

CLEAN

Contract No. N62474-88-D-5086

Contract Task Order 0324

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Prepared for:

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Naval Facilities Engineering Command

**MOFFETT FEDERAL AIRFIELD  
CALIFORNIA  
(Formerly Naval Air Station Moffett Field)**

**NOVEMBER 1994  
FINAL QUARTERLY REPORT**

Prepared By

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Navy monitoring wells (a total of 346 wells) are included in the quarterly sampling program being performed under the CLEAN contract, but each well is not sampled every quarter. The quarterly sampling program concentrates on areas affected by Navy sources and regional contamination. Rationale for the current selection process is detailed in the Year-Two Quarterly Groundwater Sampling and Analysis Plan (SAP) (PRC and Montgomery Watson 1994).

As stated above, the sampling schedule is designed to provide geographically relevant and comprehensive data. Sampling wells in geographic proximity to each other allows for more accurate characterization of a specific geographical area. The November quarterly monitoring effort focused on wells in the east-side aquifers and newly installed wells. Groundwater was sampled from 91 A1-aquifer zone monitoring wells, 5 A2-aquifer zone wells, 1 A1/A2-aquifer zone well, and 5 wells screened in landfill material. The locations of the A1-aquifer zone monitoring wells and the wells screened in landfill material that were sampled in November and December 1994 are shown in Figure 3. The locations of the A2-aquifer zone monitoring wells sampled in November and December 1994 are shown in Figure 4. By site, sampled wells include 15 Site 1 wells; 9 Site 2 wells; 11 Site 3 wells; 10 Site 4 wells; 16 Site 7 wells; 30 additional wells from selected locations in the east-side aquifer; and 11 wells from selected locations in the west-side aquifer.

A list of proposed wells to be sampled and analytical methods to be performed was specified in a letter from PRC to ENGFLDACTWEST dated November 1, 1994 (PRC 1994). The list served to amend the proposed list of wells to be sampled that is provided in the SAP. The following minor changes to the proposed scope of work were made: 1) Well W7-5 was not sampled as proposed because it could not be located; 2) sampling for general chemistry parameters was performed at wells W1-2 and WGC2-2 in order to provide general chemistry data for Site 1 and Golf Course Landfill 2, respectively (each site sampled during the monitoring event had one well sampled for general chemistry); 3) groundwater samples collected from Site 1 wells W1-5 through W1-9, W1-11, W1-12, and W1-14 through W1-17 were filtered with 0.45-micron-size and 5.0-micron-size filters and separately analyzed for dissolved metals. Prior to May 1994, all samples collected for dissolved metals analysis were filtered solely with 0.45-micron-size filters. During the May and August 1994 sampling events, 5.0-micron-size filters were solely used for dissolved metals sample filtration. The change from 0.45-micron-size filters to 5.0-micron-size filters was made at the request of the EPA. Both filter types were used during the November 1994 sampling event in order to correlate historical

analytical data for samples collected with 0.45-micron-size filters with data from the 5-micron-size filter samples. This information was necessary for the OU1 feasibility study. Following the November 1994 quarter, metals sample filtration will resume by solely using 5.0-micron-size filters.

Table 1 lists each monitoring well sampled during the November 1994 monitoring event. Table 1 also lists the aquifer zone monitored, date of sampling, laboratory analyses performed, and related quality assurance/quality control (QA/QC) samples.

### **3.0 METHODS AND PROCEDURES**

The specific methods and procedures used for quarterly sampling are described in the SAP (PRC and Montgomery Watson 1994) and are not reiterated in this quarterly report. However, a brief description of field data is provided in Section 3.1, and each of the RI/FS plans are described in Section 3.2 to indicate the source of detailed information concerning a specific method or procedure. Section 3.3 describes the quarterly groundwater level survey, since this topic is not covered in the guidance plans and documents. In addition, the laboratory analytical methods used to quantify and report groundwater chemical constituents are described in Section 3.4.

#### **3.1 FIELD SAMPLING DATA**

The sampling technicians recorded observations and instrument readings in both a field notebook and on groundwater sampling data sheets. The following information was recorded while sampling:

- Well volume
- Amount of water removed during purging
- Field instrument model and serial numbers
- Date and time purging began, time that each parameter was measured, and time of sample collection
- Pumping rate during well purging and sampling
- Dissolved oxygen, pH, temperature, specific conductance, and turbidity measured in groundwater while purging and sampling

- Organic vapor concentration detected in air near the top of the well casing
- Depth of sample collection
- Static water level

Each well was purged until at least three well volumes (which includes the volume of water in the well casing plus the pore space of the annular sand pack) had been removed. This volume was usually sufficient for the stabilization of the groundwater parameters. For a few wells that recharged very slowly, a sample was collected after the well had been purged dry then allowed to recharge at least 80 percent of its pre-purge water level. The SAP (PRC and Montgomery Watson 1994) contains more detailed information concerning well purging and sampling methods and procedures.

### **3.2 MOFFETT FEDERAL AIRFIELD GUIDANCE DOCUMENTS**

Four CLEAN RI/FS documents prepared by PRC and Montgomery Watson were used to guide activities during the November 1994 quarterly sampling event at MFA. These documents include the SAP (PRC and Montgomery Watson 1994), Field Sampling Plan (FSP) (PRC and JMM 1992b), Quality Assurance Project Plan (QAPjP) (PRC and JMM 1992c), and the General Health and Safety Plan (HSP) (PRC and JMM 1992a). The contents of each of these documents are briefly described below.

#### **3.2.1 Quarterly Groundwater Sampling and Analysis Plan**

The following is a list of field methods and procedures described in detail in the SAP (PRC and Montgomery Watson 1994):

- Sample identification
- Sampling equipment and procedures, including decontamination procedures, field QC requirements, calibration and maintenance of field equipment, and waste handling and disposal practices
- Sample handling and documentation

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November Quarter 1994

APPENDIX C  
CONCENTRATION-VERSUS-TIME GRAPHS

**APPENDIX C CONTAINS THE FOLLOWING DATA:**

- **TABLE OF HISTORICAL CHEMICAL DATA USED TO GENERATE CONCENTRATION-VERSUS-TIME GRAPHS**
- **CONCENTRATION-VERSUS-TIME GRAPHS FOR SELECTED WELLS AND COMPOUNDS AT MOFFETT FEDERAL AIRFIELD**

TABLE C-1

GROUNDWATER SAMPLE CHEMICAL CONCENTRATIONS FOR  
WELLS INCLUDED IN TIME-VERSUS-CONCENTRATION GRAPHS  
MOFFETT FEDERAL AIRFIELD  
QUARTERLY MONITORING PROGRAM  
NOVEMBER 1994

Well ID	Sampling Date	Concentration ( $\mu\text{g/L}$ )					
		PCE	TCE	1,2-DCE	Benzene	TPH-g	TPH-d
W1-1	8/12/88	25 U	25 U	25 U	9 J	NS	NS
	9/16/88	5 U	5 U	5 U	5 U	NS	NS
	10/11/88	12 U	12 U	12 U	12	NS	NS
	2/3/89	25 U	25 U	25 U	6 J	NS	NS
	5/9/89	20 U	20 U	20 U	15 J	NS	NS
	8/7/89	13 U	13 U	13 U	7 J	NS	NS
	12/3/92	33 U	33 U	33 U	12 J	1,000 J-K	7,800 J-K
	9/9/94	2 U	2 U	0.3 J	13 B	1,100 Y	12,000 JY-S
	11/21/94	25 U	25 U	25 U	12	880 Y	10,000 Y
W3-19	5/22/91	5 U	5 U	12	5 U	NS	250 U
	6/21/91	5 U	5 U	10	5 U	NS	250 U
	7/30/91	10 U	10 U	19	10 U	NS	250 U
	9/24/91	10 U	10 U	18	10 U	NS	250 U
	1/7/92	10 U	10 U	20	10 U	NS	250 U
	4/2/92	10 U	10 U	18	10 U	NS	250 U
	10/5/93	2 U	2 U	24	0.5 U	50 U	500 U
	5/26/94	2 U	0.4 J	23	2 U	NS	NS
	8/31/94	2 U	2 U	35	0.5 U	50 U	500 U
11/18/94	2 UJ-S	2 UJ-S	33 J-S	2 UJ-S	NS	NS	
W4-4	11/21/88	8 J	20 J	490	9 J	NS	NS
	2/21/89	5	16	140	5 U	NS	NS
	5/24/89	7	24	100	5 U	NS	NS
	8/28/89	4 J	19	69	5 U	NS	NS
	5/7/91	5	33	21	5 U	NS	1,880 JZ
	10/14/91	4 J	30	140	10 U	NS	1,860 J
	1/22/92	3 J	25	140	10 U	NS	250 U
	4/24/92	2 J	22	36	10 U	NS	730 J
	12/11/92	2	26	200 D	0.5 U	150 J-N	500 U
	8/31/94	2 J-H	18 J-H	31 J-H	0.2 J-H	NS	NS
	11/15/94	2 J	19	55	0.5 U	73 Y	NS

TABLE C-1

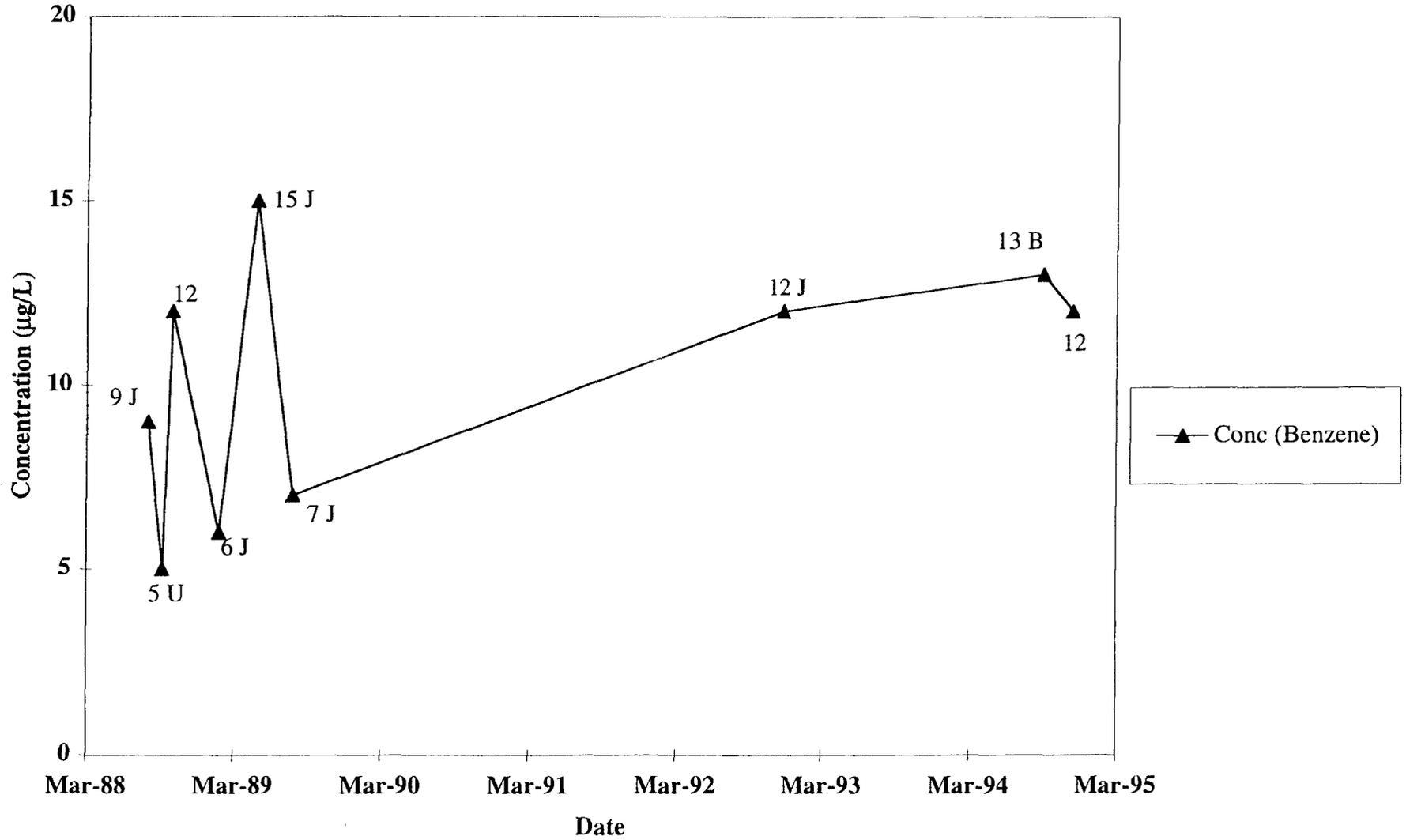
**GROUNDWATER SAMPLE CHEMICAL CONCENTRATIONS FOR  
WELLS INCLUDED IN TIME-VERSUS-CONCENTRATION GRAPHS  
MOFFETT FEDERAL AIRFIELD  
QUARTERLY MONITORING PROGRAM  
NOVEMBER 1994  
(Continued)**

Well ID	Sampling Date	Concentration ( $\mu\text{g/L}$ )					
		PCE	TCE	1,2-DCE	Benzene	TPH-g	TPH-d
W43-2	9/11/90	130	53	12	NS	NS	NS
	7/30/91	260	53	12	NS	NS	NS
	11/14/91	210	67	13	NS	NS	NS
	2/13/92	92	35	9.5	NS	NS	NS
	6/2/92	130	40	13	NS	NS	NS
	12/16/92	120	46	17	NS	NS	NS
	12/11/93	NS	NS	NS	NS	NS	NS
	5/24/94	NS	NS	NS	NS	NS	NS
	9/2/94	NS	NS	NS	NS	NS	NS
11/28/94	140 D	51 D	17	NS	NS	NS	
W7-7	6/9/93	3	7	83 D	NS	670	21,000 J-T
	12/10/93	4 J	7 J	48	NS	NS	99,000
	5/24/94	2 J	4 J	51	NS	6,600 Y	8,900 J-S
	9/9/94	NS	NS	NS	NS	2,000 Y	16,000 Y
	11/16/94	5	7	58	NS	3,200 Y	9,500 J-S
WNX-4	3/10/94	250 U	250 U	240 J	4,900	21,000	NS
	6/2/94	250 U	250 U	160 J	3,900	16,000	NS
	9/14/94	33 U	33 U	230	3,900 D	12,000	NS
	11/16/94	33 U	11 J	220	3,800	13,000 Y	NS

NS - Not sampled for this constituent

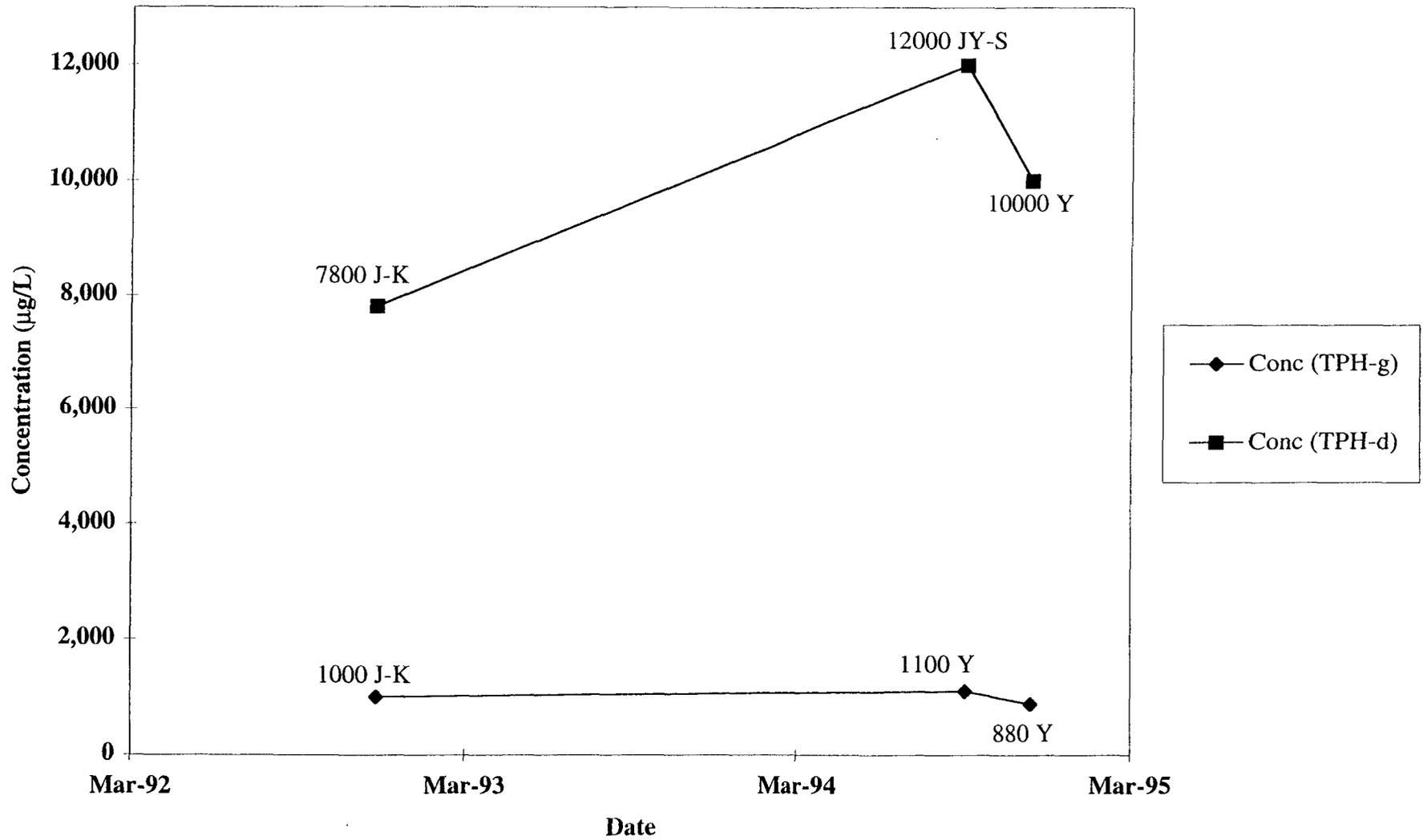
- Not shown on graph

Moffett Federal Airfield  
W1-11



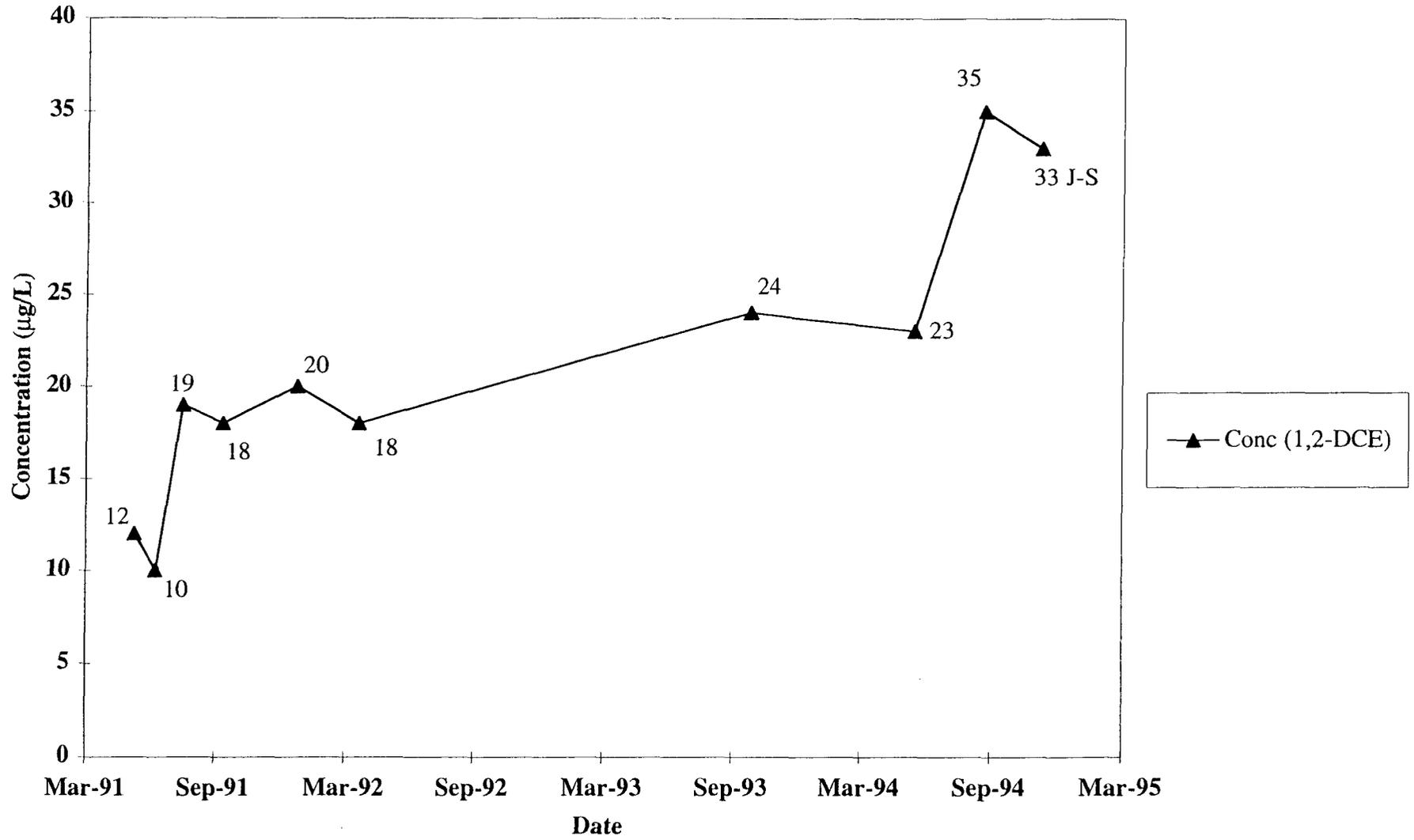
Note: See Table 4 in text for explanation of data qualifiers.

Moffett Federal Airfield  
W1-11



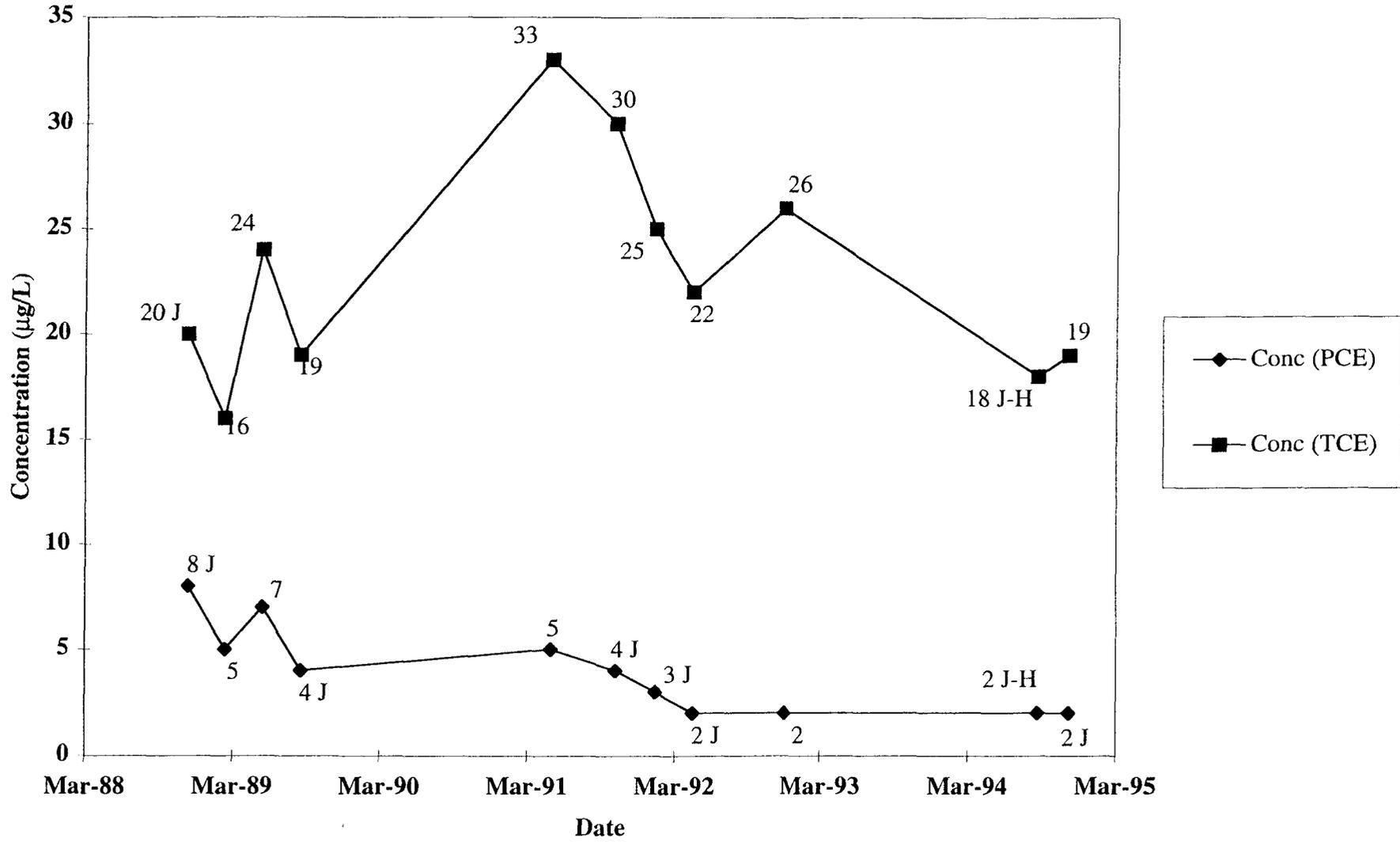
Note: See Table 4 in text for explanation of data qualifiers.

Moffett Federal Airfield  
W3-19



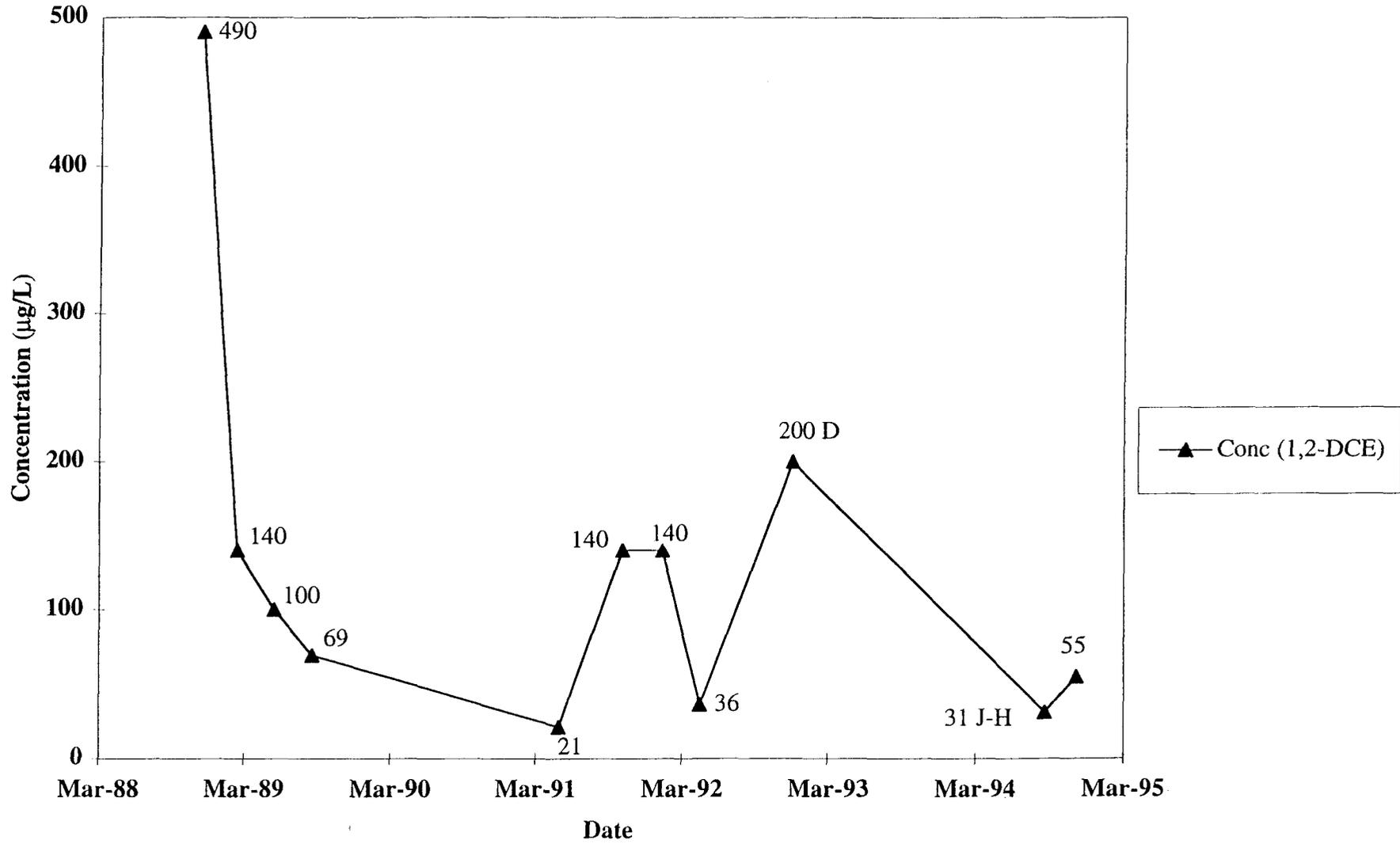
Note: See Table 4 in text for explanation of data qualifiers.

Moffett Federal Airfield  
W4-4



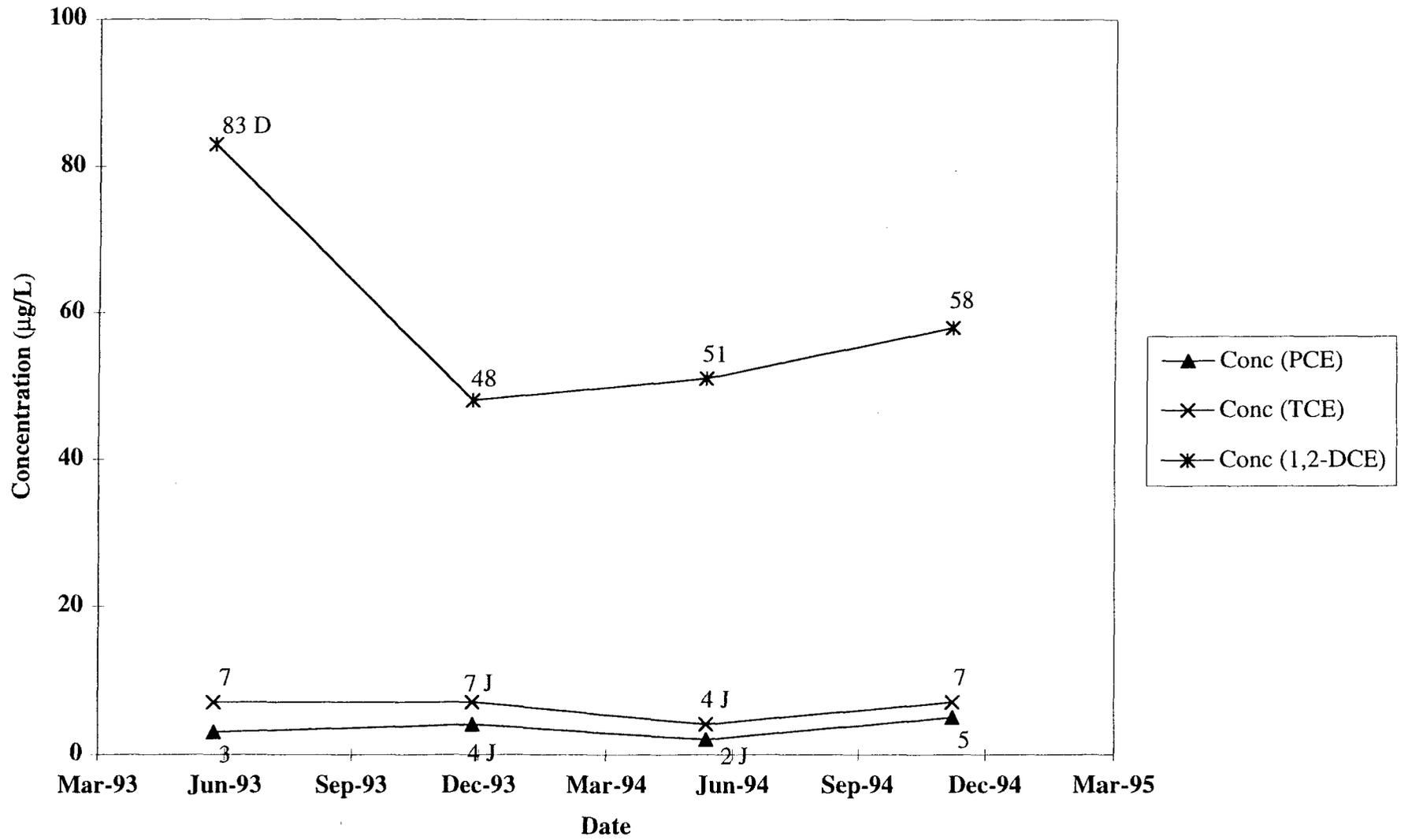
Note: See Table 4 in text for explanation of data qualifiers.

Moffett Federal Airfield  
W4-4



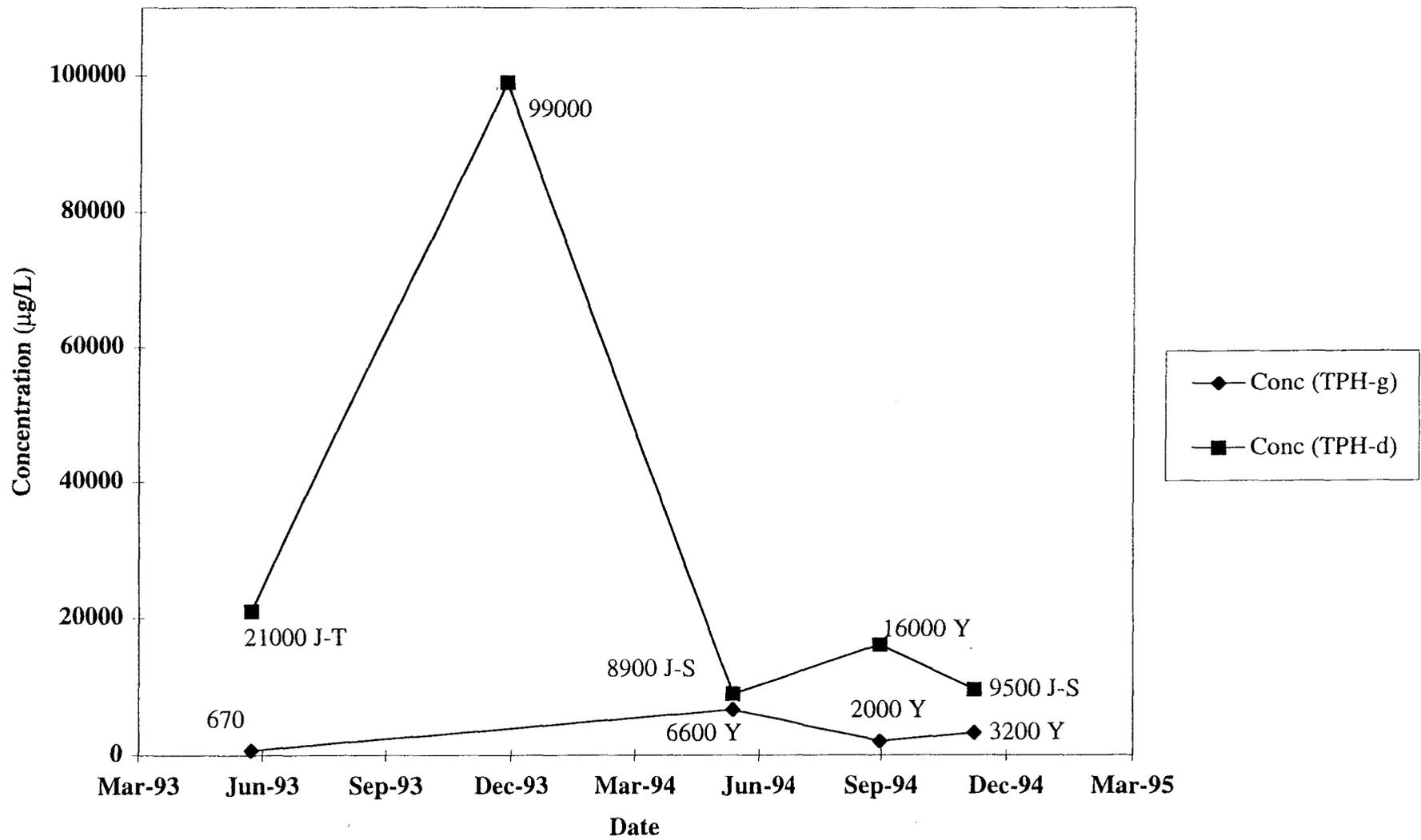
Note: See Table 4 in text for explanation of data qualifiers.

Moffett Federal Airfield  
W7-7



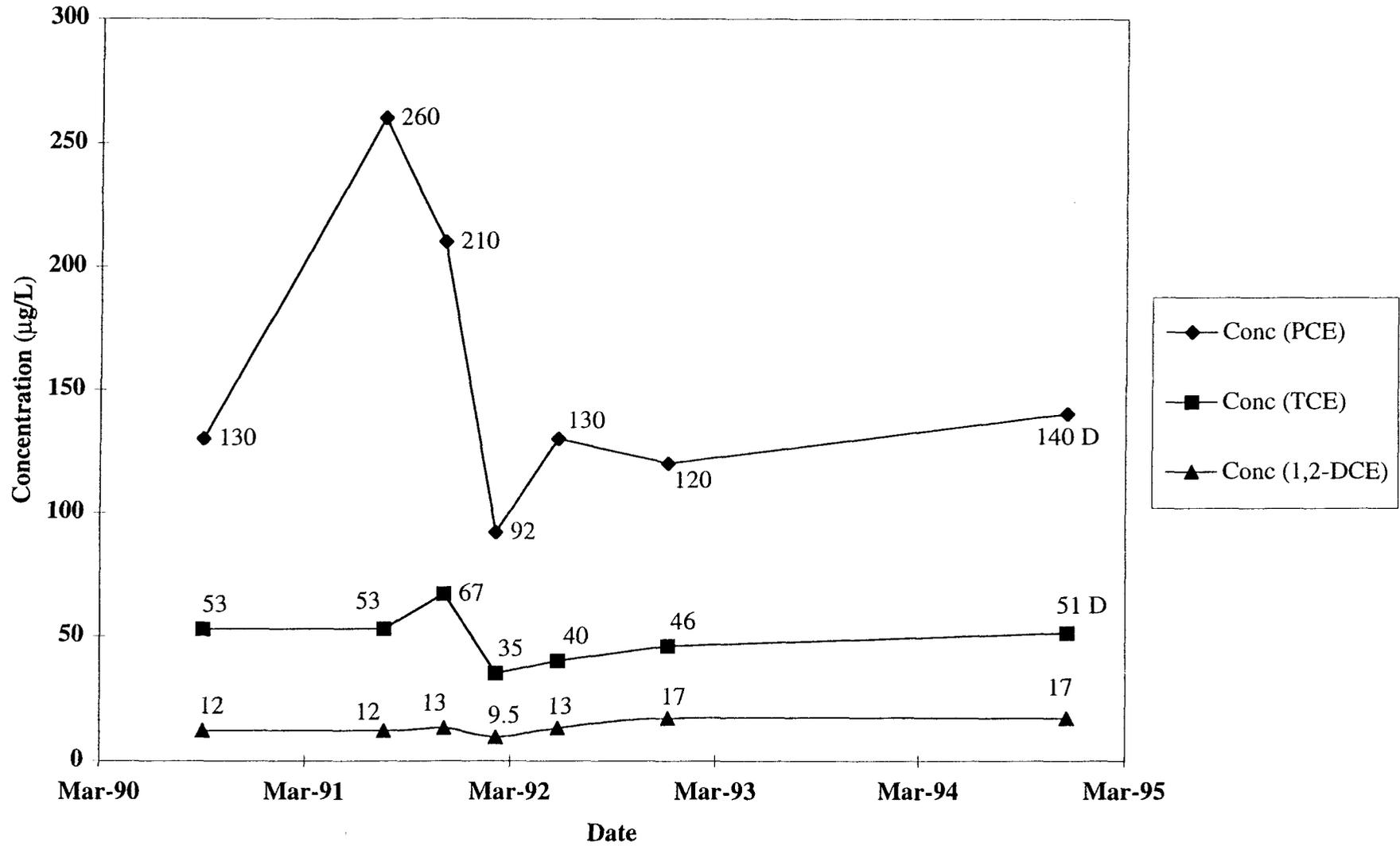
Note: See Table 4 in text for explanation of data qualifiers.

Moffett Federal Airfield  
W7-7



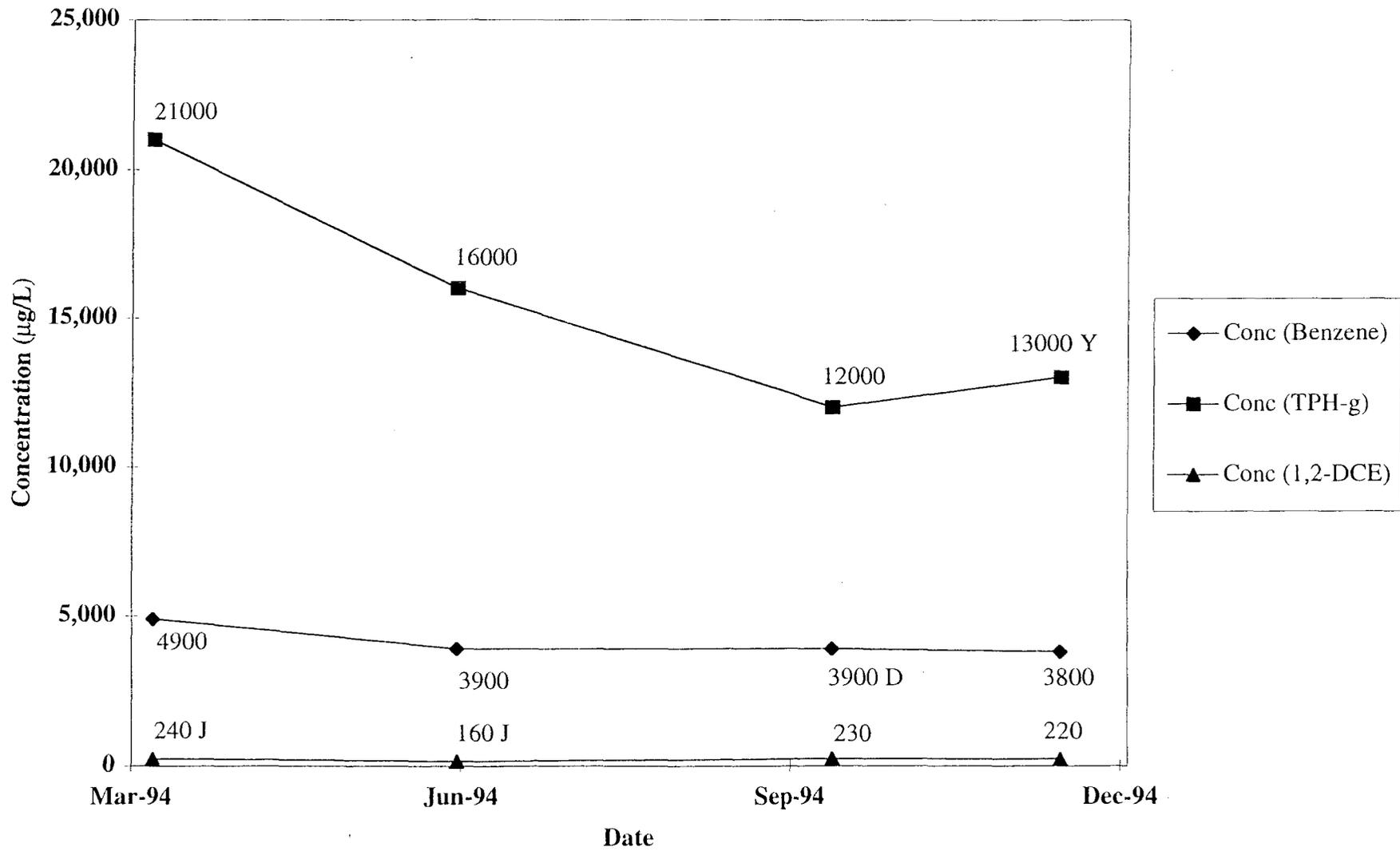
Note: See Table 4 in text for explanation of data qualifiers.

Moffett Federal Airfield  
W43-2



Note: See Table 4 in text for explanation of data qualifiers.

Moffett Federal Airfield  
WNX-4



Note: See Table 4 in text for explanation of data qualifiers.