OVERVIEW OF PDP QUALITY ASSURANCE ELEMENTS FOR FINISHED DRINKING WATER

1. Standard Operating Procedures (SOPs) - Written SOPs are in place to provide uniform administrative, sampling, and laboratory procedures. Before submission, data are reviewed by each Quality Assurance Unit (QAU) for completeness and adherence to PDP requirements.

2. On-site Reviews - On-site reviews are performed to determine compliance with PDP SOPs. Improvements in sampling, chain-of-custody, record keeping, laboratory, and electronic data transmission procedures are made as a result of on-site reviews.

3. Proficiency Check Samples - All facilities are required to participate in PDP's Check Sample program. Periodically, custom quality control (QC) solutions containing pesticide(s) of known quantities are sent to the participating laboratories to be spiked into finished drinking water matrix blanks and tested under the same conditions as routine samples. The resulting data are used to determine performance equivalency among the testing laboratories, and to evaluate individual laboratory performance.

4. Quality Control Procedures - PDP operating procedures for quality control (QC) are intended to assess method and analyst performance during sample preparation, extraction, and determination. To maximize sample output and decrease the QC/sample ratio, samples are analyzed in analytical sets, generally 12 and not to exceed 20 samples per set, which include the field samples and the following QC components.

    a. Field Blank: One field blank will be generated per sample collection event at one designated QA/QC site. At the time the analytical sample is obtained, the collector will generate a field blank. A field blank consists of 1 liter of pesticide-free water, which is poured into a sample collection bottle and shipped with the analytical sample. The purpose of the field blank is to demonstrate that contamination is not introduced during sampling and shipping to the laboratory.

    b. Reagent Blank: For finished drinking water analyses, no reagent blank is required.

    c. Matrix Blank: Filtered tap water will be used as the matrix blank for finished drinking water analyses.

    d. Matrix Spike(s): Prior to extraction, a portion(s) of matrix blank is spiked with marker pesticides to determine the accuracy of the analyst and instrument performance. Marker pesticides are compounds selected from different pesticide classes (organochlorines, organophosphates, carbamates), which have physical and chemical characteristics similar to those in the class they represent.

    e. Process Control Spike: A compound of physical and chemical characteristics, similar to those of the pesticides being tested, is used to evaluate the analytical process on a

sample-by-sample basis. Each of the analytical set components, except the matrix blank, is spiked with process controls.

5. Method Performance and Verification Procedures - Laboratories are required to experimentally determine and verify the limits of detection (LODs) and LOQs for each compound. LODs depend on the analyte and the detection system and range from 0.001 to 2.0 parts per billion (ppb) – refer to applicable laboratory LOD and LOQ summary sheets for additional information. Quantitation and confirmation is primarily performed by mass spectrometry (MS) techniques, including gas chromatography (GC)/MS-MS and liquid chromatography (LC)/MS. For selected compounds such as the organophosphates, which do not perform well under MS conditions, specific detectors such as flame photometric detectors (FPDs) are utilized. All initial residue determinations must be confirmed, preferably by MS. In the few occasions when MS verification is not possible, verification may be restricted to dual column confirmation. Verified residue amounts above LOD and below LOQ are reported as below quantifiable level and assigned values at ½ LOQ at the request of EPA for use in dietary risk assessment.