American Radiolabeled
Chemicals, Inc.

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27 October 2011

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

ATTN: Kevin Null

LICENSE No: 24-21362-01
Conversation Record dated 9/30/11

SUBJECT: Response to Request For Additional Information (RFAI)

Gentlemen:

American Radiolabeled Chemicals, Inc (ARC) submits the following response to the concerns raised in the above referenced conversation record.

ARC is in agreement that there appears to be no problem with the H-3 measurement. There fore H-3 samplers will be installed on both stacks and the new system's results will be used. There also appears to be no problem with the C-14 measurement on the Building 300 stack and therefore the new sampler system will be installed and the results will be used.

There appears to be difficulty in the measurement of C-14 for the Building 100 stack, the explanation of why there is difficulty is as follows. The waste processing facility, known as Building 200, uses the Building 100 stack. Because Building 200 also includes liquid waste evaporation, the evaporation rate and the chemical make-up of the waste varies from day to day. The C-14 compounds in the waste can be classified into three (3) broad categories which are carried out by the evaporating solvent;

1.) Little or no volatility at room temperature
2.) Moderate volatility at room temperature
3.) High, essentially complete volatility at room temperature

The existing impinger system uses approximately three hundred milliliters (300mL) of 0.1 N Sodium-Hydroxide (NaOH). This volume of solution mechanically traps close to all of those categorized under group 1.) above. However this volume of solution will mechanically trap *some* of those in group 2.) and will trap only a small portion of those in group 3.).

The new C-14 systems have a volume of twenty milliliters (20mL) per bottle of ethanolamine with a collection efficiency of greater than ninety-nine percent (99%) for inorganic C-14. With this new system there would be physical entrapment of only some portion of those in group 1.) organic compounds.

It is ARC's intent to install the new system with one each for H-3 and C-14 on the Building 300 stack and to install one each for H-3 and C-14 on the Building 100 stack as well. We also intend to keep the present, large volume impinger system installed on the Building 100 stack, but on separate sampling lines. This system would be run in parallel with the new system for such time as to develop a "correction factor" for the new system.

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This "correction factor" would be determined by taking the activity measured by the current large volume system and subtracting the new small volume system, it is assumed that the difference would be the organic compounds captured by the large volume. The correction factor would be determined by this method.

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

Sincerely

AMERICAN RADIOLABELED CHEMICALS, INC

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

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