Radiological & Regulatory Status of the WJN Abandoned Filterbed Areas

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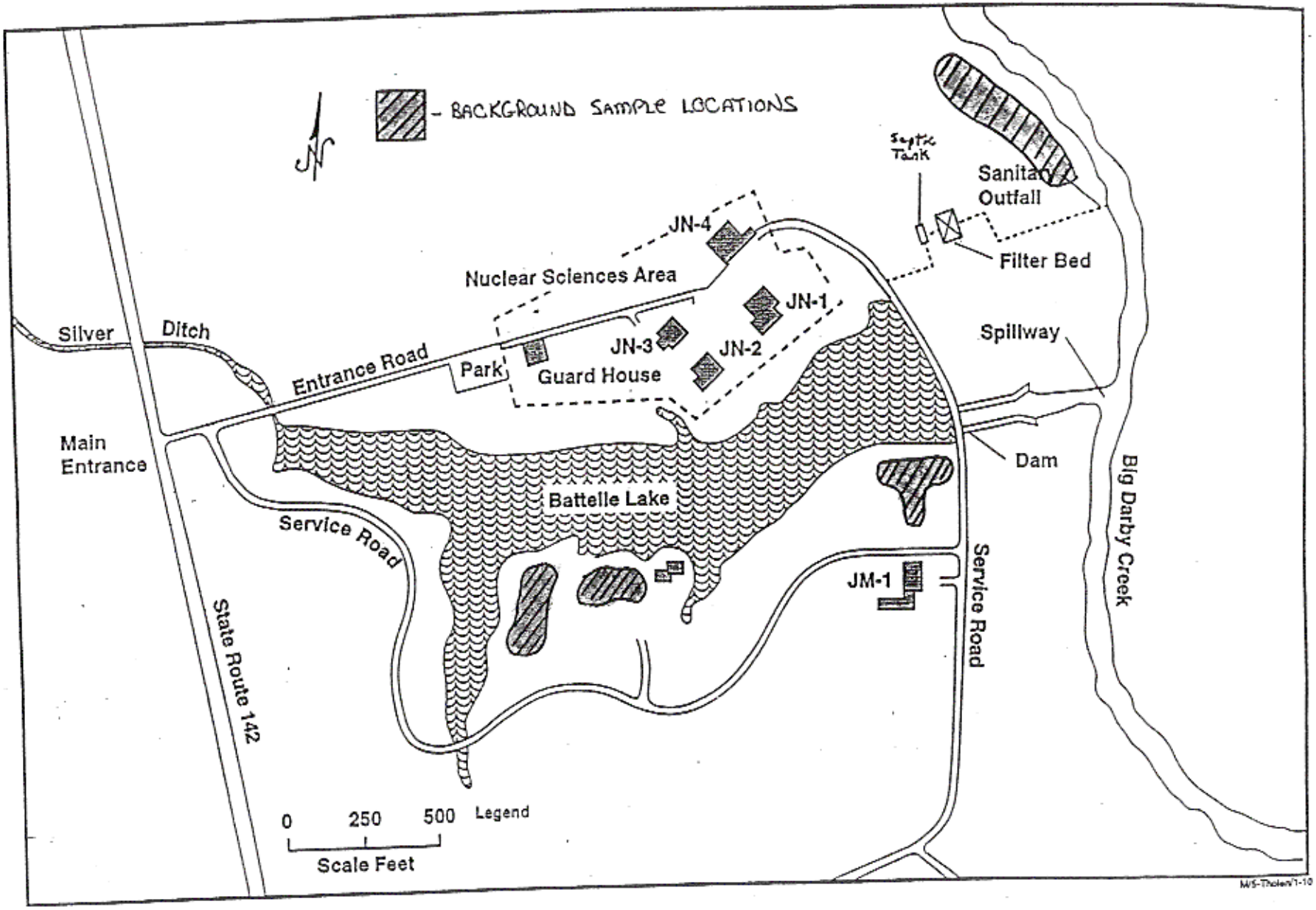
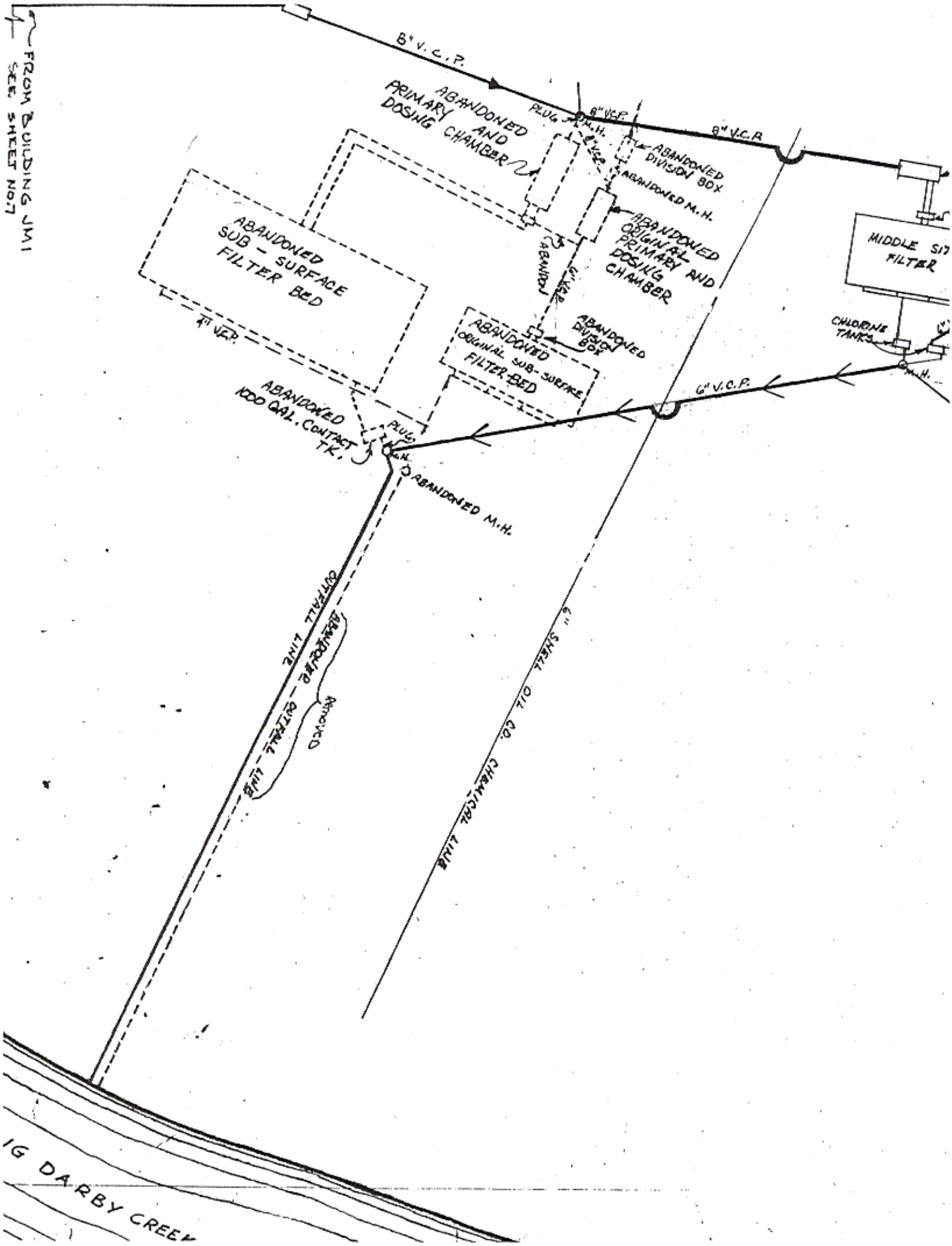
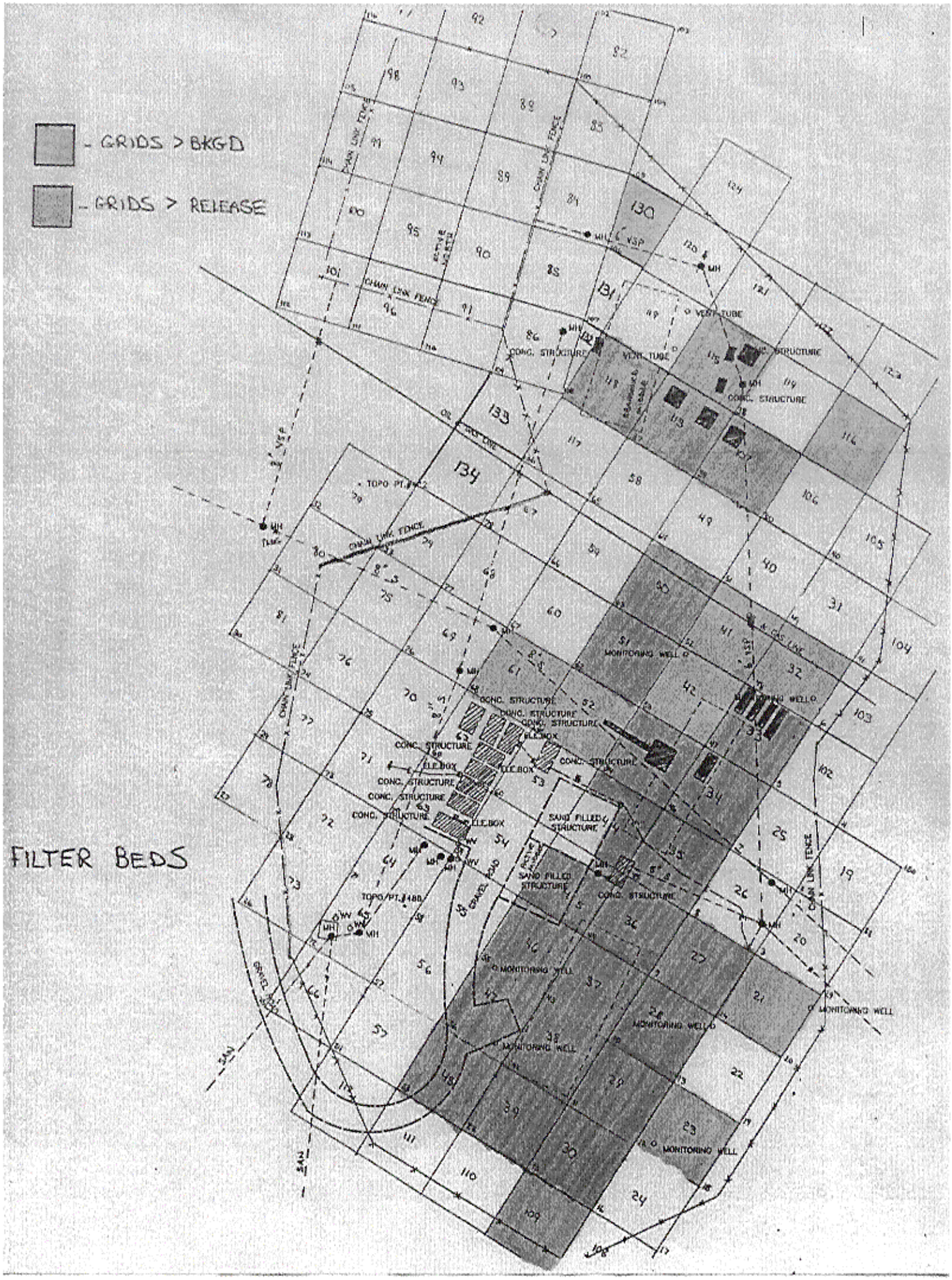

- BACKGROUND SAMPLE LOCATIONS
Septic Tank
Sanitary Outfall
Filter Bed
JN-4
Nuclear Sciences Area
JN-1
JN-3
JN-2
Silver
Ditch
Entrance Road
Park
Guard House
Spillway
Main Entrance
Dam
Big Darby Creek
Battelle Lake
Service Road
JM-1
Service Road
State Route 142
0
250
500
Legend
Scale Feet
M/S-Tholen/1-10


FROM BUILDING JM1
SEE SHEET NO.7
8" V.C.P.
ABANDONED PRIMARY AND DOSING CHAMBER
PLUG
M.H.
8" V.C.P.
8" V.C.P.
ABANDONED DIVISION BOX
ABANDONED M.H.
ABANDONED ORIGINAL PRIMARY AND DOSING CHAMBER
ABANDONED SUB - SURFACE FILTER BED
ABANDON
6" V.C.P.
ABANDONED DIVISION BOX
ABANDONED ORIGINAL SUB-SURFACE FILTER BED
4" V.C.P.
MIDDLE SIT
FILTER
CHLORINE TANKS
M.H.
6" V.C.P.
ABANDONED 1000 GAL. CONTACT TK.
PLUG
M.H.
ABANDONED M.H.
OUTFALL LINE
ABANDONED - OUTFALL LINE
REMOVED
6" SHELL OIL CO. CHEMICAL LINE
IG DARBY CREEK


- GRIDS > BKGD
- GRIDS > RELEASE
FILTER BEDS
CHAIN LINK FENCE
CONC. STRUCTURE
VENT TUBE
MONITORING WELL
SAND FILLED STRUCTURE
ELE.BOX
TOPO PT.#482
TOPO PT.#488
GRAVEL ROAD
SAN

BCLDP Characterization Program Status
Filterbed Area

- Abandoned filterbeds characterized mainly in 2000
  - Fence perimeter altered
- Main filterbed ~40m x 30m x 3m (WIDE application)
- Secondary bed ~20m X 20m x 2m
- ~1600 samples taken / screened
- Existing middle area filterbed also characterized
- See map / see cross section

BCLDP Program Status
(QA/QC)

- QA/QC built into program & procedures

- Samples
  - chain of custody
  - sample logbook / sample identification
  - cross contamination / sampler decon & verification

- Instrumentation
  - calibration program
  - response checks / performance checks
  - material specific DLVs

- Data Handling
  - Data Package reviewed by lead NRRPT
  - Data Validation & Verification performed by NRRPT

9/11/2002

Radioactive Inventory of the Abandoned North Filter Beds & Limit Fractions

Sample #	pCi/g Cs-137	Fraction Cs137 Lim	pCi/g Co-60	Fraction Co60 Lim	pCi/g Eu-152	Fraction Eu152 Lim	pCi/g Eu-154	Fraction Eu-154Lim	pCi/g Am-241	Fraction Am241Lim	pCi/g Sr-90	Fraction Sr90 Lim	pCi/g Pu-238	Fraction Pu238Lim	pCi/g Pu-239	Fraction Pu239Lim
16741	40.1	2.67	0.05	0.006	<0.096	<0.0003	<0.053	<0.0002	1.36 g	0.045	<0.172	<0.034	<0.009	<0.0004	0.053	0.002
16746	21.6	1.44	0.04	0.005	<0.079	<0.0002	<0.051	<0.0002	1.29 a	0.043	<0.184	<0.037	0.026	0.001	0.9	0.036
16747	26.1	1.74	0.06	0.008	<0.077	<0.0002	<0.046	<0.0002	0.89 g	0.03	<0.175	<0.035	<0.011	<0.0004	0.116	0.005
16751	8	0.44	<0.024	<0.003	<0.068	<0.0002	<0.047	<0.0002	0.93 g	0.031	<0.151	<0.030	0.021	0.008	0.496	0.02
16752	39.1	2.61	0.06	0.008	<0.086	<0.0002	<0.046	<0.0002	10.74 a	0.358	<0.167	<0.033	0.131	0.005	5.822	0.233
16607	74.2	4.95	0.28	0.035	7.26	0.019	0.65	0.003	1.18 a	0.039	0.59	0.118	0.0213	0.009	0.629	0.025
16608	18.7	1.25	0.07	0.009	4.03	0.016	0.26	0.001	0.47 a	0.016	<0.180	<0.036	0.016	0.001	0.287	0.011
16668	41.6	2.77	0.08	0.01	<0.098	<0.0003	<0.061	<0.0002	2.59 a	0.086	NA	NA	0.036	0.001	1.846	0.074
16686	38.1	2.54	0.07	0.009	<0.050	<0.0001	<0.031	<0.0001	4.71 a	0.157	NA	NA	0.135	0.005	3.84	0.154
19079	11.7	0.78	0.17	0.021	8.02	0.021	0.64	0.0025	0.018	0.006	4.39	0.878	<0.016	<0.0006	0.034	0.0014
19080	32.4	2.16	<0.016	<0.002	0.562	0.0014	<0.053	<0.0002	<0.016	0.0005	0.21	0.042	<0.019	<0.0008	<0.017	<0.0007
Average	31.99	2.13	0.084	0.01	1.857	0.0048	0.176	0.0007	2.2	0.073	0.691	0.138	0.04	0.002	1.276	0.051

Limits :

Cs-137	15 pCi/g
Co-60	8 pCi/g
Eu-152	390 pCi/g
Eu-154	260 pCi/g
Am-241	30 pCi/g
Sr-90	5 pCi/g
Pu-238	25 pCi/g
Pu-239	25 pCi/g

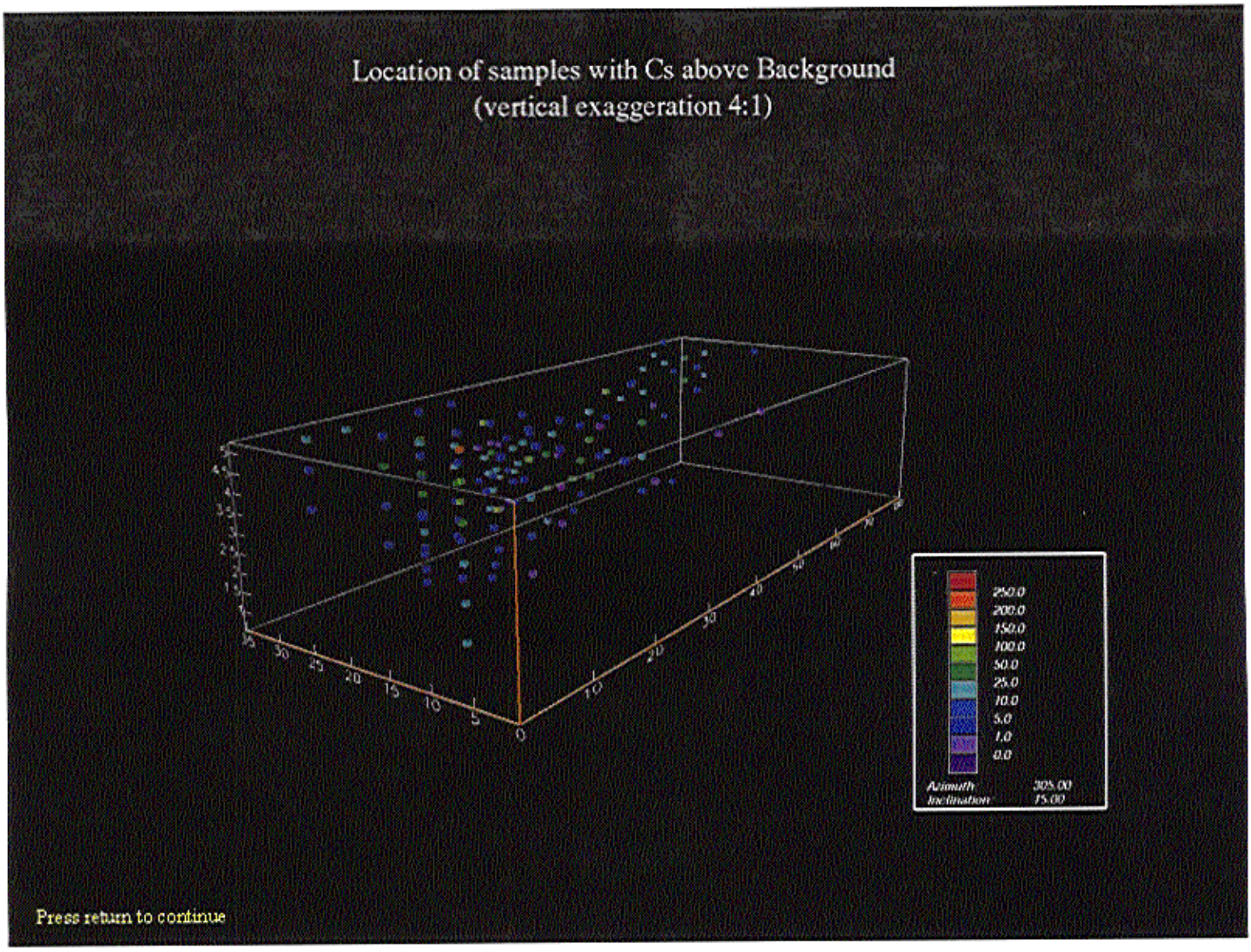
Average Cs137 Ratios

Cs/Co60	381
Cs/Eu152	17
Cs/Eu154	182
Cs/Am241	15
Cs/Sr90	46
Cs/Pu238	800
Cs/Pu239	25

Min Cs-137 Ratios

Cs/Co60	69
Cs/Eu152	2
Cs/Eu154	18
Cs/Am241	4
Cs/Sr90	3
Cs/Pu238	299
Cs/Pu/239	7

Revision 1
10/24/2000



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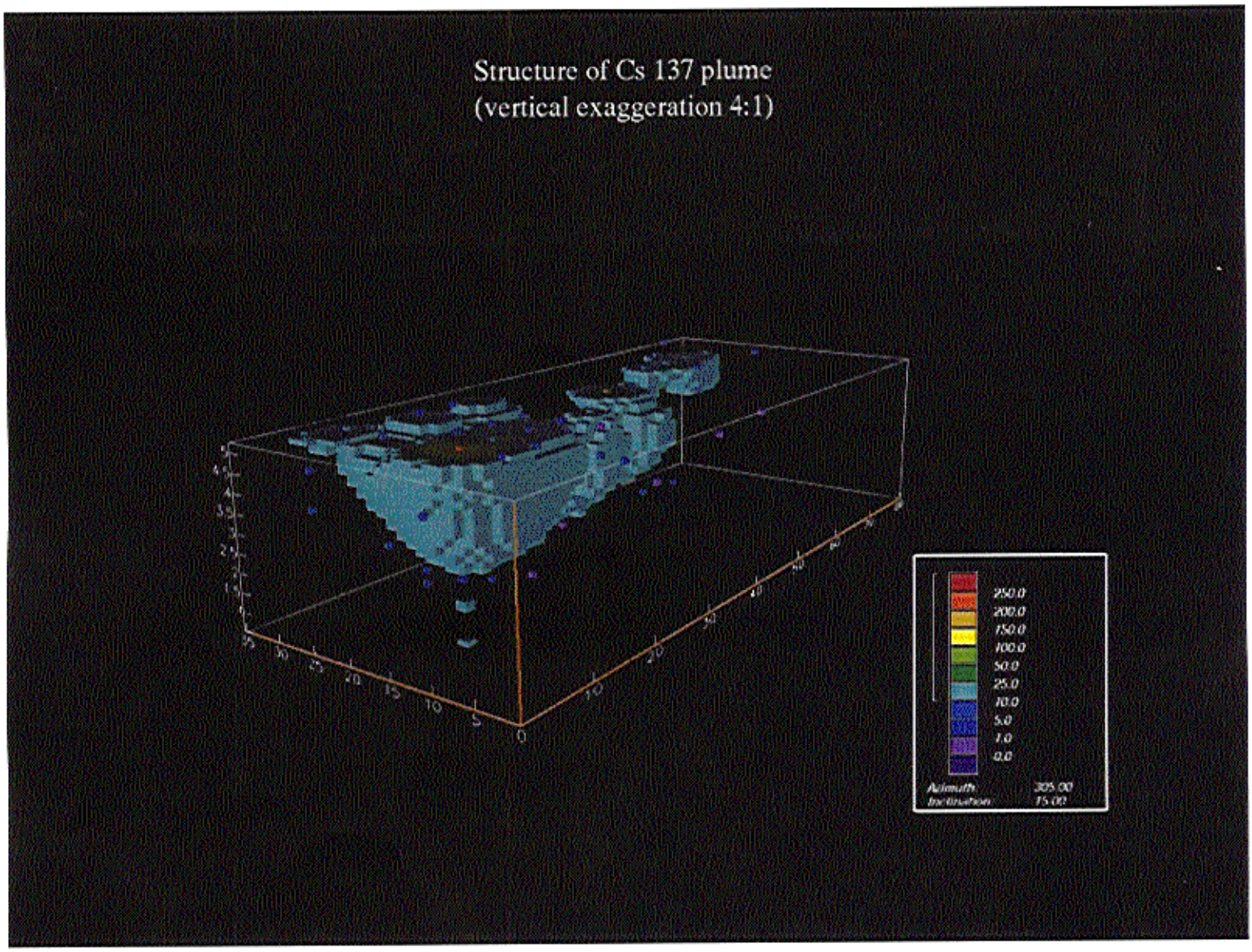

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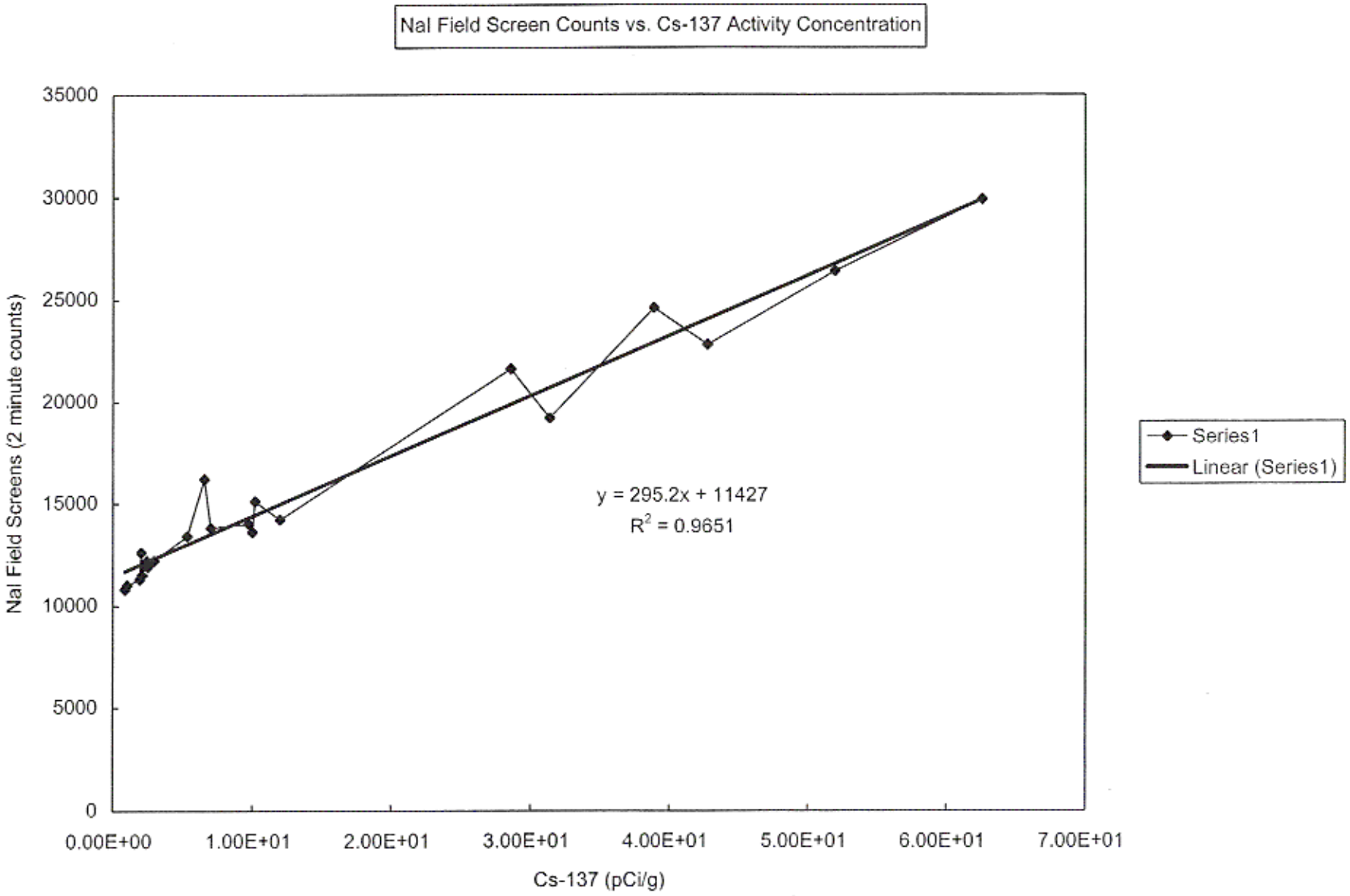
BCLDP Soil Release Limits

- Combination of Derived & Generic Release Values
- NRC & DOE Mandated Generic Values
- RESRAD Code Used to Generate Derived Values (pathway analysis code; 10m*10m*15cm volume)
- Derived Values @ 100 mrem/yr limit
- Meeting NRC limit of 15 pCi/g satisfies 25 mrem/yr limit

Comparison of EPA Soil Activity Concentration Limits vrs. BCLDP Soil Activity Concentration Limits

A EPA Isotope	B EPA Limit (pCi/g)	C BCLDP Limit (pCi/g)	D % Change ((E-B)/B)* 100
H-3	228	38,000	-9.94E+01
C-14	46	940	-9.51E+01
Na-22	9	NA	NA
S-35	19,600	NA	NA
Cl-36	6	NA	NA
Ca-45	13,500	NA	NA
Sc-46	105	NA	NA
Mn-54	69	NA	NA
Fe-55	269,000	NA	NA
Co-57	873	NA	NA
Co-60	4	**8**	-5.00E+01
Ni-59	20,800	1.30E+07	-9.98E+01
Ni-63	9,480	4.90E+06	-9.98E+01
Sr-90+D	23	**5**	3.60E+02
Nb-94	2	NA	NA
Tc-99	25	NA	NA
I-129	60	NA	NA
Cs-134	16	33	-5.15E+01
Cs-137+D	6	**15**	-6.00E+01
Eu-152	4	390	-9.90E+01
Eu-154	5	260	-9.81E+01
Ir-192	336	NA	NA
Pb210+D	15	NA	NA
Ra-226	5	NA	NA
Ac-227+D	10	19	-4.74E+01
Th-228+D	15	NA	NA
Th-232	5	NA	NA
U-234	401	**35**	1.05E+03
U-235+D	20	**30**	-3.33E+01
U-238+D	74	**35**	1.11E+02
Total U	47(mg/kg)	NA	NA
Pu-238	297	**25**	1.09E+03
Pu-239	259	**25**	9.36E+02
Pu-241	40,600	**25**	1.62E+05
Am-241	187	**30**	5.23E+02
Cm-242	32,200	NA	NA
Cm-243	35	0.8	4.28E+03

Column C - Bold & Underlined Number denotes a nuclide with a generic regulatory limit vrs a RESRAD calculated limit
Column C - NA indicates a nuclide not in the BCLDP inventory
Column D - E denotes the EPA limit & B denotes the BCLDP limit
Column D - Negative values indicate the EPA limit is more restrictive
Column D- Positve values indicate the BCLDP limit is more restrictive



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10/2000