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ADDENDUM TO THE SITEWIDE EXCAVATION PLAN

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
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REVISION SUMMARY

Revision	Date	Description of Revision
Rev. 0	7-31-98	Initial controlled issuance
Addendum 1	3-19-01	Added Section 3.4.8 and Figures 3-15 through 3-17 for precertification and certification methods for cultivated areas

3.4.8 Precertification and Certification of Cultivated Areas

Several of the off-site properties surrounding the FEMP that need to be certified are either currently being cultivated or have previously been cultivated. Evaluations of subsurface (i.e., below 6 inches) soil concentrations of selected COCs in these areas are required to determine whether cultivation had any influence on the distribution of FEMP-introduced COCs. As a result, cultivated soil certification involves the following: 1) evaluations against impacted soil FRLs (i.e., FRL certification) in the surface layer, or potentially impacted zone, and 2) baseline confirmation sampling in the subsurface, below the potentially impacted zone at various depths, to statistically demonstrate that it is not impacted as compared to background conditions. General regulatory requirements and the source of the background data set to be considered are summarized in the Addendum to the CERCLA/RCRA Background Soil Study (DOE 2001). This subsection provides guidelines for conducting precertification and certification in cultivated areas.

The general activities to be followed during precertification of a cultivated area are outlined in Figure 3-15. Large-volume NaI detectors and portable HPGe instruments will be used to scan as much as possible of the remediation area per Section 3.3.3. In addition to the scanning, subsurface soil sampling will be conducted to determine representative concentration profiles of COCs to at least a 2-foot depth below the cultivated depth. Comparisons of COC concentrations to background conditions will be conducted layer by layer (6 to 12-inch, 12 to 18-inch, 18 to 24-inch, etc.) in order to determine the depth of the impacted zone. An impacted area is defined as any area that has received contamination from past site operations and/or clearly has above background conditions. Based on the COC levels, remediation may be deemed necessary for the impacted areas before the areas can be certified. Refer to Figure 3-5 and 3-11 for remediation implementation strategies.

Upon completion of remediation, or in areas where remediation is not necessary, delineation of Group 1 and Group 2 CUs in the impacted zone can be conducted per Section 3.3.3.2 and Figure 3-8. Once the CUs have been delineated, the FRL certification sampling locations in each CU will be identified and surveyed in the field per Section 3.4.2 and Figure 3-9. In addition, at least four of the FRL certification sample locations per CU will be designated as baseline confirmation sample locations. Baseline confirmation samples will be collected at depth at these locations below the designated impacted zone. At least 40 samples will be collected in a property to conduct population-to-population comparisons to the background subsurface data. The first step of the baseline confirmation will be based on population statistics using all of the baseline confirmation samples collected in a property as a data set due to the relatively wide range of the background conditions, as compared to an individual CU area. This differs

from FRL certification, which is based on meeting a single standard (value). In addition, this approach also allows for more concentrated sampling under the more likely impacted areas where the smaller Group 1 CUs are established. Baseline confirmation soil samples collected from the entire interval at each location will be composited. The sampling design for FRL certification and baseline confirmation will be documented in each area-specific CDL and PSP.

FRL certification and baseline confirmation samples can be collected, analyzed, and validated simultaneously per Figure 3-16. FRL certification statistical analyses and evaluations for the impacted area CUs are conducted per Section 3.4 and Figure 3-10.

Statistical analyses for the baseline confirmation samples are conducted per Figure 3-17. If all the baseline confirmation data in the entire area (i.e., all 40 or more samples) to be certified are less than the 95th percentile background concentration for each COC, then the impacted area is not extended. Therefore, the area below/outside the impacted zone is confirmed to be within background conditions. For each COC that has a baseline confirmation result equal to or exceeding the 95th percentile background concentration, statistics of the baseline confirmation data set are evaluated. If those COC-specific baseline confirmation results are less than the corresponding background population, based on a population-to-population comparison (i.e., t-test or Wilcoxon tests), or cannot be differentiated at 99 percent UCL, then the original impacted zone is not extended. Therefore, the area below/outside the impacted zone is confirmed to be statistically within background conditions.

If any COC-specific data population is higher than the background population, more statistical evaluations of the data will be required. For example, all baseline confirmation data from any CU with concentration(s) higher than the 95^{th} percentile background concentration will be grouped into a subset for evaluation. If the UCL of the mean of this subset of data for each COC is less than the 95^{th} percentile background concentration, then the original impacted area is not extended and the baseline area below/outside the impacted surface CU is confirmed to be statistically within background conditions.

If the UCL of the mean of this subset of data for any COC is greater than the 95^{th} percentile background concentration, then a portion of the originally designated baseline confirmation zone will be designated as impacted. This newly designated impacted zone will require FRL certification per Figure 3-10. The reduced baseline confirmation area will require re-analyses per Figure 3-17 using the remaining baseline confirmation data to confirm that background conditions exist.

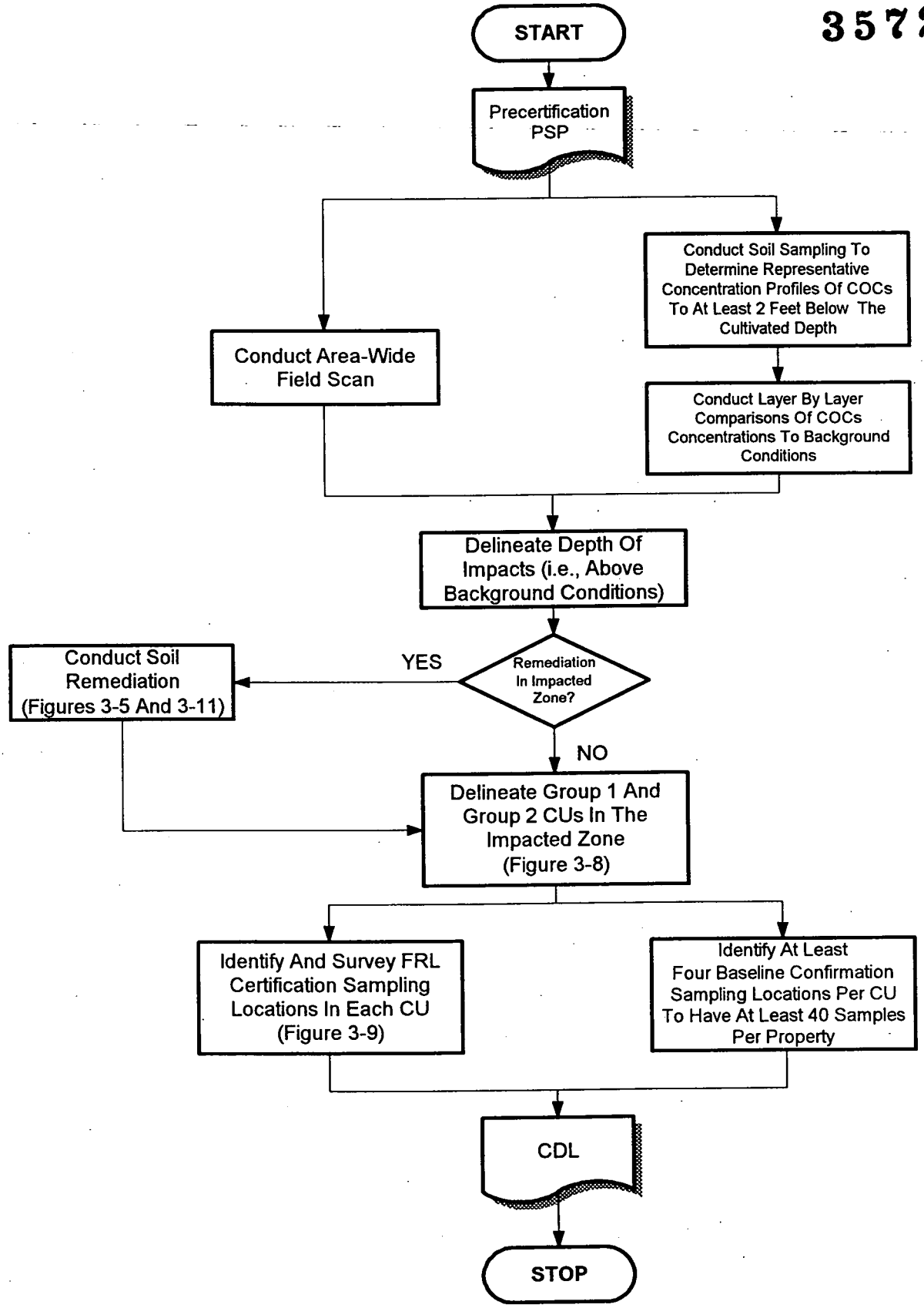

FIGURE 3-15 GENERAL PRECERTIFICATION ACTIVITIES IN CULTIVATED AREA

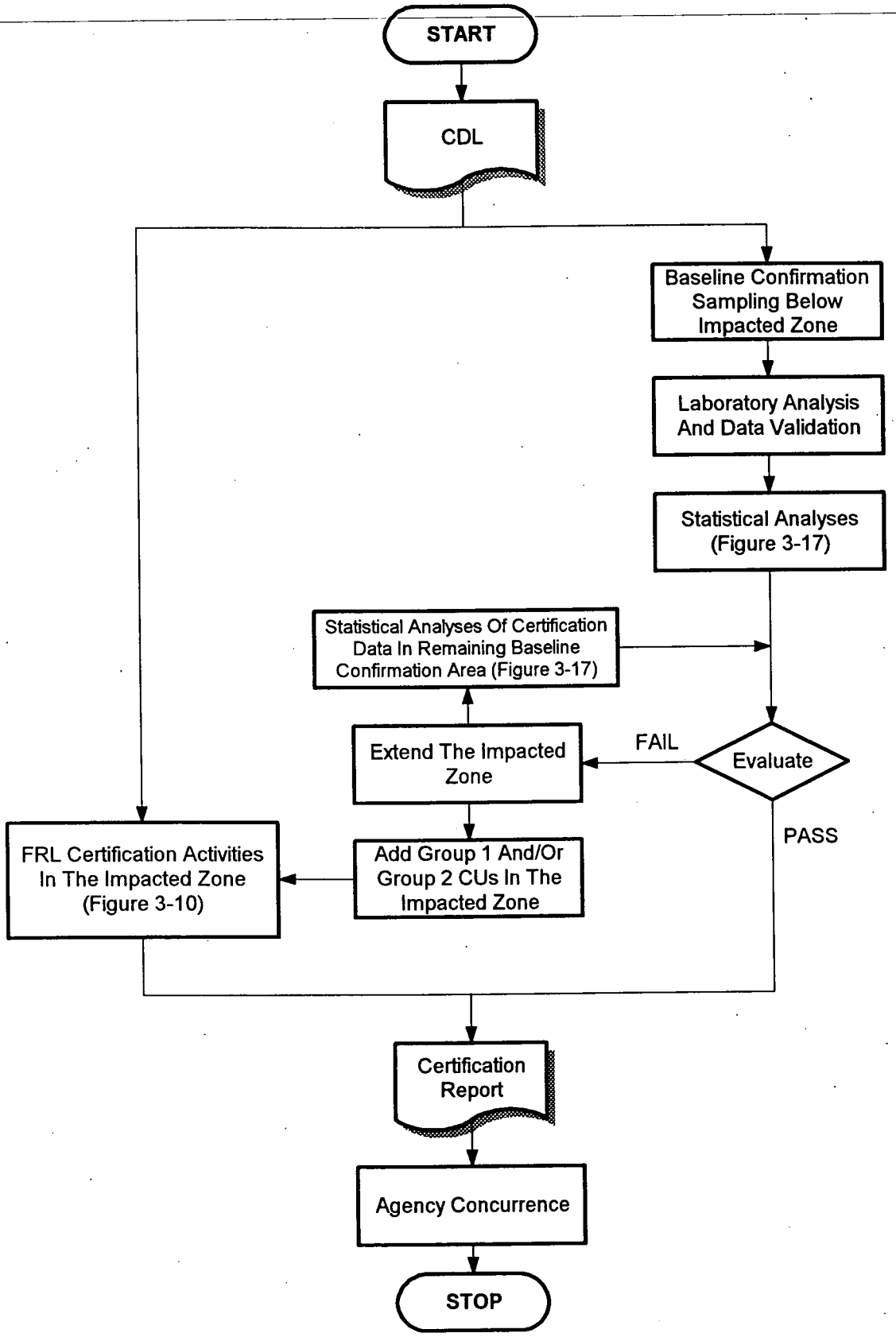

FIGURE 3-16 GENERAL CERTIFICATION PROCEDURE IN CULTIVATED AREA

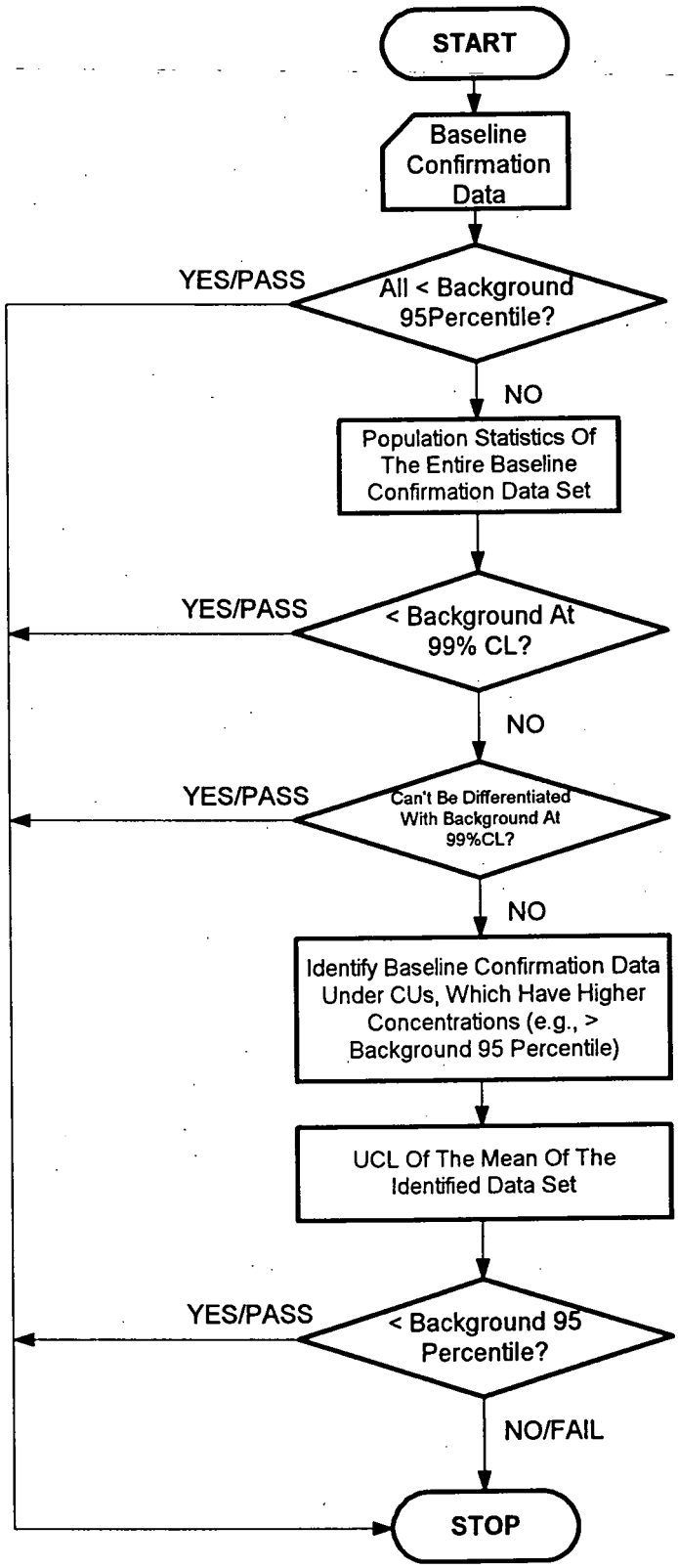

FIGURE 3-17 GENERAL STATISTICAL ANALYSES FOR BASELINE CONFIRMATION IN CULTIVATED AREA