

Final Work Plan for Targeted Sampling at Webber, Kansas

Environmental Science Division



United States Department of Agriculture

Work sponsored by Commodity Credit Corporation,
United States Department of Agriculture

About Argonne National Laboratory

Argonne is a U.S. Department of Energy laboratory managed by The University of Chicago under contract W-31-109-Eng-38. The Laboratory's main facility is outside Chicago, at 9700 South Cass Avenue, Argonne, Illinois 60439. For information about Argonne, see www.anl.gov.

Availability of This Report

This report is available, at no cost, at <http://www.osti.gov/bridge>. It is also available on paper to the U.S. Department of Energy and its contractors, for a processing fee, from:

U.S. Department of Energy

Office of Scientific and Technical Information

P.O. Box 62

Oak Ridge, TN 37831-0062

phone (865) 576-8401

fax (865) 576-5728

reports@adonis.osti.gov

Disclaimer

This report was prepared as an account of work sponsored by an agency of the United States Government. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof.

The views and opinions of document authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof, Argonne National Laboratory, or The University of Chicago.

Final Work Plan for Targeted Sampling at Webber, Kansas

by
Applied Geosciences and Environmental Management Section
Environmental Science Division, Argonne National Laboratory

May 2006



United States Department of Agriculture

Work sponsored by Commodity Credit Corporation,
United States Department of Agriculture

Contents

| | |
|--|------|
| Notation..... | iv |
| 1 Introduction | 1-1 |
| 2 Background | 2-1 |
| 2.1 Previous Investigations..... | 2-1 |
| 2.1.1 Private Well Sampling in February 1996..... | 2-8 |
| 2.1.2 Sampling for Site Reconnaissance and Evaluation, February 1997..... | 2-8 |
| 2.1.3 Sampling for the Phase I Comprehensive Investigation, October 1997–March 1998 | 2-10 |
| 2.1.4 KDHE Sampling in December 2001 | 2-10 |
| 2.2 Ongoing Monitoring Activities..... | 2-11 |
| 2.3 Potentially Responsible Parties..... | 2-12 |
| 3 Sampling Plan..... | 3-1 |
| 3.1 Project Objectives | 3-1 |
| 3.2 Scope of Work | 3-1 |
| 3.2.1 Sampling of Existing Wells | 3-1 |
| 3.2.2 Groundwater Sampling with the Cone Penetrometer | 3-3 |
| 3.2.3 Vertical-Profile Soil Sampling with the Cone Penetrometer (If Warranted)..... | 3-4 |
| 3.3 Potential Access Issues..... | 3-5 |
| 3.4 Sampling and Reporting Schedule..... | 3-5 |
| 3.5 Quality Assurance and Quality Control | 3-6 |
| 3.6 Health and Safety | 3-8 |
| 3.7 Webber Contacts | 3-8 |
| 4 References | 4-1 |
| Appendix A: Activities Related to Webber, 2001-2006..... | A-1 |

Figures

| | |
|--|------|
| 1.1 Location of Webber, Jewell County, Kansas | 1-2 |
| 2.1 Analytical results for carbon tetrachloride in three private wells sampled by the KDHE in 1996..... | 2-15 |
| 2.2 Analytical results for carbon tetrachloride in five private wells sampled by the KDHE in 1997..... | 2-16 |

Figures (Cont.)

| | | |
|-----|---|------|
| 2.3 | Analytical results for carbon tetrachloride in groundwater samples collected during the KDHE Phase I Comprehensive Investigation in 1997–1998 | 2-17 |
| 2.4 | Analytical results for carbon tetrachloride in soil samples collected during the KDHE Phase I Comprehensive Investigation in 1997–1998 | 2-18 |
| 2.5 | Analytical results for nitrate in groundwater samples collected during the KDHE Phase I Comprehensive Investigation in 1997–1998 | 2-19 |
| 2.6 | Automatically recorded water levels in KDHE wells MW1–MW6 in 2001–2005 | 2-20 |
| 2.7 | Water table contours for KDHE measurements on February 25, 1998, and Argonne measurements on August 19, 2004, with locations of present and former grain storage facilities and the Brachvogel home well (HW-8) | 2-21 |
| 2.8 | Interpreted locations of former grain storage facilities at Webber | 2-22 |
| 2.9 | Locations of present grain storage structures at Webber | 2-23 |
| 3.1 | Proposed sampling locations | 3-11 |
| 3.2 | Route from Webber to Brodstone Memorial Hospital, Superior, Nebraska | 3-12 |

Tables

| | | |
|-----|---|------|
| 2.1 | Analytical results from previous investigations at Webber, Kansas | 2-2 |
| 2.2 | Summary of results of off-site laboratory analyses for carbon tetrachloride in groundwater samples collected at Webber, 1996–2005 | 2-9 |
| 2.3 | Precipitation data for the Webber area, as measured at Lovewell Dam | 2-12 |
| 3.1 | Emergency information for the sampling event at Webber, Kansas | 3-10 |

Notation

| | |
|-------|--|
| AGEM | Applied Geosciences and Environmental Management |
| AMSL | above mean sea level |
| BGL | below ground level |
| °C | degree(s) Celsius |
| CCC | Commodity Credit Corporation |
| CPT | cone penetrometer |
| DOE | U.S. Department of Energy |
| EPA | U.S. Environmental Protection Agency |
| ft | foot (feet) |
| h | hour |
| I.D. | inner diameter |
| KDHE | Kansas Department of Health and Environment |
| KGCC | Kansas Geospatial Community Commons |
| µg/kg | microgram(s) per kilogram |
| µg/L | microgram(s) per liter |
| MCL | maximum contaminant level |
| mg/L | milligram(s) per liter |
| mi | mile(s) |
| MW | monitoring well |
| ppb | part(s) per billion |
| ppm | part(s) per million |
| PVC | polyvinyl chloride |
| QA | quality assurance |
| QC | quality control |
| RWD | Rural Water District |
| USDA | U.S. Department of Agriculture |
| VOC | volatile organic compound |

Final Work Plan for Targeted Sampling at Webber, Kansas

1 Introduction

This *Work Plan* outlines the scope of work for targeted sampling at Webber, Kansas (Figure 1.1). This activity is being conducted at the request of the Kansas Department of Health and Environment (KDHE), in accordance with Section V of the Intergovernmental Agreement between the KDHE and the Commodity Credit Corporation of the U.S. Department of Agriculture (CCC/USDA). Data obtained in this sampling event will be used to (1) evaluate the current status of previously detected contamination at Webber and (2) determine whether the site requires further action.

This work is being performed on behalf of the CCC/USDA by the Environmental Science Division of Argonne National Laboratory. Argonne is a nonprofit, multidisciplinary research center operated by the University of Chicago for the U.S. Department of Energy (DOE). The CCC/USDA has entered into an interagency agreement with DOE, under which Argonne provides technical assistance to the CCC/USDA with environmental site characterization and remediation at its former grain storage facilities.

Argonne has issued a *Master Work Plan* (Argonne 2002) that describes the general scope of and guidance for all investigations at former CCC/USDA facilities in Kansas. The *Master Work Plan*, approved by the KDHE, contains the materials common to investigations at all locations in Kansas. This document should be consulted for complete details of the technical activities proposed at the former CCC/USDA facility in Webber.

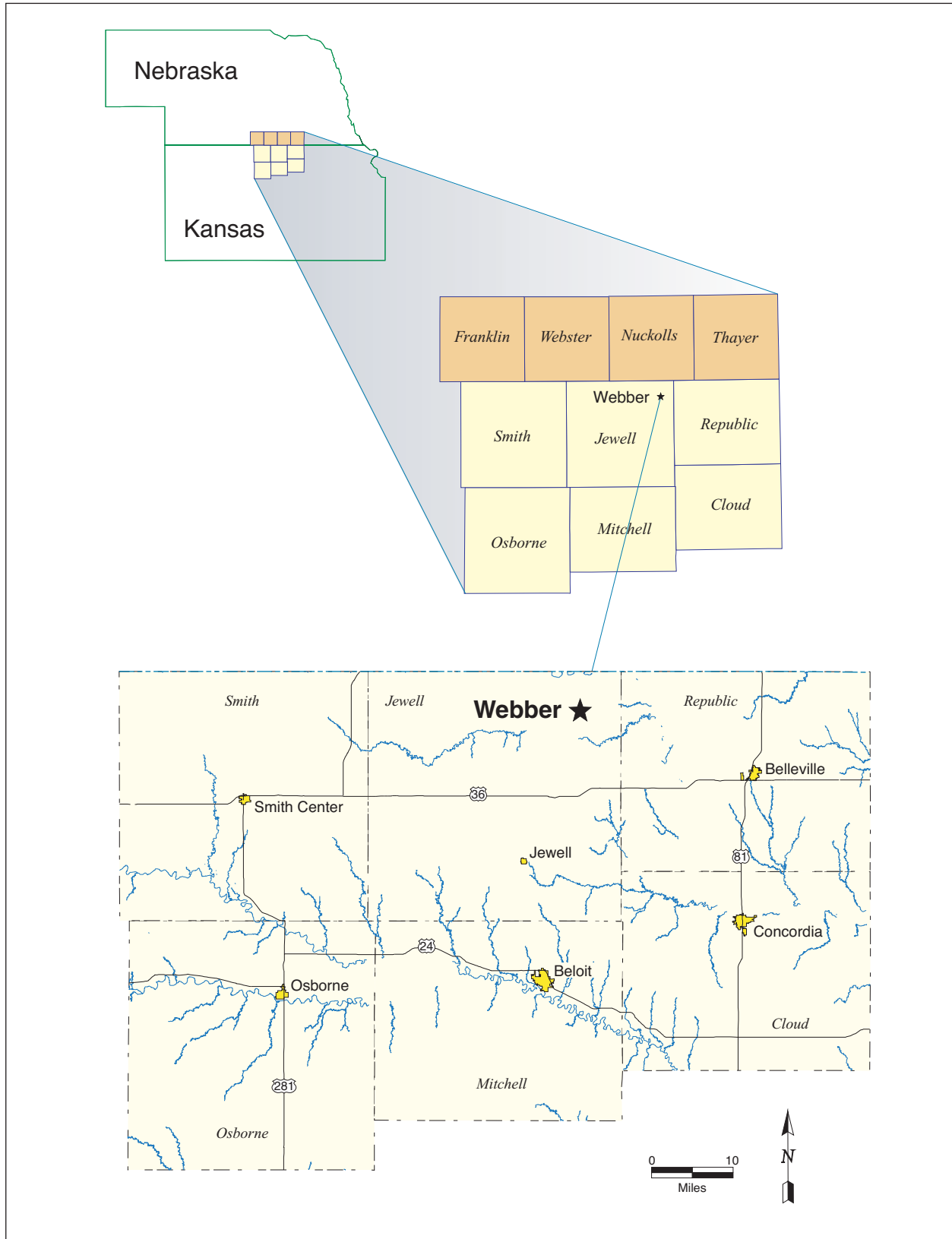


FIGURE 1.1 Location of Webber, Jewell County, Kansas.

2 Background

The incorporated city of Webber, Kansas, is a small rural community of approximately 34 residents, located in northeastern Jewell County. Webber has never had a municipal water supply or sewer system. Domestic water is obtained primarily from private wells; however, a number of residences are connected to the Jewell County Rural Water District (RWD) #1.

Webber lies within the dissected high terrace physiographic region of north-central Kansas and is located near the crests of both a relatively low-relief topographic divide and a subsurface bedrock high that extend roughly east-west across the region. Because the regional groundwater supplies are sparse, the lands surrounding Webber are used predominantly for dry-land agriculture. No irrigation wells have been identified within approximately a 1-mi radius of the town. The groundwater flow direction beneath the town is toward the north-northeast.

The geologic section at Webber consists of Pleistocene loess (35–50 ft) overlying a 35- to 50-ft sequence of interbedded silts, clays, sands, and gravels that rest on Cretaceous shale bedrock. Groundwater for domestic use in the town is drawn from the saturated lower portion of a Pleistocene sequence of sand and gravel that appears to host a single unconfined aquifer. Studies described below indicate that groundwater generally flows to the north or northeast in the vicinity of the town (Argonne 2003).

Carbon tetrachloride contamination in groundwater at Webber was initially identified in February 1996 as a result of the private well sampling program funded by the CCC/USDA and the U.S. Environmental Protection Agency (EPA) (KDHE 1996a). Subsequent sampling of the three wells originally sampled in February 1996, additional private wells, and six monitoring wells installed by the KDHE confirmed the presence of relatively low levels of carbon tetrachloride contamination (generally < 10 µg/L) in the groundwater at Webber. The results of all sampling activities performed at the site are summarized in Table 2.1 and described in Section 2.1.

2.1 Previous Investigations

Several investigations have been performed at Webber on behalf of both the KDHE and the CCC/USDA to (1) identify potential sources of the carbon tetrachloride in groundwater and (2) determine the patterns of groundwater flow and contaminant distribution at this site.

TABLE 2.1 Analytical results from previous investigations at Webber, Kansas.

| Sample Date | Sample Location ^b | Sample Medium | Property Identifier | Sample Depth (ft) ^c | Results of Field Analyses ^a | | | Results of Off-site Laboratory Analyses ^a | | | |
|--|------------------------------|---------------|---------------------|--------------------------------|--|-----------------------------|-------------------|--|-----------------------------|-------------------|-------------------------------|
| | | | | | Nitrate (ppm) | Carbon Tetra-chloride (ppb) | Chloro-form (ppb) | Nitrate (ppm) | Carbon Tetra-chloride (ppb) | Chloro-form (ppb) | Other VOCs ^d (ppb) |
| <i>Sampling of wells under the private well sampling program (Source: KDHE 1996a)</i> | | | | | | | | | | | |
| 2/13/96 | HW-7 | Water | Davidson | 45 | – ^e | ND ^f | NR ^g | – | 0.36 | NR | |
| 2/13/96 | HW-9 | Water | Burge | 50 | – | < 2 ^h | NR | 26.63 | 0.41 | NR | |
| 2/13/96 | HW-13 | Water | C. Carter | 63 | – | ND | NR | – | < 0.06 | NR | |
| <i>Sampling conducted for the Site Reconnaissance and Evaluation (Source: KDHE 1997)</i> | | | | | | | | | | | |
| 2/18/97 | HW-7 | Water | Davidson | 45 | 8.9 | 0.5 | NR | 8.29 | 1.0 | < 0.5 | |
| 2/18/97 | HW-9 | Water | Burge | 50 | 22.2 | < 0.2 | NR | 28.5 | < 0.5 | < 0.5 | |
| 2/18/97 | HW-11 | Water | J. Carter | Unknown | 11.1 | < 0.2 | NR | 15.43 | < 0.5 | < 0.5 | |
| 2/19/97 | HW-13 | Water | C. Carter | 63 | 11.1 | < 0.2 | NR | 13.58 | < 0.5 | < 0.5 | |
| 2/19/97 | HW-17 | Water | Bait Shop | 65 | 22.2 | < 0.2 | NR | 17.04 | < 0.5 | < 0.5 | |
| 2/18/97 | P-1 | Soil | CCC/USDA | 3.5 | – | < 0.2 | < 0.2 | – | – | – | |
| 2/18/97 | P-1 | Soil | CCC/USDA | 9 | – | < 0.2 | < 0.2 | – | – | – | |
| 2/19/97 | P-2 | Soil | Co-op | 3.5 | – | < 0.2 | < 0.2 | – | – | – | |
| 2/19/97 | P-2 | Soil | Co-op | 9 | – | < 0.2 | < 0.2 | – | – | – | |
| <i>Soil sampling at suspected source areas in the Phase I Comprehensive Investigation (Source: Burns and McDonnell 1998)</i> | | | | | | | | | | | |
| 10/29/97 | SP-1 | Soil | Background | 8–10 | – | < 0.1 | – | 20.1 | – | – | |
| 10/29/97 | SP-2 | Soil | Co-op | 8–10 | – | < 0.1 | – | 21.6 | – | – | |
| 10/29/97 | SP-3 | Soil | Co-op | 8–10 | – | < 0.1 | – | 0.56 | – | – | |
| 10/29/97 | SP-4 | Soil | Co-op | 8–10 | – | < 0.1 | – | 405 | – | – | |
| 10/29/97 | SP-5 | Soil | Dahl | 8–10 | – | < 0.1 | – | 0.61 | – | – | |
| 10/29/97 | SP-6 | Soil | Dahl | 8–10 | – | < 0.1 | – | 0.47 | – | – | |
| 10/29/97 | SP-7 | Soil | Dahl | 8–9 | – | < 0.1 | – | 0.41 | – | – | |
| 10/29/97 | SP-8 | Soil | CCC/USDA | 8–10 | – | 0.3 | – | 0.27 | – | – | |
| 10/29/97 | SP-8 Dup | Soil | CCC/USDA | 8–10 | – | 0.3 | – | – | – | – | |
| 10/29/97 | SP-9 | Soil | CCC/USDA | 8–10 | – | 0.4 | – | 0.43 | – | – | |
| 10/29/97 | SP-10 | Soil | Background | 8–10 | – | < 0.1 | – | < 1 | – | – | |

TABLE 2.1 (Cont.)

| Sample Date | Sample Location ^b | Sample Medium | Property Identifier | Sample Depth (ft) ^c | Results of Field Analyses ^a | | | Results of Off-site Laboratory Analyses ^a | | | |
|--|------------------------------|---------------|---------------------|--------------------------------|--|-----------------------------|-------------------|--|-----------------------------|-------------------|-------------------------------|
| | | | | | Nitrate (ppm) | Carbon Tetra-chloride (ppb) | Chloro-form (ppb) | Nitrate (ppm) | Carbon Tetra-chloride (ppb) | Chloro-form (ppb) | Other VOCs ^d (ppb) |
| <i>Soil sampling at suspected source areas in the Phase I Comprehensive Investigation (Cont.)</i> | | | | | | | | | | | |
| 11/5/97 | SP-11 | Soil | CCC/USDA | 8–10 | – | – | – | 0.2 | < 1 | < 1 | |
| 11/5/97 | SP-12 | Soil | CCC/USDA | 8–10 | – | – | – | 0.1 | < 1 | < 1 | |
| 11/5/97 | SP-13 | Soil | CCC/USDA | 8–10 | – | – | – | < 1 | < 1 | < 1 | Tetrachloroethylene = 10.8 |
| 11/5/97 | SP-14 | Soil | CCC/USDA | 8–10 | – | – | – | 1.65 | < 1 | < 1 | |
| 11/5/97 | SP-15 | Soil | CCC/USDA | 8–10 | – | – | – | 2.37 | < 1 | < 1 | |
| <i>Unsuccessful groundwater sampling with Geoprobe (no water encountered) in the Phase I Comprehensive Investigation (Source: Burns and McDonnell 1998)</i> | | | | | | | | | | | |
| 10/29/97 | SP-1 | Water | Background | 32 | | | | | | | |
| 10/29/97 | SP-4 | Water | Co-op | 37 | | | | | | | |
| 10/29/97 | SP-8 | Water | CCC/USDA | 35 | | | | | | | |
| <i>Sampling of domestic wells for analyses for volatile organic compounds, with selected samples sent off-site for analysis, in the Phase I Comprehensive Investigation (Source: Burns and McDonnell 1998)</i> | | | | | | | | | | | |
| 10/30/97 | HW-1 | Water | Wyatt | Unknown | – | < 0.1 | – | – | – | – | |
| 10/30/97 | HW-2 | Water | Blackstone home | Unknown | – | < 0.1 | – | – | – | – | |
| 10/30/97 | HW-3 | Water | Warren | Unknown | – | < 0.1 | – | – | – | – | |
| 10/30/97 | HW-4 | Water | Marr | Unknown | – | 0.4 | – | – | – | – | |
| 10/30/97 | HW-5 | Water | Thomas | 90 | – | < 0.1 | – | – | – | – | |
| 10/30/97 | HW-6 | Water | Avery | Unknown | – | 0.3 | – | – | – | – | |
| 10/30/97 | HW-7 | Water | Davidson | 45 | – | 0.2 | – | – | – | – | |
| 10/30/97 | HW-8 | Water | Brachvogel home | Unknown | – | 5.3 | – | – | 14.3 | < 0.2 | |
| 10/30/97 | HW-8 Dup | Water | Brachvogel home | Unknown | – | 5.2 | – | – | – | – | |
| 10/30/97 | HW-9 | Water | Burge | 50 | – | < 0.1 | – | – | – | – | |
| 10/30/97 | HW-10 | Water | Grammer | 60–65 | – | < 0.1 | – | – | – | – | |
| 10/30/97 | HW-11 | Water | G. Carter | Unknown | – | < 0.1 | – | – | – | – | |
| 10/30/97 | HW-12 | Water | Van Meter | 60–70 | – | < 0.1 | – | – | – | – | |
| 10/30/97 | HW-13 | Water | C. Carter home | 63 | – | < 0.1 | – | – | – | – | |
| 10/30/97 | HW-14 | Water | Dove | 65 | 14.6 | < 0.1 | – | 11 | – | – | |
| 10/30/97 | HW-15 | Water | Hutchinson | 35 | – | 0.2 | – | – | – | – | |

TABLE 2.1 (Cont.)

| Sample Date | Sample Location ^b | Sample Medium | Property Identifier | Sample Depth (ft) ^c | Results of Field Analyses ^a | | | Results of Off-site Laboratory Analyses ^a | | | |
|---|------------------------------|---------------|---------------------|--------------------------------|--|-----------------------------|-------------------|--|-----------------------------|-------------------|--|
| | | | | | Nitrate (ppm) | Carbon Tetra-chloride (ppb) | Chloro-form (ppb) | Nitrate (ppm) | Carbon Tetra-chloride (ppb) | Chloro-form (ppb) | Other VOCs ^d (ppb) |
| <i>Sampling of domestic wells for nitrate analysis, with selected samples sent off-site for nitrate and organic analyses, in the Phase I Comprehensive Investigation (Source: Burns and McDonnell 1998)</i> | | | | | | | | | | | |
| 11/6/97 | HW-1 | Water | Wyatt | Unknown | 38.1 | — | — | — | — | — | |
| 11/6/97 | HW-2 | Water | Blackstone home | Unknown | 35 | — | — | — | < 0.2 | < 0.2 | 1,1-Dichloroethane = 2.25 Tetrachloroethylene = 2.43 |
| 11/6/97 | | Water | Blackstone farm | | 28.5 | — | — | — | — | — | |
| 11/6/97 | HW-3 | Water | Warren | Unknown | 14.9 | — | — | — | — | — | |
| 11/6/97 | HW-4 | Water | Marr | Unknown | 9.3 | — | — | — | — | — | |
| 11/6/97 | HW-5 | Water | Thomas | 90 | 14 | — | — | — | — | — | |
| 11/6/97 | HW-6 | Water | Avery | Unknown | 12.3 | — | — | — | — | — | |
| 11/6/97 | HW-7 | Water | Davidson | 45 | 9.61 | — | — | — | — | — | |
| 11/6/97 | HW-8 | Water | Brachvogel home | Unknown | 8.02 | — | — | — | 15.1 | < 0.2 | |
| 11/6/97 | HW-9 | Water | Burge | 50 | 31.2 | — | — | — | — | — | |
| 11/6/97 | HW-10 | Water | Grammer | 60–65 | 13.8 | — | — | — | — | — | |
| 11/6/97 | HW-11 | Water | G. Carter | Unknown | 19.6 | — | — | — | — | — | |
| 11/6/97 | HW-12 | Water | Van Meter | ~ 60–70 | 13.7 | — | — | 9.5 | — | — | |
| 11/6/97 | HW-13 | Water | C. Carter | 60–70 | 16.1 | — | — | — | — | — | |
| 11/6/97 | HW-15 | Water | Hutchinson | 35 | 18.3 | — | — | — | — | — | |
| 11/6/97 | HW-16 | Water | Brachvogel garden | | 9.15 | — | — | — | 3.91 | < 0.2 | |
| 11/6/97 | HW-17 | Water | Bait Shop | 65 | 26.4 | — | — | — | — | — | |
| 11/6/97 | HW-18 | Water | Behrends | Unknown | 10.9 | — | — | — | — | — | |
| 11/6/97 | HW-19 | Water | Ehlers | Unknown | 19.8 | — | — | — | — | — | |
| 11/6/97 | HW-20 | Water | Diedrick | | 7.8 | — | — | — | — | — | |
| 11/6/97 | HW-21 | Water | Diamond | 90 | 14 | — | — | — | — | — | |
| 11/6/97 | | Water | Brown | | 6.72 | — | — | — | — | — | |
| 11/6/97 | | Water | Cassens | Unknown | 3.83 | — | — | — | — | — | |
| 11/6/97 | | Water | Doyle | Unknown | 20.4 | — | — | — | — | — | |
| 11/6/97 | | Water | Van Meter | Unknown | 6.17 | — | — | — | — | — | |
| <i>Second sampling of domestic wells in the Phase I Comprehensive Investigation (Source: Burns and McDonnell 1998)</i> | | | | | | | | | | | |
| 2/3/98 | HW-1 | Water | Wyatt | Unknown | — | — | — | 26.4 | — | — | |
| 2/3/98 | HW-2 | Water | Blackstone home | Unknown | — | — | — | 26.2 | < 0.2 | < 0.2 | 1,1-Dichloroethane = 2.31 1,1-Dichloroethylene = 0.33 |

TABLE 2.1 (Cont.)

| Sample Date | Sample Location ^b | Sample Medium | Property Identifier | Sample Depth (ft) ^c | Results of Field Analyses ^a | | | Results of Off-site Laboratory Analyses ^a | | | |
|---|------------------------------|---------------|---------------------|--------------------------------|--|-----------------------------|-------------------|--|-----------------------------|-------------------|-------------------------------|
| | | | | | Nitrate (ppm) | Carbon Tetra-chloride (ppb) | Chloro-form (ppb) | Nitrate (ppm) | Carbon Tetra-chloride (ppb) | Chloro-form (ppb) | Other VOCs ^d (ppb) |
| <i>Second sampling of domestic wells in the Phase I Comprehensive Investigation (Cont.)</i> | | | | | | | | | | | |
| 2/4/98 | | Water | Blackstone farm | | – | – | – | 23.3 | – | – | |
| 2/4/98 | HW-3 | Water | Warren | Unknown | – | – | – | 11.3 | – | – | |
| 2/4/98 | HW-4 | Water | Marr | Unknown | – | – | – | 7.58 | 0.88 | < 0.2 | |
| 2/3/98 | HW-5 | Water | Thomas | 90 | – | – | – | 10.4 | – | – | |
| 2/3/98 | HW-6 | Water | Avery | Unknown | – | – | – | 8.98 | 1.24 | < 0.2 | |
| 2/4/98 | HW-7 | Water | Davidson | 45 | – | – | – | 5.75 | 0.71 | < 0.2 | |
| 2/4/98 | HW-7 Dup | Water | Davidson | 45 | – | – | – | 5.77 | 0.69 | < 0.2 | |
| 2/3/98 | HW-9 | Water | Burge | 50 | – | – | – | 23.4 | – | – | |
| 2/4/98 | HW-11 | Water | G. Carter | Unknown | – | – | – | 16 | – | – | |
| 2/4/98 | HW-12 | Water | Van Meter | 60–70 | – | – | – | 9.96 | – | – | |
| 2/3/98 | HW-13 | Water | C. Carter | 63 | – | – | – | 12 | – | – | |
| 2/4/98 | HW-15 | Water | Hutchinson | 35 | – | – | – | 14.2 | 0.33 | < 0.2 | |
| 2/4/98 | HW-18 | Water | Behrends | Unknown | – | – | – | 9.65 | – | – | |
| 2/4/98 | HW-19 | Water | Ehlers | Unknown | – | – | – | 15.5 | – | – | |
| 2/4/98 | HW-21 | Water | Diamond | 90 | – | – | – | 10.9 | – | – | |
| 3/25/98 | | Water | Doyle | Unknown | – | – | – | 15.7 | – | – | |
| <i>Initial sampling of six monitoring wells in the Phase I Comprehensive Investigation (Source: Burns and McDonnell 1998)</i> | | | | | | | | | | | |
| 2/5/98 | MW1 | Water | | 71–81 | > 9 | – | – | 14.5 | 0.3 | < 0.2 | |
| 2/5/98 | MW2 | Water | | 71–81 | > 9 | – | – | 10.4 | < 0.2 | < 0.2 | |
| 2/5/98 | MW3 | Water | | 73–83 | 4.5 | – | – | – | 3.42 | < 0.2 | |
| 2/5/98 | MW3 Dup | Water | | 73–83 | – | – | – | – | 3.84 | 0.24 | |
| 2/5/98 | MW4 | Water | | 63–73 | > 9 | – | – | 8.82 | < 0.2 | < 0.2 | |
| 2/5/98 | MW5 | Water | | 60–70 | 2.6 | – | – | – | < 0.2 | < 0.2 | |
| 2/5/98 | MW6 | Water | | 60–70 | 15 | – | – | 8.94 | < 0.2 | < 0.2 | 1,1-Dichloroethane = 2.28 |

Second sampling of six monitoring wells in the Phase I Comprehensive Investigation (Source: Burns and McDonnell 1998)

TABLE 2.1 (Cont.)

| Sample Date | Sample Location ^b | Sample Medium | Property Identifier | Sample Depth (ft) ^c | Results of Field Analyses ^a | | | Results of Off-site Laboratory Analyses ^a | | | |
|--|------------------------------|---------------|---------------------|--------------------------------|--|----------------------------|------------------|--|----------------------------|------------------|---|
| | | | | | Nitrate (ppm) | Carbon Tetrachloride (ppb) | Chloroform (ppb) | Nitrate (ppm) | Carbon Tetrachloride (ppb) | Chloroform (ppb) | Other VOCs ^d (ppb) |
| 2/25/98 | MW1 | Water | | 71–81 | – | – | – | – | < 0.2 | < 0.2 | |
| 2/25/98 | MW2 | Water | | 71–81 | – | – | – | – | < 0.2 | < 0.2 | |
| 2/25/98 | MW3 | Water | | 73–83 | – | – | – | – | 3.2 | < 0.2 | |
| 2/25/98 | MW4 | Water | | 63–73 | – | – | – | – | 0.61 | 0.25 | |
| 2/25/98 | MW5 | Water | | 60–70 | – | – | – | – | < 0.2 | < 0.2 | |
| 2/25/98 | MW6 | Water | | 60–70 | – | – | – | – | < 0.2 | < 0.2 | 1,1-Dichloroethane = 2.63 Tetrachloroethylene = 0.56 |
| <i>Sampling of selected domestic wells by the KDHE in December 2001 (Source: KDHE 2002)</i> | | | | | | | | | | | |
| 12/4/01 | HW-3 | GW | Warren | Unknown | – | – | – | – | < 0.7 | < 0.5 | |
| 12/4/01 | HW-4 | GW | Marr (Dwight) | Unknown | – | – | – | – | < 0.7 | < 0.5 | |
| 12/4/01 | H-W5 | GW | Thomas | Unknown | – | – | – | – | < 0.7 | < 0.5 | |
| 12/4/01 | HW-6 | GW | Avery (Case) | Unknown | – | – | – | – | 1.3 | < 0.5 | |
| 12/4/01 | HW-7 | GW | Davidson | Unknown | – | – | – | – | < 0.7 | < 0.5 | |
| 12/4/01 | HW-15 | GW | Hutchinson | Unknown | – | – | – | – | < 0.7 | < 0.5 | |
| <i>Long-term monitoring of the Brachvogel well by CCC/USDA (Analyses by Culligan, 1998-2005)</i> | | | | | | | | | | | |
| 8/5/98 | HW-8 | Water | Brachvogel home | Unknown | – | – | – | – | 7.3 | – | |
| 2/22/99 | HW-8 | Water | Brachvogel home | Unknown | – | – | – | – | 2.9 ⁱ | – | |
| 10/28/99 | HW-8 | Water | Brachvogel home | Unknown | – | – | – | – | 4.3 ⁱ | – | |
| 2/19/00 | HW-8 | Water | Brachvogel home | Unknown | – | – | – | – | 6.2 | – | |
| 10/4/00 | HW-8 | Water | Brachvogel home | Unknown | – | – | – | – | 9 | – | |
| 3/26/01 | HW-8 | Water | Brachvogel home | Unknown | – | – | – | – | 13.3 | – | |
| 10/23/01 | HW-8 | Water | Brachvogel home | Unknown | – | – | – | – | 9.5 | – | |
| 5/13/02 | HW-8 | Water | Brachvogel home | Unknown | – | – | – | – | 10.6 | – | |
| 11/18/02 | HW-8 | Water | Brachvogel home | Unknown | – | – | – | – | 6.2 | – | |
| 4/9/03 | HW-8 | Water | Brachvogel home | Unknown | – | – | – | – | 7.5 | – | |
| 10/15/03 | HW-8 | Water | Brachvogel home | Unknown | – | – | – | – | 5.5 | – | |
| 4/23/04 | HW-8 | Water | Brachvogel home | Unknown | – | – | – | – | 5.1 | – | |

Long-term monitoring of the Brachvogel well by CCC/USDA (Cont.)

TABLE 2.1 (Cont.)

| Sample Date | Sample Location ^b | Sample Medium | Property Identifier | Sample Depth (ft) ^c | Results of Field Analyses ^a | | | Results of Off-site Laboratory Analyses ^a | | | |
|-------------|------------------------------|---------------|---------------------|--------------------------------|--|----------------------------|------------------|--|----------------------------|------------------|-------------------------------|
| | | | | | Nitrate (ppm) | Carbon Tetrachloride (ppb) | Chloroform (ppb) | Nitrate (ppm) | Carbon Tetrachloride (ppb) | Chloroform (ppb) | Other VOCs ^d (ppb) |
| 10/26/04 | HW-8 | Water | Brachvogel home | Unknown | – | – | – | – | 5 | – | |
| 4/26/05 | HW-8 | Water | Brachvogel home | Unknown | – | – | – | – | 7.2 | – | |
| 10/27/05 | HW-8 | Water | Brachvogel home | Unknown | | | | | 2.7 ^k | | |

^a Concentrations are given in parts per million (ppm; mg/L in water and mg/kg in soil) or in parts per billion (ppb; µg/L in water or µg/kg in soil).

^b Private well identifiers are those assigned in the 1998 Phase I Comprehensive Investigation report (Burns and McDonnell 1998). Some wells were not assigned a location number.

^c Depths of private wells are approximate, based on information from the well owners.

^d Laboratory contaminants present in samples at concentrations similar to those in method blanks are not reported.

^e Sample not analyzed for this constituent.

^f ND, result reported as not detected.

^g NR, result not reported in the documentation on file.

^H Result reported as detected at < 2 ppb.

^I Sample collected without purging of well.

^j Sample received by the laboratory at a temperature of 14°C.

^k Bubble in vial; samples received by the laboratory at a temperature above 6°C.

2.1.1 Private Well Sampling in February 1996

Carbon tetrachloride contamination in groundwater at Webber was initially identified in February 1996 as a result of the private well sampling program funded by the CCC/USDA and the EPA (KDHE 1996a). Three private wells (HW-7, HW-9, and HW-13) were sampled. The results of the analyses for carbon tetrachloride are shown in Figure 2.1. Carbon tetrachloride was detected in 1996 in samples from well HW-7 (Davidson) and well HW-9 (Burge), at concentrations below 1 µg/L. The contaminant was not detected in the sample from well HW-13 (C. Carter) at a quantitation limit of 0.06 µg/L. Analytical results from off-site laboratories for carbon tetrachloride in groundwater in 1996–2005 are summarized in Table 2.2.

2.1.2 Sampling for Site Reconnaissance and Evaluation, February 1997

In 1997, the KDHE conducted a pre-CERCLIS Site Reconnaissance and Evaluation (KDHE 1997) to identify potential sources of the carbon tetrachloride contamination detected during the 1996 private well testing. Analysis of groundwater samples collected in February 1997 from five private wells (HW-7, HW-9, HW-11, HW-13, and HW-17) identified carbon tetrachloride in only well HW-7 (Davidson), at 1.0 µg/L (Figure 2.2 and Table 2.2). All other results were below the quantitation limit of 0.5 µg/L for the off-site laboratory. Thus, these results failed to confirm the 1996 detection of carbon tetrachloride in well HW-9 (Burge).

Nitrate was detected in all five private wells sampled in February 1997, at concentrations of 8–28 mg/L (Table 2.1; off-site laboratory values). The maximum contaminant level (MCL) for nitrate is 10 mg/L. Nitrate contamination is discussed further in Section 2.1.3.

Carbon tetrachloride was not detected in either of two subsurface soils samples collected in February 1997 on the former Co-op/Montrose Grain property or in two samples collected near the northwestern boundary of the former CCC/USDA facility (Table 2.1).

The KDHE concluded that, because of the low concentrations of carbon tetrachloride detected, no further action at Webber was warranted under the Comprehensive Environmental Response, Compensation, and Liability Act, but that further response was necessary to address the nitrate contamination. The site was referred to the KDHE Bureau of Environmental Remediation State Water Plan program for further evaluation.

TABLE 2.2 Summary of results of off-site laboratory analyses for carbon tetrachloride in groundwater samples collected at Webber, 1996–2005.

| Location | Location Identifier | Depth (ft BGL) | | Carbon Tetrachloride (µg/L) on Sampling Date Indicated | | | | | | | | | | | | | | | | | | | | |
|----------|---------------------|-------------------|--------------------|--|-------|-------------------|-------|-------------------|------|------------------|------------------|------|-------|------|-------|-------|------|-------|------|-------|------|-------|------|------------------|
| | | Screened Interval | Total ^a | 2/96 | 2/97 | 10/97 | 11/97 | 2/98 ^b | 8/98 | 2/99 | 10/99 | 2/00 | 10/00 | 3/01 | 10/01 | 12/01 | 5/02 | 11/02 | 4/03 | 10/03 | 4/04 | 10/04 | 4/05 | 10/05 |
| HW-1 | Wyatt | Unknown | Unknown | c | | F ^d | | | | | | | | | | | | | | | | | | |
| HW-2 | Blackstone farm | Unknown | Unknown | | | F | < 0.2 | < 0.2 | | | | | | | | | | | | | | | | |
| HW-3 | Warren | Unknown | Unknown | | | F | | | | | | | | | < 0.7 | | | | | | | | | |
| HW-4 | Marr | Unknown | Unknown | | | F | | 0.88 | | | | | | | < 0.7 | | | | | | | | | |
| HW-5 | Thomas | Unknown | ~ 90 | | | F | | | | | | | | | < 0.7 | | | | | | | | | |
| HW-6 | Avery/Case | Unknown | Unknown | | | F | | 1.24 | | | | | | | 1.3 | | | | | | | | | |
| HW-7 | Davdison | Unknown | 45 | 0.36 | 1.0 | F | | 0.71 | | | | | | | < 0.7 | | | | | | | | | |
| HW-8 | Brachvogel home | Unknown | Unknown | | | 14.3 ^e | 15.1 | | 7.3 | 2.9 ^f | 4.3 ^g | 6.2 | 9.0 | 13.3 | 9.5 | | 10.6 | 6.2 | 7.5 | 5.5 | 5.1 | 5.0 | 7.2 | 2.7 ^h |
| HW-9 | Burge | Unknown | 50 | 0.41 ⁱ | < 0.5 | F | | | | | | | | | | | | | | | | | | |
| HW-10 | Grammer | Unknown | ~ 60–65 | | | F | | | | | | | | | | | | | | | | | | |
| HW-11 | G. Carter | Unknown | Unknown | | < 0.5 | F | | | | | | | | | | | | | | | | | | |
| HW-12 | Van Meter | Unknown | ~ 60-70 | | | F | | | | | | | | | | | | | | | | | | |
| HW-13 | C. Carter home | Unknown | 63 | < 0.06 | < 0.5 | F | | | | | | | | | | | | | | | | | | |
| HW-14 | Dove | Unknown | ~ 65 | | | F | | | | | | | | | | | | | | | | | | |
| HW-15 | Hutchinson | Unknown | ~ 35 | | | F | | 0.33 | | | | | | | < 0.7 | | | | | | | | | |
| HW-16 | Brachvogel garden | Unknown | Unknown | | | | 3.91 | | | | | | | | | | | | | | | | | |
| HW-17 | Bait Shop | Unknown | 65 | | < 0.5 | | | | | | | | | | | | | | | | | | | |
| MW1 | | 71–81 | 81 | | | | | 0.3, < 0.2 | | | | | | | | | | | | | | | | |
| MW2 | | 71–81 | 81 ^j | | | | | < 0.2, < 0.2 | | | | | | | | | | | | | | | | |
| MW3 | | 73–83 | 83 ^k | | | | | 3.42, 3.2 | | | | | | | | | | | | | | | | |
| MW4 | | 63–73 | 73 | | | | | < 0.2, 0.61 | | | | | | | | | | | | | | | | |
| MW5 | | 60–70 | 70 | | | | | < 0.2, < 0.2 | | | | | | | | | | | | | | | | |
| MW6 | | 60–70 | 70 | | | | | < 0.2, < 0.2 | | | | | | | | | | | | | | | | |

^a Total depths for private wells are approximate, as reported by the well owners during sampling for the 1998 comprehensive investigation (Burns and McDonnell 1998).

^b Monitoring wells MW1–MW6 were sampled on February 5, 1998, and again on February 25, 1998 (Burns and McDonnell 1998).

^c Empty cell indicates no sample or no analysis for carbon tetrachloride.

^d Field laboratory analysis for carbon tetrachloride gave a result of < 1 µg/L; sample not analyzed in off-site laboratory.

^e Field laboratory result, 5.3 µg/L.

^f Sample collected without purging of the well.

^g Sample received at off-site laboratory at a temperature of 14°C.

^h Bubble in vial; sample received by the laboratory at a temperature above 6°C.

ⁱ Identified as a duplicate sample.

^j The registered well depth of 83 ft BGL is inconsistent with the documentation by Burns and McDonnell (1998) of a depth of 81 ft BGL (Table 3.2 and Appendix B [field notes] of that report).

^k The registered well depth of 95 ft BGL is inconsistent with the documentation by Burns and McDonnell (1998) of a depth of 83 ft BGL (Table 3.2 and Appendix B [field notes] of that report).

2.1.3 Sampling for the Phase I Comprehensive Investigation, October 1997–March 1998

In April 1998, a Phase I Comprehensive Investigation of the nitrate and carbon tetrachloride contamination at Webber was completed by Burns and McDonnell Waste Consultants (Burns and McDonnell 1998), on behalf of the KDHE. Field activities in October 1997–March 1998 included groundwater sampling from private wells for nitrate analyses and analyses for volatile organic compound (VOCs); subsurface soil sampling for VOCs and nitrate analyses; and the drilling, installation, and sampling of six monitoring wells (MW1–MW6; Table 2.1).

Laboratory analyses of the groundwater samples collected in October 1997–March 1998 identified carbon tetrachloride in six wells north of the former CCC/USDA facility and east of the railroad tracks. These six wells include five private wells (HW-4 [Marr], HW-6 [Avery], HW-7 [Davidson], HW-8 [Brachvogel home], and HW-16 [Brachvogel garden]) and KDHE monitoring well MW3. Carbon tetrachloride was also detected in monitoring well MW4 south of the former CCC/USDA facility and in monitoring well MW1 and one private well (HW-15 [Hutchinson]) north of the former Co-op/Montrose Grain facility (Figure 2.3 and Table 2.2). Concentrations detected in these samples ranged from 0.2 µg/L to a maximum of 15.1 µg/L in well HW-8 (the Brachvogel home well). As a consequence of the elevated levels of carbon tetrachloride in well HW-8, the CCC/USDA began supplying the Brachvogel residence with bottled water in 1998 and subsequently connected the residence to the RWD.

In subsurface soil sampling in October 1997–March 1998, trace concentrations of carbon tetrachloride (0.3–0.4 µg/kg) were reported (on the basis of field screening analyses only) in two subsurface soil samples (depth 8–10 ft BGL [below ground level]) collected at the approximate location of the former CCC/USDA facility (Figure 2.4 and Table 2.1); no carbon tetrachloride was detected in soil samples from the former Co-op/Montrose Grain facility.

Nitrate contamination was found at levels generally exceeding the MCL of 10 mg/L in groundwater samples collected throughout the study area in October 1997–March 1998 (Figure 2.5 and Table 2.1 [off-site laboratory results]).

2.1.4 KDHE Sampling in December 2001

In December 2001, the KDHE collected groundwater for VOCs analyses from six private domestic wells (HW-3, HW-4, HW-5, HW-6, HW-7, and HW-15) that had also been sampled in

1997–1998, during the Phase I Comprehensive Investigation (Table 2.2). Carbon tetrachloride contamination was detected in only one sample, from well HW-6 (Avery/Case), at 1.3 µg/L (KDHE 2002).

2.2 Ongoing Monitoring Activities

Since completion of the Phase I Comprehensive Investigation (Burns and McDonnell 1998), the CCC/USDA has monitored the contamination in well HW-8 (Brachvogel home well), which is no longer used for domestic water supply. Culligan Water Services samples groundwater from this well semi-annually on behalf of the CCC/USDA. The samples are currently analyzed by Continental Analytical Services. The well was last sampled in October 2005. The results of the analyses (Table 2.2) have generally remained at or above the MCL of 5.0 µg/L, ranging from 5.0 µg/L to 13.3 µg/L. An apparent concentration of 2.7 µg/L was reported for the sample collected in October 2005; however, the sample was received for analysis at an unacceptable holding temperature, and additional quality control issues make this value questionable. Carbon tetrachloride concentrations in the well have shown no clear rising or falling trend; the maximum value of 13.3 µg/L occurred in March 2001, and the minimum of 5.0 µg/L (equal to the MCL) occurred in October 2004.

In 2001, the CCC/USDA and Argonne obtained the KDHE's permission (KDHE 2001) to install automatic groundwater level recorders in the six monitoring wells previously constructed by the KDHE. Water levels at these locations were recorded continuously (every 4–8 h) in all six wells from November 2001 until August 2004. Automatic monitoring in MW2 continued until September 2005. The resulting hydrographs, summarized in Figure 2.6, show that groundwater levels at the site changed little in 2001–2005. A uniform decline of about 2 ft occurred from late 2002 until early 2003, and levels slowly recovered by a similar amount in late 2003 and 2004. The available data show a subsequent decline and a partial rebound of water levels during 2005. Precipitation data for the Webber area during the monitoring period of 2001–2005 are summarized in Table 2.3, along with the long-term average for this location in 1971–2000. The years 2001, 2003, and 2004 were significantly wetter than the average, whereas 2002 was significantly drier, and 2005 was slightly drier.

TABLE 2.3 Precipitation data for the Webber area, as measured at Lovewell Dam.^a

| Month | Precipitation (in.) | | | | | 1971-2000 Average |
|---------------------------|---------------------|-------|-------|-------|-------|----------------------|
| | 2001 | 2002 | 2003 | 2004 | 2005 | |
| January | 1.18 | 0.40 | 0.26 | 0.94 | 1.28 | 0.64 |
| February | 2.96 | 0.53 | 0.77 | 0.76 | 1.22 | 0.69 |
| March | 0.96 | 0.54 | 1.51 | 3.65 | 2.17 | 2.12 |
| April | 1.27 | 2.41 | 2.52 | 1.47 | 0.0 | 2.58 |
| May | 9.93 | 4.09 | 3.70 | 4.58 | 0.85 | 3.92 |
| June | 2.99 | 3.36 | 10.84 | 5.00 | 3.69 | 3.31 |
| July | 2.99 | 0.57 | 0.26 | 7.44 | 4.91 | 3.75 |
| August | 5.91 | 1.71 | 4.30 | 2.09 | 7.40 | 3.25 |
| September | 3.87 | 1.99 | 4.78 | 2.62 | 1.23 | 2.69 |
| October | 1.69 | 5.13 | 0.83 | 1.20 | 1.89 | 1.91 |
| November | 0.64 | 0.39 | 1.92 | 0.80 | 0.56 | 1.51 |
| December | 0.11 | 0.02 | 0.73 | 0.04 | 0.19 | 0.77 |
| Year total | 34.50 | 21.14 | 32.42 | 30.59 | 25.39 | 27.14 |
| Departure from average | +7.36 | -6.00 | +5.28 | +3.45 | -1.75 | |

^a Source: KSU (2006).

Two representative configurations of the local water table, as determined from groundwater level measurements made by the KDHE on February 25, 1998, and by Argonne on August 19, 2004, are shown in Figure 2.7. The monitoring results confirm a groundwater flow direction of north-northeast beneath the town.

2.3 Potentially Responsible Parties

The CCC/USDA and Argonne have identified five former commercial grain storage operations at Webber, in addition to the grain storage facilities formerly operated by the CCC/USDA. These additional facilities are the Webber Co-op; Montrose Grain Company, Inc.; the Farmers Union Co-op (a predecessor to the Webber Co-op); the Bossemeyer Grain

Company; and the Scoular-Bishop Grain Company (now The Scoular Company; <http://www.scoular.com/>). The interpreted locations of these former facilities, as determined from historic legal records, photographic records, and anecdotal information provided by long-term residents of Webber, are shown in Figure 2.8. As Figure 2.7 indicates, several former grain storage facilities lie upgradient from the carbon tetrachloride detected in groundwater at Webber. The owners of the upgradient facilities are all potentially responsible parties, as are the owners of the properties on which the facilities have operated.

No lease information has been discovered for the facilities operated by Scoular, Bossemeyer Grain, and the Farmers Union Co-op. Current tax records indicate that all of these operations were located on property now owned by the Burlington Northern Santa Fe Railroad. The western portion of the former Webber Co-op/Montrose Grain facility, formerly believed to be privately owned, also lies on railroad property, according to current tax records. The eastern portion of this former facility is privately owned by Mr. Richard Barry.

The water table contours shown in Figure 2.7 indicate that the former CCC/USDA facility is one of the potential source areas for the carbon tetrachloride concentration identified above the MCL in groundwater at the Brachvogel home well (HW-8). The former Farmers Union Co-op facility was also located generally upgradient of this contamination. The Farmers Union Co-op and its successor, the Webber Co-op, no longer exist as financially viable entities, despite their potential responsibility as a source.

The data illustrated in Figure 2.7 further indicate that the former Webber Co-op/Montrose Grain, Scoular, and Bossemeyer facilities are potential source areas for the low levels of carbon tetrachloride in groundwater reported by the KDHE in the north-central portion of Webber (Figure 2.3). Only The Scoular Company remains a financially viable entity. In another case involving carbon tetrachloride contamination, Scoular was involved in a remedial action in 1998 for carbon tetrachloride and ethylene dibromide in soil and groundwater at its elevator site in Salina, Kansas.

Some of the grain storage structures shown on the former Scoular-Bishop and Webber Co-op/Montrose Grain properties in 1957 (Figure 2.8) still remain and are now used by private individuals for grain storage. The storage capacity at this location was increased during the periods of operation by the Webber Co-op and Montrose Grain, as shown in Figure 2.9. Additionally, a number of privately owned (Dahl family) grain bins were installed after 1990 on property southwest of the former CCC/USDA and Farmers Union Co-op facilities. No storage

structures formerly operated by the CCC/USDA, Bossemeyer Grain, the Scoular-Bishop Grain Company, or the Farmers Union Co-op remain.

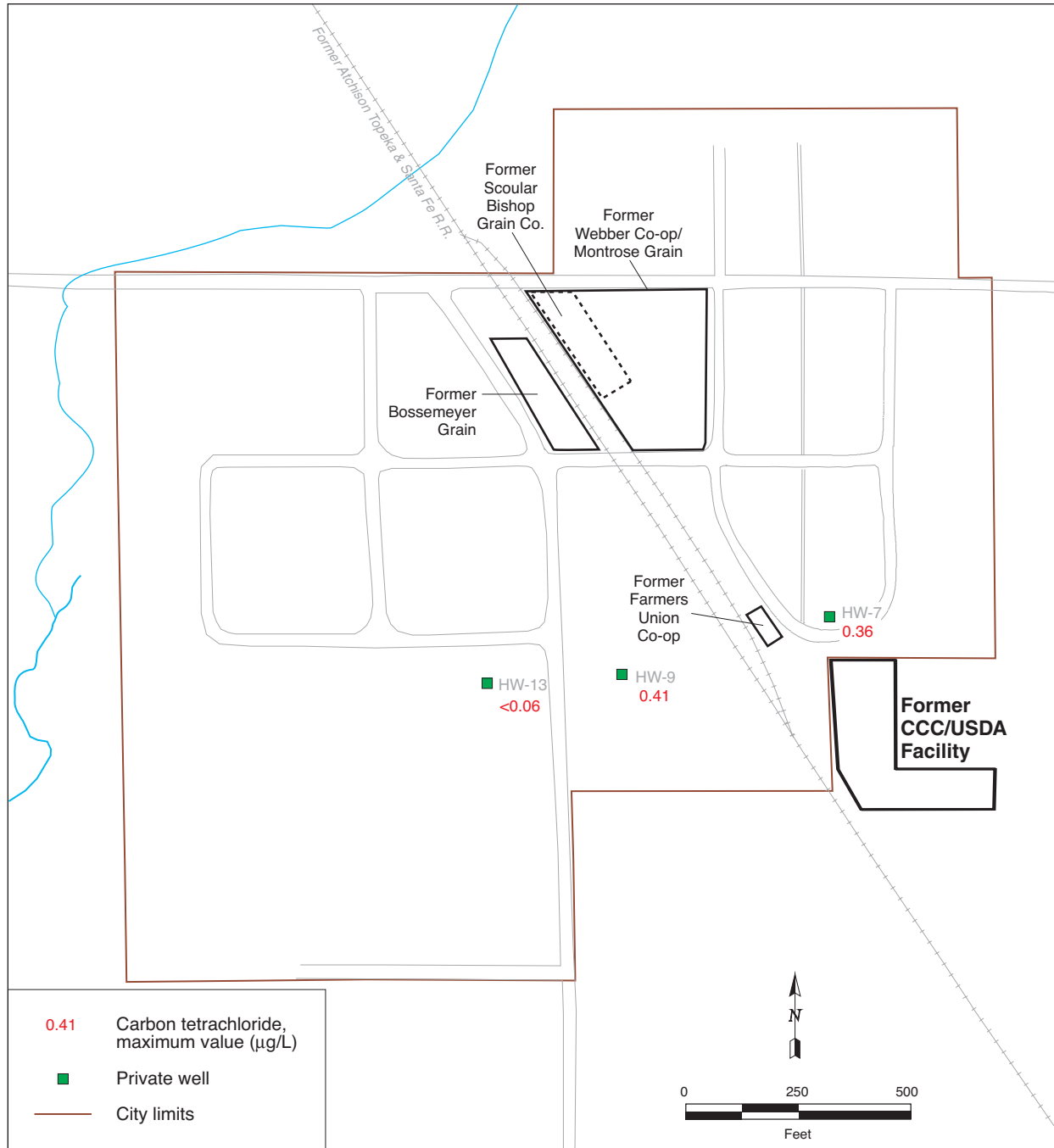


FIGURE 2.1 Analytical results for carbon tetrachloride in three private wells sampled by the KDHE in 1996. Source of data: KDHE (1996a).

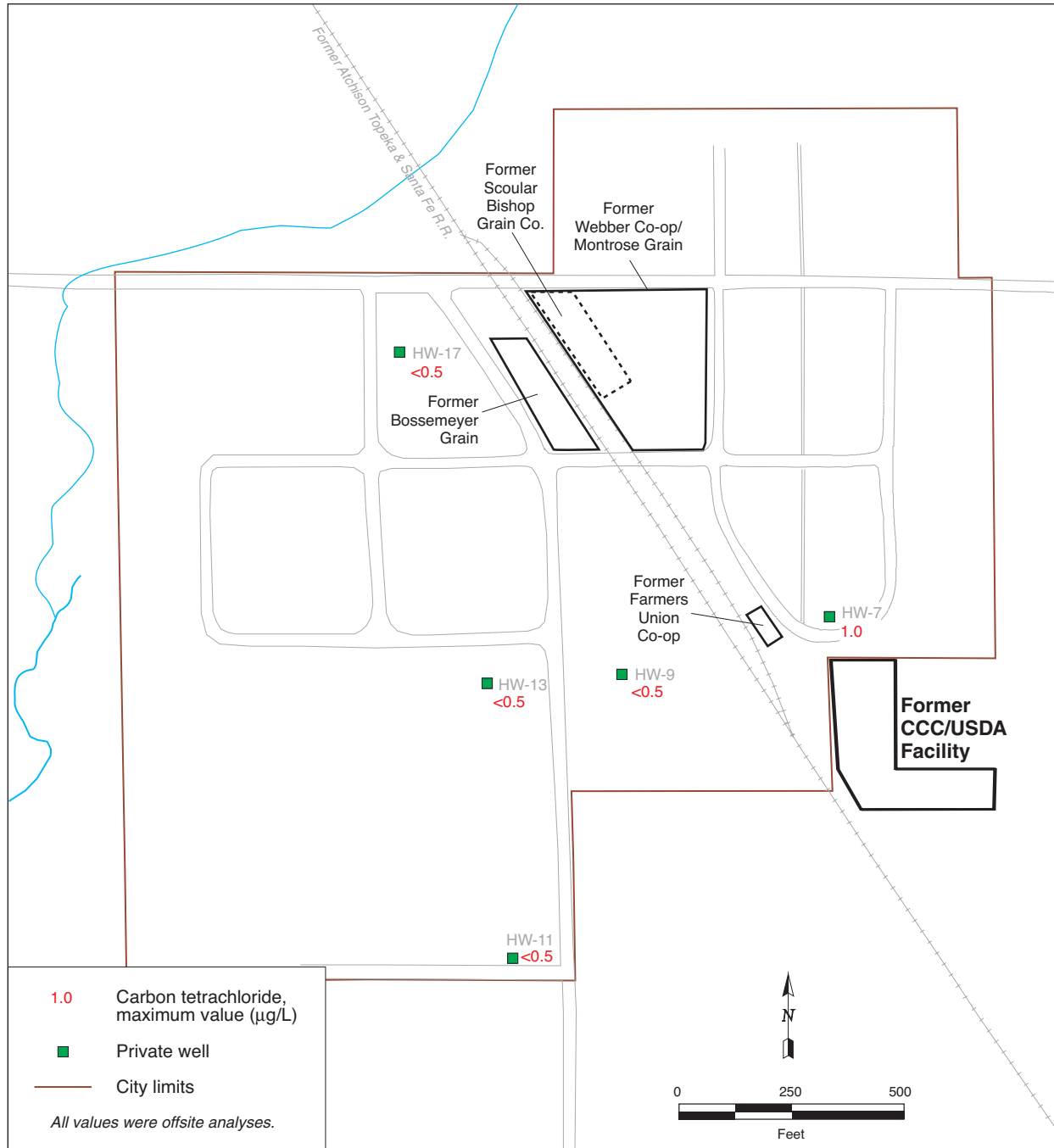


FIGURE 2.2 Analytical results for carbon tetrachloride in five private wells sampled by the KDHE in 1997. Source of data: KDHE (1997).

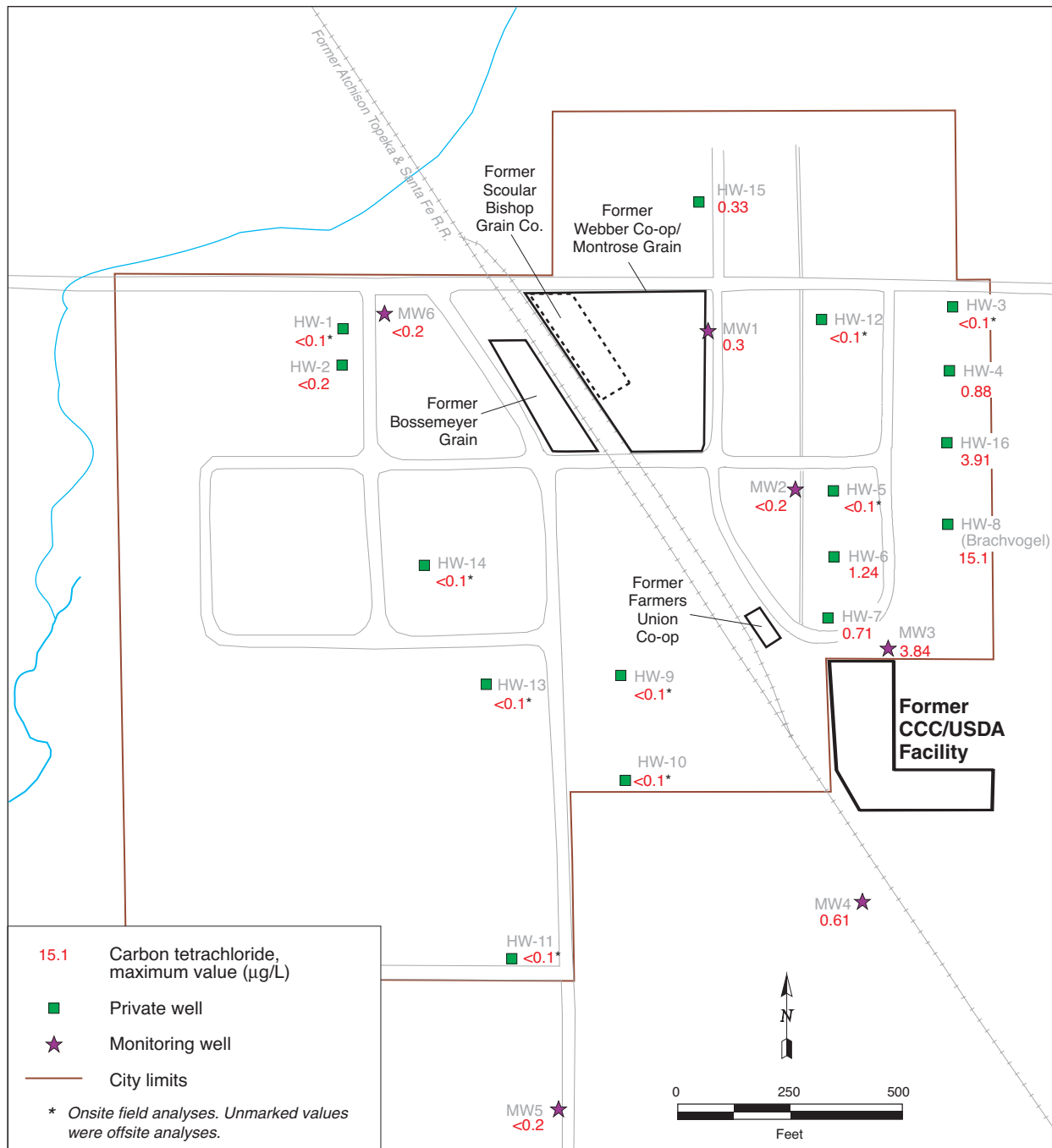


FIGURE 2.3 Analytical results for carbon tetrachloride in groundwater samples collected during the KDHE Phase I Comprehensive Investigation in 1997–1998. Source of data: Burns and McDonnell (1998).

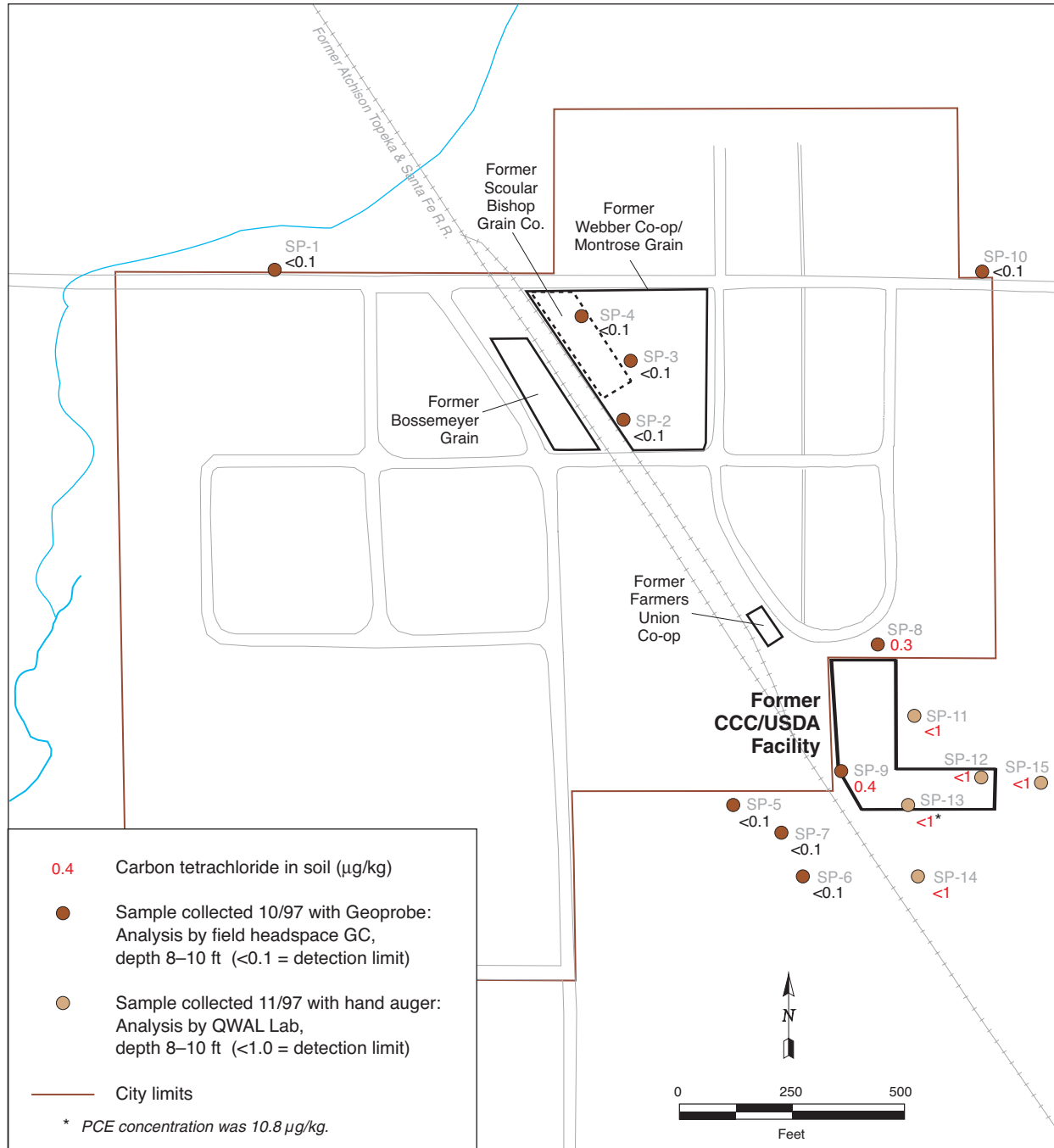


FIGURE 2.4 Analytical results for carbon tetrachloride in soil samples collected during the KDHE Phase I Comprehensive Investigation in 1997–1998. Source of data: Burns and McDonnell (1998).

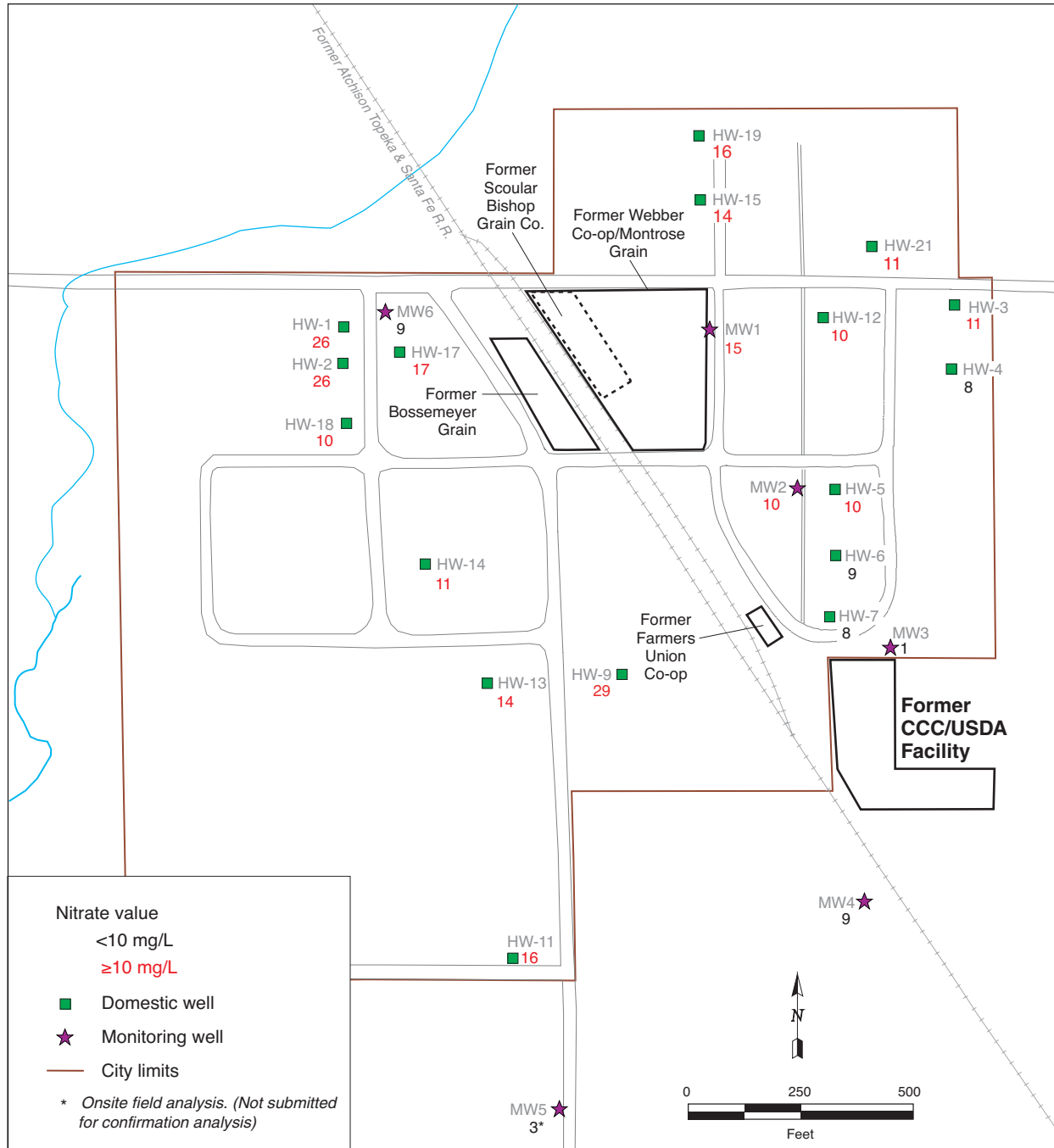


FIGURE 2.5 Analytical results for nitrate in groundwater samples collected during the KDHE Phase I Comprehensive Investigation in 1997–1998. Source of data: Burns and McDonnell (1998).

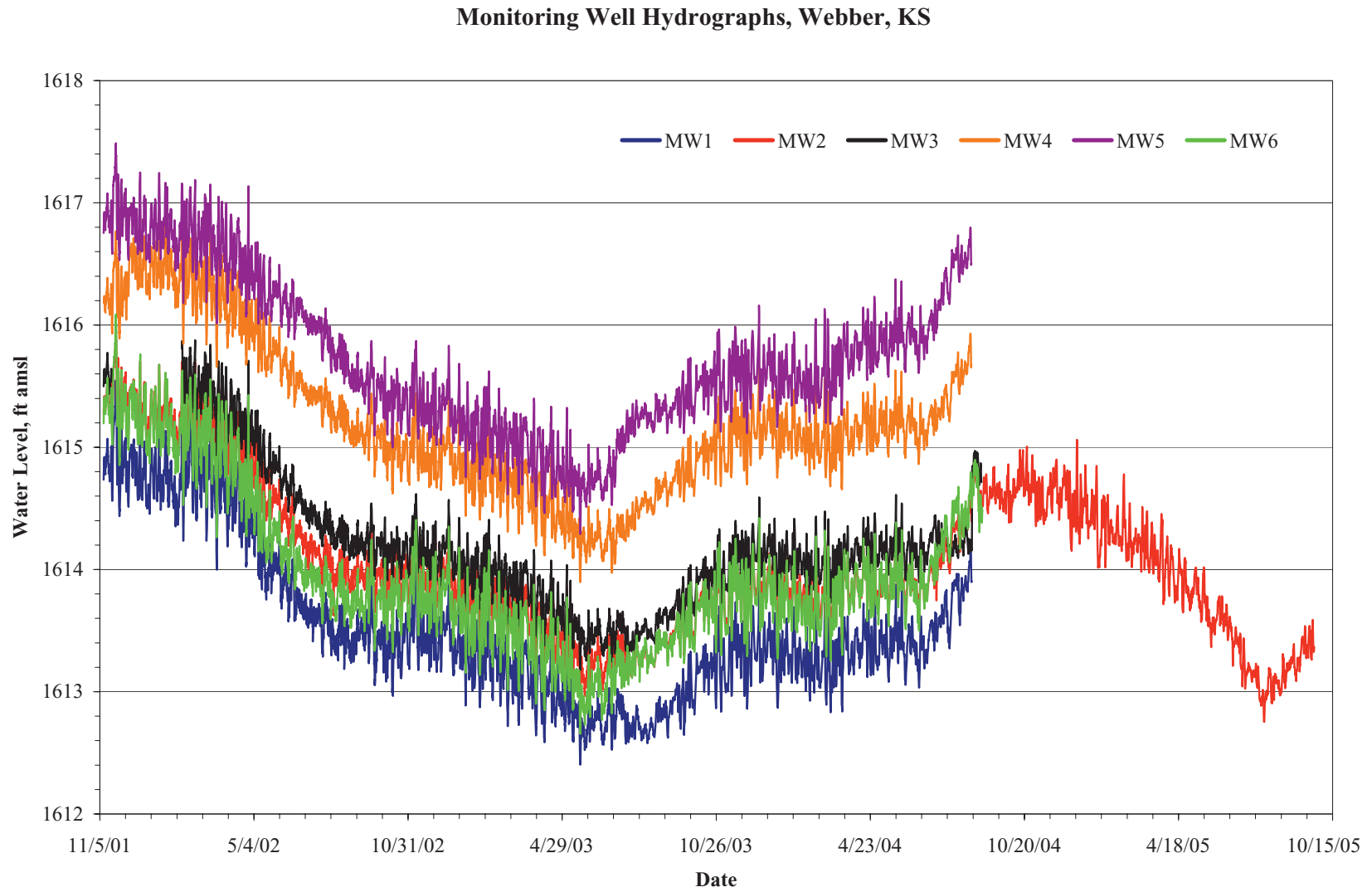


FIGURE 2.6 Automatically recorded water levels in KDHE wells MW1–MW6 in 2001–2004.

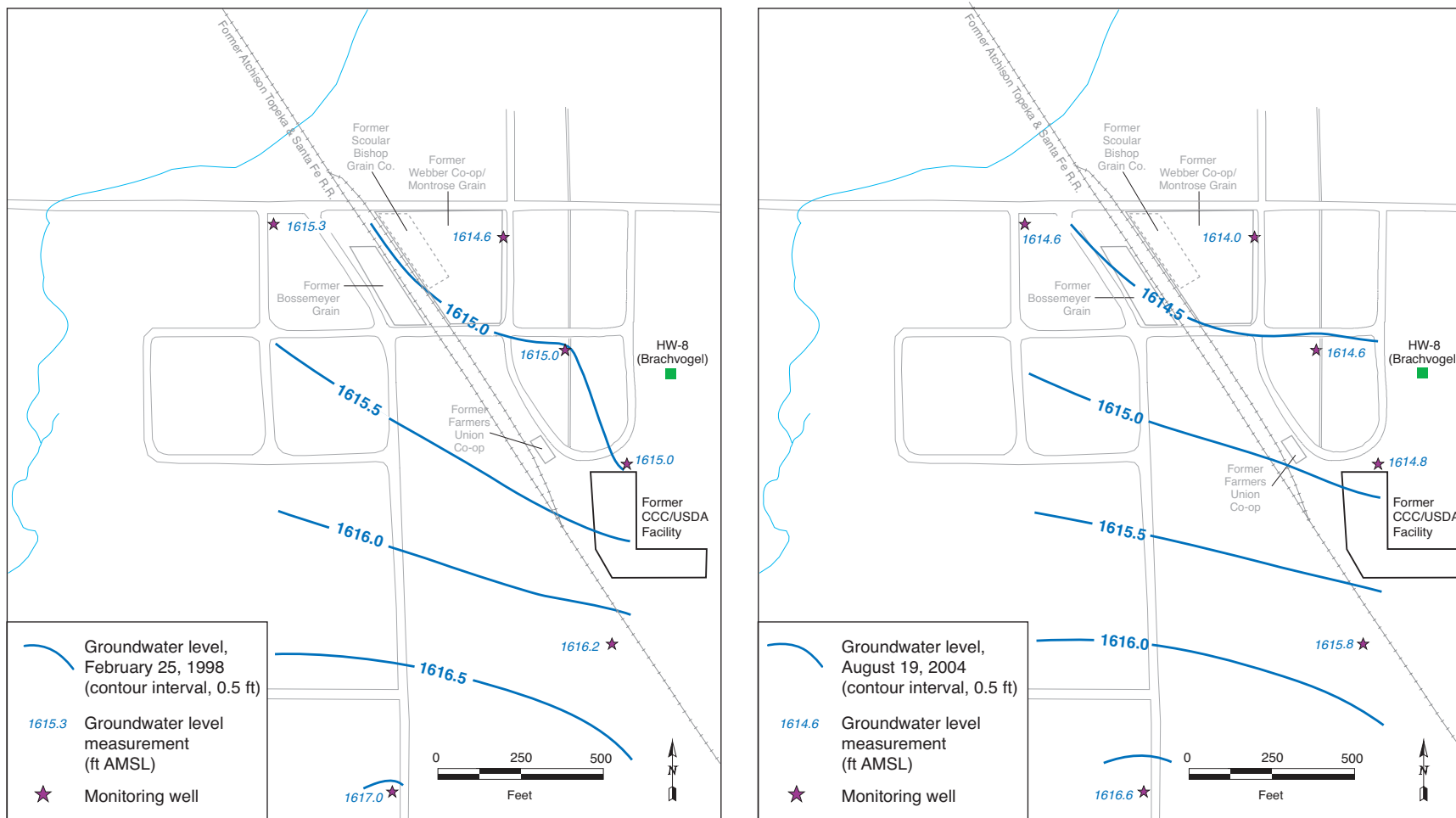


FIGURE 2.7 Water table contours for KDHE measurements on February 25, 1998 (left), and Argonne measurements on August 19, 2004 (right), with locations of present and former grain storage facilities and the Brachvogel home well (HW-8). These results confirm a groundwater flow direction toward the north-northeast.

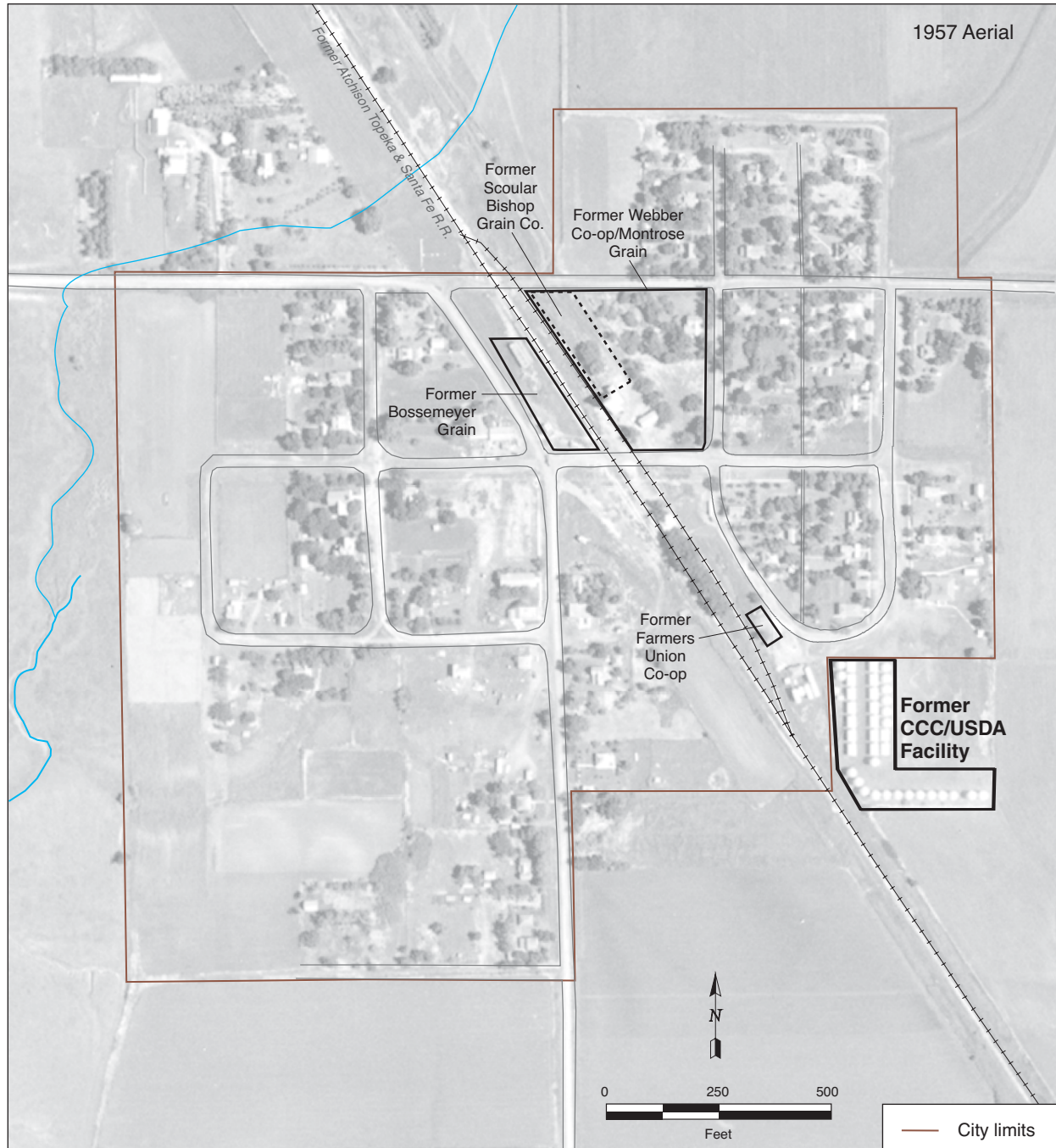


FIGURE 2.8 Interpreted locations of former grain storage facilities at Webber. Source of photograph: USDA (1957).



FIGURE 2.9 Locations of present grain storage structures at Webber. Source of photograph: KGCC (2002).

3 Sampling Plan

3.1 Project Objectives

The objective of the project outlined here is to conduct a single sampling event that will generate updated information on the distribution and concentrations of the previously detected carbon tetrachloride contamination in groundwater and soils at Webber. The data collected will be used to determine whether the Webber site requires further action.

3.2 Scope of Work

To satisfy the project objectives, the following activities will be performed to obtain samples for VOCs analyses:

- Groundwater sampling from selected existing private and monitoring wells
- Groundwater sampling at selected locations with the Argonne CPT vehicle
- Soil sampling (if warranted) at selected locations with the Argonne CPT vehicle

The proposed locations for these sampling activities are illustrated in Figure 3.1.

3.2.1 Sampling of Existing Wells

With the approval of the KDHE (2006) and the CCC/USDA, Argonne will collect groundwater samples for VOCs analyses from private wells HW-4 (Marr), HW-6 (Avery/Case), and HW-16 (Brachvogel garden) and from monitoring wells MW3 and MW4 (Figure 3.1). Carbon tetrachloride contamination was previously detected (at low levels; Table 2.2) at each of these locations in laboratory analyses performed as part of the KDHE Phase I Comprehensive Investigation (Burns and McDonnell 1998). Carbon tetrachloride was also detected at HW-6 in resampling in 2001 (KDHE 2001). At the request of the KDHE (KDHE 2005), monitoring well MW2 will also be sampled as part of the proposed field activities.

Sampling of well HW-8 (Brachvogel home well) for VOCs analyses is performed twice annually. This ongoing monitoring will continue until the carbon tetrachloride level in the well falls below the MCL and the CCC/USDA's obligation to provide an alternate water supply ends (Linsinbiger 1998). The well was sampled in October 2005 and will be sampled again in April 2006.

Measuring and sampling of the private and monitoring wells will be conducted in accordance with the procedures described in the *Master Work Plan* (Argonne 2002b, Sections 6.1.2 and 6.2), as follows:

1. The well number, the well owner's name, or both will be documented in the site field notebook.
2. If possible, the static groundwater level and then the total depth will be measured and documented for each well.
3. The groundwater from each well will be purged until field parameters of pH, temperature, and conductivity are stable. If possible, a minimum of three well volumes of water will be purged. The field parameters and volume purged will be documented. Each well will be purged before it is sampled.
4. The wells will be sampled after adequate recharge has occurred but no more than 24 h after purging.
5. Groundwater samples for analysis of VOCs including carbon tetrachloride and chloroform will be collected in laboratory-approved containers and immediately placed in a cooler at 4°C. These samples will be shipped for overnight delivery to the Applied Geosciences and Environmental Management (AGEM) Laboratory at Argonne for off-site analysis.
6. Any unavoidable deviations from these procedures will be documented in the field notebook.

3.2.2 Groundwater Sampling with the Cone Penetrometer

The Argonne cone penetrometer (CPT) unit will be used for groundwater sampling in the area downgradient and to the northeast of the former CCC/USDA facility and the former Farmers Union Co-op facility. The results will provide information on the current areal extent and levels of carbon tetrachloride contamination in the groundwater at Webber. If the CPT cannot penetrate the local stratigraphic sequence sufficiently to meet the objectives of this study, the CCC/USDA and the KDHE will be consulted and, with their approval, drilling will be employed to continue the required investigations.

Up to nine locations are proposed for groundwater sampling (Figure 3.1). The sampling will begin at the proposed locations closest to the former CCC/USDA and Farmers Union Co-op facilities and will generally progress northeastward, so that data from the initial locations can guide the specific placement of the subsequent, more downgradient borings. The groundwater samples collected with the CPT will be submitted to the AGEM Laboratory for rapid-turnaround (24-h) analyses (Section 3.5), to facilitate review of the investigation results by Argonne, the CCC/USDA, and the KDHE during the field program.

At each location investigated, CPT logs of tip pressure, sleeve friction, and conductance will first be acquired to determine the basic lithostratigraphy and hydrostratigraphy of the site in the context of the local hydrogeologic setting (Argonne 2003). On the basis of these logs, selected depth intervals (to be determined in the field) may be chosen for coring, to provide sediment samples for lithologic confirmation and correlation of the CPT log responses.

At each location investigated, one or more depth intervals (up to a maximum of three) will be chosen in the field for groundwater sampling on the basis of the site-specific lithologic and hydrostratigraphic information outlined above. The groundwater sampling will be performed in accordance with the procedures described in the *Master Work Plan* (Argonne 2002, Sections 6.1.2, 6.2 and 6.5), by first using the CPT rods to push a sacrificial tip and 0.5-in.-I.D. polyvinyl chloride (PVC) filter screen and riser to the desired maximum sampling depth. The rods will then be partially withdrawn to the desired minimum sampling depth, to expose the screen to the formation waters. Samples will be collected from the PVC casing by using a bailer, without purging, for preservation and analysis as described in Section 3.2.1 and Section 3.5.

The screen and riser used for sampling at two of the proposed CPT locations (Figure 3.1) will be temporarily left in place, to permit the periodic measurement of static groundwater levels

during the field program. These locations will augment and extend the existing network of six permanent monitoring wells (MW1-MW6, Figure 3.1) in western and central Webber by providing control points for the determination of groundwater flow direction(s) in the northeastern portion of the area targeted by this investigation. The temporary observation points will be abandoned in accordance with KDHE requirements upon completion of the field investigation. At the discretion of the CCC/USDA and KDHE project managers — and if access is granted — permanent monitoring wells can be installed at these locations in accordance with procedures described in the *Master Work Plan*.

3.2.3 Vertical-Profile Soil Sampling with the Cone Penetrometer (If Warranted)

The limited soil sampling and analysis (field headspace gas chromatography) events to date (Sections 2.1.2 and 2.1.3; Table 2.1) have identified only trace quantities of carbon tetrachloride in two soil samples collected at depths of 8–10 ft BGL along the northern and western margins of the former CCC/USDA facility (Figure 2.4). The results of the upcoming private well and monitoring well sampling and the proposed CPT investigations will therefore be reviewed and discussed with the CCC/USDA and the KDHE project managers to determine whether the data provide evidence for a continuing soil source of carbon tetrachloride contamination to the groundwater at Webber.

If the analytical results for VOCs in groundwater suggest that a continuing source threat exists, the CPT will be used for vadose zone soil sampling in vertical profiles at approximately three locations on the former CCC/USDA property and at one location on the former Farmers Union Co-op property. The provisional locations for this sampling shown in Figure 3.1 are based on the distribution of the grain storage structures shown in Figure 2.8 and the soil sampling results in Figure 2.4. If the soil sampling is warranted, the specific locations for sampling will be selected in consultation with the CCC/USDA and the KDHE project managers upon review of the groundwater analysis data.

The provisional soil sampling (Figure 3.1) will be performed by using the CPT to obtain core samples from the ground surface to the top of the saturated zone. Soil samples will be taken every 5 ft and/or at changes in lithology. The soil samples recovered will be placed in jars, sealed, preserved on dry ice in the field, and shipped to the AGEM Laboratory for preparation and analysis, in accordance with the *Master Work Plan* (Argonne 2002, Sections 6.1.1, 6.2 and 6.3.1). A corresponding groundwater sample will be collected from the saturated zone directly

beneath each soil sampling location, by using the methods described in Section 3.2.2, to permit direct evaluation of any potential soil source influence.

3.3 Potential Access Issues

The investigation program outlined in Section 3.2 is subject to the negotiation of access by the CCC/USDA to the properties required for the proposed field work. Access issues have been and continue to be a problem at Webber. Figure 3.1 shows property ownership related to the proposed CPT investigation locations. The CCC/USDA was previously denied access to the property owned by Mr. Illif Banks, which constitutes the major portion of the proposed study area. A summary of the CCC/USDA's and Argonne's activities related to access to the former CCC/USDA property is in Appendix A. The CCC/USDA will continue to pursue access agreements with the affected property owners; however, the CCC/USDA might require formal assistance from the KDHE to resolve these issues in a timely fashion.

3.4 Sampling and Reporting Schedule

The proposed investigation is scheduled for early summer 2006, pending successful negotiation of access. The CCC/USDA and Argonne will notify the KDHE a minimum of two weeks before field activities related to the proposed sampling program begin. Subsequently, a report will be completed and submitted to the KDHE within 90 days after sampling. The report will follow the guidelines for site monitoring established by KDHE Policy BER-RS-036 (KDHE 1996b). Accordingly, the report will include, at a minimum, the following:

- A narrative of work conducted
- Recommendations for further action(s) at this site, if warranted
- Maps depicting sample locations, groundwater flow, and contaminant levels
- Tables that include all analytical and field data
- Laboratory analytical data reports

- Field documentation
- Quality assurance and quality control data

3.5 Quality Assurance and Quality Control

Included in this section is a summary of methods that will be followed to meet quality assurance/quality control (QA/QC) standards. Descriptions of all QA/QC methods are in Section 4.2 of the *Master Work Plan* (Argonne 2002). That document should be consulted for more a more detailed narrative of the QA/QC procedures.

The QA/QC requirements during field sampling are as follows:

- Ensure that samples collected are representative of current site conditions.
- Ensure that sufficient samples are collected to meet the monitoring goals.
- Ensure that field instrument calibration procedures are followed and that the appropriate number of field blanks, rinsate samples, trip blanks, and field replicates are collected. For this project, a minimum of one field blank, one rinsate sample, one trip blank, and one or two field replicates will be collected.
- Record in a bound notebook with printed page numbers all details of the work conducted. Use permanent ink for this documentation.
- To the extent possible, use disposable sampling equipment at each sampling location.
- Between wells, thoroughly rinse RediFlow pumps and hoses. Triple-wash all other nondisposable sampling equipment with a nonionic detergent in water, then rinse with water.

- Collect soil and groundwater samples according to the procedures specified in Section 3.2.
- Label sample containers as instructed in Appendix D, Section D.1.4, of the *Master Work Plan* (Argonne 2002). At a minimum, include the following information: sample identifier, date, time, preservative, and intended analysis. Use preprinted sample labels for this task.
- Complete a preprinted chain-of-custody record as instructed in Appendix D, Section D.1.5, of the *Master Work Plan* (Argonne 2002).
- Appropriately pack and seal shipping containers to ensure that chain of custody is maintained.
- Use preprinted shipping labels for sample containers being sent to laboratories for off-site analyses.

Laboratory QA/QC procedures are designed to ensure that sample integrity is maintained and that sample analysis is reproducible. This will be accomplished, in part, by verifying that laboratory-related field documentation is complete and that procedures have been followed with regard to chain-of-custody records, sample storage, and sample holding times. In addition, laboratory procedures, equipment calibration, and performance standards (reproducibility, standards, spikes recoveries, etc.) will be reviewed and documented in the monitoring report discussed in Section 3.4.

Groundwater samples received at the AGEM Laboratory will be analyzed within the specified holding times for VOCs with a gas chromatograph-mass spectrometer system. Laboratory methods to be used will include modifications of EPA Methods 5030B and 8260B. To ensure reproducibility, 10% of the samples (or a minimum of one sample) will be selected for analysis by a second laboratory with the EPA's Contract Laboratory Program methods. An index of the EPA methods is online (<http://www.epa.gov/epahome/index/>).

Soil samples received at the AGEM Laboratory will be subjected to purge-and-trap preparation, then analysis for carbon tetrachloride and chloroform using methanol extraction and a gas chromatograph-mass spectrometer system (EPA Methods 5030B and 8260B), in

accordance with the *Master Work Plan* (Argonne 2002, Sections 6.1.1, 6.2 and 6.3.1). To ensure reproducibility, 10% of the samples will be selected for analysis by a second laboratory with the same analytical methodology.

Quality assurance records completed during the project will be maintained by the QA/QC coordinator and stored with the project files.

3.6 Health and Safety

The general health and safety plan for use during this project, in Section 3 of the *Master Work Plan* (Argonne 2002), addresses all anticipated safety issues for the activities at the Webber site. Specific emergency information for Webber is given here.

Webber has emergency 911 service. All emergency calls, including police, fire, and ambulance calls, will be directed for an appropriate response from this number. No emergency medical facilities exist at Webber. The nearest hospital with emergency medical facilities is in Superior, Nebraska. Driving directions to the hospital are below, and a map is in Figure 3.2. Additional emergency information is in Table 3.1.

3.7 Webber Contacts

Jewell County Clerk
307 North Commercial
Mankato, KS 66956
(785) 378-4020
Office closed noon – 1 p.m. daily

Post Office
500 Main Street
Webber, KS 66970
(785) 753-4495

Mayor, Lisa Boyles
(785) 753-4971 (daytime [work])
(785) 753-4821 (evening [home])

City Clerk/Treasurer, Ruby Burge
(785) 753-4371 (home)

**Directions from Webber, Kansas,
to Brodstone Memorial Hospital in Superior, Nebraska
(520 East Tenth Street)**

1. Depart Webber, heading west on North Street.
2. Approximately 0.5 mi west of town, follow the northward bend on North Street, which then becomes Webber Road.
3. Follow Webber Road north approximately 4 mi to a "T" junction.
4. Follow Webber Road left at the junction, and travel approximately 1 mi to RD2365. Turn right.
5. Follow RD2365 north approximately 2.8 mi to East Tenth Street. (RD2365 becomes Bloom Street, then Nebraska Highway 14.)
6. Follow East Tenth Street approximately 300 ft west to the hospital.

TABLE 3.1 Emergency information for the sampling event at Webber, Kansas.^a

| Resource | Telephone No. | Name |
|--------------------|---------------------------------|---|
| All Emergencies | 911 ^b | Jewell County 911 Center |
| Hospital | 402-879-3281 | Brodstone Memorial ^c 520 East Tenth Street Superior, Nebraska |
| Police | 785-378-3194 | Jewell County Sheriff (nonemergency) 307 North Commercial Mankato, KS 66956 |
| Industrial Hygiene | 630-252-3310 | Argonne — Industrial Hygiene |
| Safety | 630-252-2885 | EVS Division ^d Field Safety Coordinator (Monte Brandner) |
| | 630-252-3924 | EVS Division ^d Environment, Safety, and Health Coordinator (Dave Peterson) |
| Security | 630-252-5737 630-252-5731 | Argonne — Operations Security (workdays) Argonne — Operations Security (weekends and after hours) |
| Poison Control | 800-222-1222 or 913-588-6633 | Mid-America Poison Control Center, University of Kansas Medical Center |
| Utilities Survey | 800-344-7233 (800-DIG-SAFE) | Kansas One Call, Wichita, Kansas |

^a Post this table in the field operations base.

^b 911 calls from cell phones can be routed to various 911 centers, depending on which tower picks up the call. Ask whether you have the **Jewell County 911 Center** before you describe your emergency. The call will be transferred if you have reached a different 911 center.

^c The route from Webber to the hospital is shown in Figure 3.2.

^d Environmental Science Division at Argonne National Laboratory.

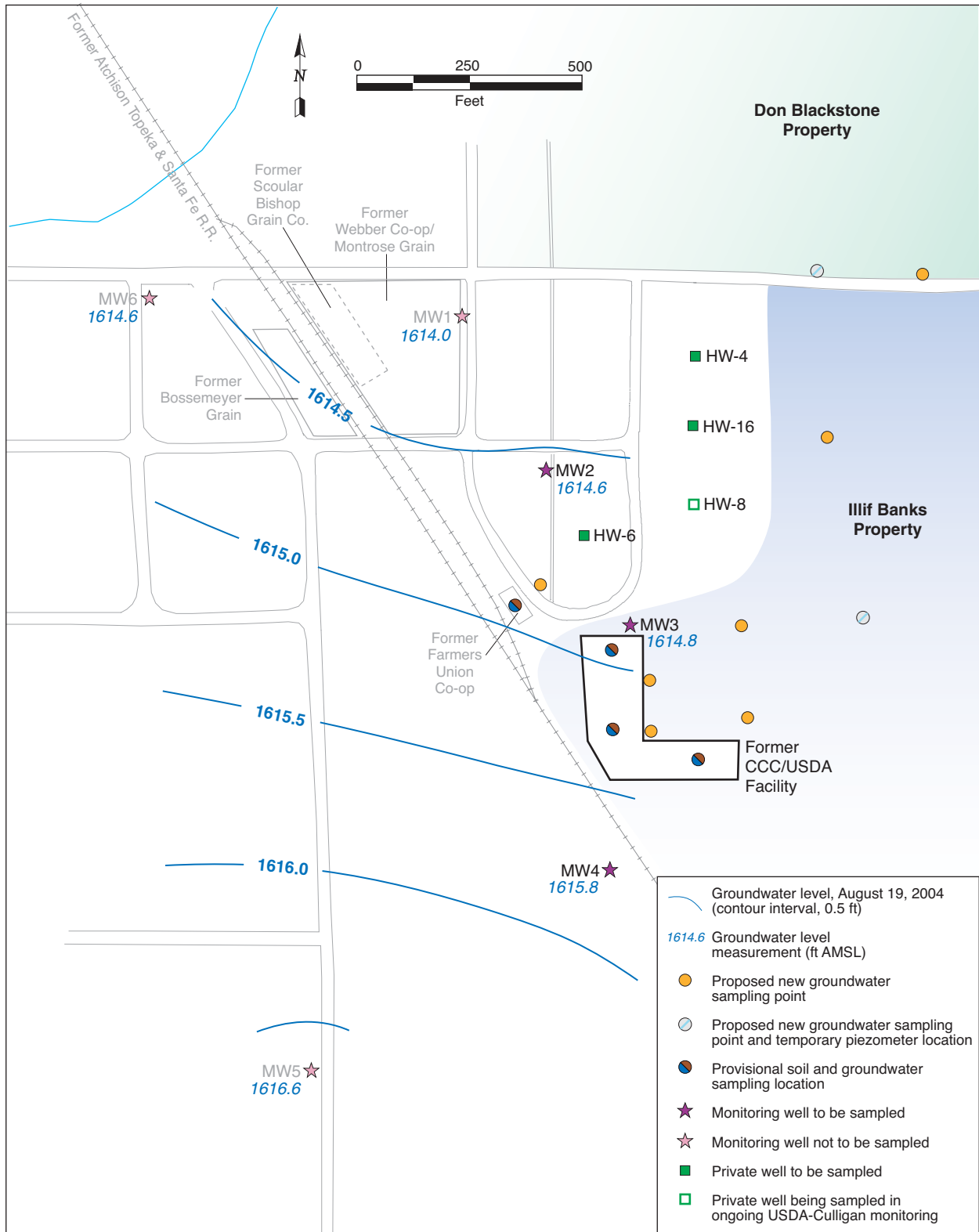


FIGURE 3.1 Proposed sampling locations.

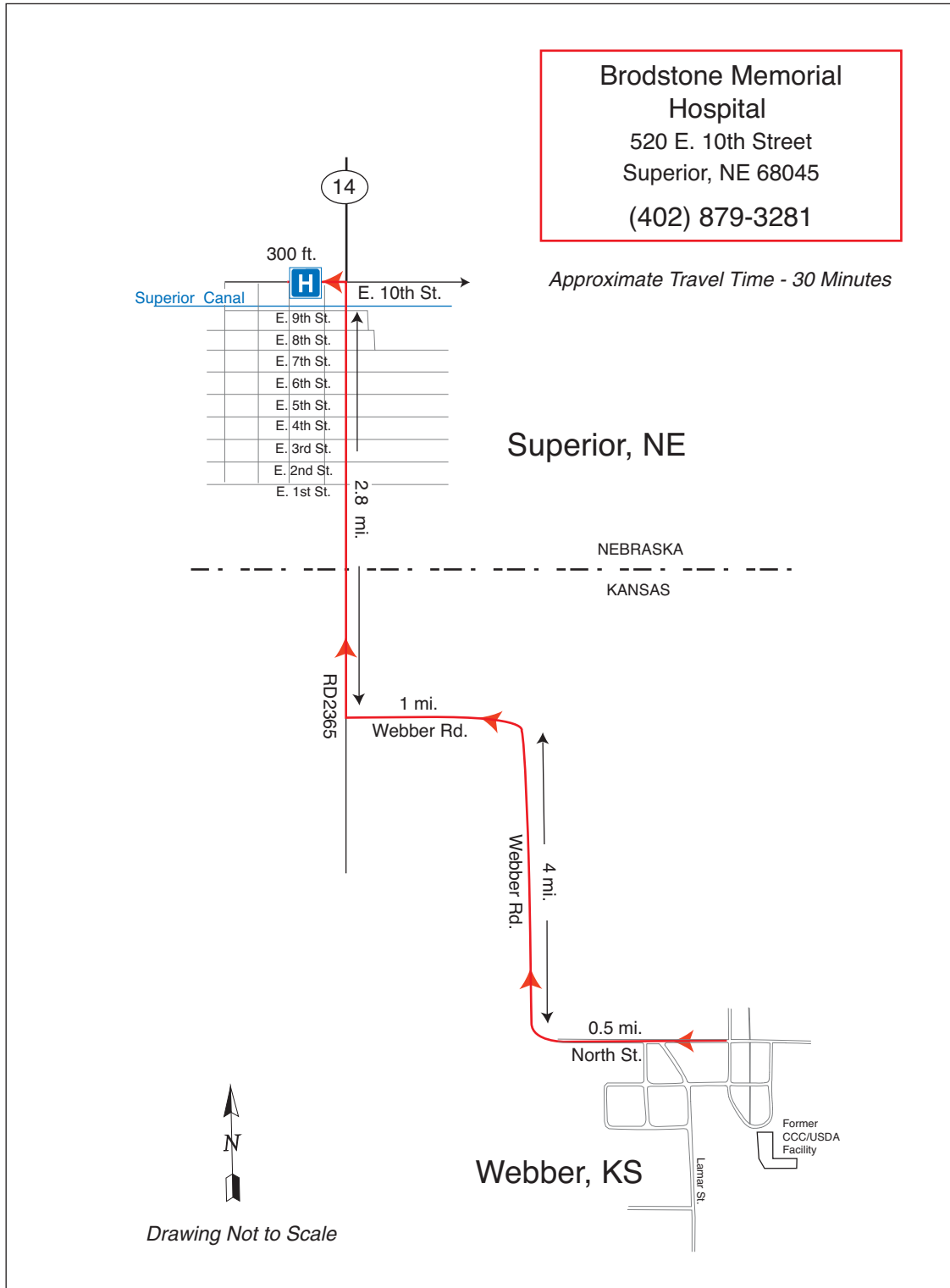


FIGURE 3.2 Route from Webber to Brodstone Memorial Hospital, Superior, Nebraska.

4 References

Argonne, 2002, *Master Work Plan: Environmental Investigations at Former CCC/USDA Facilities in Kansas, 2002 Revision*, ANL/ER/TR-02/004, prepared for the Commodity Credit Corporation, U.S. Department of Agriculture, by Argonne National Laboratory, Argonne, Illinois, January.

Argonne, 2003, *Update on Activities and Results at the Webber, Kansas, Former CCC/USDA Facility, November 9, 2001–August 1, 2002*, ANL/ER/AGEM/CHRON-481, prepared for the Commodity Credit Corporation, U.S. Department of Agriculture, by Argonne National Laboratory, Argonne, Illinois, April 9.

Burns and McDonnell, 1998, *Phase I Comprehensive Investigation of Nitrate and Carbon Tetrachloride Contamination in Domestic Water Supply Wells, Webber, Kansas*, prepared for the Kansas Department of Health and Environment by Burns and McDonnell Waste Consultants, Inc., Kansas City, Missouri, April 13.

KDHE, 1996a, *Homesite/Well Assessment Forms*, sample log sheets completed by R. Rust (Kansas Department of Health and Environment, Topeka, Kansas) for sampling of private wells under the KDHE/USDA private well sampling program, February 13.

KDHE, 1996b, *Bureau of Environmental Remediation/Remedial Section Guideline: Scope of Work Site Monitoring*, BER Policy #BER-RS-036, Remedial Section, Bureau of Environmental Remediation, Kansas Department of Health and Environment, Topeka, Kansas, <http://www.kdhe.state.ks.us/remedial/download/monitor.pdf>.

KDHE, 1997, *Pre-CERCLIS Site Reconnaissance and Evaluation, Webber Ground Water Contamination Site, Webber, Jewell County, Kansas*, Kansas Department of Health and Environment, Bureau of Environmental Remediation, Topeka, Kansas, March.

KDHE, 2001, letter from D. Porter (Bureau of Environmental Remediation, Kansas Department of Health and Environment, Topeka, Kansas) to C. Roe (Commodity Credit Corporation, U.S. Department of Agriculture, Washington, D.C.), regarding *Draft Work Plan: Phase I QuickSite® Investigation, Webber, Kansas*, November 2.

KDHE, 2002, letter from D. Porter (Bureau of Environmental Remediation, Kansas Department of Health and Environment, Topeka, Kansas) to C. Roe (Commodity Credit Corporation, U.S. Department of Agriculture, Washington, D.C.), providing results of the KDHE's sampling of six private wells in Webber, Kansas, on December 4, 2001, January 29.

KDHE, 2005, letter from C. Carey (Bureau of Environmental Remediation, Kansas Department of Health and Environment, Topeka, Kansas) to C. Roe (Commodity Credit Corporation, U.S. Department of Agriculture, Washington, D.C.), September 1.

KDHE, 2006, letter from C. Carey (Bureau of Environmental Remediation, Kansas Department of Health and Environment, Topeka, Kansas) to C. Roe (Commodity Credit Corporation, U.S. Department of Agriculture, Washington, D.C.), February 3.

KGCC, 2002, Webber, Kansas, digital ortho aerial photo, Kansas Geospatial Community Commons, Kansas Geological Survey, University of Kansas, Lawrence, Kansas, (<http://maps.kansasgis.org/kgcc/catalog/catalog.cfm>; accessed March 2006).

KSU, 2006, precipitation summary for Jewell County, assembled by Kansas State University, Manhattan, Kansas (<http://www.oznet.ksu.edu/wdl/>; accessed January 20).

Linsenbigler, M., 1998, letter from Linsenbigler (Environmental Activities Branch, U.S. Department of Agriculture, Commodity Credit Corporation, Washington, D.C.) to W. Brachvogel (resident of Webber, Kansas), regarding arrangements for a supply of bottled water from Culligan and sampling of Brachvogel's drinking water well by Culligan, July 7

USDA, 1957, *Aerial Photograph of Webber, Kansas*, AYS-28-57, U.S. Department of Agriculture, June 28.

Appendix A

Activities Related to Webber, 2001-2006

TABLE A.1 Argonne's activities related to the former CCC/USDA property at Webber, Kansas.

| Date | Source of Information | Action or Issue |
|----------|-----------------------|--|
| 9/26/01 | Argonne to CCC | List of landowners or contacts from whom access is required for the planned Phase I investigation sent by Argonne to CCC for preparation and submittal of access letters by CCC. |
| 10/2/01 | Sedivy to Walker | Roe has indicated that access to railroad-controlled properties will be arranged through CCC's legal office. |
| 10/11/01 | CCC to Argonne | CCC query regarding technical implications of not gaining access to railroad property to do planned soil and vegetation sampling. |
| 10/12/01 | Hansen to Gilmore | The proposed Phase I investigation will be affected by the lack of access to railroad-controlled property. Argonne recommends deferral of the planned soil and vegetation sampling until access issues are resolved, but to proceed with the limited groundwater sampling and installation of water level recorders. |
| 10/16/01 | Gilmore to Burton | Gilmore received a phone call from Eileen Tietjen, the daughter of Illiff Banks, who is the current owner of the former CCC property, in which she denied access to the former CCC property on behalf of her father. |
| 10/16/01 | Burton to Sedivy | In light of the denial of access, proceed with water level monitoring if possible. |
| 10/16/01 | Burton to Hansen | Caroline Roe has spoken to Donna Porter at KDHE about proceeding with a limited Phase I investigation, and Porter is amenable to that. Gilmore wants Argonne to draft a letter report that references the Work Plan and spells out the tasks that will not be conducted and why. |
| 10/16/01 | Hansen to Burton | A meeting with the city to brief them on the work that was to be performed in Phase I has been scheduled for November 8. In light of the limited investigation, Hansen recommends that the briefing be cancelled. |
| 10/17/01 | Sedivy to Burton | Summary of site visit includes information obtained that there were actually three, not just two, previous grain elevators in town before the present Co-op/Montrose Grain structures. All three were located along the railroad right-of-way. |
| 10/18/01 | Residents to Argonne | Signed access agreements from owners of private wells to be sampled (Kenneth Marr, Walt Brachvogel, Margaret Warren, Marlin Burge, Lola VanMeter). |
| 10/23/01 | Hansen to Burton | Caroline Roe has indicated that KDHE is agreeable to our recommendation of installing the water level recorders if the planned Phase I sampling activities are deferred because of access issues. |
| 10/24/01 | Hansen to Gilmore | Draft letter for submittal by CCC to KDHE, stating that the objectives of the work plan cannot be accomplished with the access restrictions. CCC requests KDHE approval to install the water level recorders. |
| 10/25/01 | Hansen to Roe | Argonne requests information about KDHE agreement to install the water level recorders so that Argonne can coordinate access to KDHE's monitoring wells. |
| 10/25/01 | Roe to Porter | CCC is preparing a brief letter outlining the change in scope of technical work planned for Webber and is seeking KDHE's approval for the recommended course of action (i.e., extended water level recording). |
| 10/31/01 | Hansen to Gilmore | Argonne is scheduled to go to Webber in the coming week to install the water level recorders when confirmation has been received from KDHE and CCC to proceed. |
| 11/2/01 | Hansen to Gilmore | Caroline Roe has spoken with Donna Porter, who said to proceed with installing the water level recorders. |

TABLE A.1 (Cont.)

| Date | Source of Information | Action or Issue |
|----------|-----------------------|---|
| 11/2/01 | Hansen to Dennis | Email with attached letter from KDHE to Caroline Roe, stating that KDHE understands about the deferral of soil and vegetation sampling in light of the access restrictions and that installation of the water level recorders should proceed if CCC will sample selected private wells. |
| 11/5/01 | Hansen to Burton | Donna Porter informed Bob Sedivy that KDHE would allow CCC (Argonne) access to their monitoring wells to install water level recorders only if CCC agreed to also sample four private wells that have previously shown carbon tetrachloride values below the MCL. |
| 11/7/01 | Hansen to Gilmore | Summary of phone conversation in which it was iterated that Argonne will proceed with installation of the water level recorders and that CCC agrees with KDHE's request to sample the selected private wells. |
| 11/8/01 | Porter to Hansen | KDHE is willing to sample the four private wells and charge the CCC through the IGA. |
| 11/8/01 | Roe to Hansen | CCC will confirm with KDHE that KDHE will sample the selected private wells. |
| 11/9/01 | Sedivy to Hansen | The automatic water level recorders have been installed. |
| 11/12/01 | Hansen to Dennis | Transmittal of letter from Bob Sedivy to KDHE informing KDHE that the water level recorders have been installed and providing keys to the new locks placed on the wells after installation. |
| 11/28/01 | Roe to Porter | Information compiled by Argonne on the four private wells that KDHE wants to sample. |
| 1/28/02 | Porter to Roe | Sampling of selected private wells. Transmittal of analytical data for wells sampled by KDHE on 12/4/01. Received by Argonne on 2/11/02. |
| 10/24/02 | Sedivy to Rosignolo | A summary of the modified Phase I activities at Webber is in preparation as a "letter report" for submittal to CCC and KDHE. |
| 11/19/02 | Haugen to Sedivy | Edited letter report sent to Sedivy for internal review |
| 12/2/02 | Burton to Gilmore | Webber letter report submitted to CCC: Update on Activities and results at the Webber, Kansas, Former CCC/USDA Site: November 9, 2001–August 1, 2002. |
| 1/21/03 | CCC to Argonne | CCC comments on the letter report, with directive that no further site work or PRP activities are required pending future discussions with KDHE. |
| 1/28/03 | Argonne to CCC | Argonne response to CCC's comments on the letter report. |
| 3/25/03 | Sedivy to Hansen | CCC has directed that the letter report completed in Dec 2002 be reviewed and updated to include recent investigation activities, including monitoring of the Brachvogel well, for submittal to KDHE. |
| 4/9/03 | Argonne to CCC | Five copies of the letter report sent to CCC for submittal to KDHE with draft transmittal letter to KDHE. |
| 8/20/04 | Sedivy to LaFreniere | Email transmitting all water level data and weather data acquired by Argonne to date. Message says that Caroline Roe sent water level data and figures from the letter report to KDHE on 7/14/04, at KDHE's request. |
| 1/17/06 | Sedivy to LaFreniere | Email message stating that Sedivy visited Webber on 7/11/03, 8/19/04, and 9/23/05 to make water level measurements and download recorders. He removed the recorders on the last visit. |