2.10 400 Area

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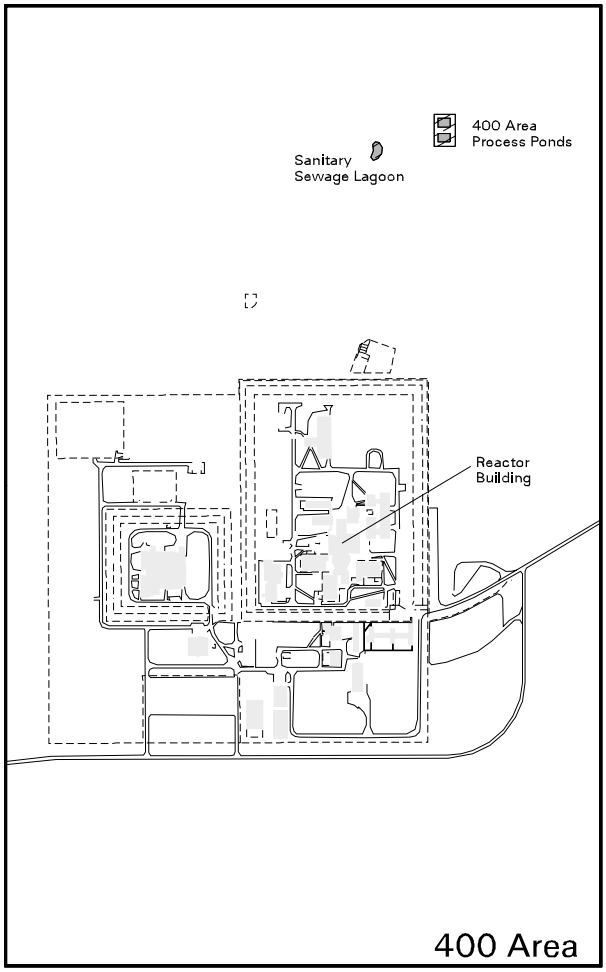
The 400 Area on the Hanford Site is the location of the Fast Flux Test Facility, a liquid sodium-cooled reactor. The reactor is on standby, pending a decision to restart it for the production of medical isotopes. Assessment efforts associated with the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* 300-FF-2 Operable Unit will extend to include groundwater contamination in the 400 Area. Primary groundwater monitoring activities in the 400 Area include monitoring of the 4608 B/C ponds (also called the 400 Area process ponds) for compliance with a waste discharge permit and monitoring of the 400 Area water supply, which is provided by wells completed in the unconfined aquifer system. Monitoring is also conducted to provide information needed to describe the nature and extent of site-wide contamination.



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2.10.1 Groundwater Flow

The Hanford Site water-table map (see Plate 2) shows the groundwater-level contours for the 400 Area. The water-table map indicates that flow is generally from west to east across the 400 Area. The water table is located near the contact of the Hanford and Ringold formations, which is ~49 meters below ground surface (WHC-EP-0587). Hanford formation sediment dominates groundwater flow in the 400 Area because of its relatively high permeability compared to that of sediment in the Ringold Formation.

Monitoring Objectives in 400 Area

Groundwater monitoring is conducted in the 400 Area:

- triennially to annually to describe the nature and extent of contamination
- quarterly to detect possible impacts of 400 Area process ponds
- monthly to monitor tritium trends in drinking water wells.

2.10.2 Nitrate and Nitrite

Nitrate is the only significant contaminant attributable to 400 Area operations and has been detected at elevated levels in one of the wells (699-2-7) downgradient to the process ponds. Elevated nitrate concentrations up to 92 mg/L (45-mg/L maximum contaminant level) were found in well 699-2-7 during fiscal year

1999 and are attributed to the sanitary sewage lagoon immediately west and upgradient of the process ponds (Figures 2.10-1 and 2.10-2). Groundwater samples associated with this well are also frequently elevated with respect to nitrite (Figure 2.10-3), which may have been generated by reduction of nitrate to nitrite as part of denitrification. All nitrite values are below the 3.3-mg/L maximum contaminant level, however. Disposal to the lagoon has been discontinued, and the lagoon has been backfilled. Thus, groundwater contamination from this source is expected to diminish with time. Nitrate and nitrite concentrations in samples obtained from the new downgradient well 699-2-6A have not been significantly elevated relative to the upgradient well 699-8-17.

The 400 Area lies within the contaminant plume from the 200 Areas. Nitrate is the only contaminant with a source in the 400 Area.

2.10.3 Tritium

Elevated levels of tritium (Figure 2.10-4) associated with the groundwater plume from the vicinity of the Plutonium-Uranium Extraction Plant in the 200 East Area were identified in 400 Area wells as in previous years. This source of groundwater contamination is relevant to the water-supply wells, which provide drinking water and emergency supply water for the 400 Area. The tritium concentrations in wells 499-S0-7, 499-S0-8, and 499-S1-8J are compared in Figure 2.10-5 to that of the 400 Area drinking water supply. Tritium was found at levels at or above the 20,000-pCi/L interim drinking water standard in most samples from well 499-S0-7 during fiscal year 1999. Samples collected from well 499-S0-8 also exceeded the interim drinking water standard during the latter part of fiscal year 1999. All samples collected from well 499-S1-8J in fiscal year 1999 were below the interim drinking water standard. The lower concentrations of tritium north of the 400 Area are probably related to discharge at the process ponds.

Tritium remained below the 20,000-pCi/L interim drinking water standard and the 4-mrem/yr dose equivalent in the drinking water supply, sampled at a tap for all sampling events in fiscal year 1999 (see Figure 2.10-5). Nitrate remained below the maximum contaminant level in fiscal year 1999 for the water-supply wells. Data from fiscal year 1999 and earlier from 400 Area and surrounding wells indicates no other constituents are present at levels above their maximum contaminant levels or interim drinking water standards.

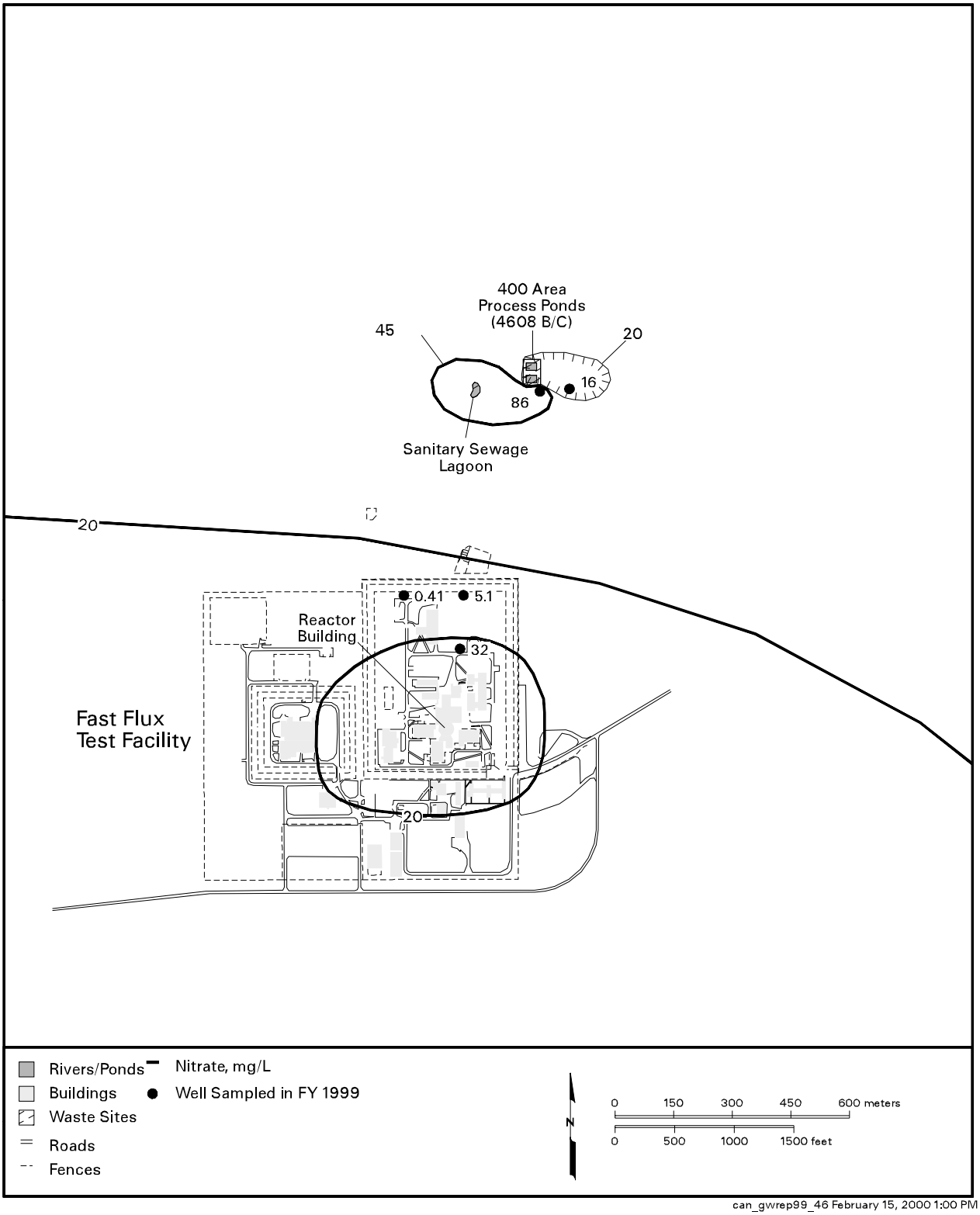

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Figure 2.10-1. Average Nitrate in Wells at 400 Area

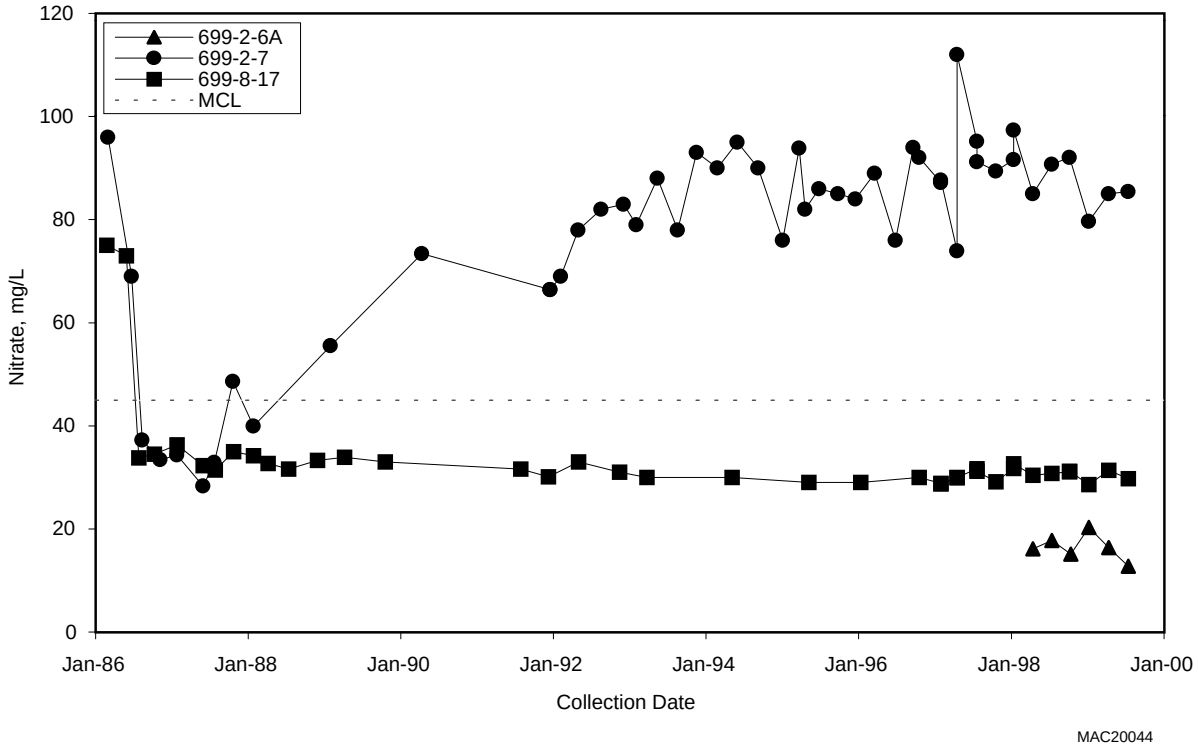

Figure 2.10-2. Nitrate in 600 Area Wells Near 400 Area

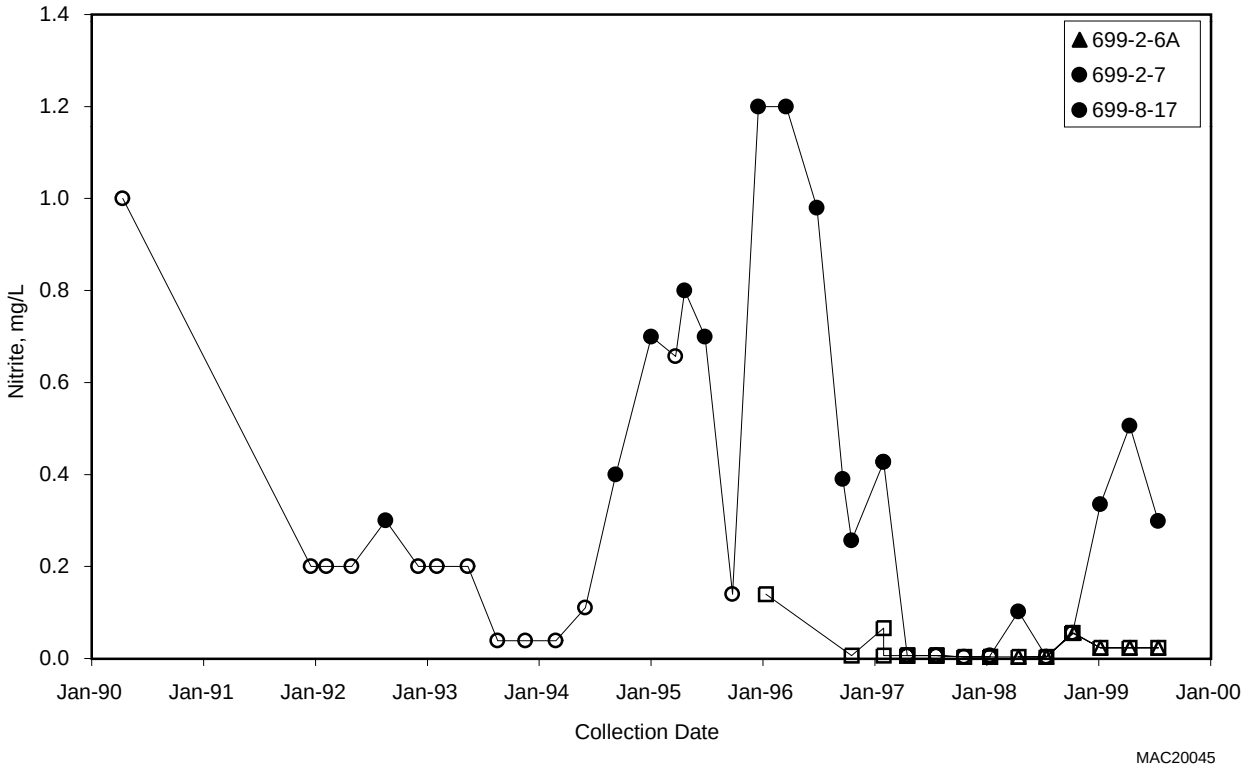

Figure 2.10-3. Nitrite in 600 Area Wells Near 400 Area

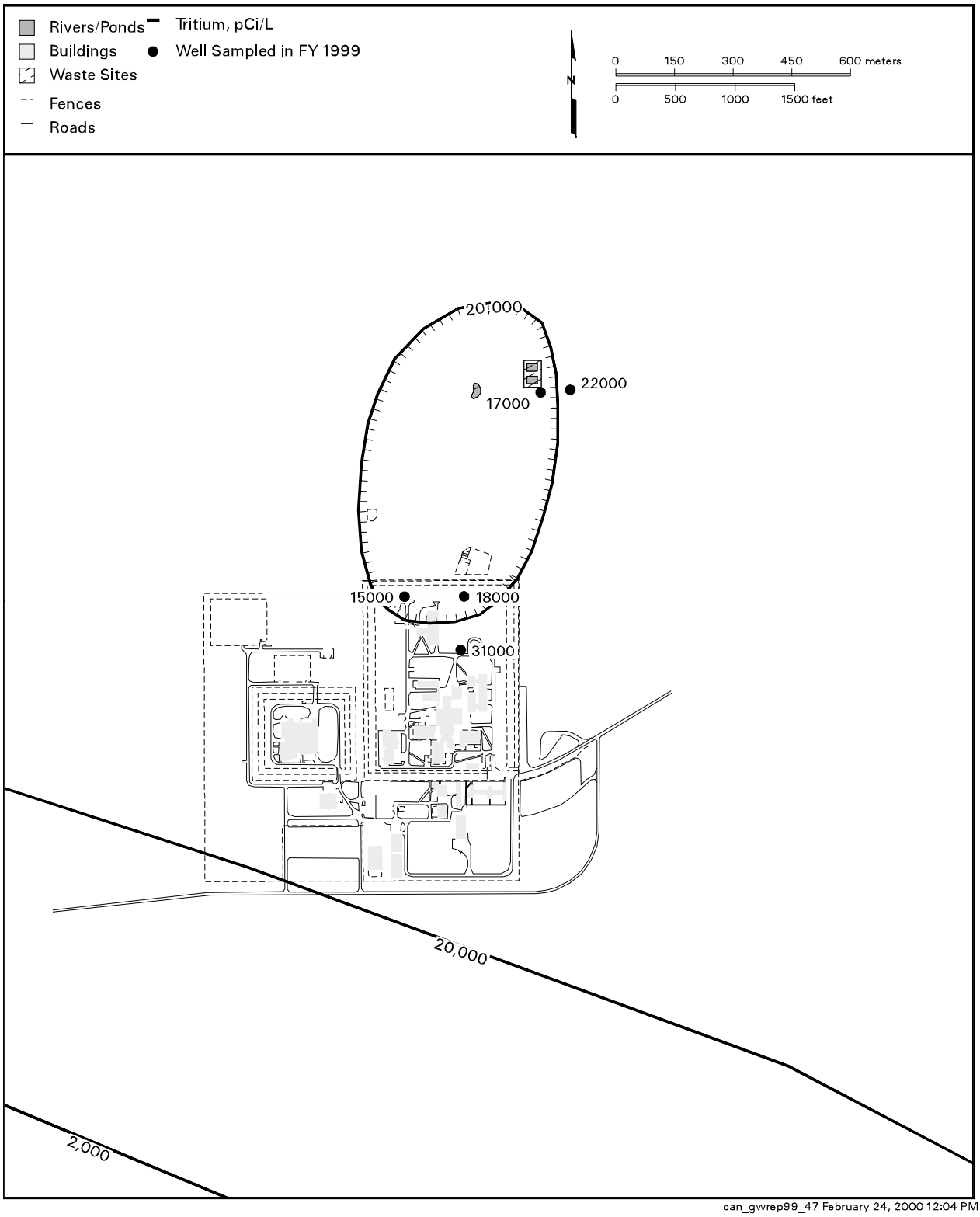

Figure 2.10-4. Average Tritium in Wells at 400 Area

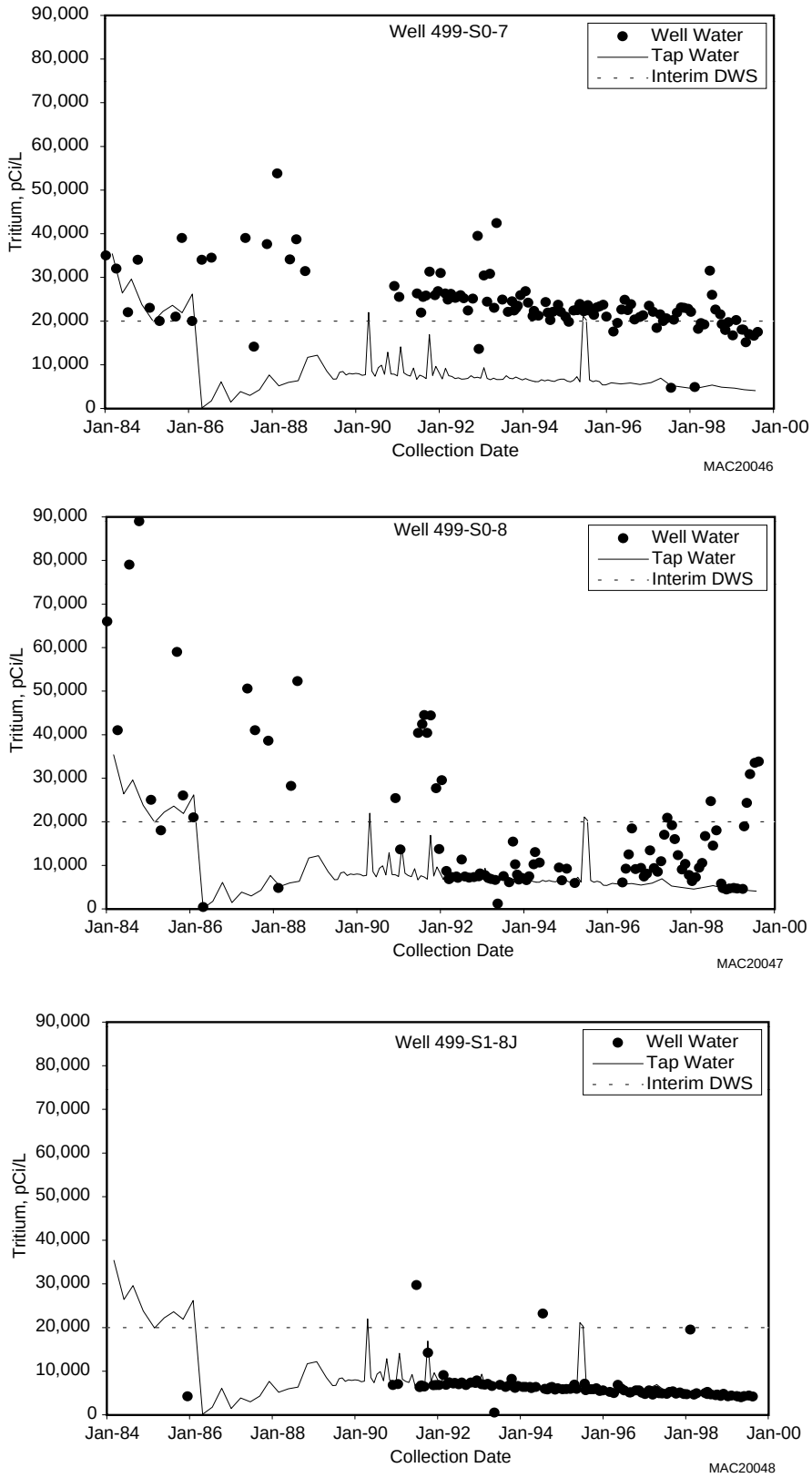

Figure 2.10-5. Comparison of Tritium Concentrations in 400 Area Drinking Water System