"Rite in the Rain"®

ALL-WEATHER

FIELD

No. 351

Page 1 Beta Chem Site
Lenexa, KS
5/9/2014 0900
Experiment on Decon various surfaces.

	Loc/Type	Static 44-9	Swipe 3030
Pic 1/2	Fume Hood Sash	1.2 kcpm	0/135
	After Decon wet wipe	1.2 kcpm	0/42
Pic 3/4	Exposed wood beam	1.5 kcpm	0/198
	After Decon	0.9 kcpm	0/96
~~Pic 3~~	Floor below Hood	2.6 kcpm	0/403
Pic 5/6	After Decon	2.6 kcpm	0/33

4000 dpm/100-cm² (Removable Invest) × 8% = 320 cpm (3030)
6000 dpm/100 cm² (Limit Removable) × 8% = 480 cpm (30)
60,000 dpm/100 cm² (Fixed) × 2.5% × $\frac{12.26 \text{ cm}^2}{100 \text{ cm}^2}$ = 186 cpm (44-9)

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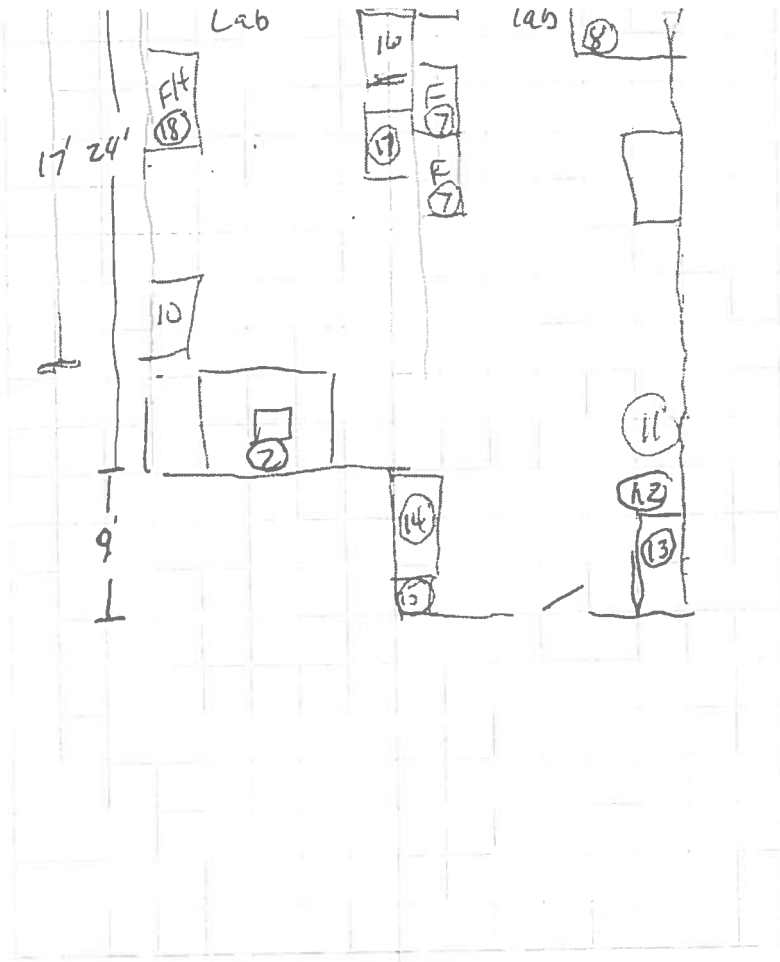
Loc/Type	Static
Fume Hood Sash	1.2 kcpm
" w/Vinegar:	1.2 kcpm
Exposed Beam	1.5 kcpm
" w/Vinegar:	1.2 kcpm
Floor below Hood	2.5 kcpm
" w/Vinegar.	2.5 kcpm
Fume Hood Sash	1.2 kcpm (-1.3)
" Alcohol:	1.2 kcpm
Exposed Beam	1.3 kcpm
" Alcohol:	1.2 kcpm
Floor Below Hood	2.5 kcpm
" w/Alcohol.	2.5 kcpm
Floor Below Hood	2.5 kcpm
" w/Baking Soda:	2.3 kcpm

types that exceed 180 total gpm
w/ 44-9. See calculation on page 1.
(Assuming readings are fixed)
All 4 fume hoods in NW side
of lab. are above fixed value.
Refrigerator
All exposed wood surfaces including
those under fume hoods. wood
around alcove/storage area. And
under sink.
All flooring
most wall board
Ceiling tiles are close to the
limit and need to be further
surveyed.
Air Return + Supply vents are high
∴ All Duct work is likely elevated.
Anaerobic Incubator + cart. ①
Cart is a "water bath cart"...
needs to be investigated, sits
under incubator.



cylinders
sink, counter top faucet handles (2)
much of the glassware and
equipment under the sink (2) is
contaminated. (Includes a
Razzle dial clock)
most of the glassware drying
panel knobs are contaminated.

Summary: Some equipment, gas cylinders
some glass ware, May Not be
contaminated but for disposal
estimate assume all NW lab
to be gutted.
End NW lab area.

NE lab Area. Elevated items
and areas include.

Fume Hood mainly interior walls. (3)

- (4) Semi-portable fume hood
  is contaminated at
  center top vent area and
  exterior where stickers were
  once present.
- Table supporting this fume hood
  (4) is contaminated on legs.
- Some compressed gas cylinder
  handles. Cylinders themselves
  appear N. (5)
- (6) Buttons on equipment almost
  all contaminated.
- Exposed wood for table are contaminated
- Flooring again
- Ceiling tile (false ceiling) actually
  seems ~~higher on this side of lab~~
  (Not True). NE lab ceiling ~ 500 cpm,
  NW > 700 cpm.
- Return + Supply ceiling ducts
- Shelves in both Flammable cabinets (7)

lab Clamps and some glassware in cabinets (8). Couldn't survey all of it.

Most cabinet handles in both sides of lab are contaminated.

(9) Items in rolling drawers:
Outer surface is marginal.
Top Right drawer. most glassware and 1 empty (?) cardboard cylinder container > 20 kcpm

Drawer #7 in (9) had a >50 kcpm beaker heating pad. Put in plastic bag and moved to Rad area in NW lab. (10) Also, A piece of tubing @ 70 kcpm moved to (10).

Some other glassware in drawers are contaminated to a much lesser extent.

Older pieces of wallboard are contaminated.

on buttons and vial centrifuge openings.

- ~30 gal cardboard drum
Appears to have debris trash but needs to be further investigated
top material was not radioactive
But out cardboard boxes are contaminated.

- (12) Outer cardboard boxes appear contaminated. All porous materials like wood, seem to have been contaminated by airborne source

- (13) Packard liquid Scintillation Counter. Buttons are again contaminated. And handles.
Some contamination at counting location interior middle but not bad. This unit also contains a Ra 226 check source, 20 uCi

is contaminated. Looks like refrigerator drawers and parts.
(15) Drawer Cabinet looks ok.

Summary of Lab Contaminated Volume

1 Fume Hood 8'x3' (NW Lab) (16)
7½' High w/ 3' high cabinet-wood
1 Fume Hood 6'x3' (NW Lab (17)
8' (to ceiling) Ht. with 3' cabinet-metal
1 Fume Hood 8'x3' (NW Lab) (18)
7½' Ht w/ 3' metal cabinet
1 Refrigerator
Equipment ~ ½ vol of refrigerator
Sink & cabinet 8'x3' countertop w/ wood frame cabinet beneath.
- Fume Hood (3) 2½'x4'x8' w/ 3' Ht wood cabinet (cabinet might be ok)
Fume Hood (4) 2½'x 4½' - mostly plastic + table

- File Cabinet (15) 1½'x2½' marginal
- 2 Flammables cabinets:
  1: 1½' x 3½' x 4'
  2: 1½' D x 3½' x 5½' H
- 5 wall mounted cabinets that are above (6) & (8) measure 3' W x 2' H x 1' D.
- misc glassware & equipment

Offices South of the lab appear to be marginal. Some equipment - 2nd Liquid Scin Counter, Chair, Ceiling tiles are contaminated. Floor and walls are marginal but mostly below fixed measurement. False ceiling upstairs needs to be assessed but assume furnace, flooring and some remaining bags of trash need disposal.

[signature]

313 Cylinder: Ammonia Anhydrous
Max Reading: 5.5 kcpm on bottle neck on brown discolored portion
Swipe #1 on max reading 0/489 48 cpm 0/39 [illegible]
Swipe #2 on side 0/144
Can't survey back side of cylinder

290 Cylinder: Hydrogen
Max Reading: 3 kcpm at top neck at threads below handle.
Secondary high reading 2 kcpm at bottom of cylinder.
Swipe #3 at neck 0/532 cpm
Swipe #4 at bottom 0/970 cpm

Deconned 313 w/wet wipes and swiped same areas
Swipe #5 at neck on max; 5 kcpm 0/99
Swipe #6 on side 0/81 x13 cpm (0/39 [illegible])

deconned below 6000 dpm 100 cm² with wet wipes. But that the fixed reading is still higher than the 60,000 dpm/100 cm² level.

(or 291 (6/12/2014)),
#162 Cylinder - Acetylene
Max Reading: 1.2 kcpm on cap at rust spot. 2nd highest reading on side of cylinder 0.9 kcpm also on rust spot.

#287 cylinder - Argon
Max Reading: 0.7 kcpm along neck at sticker. But entire cylinder appears to be 0.5 - 0.6 kcpm.

Top of cylinder at threads is 0.55 Kcpm.

#289 cylinder - UNK
Max Reading = 4 Kcpm on cap
And 1.2 Kcpm on side of cylinder.

#21 cylinder = Liquid Nitrogen
Max Reading = 450-550 cpm on handles. Cylinder itself <200 cpm.

#161 - cylinder = Air
Max Reading - 1.0 Kcpm on secondary valve handle.
And 260 cpm on cylinder neck at threads.

threads

#16 - Cylinder - UNK
(Sticker on back side)
Max Reading = 2.6 Kcpm on handle And 2.6 Kcpm on neck @ threads

#978 or 826 - Cylinder 42 size - Acetylene
Max Reading = 1.3 Kcpm on handle. And 1.1 Kcpm on neck at threads.

#279 - Cylinder 10% methane / 90% Argon
Max Reading = 1.6 Kcpm on neck of cylinder at threads.
And 1.3 Kcpm on handle.

on handle.

Smaller Cylinders under fume Hood.
#344 - Chlorine 2.5 kcpm
#345 - Chlorine 1.8 kcpm
#322 - 4 kcpm
Anhydrous Amonia Group
max = 400 cpm - 500 cpm
Rasty - unlabeled? Dimethy Amine?
max ~ 700 kcpm

Smaller under fume Hood
#349, 354, 323 = 0.2 - 3.0 kcpm
#358, 355, etc = 3.4 kcpm

E1: Packard, Tri-Carb
Liquid Scintillation Spectrometer
S/N: 25206

Pre-Decon:
Handle: 1.1 kcpm Swipe E1-1: 0/108 BKGD 0/36
Top - Instrument Panel buttons "on/off"
max Reading: 850 cpm ~~Swipe~~ CK
Swipe E1-2: 0/612 (α/β cpm), bkdg = 0/36
Lower Right exterior corner:
max Reading: 1.1 kcpm
Swipe E1-3: 0/184
Decon w/ wet wipes and Resurveyed
Handle E1-4: 0/79
Button-Switch: E1-5: 0/204
Lower Rt Corner: E1-6: 0/112
Resurvey - max Reading
Handle - max Reading: 1.1 kcpm
"on/off" switch: 600 cpm
Lower Right Corner: 1.0 kcpm

switch = 2.3 Kcpm
Top of instrument = 700 cpm
Sides = 550 cpm
Black valve in back = 1.6 kcpm @ top
IBM Computer : 650 cpm
Chad [illegible]

Cal 12/10/13

6/4/2014 4-9 w/#36, Resp Chk-good BKED ~70 cpm
E2-1 Swipe : Instrument Panel Volt switch
E2-1 = 0/46 cpm α/β (BKED = 0/43)
E2-2 @ top of b/k valve in back
E2-2 = 0/477 cpm
E2-3 @ side of IBM Computer
E2-3 = 0/1312 cpm
E2-4 @ Instrument Panel face
E2-4 = 0/81 cpm
Deconned E2 w/ wet wipes and Reswiped
E2-5 @ Panel = 0/108 cpm
E2-6 @ B/K valve = 0/45 cpm
E2-7 @ side of computer = 0/61 cpm

Top of Black valve = 1.4 kcpm
Side of IBM Computer = 400 cpm

E3 = Varian 9050
Variable Wavelength UV-VIS Detector
Panel max Reading = 700 cpm
Top of Instrument = 550 cpm
Lower Panel (Dynamax - Solvent Delivery System) = 500 cpm
Swipes Prior to Decon
E3-1 @ upper Instrument Panel
E3-1 = 0/363 cpm
E3-2 @ top of instrument
E3-2 = 0/60 cpm
E3-3 @ lower Panel
E3-3 = 0/147 cpm

Swiped areas are deconned w/ wet wipes and Re Swiped

E5-3 @ Panel
E5-3 = 0/51 cpm (0/43 BKGD)
E5-4 @ Top
E5-4 = 0/54 cpm

44-9 #36 Response Check ok BKGD ~8kcpm

Max Reading = 5 kcpm where glassware attaches at bottom
10 kcpm at knob at lower right
8 kcpm on upper knob - right side
E6-1 @ glassware attachment
E6-1 = 0/4107 (0/18 cpm + BKGD ~ 0/42)
E6-2 @ lower right knob
E6-2 = 0/747 cpm
E6-3 @ upper right knob
E6-#3 = 0/370 cpm
Areas swiped were decon'd w/ wet wipes and resurveyed + reswiped
E6-4 @ glassware attachment; 5 kcpm
E6-4 = 0/354 cpm; Decon Repeat E6-7 = 0/126 cpm
E6-5 @ lower right knob; 10 kcpm
E6-5 = 1/78 cpm
E6-6 @ upper right knob; 6 kcpm
E6-6 = 0/78 cpm

Resurvey After Decon
Upper panel face = 700 cpm
Top of instrument = 500 cpm
Lower panel face = 450 cpm

E4 = Canberra Radiomatic
Flo-One Beta
Radio-Chromatography Detector
series A-100
Max Reading on Lab Alliance Side
Panels - Center Panel = 850 cpm
Top of Lab Alliance = 600 cpm
Radiomatic panel = 1.0 kcpm
Black panel in back = 300 cpm
E4-1 @ Alliance Panel
E4-1 = 0/64 cpm α/β (0/43 = BKGD)
E4-2 @ top of Alliance panel
E4-2 = 0/162 cpm
E4-3 @ Radiomatic panel
E4-3 = 0/93 cpm

surfaces and resurveyed + swipedi
Alliance Panel = 1.0 kcpm E4-5
Top of Alliance = 700 cpm E4-6
Radiomatic panel = 900 cpm E4-7
Black panel in back = 350 cpm E4-8
E4-5 = 0/45 cpm Alliance Panel
E4-6 = 0/36 cpm Top
E4-7 = 0/58 cpm Radiomatic Panel
E4-8 = 1/51 cpm Black panel

E5 = Varian 3400
Gas Chromatograph
max Reading on Panel = 1.0 kcpm
@ top = 550 cpm
E5-1 @ Panel
E5-2 @ top
E5-1 = 0/82 cpm (0/43 BKGD)
E5-2 = 0/123 cpm
Surfaces decoured w/ wet wipes
and Resurveyed + Reswiped

Resurvey After Decon
Upper panel face = 700 cpm
Top of instrument = 600 cpm
Lower panel face = 450 cpm

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Max Reading on Lab Alliance Side
Panels - Center Panel = 850 cpm
Top of Lab Alliance = 600 cpm
Radiomatic panel = 1.0 kcpm
Black panel in back = 300 cpm
E4-1 @ Alliance Panel
E4-1 = 0/64 cpm α/β (0/43 = BKGD)
E4-2 @ top of Alliance panel
E4-2 = 0/162 cpm
E4-3 @ Radiomatic panel
E4-3 = 0/93 cpm

surfaces and resurveyed + swipedi
Alliance Panel = 1.0 kcpm E4-5
Top of Alliance = 700 cpm E4-6
Radiomatic panel = 900 cpm E4-7
Black panel in back = 350 cpm E4-8
E4-5 = 0/45 cpm Alliance Panel
E4-6 = 0/36 cpm Top
E4-7 = 0/58 cpm Radiomatic Panel
E4-8 = 1/51 cpm Black panel

E5 = Varian 3400
Gas Chromatograph
max Reading on Panel = 1.0 kcpm
@ top = 550 cpm
E5-1 @ Panel
E5-2 @ top
E5-1 = 0/82 cpm (0/43 BKGD)
E5-2 = 0/123 cpm
Surfaces decon w/ wet wipes
and Resurveyed + swiped

Max Reading @ display = 1.1 kcpm
Swipe E7-1 at display
E7-1 = 0/111 cpm (α/β BKGD = 0/40 cpm)
Wet wipe decon, then re survey & swipe
Reading = 1.1 kcpm
E7-2 @ display
E7-2 = 0/45 cpm

Cardboard test - Decon
Before setting out in sun/heat:
1) 1369 cpm 2) 1401 3) 1439
4) 1448 Avg) 1414.25 cpm
Recount after sitting in sun
1) 1616 2) 1673 3) 1702 4) 1633
Avg after Sunning) 1656 Δ - 17%

2nd Baking Soda test on flooring.
1) 1285 2) 1399 3) 1354 4) 1326
1) 1289 2) 1368 3) 1352 4) 1249
Avg 1 Pre) 1341 cpm Δ - 2%
Avg 2 Post) 1314.5 cpm

E8 = Ludlum Model 3 w/ 44-9
S/n = 229349
E8-1 @ dial: 300 cpm w/ #1597
E8-1 = 0/157 (α/β; BKGD = 0/36 cpm)
Deconned w/ wet wipes
E8-2 @ dial; 300 cpm
E8-2 = 0/48 cpm

E9 = WM B. Johnson meter
model DIG-5
S/n: 329
E9-1 @ switch; 200 cpm
E9-1 = 0/55 cpm
Deconned w/ wet wipes
E9-2 @ switch = 200 cpm
E9-2 = 0/42 cpm

Fume Hood #17 (See next Pg 4)
1.2 kcpm on front sill ledge
E17-1 on sill
E17-1 = 0/390 cpm (α/β Bkgd = 0/33 cpm)
Top - around light inside hood ~ 6.5 kcpm
most of this fume hood has been
covered w/ a silver-looking tape.
E17-2 light base
E17-2 = 0/897 cpm
Right side near lower nozzle
was 250 cpm. Removing part of
the silver tape the reading was 1.1 kcpm. See sill
E17-3 on top silver tape at lower rt nozzle
E17-3 = 0/48 cpm
E17-4 @ underneath tape at #17-3 loc.
E17-4 = 1/90 cpm
Deconned all 4 areas (top + bottom) of
silver tape @ lower right nozzle. w/
wet wipes + Resurveyed.
E17-5 @ sill; 1.2 kcpm
E17-5 = 0/60 cpm

E17-7 = 0/39 cpm
E17-8 @ behind silver tape; 1.2 kcpm
E17-8 = 0/63 cpm

E16 = Fume Hood #16 (Page 4) - No tape
Right side seems to have higher
activity levels. But left side has
Foam ceiling tile @ > 4 kcpm
Rt sill ~ 1.2 kcpm
Back panel ~ 1.9 kcpm
E16-1 on sill
E16-1 = 0/175 cpm
E16-2 Back panel
E16-2 = 0/120 cpm
Deconned w/ wet wipes
E16-3 on sill; 1.2 kcpm
E16-3 = 0/52
E16-4 back panel; 1.9 kcpm
E16-4 = 0/144 sill rusty on swipe

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E18 = Fume Hood #18 (Page 4) - White + Blk tape
PVC on left @ 3.0 kcpm
Right side sill @ 3.5 kcpm
Right side wall corner, Over tape
= 220 cpm, Under tape 1.3 Kcpm
E18-1 @ PVC drain
E18-1 = 0/1551 cpm
E18-2 @ Rt corner sill
E18-2 = 0/180 cpm
E18-3 @ over tape Right corner
E18-3 = 0/39 cpm
E18-4 @ under tape - visible ~~tape~~ underneath paint
E18-4 = 0/45 cpm
Decon each swipe area: Reswiped
E18-5 = 0/333 cpm (PVC) 2.8 kcpm
E18-6 = 0/51 cpm (Rt sill) 5 kcpm
E18-7 = 0/45 cpm (over tape) 250 cpm
E18-8 = 0/45 cpm (under tape) 1.7 kcpm

EFH ~~6~~3 = #~~6~~3 Fume Hood (Page 4) - no tape or paint Corner Hood
Side walls @ 3 kcpm
EFH ~~6~~3-1 left side
EFH ~~6~~3-1 = 0/57 cpm
Decon + Resurvey

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EFH ~~6~~3-2 = 0/90 cpm After Decon = 3 kcpm
0/48 cpm after 2nd Decon

EFH4 = Fume Hood #4 - Semi-Portable
1.4 kcpm area of removed sticker - front
2.7 kcpm inside exhaust box on top
EFH4-1 @ sticker
EFH4-1 = 0/87 cpm
EFH4-2 @ inside exhaust box on top
EFH4-2 = 0/375 cpm
Decon w/ wet wipes:
EFH4-3 @ sticker 1.4 kcpm
EFH4-3 = 0/48 cpm
EFH4-4 @ inside exh @ top 2.0 kcpm
EFH4-4 = 0/309 cpm - Could not decon exh box well. out of sight + reach.