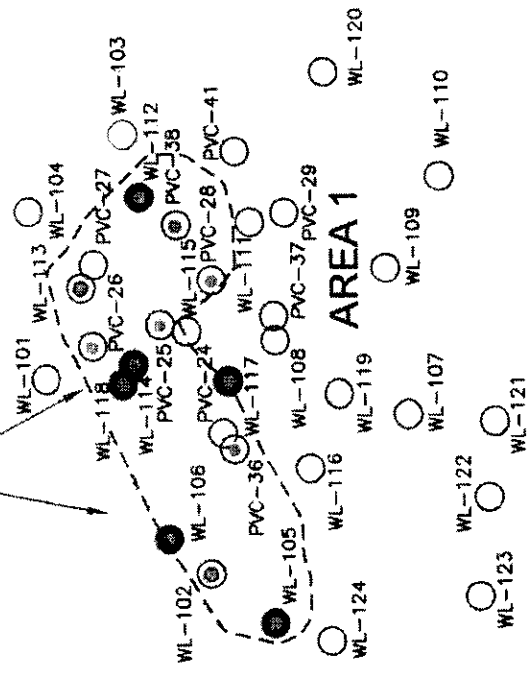
SCALE IN FEET



FEASIBILITY STUDY - MAY 2006	Figure 2-1 Site Location Map	OPERABLE UNIT 1 Areas ① and ②
West Lake Landfill OU-1 Feasibility Study		
EMSI Engineering Management Support, Inc. ④		

APPROXIMATE SUBSURFACE EXTENT OF RADIONUCLIDES ABOVE REFERENCE LEVELS

BRIDGETON LANDFILL OFFICE BUILDING



LEGEND

- Boring with subsurface samples above reference levels
Soil boring number
- Boring with subsurface samples above background but below reference levels
Soil boring number
- Boring Location with no exceedances
Soil boring number

- Boring with elevated downhole gamma readings
PVC-110

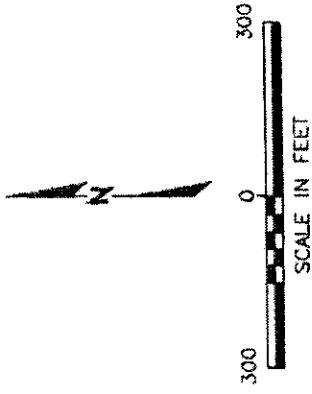
Note: color of circle denotes maximum reading

- Red: >760,000 counts per minute (CPM)
- Blue: >160,000 and <760,000 CPM
- Green: >6,000 and <160,000 CPM

REMEDIAL INVESTIGATION REPORT
Approximate Extent of Radionuclide Impacted Materials in the Subsurface in Area 1
 West Lake Landfill OU-1 Remedial Investigation Report
 EMSI Engineering Management Support, Inc.

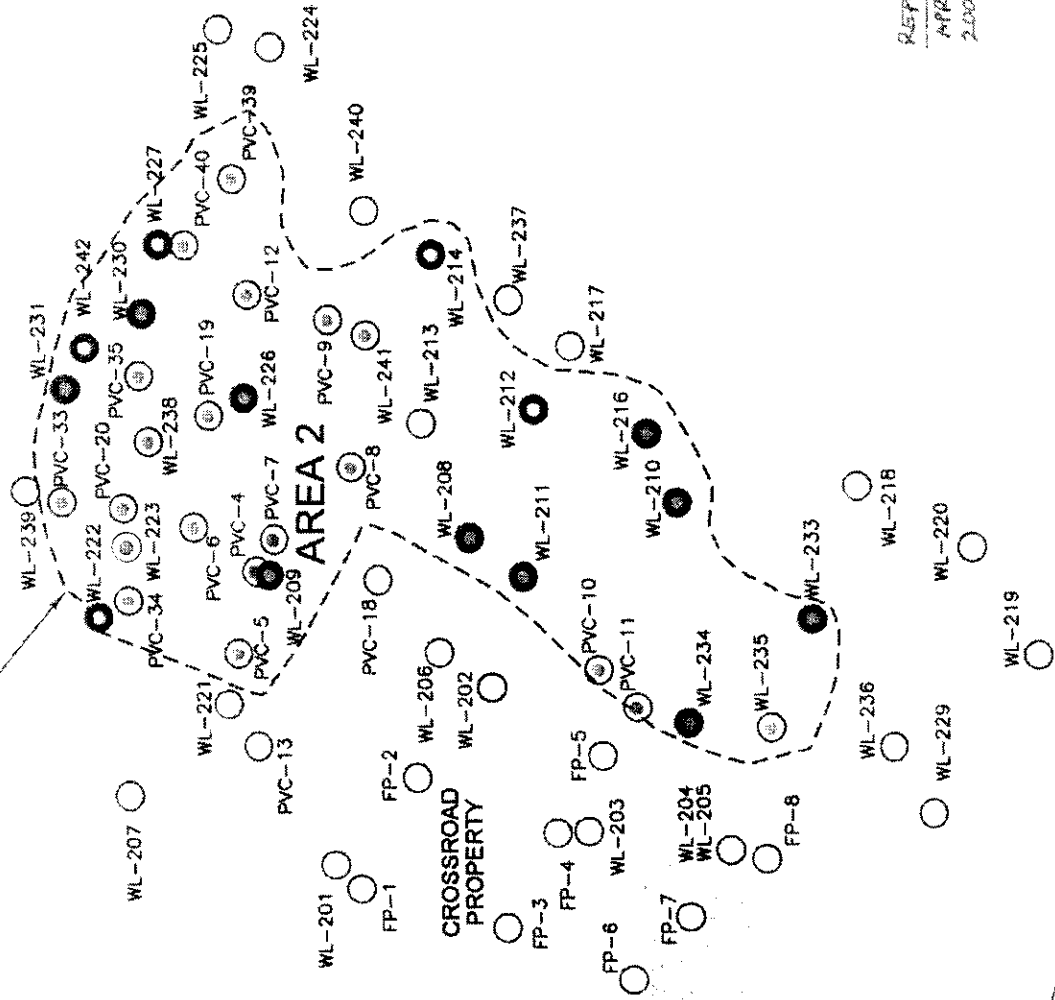
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APPROXIMATE SUBSURFACE EXTENT
OF RADIONUCLIDES ABOVE
REFERENCE LEVELS



LEGEND

- WL-230 Boring with subsurface samples above reference levels
 - WL-113 Boring with subsurface samples above background but below reference levels
 - WL-240 Boring Location with no exceedances
 - PVC-20 Boring with elevated downhole gamma readings
- Note: color of circle denotes maximum reading
 Red: >760,000 counts per minute (CPM)
 Blue: >180,000 and <760,000 CPM
 Green: >6,000 and <160,000 CPM



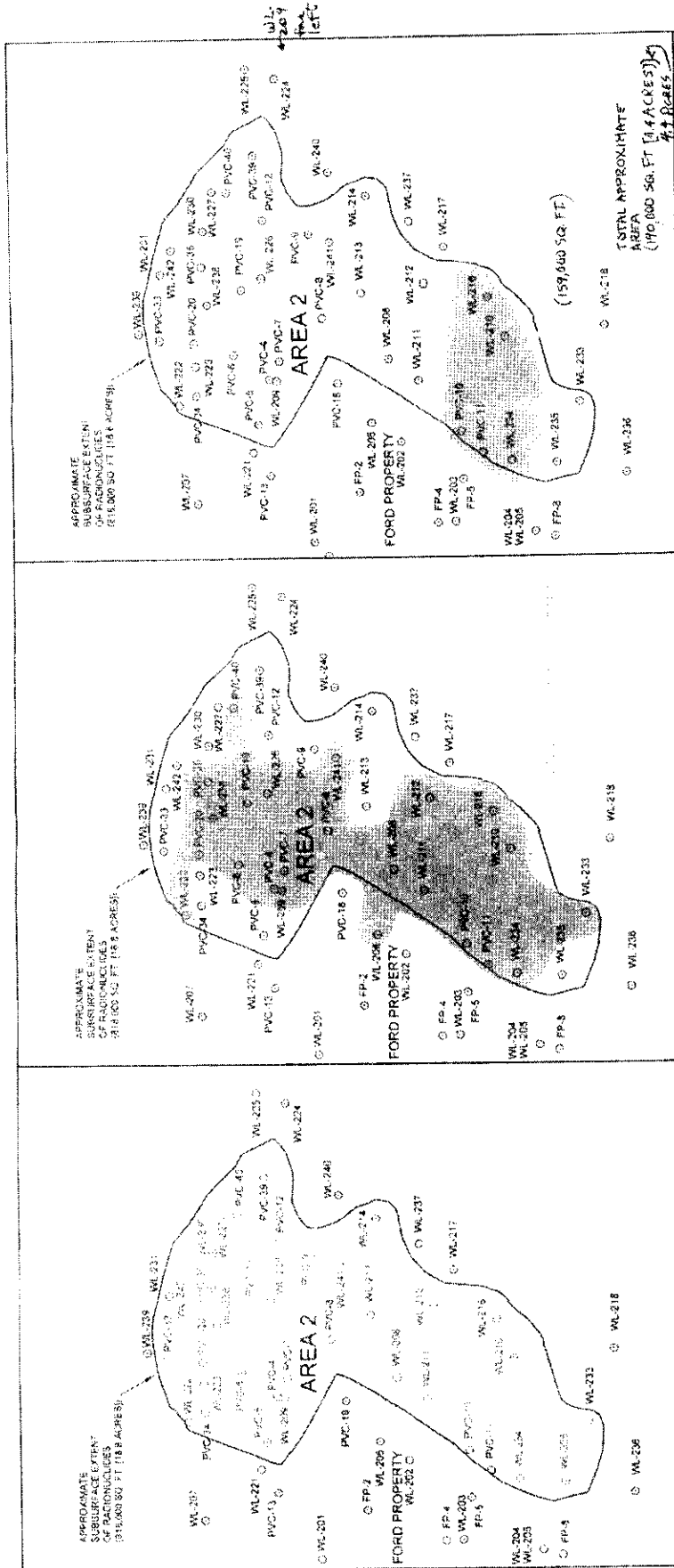
REMEDIAL INVESTIGATION REPORT
 APRIL 2000

Figure 6-6
Approximate Extent of Radionuclide Impacted Materials in the Subsurface in Area 2

West Lake Landfill OU-1 Remedial Investigation Report

EMSI Engineering Management Support, Inc.

RIR



Area with downhole gamma readings above 6,000 cpm and/or occurrences of individual radionuclides above background plus 15 pci/g

Area with downhole gamma readings above 100,000 cpm and/or occurrences of individual radionuclides above 100 pci/g

Area with downhole gamma readings above 500,000 cpm and/or occurrences of individual radionuclides above 1,000 pci/g

Figure 4-16
Approximate Extent of Area 2 with Elevated Downhole Gamma/Radionuclide Occurrences (Alternative L6)
West Lake Landfill OU-1 Feasibility Study
EMSI Engineering Management Support, Inc.

Scale: 1" = 100'

North Arrow