Record of Decision

Griggs and Walnut Ground Water Plume Superfund Site
Las Cruces, New Mexico

June 2007

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

SUPERFUND DIVISION

216492

009743

Part 1: Declaration

A. Site Name and Location

Griggs and Walnut Ground Water Plume Superfund Site
Las Cruces, Doña Ana County, New Mexico
NMD0002271286
Site ID: 0605116

B. Statement of Basis and Purpose

This decision document presents the selected remedial action (the "Selected Remedy") for the Griggs and Walnut Ground Water Plume Superfund Site ("the Site"), in the City of Las Cruces, (CLC) Doña Ana County (County), New Mexico, developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 United States Code (U.S.C.) § 9601-9675 as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300 as amended. The Selected Remedy is Alternative 4 Enhanced Ground Water Extraction with Treatment which is described in detail in Section 12 of this Record of Decision (ROD).

This decision is based on the Administrative Record for the Site, which has been developed in accordance with Section 113(k) of CERCLA, 42U.S.C. § 9613(k). The Administrative Record file for this Site is available for review at the Branigan Memorial Library in Las Cruces, New Mexico, the offices of the New Mexico Environment Department, Superfund Oversight Section, Santa Fe, New Mexico, and at the United States Environmental Protection Agency (EPA, Region 6) Records Center in Dallas, Texas. The Administrative Record Index (Appendix D) identifies each of the items comprising the Administrative Record upon which the selection of the Remedial Action is based. The State of New Mexico (New Mexico Environment Department) concurs with the Selected Remedy.

C. Assessment of Site

The response action selected in this Record of Decision (ROD) is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances

into the environment. The primary contaminant at this Site is perchloroethylene (PCE, also known as tetrachloroethene or tetrachloroethylene), a volatile organic compound. The contaminant mass of PCE that will be remediated includes those areas within the designated plume boundaries with PCE concentrations greater than 5 micrograms per liter (µg/L), the Maximum Concentration Limit (MCL) established for PCE under the federal Safe Drinking Water Act. The total mass of PCE estimated to be affecting ground water is between 110 and 160 kilograms (between 242 and 357 pounds). The estimated volume is between 1,928 and 2,892 acre-feet (6.82 to 9.42 billion gallons). The approximate volume of ground water with PCE concentrations greater than 5 µg/L that will be remediated is estimated to be between 735 and 1,102 acre-feet (2.39 to 3.59 billion gallons).

The PCE plume is approximately 1.8 miles by one-half miles in size, based on ground water sampling. The Site is defined by soil vapor and ground water samples found to be contaminated with PCE. The detection of PCE in ground water began at about 190 feet below ground surface (bgs). The PCE detected affects the local municipal water supply to depths of about 650 feet bgs. The Site contamination is located in the subsurface generally between East Griggs Avenue and East Hadley Avenue, in Las Cruces, Doña Ana County, New Mexico, extending east to beyond Interstate 25 (I-25), and west to beyond North Solano Avenue. The predominant land uses in this area are recreational, light industrial/commercial, and residential land uses.

D. Description of Selected Remedy

The Selected Remedy for the Site is Alternative 4, **Enhanced Ground Water Extraction with Treatment** which is estimated to cost $13.8 million dollars.

The remedy includes treatment of ground water and hydraulic control relying upon the existing municipal supply wells to the extent possible.

The objective of the remedy is to remove PCE from ground water to concentrations at or below the drinking water standard through hydraulic containment and treatment to reduce plume size by targeting hydraulic pumping at areas within the plume boundaries with higher PCE concentrations.

The remedy will maximize the existing water pumping and delivery infrastructure already in place with some retrofitting prior to ground water conveyance for treatment. The treatment plant

will be centrally located somewhere within the plume boundaries and is expected to take minimal space. Once treated, ground water will then be available for delivery into the public water supply.

The Selected Remedy is intended to address the entire ground water plume Site through treatment. The contamination at the Site is neither a principal threat nor is it a low level threat. Principal threat wastes are wastes that cannot be reliably controlled in place, such as liquids, highly mobile materials (e.g., solvents), and high concentrations of toxic compounds (e.g., concentrations that are several order of magnitude above levels that allow for unrestricted use and unlimited exposure). The EPA expects that treatment will be the preferred means to address the principal threats posed by a Site, wherever practicable. Low-level threat wastes are those source materials that generally can be reliably contained and that contain contaminant concentrations not greatly above the acceptable levels. The contamination at the Site is neither a principal threat nor is it a low level threat. The waste is not a principal threat because the ground water contamination is not a source material such as a Dense Nonaqueous Phase Liquid (DNAPL). The waste is not a low-level threat because it cannot be reliably contained in place. The remedy will incorporate treatment to reduce the toxicity, mobility and volume of the PCE and the remedy will use engineering controls for plume containment. The remedy will also use institutional controls (e.g., temporary ground water drilling moratorium, interagency, interdepartmental memorandums of agreement, etc.,) to augment the remedy. The reason for such action is because the contamination plume affects a primary drinking water supply source. The remedy expectation is to return the ground water to its beneficial use in an expeditious manner.

Major components of the selected remedy:

Under this Selected Remedy, water will be pumped from municipal supply wells (CLC Well Nos. 18 and 27, or other wells, if it is determined during remedial design and implementation that the use of other wells is appropriate). Based on modeling results it is expected that within approximately five years one new extraction well location will be necessary to continue treating and reducing the PCE concentrations to below the MCL of 5 µg/L. The new extraction well would likely replace CLC Well No. 18 after the first five years of operation because the fate and transport model predicts that over time, CLC Well No. 18 will draw more clean water than PCE affected water and consequently, it will remove contamination less efficiently. PCE plume containment will rely on hydraulic control, and on discontinuing operation at CLC Wells 19, 20, 21, 24, 26, and 38, during remediation. Hydraulic control, treatment of contaminated ground

water, and plume reduction will be further evaluated and refined during remedy design to determine the appropriate measures for implementation. The remedy will be supported by the following activities:

Institutional Controls

Long-Term Monitoring Program

Annual Reviews and Reporting

The Remedial Action Objectives (RAOs) are expected to be reached in approximately 14 years.

E. Statutory Determinations

The Selected Remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and uses permanent solutions and treatment or resource recovery technologies to the maximum extent practicable. The remedy satisfies the statutory preference for treatment, and reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment.

This remedy will allow for unrestricted use of the Site upon completion and will take more than five years to attain the RAOs. The EPA will conduct a review within five years from the start of the Remedial Action to ensure the remedy protects human health and the environment as described in CERCLA Section 121, 42 U.S.C. § 9621.

F. Data Certification Checklist

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record file for the Site.

Chemicals of Concern (COCs) and their respective concentrations;
Baseline risk represented by the COCs;
Remediation goals established for COCs and the basis for these goals;
Current and reasonably-anticipated future land use assumption, and current and potential future beneficial uses of ground water used in the baseline risk assessment and ROD;
Potential land and ground water use that will be available at the Site as a result of the selected remedy;
Estimated capital, operation and maintenance (O&M), and total present worth costs; discount

rate; and the number of years over which the remedy cost estimate are projected; and

Key factors that led to selection of the remedy.

G. Authorizing Signature

Pamela Phillips, Acting

Samuel Coleman, P.E., Director
Superfund Division
EPA Region 6

Date: June 18, 2007

RECORD OF DECISION

Griggs and Walnut Ground Water Superfund Site

Concurrences

Petra Sanchez
Remedial Project Manager — Date 5/22/07

Henry J. Parr, Team Leader
LA/NM/OK Team — 06/01/2007

Donald Williams, Deputy Associate Director
Superfund Remedial Branch — 6/1/07

John Hepola, Associate Director
Superfund Remedial Branch — 6/4/07

James Costello, Assistant Regional Counsel
Office of Regional Counsel — 5/22/07

Mark A. Peycke, Chief
Superfund Branch, Office of Regional Counsel — 06/08/07

Pamela Phillips, Deputy Director
Superfund Division — 6/18/07

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List of Acronyms

°C	degrees Centigrade
°F	degrees Fahrenheit
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
µg/m^3	micrograms per cubic meter
µS/cm	microsiemens per centimeter
1,1-DCA	1,1-Dichloroethane
1,1-DCE	1,1-Dichloroethene
1,2-DCA	1,2-Dichloroethane
ARAR	Applicable or Relevant and Appropriate Requirement
ASL	Applied Sciences Laboratory
ATSDR	United States Agency for Toxic Substances and Disease Registry
atm	atmospheres
bgs	below ground surface
BHHRA	Baseline Human Health Risk Assessment
$CaCO_3$	Calcium Bicarbonate
California EPA	California Environmental Protection Agency
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cis-1,2-DCE	cis-1,2-Dichloroethene
CLC	City of Las Cruces
CLP	Contract Laboratory Program
COC	Chain of Custody
COPC	Chemical of Potential Concern
CRQL	Contract-Required Quantitation Limit
CSM	Conceptual Site Model
CT	Central Tendency
DAC	Doña Ana County
DACTD	Doña Ana County Transportation Department
DMC	Deuterated Monitoring Compound
DNAPL	dense non-aqueous phase liquid
DO	Dissolved Oxygen
DPT	Direct-Push Technology
DQE	Data Quality Evaluation
DQO	Data Quality Objective
DWB	Drinking Water Bureau
EPA	U.S. Environmental Protection Agency
EPC	Exposure Point Concentration
ELCR	Excess Lifetime Cancer Risk
FOD	Frequency of Detection
FS	Feasibility Study
FSP	Field Sampling Plan
ft	feet
GC	Gas Chromatograph
gpm	gallons per minute
GPS	Global Positioning System

GWP	Griggs and Walnut Ground Water Plume
HEAST	Health Effects Assessment Summary Tables
HI	Hazard Index
HSA	Hollow-Stem Auger
HRS	Hazard Ranking System
HVAC	Heating, Ventilating, and Air Conditioning
I-25	Interstate 25
IARC	International Association for Research on Cancer
IDRA	Identification of PCE Release Areas
IDW	Investigation-Derived Waste
IRIS	Integrated Risk Information System
JSP	Joint Superfund Project
LHZ	Lower Hydrologic Zone
LTM	Long-Term Monitoring
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MEK	methyl ethyl ketone
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mmHg	millimeters of Mercury
MNA	Monitored Natural Attenuation
MSL	Mean Sea Level
MSSL	Media-Specific Screening Levels
MTBE	Methyl Tertiary Butyl Ether
MW	Monitor Well
mV	Millivolt
NCEA	National Center for Environmental Assessment
NCP	National Oil and Hazardous Substance Pollution Contingency Plan
NMED	New Mexico Environment Department
NMOSE	New Mexico Office of the State Engineer
NMSA	New Mexico Statutes Annotated
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List
O&M	Operation and Maintenance
ORP	Oxidation /Reduction Potential
OSWER	Office of Solid Waste and Emergency Response
PAL	Police Athletic League
PCB	Polychlorinated Biphenyl
PCE	perchloroethylene, tetrachloroethene, or tetrachloroethylene
PDB	Passive Diffusion Bag
ppb	parts per billion
ppbv	parts per billion by volume
PPRTV	Provisional Peer-Reviewed Toxicity Values
PQL	Practical Quantitation Limit
QAPP	Quality Assurance Project Plan
QA	Quality Assurance
QC	Quality Control
RAGS	Risk Assessment Guidance for Superfund
RA	Remedial Action
RD	Remedial Design
RCRA	Resource Conservation and Recovery Act

Part 2: Decision Summary

Section 1

Site Name, Location, and Brief Description

This Decision Summary provides a description of the site-specific factors and analyses that led to the selection of the ground water remedy for the Griggs and Walnut Ground Water Plume Superfund Site (Site). It includes background information about the Site, the nature and extent of contamination found at the Site, the assessment of human health and environmental risks posed by the contaminants, and the identification and evaluation of remedial action alternatives for the Site.

The Griggs and Walnut Ground Water Plume Superfund Site is located in the City of Las Cruces (CLC), Doña Ana County (County), New Mexico. The County is located in the south central part of the state and borders Mexico and Texas at its southern boundary. See Site Location Map, Figure 1-1. The geographic coordinates at the Site are approximately 32º 18' 56.0" north latitude and 106º 45' 36.0"west longitude. The Site is a ground water contaminant plume approximately 1.8 miles by one-half miles in size. The Site is defined by soil vapor samples and ground water samples found to be contaminated with primarily perchloroethylene (PCE, also known as tetrachloroethene or tetrachloroethylene). The PCE contamination detected in ground water begins at about 190 feet (ft) below ground surface (bgs) and affects the local municipal water supply to depths of about 650 feet bgs. There are four CLC municipal supply wells (Well Nos. 18, 19, 21, and 27) that have been affected by the PCE contamination at concentrations exceeding the Maximum Concentration Limit (MCL) for PCE established by the Federal SDWA. The Site contamination is located in the subsurface generally between East Griggs Avenue and East Hadley Avenue, extending east to beyond Interstate 25 (I-25), and west to beyond North Solano Avenue (see Site Map, Figure 2-1). The property uses in this area are predominately recreational, light industrial/commercial, and residential land uses.

The Environmental Protection Agency (EPA) is the lead agency for the Remedial Action at the Site. The New Mexico Environment Department (NMED) is the support agency. The Potentially Responsible Parties (PRPs) for the Site are the CLC and the County. The CLC and the County entered into a Settlement Agreement with EPA on April 20, 2005, and financed EPA's Remedial Investigation/Feasibility Study (RI/FS) for the Site. The CLC and County entered into a memorandum of agreement with one another, and formed a local consortium called the Joint

Superfund Project (JSP) prior to settling with EPA and assisting with the RI/FS. The JSP also assisted by performing a fate and transport ground water model analysis for the Site and assisted with the completion of the RI/FS. The fate and transport model was instrumental in the development of the alternatives for the Site.

The PCE-affected ground water occurs within the Mesilla Bolson Aquifer, an aquifer used by the CLC for public drinking water supply and irrigation. This aquifer extends below the entire length of the Mesilla Valley. Ground water occurs 100 ft or more bgs within the Site boundaries. A limited number of private wells also tap into this aquifer along with the municipal water supply wells. Among the private wells that remain in use, the property owners primarily use the wells for home landscape irrigation. Five of the private wells are located within one-half mile of the known boundary of PCE-affected ground water (i.e., plume boundary). There are no private wells known to exist within or immediately down-gradient of the plume boundary.

Location of PCE Affected Municipal Water Supply Wells

The CLC Well No. 18 is located northwest of the intersection of East Griggs Avenue and North Walnut Street, between East Griggs and Hadley Avenue (on the north side of the Doña Ana County Transportation Department [DACTD] maintenance facility). The CLC Well No. 19 is located on the west side of I-25 at the east end of East Griggs Avenue. The CLC Well No. 21 is located along the west side of I-25 at the east end of Craig Avenue. The CLC Well No. 27 is located near the southeast corner of the East Griggs Avenue and North Walnut Street intersection.

Site Location Map – Fig. 1-1

Section 2

Site History and Enforcement Activities

In 1993, the Safe Drinking Water Act (SDWA) formally added PCE to the list of contaminants to be monitored in drinking water supplies during compliance monitoring. That same year, NMED detected PCE contamination in CLC Wells Nos. 21 and 27. In 2000, PCE was first detected in CLC Well No. 24 at slightly less than 1µg/L. CLC Well No. 24 is located about one mile south of CLC Well Nos. 18, 19, 21, and 27. Three unaffected municipal supply wells (CLC Well Nos. 20, 26, and 61) are located between CLC Well No. 24 and CLC Well Nos. 18, 19, 21, and 27.

The Site was added to EPA's National Priorities List (NPL) of Superfund sites on June 14, 2001 (66 Federal Register 32235 [June 14, 2001]). At the time of listing, four CLC municipal drinking water supply wells (CLC Well Nos. 18, 19, 21, and 27) were known to be affected by PCE contamination at concentrations above the MCL of 5 µg/L. The highest and most variable concentrations of PCE were found in CLC Well No. 18, ranging from slightly above (or below) 5 µg/L to over 45 µg/L. The concentrations of PCE in the other affected supply wells have increased over time, but have stayed near (slightly above or below) the MCL.

PCE has also been detected in the past at concentrations below the MCL in one private well (LRG-3191, located southwest and outside of the plume) and in one public school irrigation well (LRG-1457, located south and outside of the plume, near CLC Well No. 24). At the private residential well, the property owner reports that well LRG-3191 is used primarily for residential landscape watering. Recent samples at this well show no detections of PCE. Lynn Middle School used well LRG-1457 in the past to provide landscape irrigation at the school, but this well is no longer in service because of mechanical problems.

Meeting Current Water Supply Demand

Of the four affected supply wells, only CLC Well No. 21 remains in service. PCE concentrations at this well have been detected at slightly above, or slightly below the MCL of 5 µg/L. The CLC manages Well No. 21's usage under a blending program approved by the NMED Drinking Water Bureau (DWB) on September 24, 2002. The CLC designed the Well No. 21 blending program to mix affected water with unaffected water in the Upper Griggs Reservoir in order to reduce PCE concentrations to levels below the MCL before the water reaches the distribution system. The CLC monitors the concentration of PCE in the Upper Griggs Reservoir to ensure that concentrations of PCE remain below the MCL. Periodic sampling performed in 2005 (from

January 2005 through December 2005) revealed PCE concentrations at the Upper Griggs Reservoir ranged from not detected to 3.2 µg/L (with an average concentration of about 1.7 µg/L).

Previous Investigations Conducted at the Site

The NMED provided the first regulatory response at the Site. After PCE was detected at the CLC municipal supply wells by the NMED DWB, the NMED Superfund program performed a preliminary site assessment and site inspection activities in consultation with EPA. The NMED analyzed ground water and soil samples collected at new and existing monitoring well locations and tested soil vapor at the DACTD maintenance facility. The results confirmed the presence of PCE in ground water, soil vapor, and in soil. PCE was detected in only one soil sample, at a concentration of 241 micrograms per kilogram (µg/kg). This sample was collected at 135 ft bgs at MW-5. PCE was detected in the shallow soil vapor at the DACTD maintenance facility at concentrations up to 12 parts per billion by volume (ppbv).

EPA's Hazard Ranking System (HRS) documentation describes the results of these collective investigations as the basis for EPA adding the Site to the NPL. The data collected by NMED were helpful in establishing preliminary data trends and the NMED information was used to help characterize the nature and extent of contamination.

EPA Issues Identification of PCE Release Areas Report (IDRA)

The EPA summarized the results and conclusions from this first mobilization in the report entitled "Identification of PCE Release Areas Report (IDRA Report). The IDRA Report identified three source areas where PCE was released into the environment and helped support the issuance of the Special Notice Letters to the PRPs. These three PCE source areas are located as follows:

1. Near the intersection of East Hadley Avenue and North Walnut Street (along the former Crawford Municipal Airport runway and along the former arroyo that runs parallel to, and south of the former airport runway).
2. At the Doña Ana County Transportation Department (DACTD) maintenance facility on East Griggs Avenue.
3. At the property where the former New Mexico Army National Guard facility was located on East Hadley Avenue.

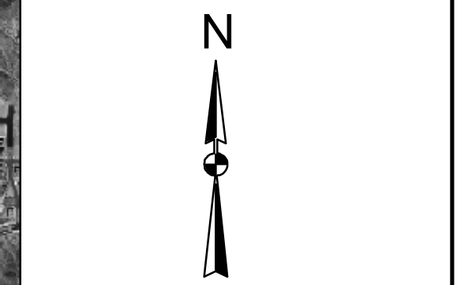
Settlement Agreement with the Potentially Responsible Parties

On April 20, 2005, EPA signed a Settlement Agreement with the CLC and the County. This agreement addressed completion of the RI/FS at the Site. The CLC and the County formed the JSP to facilitate their participation in the remedial process. The EPA then formed a Technical Work Group with NMED and JSP to provide a forum for stakeholders to participate in the completion of the RI/FS and to provide input related to stakeholder needs. In addition to supporting and assisting field data collection data efforts, the JSP modeled flow and transport of PCE in the ground water to refine the conceptual site model (CSM) and to support the evaluation of remedial alternatives in the FS.

EPA Remedial Investigation/Feasibility Study (RI/FS)

Working under the Settlement Agreement EPA, JSP and NMED finalized the RI/FS in November 2006. Prior to the Settlement Agreement, EPA had been conducting the early stages of the RI to determine the nature and extent of the ground water and soil vapor contamination throughout the Site. The JSP provided funds to complete the RI/FS through the Settlement Agreement and helped provide technical assistance as well as financial support towards the RI/FS. Ground water and soil vapor samples were collected and analyzed to complete the nature and extent characterization of the PCE contamination and to perform a baseline human health risk assessment (BHHRA). The BHHRA included modeling of indoor vapor intrusion, using soil vapor samples collected near residential properties and near recreational buildings. These data helped evaluate whether PCE vapor from shallow soil directly underlying the residential properties or recreational facilities presented an unacceptable risk to human health.

A chronology of significant events related to the Site is presented in Table 2-1.



LEGEND

City of Las Cruces (CLC) Municipal Water Supply Wells:

- affected by perchloroethylene (PCE)
- not affected by perchloroethylene (PCE)

(screen depths of these wells range from 281 to 1,050 feet below ground surface.)

Private Water Supply Wells:

- affected by perchloroethylene (PCE)
- not affected by perchloroethylene (PCE)

(screen depths of these wells range from 150 to 290 feet bgs, depth of screen information is not available for LRG-1457)

Estimated Extent of GWP-related PCE Detections

Notes:

Image Data: Provided by City of Las Cruces, Resolution: 2 Ft
Map Projection: New Mexico Central State Plane, NAD83 Ft
Date Flown: 2004

1. The CLC Paz Park Well is used for irrigation. The other CLC wells illustrated on this map are designated for drinking water supply (not all are used).
2. Samples from LRG-3191 have demonstrated the presence of PCE, but samples collected since August 2002 have been non-detect for PCE
3. Private well LRG-7375 was last sampled in June 1998.
4. LRG-1457 is an irrigation well for the Lynn Middle School. It is not currently in service.

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Figure 2-1
Site Location Map
Griggs & Walnut Ground Water Plume Site
Las Cruces, New Mexico

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Chronology of Site Events
Griggs and Walnut Ground Water Plume
Las Cruces, NM
Table 2-1

Date	Event
June 1991	Samples from City of Las Cruces (CLC) Wells 18, 19, 21, and 27 were collected and analyzed for perchloroethylene (PCE) by the New Mexico Environment Department (NMED) Drinking Water Bureau (DWB). PCE was not detected; the analytical quantitation limit was 1.0 micrograms per liter (µg/L).
August 8, 1993	PCE was detected in CLC Well No. 21 and CLC Well No. 27 in samples collected by the NMED DWB, the first sampling event performed under the Safe Drinking Water Act (SDWA) requirements adding PCE to the list of drinking water contaminants. PCE was detected in CLC Well No. 21 at a concentration of 1.4 µg/L and CLC Well No. 27 at a concentration of 0.9 µg/L. This was the first detection of PCE in CLC supply wells. Results were below the Maximum Contaminant Level (MCL) of 5 µg/L.
January 10, 1995	PCE was detected in CLC Well No. 18 in a sample collected by the NMED DWB. This was the first detection of PCE in this well. The concentration of PCE was 32.0 µg/L.
February 22, 1995	CLC Well No. 18 was re-sampled, and the PCE result was 1.50 µg/L.
January 9, 1996	In a sample collected by NMED DWB from CLC Well No. 18, PCE was again detected above the MCL, at a concentration of 6.4 µg/L (results for subsequent samples collected in February, April, May, and July 1996 were all below the MCL).
September 26, 1996	CLC Well No. 18 was removed by the CLC from the municipal drinking water distribution system (mechanical difficulties were reported).
May to October 1997	In May through October 1997, NMED Superfund Oversight Program performed a Preliminary Assessment for the GWP site. In October 30,1997, NMED issued a report for the Griggs and Walnut Ground Water Plume (GWP) site entitled *Preliminary Assessment, Las Cruces PCE, Doña Ana County, New Mexico* . The report states that the threat to human health and the environment due to the PCE detected at CLC Well No. 18 is likely to be significant via the ground water pathway.
June 1997	An underground storage tank (UST) investigation was initiated at the Doña Ana County Transportation Department (DACTD) maintenance facility on East Griggs Avenue. This investigation was conducted in response to a fuel spill associated with underground fuel storage tanks located at the facility.
February 1998 through July 2000	NMED performed a Focused Site Inspection for the Site. The work plan was dated February 6, 1998, and the last sampling event under this investigation was conducted in July 2000.
September 23, 1997	A UST investigation was initiated at the Gas Card site located on North Solano Drive, to the west of the GWP site, to address a petroleum release unrelated to the GWP site.
February and March 1998	Additional UST investigation work was conducted at the DACTD maintenance facility to determine the extent of the fuel spill detected during the first UST investigation initiated in June 1997. NMED participated in this investigation as part of the GWP site Focused Site Inspection (in part by collecting additional samples for analysis of PCE).
April 1998	EPA issued a Superfund Site Strategy Recommendation for the Site that recommends that the NMED complete a Focused Site Inspection.

Chronology of Site Events
Griggs and Walnut Ground Water Plume
Las Cruces, NM (cont'd)
Table 2-1

Date	Event
May 1998	The NMED sampled the Gas Card Site monitor well. PCE was detected for the first time in this monitor well at a concentration of 15.0 µg/L.
July 1999	NMED conducted a soil vapor survey at the DACTD maintenance facility as part of the Focused Site Inspection for the GWP site.
February and June 2000	NMED installed 10 monitoring wells in the vicinity of the Site to determine extent of contamination and to identify potential sources associated with the Site.
June 6, 2000	PCE first detected in CLC Well No. 24, at a concentration of 0.90 µg/L (less than the MCL).
November 2000	EPA prepares the Hazard Ranking System (HRS) Scoring documentation for the Site under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
January 11, 2001	The Site is proposed for inclusion on the Superfund National Priorities List (NPL).
March 21, 2001	A UST risk assessment investigation is conducted at the Circle K northwest of the GWP site. Because of the GWP site PCE detections in the vicinity, the Circle K monitor wells are sampled for PCE in addition to petroleum constituents; PCE is not detected in any of the samples.
May 2001	The NMED DWB begins monthly sampling of PCE-affected CLC drinking water supply wells. Monthly sampling of the PCE-affected wells continued until July 2003.
June 14, 2001	The Site listing on the NPL becomes final.
September 2001	CLC Well No. 27 is removed from the drinking water supply distribution system due to increases in the PCE concentration (up to 4.90 µg/L at that time).
April 29, 2002	EPA initiates the first mobilization field work for the GWP Remedial Investigation (RI) process under Superfund.
June 2002	CLC begins pumping of CLC Well Nos. 18 and 27 to provide some measure of plume control with the goal of preventing further migration of PCE toward CLC Well Nos. 19 and 21.
July 2002	CLC submits a blending plan to the NMED DWB for CLC Well No. 21. The plan is designed to maintain PCE concentrations in drinking water from the Upper Griggs Reservoir below drinking water standards.
September 24, 2002	NMED DWB approves the final blending plan.
February 2003	Field work for the first mobilization of the RI is completed.
October 2003	The NMED DWB begins quarterly sampling of PCE-affected CLC drinking water supply wells.
November 2003	EPA issues the report *Identification of PCE Release Areas in the Vicinity of the Griggs and Walnut Ground Water Plume* documenting the results of the first field mobilization.
January 2004	EPA performs comprehensive ground water sampling event to document current condition and changes at the Site.

Chronology of Site Events
Griggs and Walnut Ground Water Plume
Las Cruces, NM (cont'd)
Table 2-1

Date	Event
April 2005	A settlement agreement between the EPA, CLC, and Doña Ana County (DAC) is signed. A Technical Activities Work Group is formed between the EPA, CLC, DAC, and NMED to provide a forum for stakeholder input into the RI/FS process for the site.
July 2005	CLC Well No. 19 taken out of service due to mechanical problems.
July 21, 2005	The Technical Activities Work Group meets and finalizes the scope of the RI/FS for the site.
October 17, 2005	Field activities for second field mobilization of the RI begin.
December 27, 2005	RI for the second field mobilization activities is completed.
November 21, 2006	RI/FS completed and released.
December 4 2006, – Jan. 5 2007	Public Comment Period on Proposed Plan
December 7, 2006	Public Meeting on Proposed Plan

Section 3

Community Participation

Throughout the Site's history, EPA, JSP and NMED kept the community, other governmental entities, citizen advisory groups and interested parties informed of the Site activities. Listed below is a detailed summary and chronology of the various public outreach efforts. In addition to the outreach activities listed below, and the public website maintained by EPA, the JSP also maintains a website specifically devoted to the Site. The EPA uses various methods for informing communities on site activities at Superfund sites and seeking public participation in the process. One routine activity EPA uses for updating a community is the development of site Fact Sheets. Informational Fact Sheets at Superfund sites are routinely mailed to individuals on the site mailing list, which includes community members located within approximately one mile of the site, elected officials, and other interested parties who have requested information or who have attended public meetings. At the Site, EPA met community members and performed various outreach activities in response to the Site-specific needs of the community. This included responding to citizen concerns, neighborhood associations, and the community through informal discussions, community open houses, and public meetings. The JSP was particularly helpful in the success in all of the events listed below and provided local support throughout EPA's community involvement process and by assisting in newspaper publications through various local outlets.

- January 11, 2001: *The Environmental News*, a national periodical, published an article concerning EPA's decision to propose the Site to the NPL.
- January 20, 2001: EPA issued a Public Notice in newspapers in wide circulation throughout the State announcing that the Site was being proposed to the NPL, when the comment period would open for public comments, and when the comment period would end.
- February, 2001: In a Federal Register notice, EPA proposed the Site to the NPL due to the presence of PCE contaminating the ground water.
- June 16, 2001: The Associated Press in Las Cruces, reports that the EPA has added the Site to the NPL.
- June 25, 2001: EPA places an ad in the local newspaper of general distribution (the *Las Cruces Sun News)* regarding the listing of the Site on the NPL.

- July 21, 2001: EPA placed a notice in the *Las Cruces Sun News* stating that Region 6 has received a letter of intent from a citizen group indicating that it intended to apply for a Technical Assistance Grant (TAG) related to the Site.

- EPA postpones the September 11, 2001 open house in response to 9/11 terrorists attacks and airport closings.

- September 12, 2001: EPA sends out post card announcements inviting the residents near the Site, and those listed on EPA's mailing list to an open house meeting to be held at the local elementary school (Hermosa Elementary) to discuss the Superfund program, the Site conditions that made the Site eligible for NPL listing, and answer other related questions from the public.

- October, 2001: EPA sends out a Fact Sheet to citizens within 2 miles from the plume boundaries and those other interested parties listed on the EPA mailing list describing recent and upcoming developments at the Site.

- November 8, 2001: EPA sends out flyers inviting residents on the EPA mailing list to an Open House to be held on September 11, 2001 at the Sierra Middle School Cafeteria in Las Cruces, New Mexico.

- November 9, 2001: EPA releases information to the *Las Cruces Sun News,* with an update about the Site and some information that was to be discussed at the Open House.

- January 1, 2002 EPA assists ATSDR in conducting its health assessment and evaluation of the Site.

- February 21, 2002: EPA meets with a Community Advisory Group (CAG) and holds a public meeting at the Sierra Middle School to update the community on Site activities and options associated with applying for TAG grants.

- April 4, 2002: EPA announces an open house scheduled to answer questions associated with Site activities. EPA sends out Fact Sheet to citizens on the mailing list updating them on Site plans and sampling activities taking place near their neighborhoods. Announcement published in local newspapers including the *Las Cruces Sun News* and the *Las Cruces Bulletin.*

- April 9, 2002: EPA sends out invitation to those on the mailing list announcing the open house scheduled to be held on April 25, 2002 at the Hermosa Heights Elementary School Cafeteria.

- April 24, 2002: EPA met with the CAG members and answered questions from parties interested in applying for the TAG. The EPA never received any formal applications, and only inquiries, therefore, a TAG was never awarded.

- April 25, 2002: EPA holds open house.

- August 12, 2002: The CLC begins mailing a bi-monthly Fact Sheet entitled, *Superfund PCE Project Update* to interested persons on alternating months. The update contains data results collected from municipal water supply wells and explains how the blending program is maintaining compliance with the drinking water standards.

- November, 2002: EPA sends out Fact Sheet to residents on the mailing list summarizing data findings at the Site and provides the community an update on Site activities.

- ATSDR announces in the *Las Cruces Sun News*, and other local publications about a scheduled open house on January 13, 2003 to discuss the public health assessment performed for the Site.

- January 31, 2003: EPA sends out notification letters and postcards to residents who requested EPA to sample their tap water.

- November, 2003: EPA mails a Fact Sheet to residents on the mailing list updating them on Site activities.

- July 21, 2005: EPA holds an open house at the Sierra Middle School Cafeteria. Fact Sheets were mailed prior to the meeting, along with invitations to residents on the EPA mailing list. The Fact Sheet provided an update to residents on recent Site activities including the Settlement Agreement reached with the JSP (CLC and County) for completing the RI/FS.

- November 25, 2006: EPA announces in the Las Cruces Sun News the public comment period begins on December 4, 2006 and ends January 5, 2007 on the Proposed Plan publication and invites the public to attend the public meeting where EPA will discuss the proposed remedy and hear comments from the public. EPA also mailed post cards inviting residents on the mailing list to the public meeting and identified where the Site documents could be reviewed, before the comment period ended. EPA also mailed a Fact Sheet summarizing the contents of the Proposed Plan document and described how EPA proposes to clean up the ground water Site. The public meeting was held on December 7, 2006 at Sierra Middle School.

Section 4

Scope and Role of Response Action

- The ground water remedy will treat the entire PCE plume by pumping ground water

from selected wells and piping it to a treatment facility where it will be treated to meet the MCL prior to delivery into the municipal water supply. The treatment facility will be located within the plume boundaries.

- Ground water will be extracted at rates sufficient to contain the plume and to prevent plume expansion. The remedy includes pumping modifications to existing CLC supply wells and one replacement well.
- The JSP model determined CLC Wells 19, 20, 21, 24, 26, and 38 should be turned off for purposes of controlling plume expansion. The modeling results also identified CLC Wells Nos. 18 and 27 as appropriately located wells and for remediating the entire plume. During design, final adjustments will be made toward refining locations and pumping rates if necessary.
- The selected wells and their associated infrastructure will be modified to extract water from targeted ground water zones that contain higher PCE concentrations.
- In addition to pumping CLC Well 18 and 27 a minimum of one new extraction well will be installed. Preliminary modeling results indicate the most effective location for extracting contaminants to be along the axis of the CLC Well No. 27. The extraction well will be installed in about the first five years of operation as CLC Well No. 18 begins to demonstrate that it will draw more clean water than PCE-affected water, thus becoming less efficient.
- The goal is to restore the aquifer in approximately 14 years however, once the remedy is operational, the data could indicate that more time (or less) may be required to meet remedial action objectives.
- PCE- contaminated water that is extracted from the plume will be treated until PCE concentrations meet the MCL. It is anticipated that air stripping technology will be used to treat the extracted contaminated ground water. However, during bench scale analysis, remedy design, etc., the remedy may show that other treatment options or methods identified in the Proposed Plan, i.e., GAC, or chemical/UltraViolet (UV) oxidation would be more effective for treating the contaminated ground water, and these other methods may be employed as part of the remedy.

Section 5

Site Characteristics

The Site is a ground water contaminant plume site located within the City of Las Cruces (CLC) in the central portion of Doña Ana County (County). The contaminant plume is approximately 1.8

miles by one-half mile in aerial extent. The elevation at the Site varies from a maximum of about 4,080 ft above MSL to 3,930 ft above MSL. The topography at the Site slopes towards the Rio Grande, located west of the Site.

The eastern area of the Site includes two topographically elevated areas with an arroyo valley extending east-west in between. The arroyo once flowed east to west parallel to, and south of the present-day East Hadley Avenue. The topographically elevated areas on either side of this feature were aligned approximately along East Hadley Avenue and East Griggs Avenue. This arroyo no longer serves as a channel for surface water flow, and is presently intersected by the recreational parks, streets, and storm-water retention basins.

Portions of a separate and larger arroyo (the Las Cruces Arroyo) are still present south of the GWP Site. The Las Cruces Arroyo trends east-to-west from I-25 to near East Lohman Avenue west of North Walnut Street, with some remnants of the original arroyo located slightly north and parallel to the Arroyo Plaza Shopping Center. The Las Cruces Flood Control Dam and I-25 intercept the original extent of Las Cruces Arroyo, reducing the flow of this arroyo drainage originating west of I-25.

Precipitation

The average annual precipitation in the Mesilla Valley ranges between 8.0 and 9.0 inches per year, with most precipitation in the form of rain. Most rain is limited to brief, sometimes intense thunderstorms, with more than half of the annual precipitation falling during the period July through September. Nearly three-fourths of the annual precipitation occurs in the warmest six months of the year (May through October). Potential evaporation and transpiration greatly exceeds rainfall. Potential evaporation rates measured in an evaporation pan average about 97 inches per year. Potential evaporation and transpiration rates limit the amount of surface water available in the area. This also limits the amount of recharge the aquifer receives from rainfall.

Demography and Land Use

The population of the CLC, as reported from the 2000 census, was 74,267. The population reported for the County from the 2000 census was 174,682. Land use at and near the GWP Site is characterized by a broad mix of commercial, public recreational, light industrial, and residential areas. Just north of CLC Well No. 18 and extending west to North Solano Drive and east to past North Walnut Street, a large portion of the area is used for public recreation such as, soccer, basketball, and baseball parks, and skate boarding facilities. Residential neighborhoods are

present west of North Solano Drive, east of North Walnut Street, north of East Hadley Avenue, and south of East Griggs Avenue. The rest of the area along East Hadley Avenue and East Griggs Avenue between North Solano Drive and just east of North Walnut Street is light industrial/commercial. Other commercial and light industrial properties can be found along the major roadways in the vicinity of the Site, including East Lohman Avenue, North Solano Drive, and East Spruce Avenue (refer to **Figure 2-1** for the layout of the streets).

Development in the area of the Site has resulted in changes in land uses since the 1950s. As development evolved from the open desert space to the current land uses, significant modification of the landscape has occurred (e.g., the reworking of soils, installation of turf, importation of fill materials and asphalt cover) in various areas of the Site.

Several past land use activities were determined to be relevant to the Site and represent the sources of contamination in ground water. These land uses are (1) the historical operations at the former New Mexico Army National Guard facility, (2) historical operations at the former Crawford Municipal Airport and other maintenance facilities owned or operated by the CLC and (3) suspected historical uncontrolled dumping of waste materials and historical and/or current operations at the DACTD maintenance facility.

Surface Water

The Site receives a low amount of precipitation annually and experiences a rapid rate of soil infiltration, particularly during the monsoon season. Surface water flow at the Site can be characterized as ephemeral. Most surface water flow resulting from rainfall is channeled along streets into the CLC's storm water sewer system. Several storm water retention basins are present throughout the vicinity of the Site and accumulate surface runoff during rain events before drainage or evapotranspiration occurs. The arroyo that once flowed east to west parallel to the present-day East Hadley Avenue no longer serves as a channel to surface water flow, having been intersected by the parks and streets and storm water retention basins. The Las Cruces Arroyo flows east-to-west from about I-25 to near East Lohman Avenue west of North Walnut Street. The Las Cruces Flood Control Dam and I-25 block the majority of stormwater flow from traveling into the central areas of Las Cruces.

Regional Geology

The CLC is located in the Mexican Highlands section of the Basin and Range physiographic province. In general, the physiography of the area consists of uplifted fault-block mountain

ranges and intermontane basins. The intermontane basins are structurally depressed low areas that have been displaced downward with respect to the mountains. The mountain ranges and intermontane basins generally have a north-south trend. Other mountain types in the area include broad domal uplifts and erosional remnants of igneous intrusive bodies.

The major physiographic features in the Las Cruces area are the entrenched Rio Grande and two intermontane basins; the Jornada del Muerto and the Mesilla Bolson. Las Cruces is located in the Mesilla Valley (located within the Mesilla Bolson) east of the Rio Grande. The Jornada del Muerto is located north and east of Las Cruces. A subsurface high area in the bedrock, known as a horst, separates the two basins. The horst is located approximately 1 mile east of the GWP Site and was not encountered during drilling of any Site monitoring wells.

The regional geology is composed of the Quaternary flood plain alluvium and the Miocene to Middle Pleistocene Santa Fe Group. The flood plain alluvium was deposited by the Rio Grande. It generally consists of a thick basal sand and gravel channel unit overlain by finer-grained flood plain deposits. The flood plain alluvium is generally about 4 miles wide and 80 ft thick. The Santa Fe Group is composed of sequences of unconsolidated to moderately-consolidated sedimentary deposits of clay, silt, sand, gravel, some basalts, and minor ash-fall deposits. The Santa Fe Group can be up to 4,000 ft thick.

Site Geology

A Site stratigraphic model was developed through data obtained from drilling 10 deep multi-port ground water monitoring wells. This included use of the soil boring logs and geophysical logs completed for each well. The boreholes for these wells were drilled to depths comparable to the depths of PCE-affected CLC municipal supply wells.

The Site stratigraphy data observed during drilling operations is consistent with the regional stratigraphy documented in published literature for the Rio Grande Alluvium and the Santa Fe Group. Alternating beds of gravels, sands, silts, and clays occur across the vicinity of the Site. Many beds can be correlated across most of the area. Hydro-geophysical cross-sections were prepared based on both geologic and hydrogeologic observations from the geophysical logs and boring logs obtained during drilling operations. Visual descriptions of drill cuttings logged during well construction served to cross-check the geophysical data and confirm the lateral correlations presented on the cross-sections.

The Rio Grande Alluvium is present across the western portion of the Site from ground surface to a depth of between 80 and 120 ft bgs. It is composed of primarily sand and gravel deposits, with some inter-bedded clays and silts. Only the lower 10 to 15 ft of the alluvium is saturated. The Santa Fe Group sediments are present beneath the Rio Grande Alluvium west of GWMW03 and at ground surface east of GWMW03. Along the eastern portion of the Site, the upper part of the Santa Fe Group consists of mostly inter-bedded sand and gravel deposits. The surficial deposits are between 150 and 260 ft thick. This upper portion of the Santa Fe Group is unsaturated.

A thick layer composed of fine sand with varying percentages of silt and clay is present below the upper portion of the Santa Fe Group deposits and the base of the Rio Grande Alluvium. The thickness of this layer is between 50 and 115 ft, and is continuous across the Site, but thins towards the east. The first water encountered beneath the eastern portion of the Site occurs within this unit. At its base, the unit becomes inter-bedded with silt and clay deposits. These inter-bedded clay and silt deposits are not present beneath the far eastern portion of the GWP Site at monitoring well GWMW15.

Below these layers, the Santa Fe Group is composed primarily of fine to coarse sand units ranging in thickness from 10 to 130 ft. These units are commonly separated with thin, inter-bedded finer grained units. These finer-grained beds are more numerous in the western portion of the Site, with the beds pinching out towards the east. Some gravel beds are present at lower depths. The base of the Santa Fe Group was not encountered in any of the boreholes drilled at the Site, down to an elevation of 3,325 ft MSL.

Regional Hydrogeology

The CLC is located within the Mesilla Ground Water Basin (Mesilla Basin), which is primarily located within the County, but also extends into El Paso County, Texas, and the State of Chihuahua, Mexico. The Rio Grande Alluvium and the Santa Fe Group are the two major ground water aquifers within the Mesilla Basin, with the two aquifers forming a complex aquifer system. Regionally, recharge to ground water is primarily from the Rio Grande River and inter-connected irrigation canals along the Rio Grande River into the flood plain alluvium. Minor amounts of recharge also occurs as mountain and slope-front recharge. Mountain-front recharge occurs along the western slopes of the Organ and Franklin Mountains, located to the east of Las Cruces. Slope-front recharge occurs from surface water that has accumulated in arroyos during precipitation events.

Water migrates downward through the Rio Grande Alluvium to the upper Santa Fe Group through a series of interconnected gravel, sand, and silt lenses. Vertical flow within the system is limited by thin, inter-bedded clay lenses in the lower part of the alluvium and the upper portion of the Santa Fe Group. This vertical heterogeneity indicates that the permeability is greater horizontally than vertically.

Ground water occurs under unconfined conditions within the Rio Grande Alluvium and under unconfined to semi-confined conditions within the Santa Fe Group. Ground water flow within the Mesilla Basin is generally to the southeast.

Ground water is removed from the aquifer by pumping wells and as discharge along irrigation canals when ground water levels are sufficiently high. Minor amounts of ground water leave the basin through the El Paso Narrows, at the southern end of the basin. The primary use of ground and surface water within the Mesilla Basin is for irrigation. Communities within the basin rely on ground water as the source of municipal and industrial water supplies. During non-drought years, most irrigation water is diverted from the Rio Grande. During years of drought, ground water is used to make up for the shortfall in surface water supplies for irrigation. Prior to about 1975, most irrigation wells were completed within the Rio Grande Alluvium, but after 1975, wells were drilled deeper into the Santa Fe Group to acquire better quality water.

The Mesilla Basin aquifer has excellent recharge, transmission, and storage capacity. These characteristics make the aquifer system capable of producing large quantities of high quality water for agricultural, municipal, and industrial uses. Ground water is currently the only source of drinking water for the CLC. The CLC obtains water from both the Mesilla and the adjacent Jornada Ground Water Basin.

The CLC Municipal Water System is a blended system supplying water from approximately 30 wells. The Site map (**Figure 2-1**) presents the CLC wells within and near the Site. The CLC's municipal wells are completed within sand and gravel layers in the Santa Fe Group. Most wells are located on the east side of the Rio Grande, but there are also wells located west of the Rio Grande on the West Mesa. No single well supplies more than 40% of the total water within the system, and the system produces approximately 19 million gallons per day on average. There are few private wells in the area of the GWP Site and they are used primarily for residential irrigation purposes.

Site Hydrogeology

Directly beneath the Site is an unsaturated zone (also known as the vadose zone) of sands, silts and clays ranging in thickness from 80 ft on the western side of the Site to over 200 ft on the east. This zone is typically a permeable layer of sediments through which water infiltrates to the aquifer. Air and other vapors can migrate in horizontal and vertical directions in the unsaturated zone through physical processes such as diffusion.

Underlying the unsaturated zone, there are two distinct hydrologic zones beneath the Site, referred to as the Upper Hydrologic Zone (UHZ) and the Lower Hydrologic Zone (LHZ). (See **Figures 5-2, 5-3**, and **5-4**). Both zones are fully saturated and can be correlated across the area of the Site. The boundaries between the zones were established from observed water levels and geophysical changes observed with depth. Water levels were obtained from the multi-port and nested monitoring wells screened across each zone.

Upper Hydrologic Zone (UHZ)

The UHZ is composed of the lower portions of the Rio Grande Alluvium and the upper portion of the Santa Fe Group. It represents the uppermost portion of the aquifer and is over 100 ft thick along the western portion of the Site. Representative thickness of the UHZ in the eastern part of the Site range from 20 ft at GWMW09 to 50 ft at GWMW15. The zone is thicker in the western portions of the Site, but becomes thinner towards the east. Ground water in this zone occurs under unconfined or water-table conditions. Water level data from the UHZ and LHZ indicate greater hydraulic communication between the two zones to the east.

Ground water flow in the UHZ is towards the east-southeast in the western portion of the Site. The ground water flow becomes more eastward near monitoring wells GWMW03 and MW-SF6. This easterly flow direction is consistent across the eastern portion of the Site, flowing towards the CLC's municipal supply wells in the area of I-25. The ground water flow direction indicates that the UHZ is affected by pumping at the CLC municipal supply wells, especially in areas east of monitoring well GWMW03.

There is a downward vertical gradient (range of 0.02 to 0.06 (ft per foot)) that exists between the UHZ and LHZ at all locations.

Lower Hydrologic Zone (LHZ)

The LHZ is within the Santa Fe Group. Most of the LHZ is composed of fine to coarse sand with

some fine gravel. The boundary between LHZ and the UHZ is marked by overlapping layers of fine sand with clay and silt, clay, and silt that are present across most of the Site. These finer grained sediment layers appear to pinch out east of monitoring wells GWMW09 and GWMW10. The LHZ is divided into upper and lower portions based primarily on contaminant concentration differences and lithologic differences that occur in areas of the Site west of monitoring wells GWMW09 and GWMW10. Some subtle hydrologic differences also occur between the units, particularly with respect to ground water flow direction.

While the total thickness of the LHZ is unknown, it does extend from the base of the UHZ to at least 800 ft bgs at an elevation of 3,300 ft above MSL. The bottom of the LHZ was not encountered in any of the boreholes drilled at the Site. This zone is the primary ground water production interval for the CLC municipal supply wells located within the Site boundaries.

It is important to note that ground water flow in both the upper and lower portions of the LHZ are directly influenced by pumping at the CLC municipal water supply wells, with water levels responding somewhat, to peak periods of pumping, and water level trends within the upper and lower portions of the LHZ being similar. The horizontal hydraulic conductivity is significantly greater than the vertical hydraulic conductivity as a result of the inter-bedded nature of this zone, especially in the western portion of the Site. The pumping data from the CLC wells were compared against water level responses in monitoring wells, and seemed to support a hydraulic connection between the UHZ and LHZ at the time of this ground water flow characterization.

It was also determined that vertical potentiometric head differences are less pronounced within the LHZ. The water levels in multi-port wells screened within the LHZ are similar in the upper and lower portions. Therefore, vertical gradients were not calculated between the upper and lower portions of the LHZ.

Comparison of the Site Hydrogeology to the JSP Site Model

The ground water model developed by JSP assists in refining the Site hydrogeologic conceptual model. The JSP model divides the Site hydrogeology into five model layers. The five model layers are based on the hydrostratigraphic units and lithofacies assemblages. The JSP ground water model report further details how the model and hydrogeologic framework were determined and explains each model layer.

Table 5-1 provides a cross-reference of the UHZ, upper portion of the LHZ, and lower portion of

the LHZ to the JSP's ground water model layers and the hydrostratigraphic units and lithofacies assemblages. The UHZ is equivalent to layer 1 of the ground water model. The upper portion of the LHZ is equivalent to layer 2 of the ground water model and the uppermost portion of layer 3 of the ground water model. The lower portion of the LHZ is equivalent to the majority of layer 3 and layers 4 and 5 of the ground water model.

The ground water model indicates that ground water flow at the Site is towards the south-southeast and southeast within the LHZ (model layers 2 through 5). The ground water model report states that a lack of water level data exists north and east of CLC Well 21 and east of I-25 and does not fully reflect the current monitoring well network to delineate the cone-of-depression created by pumping at the CLC Wells. The current monitoring well network is limited to a narrow west-to-east area beginning near monitoring wells GWMW07 and GWMW06 and east to GWMW15. The CLC supply wells are screened across most of the LHZ. The flow patterns indicate that ground water flow in the LHZ at the Site is affected by pumping at the CLC municipal supply wells. This observation is also consistent with EPA's assessment on the influence of the supply wells to ground water flow at the Site, as discussed above.

Extent of Environmental Impacts

PCE is the primary Contaminant of Concern (COC) at the Site. It is the most widespread contaminant in both soil vapor and ground water. Low levels of PCE were detected in soil vapor (ranging from non-detect to 1,186 ppbv or 8.8 µg/L) in the unsaturated zone between 15 and 184 ft bgs. The highest concentrations of PCE in soil occur beneath, and in the vicinity of, the three identified source areas. (See Figure 5-8) Shallow soil vapor sampling confirms that broad areas of the subsurface are impacted by the PCE contamination from the source areas. Concentrations of PCE in more than half of the soil vapor samples collected from the shallow subsurface in the residential area northeast of the intersection of East Hadley Avenue and North Walnut Street exceeded screening criteria for PCE through the vapor intrusion pathway. Laterally, the concentration of PCE in soil vapor decreases in samples collected further away from each source area.

In ground water, the highest levels of PCE contamination occur in the UHZ and the upper portion of the LHZ. The highest detections of PCE are typically in wells screened at the water table or at the upper portion of the LHZ near the DACTD maintenance facility. Lower concentration levels of PCE are detected in the shallow wells located near the other two source areas. Ground water

contamination in the LHZ is more extensive due to the presence of higher permeability strata that serve as the primary production zone for the City's municipal wells. Pumping of these wells has resulted in the vertical migration of PCE contamination into deeper portions of the aquifer. PCE contour maps depict the extent of PCE contamination in ground water for the UHZ, and the upper and lower portions of the LHZ.

The PCE ground water plume with concentrations that exceed the MCL for PCE extends approximately 9,500 ft west to east and approximately 2,700 ft north to south. The plume however, is not well defined in certain areas. In particular, the plume is not well defined in the area that is west and northwest of up-gradient monitoring well GWMW06, and, in the area east of down-gradient monitoring well GWMW15.

Laterally, there are two areas where PCE concentrations exceed the MCL. The first of these two areas is located near monitoring well GWMW06 and the second is located in an area extending from the DACTD maintenance facility east to monitoring well GWMW15. These two areas are separated by intervening wells where the PCE concentrations are less than the MCL. The PCE contaminated ground water plume extends vertically to a depth of approximately 635 ft bgs. The depth of the plume is defined vertically at the point where concentrations fall below the MCL for PCE.

Other VOCs detected in the ground water within the footprint of the PCE plume are benzene, toluene, methyl tertiary butyl ether (MTBE), and the PCE degradation products: TCE, and 1,2 cis- and 1,2 trans-DCE. Of these, only benzene has been detected in Site monitoring wells above its corresponding MCL (in seven monitoring wells), and MTBE is detected above its corresponding EPA Region 6 Medium-specific screening level (MSSL) in one monitoring well. Benzene is not detected in any municipal supply wells. MTBE is detected in one municipal supply well at concentrations below the MSSL.

Ground water samples collected in January 2004 were analyzed for Target Analyte List (TAL) metals at the multi-port monitoring wells during January 2004 (see Table 5-5). The samples were collected for the analysis of total (unfiltered) metals. Metals that were detected included aluminum, antimony, arsenic, barium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, sodium, thallium, vanadium, and

zinc. Of these metals, aluminum, antimony, arsenic barium, calcium, chromium, cobalt, copper, iron, lead magnesium, manganese, nickel, potassium, sodium, vanadium, and zinc were detected in more than five percent of the samples. However, none of these metals were detected at concentrations that exceeded drinking water standards.

The NMED collected samples for metal analysis during the Site Inspection activities that occurred in 2000. With the exception of arsenic, the NMED's analytical results were similar to those obtained in January 2004, for metals at the multi-port wells. Based on data collected at municipal water supply compliance wells, the CLC water system is currently meeting the arsenic standard of 10 parts per billion, or 10 µg/L.

Uranium has also been detected at concentrations exceeding its corresponding MCL in seven municipal supply wells (Well Nos. 10, 19, 20, 21, 24, 38 and 44). It was originally discovered by NMED in 2005 when it sampled the CLC wells to evaluate the drinking water system's compliance with the new MCL for uranium (30 µg/L). However, based on previous work by the U.S. Geological Survey (USGS) on ground water quality in portions of New Mexico, it was determined that the elevated concentrations of uranium (<1.0 µg/L and 102 µg/L) and other radionuclides in the Mesilla Basin are naturally occurring. The CLC also performed an evaluation of the potential sources of uranium in their municipal supply wells. This evaluation concluded that the uranium was naturally occurring (JSAI, 2006b). The CLC and NMED continue to monitor these wells for uranium, and the CLC is currently evaluating options for addressing the uranium exceedences in the drinking water supply as part of compliance with the SDWA.

Ground Water Quality

General water quality parameters that were measured included acidity (pH), alkalinity, temperature, oxidation/reduction potential (ORP – also known as redox potential), conductivity, and dissolved oxygen (DO).

General Water Chemistry

Ground water samples were collected in December 2005 for analysis of general water chemistry, and the analyses included alkalinity (carbonate, bicarbonate, and total as calcium bicarbonate [CaCO3]), calcium, magnesium, chloride, hardness, nitrate/nitrite, sulfate, sulfide, total dissolved solids (TDS), and total organic carbon (TOC). This data assists in evaluating the physical nature and conditions of ground water at a Site and in evaluating the fate and transport of contaminants,

and the likelihood for natural degradation of organic compounds and contaminants such as organic solvents. Water chemistry data also provides a better understanding of the general Site conditions when evaluating appropriate remedies.

Migration Pathways and the Conceptual Site Model

PCE in ground water is probably the result of surface spills with subsequent leaching/infiltration and volatilization into the soil (or unsaturated zone). After leaching into the subsurface, some of the PCE volatilized within the unsaturated zone, forming soil vapor, while the remaining PCE continued its migration into the saturated zone and affected ground water. Dense non-aqueous phase liquid (DNAPL) chemicals have not been found to exist within the unsaturated zone or in the aquifer at the Site. Dissolved phase PCE in ground water is likely a result of induced infiltration and air diffusion. Local pumping from CLC municipal supply wells has drawn PCE horizontally and vertically across the Site into deeper portions of the aquifer. (See CSM Fig. 5-1).

Shallow soil vapor data suggested that PCE in soil vapor could potentially migrate into residential homes located in an area northeast of the intersection of East Hadley Avenue and North Walnut Street. Consequently, additional soil vapor data was collected to further evaluate the potential for indoor vapor intrusion at residential homes and to determine if the concentrations exceeded acceptable risk range levels to human health. The soil vapor samples were collected in a manner consistent with the guidance for evaluating the potential for indoor air vapor intrusion. The Baseline Human Health Risk Assessment (BHHRA) concluded that the concentrations at or near residential properties are within acceptable health risk range levels.

The JSP Team has completed a ground water model report for the Site that supplemented the fate and transport analysis. The results of the model indicate that the PCE plume located at, and down-gradient of, the DACTD maintenance facility will migrate southeast towards CLC Wells 20, 24, 26, and 61.

The current distribution of PCE contamination in the vadose zone and the current distribution of PCE contamination in both the UHZ and LHZ ground water indicate that the contamination in the subsurface is at or near equilibrium. While the soil vapor is believed to be a source of contamination to ground water, the low PCE concentration levels present in soil vapor indicate a decreasing threat to ground water. Although it is plausible that some contamination could volatilize from the water table to the vadose zone down-gradient from the three source areas, the concentration levels of PCE near the water table down-gradient of these source areas contain

lower concentrations of PCE and are not likely to present a significant source of PCE contamination for the vadose zone.

The existing ground water plume is likely to continue migrating toward operational municipal supply wells, acting as a low level source of PCE to these wells. Natural attenuation, principally via dispersion and diffusion of PCE in both soil vapor and ground water, is expected to further reduce the concentrations of PCE over time.

Figure 5-1
Conceptual Model of PCE Release and Subsurface Contamination
Griggs and Walnut Ground Water Plume Site
Las Cruces, New Mexico

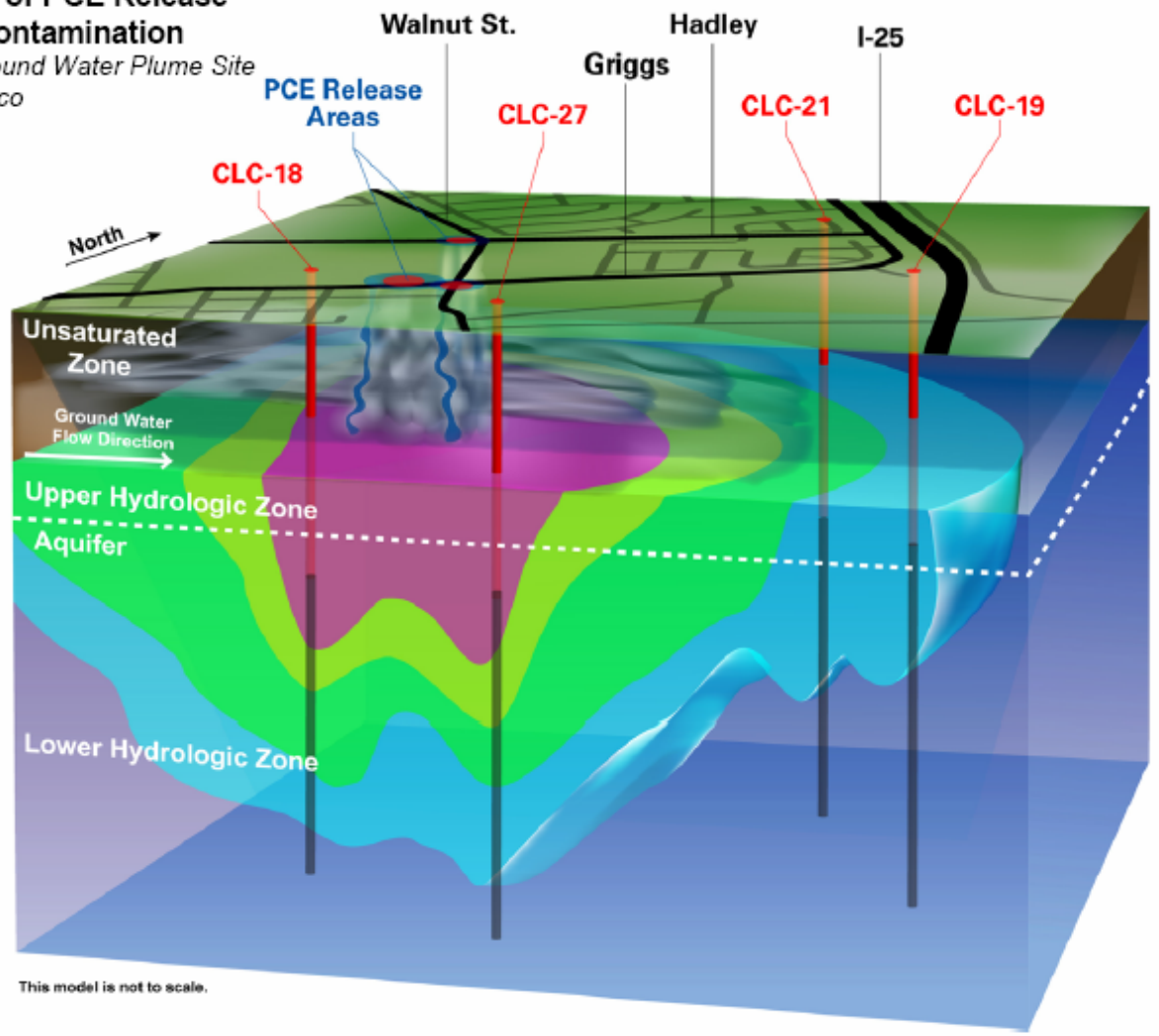


Table 5-1

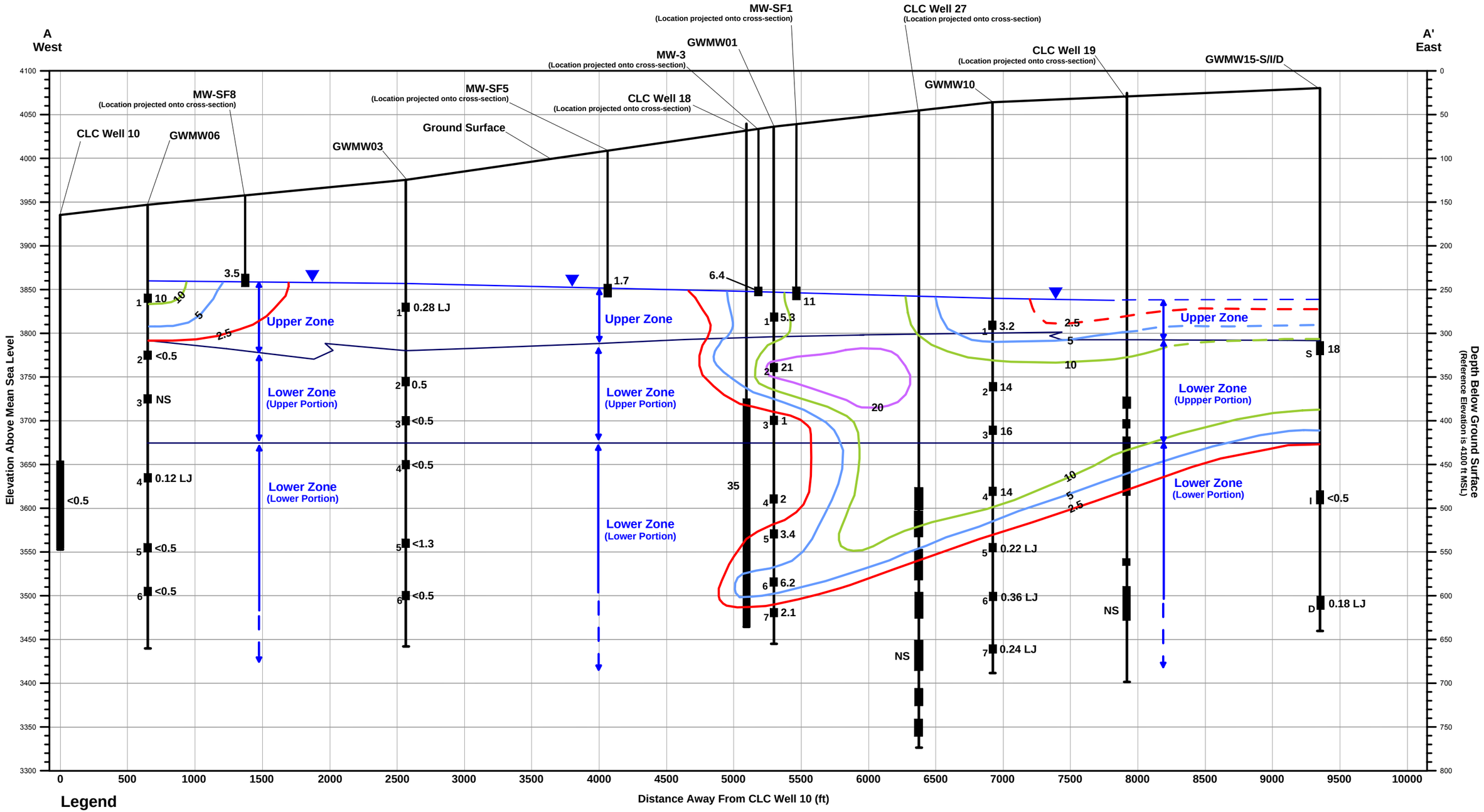
Comparison of Griggs and Walnut Ground Water Model Layers, Hydrologic Zones, and Units Defined by Hawley and Kennedy (2004)
Griggs and Walnut Ground Water Plume
Las Cruces, New Mexico

Griggs and Walnut Model layer	Griggs and Walnut Ground Water Model layer thickness (ft)	Hawley and Kennedy (2004) Hydrostratigraphic unit	Hawley and Kennedy (2004) lithofacies assembleges in the Santa Fe Group Sediments	Site Specific geologic unit (RI/FS)	Site Specific Hydrologic Zone (RI/FS)
1	75	USF	LFA 1	Rio Grande Alluvium and Upper Santa Fe Group Sediments	Upper Hydraulic Zone (UHZ)
2	80	RA and USF	LFA a3 and 1	Silt and clay layer between Rio Grande Alluvium and Upper Santa Fe Group Sediments	Upper Portion of Lower Hydraulic Zone (LHZ)
3	200	USF	LFA 1 and 2	Santa Fe Group Sediments (alternating layers of sand, gravel, and fine-grained beds)	
4	200	USF and MSF	LFA 1 and 5	Same as above	Lower Portion of Lower Hydrologic Zone (LHZ)
5	Variable	MSF and LSF	LFA 2 and 3	Same as above	

Descriptions of Lithofacies assembleges (LFA) from Hawley and Kennedy (2004):
LFA a3 (silty clay, clay and sand)
LFA 1 (sand and pebble gravel, lenses of silty clay)
LFA 2 (sand, lenses of pebble sand, and silty clay)
LFA 3 (interbedded sand and silty clay, lenses of pebbly sand)
LFA 5 (predominately gravel and sand, and some silt and clay)

Hydrostratigraphic Units (HSU) from Hawley and Kennedy (2004):

RA	Rio Grande Alluvium
USF	Upper Santa Fe Group Sediments
MSF	Middle Santa Fe Group Sediments
LSF	Lower Santa Fe Group Sediments



Legend

PCE Concentration (ug/l)

1 — 10 — Screened Interval

Monitor Well Port ID
(Multi-port and cluster wells only)

City of Las Cruces Municipal Supply Well and Screened Interval(s)
(see Table 3-2 for completion details)

PCE Isoconcentration Contours
(units are ug/l)
Dashed where infered

- 20
- 10
- 5
- 2.5

Water Table Surface
(dashed where inferred)

Hydrologic Zone Boundary

SCALE:

Horizontal: 1" = 725'
Vertical: 1" = 110'
Vertical Exageration = 6.6:1

NOTES:

Water table elevation based on water levels collected between November 29 and December 1, 2005

PCE concentrations are for samples collected during December 2005.

See Figure 3-4 for location of cross-section.

Where samples were collected using PDBs and low-flow purge method, the PDB data are presented.

Data for CLC Municipal Supply Wells is provided for informational purposes only. These data were not used for contouring.

Abbreviations: PCE - tetrachloroethene; PDB - passive diffusion bag; CLC - City of Las Cruces; ug/l - micrograms per liter; NS - Not Sampled LJ - Result is estimated and below the contract required quantitation limit.

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FIGURE 5-2
Vertical Distribution of PCE
Cross-Section A-A'
Griggs and Walnut Ground Water Plume Site
Las Cruces, New Mexico

B
Southwest

B'
Northeast

GWMW07
LRG-3191
(Location projected onto cross-section)
GWMW03
Ground Surface
MW-SF5
(Location projected onto cross-section)
CLC Well 18
(Location projected onto cross-section)
MW-3
(Location projected onto cross-section)
GWMW01
MW-SF1
(Location projected onto cross-section)
MW-SF10
(Location projected onto cross-section)
GWMW09
CLC Well 21
(Location projected onto cross-section)
GWMW15-S/I/D

Upper Zone
Lower Zone
(Upper Portion)
Lower Zone
(Lower Portion)

1 1
2 0.14 LJ
3 <0.5
4 <0.5
5 0.13 LJ
6 <0.5

1 0.28 LJ
2 0.5
3 <0.5
4 <0.5
5 <1.3
6 <0.5

1.7

6.4
1 5.3
2 21
3 1
4 2
5 3.4
6 6.2
7 2.1
35
20
10
5
2.5

17

1 0.55 LJ
2 18
3 14
4 16
5 13
6 0.21 LJ
7 <1.8
5
10
4.3

S 18
I <0.5
D 0.18 LJ

Elevation Above Mean Sea Level

Depth Below Ground Surface
(Reference Elevation is 4100 ft MSL)

4100 4050 4000 3950 3900 3850 3800 3750 3700 3650 3600 3550 3500 3450 3400 3350 3300

0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800

0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000 6500 7000 7500 8000 8500 9000 9500 10000

Distance Away From GWMW07 (ft)

Legend

PCE Concentration (ug/l)
1 10
Screened Interval
Monitor Well Port ID
(Multi-port and cluster wells only)

City of Las Cruces
Municipal Supply Well
and Screened Interval(s)
(see Table 3-2 for completion
details)

PCE Isoconcentration Contours
(units are ug/l)
Dashed where infered
20
10
5
2.5

Water Table Surface
(dashed where inferred)

Hydrologic Zone Boundary

SCALE:

Horizontal: 1" = 725'
Vertical: 1" = 110'
Vertical Exageration = 6.6:1

NOTES:

Water table elevation based on water levels collected between November 29 and December 1, 2005

PCE concentrations are for samples collected during December 2005.

See Figure 3-4 for location of cross-section.

Where samples were collected using PDBs and low-flow purge method, the PDB data are presented.

Data for CLC Municipal Supply Wells is provided for informational purposes only. These data were not used for contouring.

Abbreviations: PCE - tetrachloroethene; PDB - passive diffusion bag; CLC - City of Las Cruces; ug/l - micrograms per liter; NS - Not Sampled
LJ - Result is estimated and below the contract required quantitation limit.

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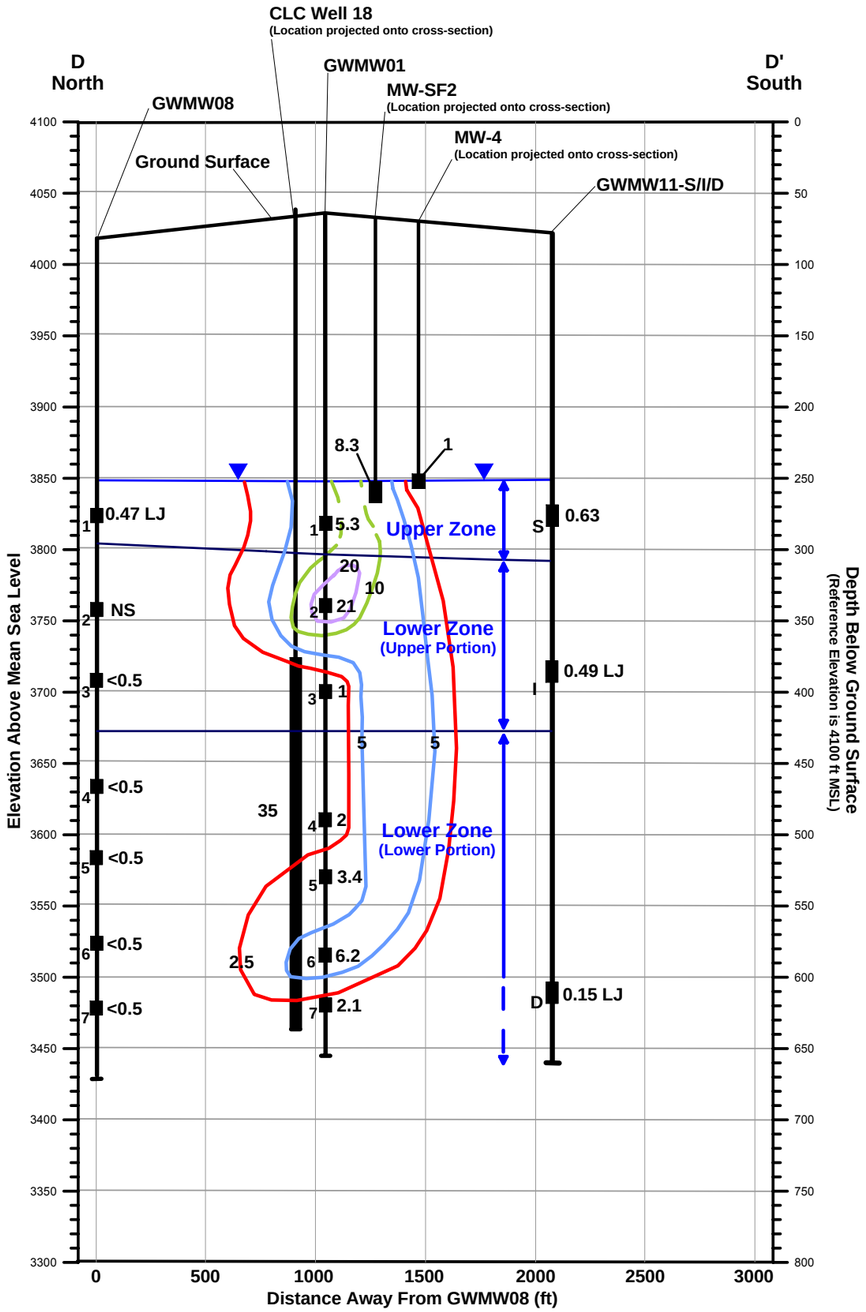
FIGURE 5-3
Vertical Distribution of PCE
Cross-Section B-B'
Griggs and Walnut Ground Water Plume Site
Las Cruces, New Mexico



Legend

PCE Concentration (ug/l)

10

1

Screened Interval

Monitor Well Port ID
(Multi-port and cluster wells only)

City of Las Cruces Municipal Supply Well and Screened Interval(s)
(see Table 3-2 for completion details)

PCE Isoconcentration Contours
(units are ug/l)
Dashed where infered

- 20
- 10
- 5
- 2.5

Water Table Surface
(dashed where inferred)

Hydrologic Zone Boundary

SCALE:

Horizontal: 1" = 725'
Vertical: 1" = 110'
Vertical Exageration = 6.6:1

NOTES:

Water table elevation based on water levels collected between November 29 and December 1, 2005

PCE concentrations are for samples collected during December 2005.

See Figure 3-4 for location of cross-section.

Where samples were collected using PDBs and low-flow purge method, the PDB data are presented.

Data for CLC Municipal Supply Wells is provided for informational purposes only. These data were not used for contouring.

Abbreviations: PCE - tetrachloroethene; PDB - passive diffusion bag; CLC - City of Las Cruces; ug/l - micrograms per liter; NS - Not Sampled
LJ - Result is estimated and below the contract required quantitation limit.

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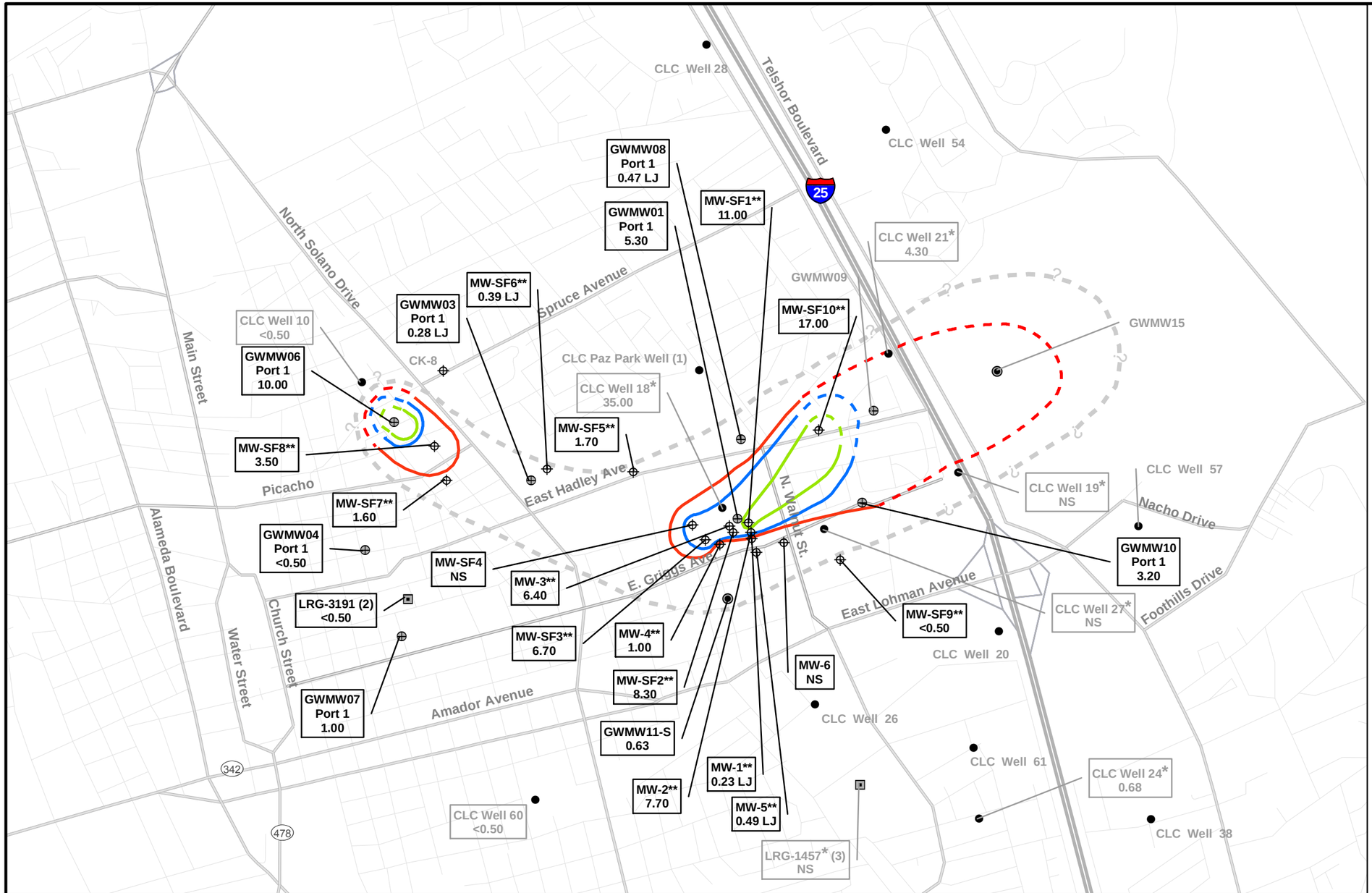
FIGURE 5-4
Vertical Distribution of PCE
Cross-Section D-D'
Griggs and Walnut Ground Water Plume Site
Las Cruces, New Mexico



N

Notes:

PCE Concentrations in micrograms per liter (ug/L).

1. The CLC Paz Park Well is used for irrigation. The other CLC wells illustrated on this map are designated for drinking water supply (not all are used).
2. Samples from LRG-3191 have demonstrated the presence of PCE, but samples collected since August 2002 have been non-detect for PCE
3. LRG-1457 is an irrigation well for the Lynn Middle School. It is not currently in service.

Gas Card Monitor Well and Private Well LRG-7375 have been abandoned and are not shown on figure.

Unit Qualifiers:
J - Estimated
L - Concentration below the reporting limit

Concentration Data Contoured by Hand.

NS - Not Sampled

The municipal supply well concentrations are used for informational purposes only. The PCE concentrations in these wells were not used to prepare the PCE isoconcentration contours shown on this figure.

* Indicates Private and CLC Municipal Supply Wells where PCE is detected.

** PCE results shown were obtained using Passive Diffusion Bags (PDBs). Duplicate samples were collected at a subset of locations using low flow sampling method. The concentration of samples collected with the low flow method was about two to three times higher then the corresponding samples collected using PDB samples. For a comparison of analytical results obtained from using PDBs versus low flow sampling, see RI Report, Appendix G-2.

0 750 1,500 3,000 Feet

LEGEND

- **Water Table Monitor Well** (screen depths of these wells range from 101 to 204 feet bgs.)
- **City of Las Cruces (CLC) Municipal Water Supply Wells** (screen depths of these wells range from 281 to 1,050 feet bgs.)
- **Private Water Supply Wells** (screen depths of these wells range from 150 to 290 feet bgs, depth of screen information is not available for LRG-1457)
- **Multi-Port Monitor Well** (screen depth of these wells range from 90 to 640 feet bgs)
- **Nested Monitor Well** (screen depths of these wells range from 190 to 590 ft bgs)
- GWMW06 Port 1 10.00 — Monitor Well ID, Port Number & PCE Concentration
- ? — Indicates Uncertainty of Extent of GWP-Related PCE Detections
- Estimated Extent of GWP-Related PCE Detections

PCE Concentration Levels (Dashed Where Infered)
- 2.5 ug/L
- 5 ug/L
- 10 ug/L
- 20 ug/L

CH2MHILL

Figure 5-5
Horizontal Distribution of PCE in the Upper Hydrologic Zone (December 2005)

Griggs & Walnut Ground Water Plume Site

Las Cruces, New Mexico

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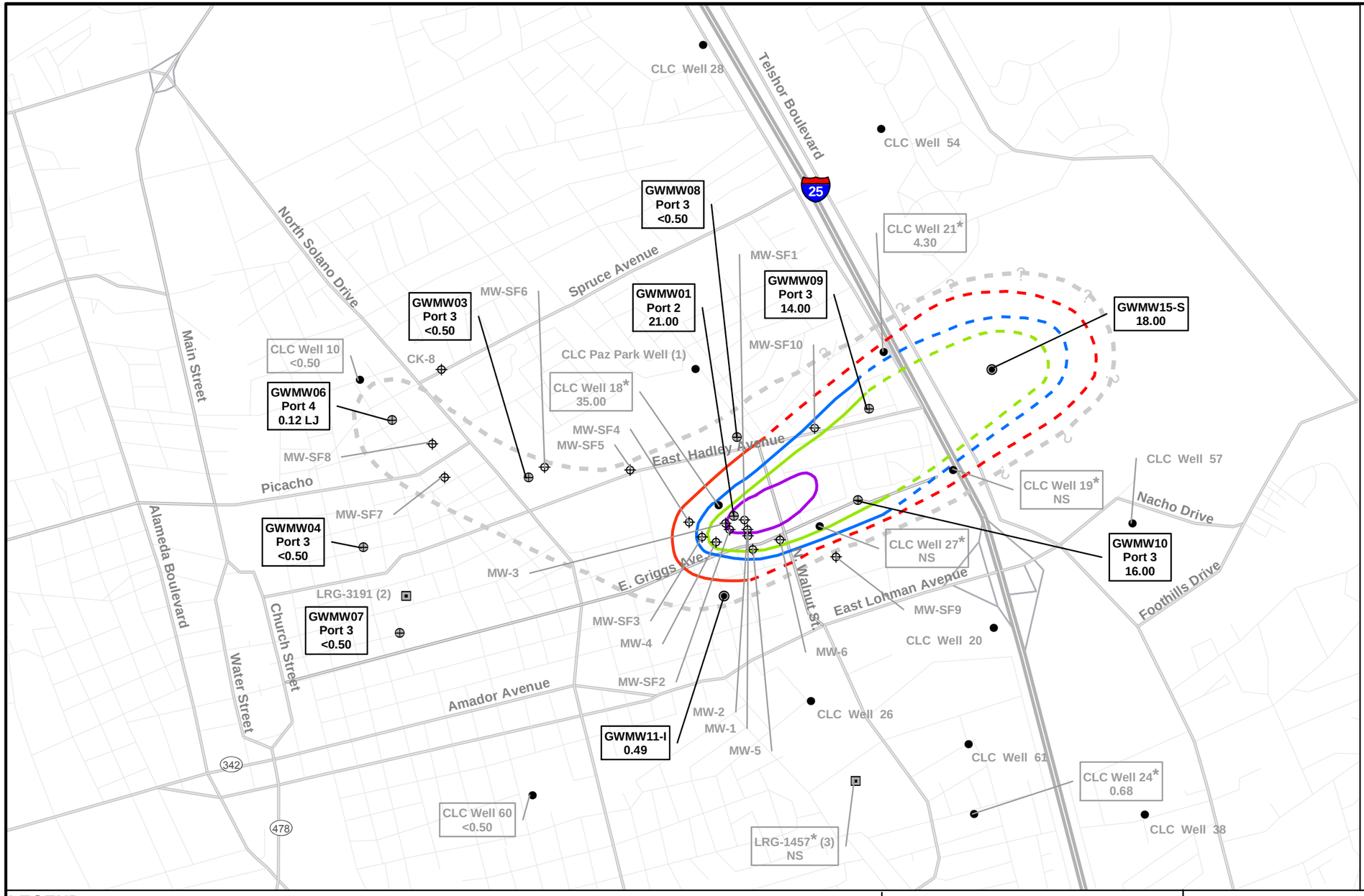

N

Notes:

PCE Concentrations in micrograms per liter (ug/L).

No Data obtained from GWMW06 Port 3. Data for Port 2 was <0.50 and data for Port 4 was 0.12 LJ. Therefore, PCE contamination is assumed to extend past GWMW06.

1. The CLC Paz Park Well is used for irrigation. The other CLC wells illustrated on this map are designated for drinking water supply (not all are used).
2. Samples from LRG-3191 have demonstrated the presence of PCE, but samples collected since August 2002 have been non-detect for PCE
3. LRG-1457 is an irrigation well for the Lynn Middle School. It is not currently in service.

Gas Card Monitor Well and Private Well LRG-7375 have been abandoned and are not shown on figure.

Unit Qualifiers:
J - Estimated
L - Concentration below the reporting limit

Concentration Data Contoured by Hand.

NS - Not Sampled

The municipal supply well concentrations are used for informational purposes only. The PCE concentrations in these wells were not used to prepare the PCE isoconcentration contours shown on this figure.

Upper portion of Lower Zone corresponds to an approximate elevation range of 3675 to 3775 ft MSL.

* Indicates Private and CLC Municipal Supply Wells where PCE is detected.

Feet
0 750 1,500 3,000

LEGEND

- **Water Table Monitor Well** (screen depths of these wells range from 101 to 204 feet bgs.)
- **City of Las Cruces (CLC) Municipal Water Supply Wells** (screen depths of these wells range from 281 to 1,050 feet bgs.)
- **Private Water Supply Wells** (screen depths of these wells range from 150 to 290 feet bgs, depth of screen information is not available for LRG-1457)
- **Multi-Port Monitor Well** (screen depth of these wells range from 90 to 640 feet bgs)
- **Nested Monitor Well** (screen depths of these wells range from 190 to 590 ft bgs)
- GWMW07 Port 3 <0.50 — Monitor Well ID, Port Number & PCE Concentration
- ? — Indicates Uncertainty of Extent of GWP-Related PCE Detections
- Estimated Extent of GWP-Related PCE Detections

PCE Concentration Levels (Dashed Where Infered)
- 2.5 ug/L
- 5 ug/L
- 10 ug/L
- 20 ug/L

CH2MHILL

Figure 5-5
Horizontal Distribution of PCE in Upper Portion of the Lower Hydrologic Zone (December 2005)

Griggs & Walnut Ground Water Plume Site

Las Cruces, New Mexico

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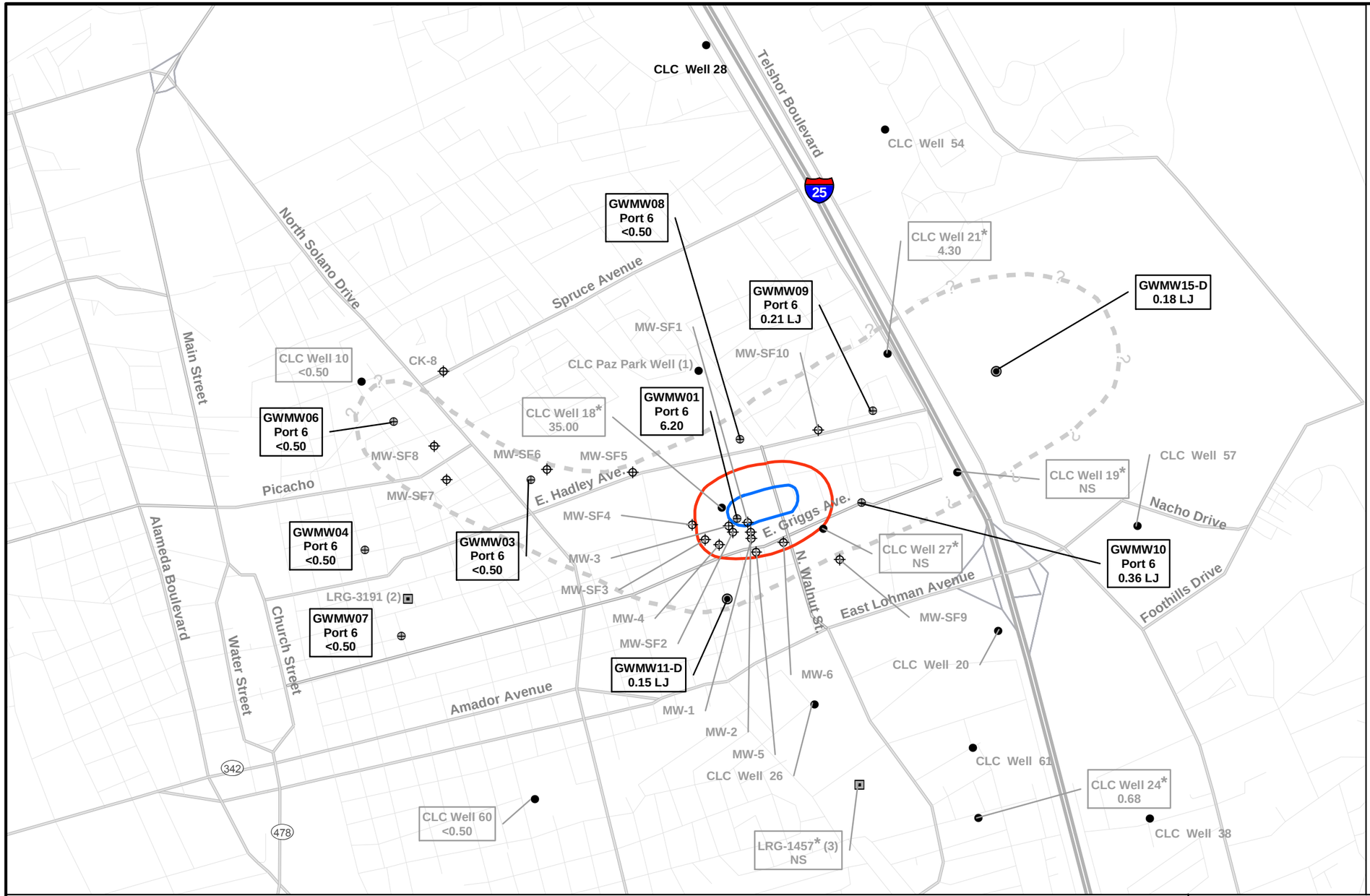

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Notes:

PCE Concentrations in micrograms per liter (ug/L).

1. The CLC Paz Park Well is used for irrigation. The other CLC wells illustrated on this map are designated for drinking water supply (not all are used).
2. Samples from LRG-3191 have demonstrated the presence of PCE, but samples collected since August 2002 have been non-detect for PCE
3. LRG-1457 is an irrigation well for the Lynn Middle School. It is not currently in service.

Gas Card Monitor Well and Private Well LRG-7375 have been abandoned and are not shown on figure.

Unit Qualifiers:
J - Estimated
L - Concentration below the reporting limit

Concentration Data Contoured by Hand.

NS - Not Sampled

The municipal supply well concentrations are used for informational purposes only. The PCE concentrations in these wells were not used to prepare the PCE isoconcentration contours shown on this figure.

Lower portion of Lower Zone corresponds to an approximate elevation 3450 to 3675 ft MSL.

* Indicates Private and CLC Municipal Supply Wells where PCE is detected.

Feet
0 750 1,500 3,000

LEGEND

- **Water Table Monitor Well** (screen depths of these wells range from 101 to 204 feet bgs.)
- **City of Las Cruces (CLC) Municipal Water Supply Wells** (screen depths of these wells range from 281 to 1,050 feet bgs.)
- **Private Water Supply Wells** (screen depths of these wells range from 150 to 290 feet bgs, depth of screen information is not available for LRG-1457)
- **Multi-Port Monitor Well** (screen depth of these wells range from 90 to 640 feet bgs)
- **Nested Monitor Well** (screen depths of these wells range from 190 to 590 ft bgs)
- GWMW07 Port 6 <0.50 — Monitor Well ID, Port Number & PCE Concentration
- ? — Indicates Uncertainty of Extent of GWP-Related PCE Detections
- Estimated Extent of GWP-Related PCE Detections

PCE Concentration Levels (Dashed Where Infered)
- 2.5 ug/L
- 5 ug/L

CH2MHILL

Figure 5-7
Horizontal Distribution of PCE in Lower Portion of the Lower Hydrologic Zone (December 2005)
Griggs & Walnut Ground Water Plume Site
Las Cruces, New Mexico

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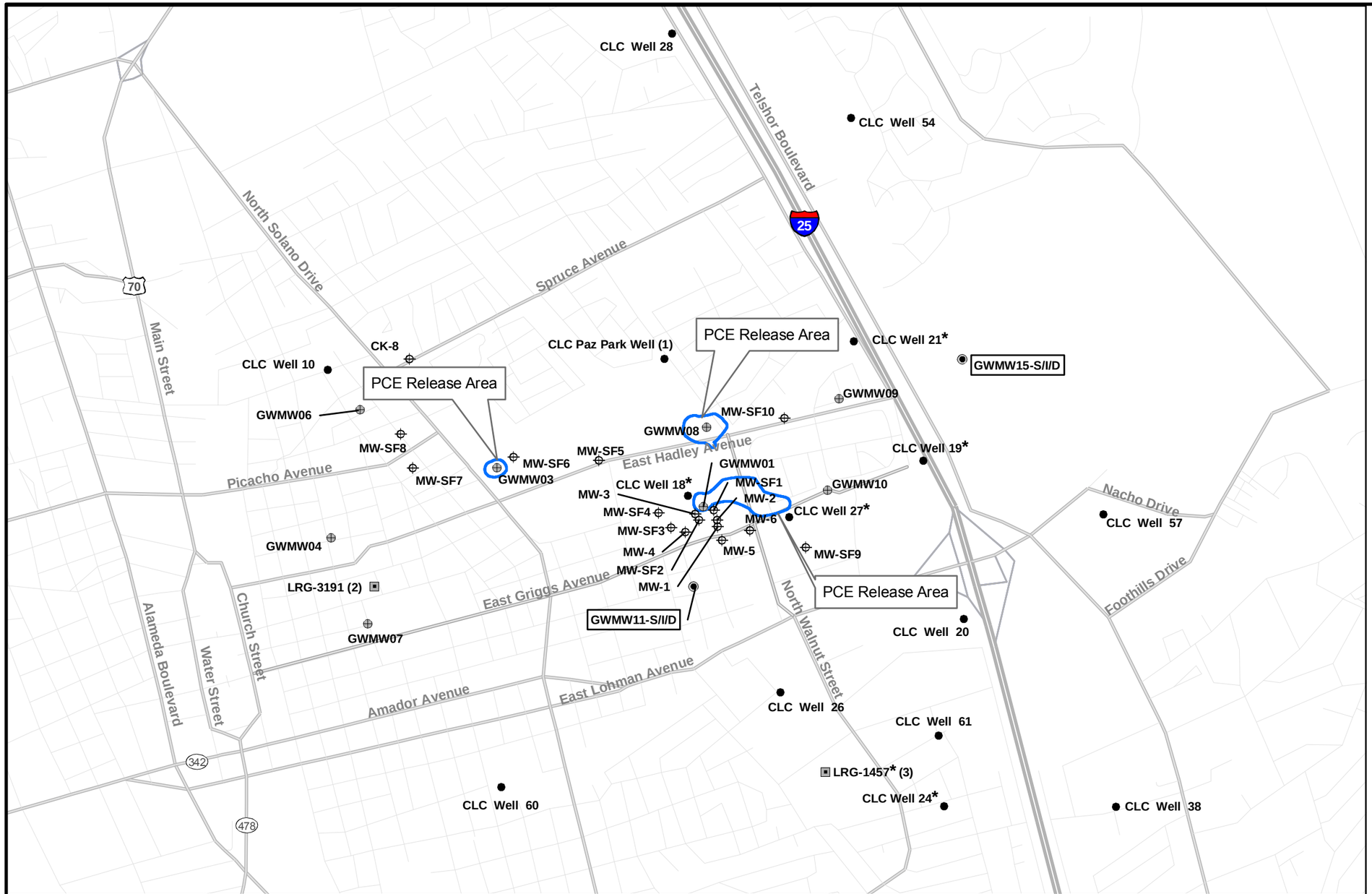

N

Notes:

1. The CLC Paz Park Well is used for irrigation. The other CLC wells illustrated on this map are designated for drinking water supply (not all are used).
2. Samples from LRG-3191 have demonstrated the presence of PCE, but samples collected since August 2002 have been non-detect for PCE
3. LRG-1457 is an irrigation well for the Lynn Middle School. It is not currently in service.

* Indicates Private and CLC Municipal Supply Wells where PCE is detected.

Feet
0 750 1,500 3,000

LEGEND

- **Water Table Monitor Well** (screen depths of these wells range from 101 to 204 feet bgs.)
- **City of Las Cruces (CLC) Municipal Water Supply Wells** (screen depths of these wells range from 281 to 1,050 feet bgs.)
- **Private Water Supply Wells** (screen depths of these wells range from 150 to 290 feet bgs, depth of screen information is not available for LRG-1457)
- **Multi-Port Monitor Well** (screen depth of these wells range from 90 to 640 feet bgs)
- **Nested Monitor Well** (screen depths of these wells range from 190 to 590 ft bgs)
- PCE Release Area

CH2MHILL

Figure 5-8 PCE Release Areas and Well Locations

Griggs & Walnut Ground Water Plume Site

Las Cruces, New Mexico

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