

Submitted by: <i>Farex</i>	Telephone _____	Mail Stop _____	LAN ID _____	Date Submitted to DPC <i>3/10/70</i>
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Accession No. ML020170281

Response to Requests for Additional Information for request for unrestricted release of Building 26 from Veteran Affairs Permit Number 09-12467-02 located in Gainesville, FL.

General background information [provided by permittee Radiation Safety Officer]:

- The Radiation Safety Officer (RSO), Shailendra Shukla, Ph.D., has worked continuously at the Gainesville VA Medical Center since October 1987 as the RSO.
- We have used this shed since 1992. Before that, the University of Florida collected all our radioactive waste for disposal.
- Except for H-3, permittee research investigators have never (during RSO's tenure) ordered any long-lived (half-lives greater than 120 days) radioisotope in amounts greater than 1 millicurie at a time.
- Among the aqueous liquid disposed via the sewerage, the last time any Na-22 (less than 1 microcurie) was disposed was on 8/8/2005. Records do not show any Cl-36 disposed via the sewerage system. Dry Cl-36 contaminated tips were stored in this shed until their eventual disposal via a broker.
- We have a broad scope permit to use radioisotopes for various purposes (research and medical--both diagnostic & therapeutic). Except for nuclear medicine, uses of radioisotopes throughout the years have been very low.
- There have been no known spills in the shed. Because of this, at worst we expected some contamination in the sink and/or pipe, but apart from that area, did not expect any high levels of contamination in the shed. Decommissioning activities were based on this expectation, and our initial survey did indicate that there were no high levels of contamination in the shed, verifying that expectation.
- The full decommissioning process has been described in our correspondences with NHPP [submitted to NRC by letter dated October 29, 2009] and more information is clarified below.

Responses to Specific Items in NRC Request of December 7, 2009:

1) *The September 1, 2009 permit request states that the plumbing was cut from underneath the sink.*

a. *Describe how the plumbing was "cut" and supply the procedure used, if any, for this activity.*

Response: The water supply to the sink had been turned off about two weeks prior to the beginning of the decommissioning process. The pipe under the sink was cut with a hand-saw. A plastic sheet was placed under the pipe to be cut in the outside of the shed where the pipe connected to the sewer line. There also, the pipe was cut by a hand-saw. The sewer pipe was then capped off. After the cutting, the plastic sheet and the saw were frisked by our survey meter and it did not indicate any reading above twice the background levels. The cut pipe was also frisked and it also did not record any radiation level above background in most of the pipe except the clean-out part.

- b. *Describe if an evaluation was done to determine the amount of contamination on the inside of the pipe prior to cutting the pipe.*

Response: We surveyed the pipe from just under the sink to the outside sewer line. Our survey did not indicate measurable radiation in any part of the pipe except just outside the shed. Due to the types and amount of radioisotope used in our facility, we suspected that this reading may be due to the radiation from S-35 which was disposed of recently in the sink.

- c. *Describe the survey on the remaining pipe to ensure all contamination above release criteria has been removed.*

Response: We took the swipes all around the pipe and also inside the pipe with 16" long swabs ("jumbo absorbent tipped applicators"), and measured it with the survey meter and found no level distinguishable from background. We also measured this swipe sample in our well counter and did not detect any contamination. **See also the response to item "e" below.**

- d. *Describe where on the pipe the 3000 cpm reading was found (i.e. outside, inside, or at an open end.) Also, provide the date when this survey was completed.*

Response: The "high" count was recorded in the open end of the clean out part of the pipe. The 3000 cpm reading was seen on about August 20, 2009 (The exact date is not on the record, but we started the decommissioning process in mid-August). The reading is down to less than 800 cpm as of December 16, 2009. [This result indicates a half life much less than 120 days.]

- e. *Response to NHPP's request for additional information dated October 5, 2005 [2009?] states no removable contamination was detected from the pipe. Were the wipes checked by a liquid scintillation counter? If so, provide liquid scintillation survey results.*

Response: See response to "c" above. In addition, we collected a new series of swipes (inside and out) for the removed section of pipe on December 15, 2009 and counted it in our Liquid Scintillation Counter on December 18, 2009 (see attachment). A few spots have elevated levels and we will store the removed pipe until the radiation levels decay to background and removable contamination is below the regulatory limits.

We want to emphasize that we are not requesting to release the removed section of pipe at this time. We are storing it in a different area until release criteria is met. We are requesting only the release of the shed.

- 2) *The September 1, 2009 states three areas were found to be over NUREG 1556 release criteria and cleaning was performed.*

- a. *Describe the type of cleaning performed (i.e. wiped with soapy water).*

Response: It was cleaned by Lysol foam spray with emery cloth.

- b. *Since contamination was found to be above background in several areas, was only the locations with removable contamination found above 500 dpm washed or was the whole facility cleaned in accordance with the ALARA principle?*

Response: Only the "high" level areas were cleaned.

- c. *The request states there was no removable contamination above 500 dpm per 100 ft² found in the shed after cleaning. Verify if this should state 500 dpm per 100 cm² or if wipes were taken over larger areas.*

Response: Yes, we meant per 100 cm² (per 100 square centimeters).

- 3) *Material and cabinets appear to be located on the floor and against walls in the pictures provided in the September 1, 2009 request. Was the floor and walls cleared prior to doing the direct scan and wipe surveys? If not, justify how your survey would identify fixed and removable contamination above NUREG-1156 [1556?] release criteria located under or behind these objects.*

Response: These materials were removed prior to taking the swipes, as described in our e-mail response dated October 22, 2009 [this is provided in Enclosure 5 to letter from NHPP to NRC dated October 29, 2009].

- 4) *Provide the C-14 efficiency for the Ludlum 14C instrument with pancake probe used in completing the direct survey.*

Response: The efficiency for C-14 for this meter/probe is 1.8% at 1 cm, and 21% for Cl-36 at 1 cm.

- 5) *In the September 1, 2009 request and additional information in support of release request shows Cl-36 and Na-22 may have been stored in Building 26. Since Cl-36 and Na-22 have significantly longer half lives than 120 days, describe how current surveys or perform new surveys to justify these radionuclides are below the release criteria.*

Response: See our general comment above about the low level and rare use of these isotopes in our facility. In addition, any contamination above the release level would have been detected by our survey meter but we did not detect any after the initial clean-up of some spots as described in our e-mail response to NHPP on October 22, 2009.

[Additional comment by NHPP reviewer: Cl-36 and Na-22 are both beta emitters with much higher average energies than C-14. These beta particles (on average) are more readily detected (i.e., higher detection efficiency—see response to #4 above) than C-14 using a GM pancake probe. The permittee noted (in the e-mail dated October 22, 2009, or Enclosure 5 to NRC letter dated October 29, 2009) that nowhere did the count rate exceed three times the background count rate of about 30 cpm. This corresponds to a scanning action level of about $[(90 \text{ cpm}) / (0.2 \text{ c/d}) / (15 \text{ cm}^2)] * (100 \text{ cm}^2) = 2800 \text{ dpm}/100\text{cm}^2$. This action level is less than release criteria cited for Cl-36 and Na-22 in NUREG-1556, Volume 7, Appendix Q, Table Q.3].

PRESET TIME : 1.00
 DATA CALC : DL DPM %REF H# : YES SAMPLE REPEATS : 1 PRINTER : STD
 COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : OFF
 TWO PHASE : YES AQC : YES CYCLE REPEATS : 1
 SCINTILLATOR : LIQUID LUMEX: YES LOW SAMPLE REJ: 0
 LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

ISOTOPE 1: 3H %ERROR: 0.50 FACTOR: 1.000000 BKG. SUB: 0
 ISOTOPE 2: 14C %ERROR: 0.00 FACTOR: 1.000000 BKG. SUB: 0

BACKGROUND QUENCH CURVE: Off COLOR QUENCH CORRECTION: Off

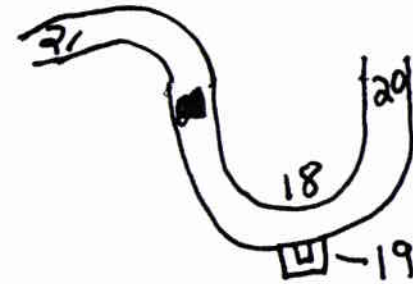
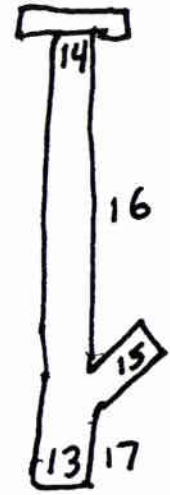
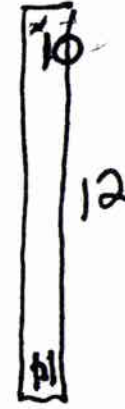
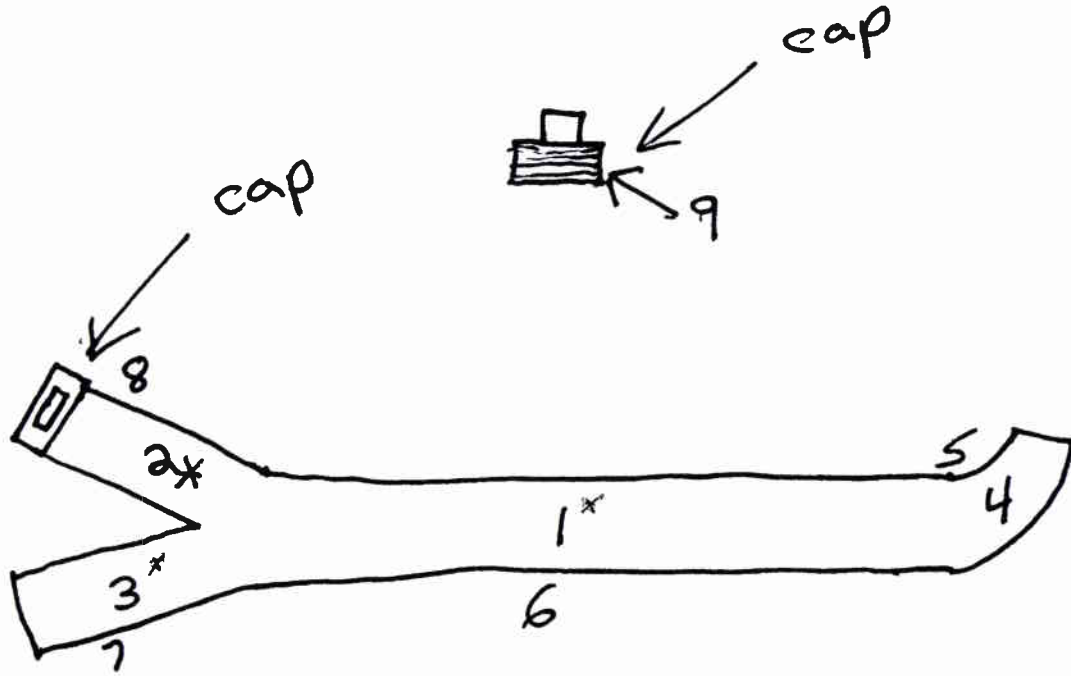
Quench Limits Low: 20.569 High: 306.79

SAM NO	POS	TIME MIN	H#	ISO	CORRECTED CPM	%ERROR	DPM	EFF-1	EFF-2	%REF	RATIO	LUMEX %	ELAPSED 2P TIME
R1	**1	1.00	56.2	3H	98.00	39.38	156.26	54.95	0.69		2.327	61.93	1.64
				14C	53.00	27.47	67.16	18.06	77.31				
R2	**2	1.00	58.2	3H	29.00	37.14	46.92	54.49	0.69		2.469	0.29	3.21 2P
				14C	15.00	51.64	19.00	18.07	77.24				
R3	**3	1.00	54.6	3H	29.00	37.14	42.43	55.32	0.69		1.385	0.20	4.77
				14C	24.00	40.82	30.64	18.05	77.37				
R4	**4	1.00	77.3	3H	48.00	28.87	81.25	49.89	0.67		1.977	0.90	6.33
				14C	32.00	35.36	41.09	18.17	76.55				
R5	**5	1.00	72.0	3H	20.00	44.72	29.01	51.18	0.68		1.021	1.37	7.91
				14C	22.00	42.64	28.41	18.14	76.74				
R6	**6	1.00	64.9	3H	20.00	44.72	31.24	52.89	0.68		1.627	1.30	9.49
				14C	15.00	51.64	19.21	18.11	77.00				
R7	**7	1.00	68.1	3H	35.00	33.33	47.97	52.11	0.68		0.790	0.81	11.07
				14C	47.00	29.17	60.71	18.13	76.80				
R8	**8	1.00	63.3	3H	327.00	11.06	314.45	53.28	0.68		0.357	0.08	12.52
				14C	681.00	7.66	880.98	18.10	77.06				
R9	**9	1.00	63.2	3H	26.00	39.22	37.88	53.29	0.68		1.180	0.86	14.20
				14C	25.00	40.80	32.11	18.10	77.06				
R10	**10	1.00	63.8	3H	654.00	7.76	822.01	53.15	0.68		0.655	0.01	15.76 2P
				14C	972.00	6.42	1254.45	18.10	77.04				
R11	**11	1.00	66.7	3H	53.00	27.47	80.64	52.45	0.68		1.365	0.78	17.33
				14C	46.00	29.49	59.08	18.12	76.93				
R12	**12	1.00	69.5	3H	27.00	38.49	42.25	51.78	0.68		1.495	1.04	18.91
				14C	22.00	42.64	28.26	18.13	76.83				
R13	**1	1.00	77.3	3H	120.00	18.26	193.58	49.89	0.67		1.501	0.58	20.59
				14C	100.00	20.00	128.93	18.17	76.55				
R14	**2	1.00	61.2	3H	32.00	35.36	49.20	52.76	0.68		1.604	0.56	22.16
				14C	24.00	40.82	30.68	18.09	77.13				
R15	**3	1.00	91.1	3H	383.00	10.22	743.17	46.48	0.67		3.599	0.17	23.76 2P
				14C	162.00	15.71	206.49	18.21	76.03				
R16	**4	1.00	70.0	3H	23.00	41.70	35.03	51.56	0.68		1.296	0.97	25.31 2P
				14C	21.00	43.64	27.03	18.13	76.91				
R17	**5	1.00	78.2	3H	15.00	51.64	22.62	49.67	0.67		1.092	1.06	26.90
				14C	16.00	50.00	20.71	18.17	76.52				
R18	**6	1.00	82.3	3H	18.00	47.14	31.71	48.66	0.67		2.245	0.99	28.46 2P
				14C	11.00	60.30	14.13	18.18	76.35				
R19	**7	1.00	63.9	3H	43.00	35.49	48.54	48.10	0.68		2.392	0.97	30.04
				14C	43.00	35.49	48.54	48.10	79.68				
R20	**8	1.00	74.7	3H	44.00	38.15	71.85	50.52	0.67		1.694	0.45	31.60
				14C	33.00	34.82	42.42	18.16	76.64				

SAM NO	POS	TIME MIN	H#	ISO	CORRECTED CPM	%ERROR	DPM	EFF-1	EFF-2	%REF	RATIO	LUMEX %	ELAPSED 2P TIME
R21	**9	1.00	67.8	3H	106.00	19.43	174.69	52.20	0.68		2.139	0.54	33.22
				14C	64.00	25.00	81.69	18.12	76.90				
R22	**10	1.00	64.5	3H	19.00	45.88	30.63	52.99	0.68		2.000	1.20	34.77
				14C	12.00	57.74	15.31	18.11	77.01				

← background (Blank)

PIPE ASSEMBLY



22 background

* = swabs applicators
swipes