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NSTC GREAT LAKES, IL
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ENVIRONMENTAL UPDATE FORT SHERIDAN IL
9/19/2000
DEPARTMENT OF THE NAVY

9/19/2000

Environmental Update

The playground area of the Fort Sheridan Navy Youth Center has been temporarily closed in order to continue environmental sampling in the area. Previous sampling found very low levels of industrial byproducts, dioxins, in several soil samples taken from the playground area. Dioxins are a family of compounds commonly associated with the burning of industrial and municipal waste. Although there is no immediate safety concern to children at the playground, the playground was closed strictly as a precautionary measure to allow for further investigation.

The area around the playground is being studied as part of the more comprehensive, base-wide environmental investigation on-going at the fort. Historical maps, which provide information of past activities at the base, show that a portion of the playground area was once an open ravine. The Army, who formerly owned the property, filled this ravine prior to the 1970s. Soil samples were collected at varying depths (from the ground surface down to approximately 10 feet) to determine the type of material used to fill the ravine.

Additional sampling inside the playground is scheduled for Thursday, September 21, to better define the waste area and to collect more surface soil samples across the area. Samples will be collected from the surface and below ground. Sample analysis will take approximately two weeks to ensure high-quality control, and results should be available by the first week of October. Samples are also being collected from background locations and from other study areas at the Fort.

The Army is working closely with the Illinois Environmental Protection Agency, and the U.S. Environmental Protection Agency on these investigations. Once the new sampling results are available, Army and Navy officials will advise local residents as to the next step in this process.

For more information about the status of this investigation, please contact the Environmental Department at (847) 688-5999 extension 52.

Ross, Jenny (EFA Midwest)

From: Ross, Jenny (EFA Midwest)
Sent: Wednesday, September 20, 2000 8:51 AM
To: Siegfried, CDR Robert W (PWCGL)
Cc: Schultz, Mark R (PWCGL)
Subject: FORT SHERIDAN BACKGROUND INFORMATION

Sir -- Mark told me that you need some background information on the sampling that was done at the Fort.

When closure of Fort Sheridan started under BRAC in 1989, the Army started a comprehensive environmental investigation and clean up program. Initial sampling was conducted in 1991 without regulatory agency approval and using Army analytical methods. Following several years of negotiation between the Army and the regulatory agencies (EPA and IEPA), the investigation was restarted and the second phase of sampling took place in 1997 and 1998. During this investigation, the location of a former incinerator located north of Landfill 7 near the current landfill gate was investigated. Because of the past use of the site as a trash incinerator (between WWI and the early 1960s) samples were analyzed for dioxins. This was the only study area where samples were analyzed for dioxins.

During the first phase of construction for the closure of Landfill 7, Stone and Webster installed a new storm line around landfills 6 and 7. The foundation of the former incinerator and the locations where the previous dioxin samples were collected were both removed during the installation of the storm line. Stone and Webster also found buried fill extending north of Landfill 7 during installation of the storm line. This material was not similar to the material in Landfill 7 but also was not native material. They removed the material in the storm line trench, consolidated it under the interim cap on Landfill 7, placed clay in around the storm line to seal the excavation and then continued with the storm line excavation. They collected closure samples in 1998 and 1999 on the north side of the storm line . These were analyzed for dioxins and slightly higher levels were found that during the first round of sampling.

The Army decided in November 1999 to proceed with Phase III sampling at a number of study areas in order to complete the remedial investigation. One of the study areas was the area of fill found during installation of the storm line. Based on historical aerial photographs and old maps of the Fort, there was an open arm of Wells Ravine (Wells Ravine was filled to make landfill 7) thatthe
Army filled in. The arm of the ravine extended into the fence of the playground behind the Youth Center. In late June and early July, 2000, samples were collected in and around the Youth Center playground. Surface and subsurface samples were analyzed for the full TCL/TAL list of chemical constituents including dioxins and explosives. An error was made at the laboratory which delayed receipt of the validated data. Not all of the samples collected and sent to the lab were analyzed so additional samples are being collected at the labs expense in addition to the samples being collected to determine the extent of the surface contamination.

The Army provided us with information on the results of the tests as soon as the validated analytic data and preliminary risk assessment calculations became available. We were provided with the results for the subsurface samples collected in the test pit on Thursday, September 9, and with the results for the surface soil sampling on Tuesday, September 12.

VR, Jenny Ross

Ross, Jenny (EFA Midwest)

To: Samuels, CAPT Mark B (PWCGL)
Cc: Fahey, Robert CDR (EFA Midwest); PRUE, JOHN ; HIEB, JERRY ; PAO, PWC-GRL ; Barnes, Eugene E (PWCGL); CDR-Chris Stream; GEORGIA VLAHOS; BILL DERMODY; Hanson, John R; Schultz, Mark R (PWCGL); snyder.wendy@cnet.navy.mil
Subject: Update for Contamination on Youth Center Playground, Fort Sheridan

CO,

Mark requested that I provide you with an update on this issue.

There was an error in the units of some of the data used in the original risk calculation. The data have been corrected and the risks recalculated. Both USACHPPM (the Army Center for Health Promotion and Preventive Medicine) and NEHC (the Navy Environmental Health Center) have reviewed the data and validated the new risk numbers.

The carcinogenic risks for residential or recreational use of the site are in the risk management range of 1in 1,000,000 to 1 in 10,000 used as a guideline for risk management decisions by the Environmental Protection Agency. Combined residential risk for surface and subsurface soils in the playground area is 6E-05 (which is an increased cancer risk of 6 in 100,000). Combined recreational risk for surface and subsurface soils in the playground area is 3E-05 (which is an increased cancer risk of 3 in 100,000). These risk levels do not pose an iminent threat to human health but in a playground used by children could be a source of concern.

The Army is planning to conduct additional sampling in and around the playground next week. The sampling will focus on determining the extent of the surface contamination, validating physically and chemically that the extent of buried waste in the north tributary of Wells Ravine has been defined, and replicating the samples that were not analyzed by the laboratory the first time around. Expediting the laboratory turn around time is being explored.

Once the results of this sampling effort are available and have been validated, we will have a better picture of the health risks associated with the site and a decision can be made about whether to continue to use the area as a playground. Keeping the playground secured will facilitate collecting the required samples.

CHPPM and NEHC have provided risk communication information and some draft language to use in press releases and a flyer to the residents. A draft flyer will be distributed by e-mail before the end of the day.

VR, Jenny Ross
Environmental Engineer
(847) 688-5999 ext 53

During the course of environmental clean-up activities at Fort Sheridan, the Army detected compounds that are commonly released into the air during the burning of commercial or municipal waste. These compounds were found on various areas of Fort Sheridan including areas close to the Youth Center in Building 369. SAIC, the Army's environmental investigation contractor, will be out next week to collect additional samples to better define the source and effected areas.

As a safeguard, we have closed the playground adjacent to the Youth Center until the results of these additional studies are known. As soon as the results are known, we will share them with you. Additional information about the environmental investigations at Fort Sheridan is available in the Highwood and Highland Park Libraries, if you are interested.

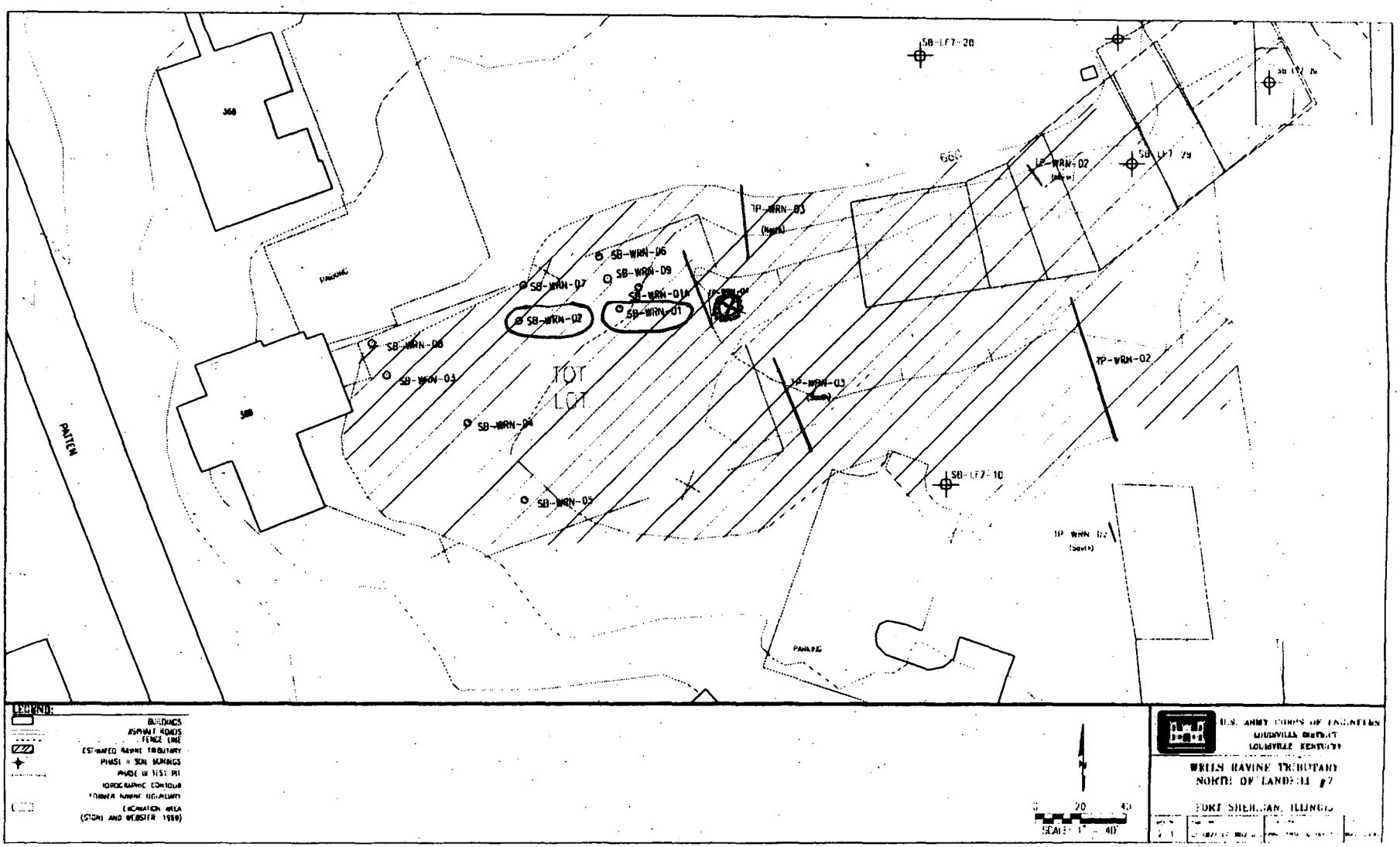
There are several steps that may be taken to reduce your child's exposure to the effected soil.

- Be sure that your child washes his or her hands frequently, particularly before eating.

- Remove shoes before going in the house, and try to remove all dust and dirt from your child's clothing before going in the house.

- Discourage your child from eating dirt or putting toys and other objects in their mouth.

A representative will be available from 4-6 pm today (15 September) at Bldg 369 to answer your questions. We will keep you informed as we get more information. In the meantime, if you have questions, please call our Environmental Department at (847) 688–5999 extension 40 or extension 53.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SB-WRN-07
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SB-WRN-01
SB-WRN-08
SB-WRN-04
SB-WRN-05
TP-WRN-03 (North)
TP-WRN-03 (South)
TP-WRN-02
TP-WRN-02 (South)
LF-WRN-02
PATTEN
FOOTBALL FIELD
PARKING
368
369
LEGEND:
BUILDINGS
ASPHALT ROADS
FENCE LINE
ESTIMATED RAVINE TRIBUTARY
PHASE II SOIL BORINGS
PHASE III TEST PIT
TOPOGRAPHIC CONTOUR
FORMER RAVINE ALIGNMENT
EXCAVATION AREA (STONE AND WEBSTER 1989)
0 20 40
SCALE: 1" = 40'
U.S. ARMY CORPS OF ENGINEERS
LOUISVILLE DISTRICT
LOUISVILLE KENTUCKY
WELLS RAVINE TRIBUTARY
NORTH OF LANDFILL #7
FORT SHERIDAN, ILLINOIS

Table 6-32. RME Risk Characterization Summary (Future Land Use)
Wells Ravine - North, U.S. DOD OU, Fort Sheridan, Illinois

Medium	Exposure Route	Noncancer HI												Cancer Risk							
		Residential				Recreational				Ind.		Const.		Resident		Recreational		Ind.		Const.	
		Child		Adult		Child		Adult		Worker		Worker						Worker		Worker	
Surface Soil (0 to < 1 ft BLS)	Ingestion	5E-01	B	6E-02	B	3E-01	B	3E-02	B	2E-02	B	3E-02	B	3E-05	B	1E-05	B	3E-06	B	2E-07	B
	Dermal Contact	4E-02	B	2E-02	B	2E-02	B	1E-02	B	2E-02	B	2E-03	B	4E-05	B	2E-05	B	3E-05	B	1E-07	B
	Inhalation (Dust)	8E-06	B	3E-06	B	1E-06	B	5E-07	B	3E-06	B	4E-06	B	1E-08	B	2E-09	B	9E-09	B	5E-10	B
Subsurface Soil (0 to 10 ft BLS)	Ingestion	4E-01	B	5E-02	B	2E-01	B	2E-02	B	2E-02	B	2E-02	B	2E-05	B	1E-05	B	3E-06	B	1E-07	B
	Dermal Contact	3E-02	B	2E-02	B	1E-02	B	8E-03	B	1E-02	B	2E-03	B	4E-05	B	2E-05	B	3E-05	B	1E-07	B
	Inhalation (Dust)	2E-04	B	1E-04	B	5E-05	B	1E-05	B	1E-04	B	2E-05	B	1E-08	B	2E-09	B	8E-09	B	4E-10	B
Surface Soil																					
Combined Hazard Index:		6E-01	B	8E-02	B	3E-01	B	4E-02	B	4E-02	B	3E-02	B								
Combined Cancer Risk:														7E-05	B	3E-05	B	3E-05	B	3E-07	B
Subsurface Soil																					
Combined Hazard Index:		5E-01	B	6E-02	B	2E-01	B	3E-02	B	3E-02	B	2E-02	B								
Combined Cancer Risk:														6E-05	B	3E-05	B	3E-05	B	3E-07	B

NA - pathway not evaluated or all detected chemicals eliminated as COPCs

0E+00 - pathway evaluated but no risks could be calculated due to lack of EPA-approved toxicity values

B - HI $\leq$ 1 or ELCR $\leq 10^{-4}$

E - HI > 1 or ELCR > 10^{-4}

Table 6-32. RME Risk Characterization Summary (Future Land Use)
Wells Ravine - North, U.S. DOD OU, Fort Sheridan, Illinois

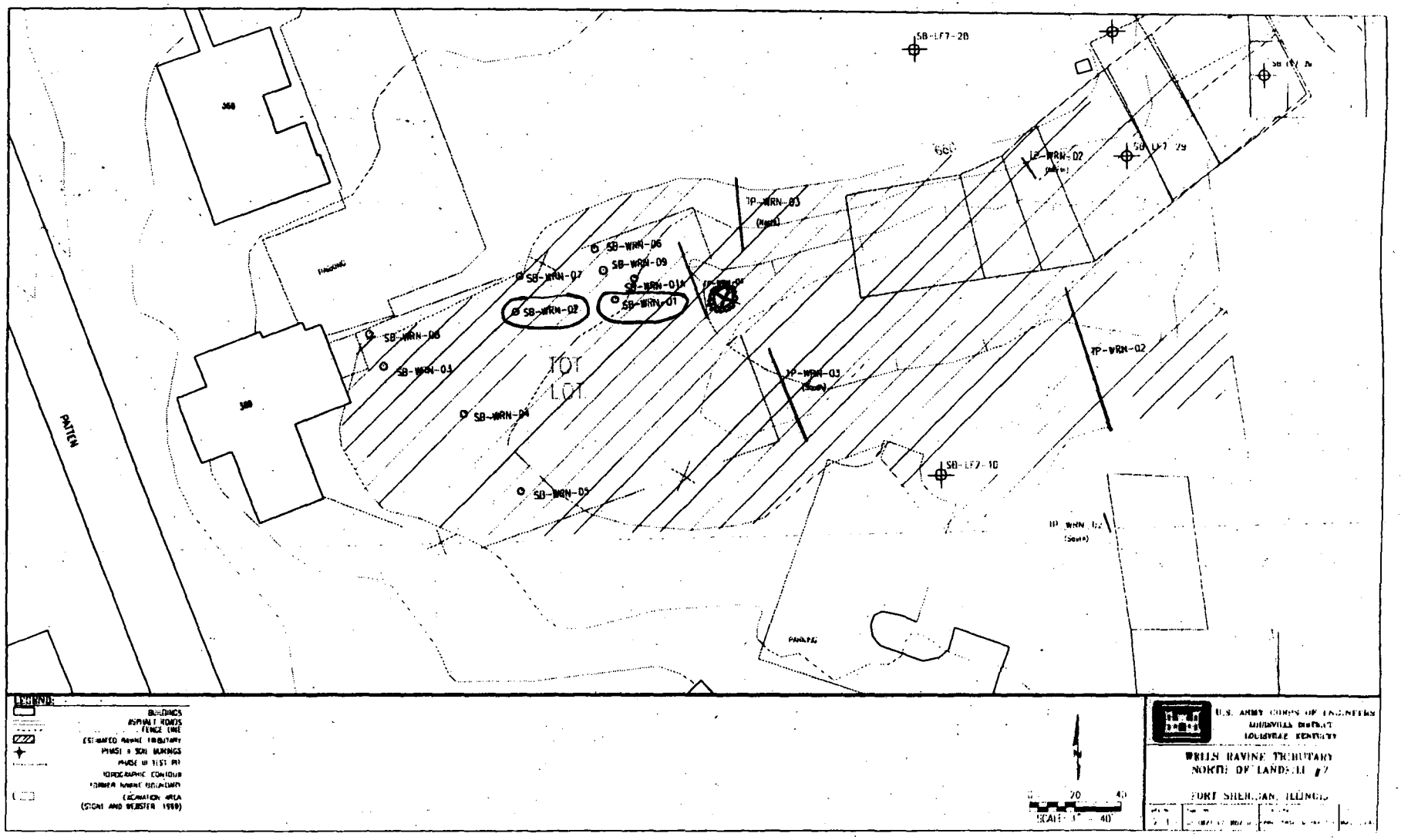
Medium	Exposure Route	Noncancer HI												Cancer Risk							
		Residential				Recreational				Ind.		Const.		Resident		Recreational		Ind.		Const.	
		Child		Adult		Child		Adult		Worker		Worker						Worker		Worker	
Surface Soil (0 to < 1 ft BLS)	Ingestion	5E-01	B	6E-02	B	3E-01	B	3E-02	B	2E-02	B	3E-02	B	3E-05	B	1E-05	B	3E-06	B	2E-07	B
	Dermal Contact	4E-02	B	2E-02	B	2E-02	B	1E-02	B	2E-02	B	2E-03	B	4E-05	B	2E-05	B	3E-05	B	1E-07	B
	Inhalation (Dust)	8E-06	B	3E-06	B	1E-06	B	5E-07	B	3E-06	B	4E-06	B	1E-08	B	2E-09	B	9E-09	B	5E-10	B
Subsurface Soil (0 to 10 ft BLS)	Ingestion	4E-01	B	5E-02	B	2E-01	B	2E-02	B	2E-02	B	2E-02	B	2E-05	B	1E-05	B	3E-06	B	1E-07	B
	Dermal Contact	3E-02	B	2E-02	B	1E-02	B	8E-03	B	1E-02	B	2E-03	B	4E-05	B	2E-05	B	3E-05	B	1E-07	B
	Inhalation (Dust)	2E-04	B	1E-04	B	5E-05	B	1E-05	B	1E-04	B	2E-05	B	1E-08	B	2E-09	B	8E-09	B	4E-10	B
Surface Soil																					
Combined Hazard Index:		6E-01	B	8E-02	B	3E-01	B	4E-02	B	4E-02	B	3E-02	B								
Combined Cancer Risk:														7E-05	B	3E-05	B	3E-05	B	3E-07	B
Subsurface Soil																					
Combined Hazard Index:		5E-01	B	6E-02	B	2E-01	B	3E-02	B	3E-02	B	2E-02	B								
Combined Cancer Risk:														6E-05	B	3E-05	B	3E-05	B	3E-07	B

NA - pathway not evaluated or all detected chemicals eliminated as COPCs

0E+00 - pathway evaluated but no risks could be calculated due to lack of EPA-approved toxicity values

B - HI ≤ 1 or ELCR ≤ 10^{-4}

E - HI > 1 or ELCR > 10^{-4}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SB-LF7-29
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SB-WRN-06
SB-WRN-09
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SB-WRN-01
SB-WRN-08
SB-WRN-04
SB-WRN-03
SB-WRN-05
TP-WRN-03
TP-WRN-02
LF-WRN-02
PATTEN
FORT LOT
PARKING
LEGEND:
BUILDINGS
ASPHALT ROADS
FENCE LINE
PHASE II SOIL BORINGS
TOPOGRAPHIC CONTOUR
EXCAVATION AREA
(STONE AND WEBSTER 1990)
SCALE: 1" = 40'
U.S. ARMY CORPS OF ENGINEERS
LOUISVILLE KENTUCKY
WELLS RAVINE TRIBUTARY
NORTH OF LANDFILL #7
FORT SHERIDAN, ILLINOIS

Soil Analytical Results Summary (Continued)
Fort Sheridan, Illinois

Site ID			SB-WRN-01	SB-WRN-01	SB-WRN-01	SB-WRN-01	TP-WRN-02	TP-WRN-02	TP WRN 02
Field Sample Number			SAIC01	SAIC01D	SAIC02	SAIC03	SAIC01	SAIC02	SAIC03
Site Type			BORE	BORE	BORE	BORE	EXCV	EXCV	EXCV
Collection Date			06/05/2000	06/05/2000	06/05/2000	06/05/2000	05/24/2000	05/24/2000	05/24/2000
Depth (ft)			0.00	0.00	3.00	10.00	0.00	2.60	0.00
Chromium	ug/g	2	13	11.1	14.4	10.3	15.9	14.5	15.2
Cobalt	ug/g	2	6.3	6.2	8.7	6.8	8.7	8.3	17.9
Copper	ug/g	2	15.8	14.4	17	15.8	20.7	19.4	27.7
Iron	ug/g	3	13200	12100	16400	12400	18600	18800	23500
Lead	ug/g	0.2	38	36.8	21.5	7.2	39.2	39.2	34.2
Magnesium	ug/g	20	18000	18200	13700	44400	18100	26400	12100
Manganese	ug/g	1	481	511	1060	565	644 J	554 J	2050 J
Mercury	ug/g	0.1	0.07	0.05	0.06	0.02 U	0.23	0.04	0.14
Nickel	ug/g	2	14.5	13.1	21.6	16.6	18.7	19.6	32.1
Potassium	ug/g	200	1520 J	1190 J	1260 J	1500 J	1520 J	1290 J	1280 J
Silver	ug/g	1	0.05 U	0.06 U	0.06 U	0.06 U	0.32	0.05 U	0.06 U
Selenium	ug/g	0.2	0.46 U	0.54 U	0.58 U	0.5 U	0.6	0.49 U	0.52 U
Sodium	ug/g	20	104 J	100 J	234 J	214 J	98.8	140	110
Thallium	ug/g	0.2	0.39 U	0.45 U	0.49 U	0.42 U	0.44 U	0.42 U	1
Vanadium	ug/g	1	16.7	13.9	19.9	12	21.9	20.9	30.1
Zinc	ug/g	1	64.5	60.9	57.1	53.2	80.3 J	65.5 J	109 J

DIOXINS/FURANS

Laboratory Id Number			0006L500	0006L500	0006L500	0006L500	0005L424	0005L424	0005L424
Parameter	Units	RL							
HXCDD, Total	ug/kg	0.16	0.06 J	0.09 U	0.08 U	0.07 U	0.1 U	0.08 U	0.07 U
1,2,3,4,6,7,8-HPCDD	ug/kg	0.07	0.07 J	0.16 J	0.08 U	0.06 U	0.1 U	0.1 U	0.09 U
HPCDD, Total	ug/kg	0.07	0.13 J	0.24 J	0.08 U	0.06 U	0.1 U	0.1 U	0.09 U
1,2,3,4,6,7,8-HPCDF	ug/kg	0.05	0.03 J	0.06 J	0.07 U	0.05 U	0.06 U	0.06 U	0.05 U
HPCDF, Total	ug/kg	0.06	0.06 J	0.15 J	0.08 U	0.06 U	0.08 U	0.07 U	0.06 U
OCDD	ug/kg	0.07	0.49 U	1.1 J	0.08 U	0.06 U	0.24	0.25	0.28
OCDF	ug/kg	0.06	0.04 J	0.08 J	0.06 U	0.05 U	0.06 U	0.07 U	0.05 U

Created on: 09/13/00

Quality Assurance Form #4: Soil Ingestion - Future Land Use - Residential (Child/Adult)
Wells Ravine - North - Surface Soil, Fort Sheridan, Chicago, Illinois

Noncancer Intake (Child)

$$Intake_{NAR} = \frac{\text{Concentration in Soil} \times \text{Conversion Factor} \times \text{Exposure Frequency} \times \text{Ingestion Rate} \times \text{Exposure Duration}}{\text{Body Weight} \times \text{Averaging Time}}$$

Concentration in Soil		Conversion Factor		Exposure Frequency		Ingestion Rate		Exposure Duration		Body Weight		Averaging Time			
10.471	mg arsenic / kg soil	1E-06	kg soil / mg soil	286	days / year	200	mg soil / day	6	years	15	kg	6	years	365	days / year

= 0.000109401 mg arsenic / kg BW x day

Hazard Quotient (Child)

$$HQ = \frac{\text{Intake}_{NAR}}{\text{RfD}}$$

Intake		RfD	
0.0001	mg arsenic / kg BW x day	0.0003	mg arsenic / kg BW x day

= 0.36467

Noncancer Intake (Adult)

$$Intake_{NAR} = \frac{\text{Concentration in Soil} \times \text{Conversion Factor} \times \text{Exposure Frequency} \times \text{Ingestion Rate} \times \text{Exposure Duration}}{\text{Body Weight} \times \text{Averaging Time}}$$

Concentration in Soil		Conversion Factor		Exposure Frequency		Ingestion Rate		Exposure Duration		Body Weight		Averaging Time			
10.471	mg arsenic / kg soil	1E-06	kg soil / mg soil	286	days / year	100	mg soil / day	24	years	70	kg	24	years	365	days / year

= 1.17215E-05 mg arsenic / kg BW x day

Hazard Quotient (Adult)

$$HQ = \frac{\text{Intake}_{NAR}}{\text{RfD}}$$

Intake		RfD	
1E-05	mg arsenic / kg BW x day	0.0003	mg arsenic / kg BW x day

= 0.03907

Cancer Intake

$$Intake_{CAR} = \frac{\text{Concentration in Soil} \times \text{Conversion Factor} \times \text{Exposure Frequency} \times \left(\frac{\text{Ingestion Rate} \times \text{Exposure Duration}}{\text{Body Weight}} + \frac{\text{Ingestion Rate} \times \text{Exposure Duration}}{\text{Body Weight}} \right)}{\text{Averaging Time}}$$

Concentration in Soil		Conversion Factor		Exposure Frequency		Ingestion Rate		Exposure Duration		Body Weight		Ingestion Rate		Exposure Duration		Body Weight		Averaging Time			
0.0001	mg 1,2,3,4,6,7,8-HpCDD / kg soil	1E-06	kg soil / mg soil	286	days / year	200	mg soil / day	6	years	15	kg	100	mg soil / day	24	years	70	kg	70	years	365	days / year

= 1.80832E-10 mg 1,2,3,4,6,7,8-HpCDD / kg BW x day

Excess Lifetime Cancer Risk

$$ELCR = \frac{\text{Intake}_{CAR}}{\text{SF}} \times \text{SF}$$

Intake		SF	
2E-10	mg 1,2,3,4,6,7,8-HpCDD / kg BW x day	1500	kg BW x day / mg 1,2,3,4,6,7,8-HpCDD

= 2.7E-07

Quality Assurance Form #3: Soil Ingestion - Future Land Use - Recreational User (Child/Adult)

Wells Ravine - North - Surface Soil, Fort Sheridan, Chicago, Illinois

Noncancer Intake (Child)

$$Intake_{NAS} = \frac{\text{Concentration in Soil} \times \text{Conversion Factor} \times \text{Exposure Frequency} \times \text{Ingestion Rate} \times \text{Exposure Duration}}{\text{Body Weight} \times \text{Averaging Time}}$$

Concentration in Soil		Conversion Factor		Exposure Frequency		Ingestion Rate		Exposure Duration		Body Weight		Averaging Time			
10.471	mg arsenic / kg soil	1E-06	kg soil / mg soil	140	days / year	200	mg soil / day	6	years	15	kg	6	years	365	days / year

= 5.35529E-05 mg arsenic / kg BW x day

Hazard Quotient (Child)

$$HQ = \frac{5E\text{-}05 \text{ mg arsenic / kg BW x day}}{0.0003 \text{ mg arsenic / kg BW x day}} = 0.17851$$

Noncancer Intake (Adult)

$$Intake_{NAS} = \frac{\text{Concentration in Soil} \times \text{Conversion Factor} \times \text{Exposure Frequency} \times \text{Ingestion Rate} \times \text{Exposure Duration}}{\text{Body Weight} \times \text{Averaging Time}}$$

Concentration in Soil		Conversion Factor		Exposure Frequency		Ingestion Rate		Exposure Duration		Body Weight		Averaging Time			
10.471	mg arsenic / kg soil	1E-06	kg soil / mg soil	140	days / year	100	mg soil / day	24	years	70	kg	24	years	365	days / year

= 5.73781E-06 mg arsenic / kg BW x day

Hazard Quotient (Adult)

$$HQ = \frac{6E\text{-}06 \text{ mg arsenic / kg BW x day}}{0.0003 \text{ mg arsenic / kg BW x day}} = 0.01913$$

Cancer Intake

$$Intake_{NAS} = \frac{\text{Concentration in Soil} \times \text{Conversion Factor} \times \text{Exposure Frequency} \times \left(\frac{\text{Ingestion Rate} \times \text{Exposure Duration}}{\text{Body Weight}} + \frac{\text{Ingestion Rate} \times \text{Exposure Duration}}{\text{Body Weight}} \right)}{\text{Averaging Time}}$$

Concentration in Soil		Conversion Factor		Exposure Frequency		Ingestion Rate		Exposure Duration	Body Weight	Ingestion Rate		Exposure Duration	Body Weight	Averaging Time		
0.0001	mg 1,2,3,4,6,7,8-HpCDD / kg soil	1E-06	kg soil / mg soil	140	days / year	200	mg soil / day	6 years	15 kg	100	mg soil / day	24 years	70 kg	70	years	365 days / year

= 8.85191E-11 mg 1,2,3,4,6,7,8-HpCDD / kg BW x day

Excess Lifetime Cancer Risk

$$ELCR = \frac{9E\text{-}11 \text{ mg 1,2,3,4,6,7,8-HpCDD}}{\text{kg BW x day}} \times \frac{1500 \text{ kg BW x day}}{\text{mg 1,2,3,4,6,7,8-HpCDD}} = 1.3E\text{-}07$$