APPENDIX B-13

DELINEATION SURVEYS FOR AREA 20A-WEST

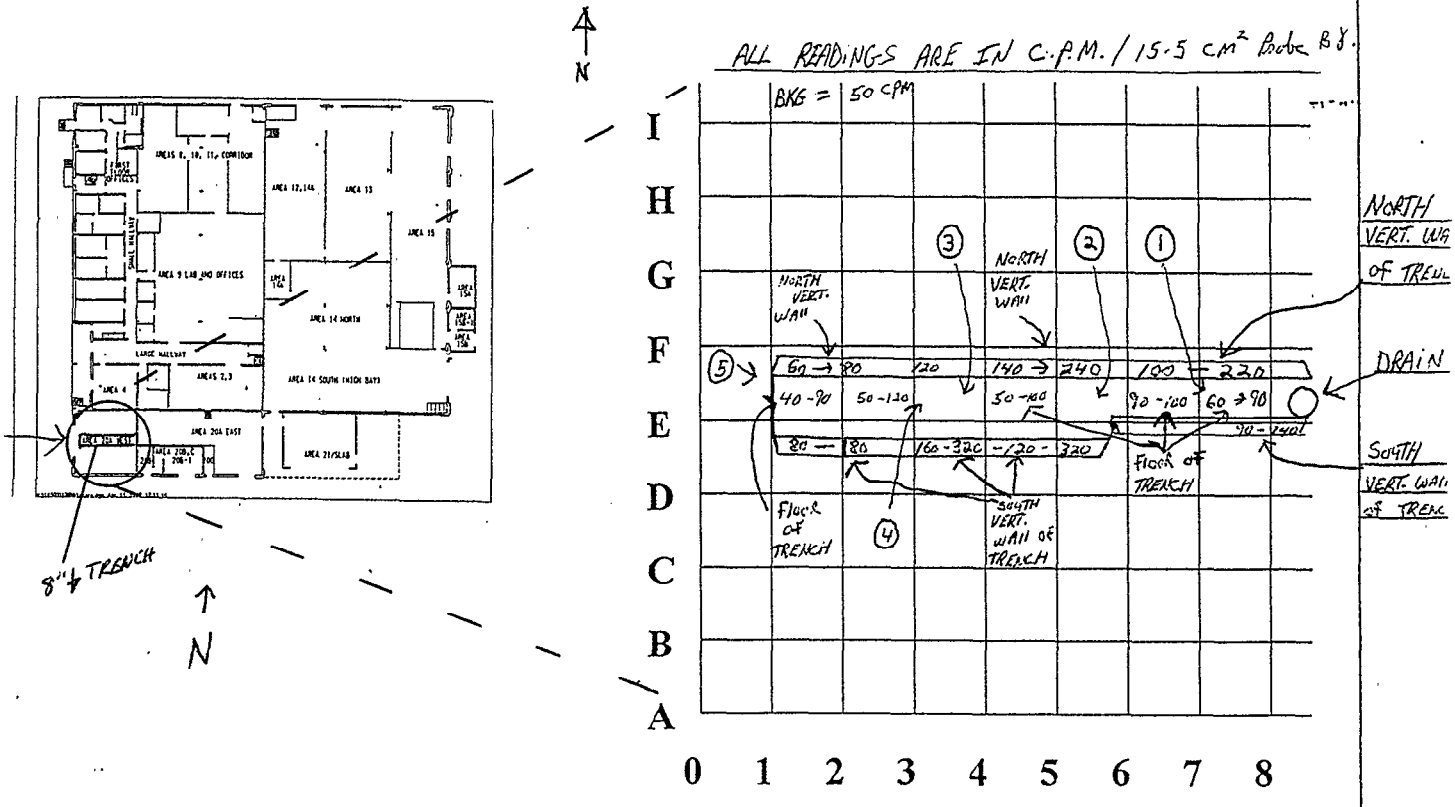
HILBERT ASSOCIATES INC
RADIOLOGICAL ENGINEERS

IDM Environmental
Bldg. 14, Praxair Site
Tonawanda, NY 14151

Radiological Survey Form

Hilbert Associates, Inc
Radiological Consultants
640 Maple Ave
Saratoga Springs, NY 12866
Phone: 518-584-0166
Fax: 518-584-8529
Contract # 95012

Date / Time 3-17-97 @ 1450	Tech M. Zigo	Instruments / sn LuDLuM 2221 B	
Location / Purpose BLD-14 AREA 20 A WEST		Survey # 117	RWP # N/A
DeLINEATION SURVEY OF TRENCH			



Loc	Type	Description	Gross	A DPM	Gross	Beta DPM
1	S	NORTH WALL OF TRENCH	2	5	52	-34
2	S	↓	0	-1	58	-14
3	S	SOUTH WALL of TRENCH	0	-1	56	-21
4	S.	FLOOR of TRENCH	0	-1	63	3
5	S	FLOOR of TRENCH	0	-1	69	24

Loc	Type	Description	Gross	A DPM	Gross	Beta DPM

Comments:

Scaler S/N LuDLuM 2929 I		BKD	EFF	MDA
CT = 1	Alpha:	165/700	.34	14
Tech M. ZIGO	Beta:	4314/700	.29	135

Review

HILBERT ASSOCIATES, INC.

DIRECT SURFACE MEASUREMENT ANALYSIS REPORT
(scaler measurement)

SURVEY # 783

SAMPLE DATE: 9-15-97 / 9-16-97
LOCATION: PRAXAIR SITE
B-14 AREA 20A WEST
SOIL CORE SAMPLING
DELINEATION
SURVEY # 764

RADIATION MEASUREMENT: Beta-Gamma
RESULTS REPORTED UNITS: dpm per 100cm2
MEASUREMENT TYPE: direct scaler measurements

TOTAL BACKGROUND COUNTS	42
BACKGROUND COUNT TIME (MIN)	1 MIN.
SAMPLE COUNT TIME (MIN)	1 MIN.

SAMPLE #	LOCATION CODE	LOCATION DESCRIPTION	~~GROSS SAMPLE COUNTS~~ CCPM (b)	C.O.C. SAMPLE #
1	0-1'	HOLE #1 (SEE MAP)	0	760
2	1-2'		0	761
3	2-3'		0	762
4	3-4'		0	763
5	0-1'	HOLE #2	0	764
6	1-2'		0	765
7	2-3'		0	766
8	3-4'		0	767
9	0-1'	HOLE #3	0	768
10	1-2'		0	769
11	2-3'		0	770
12	0-1'	HOLE #4	0	771
13	1-2'		0	772
14	2-3'		0	773
15	3-4'		0	774
16	0-1'	HOLE #5	0	775
17	1-2'		0	776
18	2-3'		0	777
19	3-4'		0	778
20				
21				
22				
23				
24				
25		N/A		
26				
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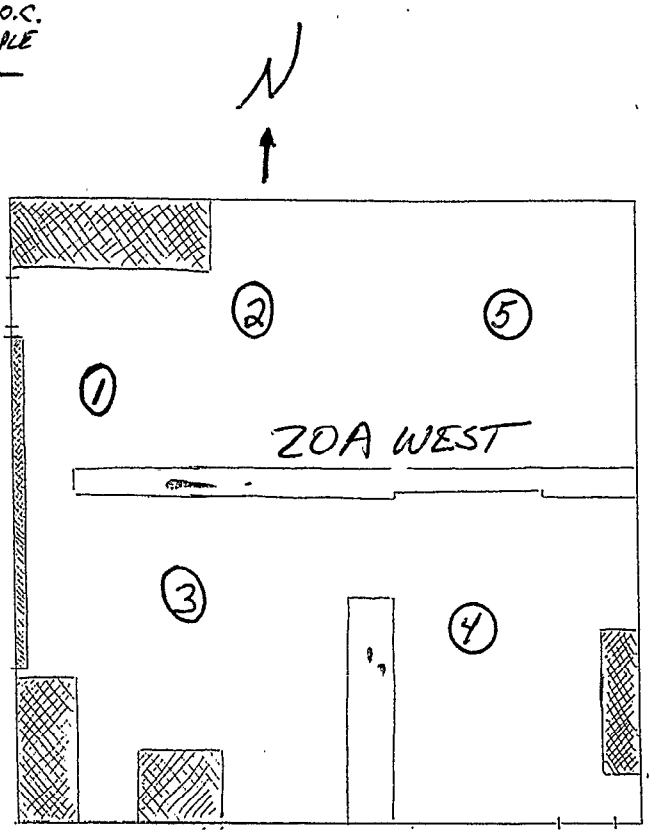
40				



KEY: (#) = SOIL SAMPLE (CORE) HOLE LOCATION.

W. [illegible]
9-15-97

Instrument Model & s/n:	INST. (c) LB221 W/44-9
Detector Model & s/n:	
Calibration Date:	
Efficiency	cpm / dpm based on S/Y90 = .20
Detector Area	cm2 = 15.5

REVIEWED [illegible]

ENCL-C2.XLS

HILBERT ASSOCIATES, INC.

DIRECT SURFACE MEASUREMENT ANALYSIS REPORT
(scaler measurement)

SURVEY # 784

SAMPLE DATE: 9-15-97
LOCATION: PRAXAIR SITE
B-14 (20A WEST AREA)
FLOOR & WALL DELINEATION
BY

RADIATION MEASUREMENT: Beta-Gamma
RESULTS REPORTED UNITS: dpm per 100cm2
MEASUREMENT TYPE: direct scalar measurements

TOTAL BACKGROUND COUNTS	413
BACKGROUND COUNT TIME (MIN)	1 min.
SAMPLE COUNT TIME (MIN)	1 min.

SAMPLE #	LOCATION CODE	LOCATION DESCRIPTION	GROSS SAMPLE COUNTS
1	SEE	TRENCH	410
2			350
3	MAP		360
4			220
5			310
6		HOR. @ TOP OF WALL	370
7			340
8		WALL SURFACE (APPROX. 10')	240-310
9		upper brick wall	
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
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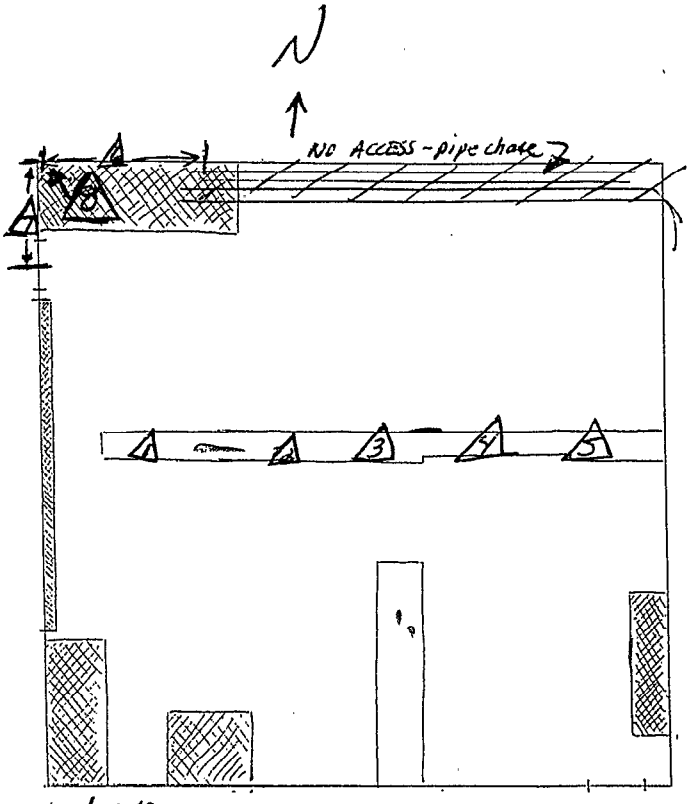
40			



KEY:
△# = DIRECT PROBE BY 1 MIN. READING LOCATION

NOTE: REMAING AREAS UPTO 2 METERS & OVERHEAD 100% SCANNED, ALL < 5k DPM/100cm² AV
BY

9-9-97

Instrument Model & s/n:	INST. © L2221 W/44-9
Detector Model & s/n:	
Calibration Date:	
Efficiency	cpm / dpm based on S/Y90 = .20
Detector Area	cm2 = 15.5

ENCL-C2.XLS

HILBERT ASSOCIATES, INC.

DIRECT SURFACE MEASUREMENT ANALYSIS REPORT
(scaler measurement)

SURVEY #1067

SAMPLE DATE: 11/21/97
LOCATION: PRAXAIR SITE B14 AREA 20A WEST TOP OF NORTH WALL (BRICK) predecon

RADIATION MEASUREMENT: Beta-Gamma
RESULTS REPORTED UNITS: dpm per 100cm2
MEASUREMENT TYPE: direct scaler measurements

B8

TOTAL BACKGROUND COUNTS	51 CPM
BACKGROUND COUNT TIME (MIN)	1 MIN
SAMPLE COUNT TIME (MIN)	1 MIN.

SAMPLE #	LOCATION CODE	LOCATION DESCRIPTION	GROSS SAMPLE COUNTS
1	N/A	SEE MAP TOP OF BRICK	265
2			290
3			360
4			258
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16		N/A	
17			
18			
19			
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21			
22			
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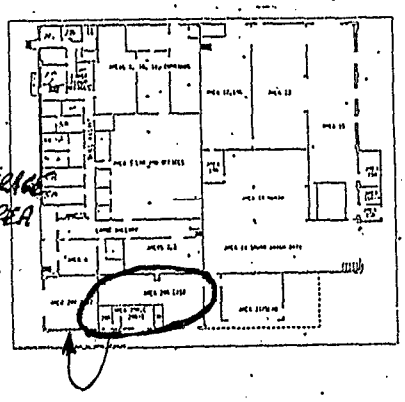
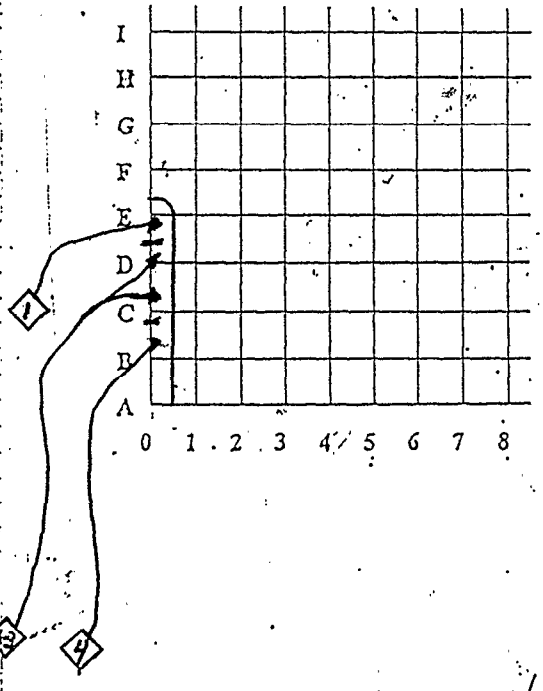
39			
40			

AVERAGE FOR AREA



AREA 20-A WEST - NORTH WALL TOP OF BRICK



11/21/97

Instrument Model & s/n:	LB121 #89648
Detector Model & s/n:	44-9 #33041
Calibration Date:	2-7-97
Efficiency	cpm / dpm based on S/P90 .20
Detector Area	cm2 = 15.5

REVIEW

PAGE

APPENDIX B-14

DELINEATION SURVEYS FOR AREA 21

ION TECHNOLOGY, INC.

DIRECT SURFACE MEASUREMENT ANALYSIS REPORT
(scaler measurement)

Survey Date: 8/28/97
Location: o/s BLDG 14 (Area 21
Description: Delin
Survey # 691

	alpha	beta-gamma
Instrument Model & s/n: 2221 "A"		
Detector Model, & s/n:		
Calibration Date:		
Efficiency [Tc99] [SY90] [Th230]		
Detector Area (CM2)		

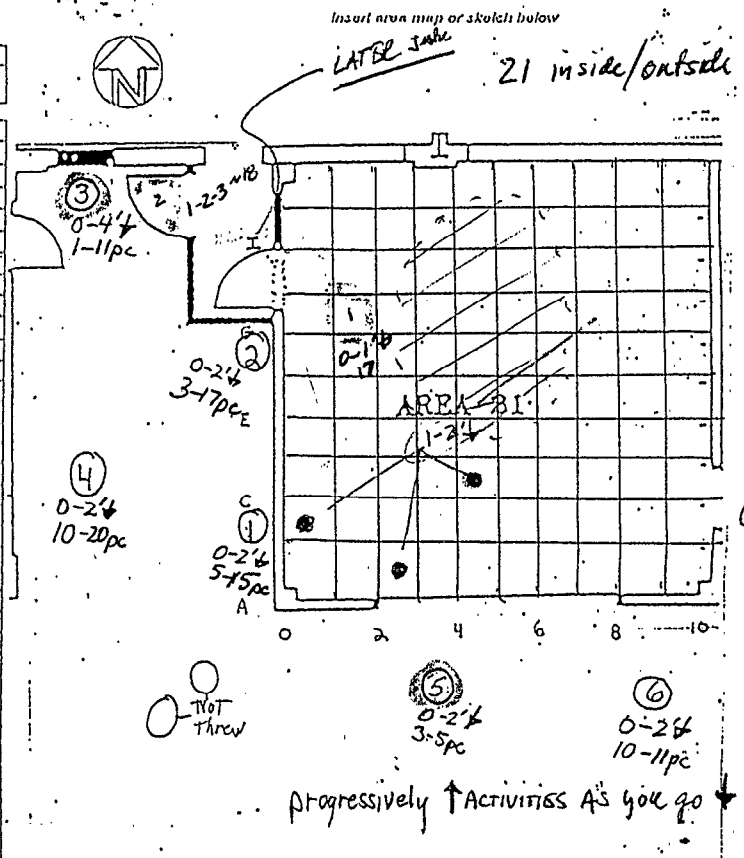
RADIATION MEASUREMENT: Alpha & Beta-Gamma
RESULTS REPORTED UNITS: gross cpm per probe area
MEASUREMENT TYPE: direct scaler measurements

	alpha	beta-gamma
TOTAL BACKGROUND COUNTS		40 cpm
BACKGROUND COUNT TIME (MIN)		1 MIN
SAMPLE COUNT TIME (MIN)		1 MIN

RP Technician: SMALLRIDGE / RS

#	GRID	DESCRIPTION	alpha GROSS COUNTS	beta-gamma GROSS COUNTS
1	o/s	Soil Sample @ 1 FT		70
		@ 2 FT		107
		Obstruction @ 3 FT		N/A
		@ 4 FT		N/A
2		Soil Sample @ 1 FT		63
		2 FT		60
		Obstruction @ 3 FT		N/A
		4 FT		N/A
3		Soil Sample @ 1 FT		60
		2 FT		66
		3 FT		60
		4 FT		75
4		Soil Sample @ 1 FT		59
		2 FT		88
		Obstruction @ 3 FT		N/A
		4 FT		N/A
5		Soil Sample @ 1 FT		43
		2 FT		48
		Obstruction @ 3 FT		N/A
		4 FT		N/A
6		Soil Sample @ 1 FT		56
		2 FT		64
		Obstruction @ 3 FT		N/A
		4 FT		N/A
7		Soil Sample @ 1 FT		50
		2 FT		49
		3 FT		81
		4 FT		66
8		Soil Sample @ 1 FT		57
		2 FT		56
		3 FT		43
		4 FT		43

Insert area map or sketch below



Note 3 holes Not Sampled due to obstructions

SURVEY01.XLS

ION TECHNOLOGY, INC.

DIRECT SURFACE MEASUREMENT ANALYSIS REPORT
(scaler measurement)

Survey Date: 8/21/97
Location: BLD 14 AREA 21
Description: DELIN
Survey # 678

	alpha	beta-gamma
Instrument Model & s/n: 2221		
Detector Model & s/n:		
Calibration Date:		
Efficiency [Tc99] [SY90] [Th230]		
Detector Area (CM2)		

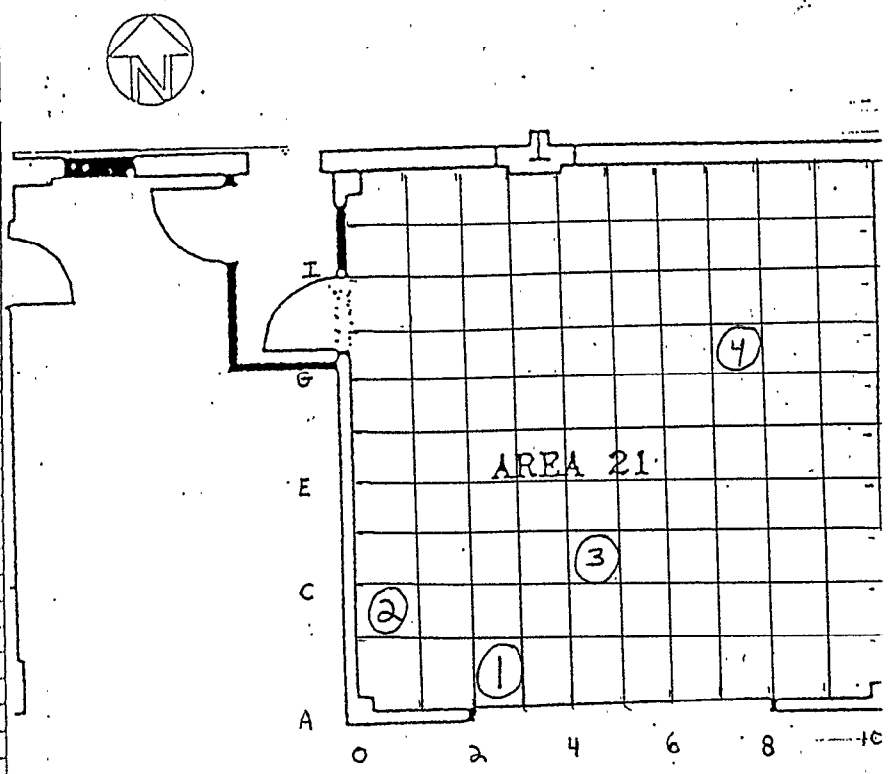
RP Technician: R. Smallridge / RS

RADIATION MEASUREMENT: Alpha & Beta-Gamma
RESULTS REPORTED UNITS: gross cpm per probe area
MEASUREMENT TYPE: direct scaler measurements

	alpha	beta-gamma
TOTAL BACKGROUND COUNTS		40
BACKGROUND COUNT TIME (MIN)		1 MIN
SAMPLE COUNT TIME (MIN)		1 MIN

#	GRID	DESCRIPTION	alpha GROSS COUNTS	beta-gamma GROSS COUNTS
1	A-3	Soil Sample @ 1 FT		59
		2 FT		39
		Obstruction @ 3 FT		N/A
		4 FT		N/A
2	B-1	Soil Sample @ 1 FT		47
		2 FT		46
		obstruction @ 3 FT		N/A
		4 FT		N/A
3	C-5	Soil Sample @ 1 FT		53
		2 FT		60
		obstruction @ 3 FT		N/A
		4 FT		N/A
4	G-8	Soil Sample @ 1 FT		62
		2 FT		60
		obstruction @ 3 FT		N/A
		4 FT		N/A

Insert area map or sketch below



Note: ○ = DRILLED
(#) SAMPLE #

REVIEW

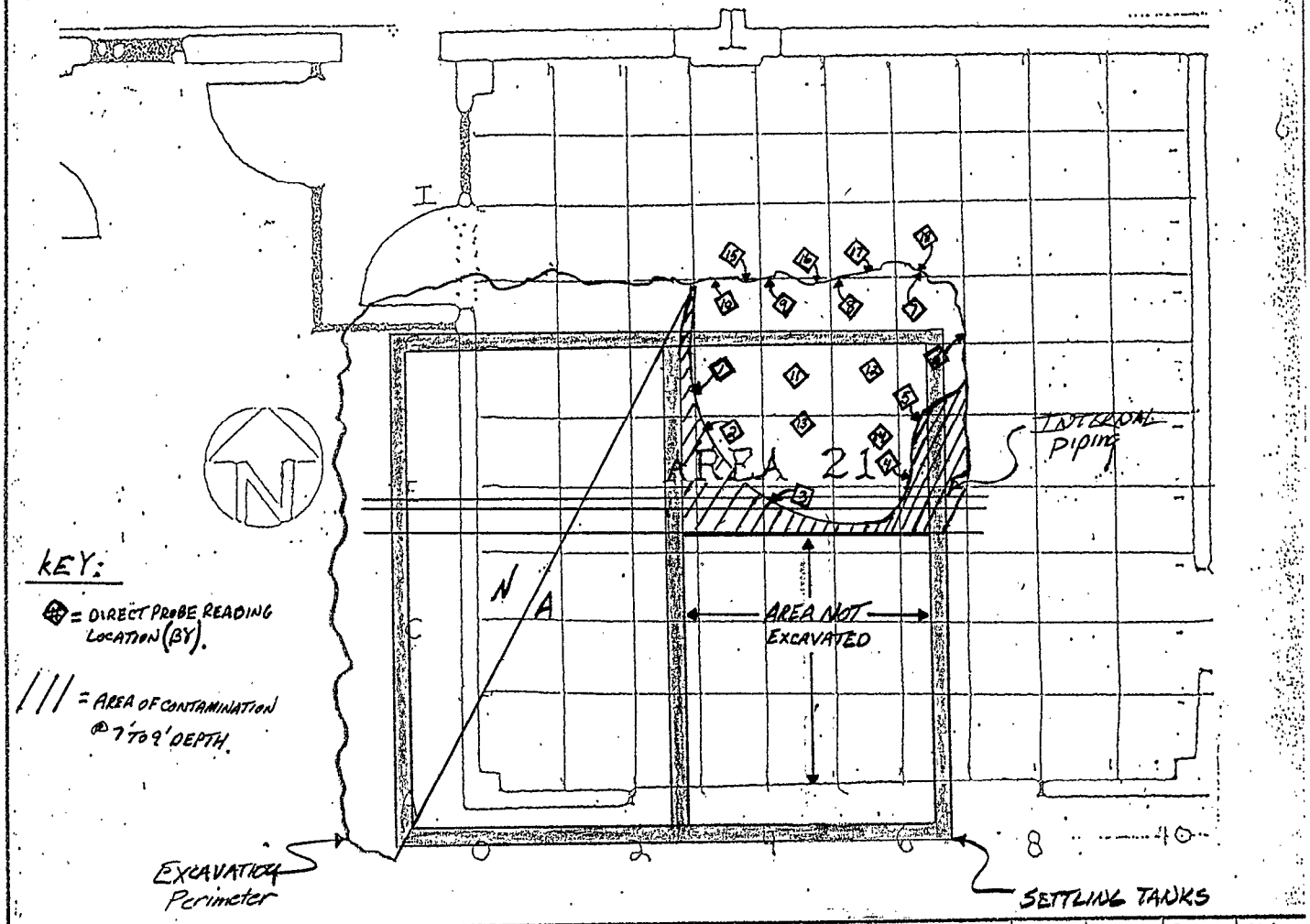
SURVEY01.XLS

ION TECHNOLOGY, INC.
640 Maple Ave
Saratoga Springs, NY
(518) 584-0166

RADIOLOGICAL SURVEY

Project: PRAXAIR - BLD 14
Area: 21 - SETTLING TANKS

Date/Time 1-28-98 1950 HRS.	Tech William W. Jeske	Instrument / sn L2221 #86313 W/44-9 #048267 EFF. = .20 BKGD = 59 CPM BY
Location/ Purpose PRAXAIR SITE B14 AREA 21 N.E. PIT EXCAVATION		Survey # 1186 DETECTOR ACTIVE = 15.5 cm² CAL. DATE: 12-29-97 RWP# 08
REMEDIATION SURVEY		



Loc	Type	Description	Gross	α dpm	Gross	β dpm	Loc	Type	Description	Gross	α dpm	Gross	β dpm
1	D.P.	SOIL CONTAMINATION @ APPROX. 7' TO 9' DEPTH (BLACK IN COLOR)			1250	38k	10	D.P.	VERTICAL WALL SURFACE -CLAY- @ 4' DEPTH			130	2k
2					740	22k	11		FLOOR OF EXCAVATION @ 8' TO 9' DEPTH			120	2k
3					680	20k	12					130	2k
4					715	21k	13					110	1.5k
5			N	A	520	15k	14			N	A	100	1.3k
6		VERTICAL WALL SURFACE -CLAY- @ 4' DEPTH			120	2k	15		HORIZONTAL BELT 1' THICK @ 1' TO 2' DEPTH - BLACK IN COLOR			420	12k
7		@ 6' DEPTH			130	2k	16					510	15k
8		@ 3' DEPTH			90	1k	17					640	19k
9		@ 5' DEPTH			110	1.5k	18					560	16k

Type: s = smearable, dp = direct probe K = X1000 DPM/100cm²

Comments: (2) SAMPLES TAKEN OF SOIL: 1) @ WEST SIDE OF PIT BLACK MATERIAL @ 8' DEPTH C.O.C. #824
2) NINE POINT COMP. "VER." SAMPLE OF N WALL C.O.C. #823

Scalar S/N	BKD	EFF	MDA
CT= DATE N α:			
Tech A β:			

Review: [signature]

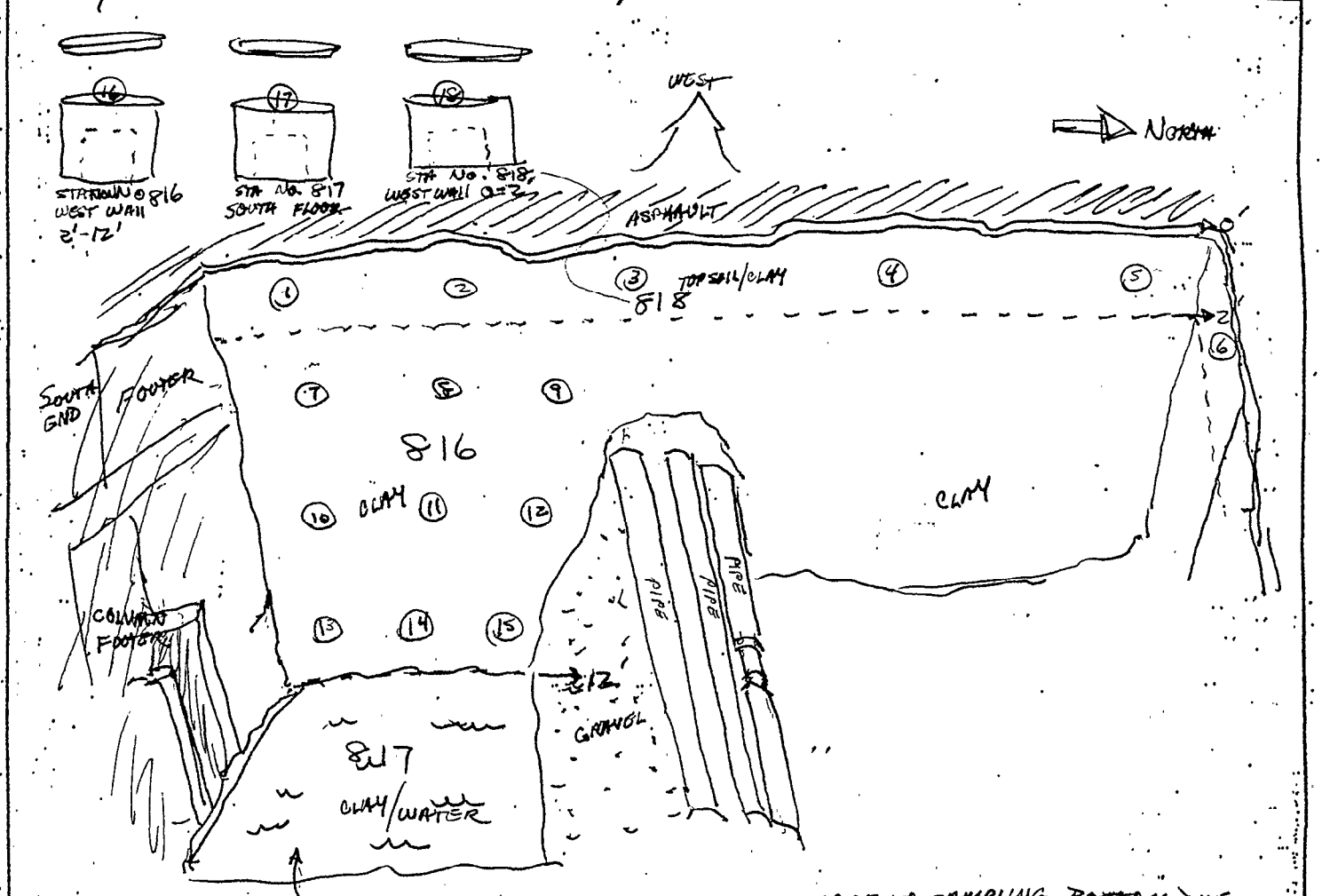
Encl 3.3 to HSP 210

ION TECHNOLOGY, INC.
640 Maple Ave
Saratoga Springs, NY
(518) 584-0166

RADIOLOGICAL SURVEY

Project: PRAXAIR BLDG 14
Area: 21

Date/Time 1-22-98/2230	Tech C. HAYNAM/[illegible]	Instrument / sn L2221/89648 L49.9/048272 EFF = 0.20 BKGD = 45 cpm
Location/ Purpose AREA 21 WEST TANK PIT / PRE-SAMPLE		Survey # 1179 RWP# 08
SURVEY		N/A



UNABLE TO OBTAIN DIRECT PROBE SURVEY PRIOR TO SAMPLING, BOTTOM DUE TO WATER CONTENT

Loc.	Type	Description	Gross	α dpm	Gross	β dpm	Loc	Type	Description	Gross	α dpm	Gross	β dpm
1	DP	SAMPLE LOCATION/ SOIL - 0 - 2' DEPTH			480	14032	10	DP	SAMPLE LOCATION SOIL 2'-12' DEPTH			70	775
2				A	220	5645	11				A	120	2325
3					160	3710	12					110	2015
4			N		350	9889	13			N		80	1085
5					270	7286	14					120	2325
6					310	8215	15					100	1705
7	DP	SAMPLE LOCATION SOILY 2'-12' DEPTH		A	80	1085	16	DP	TOP OF SAMPLE		A	90	1395
8			N		150	3255	17			N		80	1085
9					210	5115	18					265	6820

Type: s = smearable, dp = direct probe, ○ = SURVEY LOCATION/SAMPLE LOCATION

Scalar S/N	BKD	EFF	MDA
CT= DATE α:			
Tech β:			

Comments: N/A

Review: [illegible]

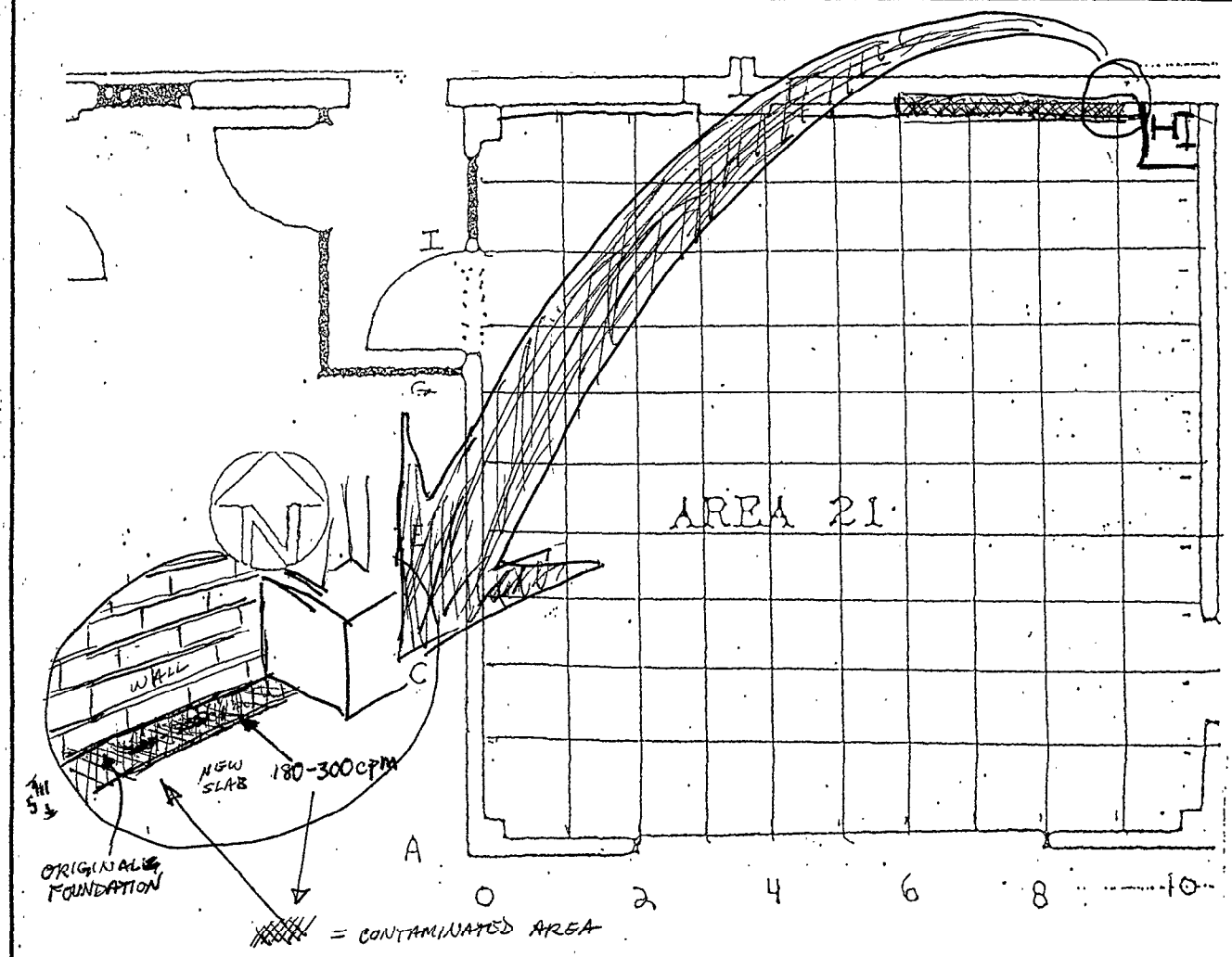
Encl 3.3 to HSP 210

ION TECHNOLOGY, INC.
640 Maple Ave
Saratoga Springs, NY
(518) 584-0166

RADIOLOGICAL SURVEY

Project: PRAXAIR BLDG 14
Area: 21

Date/Time 9-24-97/2300	Tech HALLAM/JESKE	Instrument / sn LUD MODEL 2 BKGD = 40 cpm EFF = 0.18
Location/ Purpose BLDG 14 AREA 21		Survey # 811 RWP# N/A



Loc	Type	Description	Gross	α dpm	Gross	β dpm	Loc	Type	Description	Gross	α dpm	Gross	β dpm

Type:s = smearable, dp = direct probe

Comments:

Scalar S/N		BKD	EFF	MDA
CT=	DATE α:			
Tech	β:			

Review:

Encl 3.3 to HSP 210

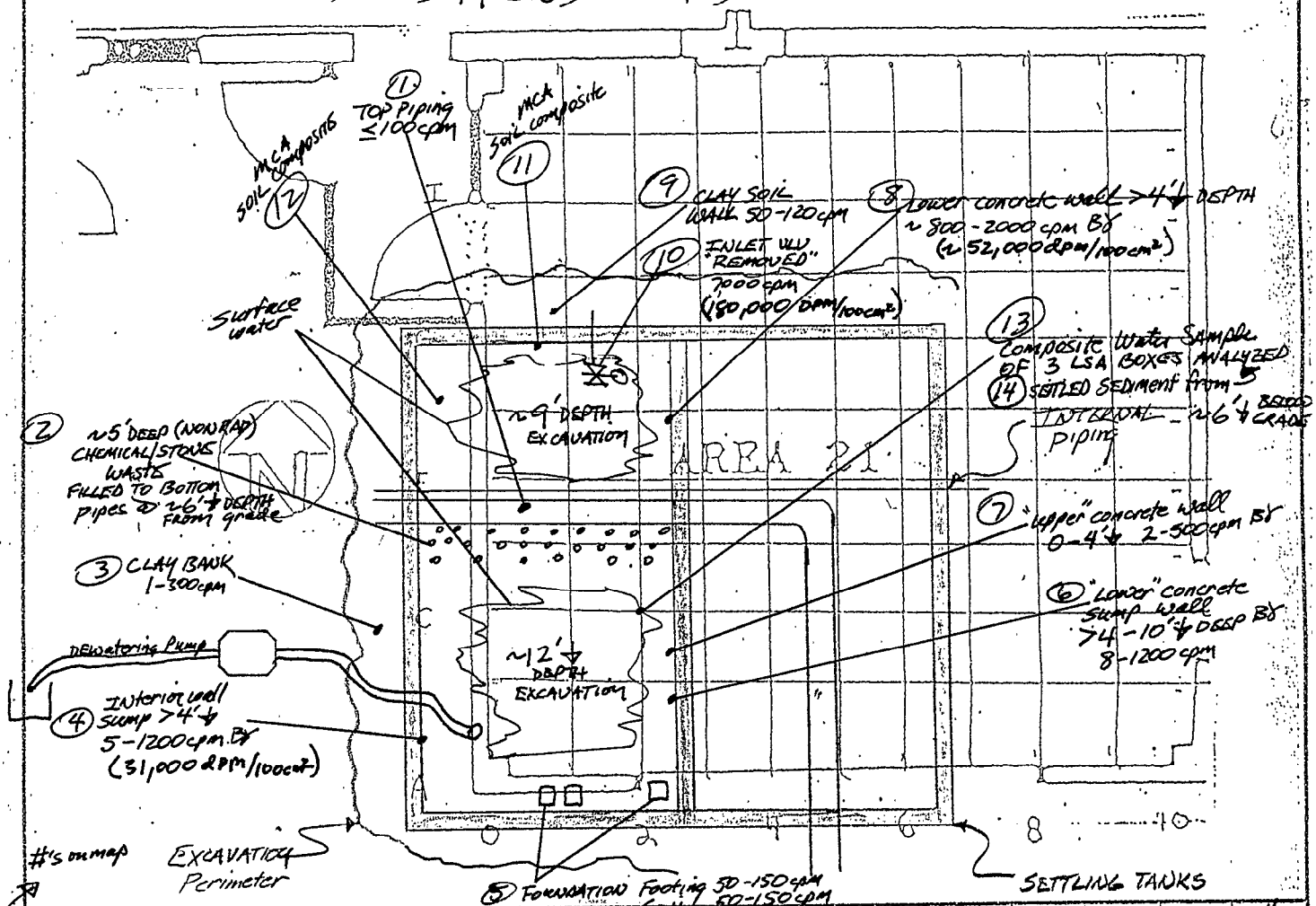
ION TECHNOLOGY, INC.
640 Maple Ave
Saratoga Springs, NY
(518) 584-0166

RADIOLOGICAL SURVEY

Project: PRAXAIR - BLD 14
Area: 21 - SETTLING TANKS

Date/Time 1-26-98	Tech C. HALLAM B. JEGKE	Instrument / sn L 2221 #86313 W04867	BKD @ 50 cpm
Location/ Purpose REMEDIATION Survey M. CATOURAS		Survey # 1184	RWP# 08

Prior to Removal of 'WEST' SIDE SETTLING TANK
concrete walls/ BOTTOM



Loc	Type	Description	~~Gross~~	~~α dpm~~	Gross cpm	β dpm/100cm²	~~Loc~~	~~Type~~	~~Description~~	Gross	α dpm	Gross	β dpm
1	BY	Thru piping →			≤100	1613	10	BY	INLET VALVE TO TANK *			7000	224K
2	BY	NON-RAD "CHEMICAL"/STONE WASTE			≤100	1613	→	MCA	@ 7' CHEM SLUDGE @ 12.3 pCi/g TOT U (#813)				
3	BY	CLAY BANK			1-300	8064	11	MCA	MCA Soil - North CTR @ 98.9 pCi/g TOT U (#812)				
4	BY	SW concrete wall surface			5-1200	37K	12	MCA	MCA Soil - West Sidewall @ 92.5 pCi/g TOT U (#811)				
5	BY	lower concrete footings			50-150	3225	13	MCA	Composite Water Sample MCA @ <5.0E-8 uCi/mL (#815)				
6	BY	SE >4' lower concrete	surface		800-1200	37K	14	MCA	Composite 3 BZS box SEDIMENT @ 16.3 pCi/g Tot U (#814)				
7	BY	SE <4' upper "	"		200-500	14516							
8	BY	NE lower (>4') concrete wall			800-2000	63K							
9	BY	CLAY SOIL WALL			50-120	2258							

Type: s = smearable, dp = direct probe

Comments: K = X1000 dpm/100cm²

* VALVE REMOVED

DIRECT dpm/100cm²

Scalar S/N		BKD	EFF	MDA
CT=	DATE	α:		
Tech		β:		

N/A

Review:

Encl 3.3 to HSP 210