

2009 ANNUAL PROGRESS REPORT

for

**Former Fairchild Buildings 20 and 20A
464 Ellis Street
Middlefield-Ellis-Whisman Area
Mountain View, California**

prepared for

Schlumberger Technology Corporation
225 Schlumberger Drive
Sugar Land, TX 77478

June 15, 2010

2009 ANNUAL PROGRESS REPORT

for

**Former Fairchild Buildings 20 and 20A
464 Ellis Street
Middlefield-Ellis-Whisman Area
Mountain View, California**

submitted to

USEPA, Region 9, Superfund Division
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San Francisco, California 94105

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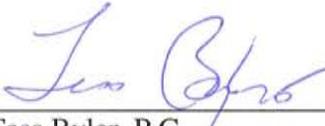
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Weiss Associates work for Schlumberger Technology Corporation was conducted under my supervision. To the best of my knowledge, the data contained in this report are true and accurate and are in accordance with generally accepted professional engineering and geologic practice. We make no other warranty, either expressed or implied, and are not responsible for the interpretation by others of the contents in this report.




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June 15, 2010

Date

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ACRONYMS AND ABBREVIATIONS

106 Order	Administrative Order for Remedial Design and Remedial Action
cm/sec	centimeter per second
DHS	Department of Health Services, California
Fairchild	Fairchild Semiconductor Corporation
ft bgs	feet below ground surface
FSCRD	final source control remedial design
HLA	Harding Lawson Associates
K	hydraulic conductivity
µg/L	micrograms per liter
mg/kg	milligram per kilogram
MEW	Middlefield-Ellis-Whisman
MCLs	maximum contaminant levels
NASA	National Aeronautics and Space Administration
NPL	National Priority List
PRPs	potentially responsible parties
QA/QC	quality analysis and quality control
RAOs	remedial action objective
RGRP	Regional Groundwater Remediation Program
RI/FS	remedial investigation and feasibility study
ROD	Record of Decision
RRWs	regional recovery wells
SCRWs	source control recovery wells
SCVWD	Santa Clara Valley Water District
the Site	464 Ellis Street in Mountain View, California
SVE	Soil Vapor Extraction
Water Board	California Regional Water Quality Control Board, San Francisco Bay Region
Weiss Associates	Weiss
TCE	trichloroethene
USEPA	United States Environmental Protection Agency
VOCs	volatile organic compounds

SUMMARY

This 2009 Annual Progress Report for Fairchild Semiconductor Corporation (Fairchild) former Buildings 20 and 20A (the Site) located at 464 Ellis Street in Mountain View, California (Figures 1, 2, and 3) contains a summary of Site activities from January 1 through December 31, 2009, and analytical data for the past five years. This report is submitted in accordance with Section XV of the 1990 Administrative Order for Remedial Design and Remedial Action (106 Order) issued by the United States Environmental Protection Agency (USEPA), Section XI of the Consent Decree entered in Action No. 20275 (N.D. Cal.) in 1992 (Consent Decree) and the USEPA's correspondence prescribing Annual Report contents (USEPA, 2005).

The 464 Ellis Street property does not have an associated groundwater extraction and treatment system. However, nine groundwater extraction wells associated with other systems are located on the property, as follows:

- RAY-1A and RAY-1B1: Two source control recovery wells (SCRWs) associated with the upgradient former Raytheon site, with extracted groundwater treated at the Raytheon treatment plant located at 350 Ellis Street.
- REG-4B1 and 65B3: Two regional recovery wells (RRWs), with the extracted groundwater treated by Fairchild System 19, located at 369 Whisman Road.
- DW3-219, DW3-244, DW3-334, DW3-364, and DW3-505R: Five deep aquifer RRWs that have been turned off with USEPA approval.

The operations and monitoring of the above extraction wells are reported in the respective Annual Progress Reports for the former Raytheon site (Locus, 2010), Fairchild System 19 Annual Report (Weiss, 2010) and the Regional Groundwater Remediation Program (Geosyntec, 2010).

Twelve groundwater monitoring wells are currently used to evaluate the distribution of volatile organic compounds (VOCs) in groundwater at the Building 20 Site. These monitoring wells are sampled annually and water levels are collected semi-annually.

Site activities conducted in compliance with the 106 Order at Buildings 20 and 20A during this reporting period included continued semiannual groundwater level monitoring in March and November, annual groundwater sampling in November 2009, and submitting information related to the USEPA's Second Five-Year Remedy Review for the Fairchild Sites in May and June 2009, including a USEPA Site inspection on May 5, 2009.

The VOC concentrations in the Building 20 monitoring wells continue to remain well below historical maximums, and show a long term decreasing trend. VOC concentrations in the monitoring wells and all extraction wells located at the Site are included in the MEW Regional Groundwater Remediation Program (RGRP) 2009 Annual Progress Report (Geosyntec, 2010).

Request to Change Reporting Requirements for Buildings 20 and 20A: The 2008 Annual Progress Report requested that further facility-specific reporting for Former Fairchild Buildings 20 and 20A be eliminated (Weiss 2009). However, this request has not yet been acknowledged by the USEPA. The PRPs are requesting again that the requirement for facility-specific reporting for Former Fairchild Building 20 be discontinued. The rationale for this request is:

1. No potential source areas were identified at former Fairchild Building 20 property during Site investigations.
2. Building 20 does not have an associated groundwater treatment system.
3. There is no facility-specific capture to evaluate.
4. Measured water levels and analytical results from groundwater monitoring wells at the property are reported in the RGRP Annual report.
5. Monitoring results from 2009 continue to indicate that VOC concentrations in groundwater are generally stable to declining.

This report is redundant with other reports at the MEW Area, since information is covered under Raytheon and Fairchild Building 19 Facility-specific reports, and Regional reporting. Furthermore, there are no planned optimization activities or USEPA Second Five Year Remedy Review follow-up actions for Buildings 20 and 20A.

1. INTRODUCTION

This 2009 Annual Progress Report contains a summary of Site activities from January 1 through December 31, 2009 at the former Fairchild Semiconductor Corporation (Fairchild) Buildings 20 and 20A previously located at 464 Ellis Street in Mountain View, California (the Site; Figures 1 and 2). This report is submitted in accordance with Section XV of the 1990 Administrative Order for Remedial Design and Remedial Action (106 Order) issued by the United States Environmental Protection Agency (USEPA), Section XI of the Consent Decree entered in Action No. 20275 (N.D. Cal.) in 1992 (Consent Decree) and the USEPA’s correspondence prescribing 2004 and future Annual Report contents (USEPA, 2005). Weiss Associates (Weiss) prepared this report on behalf of Schlumberger Technology Corporation (STC), and Geosyntec Consultants (Geosyntec) assisted with this report.

1.1 Site Background

The Building 20 and 20A Site is located at 464 Ellis Street, in a light-industrial area in Mountain View California. Building 20 functioned as a silicon wafer production facility for Fairchild Semiconductor Corporation from 1968 to the mid 1980’s. The primary constituent of concern is trichloroethene (TCE) in ground water from historical offsite underground tanks/piping, sumps and/or surface spills that migrated onto the Site. The buildings were demolished in the 1990’s, and new commercial/research offices were constructed and completed by early 2000. The past and current addresses of Former Fairchild Buildings 20 and 20A are provided below:

Previous Address	Current Address	Current Occupants
Buildings 20 and 20A 464 Ellis Street	464/466/468 Ellis Street	464 Ellis Street: Unoccupied 466 Ellis Street: Symantec 468 Ellis Street: Unoccupied

The Site is located within the Middlefield-Ellis-Whisman (MEW) area, an approximately 1/4-square mile area bound by Middlefield Road on the south, Ellis Street on the east, Whisman Road on the west, and Highway 101 on the north. Remedial Investigation and Feasibility Studies (RI/FS) were completed in 1988 (HLA, 1987, and Canonie, 1988), with the USEPA issuing a Record of Decision (ROD) in 1989. The ROD and two subsequent Explanations of Significant Differences (ESDs) specify the remedial actions for the MEW area (USEPA, 1989, 1990, 1996).

Remediation within the MEW area includes facility-specific activities by the individual PRPs, (such as this facility specific Site), and a Regional Groundwater Remediation Program (RGRP) that addresses commingled volatile organic chemicals (VOCs) that have migrated beyond the facility-specific areas and cannot be attributed to a single source. The RGRP also compiles and synthesizes all groundwater monitoring data, and presents this information in the RGRP Annual Report (Geosyntec, 2010).

1.2 Local Hydrology

Subsurface geology consists of interbedded sediments ranging in grain size from silty clay to sandy gravel. The water-bearing zones defined at the MEW Area are summarized in the following table:

Groundwater Zones	Approximate Depth Interval Below Ground Surface (bgs)
A ^a	20 to 45 ft
B1 ^b	50 to 75 ft
B2	75 to 110 ft
B3	120 to 160 ft
C	200 to 240 ft
Deep Aquifer	>240 ft

^aNavy and NASA refer to this zone as A1 zone north of Highway 101.

^bNavy and NASA refer to this zone as A2 north of Highway 101.

> = greater than

The upper groundwater zone is subdivided into two water-bearing zones, the A-zone and the B-zone, which are separated by the A/B aquitard. The B-zone aquifer has been further subdivided into three zones. From youngest to oldest (shallowest to deepest), these are the B1-, B2-, and B3-zones, separated by aquitards, designated the B1/B2 aquitard and the B2/B3 aquitard. The lower groundwater zones occur below the B/C aquitard, from about 200 ft bgs. The B/C aquitard is the major confining layer beneath the MEW area. Two lower groundwater zones have been defined: The C-zone and what has been termed the Deep Aquifer, below the C-zone (HLA, 1987; Intel, 1987).

The ranges of hydraulic conductivity (K) hydraulic gradient, and transmissivity of the upper aquifer zone i.e., above the B3/C aquitard, calculated from pumping tests conducted at the MEW Site from 1986 through 2005 are summarized below (Canonie, 1986a, 1986b, 1987, and 1988; Geomatrix, 2004; HLA, 1987; Locus, 1998; PRC, 1991; Navy, 2005; and Weiss, 1995 and 2005).

Water-Bearing Zone	Estimated Hydraulic Conductivity (ft/day)		Approximate Horizontal Gradient (ft/ft)	Saturated Thickness (ft)	Transmissivity (ft ² /day)	
	Low	High			Low	High
A-zone	6	480	0.004	15	44	4,400
B1-zone	20	260	0.003	25	150	2,600
B2-zone	0.4	5	0.002 to 0.005	35	2	230
B3-zone	0.5	5	0.001 to 0.002	40	5	130

Currently and historically, the horizontal component of groundwater flow beneath the Site is generally towards the north during non-pumping and pumping conditions. The Site groundwater gradients and velocities have been locally altered near SCRWs, RRWs, and the Fairchild and Raytheon slurry walls (Weiss, 2010).

The vertical component of groundwater flow is generally upward from the B1- to the A-zone, but is locally downward in some areas of the Site (HLA, 1987). Vertical gradients below the B1-zone are generally upward (Geosyntec, et al, 2008).

1.3 Description of Remedy

No potential sources were identified at Fairchild's former Building 20, and the Final Source Control Remedial Design (FSCRD) for the Site was included as part of Raytheon Company's (Raytheon's) FSCRD for its facility at 350 Ellis Street in Mountain View, California. The remediation of soils at the Site was incorporated in the *in-situ* aeration system operated by Raytheon at its 350 Ellis Street facility. A SVE and treatment system started operation on August 7, 1996.

On May 7, 1997, USEPA approved the Soil Closure Confirmation Sampling Report for areas outside Raytheon's slurry wall at 350 Ellis Street and on the adjacent former Fairchild Building 20 Site. The SVE wells and associated piping in the area have since been removed.

Raytheon installed and currently operates two SCRWs, RAY-1A and RAY-1B1, at the 464 Ellis Street property. Extracted groundwater from the two wells is conveyed to Raytheon's groundwater treatment system on their 350 Ellis Street property. Additionally, the MEW RGRP installed one B1-zone (REG-4B1), one B3-zone (65B3), and five C/Deep aquifer regional recovery wells; (RRWs) (DW3-219, DW3-244, DW3-334, DW3-364, and DW3-505R) at the Site. When operating, groundwater from the RRWs is conveyed to Fairchild System 19, located at 369 Whisman Road.

As specified in the ROD, the remedy consists of groundwater extraction and treatment. The remedy is designed to protect local water supplies and to remediate or control groundwater that contains elevated concentrations of chemicals, including control of discharge of such groundwater to surface water.¹ Groundwater cleanup goals are 5 µg/L for TCE in shallow groundwater (A and B zones) and 0.8 µg/L for TCE in deep groundwater (C and Deep zones).² The ROD states that the chemical ratio of TCE to other chemicals found at the Site is such that achieving the cleanup goal for TCE will result in cleanup of the other Site chemicals to at least their respective federal MCLs (USEPA, 1989).

1.4 Summary of Site Activities and Deliverables

Site activities conducted in compliance with the 106 Order during this reporting period include:

- Collecting semi-annual groundwater elevation measurements in Site monitoring wells on March 26 and November 19;
- Distributing the 2008 Annual Progress Report to the United States USEPA and MEW Distribution List parties on June 15;
- Collecting groundwater samples from Site monitoring wells in November;

¹ The objectives of the groundwater remedy design are described in the ROD and the Feasibility Study (Canonie,1988).

² Groundwater cleanup goals are presented in the ROD.

- Assessing the progress of remedial actions during 2009; and,
- Planning remedial actions for 2010.

Section 2 of this report provides a summary of groundwater extraction and remediation at the Site during the reporting period. Sections 3-7 documents additional activities, problems encountered, technical assessment, conclusions and recommendations, and a summary of remedial activities planned for calendar year 2010. Supporting data are presented in Figures 1 and 3, Tables 1 through 3, and Appendices A through D.

2. GROUNDWATER EXTRACTION AND TREATMENT

2.1 Groundwater Extraction Wells

There are no extraction wells associated with the Building 20 Site.

Raytheon SCRWs, RAY-1A and RAY-1B1 at the 464 Ellis Street property are discussed in the Raytheon Annual Report (Locus, 2010). The MEW RGRP RRWs; REG-4B1, 65B3, and DW3-219, DW3-244, DW3-334, DW3-364, and DW3-505R are discussed in the RGRP and Fairchild System 19 Annual Reports (Geosyntec, 2010 and Weiss, 2010).

2.2 Groundwater Monitoring Wells

There are currently twelve monitoring wells associated with the Building 20 and 20A Site. Four wells are in the A zone, two in the B1-zone, four in the B2-zone, and one each in the B3- and C-zones. These wells are sampled annually for VOCs and water levels are measured semi-annually. Monitoring well construction details are provided in Table 1.

2.3 VOC Analytical Results

The 2009 Annual Groundwater Sample Event at the Site was conducted in November 2009. The sampling schedule for wells at this Site is provided in Table 2. Copies of the chain of custody forms and analytic reports for the samples collected during the 2009 Annual Sampling event are located in Appendix B. A summary of chemical analytic results for the previous five is provided in Table 3. Appendix C contains the quality analysis and quality control (QA/QC) evaluation and summary tables. VOC versus time graphs for Site monitoring wells are included in Appendix B. The data provided in Table 3 and Appendix D show that for the monitoring wells sampled in 2009, VOC concentrations in groundwater are generally stable to declining.

TCE isoconcentration contour maps for 2009 are included in the MEW RGRP Annual Progress Report (Geosyntec, 2010).

3. OTHER ACTIVITIES

3.1 Optimization Evaluation for Groundwater

No optimization activities are proposed for Buildings 20 and 20A (Geosyntec, et al, 2008).

3.2 Air/ Vapor Intrusion

The final *Revised Supplemental Feasibility Study for Vapor Intrusion* was issued on June 29, 2009 (Haley & Aldrich, 2009). The USEPA issued a Proposed Plan to address Vapor Intrusion in June 2009, and held a public meeting on July 23, 2009.

In the Fall of 2009, indoor air samples were collected at ten commercial buildings in the MEW Area pursuant to requests from the owners of the buildings. Samples were collected in the several buildings near the Site located at:

- 480/488 Ellis Street;
- 500 Ellis Street; and,
- 550 Ellis Street.

The sampling results indicated no short- or long-term potential health risk concerns from the vapor intrusion pathway under current conditions (Haley & Aldrich, 2010).

The USEPA plans to issue a ROD amendment to address vapor intrusion in 2010.

3.3 Five Year Remedy Review

The USEPA issued a Second Five-Year Remedy Review in September 2009. There were no follow-up actions for Former Fairchild Buildings 20 and 20A (USEPA, 2009).

3.4 Soil Settlement Survey

An annual soil settlement survey was performed on December 9-10, 2009. The purpose of these annual measurements is to evaluate any potential adverse effects on the Site facilities, and whether long-term remedial groundwater extraction could affect soil settlement in the MEW study area. A qualified Geotechnical Engineer reviewed the historical settlement and water level elevation data and concluded that the measured values of ground elevation change do not appear to be related to groundwater extraction. Furthermore, the changes are relatively uniform over a large area, whereas settlement induced stress is typically caused by differential settlement over the scale of a single building footprint. Additional information on the settlement survey can be found in the RGRP 2009 Annual Progress Report (Geosyntec, 2010).

4. PROBLEMS ENCOUNTERED

There were no problems identified at for Former Fairchild Buildings 20 and 20A during 2009.

5. TECHNICAL ASSESSMENT

The following assessment of the groundwater remedy performance for Buildings 20 and 20A was made based on the data collected during 2009.

- The Remedy is Functioning as Intended. Groundwater is being addressed under the Raytheon and RGRP programs. An Annual Remedy Performance Checklist is included in Appendix A.
- VOC Concentrations are Stable to Decreasing. VOC concentrations in monitoring wells at the Site remain stable or are declining. Since 2003, TCE concentrations in Well 11C have fluctuated between non-detect and 6.5 µg/L. TCE was detected at 1.7 µg/L in November 2009, indicating that low concentrations remain above the 0.8 µg/L cleanup standard.

The Raytheon 2009 Annual Progress Report, the Fairchild Former Buildings 13, 19, and 23 Annual Progress Report and the MEW RGRP 2009 Annual Progress Report present further discussion of VOC mass removal and hydraulic control at the 464 Ellis Street property (Locus, 2010, Weiss, 2010, and Geosyntec, 2010).

6. CONCLUSIONS AND RECOMMENDATIONS

Twelve monitoring wells were used to assess remedial progress in the area. These wells are stable to decreasing. The reader is referred to the Raytheon 2009 Annual Progress Report, Former Fairchild Buildings 13, 19 and 23 Annual Progress Report, and the MEW RGRP 2009 Annual Progress Report for further discussion of VOC mass removal and hydraulic control at the Site (Locus, 2010 and Geosyntec, 2010).

Request to Change Reporting Requirements for Buildings 20 and 20A: Potentially responsible parties (PRPs) requested in the 2008 Annual Progress Report that further facility-specific reporting for Former Fairchild Buildings 20 and 20A be eliminated (Weiss, 2009). However, this request has not yet been acknowledged by the USEPA. The PRPs are requesting again that facility-specific reporting for Former Fairchild Building 20 be deleted. The rationale for this request is:

1. No potential source areas were identified at former Fairchild Building 20 property during Site investigations.
2. Building 20/20A does not have an associated groundwater treatment system.
3. There is no facility-specific capture to evaluate.
4. Measured water levels and analytical results from groundwater monitoring wells at the property are reported in the RGRP Annual report.
5. Monitoring results from 2009 continue to indicate that VOC concentrations in groundwater are generally stable to declining.

This report is redundant with other reports at the MEW Site since all information is covered under other MEW facility-specific and MEW regional reporting. There are no planned optimization activities or USEPA Second Five Year Remedy Review follow-up activities for Buildings 20 and 20A.

7. UPCOMING WORK IN 2010 AND PLANNED FUTURE ACTIVITIES

In 2010, the groundwater wells will continue to be monitored in accordance with the Site monitoring and reporting schedule.

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FIGURES



Figure 1. Site Location, MEW Area, Mountain View, California

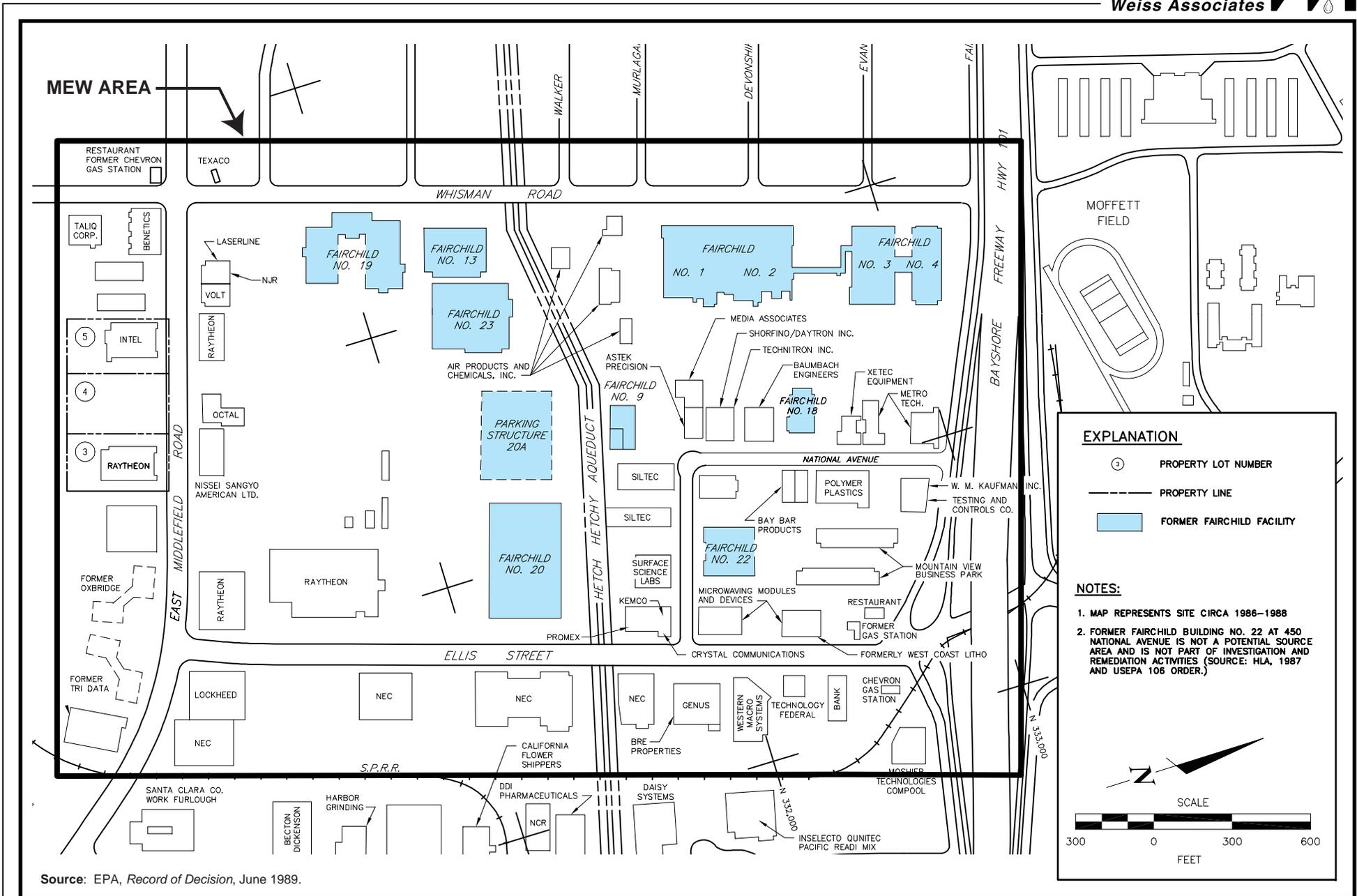


Figure 2. Previous Building Configurations, Former Fairchild Facilities, MEW Area, Mountain View, California



MEW Area Boundary

Former Fairchild Buildings
1 through 4 Site

Former Fairchild
Building 9 Site

Former Fairchild
Building 19 Site

Raytheon Site

91B1 89B2
99A 92B1 29A 153A
132B2 11C 134B2 26A 16B2
28B3

Explanation

Building 20 Remedy Components

- Monitoring Well
- Extraction and Monitoring Wells in the Vicinity**
- Regional Recovery Well
- ▲ Source Recovery Well
- Monitoring Well
- 464 Ellis Street
(Current - 464, 466, 468 Ellis Street)
- Slurry Wall
- Building
- Road

0 300 600 900 Feet



Figure 3
Former Fairchild Building 20 and 20A
Site Map and Well Network
Mountain View, California



TABLES

Table 1. Monitoring Well Details, Former Fairchild Building 20, 464 Ellis Street, Mountain View, California

Well Details	Date Installed	Zone	TOC Elevation (ft amsl)	Diameter (inches)	Total Well Depth (ft btoc)	Top of Screened Interval (ft btoc)	Bottom of Screened Interval (ft btoc)	Top of Sand Pack (ft btoc)	Bottom of Sand Pack (ft btoc)	Well Type
153A	10/10/91	A	45.72	4	23	13	23	12	25	Mon
26A	02/02/82	A	47.20	2	30	12	30	10	30	Mon
29A	02/02/82	A	46.08	2	30	15	30	10	30	Mon
99A	07/07/86	A	48.33	4	24.5	9.5	24.5	8	29	Mon
91B1	07/07/86	B1	48.44	4	58	48	58	43	60	Mon
92B1	06/06/86	B1	46.99	4	65	55	65	50	68	Mon
132B2	02/11/87	B2	49.21	4	89	79	89	78	91	Mon
134B2	06/17/87	B2	47.24	4	88	83	88	78	90	Mon
16B2	06/06/86	B2	47.18	4	84	79	84	77	87	Mon
89B2	06/06/86	B2	48.43	4	90	80	90	77	92	Mon
28B3	06/06/85	B3	46.85	4	132	122	132	120	134	Mon
11C	06/06/87	C	49.21	4	216	209	214	204	216	Mon

Notes and Abbreviations:

Top of Screened Interval = feet below top-of-casing

Bottom of Screened Interval = feet below top-of-casing

Top of Sand Pack = feet below top-of-casing

Bottom of Sand Pack = feet below top-of-casing

ft = feet

Diameter = inches

Depth = feet below top-of-casing (ft btoc)

TOC Elevation = feet above mean sea level (ft amsl)

Well Type = extraction well (Ext), monitoring well (Mon), piezometer (Pz)

Zone = A, B1, B2, or C water-bearing zone

Table 2. 2009 Monitoring and Reporting Schedule, Former Fairchild Building 20, 464 Ellis Street, Mountain View, California

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
153A			W								W, 1,o	
26A			W								W, 1,o	
29A			W								W, 1,o	
99A			W								W, 1,o	
91B1			W								W, 1,o	
92B1			W								W, 1,o	
132B2			W								W, 1,o	
134B2			W								W, 1,o	
16B2			W								W, 1,o	
89B2			W								W, 1,o	
28B3			W								W, 1,o	
11C			W								W, 1,o	
Reporting												
Annual Progress Report						15-Jun						

Notes and Abbreviations:

All the wells listed in the table are sampled annually by the RGRP, but are listed in the table because they are located at or near the Building 20 Site. Data is discussed in the RGRP Annual Report unless pertinent to this report.

W = semiannual water level

1 = annual sample for VOC analysis by USEPA Method 8270 for 8010 parameters

o = standard observations, including field analysis for pH, temperature, and conductivity

RGRP = Regional Groundwater Remediation Program

USEPA = United States Environmental Protection Agency

VOCs = volatile organic compounds

Table 3. Groundwater Sampling Results Summary, January 2005 through December 2009, Former Fairchild Buildings 20 and 20A, 464 Ellis Street, Mountain View, California

Sample Location	Sample Date	Lab/Analytical Method	Chloroform	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Freon 113	Methylene Chloride	PCE	1,1,1-TCA	TCE	Vinyl Chloride	Total VOC's	1,4-Dioxane
-----> micrograms per liter (µg/L) <-----																
26A	11/07/05	CT/8260	<1	1.9	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	2	---
26A	11/06/06	CT/8260	<1.0	2.2	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	0.5	<0.5	3	---
26A	11/09/07	CT/8260	<1.0	2.7	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	3	---
26A	11/07/08	CT/8260	<1.0	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	0.5	<0.5	2	---
26A	11/06/09	CT/8260	<1.0	2.3	<0.5	<0.5	<0.5	<0.5	<2.0	<20	<0.5	<0.5	<0.5	<0.5	2	---
29A	11/08/05	CT/8260	1.5	6.4	<0.5	12	<0.5	<0.5	6.1	<20	<0.5	80	0.9	<0.5	107	---
29A	11/06/06	CT/8260	<1.0	3.3	<0.5	9.2	<0.5	<0.5	3.1	<20	0.9	47	1.9	<0.5	65	---
29A	11/09/07	CT/8260	<1.0	4.3	<0.5	8.4	<0.5	<0.5	3.6	<20	0.8	48	1.9	<0.5	67	---
29A	11/11/08	CT/8260	1.2	6.2	<0.5	11	<0.5	<0.5	4	<20	<0.5	57	1.3	<0.5	81	---
29A	11/10/09	CT/8260	<1.0	3.7	<0.5	9	<0.5	<0.5	<2.0	<20	0.6	30	1.4	<0.5	45	---
99A	11/09/05	CT/8260	<6.3	5.7	<3.1	<3.1	190	18	45	<130	<3.1	11	410	<3.1	680	---
99A	11/07/06	CT/8260	<2.5	3.9	<1.3	6.5	160	1.4	34	<50	<1.3	8.3	300	<1.3	514	---
99A	11/08/07	CT/8260	<4.0	3.9	<2.0	5.2	140	2.9	41	<80	<2.0	9.5	360	<2.0	563	---
99A	11/11/08	CT/8260	<3.3	4.2	<1.7	6.6	150	<1.7	44	<67	<1.7	7.7	350	<1.7	563	---
99A	11/23/09	CT/8260	<4.0	3.2	<2.0	5.1	140	2.8	27	<80	<2.0	5.3	300	<2.0	483	---
153A	11/08/05	CT/8260	<1	<0.5	<0.5	1	1.2	<0.5	0.8	<20	<0.5	1.1	17	<0.5	21	---
153A	11/06/06	CT/8260	<1.0	<0.5	<0.5	1.2	1	<0.5	0.9	<20	<0.5	1.2	16	<0.5	20	---
153A	11/14/07	CT/8260	<1.0	<0.5	<0.5	1.1	1.5	<0.5	1.4	<20	<0.5	1.1	20	<0.5	25	---
153A	11/07/08	CT/8260	<1.0	<0.5	<0.5	0.7	1.2	<0.5	0.7	<20	<0.5	1	15	<0.5	19	---
153A (DUP)	11/07/08	CT/8260	<1.0	<0.5	<0.5	0.8	1.1	<0.5	0.7	<20	<0.5	1	16	<0.5	20	---
153A	11/10/09	CT/8260	<1.0	<0.5	<0.5	0.7	1	<0.5	<2.0	<20	<0.5	0.7	12	<0.5	14	---
153A (DUP)	11/10/09	CT/8260	<1.0	<0.5	<0.5	0.8	0.9	<0.5	<2.0	<20	<0.5	0.7	13	<0.5	15	---
91B1	11/09/05	CT/8260	<3.3	3.9	<1.7	<1.7	66	5.3	<1.7	<67	<1.7	<1.7	140	<1.7	215	---
91B1	11/07/06	CT/8260	<1.0	2.9	<0.5	2.5	75	0.8	1.3	<20	<0.5	0.6	130	0.5	214	---
91B1	11/08/07	CT/8260	<1.4	2.7	<0.7	1.3	62	1.7	1	<29	<0.7	<0.7	120	<0.7	189	---
91B1	11/11/08	CT/8260	<1.0	3.5	<0.5	2.7	74	0.9	1.7	<20	<0.5	0.6	120	<0.5	203	---
91B1	11/23/09	CT/8260	<1.0	1.1	<0.5	<0.5	23	<0.5	<2.0	<20	<0.5	<0.5	30	<0.5	54	---
92B1	11/08/05	CT/8260	<3.3	<1.7	<1.7	<1.7	4.3	<1.7	<1.7	<67	<1.7	<1.7	110	<1.7	114	---
92B1	11/07/06	CT/8260	<1.4	<0.7	<0.7	<0.7	4.9	<0.7	<0.7	<29	<0.7	<0.7	100	<0.7	105	---

Table 3. Groundwater Sampling Results Summary, January 2005 through December 2009, Former Fairchild Buildings 20 and 20A, 464 Ellis Street, Mountain View, California

Sample Location	Sample Date	Lab/Analytical Method	Chloroform	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Freon 113	Methylene Chloride	PCE	1,1,1-TCA	TCE	Vinyl Chloride	Total VOC's	1,4-Dioxane
----- micrograms per liter (µg/L) -----																
92B1	11/08/07	CT/8260	<2.0	<1.0	<1.0	<1.0	3.8	<1.0	<1.0	<40	<1.0	<1.0	94	<1.0	98	---
92B1	11/18/08	CT/8260	<2.0	<1.0	<1.0	<1.0	4.8	<1.0	1.2	<40	<1.0	<1.0	98	<1.0	104	---
92B1	11/18/09	CT/8260	<1.0	<0.5	<0.5	<0.5	3.3	<0.5	<2.0	<20	<0.5	<0.5	91	<0.5	94	---
16B2	11/07/05	CT/8260	<1.4	<0.7	<0.7	<0.7	2.9	<0.7	<0.7	<29	<0.7	<0.7	100	<0.7	103	---
16B2	11/06/06	CT/8260	<1.0	<0.5	<0.5	<0.5	2.6	<0.5	<0.5	<20	<0.5	<0.5	95	<0.5	98	---
16B2	11/09/07	CT/8260	<1.0	<0.5	<0.5	<0.5	2.5	<0.5	<0.5	<20	<0.5	<0.5	78	<0.5	81	---
16B2	11/11/08	CT/8260	<1.0	<0.5	<0.5	<0.5	2.9	<0.5	<0.5	<20	<0.5	<0.5	78	<0.5	81	---
16B2	11/11/09	CT/8260	<1.0	<0.5	<0.5	<0.5	2.3	<0.5	<2.0	<20	<0.5	<0.5	62	<0.5	64	---
89B2	11/09/05	CT/8260	<1	<0.5	<0.5	<0.5	21	<0.5	<0.5	<20	<0.5	<0.5	20	<0.5	41	---
89B2	11/07/06	CT/8260	<1.0	<0.5	<0.5	<0.5	19	<0.5	<0.5	<20	<0.5	<0.5	25	<0.5	44	---
89B2	11/08/07	CT/8260	<1.0	<0.5	<0.5	<0.5	11	<0.5	<0.5	<20	<0.5	<0.5	19	<0.5	30	---
89B2	11/11/08	CT/8260	<1.0	<0.5	<0.5	<0.5	8.9	<0.5	<0.5	<20	<0.5	<0.5	18	<0.5	27	---
89B2	11/23/09	CT/8260	<1.0	<0.5	<0.5	<0.5	6.4	<0.5	<2.0	<20	<0.5	<0.5	9.1	<0.5	16	---
132B2	11/07/05	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	0.5	<0.5	1	---
132B2	11/07/06	CT/8260	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND	---
132B2	11/08/07	CT/8260	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND	---
132B2	11/11/08	CT/8260	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND	---
132B2	11/04/09	CT/8260	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<20	<0.5	<0.5	<0.5	<0.5	ND	---
134B2	11/07/05	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND	---
134B2	11/07/06	CT/8260	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND	---
134B2	11/09/07	CT/8260	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND	---
134B2	11/07/08	CT/8260	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND	---
134B2	11/03/09	CT/8260	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<20	<0.5	<0.5	<0.5	<0.5	ND	---
28B3	11/07/05	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND	---
28B3	11/06/06	CT/8260	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND	---
28B3	04/24/08	CT/8260	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND	---
28B3	11/14/08	CT/8260	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND	---
28B3	11/03/09	CT/8260	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<20	<0.5	<0.5	<0.5	<0.5	ND	---

Table 3. Groundwater Sampling Results Summary, January 2005 through December 2009, Former Fairchild Buildings 20 and 20A, 464 Ellis Street, Mountain View, California

Sample Location	Sample Date	Lab/Analytical Method	Chloroform	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Freon 113	Methylene Chloride	PCE	1,1,1-TCA	TCE	Vinyl Chloride	Total VOC's	1,4-Dioxane
< ----- micrograms per liter (µg/L) ----- >																
11C	11/07/05	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	0.7	<0.5	1	---
11C	11/07/06	CT/8260	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND	---
11C	11/19/07	CT/8260	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	1.6	<0.5	2	---
11C	11/14/08	CT/8260	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	2	<0.5	2	---
11C	11/09/09	CT/8260	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<20	<0.5	<0.5	1.7	<0.5	2	---

Notes and Abbreviations:

- = sample not analyzed for particular analyte
- < # = analyte not detected above the reported detection limit of "#" µg/L
- 8260 = USEPA Method 8260B for halogenated VOCs, for USEPA Method 8010 list of analytes
- 8270 = USEPA Method 8270C-SIM for SVOCs
- CT = Curtis and Tompkins, Berkeley, California
- DCA = Dichloroethane
- DCE = Dichloroethene
- DUP = duplicate sample
- ND = no analytes detected above the laboratory detection limit
- PCE = Tetrachloroethene
- TCA = Trichloroethane
- TCE = Trichloroethene
- VOCs = volatile organic compounds

APPENDIX A

2009 ANNUAL REPORT REMEDY PERFORMANCE CHECKLIST

2009 Annual Report Remedy Performance Checklist

I. GENERAL SITE INFORMATION			
Facility Name: Former Fairchild Facilities, Middlefield-Ellis-Whisman Study Area (MEW Site)			
Facility Address, City, State: 515/545 North Whisman Road and 313 Fairchild Drive (former Bldgs. 1-4) 369 and 441 North Whisman Road (former Bldgs. 13 and 19 and 23) 401 National Avenue (former Bldg. 9) 644 National Avenue (former Bldg. 18) 464 Ellis Street (former Bldg. 20 and 20A)			
Checklist completion date: June 15, 2010	EPA Site ID: System-1: CAR000164285 System-3: CAD095989778 System-19: CAR000164228		
Site Lead: <input type="checkbox"/> Fund <input checked="" type="checkbox"/> PRP <input type="checkbox"/> State <input type="checkbox"/> State Enforcement <input type="checkbox"/> Federal Facility <input type="checkbox"/> Other: EPA Region IX			
Site Remedy Components (Include Other Reference Documents for More Information, as appropriate):			
<ol style="list-style-type: none"> 1. Three slurry wall enclosures around former Buildings 1-4, Building 9, and Building 19. The slurry walls extend to a depth of about 40 feet below ground surface and are keyed a minimum of two feet into the A2/B1 aquitard. 2. Three treatment systems as detailed below: <p style="margin-left: 20px;">System 1:</p> <ul style="list-style-type: none"> • Three 5,000-pound GAC vessels in series, treatment pad, controls, double-contained groundwater conveyance piping, vaults, electrical distribution, controls and other appurtenances. • Thirteen source control recovery wells (Four wells operated during 2009). • One regional recovery wells (One well operated during 2009). <p style="margin-left: 20px;">System 3:</p> <ul style="list-style-type: none"> • Three 5,000-pound GAC vessels in series, treatment pad, controls, double-contained groundwater conveyance piping, vaults, electrical distribution, controls and other appurtenances. • Seven source control recovery wells (Five wells operated during 2009). • Three regional recovery wells (Two wells operated during 2009). <p style="margin-left: 20px;">System 19:</p> <ul style="list-style-type: none"> • Three 5,000-pound GAC vessels in series, treatment pad, controls, double-contained groundwater conveyance piping, vaults, electrical distribution, controls and other appurtenances. • Fifteen source control recovery wells (Ten operated during 2009). • Seven regional recovery wells (Two operated during 2009). 			
II. CONTACTS			
<u>List important personnel associated with the Site:</u> Name, title, phone number, e-mail address:			
	Name/Title	Phone	E-mail
RP/Facility Representative	Du'Bois (Joe) Ferguson Schlumberger Technology Corporation	281-285-3692	dferguson3@sugar-land.oilfield.slb.com
RP Consultant	John Gallinatti Geosyntec Consultants	510-285-2750	jgallinatti@geosyntec.com
RP Consultant	Tess Byler Weiss Associates	650-968-7000	tb@weiss.com

2009 Annual Report Remedy Performance Checklist

III. O&M COSTS (OPTIONAL)
<p>What is your annual O&M cost total for the reporting year? _____</p> <p>Breakout your annual O&M cost total into the following categories (use either dollars or %):</p> <ul style="list-style-type: none"> • Analytical (e.g., lab costs): _____ • Labor (e.g., site maintenance, sampling): _____ • Materials (e.g., treatment chemicals): _____ • Oversight (e.g., project management): _____ • Utilities (e.g., electric, gas, phone, water): _____ • Reporting (e.g., NPDES, progress): _____ • Other (e.g., capital improvements): _____
<p>Describe unanticipated/unusually high or low O&M costs (go to section [fill in] to recommend optimization methods):</p>
IV. ON-SITE DOCUMENTS AND RECORDS (Check all that apply)
<p> <input checked="" type="checkbox"/> O&M Manual <input checked="" type="checkbox"/> O&M Maintenance Logs <input type="checkbox"/> O&M As-built drawings <input checked="" type="checkbox"/> O&M reports <input checked="" type="checkbox"/> Daily access/Security logs <input checked="" type="checkbox"/> Site-Specific Health & Safety Plan <input checked="" type="checkbox"/> Contingency/Emergency Response Plan <input checked="" type="checkbox"/> O&M/OSHA Training Records <input checked="" type="checkbox"/> Settlement Monument Records <input type="checkbox"/> Gas Generation Records <input checked="" type="checkbox"/> Groundwater monitoring records <input type="checkbox"/> Leachate extraction records <input checked="" type="checkbox"/> Discharge Compliance Records <input type="checkbox"/> Air discharge permit <input checked="" type="checkbox"/> Effluent discharge permit <input checked="" type="checkbox"/> Waste disposal, POTW Permit </p> <p>Are these documents currently readily available? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, where are records kept?</p> <p>Documents and records are available at treatment systems and/or on-site office located at 350 E. Middlefield Road Mountain View, CA.</p>
V. INSTITUTIONAL CONTROLS (as applicable)
<p>List institutional controls called for (and from what enforcement document):</p> <p>Signs and other security measures are in place at extraction and treatment points.</p> <p>Status of their implementation:</p> <p>Posted signage (Health & Safety and emergency contact information). Bay Alarm Security System at the site.</p> <p>Where are the ICs documented and/or reported?</p> <p>ICs are being properly implemented and enforced? <input type="checkbox"/> Yes <input type="checkbox"/> No, elaborate below ICs are adequate for site protection? <input type="checkbox"/> Yes <input type="checkbox"/> No, elaborate below</p>
<p>Additional remarks regarding ICs:</p>

2009 Annual Report Remedy Performance Checklist

VIII. GROUNDWATER REMEDY (reference isoconcentration, capture zone maps, trend analysis, and other documentation to support analysis)	
<u>Groundwater Quality Data</u>	
List the types of data that are available:	What is the source report?
<u>Potentiometric surface maps, hydrographs</u>	<u>2009 Annual Fairchild Building Reports (Weiss, 2010)</u>
<u>Capture zone maps, isoconcentration maps</u>	<u>2009 Annual Regional Report (Geosyntec, 2010)</u>
<ul style="list-style-type: none"> ■ Contaminant trend(s) tracked during O&M (i.e., temporal analysis of groundwater contaminant trends). ■ Groundwater data tracked with software for temporal analyses. <input type="checkbox"/> Reviewed MNA parameters to ensure health of substrate (e.g., DO, pH, temperature), if appropriate? 	
<u>Groundwater Pump & Treat Extraction Well and Treatment System Data</u>	
List the types of data that are available:	What is the source report?
<u>O&M logs</u>	<u>NPDES Self-Monitoring Reports</u>
<u>System Influent & Effluent water samples</u>	<u>2009 Annual Fairchild Building Reports</u>
<u>VOC mass and groundwater removal graphs, VOC concentration trends</u>	
<ul style="list-style-type: none"> ■ The system is functioning adequately. <input type="checkbox"/> The system has been shut down for significant periods of time in the past year. Please elaborate below. 	
<u>Discharge Data</u>	
List the types of data that are available:	What is the source report?
<u>System performance data such as average flow rates, totalized flow, influent/effluent chemical data, GAC removal efficiencies</u>	
<ul style="list-style-type: none"> ■ The system is in compliance with discharge permits. 	
<u>Slurry Wall Data</u>	
List the types of data that are available:	What is the source report?
<u>Water level elevations in select well pairs</u>	<u>2009 Annual Reports</u>
<u>Analysis of inward and upward hydraulic gradients</u>	
<p>Is slurry wall operating as designed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If not, what is being done to correct the situation?</p> <p>The slurry walls are operating as designed and are effective at impeding flow and preventing VOCs inside the wall from migrating downgradient. However, the ROD specifies that the slurry walls, “maintain inward and upward gradients.” Historically, this has not been observed in all well pairs, even under maximum historical pumping scenarios. Since 2007, pumping ceased in the lower concentration/higher pumping rate extraction wells within the slurry walls. Gradients have generally maintained trends consistent with those prior to reduced groundwater extraction rates, although in some cases the magnitude of the gradient has changed.</p> <p>The chemical concentration data and potentiometric surface contours from 2009 continue to demonstrate that the slurry walls are an effective means of impeding VOC migration outside of the slurry walls.</p>	
<u>Elaborate on technical data and/or other comments</u>	

2009 Annual Report Remedy Performance Checklist

IX. AIR MONITORING/VAPOR INTRUSION PATHWAY EVALUATION (Include in Annual Progress Report and reference document)
<p>Walk-throughs/Surveys: Yes</p> <p>In the Fall of 2009, indoor air samples were collected at ten commercial buildings in the MEW area pursuant to requests from the owners of the buildings. Samples were collected at the following buildings located at the Former Fairchild Buildings:</p> <ul style="list-style-type: none"> • 515 N. Whisman Road; and, • 545 N. Whisman Road. <p>Reference Documents: Haley and Aldrich, 2010. <i>Air Sampling Activities Conducted Fall 2009 at the Middlefield-Ellis-Whisman Vapor Intrusion Study Area, Mountain View, California, March 19.</i></p> <p>Haley and Aldrich 2009. <i>Revised Supplemental Feasibility Study for Vapor Intrusion Middlefield-Ellis-Whisman Vapor Intrusion Study Area, Mountain View, California June 29.</i></p>
<p>Summary of Results: The sampling results indicated no short-term or long-term potential health risk concerns from the vapor intrusion pathway under current conditions (Haley and Aldrich 2010).</p> <p>Problems Encountered: None</p> <p>Recommendations/Next Steps: None</p>
<p>Schedule: All work is coordinated with the USEPA.</p>
X. REMEDY PERFORMANCE ASSESSMENT
A. Groundwater Remedies
<p>What are the remedial goals for groundwater? <input checked="" type="checkbox"/> Plume containment (prevent plume migration); <input checked="" type="checkbox"/> Plume restoration (attain ROD-specific cleanup levels in aquifer); <input type="checkbox"/> Other goals, please explain:</p> <p>The groundwater remedy is hydraulic remediation by extraction and treatment. The Treatment System is reliable and consistent in its operation and mass removal ability, with greater than 95% up-time. The capture zones from the extraction wells provide sufficient overlap to achieve hydraulic control over the plume based on flow net evaluation and converging lines of evidence, including stable lateral extent of TCE exceeding 5 µg/L. Remediation is also demonstrated because concentrations within the TCE plume have continued to decrease in all zones. Groundwater with TCE concentrations exceeding 5 µg/L does not discharge to surface water.</p> <p>Have you done a trend analysis? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No; If Yes, what does it show?</p> <p>(Is it inconclusive due to inadequate data? Are the concentrations increasing or decreasing?) Explain and provide source document reference</p> <p>Concentrations within the core of the TCE plume have continued to decrease in all zones, while the lateral extent of TCE exceeding 5 µg/L has been stable. See Annual Reports for trends in monitoring wells (Weiss 2010).</p> <p>While the lateral extent of TCE concentrations exceeding 5 µg/L has not grown since 1992 and concentrations within TCE plume have generally decreased by an order of magnitude or more, the perimeter extent of TCE concentrations has largely stabilized. Optimization of the remedy may therefore be warranted (Geosyntec et al, 2008).</p>
<p>If plume containment is a remedial goal, check all that apply:</p>

2009 Annual Report Remedy Performance Checklist

Plume migration is under control (explain basis below)
 Plume migration is not under control (explain basis below)
 Insufficient data to determine plume stability (explain below)
(Include attachments that substantiate your answers, e.g., reference plume, trend analysis, and capture zone maps in source document)

Elaborate on basis for determining that plume containment goal is being met or not being met:

Plume containment goal is met, slurry walls provide physical containment of sources on 369 N. Whisman Road, 401 National Avenue, 515/545 N. Whisman Road and 313 Fairchild Drive.

Groundwater elevation and chemical monitoring results from 2009 demonstrate that the Fairchild extraction wells continue to achieve adequate horizontal and vertical capture based on converging lines of evidence, including graphical flow net analysis and chemical concentration trends. VOC concentrations in groundwater continue to remain well below historical maximums, and generally show long-term decreasing trends.

If plume restoration is a cleanup objective, check all that apply:

Progress is being made toward reaching cleanup levels (explain basis below)
 Progress is not being made toward reaching cleanup levels (explain basis below)
 Insufficient data to determine progress toward restoration goal (explain below)

Elaborate on basis for determining progress or lack of progress toward restoration goal:

The objective is to remediate and control the plume. The groundwater extraction, treatment, and containment systems are functioning as intended and meet the Remedial Action Objectives for the Site. While concentrations within TCE plume have generally decreased by an order of magnitude or more, treatment system influent concentrations have declined and the perimeter extent of TCE concentrations has largely stabilized. Optimization of the remedy may therefore be warranted.

B. Vertical Migration

Have you done an assessment of vertical gradients? Yes No; If Yes, what does it show? (Is it inconclusive due to inadequate data?)

Are the concentrations increasing or decreasing? Explain and provide source document reference

In general, vertical gradients across the B and deeper water-bearing zones are upward. Upward vertical gradients are typical from the B- to A-zone, but downward vertical gradients are observed at a few locations.

Source document reference: 2009 Annual Fairchild Building Reports (Weiss, 2010)

2009 Annual Regional Report (Geosyntec, 2010)

C. Source Control Remedies

What are the remedial goals for source control?

Capture of former source areas is the goal for source control. Cleanup standards are Maximum Contaminant Level (MCLs) in upper groundwater zones; the TCE MCL is 5 µg/L.

Elaborate on basis for determining progress or lack of progress toward these goals:

Capture zone analysis in the 2009 Annual Progress Report indicate plume containment of target capture areas.

2009 Annual Report Remedy Performance Checklist

XI. PROJECTIONS
<u>Administrative Issues</u> Dates of next monitoring and sampling events for next annual reporting period: Nov/Dec 2009
A. Groundwater Remedies - Projections for the upcoming year and long-term (Check all that apply)
<p style="text-align: center;"><u>Remedy Projections for the upcoming year (2009)</u></p> <p style="text-align: center;"><input type="checkbox"/> No significant changes projected.</p> <p><input type="checkbox"/> Groundwater remedy will be converted to monitored natural attenuation. Target date:</p> <p style="padding-left: 40px;"><input type="checkbox"/> Groundwater Pump & Treat will be shut down. Target date:</p> <p style="padding-left: 40px;"><input type="checkbox"/> Groundwater cleanup standards to be modified. Target date:</p> <p style="padding-left: 40px;"><input type="checkbox"/> PRP will request remedy modification. Target date of request:</p> <p><input type="checkbox"/> Change in the number of monitoring wells. <input type="checkbox"/> Increasing or <input type="checkbox"/> decreasing? Target date:</p> <p><input type="checkbox"/> Change in the number and/or types of analytes being analyzed. <input type="checkbox"/> Increasing or <input type="checkbox"/> decreasing? Target date:</p> <p><input type="checkbox"/> Change in groundwater extraction system. Expansion or minimization (i.e., number of extraction wells and/or pumping rate)? Target date:</p> <p style="padding-left: 40px;"><input type="checkbox"/> Modification on groundwater treatment? Elaborate below. Target date:</p> <p style="padding-left: 80px;"><input type="checkbox"/> Change in discharge location. Target date:</p> <p><input checked="" type="checkbox"/> Other modification(s) anticipated: Optimization Elaborate below. Target date: 2010</p> <p>During First Quarter 2010, several extraction wells were tested and new pumps were installed to support optimization of the groundwater pumping regime at Fairchild Treatment Systems 1, 3, and 19 under the jurisdiction of USEPA Region 9. Optimization of extraction rates began during the week of March 29, and extraction rates will continue to be optimized during the Second Quarter of 2010. Optimization activities will be documented in the 2010 Annual Progress Reports to USEPA for the former Fairchild Buildings 1-4, and 19.</p>
<p>Elaborate on Remedy Projections:</p> <p>The RPs for the Former Fairchild Facilities anticipate implementing remediation optimization strategies, pending receipt of and response to EPA comments on the September 3, 2008 Optimization Evaluation Report.</p>
<p><u>Remedy Projections for the long-term</u> (Check all that apply)</p> <p><input type="checkbox"/> No significant changes projected.</p> <p><input type="checkbox"/> Groundwater remedy will be converted to monitored natural attenuation. Target date:</p> <p><input type="checkbox"/> Groundwater Pump & Treat will be shut down. Target date:</p> <p><input type="checkbox"/> Groundwater cleanup standards to be modified. Target date:</p> <p><input type="checkbox"/> PRP will request remedy modification. Target date of request:</p> <p><input type="checkbox"/> Change in the number of monitoring wells. <input type="checkbox"/> Increasing or <input type="checkbox"/> decreasing? Target date:</p> <p><input type="checkbox"/> Change in the number and/or types of analytes being analyzed. <input type="checkbox"/> Increasing or <input type="checkbox"/> decreasing? Target date:</p> <p><input type="checkbox"/> Change in groundwater extraction system. <input type="checkbox"/> Expansion or <input type="checkbox"/> minimization (i.e., number of extraction wells and/or pumping rate)? Target date:</p> <p><input type="checkbox"/> Modification on groundwater treatment? Elaborate below. Target date:</p> <p><input type="checkbox"/> Change in discharge location. Target date:</p> <p><input checked="" type="checkbox"/> Other modification(s) anticipated: Groundwater Feasibility Study Elaborate below. Target date: TBD</p>
<p>Elaborate on Remedy Projections:</p> <p>Minor changes to the EPA's January 15, 2009 Draft Process Framework for a site-wide Groundwater Feasibility Study were proposed January 30, 2009. The PRPs are prepared to implement the modified Framework as soon as the Draft Framework is finalized by EPA.</p>

2009 Annual Report Remedy Performance Checklist

B. Projections – Slurry Walls (Check all that apply)
Remedy Projections for the upcoming year <input type="checkbox"/> No significant changes projected. <input type="checkbox"/> PRP will request remedy modification. Target date of request: <input type="checkbox"/> Change in the number of monitoring wells. <input type="checkbox"/> Increasing or <input type="checkbox"/> decreasing? Target date: <input checked="" type="checkbox"/> Other modification(s) anticipated: <u>Optimization</u> Elaborate below. Target date: TBD
Elaborate on Remedy Projections: The slurry walls are part of the groundwater remedy. The recommendations of the Optimization Evaluation Report will be implemented upon receipt of, and response to, comments from EPA. In the interim, the system continued to operate per the August 2007 groundwater extraction scheme.
Remedy Projections for the long-term <input type="checkbox"/> No significant changes projected. <input type="checkbox"/> PRP will request remedy modification. Target date of request: <input type="checkbox"/> Change in the number of monitoring wells. <input type="checkbox"/> Increasing or <input type="checkbox"/> decreasing? Target date: <input type="checkbox"/> Other modification(s) anticipated: <u>Groundwater Feasibility Study</u> Elaborate below. Target date: TBD
Elaborate on Remedy Projections: See above. The slurry walls are part of the groundwater remedy.
C. Projections – Other Remedial Options Being Reviewed to Enhance Cleanup Progress implementing recommendations from last report or Five-Year Review Has optimization study been implemented or scheduled? <input checked="" type="checkbox"/> Yes; <input type="checkbox"/> No; If Yes, please elaborate. An Optimization Evaluation Report was submitted September 2008.

2009 Annual Report Remedy Performance Checklist

XII. ADMINISTRATIVE ISSUES

Check all that apply:

- Explanation of Significant Differences in progress ROD Amendment in progress
 Site in operational and functional ("shake down") period;
 Notice of Intent to Delete in progress Partial site deletion in progress TI Waivers
 Other administrative issues:

Proposed Plan to address vapor intrusion pathway issued in 2009, with ROD amendment to follow.

Date of Next EPA Five-Year Review: **September 30, 2009**

XII. RECOMMENDATIONS

- **Initiate Second Five-Year Review Follow-up items for Fairchild.**
- **Implement optimization strategies for Fairchild systems.**
- **Follow revised groundwater feasibility study framework.**
- **Potentially responsible parties (PRPs) requested in the 2008 Annual Progress Report for Former Fairchild Building 20 that USEPA not require further facility-specific reporting for Building 20 beginning in 2009. However, this request has not yet been acknowledged by the USEPA. The PRPs are requesting again to discontinue additional facility-specific reporting for Former Fairchild Building 20. The rationale for this request is:**
 1. **No potential source areas were identified at former Fairchild Building 20 property during Site investigations.**
 2. **Analytical results for the monitoring wells sampled in 2008 continue to indicate that VOC concentrations in groundwater are generally stable to declining. This is also reported in the Regional Annual report.**
 3. **Building 20 does not have an associated groundwater treatment system.**
 4. **There is no facility-specific capture to evaluate.**

In summary, the groundwater monitoring data are evaluated in the Regional report, and the Building 20 report is redundant with other reports at the MEW Site since all information is covered under Raytheon Facility Specific and Regional reporting.

APPENDIX B

**ANALYTIC REPORTS AND CHAIN-OF-CUSTODY DOCUMENTS,
JANUARY THROUGH DECEMBER 2009**

*(THIS APPENDIX IS BEING SUBMITTED ON CD TO THE USEPA ONLY AND IS
AVAILABLE UPON REQUEST)*

APPENDIX C

QA/QC REPORT, SUMMARY TABLES, AND CRITERIA

2009 QA/QC SUMMARY

The analytical laboratory data and accompanying quality assurance/quality control (QA/QC) information used in the 2009 Annual Reports for Former Fairchild Buildings 1, 2, 3, 4, 9, 13, 18, 19, 20, 20A and 23 at the Middlefield-Ellis Whisman (MEW) Area were reviewed for precision, accuracy reproducibility and completeness in accordance with the approved MEW 1991 Quality Assurance Plan.¹ In addition, this data quality review is based on November 2009 Standard Operating Procedures (SOPs) for data verification and validation, and validation procedures for metals, volatile organic chemicals and semivolatile organic chemicals. The SOPs are based on the 1991 MEW “Unified” Quality Assurance Project Plan, but functionally adhere to the most recent USEPA data validation guidelines.

This data quality review summarizes the Level 2 and 10% Level 4 Data Quality Review for samples collected by Weiss Associates during the 2009 Annual Sampling event in accordance with the MEW Quality Assurance Project Plan (QAPP).

The analytical results for each sampling point were compared with the historical record to confirm they are representative. To assess reliability of field sampling procedures and materials, the following field QA/QC samples were collected or prepared for each sampling event by MEW parties:

- Quality Control Samples (Field Duplicate, Matrix Spike, Matrix Spike Duplicate) - Field Duplicate samples are blind duplicates that provide data to assess precision of the contract laboratory. Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples measure the accuracy and precision of the analytical methods. Field Duplicates are specified to be collected at a frequency of 5% of the field samples collected. MS/MSD samples are specified at a frequency of 5% of field samples collected. Note that only samples collected by Weiss Associates were evaluated for MS/MSD procedures.
- Rinseate Sample/Equipment Blank - Samples consisting of reagent water collected from a final rinse of sampling equipment after the decontamination procedure has been performed. The purpose of rinseate samples is to determine whether the sampling equipment is causing cross contamination of samples. Following equipment decontamination, deionized/organic-free water will be used as a final rinse and collected in appropriate bottles. Rinseate samples were specified at a frequency of 5% of the field samples collected.
- Field Blank - Samples consisting of source water used for decontamination of equipment. Field blanks will be collected at a frequency of 1 per source or lot of water being used for rinsing and submitted to the laboratory for all required analyses. Field blanks are specified at a frequency of 5% of the field samples collected.

¹ 1991, Quality Assurance Project Plan Middlefield-Ellis-Whisman Site, Mountain View, California, prepared by Canonic Environmental, Rev. 1.0, August 16, 1991.

- Trip Blank - Samples consisting of a "clean," volatile organic analysis (VOA) vial filled with deionized/organic-free water and preserved. These vials are supplied by the laboratory to the field site and returned to the laboratory for storage and analysis along with the field samples as may be required in the task planning documents. Trip blanks were submitted to the contract laboratory with each shipment (cooler) of environmental samples for volatile organic compound (VOC) analyses. Trip blanks were analyzed for all VOC analyses specified for samples in the corresponding cooler. The trip blank data demonstrate that the samples were not exposed to contamination during storage and transport to the laboratory. Trip blanks were submitted for VOC analysis, therefore the containers did not contain head space. Trip blanks are typically required for VOC sampling of: groundwater; surface water; storm water; and, rinseate.

For the 2009 annual groundwater sampling event, all sample results collected for Former Fairchild Buildings were verified for completeness by completion of a Level 2 Data Review Summary. Custody seals were used for each sample location as specified in the 1991 MEW QAPP.

The following QA/QC parameters were used to assess the laboratory analytic data via Level 2 Data Review:

- Holding time;
- Detection and reporting limits;
- Surrogate recovery (organic methods only);
- Laboratory control sample recovery;
- Matrix spike and spike duplicate recovery;
- Method blank contamination;
- Travel blank contamination (organic methods only);
- Field/rinseate blank contamination; and,
- Field sample duplicates precision.

Ten percent of all sample delivery groups underwent a stringent Level 4 data validation as required by the MEW QAPP. The samples validated via Level 4 data were placed on separate Chain(s) of Custody from the Level 2 data deliverables. Level 4 validation procedures vary by method. In addition to the verification check list provided above, the Level 4 review of organic laboratory data checks the following:

- Ion abundance;
- Minimum number of initial calibration standards analyzed;
- Relative response factors in initial and continuing calibrations;
- Percent relative standard deviations in initial calibrations;
- Percent differences in continuing calibrations;
- Internal standard retention times;

- Internal standard area counts;
- Analytical sequence carryover;
- Dilutions performed appropriately;
- Calibration blank contamination; and,
- Data package completeness for all raw data, including chromatograms and bench sheets, for calibration standards, quality control data, and samples.

The Level 4 review of inorganic (metals) data checks for the following:

- Minimum number of initial calibration standards analyzed;
- All initial calibration verification recoveries are within established limits;
- Initial calibration correlation coefficients are within established limits;
- Continuing calibration verification recoveries are within established limits;
- Analytical sequence carryover;
- Dilutions performed appropriately;
- Laboratory duplicate results are within established limits;
- Initial and continuing calibration blank contamination; and,
- Data package completeness for all raw data, including bench sheets, for calibration standards, quality control data, and sample.

Technical staff assigned qualifiers to data that were found outside control limits in the MEW QAPP. Data qualifiers, or flags, communicate data issues to end users and decision makers and are defined in the USEPA Contract Laboratory Program National Functional Guidelines for Organic and Inorganic Data Review.

A total of 233 samples were submitted to Curtis and Tompkins in Berkeley, California, a state-certified analytical laboratory for specified analyses, including Volatile Organic Compounds (VOCs), semi-VOCs, Bis(2-ethylhexyl) phthalate, metals, and 1,4-dioxane analysis. Two samples were analyzed for Acute Toxicity using EPA-821-R-02-012 and turbidity using USEPA method 180.1 by Block Environmental Services, Inc, another state-certified laboratory. In addition to the monthly treatment system samples, 96 total groundwater samples were collected from the Former Fairchild Buildings Area, including Treatment Systems 1, 3, and 19 monitoring and extraction wells as a part of MEW Annual Groundwater Sampling Event. The groundwater samples were analyzed for Halogenated Volatile Organic Compounds using EPA Method USEPA 8260B for the 8010 MS Parameters by Curtis and Tompkins.

All samples were collected, stored, transported, and managed according to USEPA protocols. Sample temperature and holding times were correctly observed.

No significant analytical issues were noted and the data are usable for their intended purposes. Table C-1 summarizes the sampling QA/QC, and Table C-2 summarizes samples for the 2009 annual groundwater sampling event at Former Fairchild Buildings 20 and 20A.

Table C-1. Summary of Sampling QA/QC for January through December 2009, Former Fairchild Buildings 20 and 20A, 464 Ellis Street, Mountain View, California.

Who performed sampling (Firm name/address/contact/phone):	Weiss Associates 350 East Middlefield Road, Mountain View, CA 94043 Joyce Adams (510) 450-6162
Chain of Custody forms completed for all samples?	YES
Field parameters stabilized prior to taking sample?	YES
Zero headspace in sample containers (applicable to VOCs only)?	YES
Samples preserved according to analytical method?	YES
Required field QA/QC samples taken?	YES

*Explain any "NO" answers:

Table C-2. Summary of Analytical QA/QC for January through December 2009, Former Fairchild Building 20 and 20A, 464 Ellis Street, Mountain View, California.

Who performed analysis (Lab name/address/contact/phone):	Curtis and Tompkins 2323 Fifth Street Berkeley, CA 94710 Micah Smith (510) 204-2223
Analytical methods (by method number and chemical category): Groundwater Samples ¹ :	13 samples analyzed by USEPA 8260B – Halogenated Volatile Organic Compounds (8010 MS Parameters)
Are the labs state-certified for the above analytical methods?	YES
Analyses performed according to standard methods?	YES
Sample holding times met?	YES
Analytical results reported for all values above MDL?	YES
QA/QC analyses run consistent with analytical methods?	YES
QA/QC results meet all acceptance criteria?	YES ¹
QA/QC results and acceptance criteria on file?	YES

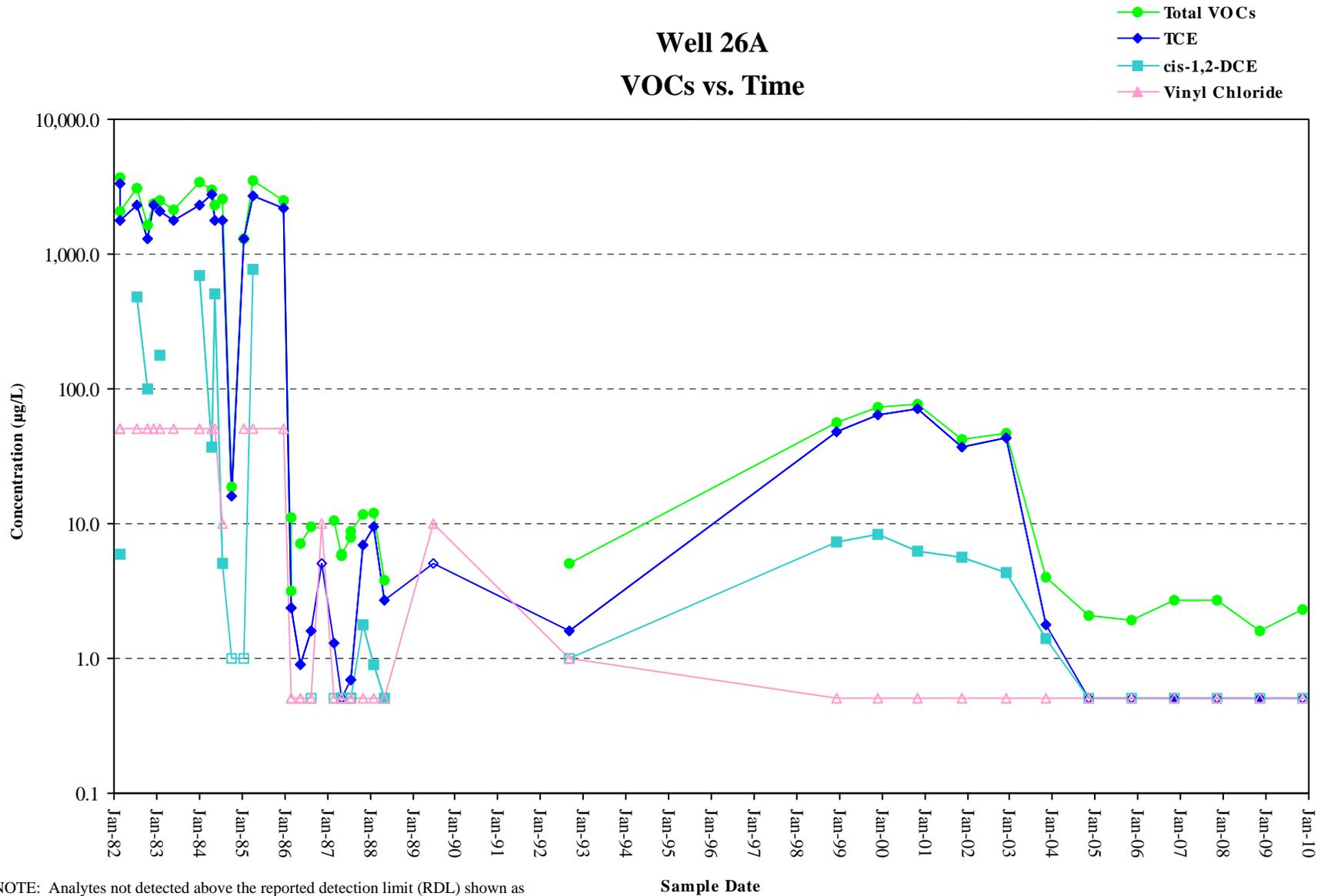
*Explain any “NO” answers:

1. The analytical reports and chain-of-custody forms are located in Appendix B.

APPENDIX D

VOC CONCENTRATION TIME-SERIES GRAPHS

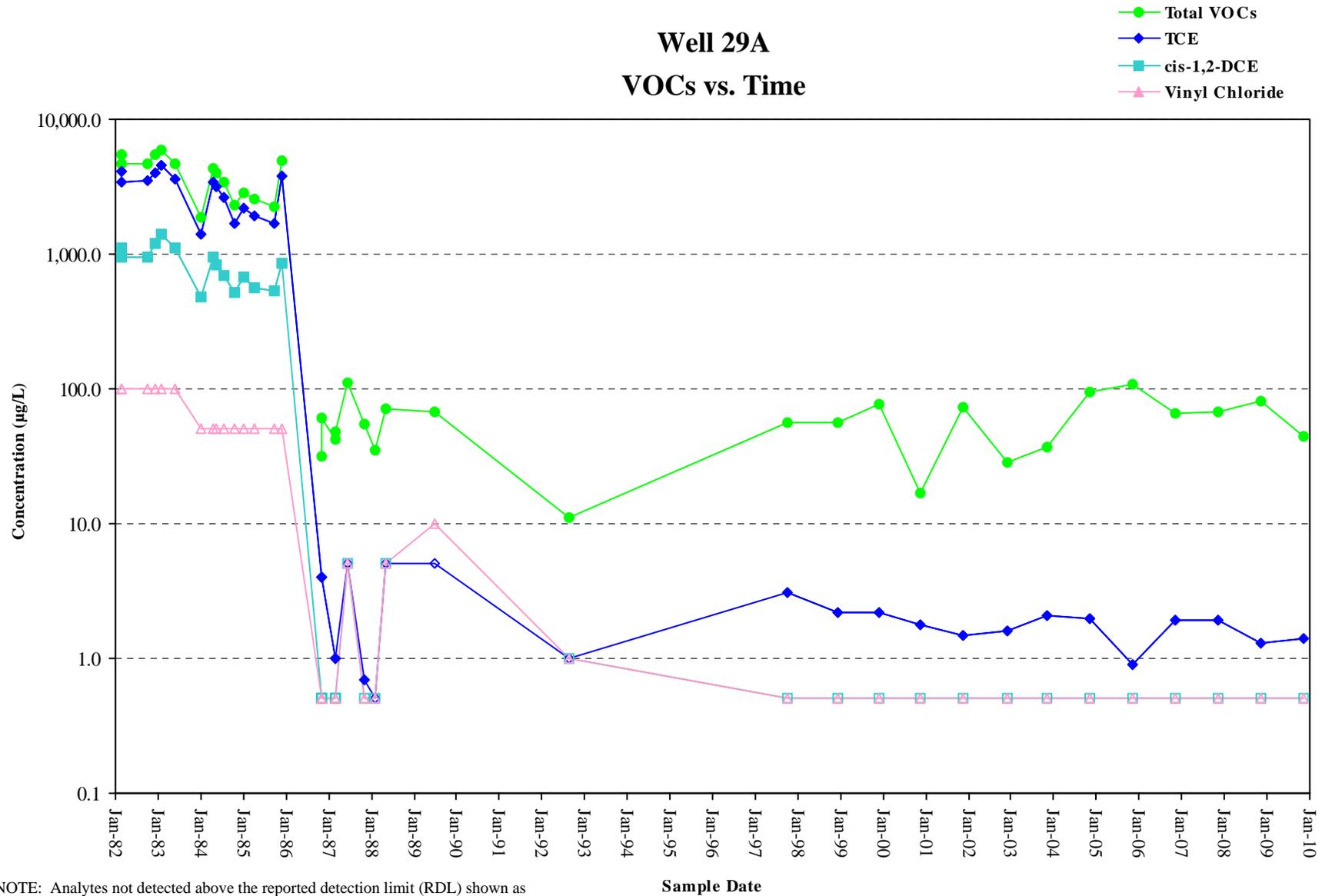
Well 26A VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

Abbreviations: VOC = volatile organic compounds, TCE = trichloroethylene,
DCE = dichloroethylene, µg/L = micrograms per liter

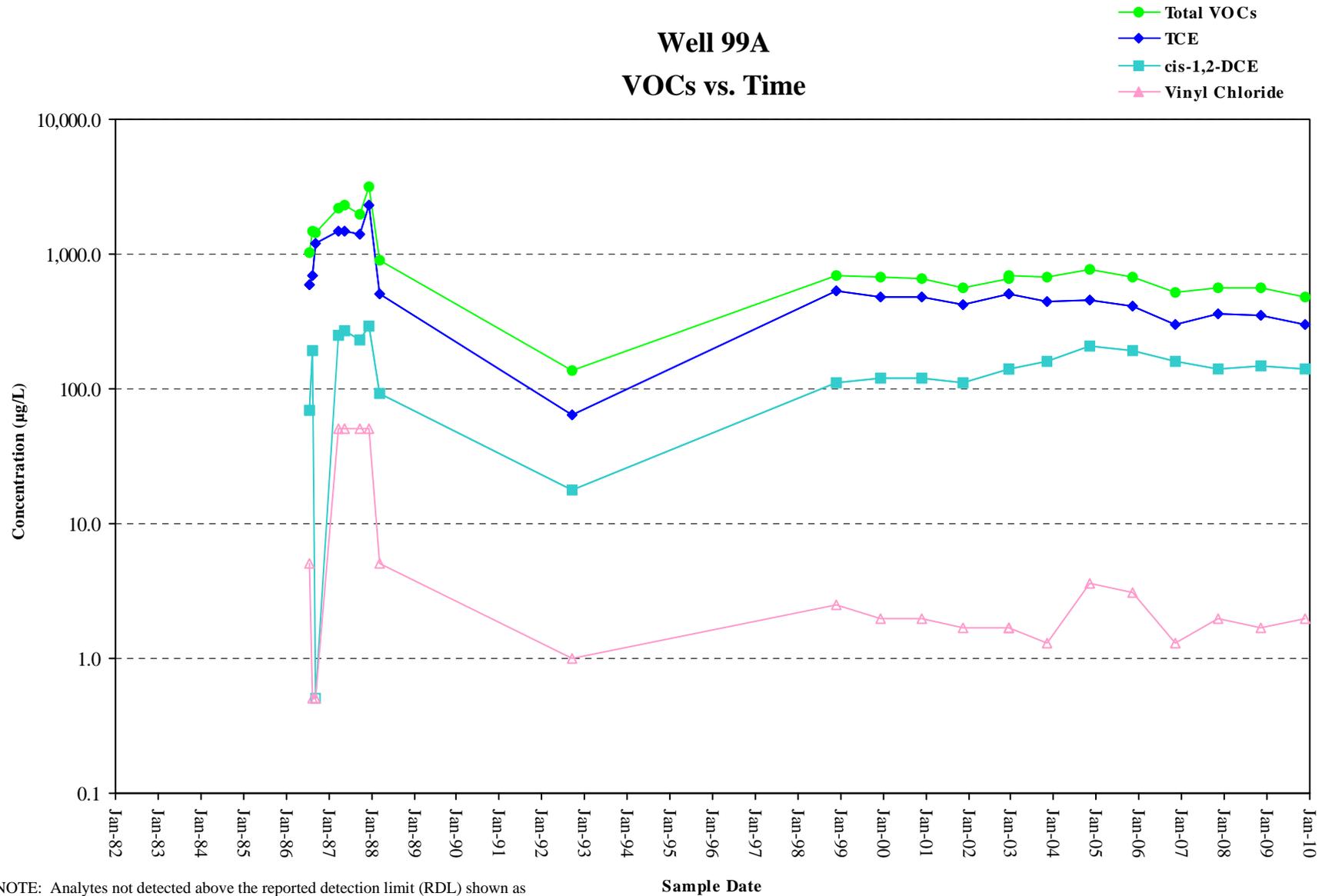
Well 29A VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

Abbreviations: VOC = volatile organic compounds, TCE = trichloroethylene,
DCE = dichloroethylene, µg/L = micrograms per liter

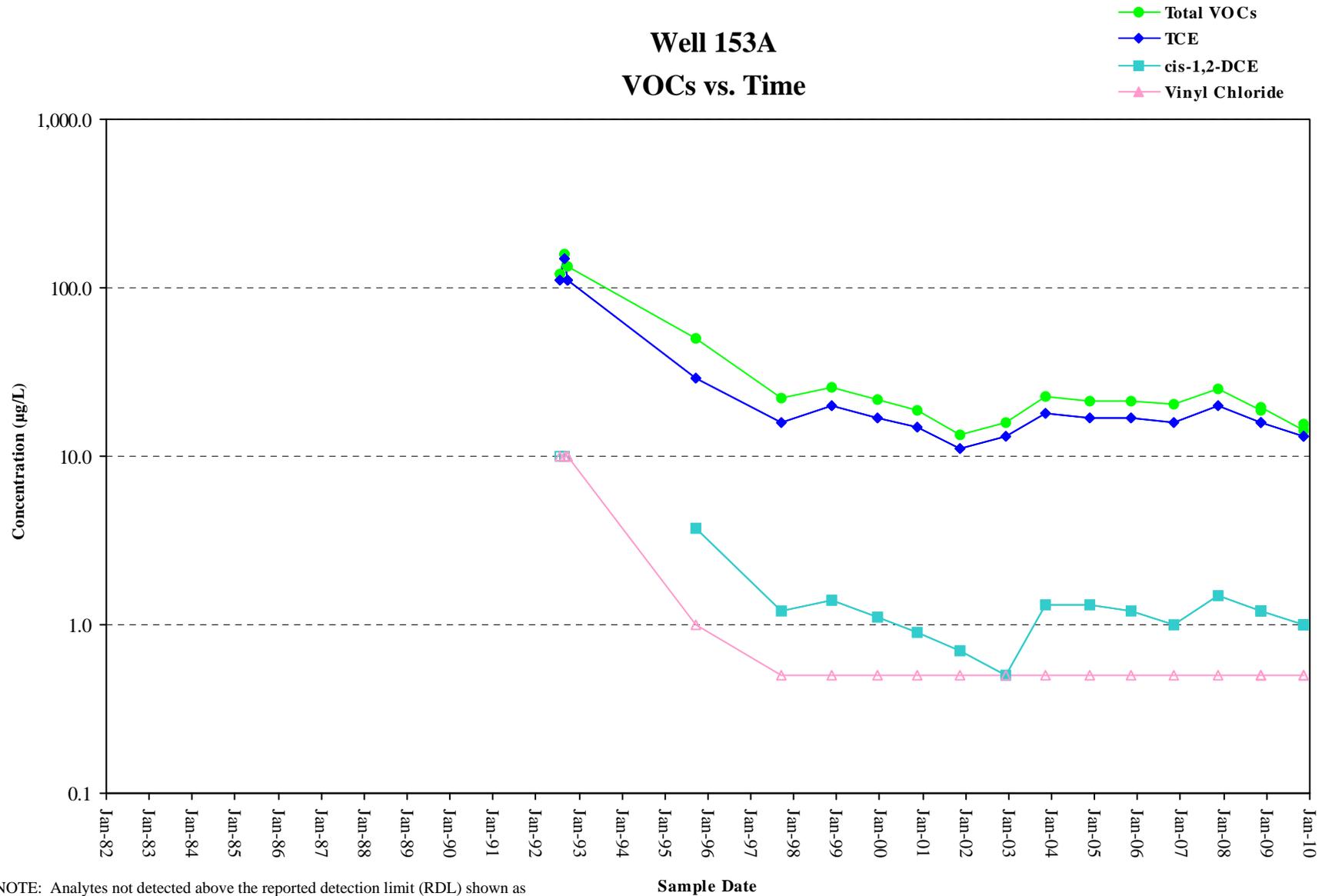
Well 99A VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

Abbreviations: VOC = volatile organic compounds, TCE = trichloroethylene,
DCE = dichloroethylene, µg/L = micrograms per liter

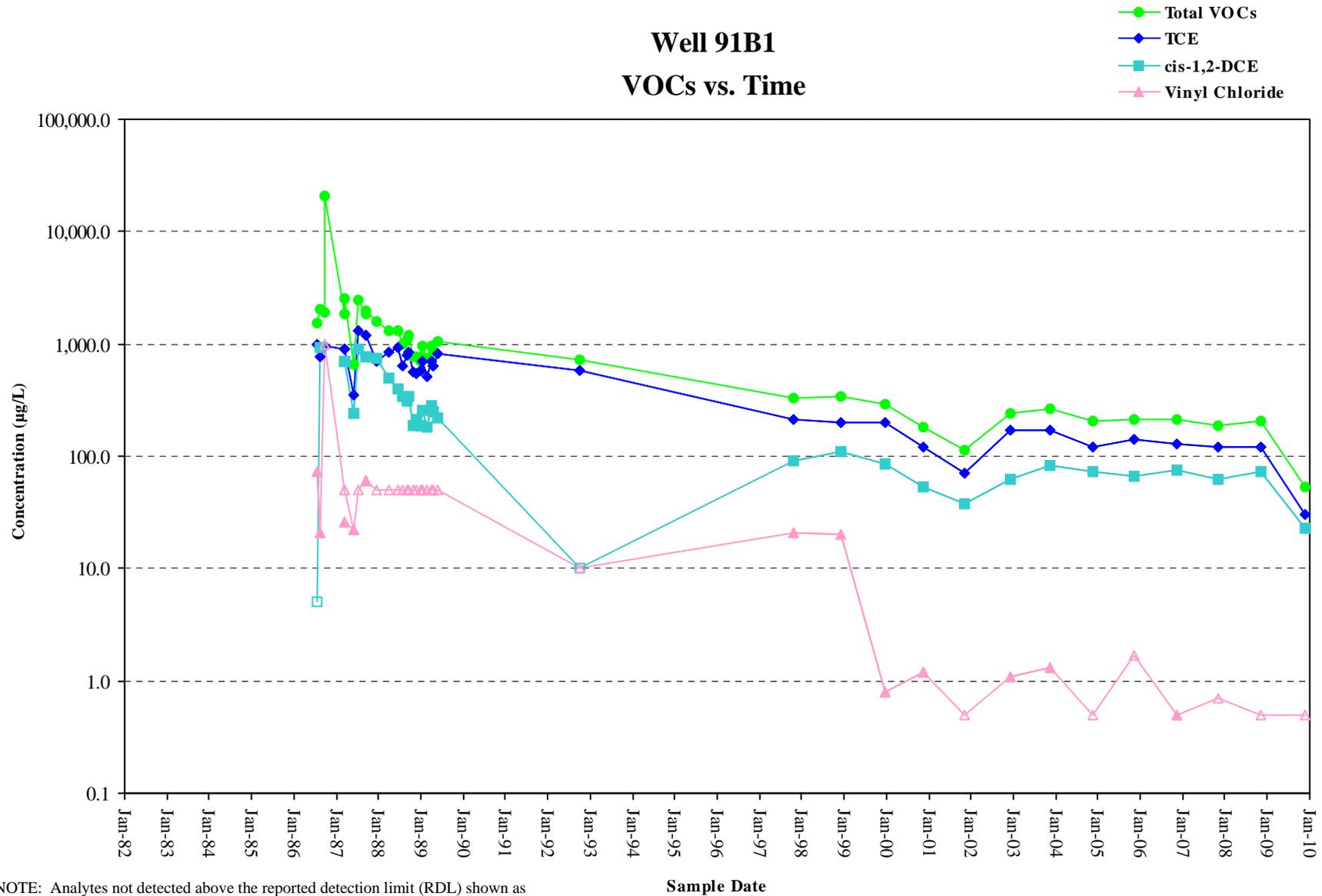
Well 153A VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

Abbreviations: VOC = volatile organic compounds, TCE = trichloroethylene,
DCE = dichloroethylene, µg/L = micrograms per liter

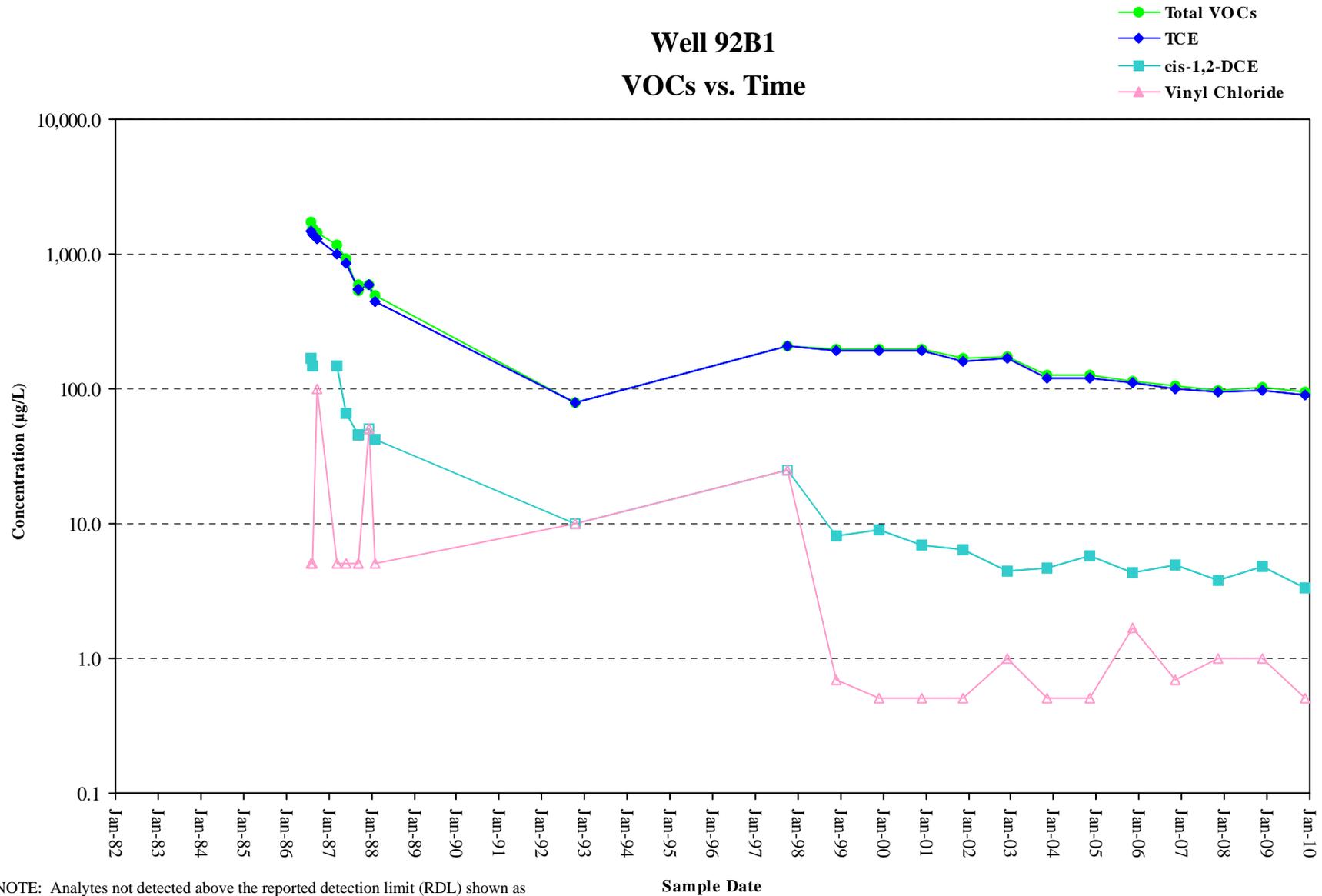
Well 91B1 VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

Abbreviations: VOC = volatile organic compounds, TCE = trichloroethylene, DCE = dichloroethylene, µg/L = micrograms per liter

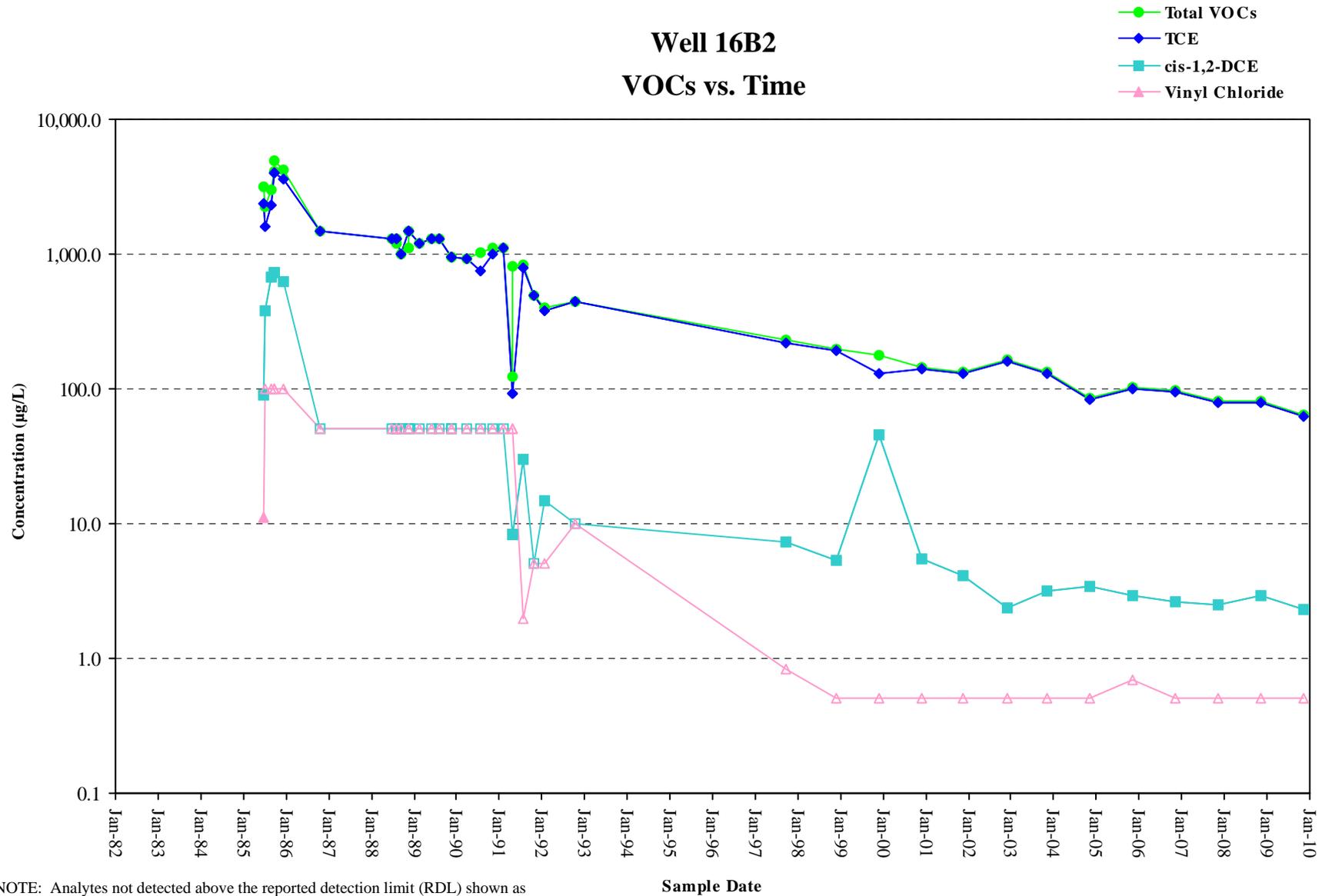
Well 92B1 VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

Abbreviations: VOC = volatile organic compounds, TCE = trichloroethylene,
DCE = dichloroethylene, µg/L = micrograms per liter

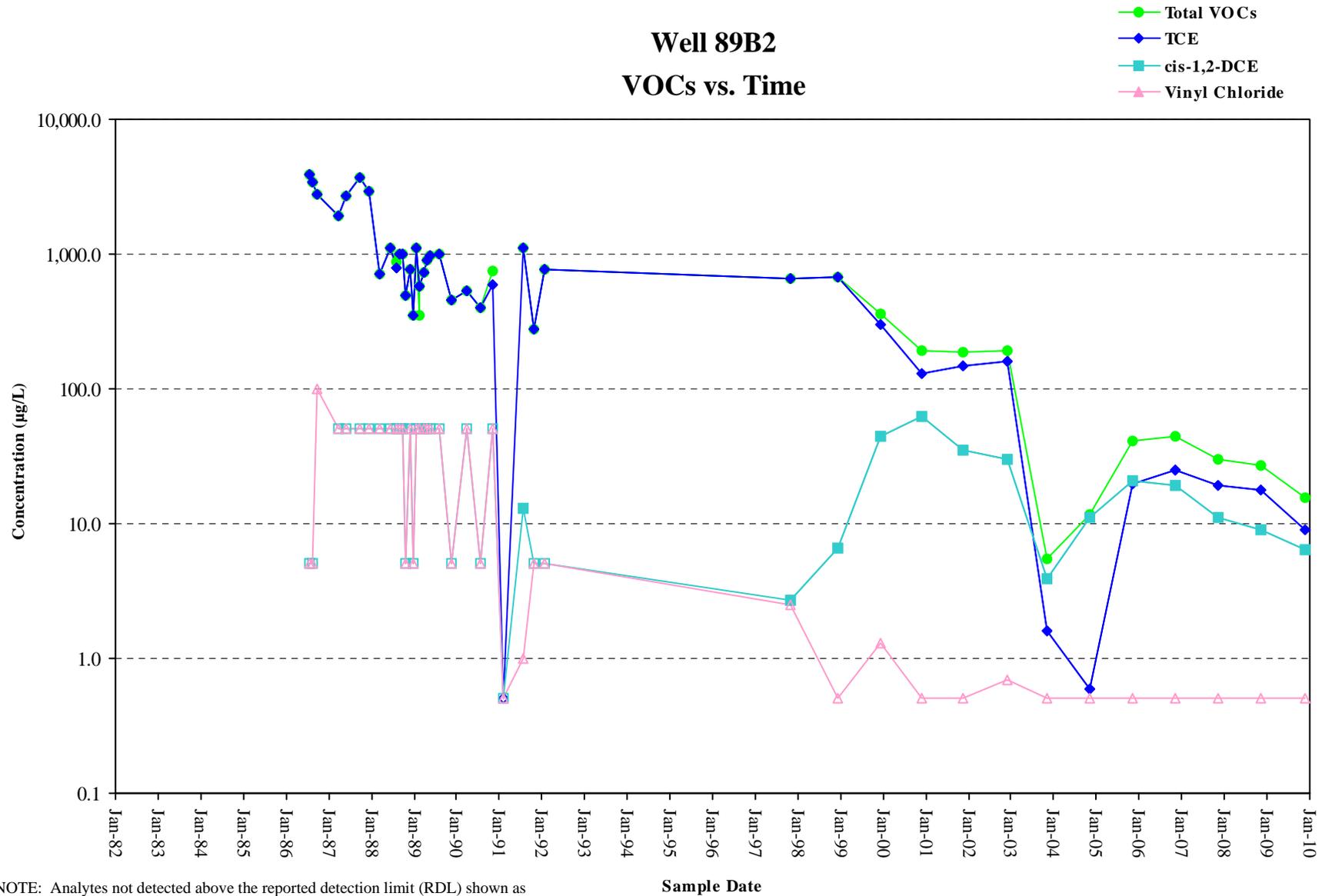
Well 16B2 VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

Abbreviations: VOC = volatile organic compounds, TCE = trichloroethylene,
DCE = dichloroethylene, µg/L = micrograms per liter

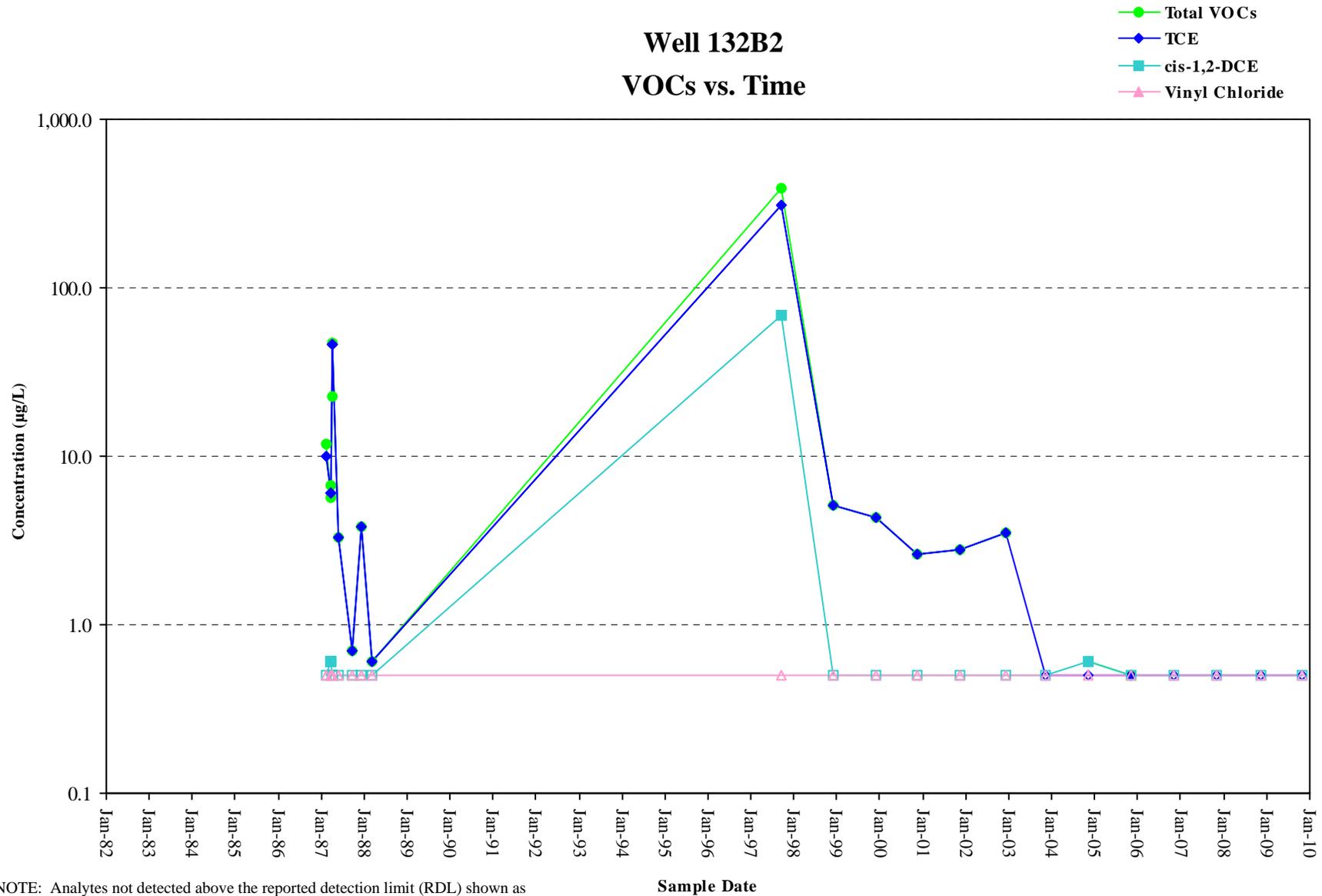
Well 89B2 VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

Abbreviations: VOC = volatile organic compounds, TCE = trichloroethylene,
DCE = dichloroethylene, µg/L = micrograms per liter

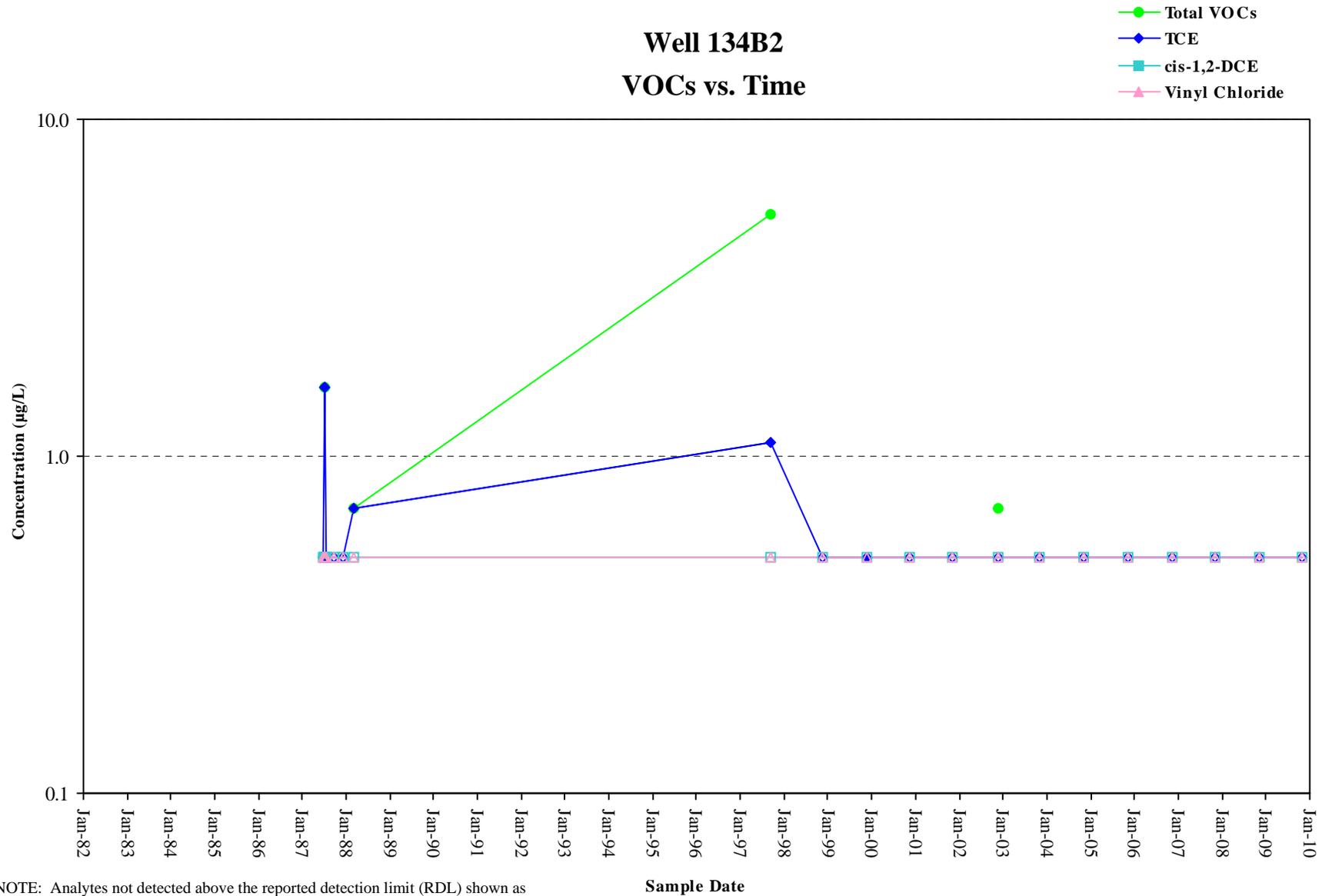
Well 132B2 VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

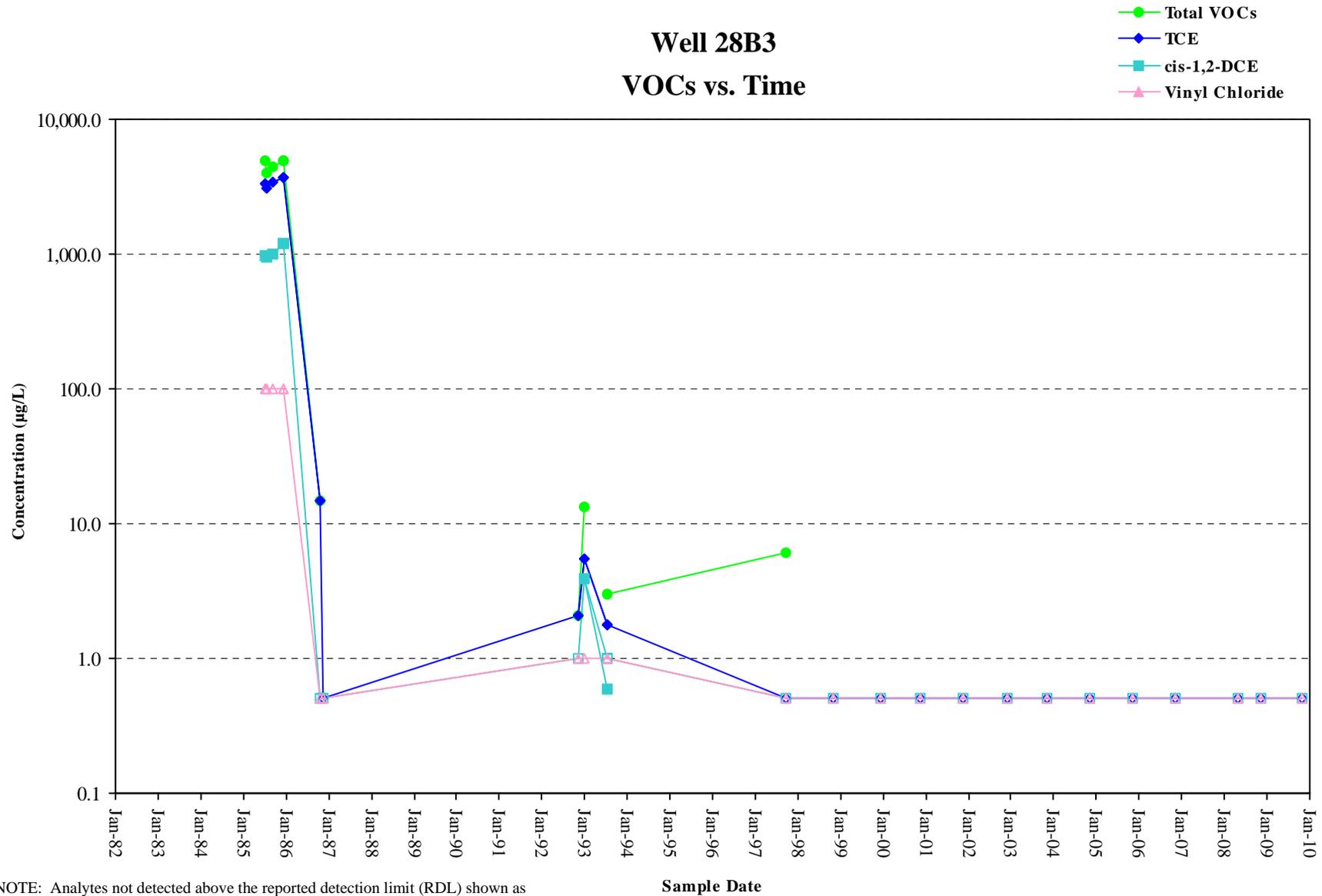
Abbreviations: VOC = volatile organic compounds, TCE = trichloroethylene, DCE = dichloroethylene, µg/L = micrograms per liter

Well 134B2 VOCs vs. Time



Abbreviations: VOC = volatile organic compounds, TCE = trichloroethylene,
DCE = dichloroethylene, µg/L = micrograms per liter

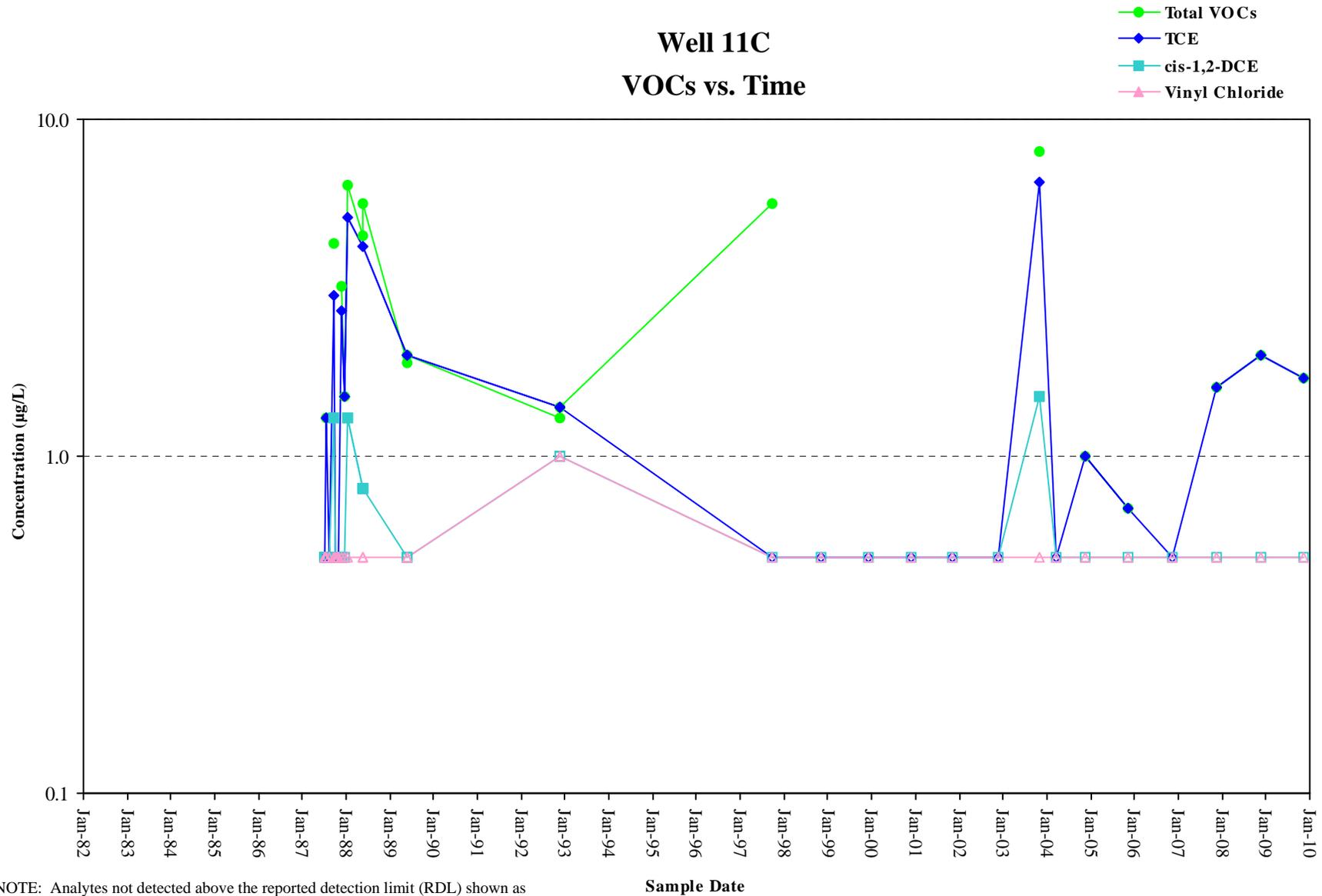
Well 28B3 VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

Abbreviations: VOC = volatile organic compounds, TCE = trichloroethylene,
DCE = dichloroethylene, µg/L = micrograms per liter

Well 11C VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

Abbreviations: VOC = volatile organic compounds, TCE = trichloroethylene, DCE = dichloroethylene, µg/L = micrograms per liter