American Radiolabeled
Chemicals, Inc.

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Saint Louis, MO 63146 USA
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21 February 2012

U.S. Nuclear Regulatory Commission, Region III
2443 Warrenville Road, Suite 210
Lisle, IL 60532-4351

ATTN: Kevin Null

LICENSE No: 24-21362-01

ConvRec 576320

SUBJECT: Request for Additional Information (RFAI).

Gentlemen:

In response to your RFAI, American Radiolabeled Chemicals, Inc (ARC) presents the attached document.

The questions from the RFAI havew been repeated with the reply following.

If you have any questions or require clarification on any of the attached information, you may contact me, directly at 314-991-4545.

Sincerely

AMERICAN RADIOLABELLED CHEMICALS, INC

Regis A Greenwood, CHP, FHPS
Radiation Safety Officer
American Radiolabeled Chemicals

Reply to RFAI in Conv Rec 576320

1. ***In terms of the authorized use of material in the 300 Annex, describe in more detail what you mean by "purification" and "analysis" of radiolabeled compounds and "preparation of certificates of analysis."***

   Purification – Taking the crude preparation and stripping out the unwanted compounds from side reactions and/or un reacted material. In the 300 Annex, this will be done by High Pressure Liquid Chromatography (HPLC) in closed systems located in a fume hood. Normal batch sizes for purification are less than 100 millicuries.

   Analysis – Determining the identity and purity of a compound by HPLC or other instrumental methods. In the 300 Annex, this will be done in closed systems located in a fume hood. Normal batch sizes for analysis are approximately 10 microcuries.

   Preparation of Certificates of analysis – the systems described above print out a spectrum and the preparatory data for the spectrum. This is used to certify to the customer that the compound is that which was ordered and in the correct purity.

2. ***Describe if the studies will be performed on a laboratory work bench or in operating fume hoods. Describe the criteria that will be followed to determine when and what type of work is done on laboratory bench, or in fume hoods.***

   Preparation of cold chemicals for reactions will be performed on the bench top. All work with radioactive chemicals is to be performed in fume hoods.

3. ***Submit a current diagram of the 300 Annex that includes both the cold and radionuclide use areas. Also, include in the diagram an illustration of the segregation between the 300 Annex and the production labs in building 300. Describe radiation safety procedures that staff will follow when exiting 300 production lab space to enter the Annex. Include specific survey procedures that will be followed in order to prevent the spread of contamination outside of building 300 production labs.***

   a. See Attachment A for 300 Annex Floor Plan

   b. Personnel exiting the production labs will use procedures described in ARC SOPs. They will pass through the controlled and unrestricted areas of Building 300. They will then leave building 300 to the unrestricted outdoors. They then enter the controlled area of the Annex. Entry to the purification and Analysis areas require PCE appropriate to that area. There is no way that an individual can go directly from the production labs to the labs in the annex.

   c. The Laboratories in the annex will be added to the Friday (end of week) and the Monday (beginning of week) surveys.

   d. The controlled and unrestricted areas of building 300 are all ready surveyed daily. The controlled and unrestricted areas of the Annex will be added to the daily survey schedule.

4. ***Provide a diagram of the air supply and exhaust system for the Annex. Include a description of the air flow rate that will be maintained, filtration in place (if none, please provide justification), air sampling and monitoring systems, and the air effluent release point location and height. Clarify whether or not the 300 Annex system is independent of the system that currently services the building 300 production labs.***

   a. See Attachment B for supply and exhaust systems.

b. Flow rates into each hood will be maintained at a minimum of 100 Linear Feet per Minute (LFPM). The hoods in the Annex have alarms. Set at 100 LFPM.

c. There is no filtration in place. Filters were removed in (approximately) 2001 with NRC approval with the determination that particulate products were negligible.

d. Air will be monitored on a 24/7 basis using the set up that is currently used in building 400. This system has been rendered redundant with the use of COMPLY for dose to the public.

e. As can be seen from Attachment B, both the make up and exhaust air systems are completely independent fro those in use for the production labs. This attachment also provides location of the make up and exhaust systems.

f. **Effective Stack Height**

To simplify the treatment of dispersion, it is convenient to assume that dispersion begins from a fictitious height above the actual source. This fictitious height is called the "effective stack height" symbolized by $\mathbf{h_{eff}}$. This is the sum of the actual stack height, $\mathbf{h_s}$ and the rise of the plume after emission, □**h,** all in meters

Dealing, with only the momentum contribution to plume rise,

If $\mathbf{V_s}$, the stack exit velocity in meter/sec, is greater than the mean wind speed, $\overline{\mu}$, in meters/sec, then

$$\Delta h = D\left(\frac{V_s}{\overline{\mu}}\right)^{1.4}$$

where D is the stack diameter in meters. This equation is valid for all stability classes.

Exit Velocity, m/sec	23.024
Physical height, m	10.6
Stack Diameter, m	0.204

Direction From	wind speed m/sec	stack height addition m	effective stack height m
N	4.42	2.056327	12.66
NNE	3.81	2.53156	13.13
NE	3.24	3.176291	13.78
ENE	3.36	3.018619	13.62

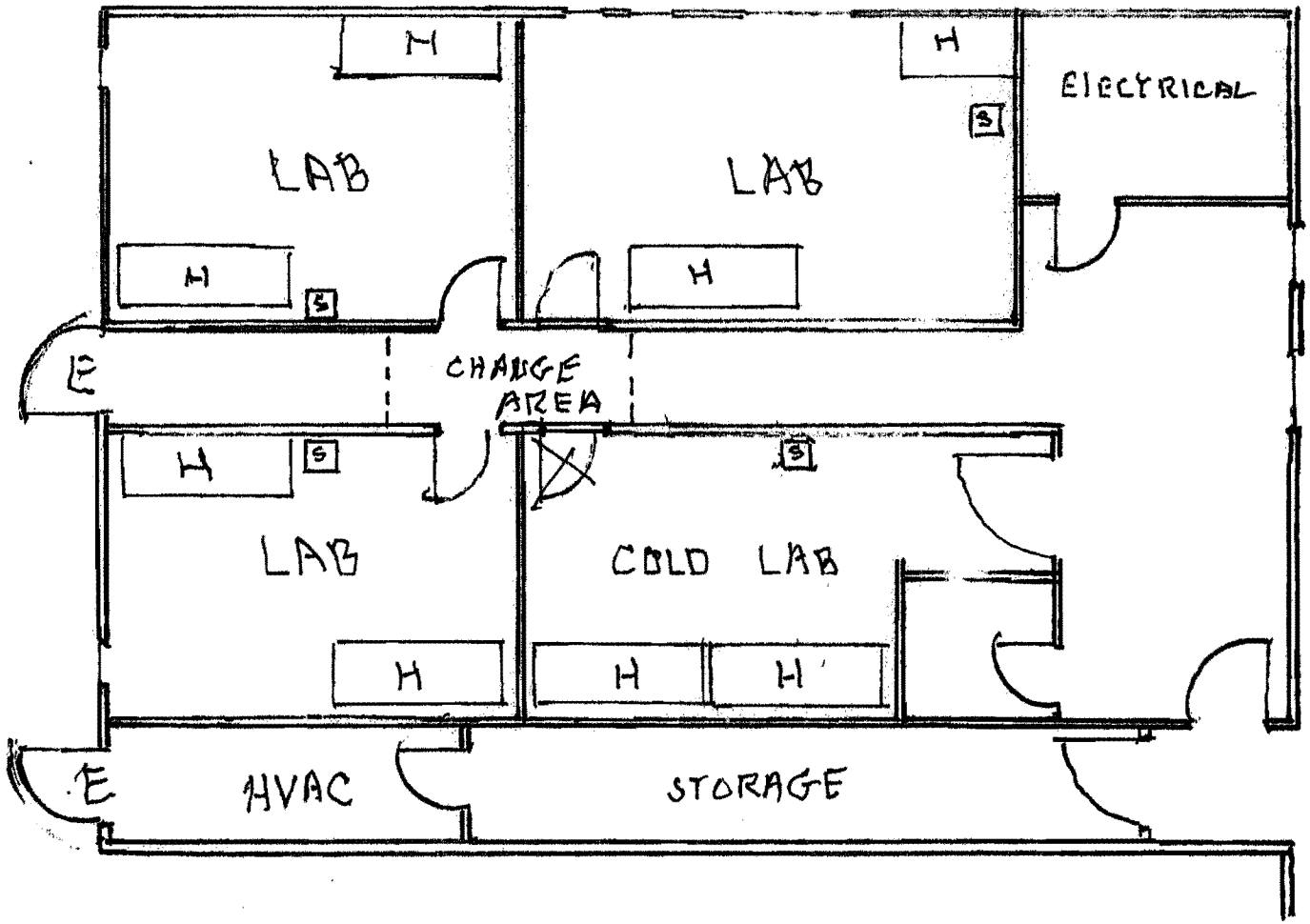
E	3.60	2.740689	13.34
ESE	3.76	2.578815	13.18
SE	3.83	2.513072	13.11
SSE	4.66	1.909602	12.51
S	4.85	1.805697	12.41
SSW	4.52	1.992918	12.59
SW	4.13	2.261274	12.86
WSW	1.19	12.90974	23.51
W	4.03	2.340217	12.94
WNW	5.38	1.561666	12.16
NW	5.32	1.586379	12.19
NNW	4.73	1.870155	12.47
		average	13.53

ATTACHMENT A

H – Hood

S – sink

E - Emerg Exit



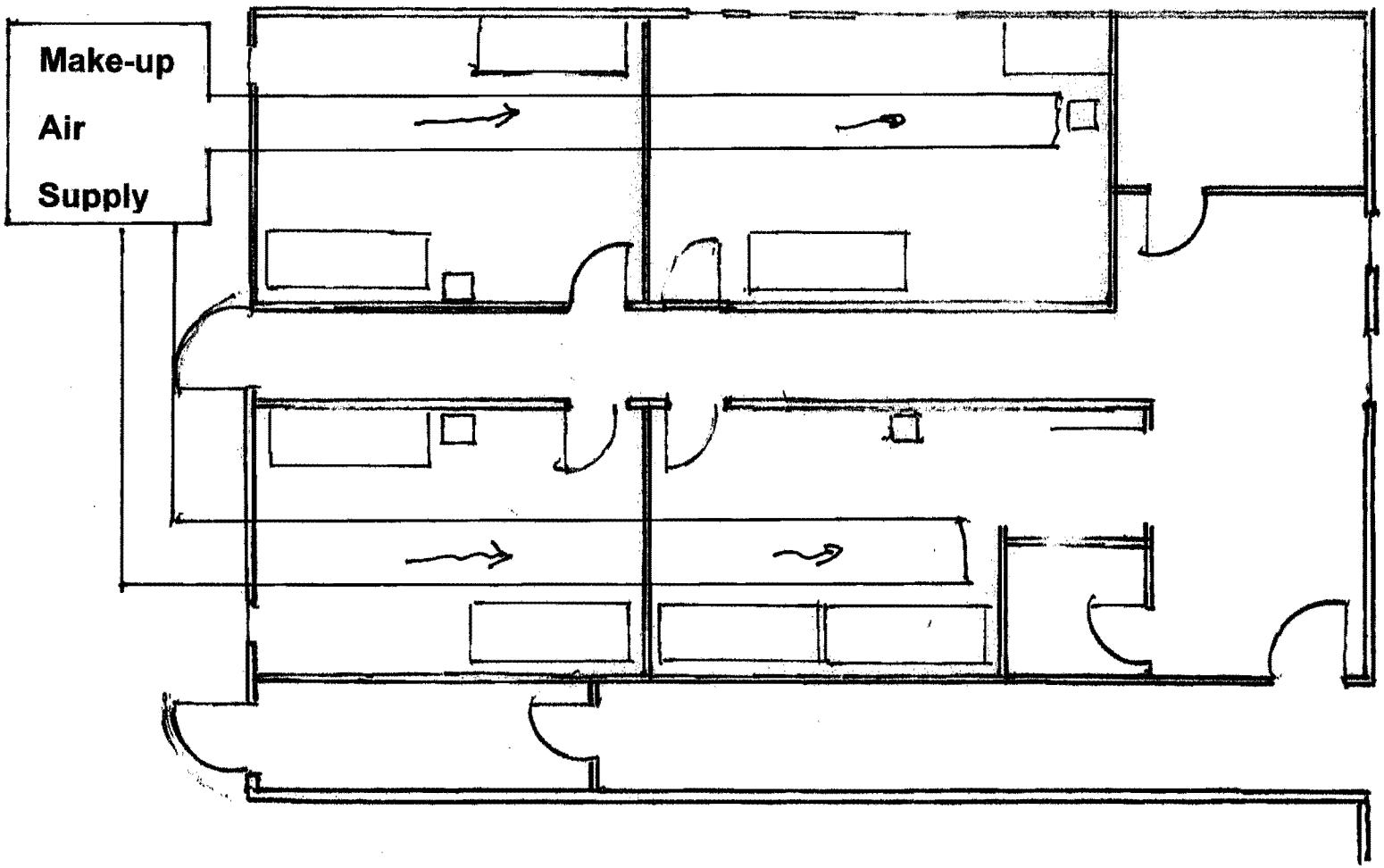
STREET

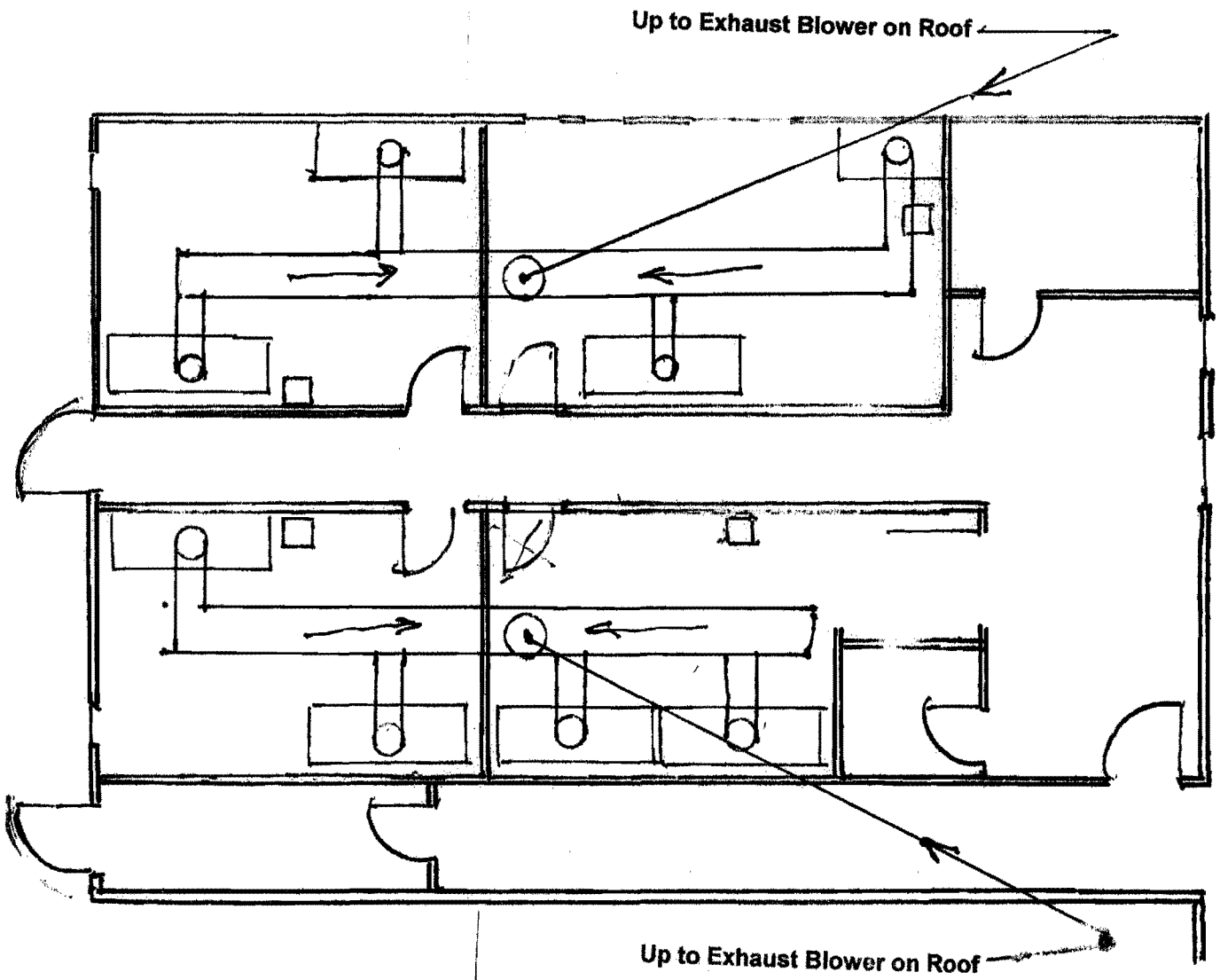
300 annex

Do Not Scale

Approx 1/8 in. = 1 foot

ATTACHMENT B


Make-up
Air
Supply



300 Annex Exhaust

FedEx Express

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OFFICE
AMERICAN RADIOLABELED CHEMICALS
101 ARC DRIVE

ST. LOUIS, MO 63146
UNITED STATES US

SHIP DATE: 21FEB12
ACTWGT: 0.2 LB MAN
CAD: 0747982/CAFE2511

BILL SENDER

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