

The following is a listing of specific items outlined on page 3, as well as a response.

Item 1. Scan Results – the report states that 50% of floors and lower wall areas plus 10% of upper walls and ceilings were scanned. However the scan results were not provided.

Response

The results of surface scans and swipe samples where residual activity was detected in excess of investigative levels were provided in section 2.3. The investigative levels for surface scans and swipe samples were provided in section 2.0. Surface scans for which no activity was detected in excess of investigative levels were not reported.

Item 2. Residual Tritium Activity – Surveys or measurements of the amount and distribution of total (fixed plus removable) residual tritium (H-3) were either not performed or not provided. Only removable activity surveys were given.

Response

A low energy beta emitter such as Tritium (^3H) is difficult to measure in the field using a windowless gas proportional detector. There are two strategies for measuring ^3H in the field; 1) scale the ^3H to the total activity present and calculate a gross activity DCGL or 2) using swipe samples. The NRC stated in 1998 that “Screening levels are based on the concept that the fraction of removable surface contamination is equal to 0.1. For cases where the fraction of removable contamination is undetermined or higher than 0.1, users may assume, for screening purposes, that 100% of surface contamination is removable and therefore the screening level should be decreased by a factor of 10.

Item 3. Instrumentation – No calibration information was provided for the instruments used to perform scans, stationary measurements, smear counting, etc.

Response

In section 2.1, Field Measurements, Methods and Instrumentation states that calibration certificates are on file at Clym Environmental Services, LLC and are available upon request. Copies of calibration certificates have been attached. The liquid scintillation counters used in the analysis of swipe sample were calibrated in accordance with the manufacturer’s procedure prior to use.

Item 4. Instrument efficiencies – The instrument detection efficiencies for the radionuclides of interest are given without justification. It is not clear whether the instruments were calibrated for the detection of these radionuclides, whether adjustments were made to calibrated values to accommodate changes to radiation type/energy, whether 2- π or 4- π source/detector geometries were used for initial calibration or for correction, etc.

Response

Portable survey instruments were obtained from Duratek Instrument Services located in Oak Ridge, TN. The Danac 4 facility at the time the final status survey was conducted was undergoing major reconstruction. All surfaces were cleared of debris and cleaned to the extent practicable using HEPA vacuums. However, ground in dirt and grime still remained on a majority of floor and lower wall surfaces. Clym Environmental Services, LLC elected to be conservative in calculating surface activity and used 4 π instrument efficiencies.

The instrument efficiencies provided on the calibration certificates were determined using 4 π geometry. The manufacturer stated that the average instrument efficiency for ^{238}U was 20%. The instrument efficiency for ^{230}Th , 17%, determined at the time of calibration was used to determine ^{238}U surface activity. The instrument service provider stated that the instrument efficiency for ^{14}C was 15% on average. This instrument efficiency was used to calculate ^{14}C surface activity. The instrument efficiency, 24.7% for ^{99}Tc , determined at the time of calibration, was used to calculate ^{36}Cl surface activity.

The following is a listing of observations outlined on page 3, as well as a response.

Observation 1. The surveyors inspected the records of sealed sources previously used at the facility and verified that no source was reported to have been leaking in excess of the license limits (i.e., less than 0.005 microcurie leakage per test). However, the report was silent as to whether all sources were accounted for and removed from the building.

Response

Section 6, entitled, Disposition of Materials and Waste, states that all licensed radioactive material and waste has been removed from the site.

Observation 2. The text in Section 2.3 indicates that 30 samples were collected in Lab 47 in order to evaluate the presence of removable activity. The map for Lab 47 (Attachment 6 of the report) only shows 23 sample locations, thus the location of seven (7) samples cannot be determined.

Response

Section 2.3, located in Section 2, discusses the methodology and provides results of Scoping, Characterization and Remediation surveys.

Attachment 6 is first referenced in Section 4. This section is titled, Final Status Surveys. The diagram of Survey Unit 47 provides the physical location of each sample point within the surface area evaluated.

The thirty swipe samples were collected as part of a Characterization survey. The sample locations were determined by the surveyor. The number of sample point required to conduct for the Sign test was determined for each contaminant. The Final Status survey sample points for each contaminant were provided in the diagram of survey unit 47. There are no missing sample points as the two surveys were confused.

Observation 3. All the maps shown in Attachment 6 of the report are missing information about when the surveys were performed, who performed the surveys, which instrument (by serial number) was used, etc.

Response

The maps in Attachment 6 were provided for use by the United States Nuclear Regulatory Commission should they choose to conduct a confirmatory survey.

Observation 4. Section 5.1 of the report requires periodic checking of the survey instrument response to a check source and to background. The results of those checks do not appear in the report.

Response

The check source reproducibility determination as well as ambient background measurements were provided as Attachment 9. Operation check source readings conducted by surveyors in the filed were not recorded. The surveyor was instructed to notify the supervisor should an instrument fail to produce an acceptable operation check source reading, $\pm 20\%$.

Observation 5. The quality control checks reported in Attachment 9 appear to have been performed and reviewed by the same person, which defeats the purpose of a second party review.

Response

A review of the entered data and subsequent calculations found the report to be complete and accurate.