THIRD FIVE-YEAR REVIEW REPORT FOR NORTH RAILROAD AVENUE PLUME SUPERFUND SITE ESPAÑOLA, RIO ARRIBA COUNTY, NEW MEXICO

AUGUST 2020

Prepared by

U.S. Environmental Protection Agency
Region 6
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THIRD FIVE-YEAR REVIEW REPORT
NORTH RAILROAD AVENUE PLUME SUPERFUND SITE
EPA ID#: NMD986670156
ESPAÑOLA, RIO ARRIBA COUNTY, NEW MEXICO

This memorandum documents the U.S. Environmental Protection Agency's (EPA's) performance, determinations, and approval of the North Railroad Avenue Plume Superfund Site (Site) third five-year review under Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S. Code Section 9621(c), as provided in the attached Third Five-Year Review Report.

Summary of the Third Five-Year Review Report

The Site consists of a groundwater plume contaminated with dissolved tetrachloroethene (also known as perchloroethylene or "PCE"). The dissolved PCE plume extends over an area of approximately 58 acres and depth of approximately 260 feet below ground surface. The source of contamination has been identified as the former Norge Town Laundry and Dry Cleaners facility, located at 113 North Railroad Avenue in Española, Rio Arriba County, New Mexico.

The groundwater contamination was first discovered after PCE was detected in two municipal water supply wells in 1989. The wells were taken off-line and have remained removed from the drinking water supply system. The New Mexico Environment Department (NMED) conducted several investigations between 1990 and 1998 to determine the source and extent of the contamination.

The EPA proposed the Site to the National Priorities List (NPL) of Superfund sites on July 30, 1998 and listing of the Site became final on January 19, 1999. The Record of Decision (ROD) was signed in September 2001 and defined the Site as a single operable unit to address the contamination. The following areas of contamination were targeted for cleanup: 1) the Source Area soil and ground water; 2) a "Hotspot" of shallow and deep aquifer groundwater contamination downgradient from the Source Area; and 3) dissolved-phase groundwater plumes in the Shallow Aquifer (Shallow Plume) and four other aquifer zones of intermediate and deep depths (collectively referred to as the "Deep Zone"). The EPA selected enhanced surfactant and/or co-solvent treatment of the Source Area contamination and enhanced *in-situ* bioremediation for the Hotspot, Shallow Plume, and Deep Zone. The ROD estimated that the cleanup would be completed within 30 years from the remedy implementation, starting in June 2009. The ROD also states that other remedial action alternatives (*e.g.,* pump and treat) that were evaluated during the feasibility study (FS), could take as long as 70 to 80 years, or longer, to reach the Remedial Action Objectives (RAOs) established by the EPA.

Construction of the remedy began in 2005. Initial operations and field pilot tests were performed on the remedial systems in 2007 and 2008. Based on the pilot test results, the EPA eliminated the operation of a surfactant enhanced aquifer remediation system at the Source Area and proposed the use of enhanced reductive dechlorination (ERD) as a bioremediation technology for

the Source Area. The EPA and NMED conducted a pre-final inspection on April 8, 2008, and determined that the groundwater remediation system was constructed in accordance with the remedial design plans and specifications. Deep Zone treatment injections were initiated on April 28, 2008, and the Source Area, Hotspot, and Shallow Plume treatment systems went online in May 2008. The remedial systems were determined to be operational and functional (O&F) on June 30, 2009. After this date, the continued operation of the remedial systems was conducted by the NMED as a ten-year, long-term response action (LTRA) until June 30, 2019. On June 30, 2019, the LTRA for groundwater was transferred to the NMED for operation and maintenance until the Site RAOs and Remediation Goals (cleanup levels) are achieved.

The remedial action for the Shallow Aquifer has functioned as designed and has been successful in reducing contaminant concentrations throughout the Shallow Plume. At the Source Area, dissolved phase PCE concentrations have been reduced by approximately 90 percent from the historic maximum (greater than 40,000 micrograms per liter), and downgradient PCE concentrations have been reduced to below the Federal Safe Drinking Water Act Maximum Contaminant Levels (MCLs). The ERD treatment has been less effective on the four Deep Zone groundwater plumes. Although treatment effects are greatest in proximity to the injection wells, an overall decreasing contaminant trend has been observed in the two deepest zones (D1 and D2), with PCE concentrations having decreased by approximately 40 to 50 percent since 2009.

Environmental Indicators

Human Exposure Status: Under Control

Contaminated Groundwater Status: Under Control

Site-Wide Ready for Anticipated Use: No

Actions Needed

The following actions must be taken for the remedy to be protective in the long term:

- Shallow Aquifer performance monitoring will need to be conducted to determine the effectiveness of the enhanced treatment strategy pilot testing of directional injections to improve the distribution of micro-emulsion carbon substrate amendments where residual PCE contamination persists at the Source Area. Based on the Shallow Aquifer performance monitoring results, additional Shallow Aquifer treatments may be needed to achieve the RAOs for the Source Area.

- Deep Zone performance monitoring will need to be conducted to determine the effectiveness of the enhanced treatment strategy pilot testing and injections of micro-emulsion carbon substrate amendments in D1 and D2 of the Deep Zone, where PCE contamination persists at concentrations above the cleanup levels established by the EPA. Based on the Deep Zone performance monitoring results, an expanded ERD treatment plan, including additional I1 and I2 zone substrate amendment injections and possibly the installation of additional D1 and D2 zone injection wells, may be needed to achieve the RAOs for the Deep Zone.

Determination

I have determined that the remedy for the North Railroad Avenue Plume Superfund Site is Short-term Protective. This five-year review report specifies the actions that need to be taken for the remedy to be protective in the long term.

WREN STENGER

Digitally signed by WREN STENGER
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Wren Stenger
Director, Superfund and Emergency Management Division
U.S. Environmental Protection Agency Region 6

Date

ISSUES/RECOMMENDATIONS

THIRD FIVE-YEAR REVIEW REPORT
NORTH RAILROAD AVENUE PLUME SUPERFUND SITE
EPA ID#: NMD986670156

Issues/Recommendations				
Issues and Recommendations Identified in the Five-Year Review:				
OU(s): 1	**Issue Category: Remedy Performance**			
	Issue: Residual Source Area contamination has been detected at concentrations above the cleanup levels in a small area (approximately 1,000 square feet), where PCE contamination persists in the Shallow Aquifer at 25 feet to 35 feet below ground surface, following targeted substrate injections that were completed at the Source Area and Hot Spot in April and September 2017.			
	Recommendation: Shallow Aquifer performance monitoring will need to be conducted to determine the effectiveness of the enhanced treatment strategy work plan implementation in March 2020, that included the pilot testing of directional injections to improve the distribution of micro-emulsion carbon substrate amendments where residual PCE contamination persists at the Source Area. Based on the Shallow Aquifer performance monitoring results, additional Shallow Aquifer treatments may be needed to achieve the Remedial Action Objectives for the Source Area.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party/ Support Agency**	**Milestone Date**
No	Yes	NMED	EPA	6/30/2021

OU(s): 1	**Issue Category: Remedy Performance**			
	Issue: Remedial progress in the Deep Zone aquifer has been slower than that in the Shallow Aquifer, and some monitoring wells show fluctuating or increasing concentrations of contaminants. Additional measures are needed to improve the effectiveness and efficiency of the remedy in meeting the Remedial Action Objectives for the Deep Zone.			
	Recommendation: Deep Zone remedy performance monitoring will need to be conducted to determine the effectiveness of the enhanced treatment strategy work plan initiated in March 2020, that included the pilot testing and injections of micro-emulsion carbon substrate amendments in the D1 and D2 zones, where PCE contamination persists at concentrations above the cleanup levels. Based on the Deep Zone performance monitoring results, an expanded enhanced reductive dichlorination (ERD) treatment plan that includes additional substrate amendment injections in the I1 and I2 zones, and possibly the installation of additional injection wells in the D1 and D2 zones, may be needed to achieve the Remedial Action Objectives for the Deep Zone.			

Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party/ Support Agency	Milestone Date
No	Yes	NMED	EPA	6/30/2022

OTHER FINDINGS

In addition, the following are recommendations that have been identified during the FYR that may improve public outreach efforts, but do not affect current and/or future protectiveness:

- A public meeting was held on December 11, 2019, to discuss the completion of the 2019 Deep Zone investigation activities and the planned implementation of an enhanced treatment strategy to address residual contamination at the Source Area, in addition to pilot testing of improved enhanced reductive dechlorination amendments for treatment of the Deep Zone. Public notices were published in the local paper and posted at the public library, and paper notices were mailed out to individuals on EPA's mailing list. An availability session was also held (immediately before the public meeting) to discuss remedial progress at the Site, where individuals were able to ask questions and express concerns. Additional public meetings will be scheduled in the future as needed to ensure the public is provided with status updates on Site activities.

- Increase the frequency of public updates and dissemination of information concerning the progress of the remedy at the Site. In addition, communication of the New Mexico Environment Department's continued commitment to complete the cleanup of the Deep Zone, may alleviate some concerns that cleanup will not be hindered by EPA's transfer of financial responsibility to the State of New Mexico for future operation and maintenance activities, following the 10-year, long-term response action for groundwater that ended on June 30, 2019.

- Re-sample private wells that were previously sampled during or prior to the RI/FS and that previously had detections below the cleanup levels. Also, arrange for notices to inform or remind property owners and well owners of the New Mexico Office of the State Engineer well drilling moratorium.

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LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cDCE	Cis-1,2-Dichloroethylene
CFR	Code of Federal Regulations
COC	Contaminant of Concern
cVOCs	Chlorinated Volatile Organic Compounds
EPA	United States Environmental Protection Agency
ERD	Enhanced Reductive Dechlorination
ETS	Enhanced Treatment Strategy
ESD	Explanation of Significant Difference
FYR	Five-Year Review
IC	Institutional Control
LTRA	Long-Term Response Action
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NMED	New Mexico Environment Department
NMOSE	New Mexico Office of the State Engineer
NMWQCC	New Mexico Water Quality Control Commission
NPL	National Priorities List
O&F	Operational and Functional
O&M	Operation and Maintenance
PCE	Tetrachloroethylene
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
ROD	Record of Decision
RPM	Remedial Project Manager
SCP	Santa Clara Pueblo
SOS	Superfund Oversight Section
TBC	To be considered
tDCE	Trans-1,2-Dichloroethylene
TCE	Trichloroethylene
VC	Vinyl Chloride
VI	Vapor Intrusion
VISL	Vapor Intrusion Screening Level
VOC	Volatile Organic Compound

I. INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports, such as this one. In addition, the FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) performs FYRs pursuant to Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (referred to as the "Superfund" law), and consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

The EPA conducted a FYR on the remedy implemented at the North Railroad Avenue Plume Superfund Site (hereinafter the "Site), located in Española, Rio Arriba County, New Mexico. The State of New Mexico's Environment Department (NMED) is the lead agency for operating and maintaining the remedy for the Site. The NMED is also the support agency representing the State of New Mexico for this FYR. The NMED has reviewed all supporting documentation and provided information to EPA during the FYR process.

This is the third FYR for the Site. It is being conducted as a matter of EPA policy,[1] until cleanup levels are achieved, allowing unlimited use and unrestricted exposure. Currently, hazardous substances, pollutants, or contaminants remain at the Site above concentrations that allow for such use and exposure. The triggering action for this policy review is the completion date of the previous FYR.

The Site FYR was led by Mr. Mark Purcell, EPA Region 6, Remedial Project Manager (RPM) and Mr. Angelo Ortelli, NMED Superfund Oversight Section (SOS). Participants included the Santa Clara Pueblo (SCP) Environmental Office Director, Mr. Dino Chavarria, and NMED's Remedial Action (RA) contractor, INTERA, Inc., as well as local residents and members of the community. The review began on August 5, 2019.

Site Background

The Site consists of a 260-foot deep groundwater contamination plume that historically covered approximately 58 acres and extended approximately 0.75 miles from the source. The

[1] The Superfund law and the NCP require that a FYR be performed whenever a cleanup results in contamination remaining on site above levels that allow for unlimited use and unrestricted exposure. This type of review is referred to as a "Statutory" review, as it is required by the statute. Unlimited use and unrestricted exposure means that the cleanup will place no restrictions on the potential use of the land or other natural resources, such as groundwater. In accordance with EPA guidance (OSWER 9355.7-03B-P), a FYR should generally be conducted as a matter of policy for those cleanups that will not leave contamination on site above such levels upon completion, but require five years or more to finish. This type of review is referred to as a "Policy" review. An example of this would be the long-term bioremediation of groundwater at the North Railroad Avenue Plume Superfund site.

source of contamination has been identified as the former Norge Town Laundry and Dry Cleaners facility (Norge Town facility), located at 113 North Railroad Avenue in the downtown area of Española. The Norge Town facility operated from 1970 until June 2007. The facility released tetrachloroethene (also known as perchloroethylene or "PCE") to groundwater, which created an extensive groundwater contaminant plume. Tetrachloroethene is a liquid chlorinated volatile organic compound (cVOC) commonly used as a solvent in the dry cleaning industry. The release is characterized as PCE and its degradation products:[2] trichloroethene (TCE), cis-1,2 dichloroethene (cDCE), trans-1,2 dichloroethene (tDCE) and vinyl chloride (VC). Of these contaminants, PCE and, to a lesser extent, TCE, are the primary contaminants of concern (COCs).

The groundwater contamination was first discovered after PCE and TCE were detected in two municipal water supply wells in 1989. The wells were taken off-line and have remained removed from the Española municipal drinking water supply system. The NMED conducted several investigations between 1990 and 1998 to determine the source and extent of the contamination. The following areas of contamination were identified by NMED:

- **Source Area** – The Source Area is a 2,000 square foot area immediately adjacent to the eastern edge of the former Norge Town facility where contaminant mass was present in the soil and shallow groundwater aquifer (Shallow Aquifer);
- **Hot Spot** – The Hot Spot area is present in a narrow corridor, downgradient of the Source Area, in the lower part of the Shallow Aquifer (20-25 feet below ground surface (bgs));
- **Shallow Plume** – The Shallow Plume is the downgradient dissolved-phase plume in the Shallow Aquifer (less than 30 feet bgs), migrating from the Hot Spot; and
- **Deep Zone** – There are four separate downgradient dissolved-phase plumes in the deeper aquifer, collectively called the Deep Zone. They range from depths of 45 feet to 265 feet bgs. The four aquifer zones are individually designated as:
    - Intermediate Zone I1
    - Intermediate Zone I2
    - Deep Zone D1
    - Deep Zone D2

The shallow groundwater contaminant plume historically extended approximately 0.75 miles (3,700 feet) south/southeast of the Norge Town facility. The contamination in the I1 and I2 zones occurs from depths of approximately 45 feet to 120 feet bgs. Contamination also occurs from approximately 155 feet to 200 feet bgs (D1 Zone) and 225 feet to 265 feet bgs (D2 Zone).

[2] PCE can degrade or breakdown in the subsurface by destructive processes such as reductive dechlorination, which can be caused by naturally-occurring microorganisms. In the reductive dichlorination process, the removal of a chloride atom occurs. This process continues to removal chloride atoms sequentially as PCE degradation (or daughter) products are produced.

In addition, a small residual source of pure PCE product, known as a dense non-aqueous phase liquid or DNAPL,[3] estimated at 27 gallons (360 pounds), was identified in the Shallow Aquifer adjacent to the Norge Town facility, where the release is thought to have occurred.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: North Railroad Avenue Plume		
EPA ID: NMD986670156		
Region: 6	**State:** NM	**City/County:** Española / Rio Arriba

SITE STATUS	
NPL Status: Final	
Multiple Operable Units? No	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA ***[If "Other Federal Agency", enter Agency name]*:**
Author name (Federal or State Project Manager): Mark Purcell (EPA-RPM)
Author affiliation: U.S. Environmental Protection Agency, Region 6
Review period: 7/14/2015 - 7/13/2020
Date of site inspection: 11/8/2019
Type of review: Policy
Review number: 3
Triggering action date: 7/14/2015
Due date *(five years after triggering action date)*: 7/14/2020

[3] A DNAPL such as PCE and other chlorinated solvents is heavier than water and does not readily dissolve in water. A DNAPL tends to sink below the water table (the level below which the ground is saturated with water) when spilled in significant quantities and typically only stops its downward movement when reaching an impermeable or less permeable layer of soil or sediment (such as a clay layer). Although a DNAPL does not readily dissolve in water, it can dissolve at concentrations above federal drinking water standards or state groundwater standards. Therefore, a DNAPL can act as a long-term secondary source of contamination to a dissolved groundwater plume.

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The principle threat wastes at the Site are residual DNAPL, located in the Source Area, and associated Shallow Aquifer and Deep Zone dissolved-phase groundwater plumes. During the remedial investigation, the dissolved-phase plumes were estimated to contain approximately 20 gallons (275 pounds) of PCE and its degradation products, based on the average groundwater concentrations recorded. Based on historical plume dimensions, an estimated 280 million gallons of groundwater were contaminated with these cVOCs. The groundwater contamination plume historically extended to within close proximity of the Rio Grande. Furthermore, the Deep Zone groundwater at the Site is a sole source drinking water aquifer and public water supply for the City of Española and Santa Clara Pueblo, which must be protected and kept from further contamination.

Response Actions

The NMED performed a Preliminary Assessment and Screening Site Inspection between 1990 and 1992, in an effort to characterize the migration and exposure pathways, and identify potential sources for the groundwater contamination. During the Screening Site Inspection, twelve private wells were sampled. Additional site investigations were performed between 1993 and 1996 to further determine the nature and extent of the groundwater contamination. This included the installation of 43 direct push[4] sampling locations and an investigation of the lint trap[5] and soils located adjacent to the Norge Town facility.

There have been no CERCLA removal actions performed at the Site. In 1997, the NMED performed a state-lead removal action to remove the water and sludge from the dry cleaner lint trap and then temporarily abandon the lint trap in-place by filling with sand. The lint trap was subsequently excavated and removed during Remedial Action (RA) construction.

The EPA proposed the Site to the National Priority List (NPL) of Superfund sites on July 30, 1998, and listing of the Site became final on January 19, 1999. Following the Site listing, a Remedial Investigation (RI) was completed in January 2001 and a Feasibility Study (FS) in June 2001.[6] The EPA signed a Record of Decision (ROD) in September 2001 that identified

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[4] Direct Push Technology or DPT uses a rig and hydraulic hammer to drive or push small-diameter rods and sampling tools into the ground without the use of drilling technology. DPT can provide a rapid and effective means to collect soil and groundwater samples for shallow applications (typically less than 25 to 30 feet bgs).

[5] A lint trap is a specialized holding tank set below grade (ground surface) to remove excessive amounts of lint and silt which could interfere with proper drainage of waste water. It is used in commercial establishments such a laundromats, dry-cleaners, and apartment complexes.

[6] Remedial Investigation (RI) is a process undertaken by EPA to determine the nature and extent of the problem presented by the release of hazardous substances at a Superfund site. The RI emphasizes data collection and site characterization, and is generally performed concurrently and in an interactive fashion with a Feasibility Study (FS). The RI includes sampling and monitoring, as necessary, and includes the gathering of sufficient information to determine the necessity for remedial action (cleanup) and to support the evaluation of remedial alternatives (cleanup options) in the FS. The FS is undertaken by EPA to develop and evaluate the cleanup options.

the selected remedy for the Site. The ROD defined the Site as one operable unit[7] to address the following areas: the Source Area soil and groundwater; the Hotspot downgradient of the Source Area within the Shallow Aquifer; and the downgradient dissolved-phase Shallow Plume and four Deep Zone groundwater plumes. The residual PCE, or DNAPL, in the Source Area and the downgradient dissolved-phase groundwater plumes were identified as the principal threat wastes at the Site. The remedy described in the ROD is intended to meet the statutory requirements of CERCLA[8] and address the entire operable unit.

The EPA selected enhanced surfactant and/or co-solvent treatment of the Source Area contamination and enhanced in-situ[9] bioremediation for the Hot Spot, Shallow Plume and Deep Zone. The EPA also selected a soil vapor extraction technology for remediating contaminated soil and groundwater monitoring. The remedy was selected as the best remedial alternative to satisfy nine evaluation criteria developed by EPA in the NCP to address CERCLA statutory requirements. The nine criteria are:

1. Overall protection of human health and the environment;
2. Compliance with applicable or relevant and appropriate requirements (ARARs);
3. Long-term effectiveness and permanence;
4. Reduction of toxicity, mobility, or volume of contamination;
5. Short-term effectiveness;
6. Implementability;
7. Cost;
8. Tribal and State Acceptance; and,
9. Community Acceptance.

These criteria were used during the evaluation of a range of remedial alternatives. The first two criteria are considered threshold criteria that must be met by each of the alternatives evaluated. The next five criteria (3-7) are considered balancing criteria that are evaluated in relation to the relative performance of each alternative, and as part of a comparative analysis between the alternatives to identify advantages and disadvantages of each alternative, relative to one another. The individual and comparative analyses are presented in the FS report. The last two criteria (8-9) are considered modifying criteria, which are used to assess any issues or

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[7] The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) defines an operable unit as a discrete action that comprises an incremental step towards comprehensively addressing site problems. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the site.

[8] The statutory requirements for a remedy or cleanup under CERCLA are that the remedy must: 1) be protective of human health and the environment; 2) attain applicable or relevant and appropriate requirements, or provide grounds for invoking a waiver; 3) be cost-effective; 4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) satisfy the preference for treatment that reduces toxicity, mobility, or volume as a principal element or provide an explanation in the ROD as to why it does not.

[9] *In-situ* is defined as in the original position or place.

concerns a tribe, state, or community may have with regards to the remedial alternative that EPA identifies as the preferred alternative, once the FS is complete. The EPA identifies its preferred alternative in a Proposed Plan that is released to the public. The final two criteria are first evaluated by EPA, following receipt of comments on the RI and FS reports and the Proposed Plan. They are addressed once a final decision is being made and the ROD is being prepared.

The selected remedy for the Site was documented in the 2001 ROD, after holding two formal public meetings and a 60-day public comment period on the Proposed Plan, and receiving letters of concurrence from the State of New Mexico and the Santa Clara Pueblo. The EPA prepared a Responsiveness Summary that addressed comments received at the public meetings and submitted to the EPA in writing during the public comment period. The Responsiveness Summary was appended to the ROD.

The ROD estimated that the cleanup would be completed within 30 years from remedy implementation. The ROD also stated that other remedial action alternatives (for example, a pump and treat system)[10] that were evaluated during the FS, could take as much as 70 to 80 years, or longer, to achieve the Remedial Action Objectives (RAOs) and Remediation Goals (cleanup levels) established by EPA in the ROD. The RAOs set forth in the ROD are for groundwater (the primary medium of concern), soil, and surface water. They are as follows:

Groundwater RAOs

- Prevent human ingestion, inhalation, or dermal contact of groundwater that contains Site related COCs at concentrations which exceed the corresponding Maximum Contaminant Level Goals (MCLGs) established under the Safe Drinking Water Act (SDWA).
- Prevent human ingestion or inhalation of groundwater containing SDWA Maximum Contaminant Levels (MCLs) of these COCs when the corresponding MCLGs are zero.
- Restore the groundwater at the Site such that it contains concentrations of the COCs less than the MCLs or MCLGs, as applicable.
- Prevent the residual-phase PCE, DNAPL, the principal threat waste at the Site, from causing concentrations of COCs in groundwater to exceed the MCLs or MCLGs.
- Prevent the transport of COCs from groundwater to surface water in concentrations that may result in exceedances of ARARs in the receiving surface water body.

[10] Pump and Treat technology is a common method or technology for cleaning up groundwater contaminated with dissolved chemicals such as chlorinated solvents. It consists of pumping groundwater at wells to an above-ground treatment system to remove the contaminants and then discharging the treated water to where it can be beneficially used for water supply, discharging it to a nearby stream, or injecting it back into the same aquifer. Pump and treat systems are also used to contain the contaminant plume (keep it from spreading in the aquifer) by pulling contaminated water in the aquifer toward the pumping wells. Pump and treat operations may last from a few years to several decades,

Soil RAO

- Prevent groundwater from being impacted above MCLs through transport from the unsaturated zone soils at levels greater than 0.019 milligrams per kilogram PCE.

Surface Water RAO

- Prevent the degradation of surface water by ensuring that the concentrations of groundwater COCs and Contaminants of Potential Concern are in compliance with applicable surface water standards.

There were no RAOs or cleanup levels for air established in the ROD because the Baseline Human Health Risk Assessment determined the potential risk from indoor air vapor intrusion was within an acceptable risk range to protect human health. To further support this determination, the ROD recommended that additional evaluation and monitoring be performed as part of the Site monitoring program.

The cleanup levels established by EPA for the COCs in groundwater and surface water are summarized in the table below. The groundwater cleanup levels are based on the more stringent of either the Federal SDWA MCLs or the New Mexico Water Quality Control Commission (NMWQCC) regulation standards for vinyl chloride (VC), 1,1-dichloroethene (1,1 DCE), iron and manganese.

Contaminants	Ground water (µg/L)	Surface water (µg/L)
PCE	5.0	5.0
TCE	5.0	5.0
cis- 1,2 DCE	70*	70
trans- 1,2 DCE	100*	100
VC	2.0*	2.0
1,1 DCE	7.0*	7.0
Arsenic	10*	NS
Manganese	200*[a]	50
Iron	1000*[a]	NS

Notes:
* Constituents not listed as Contaminants of Concern in the Record of Decision
[a] Cleanup levels based on NMQWCC standard
Surface water cleanup levels are based on the Water Quality Code for the Pueblo of Santa Clara.
NS - No standard has been established

The groundwater remedy selected by EPA in the 2001 ROD consisted of the following five components:

1. *In-situ* treatment of saturated soils in the Source Area using surfactant or co-solvent treatment to remove residual DNAPL;

2. Enhanced *in-situ* bioremediation[11] of hot spots to destroy chlorinated solvent compounds;
3. Enhanced *in-situ* bioremediation of the dissolved-phase plume;
4. Soil vapor extraction to treat unsaturated soils in the Source Area; and,
5. Monitoring of groundwater quality to assess performance of the remedial action.

The Remedial Design (RD) was completed in December 2003. The design work consisted of additional site characterization and the development of detailed plans and specifications for the remedial systems selected in the ROD. Due to uncertainties in the hydrogeology and exact direction of groundwater flow in the Deep Zone, bioremediation of the Deep Zone was designed to be conducted in a phased approach, where initial performance data would be used to evaluate and adjust the design parameters during performance of the remedy. The initial design relied on direct injection of the amendments in wells, followed by dispersive mixing of the amendments with contaminated groundwater due to natural groundwater flow. Groundwater elevation maps depicting groundwater flow direction are provided for the individual aquifer zones (I1, I2, D1, and D2) of the Deep Zone, as well as the Shallow Aquifer, in Appendix B – Additional Information (*see* Figures B6 through B10).

Construction of the remedy began in 2005. Initial operations and field pilot tests were performed on the remedial systems in 2007 and 2008. The results of the pilot tests demonstrated that an emulsified vegetable oil (EVO), used as an organic substrate[12] amendment injected into the aquifer, best stimulated the naturally occurring microorganisms that degrade comtaminants. The results also demonstrated that bioremediation was occurring in the areas targeted for remediation, including the Deep Zone. The EPA and NMED conducted a pre-final inspection on April 8, 2008, and determined that the groundwater remediation systems were constructed in accordance with the RD plans and specifications. Deep Zone treatment injections using the EVO substrate amendment were initiated on April 28, 2008. The Source Area, Hotspot, and Shallow Plume treatment systems went on line with initial EVO injections in May 2008.

In a 2008 Explanation of Significant Difference, the EPA eliminated the operation of a surfactant enhanced aquifer remediation (SEAR) system in the Source Area and proposed the use of enhanced reductive dechlorination (ERD)[13] as a bioremediation technology for the

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[11] *In-situ* bioremediation of groundwater involves the stimulation of naturally-occurring microorganism or bacteria populations (tiny bugs) to break down contaminants through the addition of various amendments to the subsurface environment. In addition, select strains of bacteria may be added to the subsurface to help treat some sites (bioaugmentation). Amendments are typically injected into the aquifer at injection wells.

[12] A substrate is a substance on or from which an organism lives, grows, or obtains its nourishment.

[13] Enhanced reductive dechlorination is a type of enhanced in-situ bioremediation used to promote anaerobic biological dechlorination of chlorinated solvents in the subsurface. An anaerobic organism is an organism living or growing in the absence of air or free oxygen. Organic carbon is a major building block for the growth of microorganisms and the stimulation of bioremediation. Commercial substrate amendments that provide organic carbon and promote ERD include alcohols, sugars, fatty acids, and/or vegetable oils.

Source Area, based on the results of the pilot tests. The EPA also eliminated the soil vapor extraction component of the remedy for treating soil. Soil contamination would be addressed via in-situ ERD. The completion of the remedy construction was documented in a Preliminary Closeout Report, dated June 30, 2008.

The Source Area and Hotspot remedial systems consist of a network of injection and extraction wells, piping, and a treatment building that houses the injection/extraction well manifold systems, amendment mixing tanks, associated instrumentation, and electronic and supervisory control and data acquisition (SCADA) systems. The EVO substrate and nutrients are mixed with potable water or recirculated treated water at the treatment building and injected into the Shallow Aquifer. A detailed description of the Source Area and Hotspot remedial systems is provided in Appendix B. Figure 2 of Appendix B depicts the Source Area and Hotspot wells and system layout.

The Shallow Plume remedial system consists of a row of alternating and closely spaced injection and extraction wells constructed along the north side of U.S. Highway 84/285 (aka Santa Clara Bridge Road), over a length of approximately 700 feet. This line of wells is located south of, and downgradient to, the Source Area and Hotspot remedial systems, in an orientation perpendicular to the groundwater flow direction, which is to the south-southeast. The injection of the EVO substrate into the Shallow Aquifer in this manner is designed to create a biologically active zone (referred to as a "Biocurtain") that treats the contaminant plume as it passes through the Biocurtain, by moving with the natural flow of groundwater. The wells are connected by piping to a treatment building that is located at the eastern end of the line of Biocurtain wells. The Biocurtain treatment building performs a similar function as the Source Area/Hotspot treatment building. A detailed description of the Shallow Plume Biocurtain remedial system is provided in Appendix B. Figure 3 of Appendix B depicts the Biocurtain wells and system layout.

The Deep Zone treatment system consists of a number of injection wells screened[14] into the four separate aquifer zones (I1, I2, D1, and D2). The Deep Zone injection system is designed as a mobile system consisting of a 3,000-gallon tanker truck and a pump that proportionately mixes the EVO substrate in water. The truck is moved between individual wells for injection of the substrate and water mixture. A detailed description of the Deep Zone remedial system is provided in Appendix B. Figure 4 of Appendix B depicts the Deep Zone well layout.

The remedial systems were determined to be operational and functional on June 30, 2009, one year after construction completion. After this date, the continued operation of the remedial systems was conducted by NMED as a ten-year, federally-financed long-term response action (LTRA), until June 30, 2019. In accordance with CERCLA and the NCP at 40 CFR § 300.435(f)(3), the LTRA transitioned to an operation and maintenance (O&M) phase of the cleanup after June 30, 2009, with the NMED performing and financing O&M. In the first annual report on remedial progress, dated December 2009, the NMED reported that complete dechlorination was occurring in the Deep Zone, but not as quickly as seen in Shallow Aquifer

[14] A well screen is a section of the well casing with open slots that serves as the intake portion of the well. The screen permits water to enter into the well from the aquifer. Water and substrate amendments injected into the wellbore can also enter into the aquifer from the well through the screen.

treatment areas. The NMED also reported that additional characterization may be warranted to make long-term decisions on the Deep Zone bioremediation design. An Interim Remedial Action Report was completed by the NMED in December 2009.

Status of Implementation

The remedial systems for the Shallow Aquifer have functioned as designed and have been successful in reducing cVOC concentrations throughout the Shallow Plume. At the Source Area, residual DNAPL mass and dissolved-phase groundwater concentrations have been reduced by approximately 90 percent from the historic high for PCE of greater than 40,000 micrograms per liter (µg/L).

The ERD treatment has been less effective on the Deep Zone (I1, I2, D1 and D2) groundwater plumes. Although treatment effects are greatest in proximity to the injection wells, an overall decreasing contaminant trend is observed within the D1 and D2 zones, with PCE concentrations having decreased by approximately 50 percent, since 2009.

In March 2015, the EPA Office of Superfund Remediation and Technology Innovation (OSRTI) completed a system evaluation and optimization study for the Site's remedy. The optimization study's focus was primarily on the Deep Zone, with additional emphasis on the Source Area relating to planned redevelopment. The OSRTI recommendations of the optimization study included additional characterization and confirmation sampling of the deeper portion of the Shallow Aquifer in the Source Area and Hotspot treatment areas, with additional targeted ERD injections as needed.

In August 2015, the NMED's contractor, CDM Smith, completed confirmation borings and sampling in the Source Area and Hotspot treatment areas. A total of 12 borings were installed, with the primary focus on the deeper fine-grained clayey sand layer at the base of the Shallow Aquifer. The drilling confirmed that isolated areas of groundwater contamination are present immediately downgradient of Source Area wells SMW-1D, SMW-3D and SMW-6D. Additional targeted substrate amendment injections were recommended for these areas.

The OSRTI recommendations for the Deep Zone included additional characterization and well installation in all four aquifer zones (I1, I2, D1 and D2). Based on the results of the characterization work, either expansion of ERD, or alternatively, a pump and treat technology would be considered.

Institutional Control Summary Table

Table 1: Summary of Planned and/or Implemented Institutional Controls

Media, engineered controls, and areas that do not support UU/UE[1] based on current conditions	IC[2] Needed	IC Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	All properties within the groundwater plume boundaries	Restricts the appropriation and transfer of water rights for permitting new groundwater wells and groundwater use within an approximate 58 acre area that encompasses the plume boundaries	New Mexico Office of State Engineer Order July 2001

[1] UU/UE = Unrestricted Use/Unlimited Exposure

[2] IC = Institutional Control

Systems Operations/Operation & Maintenance

In April 2017, NMED's contractor, INTERA Inc., conducted targeted substrate injections at the Source Area and Hotspot, identified in August 2015. The scope of work included substrate injection using 15 injection points at three primary areas (two Source Area areas, one Hotspot area), and three at other minor isolated areas, as well as in three new monitoring wells. However, the injection activities were suspended after the initial injection of the substrate at seven injection points, due to difficulties encountered with installation of the injection points and inability to inject the substrate volumes. INTERA and the drilling/injection subcontractor demobilized from the Site to re-evaluate the injection method.

In September 2017, INTERA mobilized back to the Site to complete the scope of work for targeted substrate injections at the Source Area and Hotspot. Six additional temporary injection points, one existing injection well, and two new permanent injection wells were used to complete this work. A total of 950 gallons of EVO substrate and 10,900 gallons of water were injected during the April and September field events.

INTERA and its subcontractors, Cascade Drilling, Inc. and Flexible Liner Underground Technologies (FLUTe), completed the additional Deep Zone investigation activities in January 2019. Field investigation activities included drilling and logging of boreholes completed in the Deep Zone (I1, I2, D1 and D2), FROG-5000 (portable GC) field screening of soil and

groundwater samples, multi-port and nested monitoring well installations,[15] and investigation-derived waste management.

INTERA also completed a detailed study to evaluate the efficacy of monitored natural attenuation (MNA)[16] in the Deep Zone, in addition to an evaluation of the remedial progress of targeted substrate injections to address residual Shallow Aquifer contamination in the Source Area and Hotspot.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last FYR, as well as the recommendations from the last five-year review and the current status of those recommendations.

Table 2: **Protectiveness Determinations/Statements from the 2015 Five-Year Review**

Sitewide Protectiveness Statement	
Protectiveness Determination: Protectiveness Deferred	*Addendum Due Date (if applicable):* Click here to enter a date.
Protectiveness Statement: A protectiveness determination of the remedy at the North Railroad Avenue Plume Superfund site cannot be made at this time until further information is obtained. Further information will be obtained by performing sampling to assess the potential indoor air vapor intrusion pathway for residential land use. It is expected that these actions will take approximately 12-15 months to complete, at which time a protectiveness statement will be made. For the ground water exposure pathway, there is currently no known human exposure. An institutional control is in place that restricts permitting of new ground water wells over the area of the contaminant plume while remediation is ongoing. The institutional control limits exposure to contaminated groundwater. Follow-up actions are needed to achieve long-term protectiveness because the current remedy for the Deep Zone aquifer is not expected to meet the Remedial Action Objectives and cleanup levels for the Site based on the findings of a remedy optimization review conducted in 2014 and 2015 by EPA. Further characterization of the Deep Zone aquifer and an evaluation of the merits of continuing with the existing remedy or changing the remedy for long-term protectiveness should be completed in 2018.	

[15] Nested monitoring wells are a cluster of two or more monitoring wells constructed near each other but at different depths for allowing the collection of groundwater samples from different zones of the aquifer in separate wellbores.

[16] Monitored natural attenuation is the reliance on natural processes to attenuation or breakdown contaminants in soil or groundwater to achieve site-specific remedial objectives and goals within a reasonable timeframe, as compared to that offered by other more active remediation methods.

Table 3: **Status of Recommendations from the 2015 Five-Year Review**

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1	Indoor air vapor intrusion	Additional evaluation of the indoor air vapor intrusion pathway should be performed in residential structures over the central portion of the Shallow Plume near R-12(S1) where the highest TCE concentrations are found.	Completed	EPA completed a multi-phased remedial investigation that was focused on the potential vapor intrusion pathway at the Site. In Phase I of the investigation, EPA conducted an exterior soil gas survey in November 2017, near the residential structures over the central portion of the shallow groundwater plume proximal to monitoring well R-12(S1). PCE and TCE were the only contaminants detected in soil gas over the area of the Shallow Plume at concentrations that did not warrant indoor air sampling. However, PCE and TCE were detected in soil gas at an area off the Shallow Plume at concentrations that did warrant indoor air sampling. The EPA and NMED determined that the source of these higher PCE and TCE soil vapors were associated with a new groundwater contaminant plume originating from a new source, apart and separate from the Site. EPA conducted indoor air sampling of residential and commercial structures located in the area of higher PCE and TCE soil vapors as the second phase (Phase 2) of the vapor intrusion remedial investigation. The results of the indoor air sampling showed no exceedances of EPA's health-based Regional Screening Levels for PCE and TCE. Therefore, no further response action was warranted to mitigate indoor air vapors. The	9/30/2019

				results of both the Phase 1 and Phase 2 components of the remedial investigation are presented in the EPA's Focused Remedial Investigation Report, dated August 2020.	
1	Contamination may still be present in the low permeability zone at the base of the Shallow Aquifer that is not being detected in the current sampling program at the Source Area and Hotspot.	Additional characterization and borings will need to be installed to collect soil and groundwater samples targeting the interval between 20-25 feet bgs at the Source Area and Hotspot. If contamination exists, additional targeted substrate injections will be needed.	Completed	In August 2015, NMED's contractor, CDM Smith, completed confirmation borings and sampling in the Source Area and Hotspot. Twelve borings were installed with the primary focus on the deeper, fine-grained clayey sand layer at the base of the Shallow Aquifer. The drilling confirmed that isolated areas of groundwater contamination are present at the Source Area and Hotspot. In April and September 2017, NMED's contractor, INTERA Inc., conducted targeted substrate injections in these areas.	9/11/2019
1	Changes in the groundwater geochemistry (anaerobic reducing conditions) are created as a byproduct of the ERD treatment. These conditions have caused dissolution and mobilization of three metals (arsenic, manganese, and iron) at concentrations exceeding federal drinking water standards (MCLs) and/or NMWQCC groundwater	Continue with the current groundwater monitoring program to determine if water quality exceedances continue once ERD treatment is terminated. No follow up actions are recommended at this time. However, aquifer reconditioning may be required in the future if natural conditions do not return metals to background conditions.	Ongoing	ERD amendment injections in the Shallow Aquifer have caused increases in metals concentrations in some shallow monitoring wells, which are gradually decreasing. Arsenic concentrations in one shallow monitoring well, and iron and manganese concentrations in eight shallow monitoring wells are still above the cleanup levels. Most of these shallow wells are proximal to the Source Area and Hotspot where ERD injections were last conducted in 2017. In the Deep Zone wells that have been sampled, arsenic, manganese, and iron concentrations have all remained below the cleanup levels following ERD amendment injections.	Click here to enter a date

	standards as ARARs.				
1	Increase in PCE and TCE concentrations in well BC-6 near the eastern extent of the Biocurtain	Evaluate the recent increases in PCE and TCE concentrations through additional monitoring and/or subsurface characterization in order to determine cause or source for the COCs increase.	Completed	NMED conducted direct-push/grab groundwater sampling in 2015 that indicated the presence of elevated PCE and TCE concentrations near monitoring well BC-6. In 2017 and 2018, EPA completed a vapor intrusion assessment (soil gas survey and indoor air sampling) in the vicinity of the eastern margin of the Biocurtain and along Calle Chavez. In January 2019, NMED installed and sampled three new shallow monitoring wells to determine the contaminant source. NMED concluded that contamination identified beyond the eastern margin of the Biocurtain is attributed to a new groundwater contaminant plume that is apart and separate from the Site shallow groundwater plume, and originates from a new source. NMED has referred this matter to its state regulatory programs for further investigation and cleanup enforcement.	11/20/2019
1	Deep Zone aquifer is not adequately characterized.	Additional characterization of the Deep Zone aquifer is needed to better understand the hydraulic properties and contaminant distribution within all four zones.	Completed	NMED completed additional Deep Zone investigation activities in January 2019. Field investigation activities included drilling and logging of boreholes completed in each of the four intervals of the Deep Zone (I1, I2, D1, and D2), multi-port and nested monitoring well installations, and investigation-derived waste management.	8/22/2019

1	Remediation of the Deep Zone aquifer is not progressing as expected.	Following additional characterization, an evaluation of the Deep Zone remedy is required. Either a vastly expanded ERD treatment is required or a different technology such as pump and treat should be considered.	Ongoing	NMED has developed a plan to implement an enhanced treatment strategy that will address residual contamination at the Source Area, in addition to pilot testing of improved ERD amendments for treatment of the Deep Zone. In March 2020, NMED initiated pilot testing of directional injections to improve the distribution of EVO substrate amendments through the areas of contamination at the Source Area, and injections of micro-emulsion carbon substrate amendments in the Deep Zone. The pilot testing is ongoing.	3/31/2020
1	Maintenance	Perform the following maintenance: (1) replace two pad lock access covers that are missing from two treatment well vaults, (2) replace the cracked manhole cover on monitoring well R-09 (D3), (3) properly dispose of purge water within two 250-gallon totes stored at the Source Area treatment building compound, and (4) perform general maintenance at both treatment building compounds, including cutting down the overgrowth of weeds within the compounds.	Ongoing	Replacement of the well pad locks and the manhole cover on monitoring well R-09 (D3) has been completed, and stored purgewater was processed onsite through granular-activated carbon treatment. General maintenance, including cutting down the overgrowth of weeds within the treatment building areas, has been performed by NMED at the Source Area, and by the Santa Clara Pueblo Environmental Office staff at the Biocurtain treatment building area. General maintenance will continue to be performed by NMED in the future.	Click here to enter a date

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement and Site Interviews

A public notice was published in the Rio Grande Sun newspaper on September 19, 2019, stating that the third FYR of the Site remedy was being conducted and inviting the public to submit any comments to the EPA. The results of the review will be documented in the FYR report, to be made available at the Site information repository, located at the Española Public Library, 313 N. Paseo de Oñate, in Española, New Mexico.

During the FYR process, interviews were conducted to document any perceived problems or successes with the remedy that has been implemented to date**.** The results of these interviews are summarized below:

- The presence of a Superfund site in the city proper has raised both social and economic development concerns. Both actual and perceived risk makes it difficult to both promote development of the area and attract potential developers and investors. Owners of property located within the Site have experienced challenges in selling or leasing their property.
- Several community members voiced concerns about the remediation effort, which they consider to be inadequate in addressing the four Deep Zone plumes, and that other methods of treatment (i.e. pump and treat) were not used. Furthermore, the community has not embraced the fact that the Shallow Aquifer across the Site has met the cleanup goals set forth in the ROD, with the exception of some residual contamination that persists in the Source Area and Hotspot, and that the groundwater contamination plume recently discovered beyond the eastern margin of the Site is from a new source, apart and separate from the Site plume.
- Several community members also have expressed concern about the RA transition to Operation and Maintenance, after a 10-year groundwater long-term response action (LTRA) period, implying that EPA has handed off cleanup responsibility to the State of New Mexico, before the remediation was fully completed, and that remaining remediation costs for the Site may prove burdensome for the State, resulting in the site remediation being scaled down or halted before the Site is fully cleaned up.
- A lack of public awareness about the site status and remediation efforts has been attributed to minimal outreach efforts by the agencies during this FYR period.

Data Review

A review and interpretation of all analytical results was performed during the FYR for 1) the NMED's performance monitoring of the ERD treatment systems and the annual Site wide groundwater monitoring program for the Shallow Aquifer and Deep Zone, 2) the NMED's monitoring of private water wells, 3) the EPA's indoor air vapor intrusion remedial

investigation, and 4) NMED's indoor air monitoring program for the Norge Town facility, the El Centro Health Clinic (ECHC) annex, and the Las Cumbres Community Services (LCCS) facility. A detailed description of the data review for this FYR is provided in Appendix C – Data Review.

Shallow Aquifer

The Shallow Aquifer monitoring program conducted during this FYR period included up to 12 wells within the Source Area, 5 wells within the Hotspot treatment area, 10 wells within the Biocurtain treatment area, and 22 additional wells distributed across the Shallow Plume. Shallow Aquifer wells (S1 and S2 zones) were sampled in June 2015, June 2016, June 2017, May 2018, and May 2019. Additional sampling of a limited number of wells occurred in January and September 2019. Based on comparison of historical data (Figure B-5, Appendix B) and the 2019 results (Figure C-11, Appendix C), the contaminant plume across all of these treatment areas is not expanding. Overall, the areal extent of the contaminant plume has been reduced, particularly in the northern third of the plume, where concentrations have decreased significantly since the ERD treatments began in April 2008. The Shallow Aquifer contaminants are undergoing active biodegradation through ERD, within and downgradient of both the Source Area/Hotspot and Biocurtain treatment systems. With the exception of a limited number of monitoring wells located in the Source Area and one monitoring well located at the Biocurtain, all cVOC concentrations in samples collected from Shallow Aquifer monitoring wells during the most recent sampling event (May 2019) were below Site cleanup levels.

A rebound (increase) in contaminant concentrations was observed in a limited number of monitoring wells at the Source Area, beginning in 2016. This rebound is believed to be due to "back diffusion"[17] of adsorbed and dissolved-phase PCE in the Shallow Aquifer at the Source Area from approximately 20 feet to 28 feet bgs (Figure C-12, Appendix C). Although there has been an increase in cVOC concentrations and mass[18] during this reporting period, the continued presence of ethene indicates that complete dechlorination is sustained within the Source Area treatment zone (Graph C-1, Appendix C). However, although ERD is sustained, rebound in concentrations in some Source Area wells indicates that additional substrate amendments are needed to increase the ERD effectiveness within the Source Area.

The analytical results from one Biocurtain monitoring well (BC-6) have shown an increase in PCE and TCE, since the 2012 sampling event. This well is situated at the eastern extent of the Biocurtain where cVOCs had not been detected prior to the September 2012 sampling event, when TCE was detected at 6.6 µg/L. Additional investigation around BC-6 was performed in August 2015 by NMED's contractor, CDM Smith Inc. During this investigation, five boreholes were drilled to the north and east of BC-6. A total of 11 groundwater grab samples

[17] Back diffusion is a process where groundwater contaminants become temporarily trapped in low-permeability, finer grained sediments (such as clays or silts), where the contaminant adsorbs (adheres or sticks) to the sediment particle from the water, but then reemerges into the groundwater later as it detaches from the particle.

[18] Mass is the measure of the amount of matter in a substance or object. Mass is usually measured in grams (g) or kilograms (kg). Estimating the change in contaminant mass in groundwater over time helps to determine whether the contaminant plume is stable, expanding, or contracting, thereby providing a better understanding of the overall progress of the remediation system.

were collected from depths between 12 feet and 27 feet bgs, and at least one sample from each boring exceeded the Site cleanup levels for both PCE and TCE. Three additional monitoring wells, PASMW-01, PASMW-02 and PASMW-03, were installed to the northeast of BC-6 in December 2018 and were sampled in January 2019. Tetrachloroethene, TCE and cDCE were detected at concentrations of up to 160 µg/L, 380 µg/L and 130 µg/L, respectively, in PASMW-01. Based on these results and the location of PASMW-01, the increase in cVOC concentrations observed in BC-6 since 2012 appears to be the result of a release from a separate off-site source. See Figure C-11, Appendix C.

Deep Zone – I1 and I2

There were 18 pre-existing groundwater monitoring wells in the Intermediate I1 Zone and Intermediate I2 Zone at the start of the third FYR period in 2015. Of these 18 wells, up to 16 were sampled during this FYR period. In addition, eight new monitoring wells (R-08A (I1), R-29A (I1), R-31 (I1), R-31 (I2), R-32 (I1), R-32 (I2), R-29 (I1 & I2) and R-30 (I1 & I2)) were installed between November 2018 and January 2019. These new wells were sampled during the January and May 2019 sampling events.

In general, both PCE and TCE concentrations in samples collected from wells completed within the contaminant plume boundaries of the I1 and I2 aquifer zones have historically shown an increasing trend through June 2016, followed by a decreasing trend through May 2019. The exception to this observation is the downgradient monitoring well R-08 (I2), which has consistently shown an increasing trend through 2019. Contaminants of concern have not been observed in the I1 and I2 zones beneath or immediately downgradient of the Source Area, as indicated by the historical results from samples collected from monitoring wells EWMW-4A and R-23 (I1). However, contaminants have reached the I1 and I2 zones approximately 500 feet south/southwest of the Source Area near the newly-installed well R-29A (I1) and are highest approximately 1,000 feet south/southwest of the Source Area at the R-09 well cluster, located at the northwest corner of Calle Chavez and the Los Alamos Highway.

Monitoring wells R-31 (I1), R-31 (I2), R-32 (I1) and R-32 (I2) define the western and southwestern limits of the I1 and I2 zones contaminant plumes. All cVOC sampling results from these wells in May 2019 were non-detect[19], except for PCE in R-31 (I2). The PCE concentration measured in the R-31 (I2) sample was 3.6 µg/L, which is below the Remediation Goal for PCE of 5.0 µg/L.

Deep Zone – D1 and D2

Of the 25 groundwater monitoring wells installed in the D1 and D2 zones at the Site, a maximum of 19 wells were sampled during this FYR period. Sampling results continue to indicate that the highest COC concentrations occur approximately 750 feet south/southwest of the Source Area around the DM well clusters, located in the Plaza de Española, and at the R-09

[19] Non-detect means that the laboratory did not detect a chemical in the sample above the analytical method detection limit. It does not mean that the chemical is not there, only that the concentration of the chemical is below that of the instrument's sensitivity. The EPA defines the method detection limit (MDL) as the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the chemical concentration is greater than zero.

well cluster. The lateral extent of contamination within the D1 and D2 zones is not well defined to the south.

The concentrations of all cVOCs, except VC, are below the Site cleanup levels in the injection wells, as of the most recent sampling in 2017. Vinyl chloride concentrations ranged from 1.6 µg/L to 12 µg/L. However, the cVOC mass remains relatively unchanged in the D1 and D2 zones' monitoring wells, which are located within approximately 40 feet of the injection wells. Tetrachloroethene in the monitoring wells represents approximately 80 percent of the contaminant mass (Graph C-11, Appendix C).

Analytical results from samples collected from the D1 and D2 zones wells show an overall decreasing trend in PCE concentrations, since 2007. The average PCE concentration detected in samples from ten wells in 2007 was 217 µg/L. The average PCE concentration measured in samples from the same ten wells in May-September 2019 was 103 µg/L. This represents an approximate 52 percent decrease in the PCE concentrations, since 2007. The average from the same ten wells decreased from 135 µg/L in 2014 to 103 µg/L, in 2019. This represents an approximate 24 percent decrease in PCE concentrations, compared to the end of the last FYR period.

Private Water Wells

The Cook Estate private well, located south of the Plaza de Española, is the only private well that was regularly sampled during this FYR period. The location of the well is depicted on Figure C-22, Appendix C. The well is used for irrigation purposes only. Historical results from the Cook Estate well showed PCE and TCE concentrations ranging from 15 µg/L to 74 µg/L, through the March 2009 sampling event. The concentrations of COCs measured in samples collected from this well have been below the Site cleanup levels, since the November 2009 sampling event. Tetrachloroethene was detected in the Cook Estate well in May 2018, at a concentration of 1.1 µg/L, which is below the cleanup level of 5.0 µg/L for PCE. All COCs were non-detect in the May 2019 sample. In addition, a concerned citizen requested the sampling of a domestic well, identified as 820a HWY 30, located west of the Santa Clara ditch, in the general area of the R-07(S2) monitoring well. The private well serves five residences and was reportedly installed in 2007-2008. Results from a sample collected from the well during the June 2016 sampling event were non-detect for all COCs. No additional samples have been collected from the 820a HWY 30 well, since 2016.

The NMED conducted a search of the New Mexico Office of the State Engineer (NMOSE) well database in February 2020 and compared current private and public supply wells records to those identified in the 2001 RI/FS. Figure C-22 depicts approximately 50 private wells identified within 1,000 feet of the former Bond and Jemez municipal supply wells, private wells located within the NMOSE drilling moratorium for the Site, and selected private wells located downgradient on Santa Clara Pueblo land. Private wells were identified within the search area, based on the current NMOSE database records for active points of diversion (PODs). Wells listed as active PODs were assumed, but not confirmed, to be in use. Additionally, eighteen of the private wells depicted on the figure were identified in the RI/FS; of these, not all were identified in the NMOSE database search and approximately half were sampled during or prior to the RI/FS. Figure C-22 also includes an inset depicting the six

currently active City of Española municipal supply wells, all of which are located more than one mile upgradient to cross-gradient of the Site.

Indoor Air Vapor Intrusion Remedial Investigation

The EPA conducted a multi-phased RI at the Site in 2017 through 2019, that was focused on assessing the potential for contaminant vapors to enter or intrude into residences and other buildings (referred to as indoor air vapor intrusion) from subsurface sources, such as groundwater or soil gas (Focused RI).[20] The EPA performed the Focused RI based on a recommendation in the 2015 FYR. The first phase (Phase 1), which was performed in November 2017, consisted of an exterior soil gas survey near the residential structures along the western end of Calle Chavez, in downtown Española. This area was selected because it was directly over the area of highest concentrations of contaminants in the Shallow Plume, in 2014, proximal to monitoring well R-12 (S1). The targeted area for the soil gas survey was expanded to an area off the Shallow Plume toward the eastern end of Calle Chavez and on Santa Clara Pueblo land. The expansion of the study area was to investigate an area of anomalously high TCE and PCE concentrations in groundwater in and near well BC-06, at the eastern end of the Biocurtain treatment system. The EPA and NMED suspected the presence of a new contaminant plume in the Shallow Aquifer that could be a source of PCE and TCE in soil gas and indoor air vapor intrusion. The Shallow Aquifer is present at a depth of about 8 feet bgs to a depth of about 30 feet bgs. Because of these shallow depths, this area was considered to have the greatest potential for cVOCs to evaporate from the groundwater plume and move upward through the soils as vapors and enter into homes and other structures at unsafe levels.

The Phase 1 exterior soil gas survey was designed to assess if COC vapors were present at high enough concentrations in shallow soil gas to potentially enter homes at unsafe levels. Soil gas samples were collected from boreholes drilled to a total depth of five feet bgs and analyzed for the presence of VOCs. The analytical results were then compared to vapor intrusion screening levels (VISLs) calculated for shallow soil gas following EPA guidance (2015).[21] If COCs were detected at concentrations exceeding the VISLs for soil gas, then a second phase (Phase 2) of the Focused RI would be conducted to sample indoor air and sub-slab air at residential and other structures located in the area where the VISLs for soil gas were exceeded. The soil gas VISLs were designated as Project Action Limits (PALs) for triggering the Phase 2 indoor air/sub-slab air sampling.

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[20] Volatile organic compounds, such as PCE, that are released into the subsurface and contaminate soil or groundwater may evaporate and move upward through the unsaturated soils as vapors and eventually enter buildings by seeping through cracks in basements or slab-on-grade foundations, crawlspaces, sewer lines or other openings. Concentrations of indoor vapors may accumulate to levels that pose a health concern for residents and workers.

[21] The soil gas VISLs for COCs were calculated by dividing the EPA health-based Regional Screening Levels for indoor air for a resident, based on a target cancer risk level of 1×10^{-6}, by a vapor attenuation factor of 0.03. This calculation was performed in accordance with the methodology specified in Appendix A of EPA's *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (EPA 2015). Vapor attenuation refers to the reduction in concentrations of VOCs that occur during vapor movement in the subsurface soil (as a result of physical processes in soil) coupled with the dilution that can occur when the vapors enter a building and mix with indoor air.

The Phase 1 exterior soil gas results for samples collected over the Shallow Plume (western end of Calle Chavez) showed the presence of only two chemicals: PCE and TCE. The concentrations measured in samples collected in the western half of the study area ranged from 1.1 micrograms per cubic meter ($\mu g/m^3$) to 65 $\mu g/m^3$ for PCE and from non-detect to 7.4 $\mu g/m^3$ for TCE. These concentrations were below the soil gas PALs of 367 $\mu g/m^3$ for PCE and 16 $\mu g/m^3$ for TCE. Based on these results, no indoor air sampling was warranted in the buildings located in this portion of the study area. *See* Figures D-1 and D-2, Appendix D.

The soil gas sampling locations at the western end of Calle Chavez are also located over a portion of the Deep Zone contaminant plumes, found at depths greater than the Shallow Plume. The low to non-detect vapor concentrations of PCE and TCE in soil gas show that the Deep Zone contaminant plumes do not contribute to soil gas contamination near ground surface that would present a concern for indoor air vapor intrusion. The greater depths (45 feet to 265 feet) of the Deep Zone plumes and the presence of finer grained sediment layers (clay, silt, and sandy clay layers) between the plumes likely prevent or limit the upward movement of soil gas to near ground surface. No other residences located over the other portions of the Deep Zone plumes were targeted for indoor air sampling.

The Phase 1 exterior soil gas results for samples collected on the eastern end of Calle Chavez and on Santa Clara Pueblo land showed the presence of PCE and TCE at concentrations exceeding the PALs. The exceedance of the PALs indicated that indoor air and sub-slab air sampling was warranted at residences and other structures on the east end of Calle Chavez. The source of the high soil gas concentrations was determined to be a new groundwater contamination plume, not associated with the Site. *See* Figures D-1 and D-2 (Appendix D).

The EPA targeted indoor air sampling for all residences and other buildings located in the area where soil gas concentrations exceeded the PALs. The EPA sought access agreements from each property owner for permission to enter the building and conduct the sampling. Access agreements were obtained for two residences, a church, and a commercial building. The EPA collected three indoor air samples from various locations in each of the two residences, in February 2018. The EPA collected three indoor air samples and two crawlspace air samples at the church and commercial building in December 2018. One ambient (outdoor) air sample was also collected and analyzed for comparison to the indoor air sample results. The laboratory results for the indoor air samples showed no site-related COCs present indoors, at levels above EPA and NMED health-based VISLs. The PCE concentrations detected in the two residences ranged from 1.3 $\mu g/m^3$ to 5.3 $\mu g/m^3$, which are below the health-based VISLs of 11 $\mu g/m^3$ targeted for a one-in-a-million cancer risk and 42 $\mu g/m^3$ targeted for a non-cancer health effects for residential indoor air. The TCE concentrations detected in the two residences ranged from non-detect (above the method detection limit of 0.075 $\mu g/m^3$) to 0.077 $\mu g/m^3$, which are below the VISLs of 0.48 $\mu g/m^3$ (cancer risk) and 2.1 $\mu g/m^3$ (non-cancer health effects) for residential indoor air. For the church and commercial building, the laboratory results for the indoor air samples showed PCE concentrations ranging from 0.064 $\mu g/m^3$ to 0.130 $\mu g/m^3$ and TCE concentrations ranging from non-detect to 0.079 $\mu g/m^3$. In the outdoor air sample, PCE was detected at 0.040 $\mu g/m^3$ and TCE was not detected. The results of the Focused RI for vapor intrusion, including a focused Human Health Risk Assessment, are documented in the EPA's 2020 Focused RI report.

Indoor Air Monitoring

Indoor air monitoring is performed annually at three buildings located close to the shallow groundwater contamination: the former Norge Town facility, the former ECHC annex, and the LCCS facility. The indoor air samples are analyzed for PCE, TCE, cis-1,2 DCE, and VC. During this FYR period, a total of five indoor air sampling events were performed, one for each year, between June 2015 and January 2020 at these buildings. Ambient air samples were also collected outside, at one or more of the buildings during each event, to determine background conditions. The sample results were compared to EPA's health-based VISLs for indoor air for a resident (occupying a home) or a composite worker (occupying a commercial or industrial building), depending on the type of building use.[22] The sample results for the former Norge Town facility and former ECHC annex were compared to the composite worker VISLs. For the LCCS facility, the sample results were compared to the more stringent (lower) residential VISLs because children, including infants, occupy this facility during the day. Indoor air sampling results are summarized in Table C-9 (Appendix C).

Tetrachloroethene and TCE were the only two COCs detected in the indoor air samples collected at the former Norge Town facility, during this FYR period. The maximum PCE concentration of 162 $\mu g/m^3$ was detected in September 2016, which exceeded the composite worker indoor air VISL of 47 $\mu g/m^3$ for the target cancer risk of 1 x 10^{-6} (i.e., one chance in a million of an individual getting cancer from exposure to the chemical over a lifetime). The 47 $\mu g/m^3$ screening level represents the lower end of EPA's acceptable lifetime cancer risk range for a composite worker. The indoor air screening level for PCE that represents the upper end of EPA's acceptable lifetime cancer risk range of 1 x 10^{-4} (one chance in ten thousand) for a composite worker is 4,700 $\mu g/m^3$. This screening level was not exceeded in any of the samples. The PCE concentrations at the Norge Town facility have decreased to levels below the 47 $\mu g/m^3$ VISL since 2016. The maximum TCE concentrations detected at the Norge Town facility (0.267 $\mu g/m^3$ in September 2016) were below the 1 x 10^{-6} target cancer risk VISL of 3.0 $\mu g/m^3$ for PCE for a composite worker. The non-cancer health effects VISLs for PCE (180 $\mu g/m^3$) and TCE (8.8 $\mu g/m^3$) were not exceeded in any sample collected from the Norge Town facility during this FYR period.

Tetrachloroethene and TCE were the only two COCs detected in the indoor air samples collected from the former ECHC annex during this FYR period. The maximum PCE

[22] The EPA has developed generic health-based Regional Screening Levels (RSLs) for ambient air (indoor and outdoor air) for a resident and composite worker. The RSLs are developed for a target cancer risk level and a non-cancer health effect level. The target cancer screening level represents about one chance in a million of an individual getting cancer from exposure to the chemical over a lifetime (defined as a 1 x 10^{-6} risk), which is the lower end of EPA's acceptable lifetime cancer risk range. The upper end of EPA's acceptable excess lifetime cancer risk range represents about one chance in ten thousand or 1 x 10^{-4}. The RSLs are generally used as generic indoor air vapor intrusion screening levels (VISLs) for determining if response actions may be warranted to mitigate potential health risks. The resident and composite worker RSLs for indoor air are calculated based on assumptions reflecting different lengths of time such individuals would be expected to occupy a building (such as a home or commercial building). For a resident, it is assumed the individual spends a significant amount of time in the home (i.e., 24 hours a day for 350 days a year over a period of 26 years). For the composite worker, it is assumed the individual occupies a building for shorter periods of time compared to a home (i.e., 8 hours a day for 250 days a year over a period of 25 years).

concentration detected was 43 µg/m^3 in May 2018, which is below the 1 x 10^{-6} target cancer risk VISL of 47 µg/m^3 for a composite worker. The maximum TCE concentration was also detected in the May 2018 sample at 1.78 µg/m^3. This concentration is below the 1 x 10^{-6} target cancer risk VISL of 3.0 µg/m^3 for TCE for a composite worker. The PCE and TCE concentrations did not exceed the non-cancer health effects VISLs for PCE (180 µg/m^3) and TCE (8.8 µg/m^3) in any sample collected from the former ECHC annex during this FYR period.

Three chemicals were detected in the indoor air samples collected from the LCCS facility during this FYR period: PCE, TCE, and VC. The concentrations of these chemical vapors did not exceed the EPA health-based residential VISLs. The maximum PCE concentration detected in the samples was 0.712 µg/m^3 in September 2016, which is below the 1 x 10^{-6} lifetime target cancer risk VISL of 11 µg/m^3 for PCE for a resident. The maximum TCE concentration detected was 0.132 µg/m^3 in September 2016. This concentration is also below the 1 x 10^{-6} target cancer risk VISL of 0.48 µg/m^3 for TCE for a resident. Vinyl chloride was detected in two samples at the LCCS facility, in June 2017. The first VC detection was in a conference room sample at 0.103 µg/m^3; the second was in a file room sample at 0.134 µg/m^3. Both of these measured concentrations were below the 1 x 10^{-6} target cancer risk VISL of 0.17 µg/m^3 for VC for a resident. The non-cancer health effects VISLs for PCE (42 µg/m^3), TCE (2.1 µg/m^3), and VC (100 µg/m^3) were not exceeded in any of the LCCS facility samples collected during this FYR period.

Site Inspection

The inspection of the Site was conducted on 11/7/2019. In attendance were Mark Purcell of the EPA, Angelo Ortelli of the NMED, and Joe Galemore and Jim Joseph of INTERA, Inc. The purpose of the inspection was to provide information about a site's status, and to visually confirm and document the conditions of the remedy, the site, and the surrounding area.

The inspection team walked the Site and inspected existing ERD injection/extraction wells and Site monitoring wells. The Source Area, Hotspot, and Biocurtain remediation systems equipment, including the injection and extraction wells, was observed to be in place at the time of the Site inspection; however, this equipment is not in operational status, as it has been decommissioned or is scheduled for decommissioning during 2020. Metal signs were mounted at the Source Area and Biocurtain treatment buildings, and the buildings were locked. Well caps and remediation vaults were fitted with padlocks. Several cuts in the Source Area treatment building fence were observed during the inspection. The cuts were on the east side of the enclosure. The fence at the Biocurtain treatment building was in good condition.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

The ROD states that the selected groundwater contamination remedy consists of an enhanced *in-situ* bioremediation treatment to destroy chlorinated solvent compounds at the Source Area and Hotspot, in addition to enhanced *in-situ* bioremediation of the dissolved-phase plume in

Shallow, Intermediate, and Deep Zone aquifers. Furthermore, the ROD states that groundwater cleanup should be achieved within 30 years from implementing remediation. The LTRA for groundwater began in June 2009, after the remedial systems were constructed and tested. Although the Site is considered as a single operable unit, the discussion presented below on remedy performance is broken out between the Shallow Aquifer and the Deep Zone aquifer, due to substantial differences in the remedy performance between these aquifers.

Remedial Action Performance

The Shallow Aquifer treatment systems have been successful at reducing cVOC concentrations to below the Site cleanup levels for the Shallow Plume, downgradient of the Source Area and Hotspot. Contaminant mass within the Source Area has been reduced by greater than 90 percent, since the LTRA began in June 2009. Residual Source Area contamination persists within a small area (approximately 1,000 square feet), where dissolved-phase groundwater contamination continues to "back diffuse" from fine-grained sedimentary layers (i.e. clay and clayey sands) that adsorbed DNAPL, at a depth of 25 feet to 35 feet bgs.

The Deep Zone treatments have been moderately successful at reducing cVOC concentrations. Deep Zone ERD has been observed in the wells undergoing treatment, where cVOC concentrations have decreased to near the Site cleanup levels. Decreasing concentration trends also have been observed in three of four associated Deep Zone monitoring wells: DM-1 (D1), M-9, and M-15 (*see* Figures C-17 and C-18, Appendix C). However, monitoring well DM-2 (D1) shows an increasing concentration trend, which may be attributed to limited EVO substrate distribution, due to localized heterogeneity[23] within the aquifer.

In accordance with a 2012 national strategy to expand optimization practices at Superfund sites, the EPA conducted an optimization study on the Site remedy in 2015. The study showed that bioremediation at the Source Area, Hotspot, and Shallow Plume was successful at reducing levels of contamination. However, contaminant mass still remained in the finer-grained sediments in some Source Area and Hotspot areas. The study also showed that the remedy for the Deep Zone had not been as effective in reducing contaminant concentrations, due to insufficient volumes and distribution of EVO substrate amendments and that the extent of contamination in the Deep Zone was inadequately characterized.

System Operations/O&M

In April and September 2017, the NMED completed the additional characterization at the Source Area and Hotspot and performed additional injections of the EVO substrate at targeted locations in those areas to remediate residual contamination. The NMED also initiated the additional Deep Zone investigation in 2018. In addition to these efforts, NMED completed a detailed study to evaluate the effectiveness of natural attenuation processes in the Deep Zone

[23] Aquifer heterogeneity is defined as the complexity or variability of aquifer properties such as sediment grain size, grain size distribution, porosity (size of the pore spaces between the grains), permeability (the connectivity of the pore spaces between the grains that allows groundwater movement through the pore spaces), the variable thickness of porous layers, and groundwater flow paths.

(I1, I2, D1, and D2 zones), in addition to an evaluation of the remedial progress of targeted treatments to address residual shallow groundwater contamination in the Source Area.

The NMED completed additional Deep Zone investigation activities in January 2019, including the drilling and logging of boreholes completed in the I1, I2, D1, and D2 zones, and the installation of 10 new multi-port[24] and nested monitoring wells. The review of the Deep Zone bioremediation progress and monitoring data indicate that contaminant concentrations in monitoring wells have decreased between 40 and 50 percent from 2009 to 2019. However, additional measures are needed to optimize the groundwater remedy and improve its effectiveness and efficiency.

In February 2020, NMED developed an enhanced treatment strategy work plan. In March 2020, the NMED initiated pilot testing of directional injections to improve the distribution of EVO substrate amendments, through the area of contamination at the Source Area, in addition to injections of micro-emulsion carbon substrate amendments[25] in the Deep Zone. As part of the enhanced treatment strategy work plan, the installation of three additional monitoring wells were proposed to define the downgradient extent of the Deep Zone contaminant plumes. Two nested monitoring wells were installed in the I1 and I2 zones and one monitoring well was installed in the D2 zone in March 2020.

Based on the findings of the 2018-2019 investigations, the NMED has concluded that continuing the existing bioremediation remedy, with an enhanced treatment strategy, is the best option to address residual contamination at the Site. Maximum contaminant concentrations in the Deep Zone have decreased 40 to 50 percent between 2009 and 2019, even though NMED conducted the last Deep Zone treatment injections in 2012, which supports the merits of continuing with the bioremediation remedy. The NMED has initiated a plan to implement the enhanced treatment strategy to address residual contamination at the Source Area and conduct pilot testing of improved treatment amendments for the Deep Zone contamination.

Implementation of Institutional Controls and Other Measures

A well drilling moratorium, or "institutional control," is in place that restricts permitting of new drinking water wells over the contaminant plume while remediation is ongoing. With this moratorium in place, there have been no new drinking water wells installed in, or proximal to, the groundwater plumes. Furthermore, historic sample results for existing private wells have not shown concentrations of COCs above the federal drinking water standards (i.e., Maximum Contaminant Levels or MCLs), with the exception of the Cook Estate well, which is only used for irrigation. However, the Cook Estate well has shown decreasing concentrations of the COCs over the past decade and the concentrations have been below the drinking water standards since 2010. Therefore, in light of these findings, there is currently no known human exposure to contaminated groundwater at the Site.

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[24] A multi-port monitoring well is constructed with multiple tubes and/or casings within a larger diameter casing for collecting groundwater samples from multiple discrete depths or zones of an aquifer within a single wellbore.

[25] Micro-emulsion carbon substrates are relatively low-viscosity (less thick), mixtures that can move more easily through the sediments with groundwater flow, as compared to emulsified vegetable oils, thereby increasing their distribution through the contaminated areas of the aquifer and accelerating the biodegradation process.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

The cleanup levels and RAOs used at the time of the remedy selection for groundwater continue to remain valid. There have been no significant changes in physical conditions at the Site that would affect the short-term protectiveness of the remedy with respect to the groundwater pathway. However, the exposure assumptions and toxicity data have changed for inhalation parameters and assessment of the indoor air vapor intrusion pathway.

Changes in Standards and To-Be-Considered Criteria

Federal drinking water standards and the State of New Mexico (State) groundwater standards identified for PCE in groundwater (i.e., MCLs, NMWQCC standards) have not changed during this FYR period. Amended NMWQCC groundwater standards took effect on December 21, 2018, and generally match federal MCLs. The NMWQCC standards were revised for two Site groundwater COCs: vinyl chloride (from 1.0 µg/L to 2.0 µg/L), and 1,1-dichloroethane (from 5.0 µg/L to 7.0 µg/L). The NMWQCC standards for these COCs are now the same as the federal MCLs.

There are currently no promulgated (i.e., fixed numerical) nationwide or State-wide cleanup standards for soil gas or indoor air. The EPA, under the NCP, selects cleanup levels for soil gas and indoor air based on risk to human health and the circumstances at the Superfund site at issue. The EPA developed VISLs to help determine which sites warranted further assessment and possible cleanup. Generally, at properties where subsurface concentrations of vapor-forming chemicals, such as those in ground water or "near source" soil gas concentrations, are below VISLs, no further action or study is warranted, so long as the exposure assumptions match those taken into account by the VISL calculations and the site fulfills the conditions and assumptions of the generic conceptual model underlying the screening levels (EPA 2015). Exceeding a subsurface VISL may indicate that further evaluation of the vapor intrusion pathway, typically consisting of indoor air and sub-slab and/or crawl space air sampling, is appropriate. Exceeding an indoor air VISL may indicate that additional evaluation or mitigation is appropriate. Generally, when indoor air VISLs representing the upper end of the EPA's acceptable lifetime cancer risk range, EPA's non-cancer health effects level, or NMED's lifetime cancer risk threshold level are exceeded, response actions for mitigating indoor air contaminant vapors would be warranted to protect human health.

The EPA included generic VISLs calculated for groundwater, soil gas, and indoor air in the EPA 2002 draft subsurface vapor intrusion guidance (EPA 2002, Table 2a). However, the VISLs for PCE and TCE have changed since the 2002 guidance was released. The VISLs for PCE and TCE in indoor air were updated by EPA in May 2014. The previous VISLs were based on older (1980s) chemical toxicity data. They have been updated with new toxicological studies and better modeling predictions of chemical exposure. Based on a comparison of the 2002 VISLs to the current VISLs for indoor air, the VISLs for PCE and TCE have increased. For a target cancer risk of 1×10^{-6}, which represents one chance in a million that an individual will get cancer from exposure to a chemical over a lifetime, the indoor VISL for PCE increased

from 0.81 µg/m^3 to 11 µg/m^3 and the indoor air VISL for TCE increased from 0.022 µg/m^3 to 0.48 µg/m^3. The EPA VISLs for indoor air are part of a database of Regional Screening Levels (RSLs)[26] that can be found at www.epa.gov/risk/regional-screening-levels-rsls-generic-tables.

The State abatement requirements for indoor air are described under New Mexico Administrative Code (NMAC) 20.6.2.4103(A)(2), which states that "any constituent listed in 20.6.2.3103 NMAC or any toxic pollutant in the vadose zone shall be abated so that it is not capable of endangering human health due to inhalation of vapors that may accumulate in structures, utility infrastructure, or construction excavations." The NMED Risk Assessment Guidance for Site Investigations and Remediation (February 2019) includes residential and industrial VISLs for soil gas, indoor air, and groundwater that were revised in March 2017.

During the FYR for the Site, the cVOC concentrations (i.e., PCE, TCE, cis-1,2 DCE, and VC) detected in ambient and indoor air samples collected from the former Norge Town facility, the former ECHC annex, and the LCCS facility have been monitored. The indoor air cVOC concentrations did not exceed the NMED VISLs during this FYR period for any of these buildings. Indoor air monitoring results show that cVOC concentrations at the commercial buildings (i.e., former Norge Town facility and former ECHC annex) have not exceeded the composite worker[27] EPA VISLs during this FYR period, except for exceedances of the PCE VISL in the former Norge Town facility, in June 2015 and September 2016. Similarly, the cVOC concentrations at the LCCS facility have not exceeded the residential EPA VISLs during this FYR period; however, the 2018 indoor air monitoring results at the LCCS building were compared to composite worker VISLs, since the laboratory method detection limits were not sufficiently low to meet the residential VISLs. Earlier indoor air monitoring at the LCCS facility (2008-2012) indicate that VC was detected inside the LCCS facility at a maximum concentration of 88 µg/m^3, which equals a cancer risk of 5.1 x 10^{-6} (i.e., the chance of 5.1 cancer incidents out of a million individuals from exposure to the chemical over a lifetime). However, this concentration is within the EPA's acceptable lifetime cancer risk range of 1 x 10^{-4} to 1 x 10^{-6} and below NMED's acceptable lifetime cancer risk level of 1 x 10^{-5} (one chance of a cancer incident in one hundred thousand).[28]

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[26] Regional Screening Levels are developed for the resident and composite worker using risk assessment guidance from the EPA Superfund program. They are risk-based concentrations derived from standardized equations combining exposure information assumptions with EPA toxicity data. RSLs are considered by EPA to be protective of people, including sensitive groups such as the elderly, young children, and infants, over a lifetime. They are generic screening levels calculated without site-specific information. The RSLs are used for site screening and as initial cleanup goals, if applicable.

[27] The composite worker for the air exposure pathway is a full-time employee working on-site and spends most of the workday conducting activities indoors. The composite worker is assumed to be exposed to contaminants via the inhalation of ambient air.

[28] In accordance with the NCP at § 300.430(e)(2)(i)(A), the EPA's acceptable lifetime cancer risk range from exposure to a known or suspected cancer-causing chemical is one excess cancer incident out of ten thousand individuals (10^{-4}) to one cancer incident out of one million individuals (10^{-6}). In other words, the EPA's 10^{-4} to 10^{-6} acceptable carcinogenic risk range represents about one chance in ten thousand to one chance in one million of an individual getting cancer from exposure to a chemical over a lifetime.

The EPA's acceptable lifetime carcinogenic risk range and effect level take into consideration young children and infants, as it is EPA policy to consider risks to infants and children consistently and explicitly as part of risk assessment. Such consideration of children's health is also a requirement of the Superfund law and the 1997 Presidential Executive Order (E.O. 13045) for the protection of children from environmental health risks and safety risks.

Because the vinyl chloride concentrations detected at the LCCS facility were within EPA's acceptable lifetime cancer risk range of 1×10^{-6} to 1×10^{-4}, the NMED's acceptable lifetime cancer risk level of 1×10^{-5}, and below the EPA acceptable non-cancer health effect levels, response actions to mitigate the indoor air contaminant vapors were not warranted. The NMED will continue to perform annual indoor air monitoring at the former Norge Town facility, the former ECHC annex, and the LCCS facility to evaluate contaminant vapor concentration trends over time and determine what appropriate response actions, if any, will be needed to mitigate potential health threats caused by vapor intrusion of Site-related COCs.

Changes in Toxicity and Other Contaminant Characteristics

Toxicological information for PCE and TCE in groundwater on which the MCLs were established has not changed since the original baseline risk assessment was performed. The toxicological information for the COCs in air (i.e., PCE and TCE) has changed. Since the ROD was issued, the EPA's Office of Research and Development has published a new toxicological assessment for PCE in EPA's Integrated Risk Information System (IRIS), which has resulted in a lower inhalation unit risk for PCE and TCE (indicating less toxicity).

Changes in Risk Assessment Methods

As part of the 2001 RI, EPA completed a baseline human health risk assessment (BHHRA) for the Site. The methods used to develop the BHHRA have not changed. The health-based indoor air VISLs for PCE and TCE have changed since the BHHRA was performed. These changes are discussed under "Changes in Standards and TBCs" above.

Changes in Exposure Assumptions

The exposure assumptions for modeling indoor air vapor intrusion have changed somewhat, since the completion of the RI/FS and issuance of the ROD in 2001. At the time of the RI, the science and technology associated with evaluating and mitigating risk from vapor intrusion was evolving, especially for vapor intrusion sourcing from subsurface soil or contaminated groundwater. Moreover, EPA's 2002 guidance for evaluating the indoor air vapor intrusion pathway was still in draft form. The EPA's updated vapor intrusion guidance, as of 2015, recommends further evaluation of the indoor air vapor intrusion pathway where contaminant concentrations in soil vapors exceed the EPA's VISL corresponding to a 1×10^{-6} excess lifetime cancer risk for exposure to contaminants in indoor air.

Changes in Exposure Pathways

The BHHRA estimated the human health risks at the Site, provided the basis for taking action at the Site, and identified the COCs and exposure pathways that needed to be addressed by the remedial action. Since exposure pathways are dependent on current or future land uses at a

site, a BHHRA assesses current and potential future land uses at NPL sites. There have been no changes in land use at the Site, which is expected to remain zoned as commercial, public recreational, light industrial, and residential land uses. Further, ICs have been established by the NMOSE that prohibit the installation of drinking water wells at the Site. Exposure pathways have not changed since the ROD was signed by EPA in September 2001.

Expected Progress toward Meeting Remedial Action Objectives

The remedy has been effective in removing PCE mass from the Shallow Aquifer, through the *in-situ* bioremediation treatment of contaminated groundwater. Contaminant mass within the Source Area and Hotspot has been reduced by greater than 90 percent, since the LTRA began in June 2009. The Shallow Aquifer treatment systems have been successful at reducing COC concentrations, toward meeting the RAOs for the Shallow Plume downgradient of the Source Area and Hotspot. However, residual Source Area contamination exists within a small area (approximately 1,000 square feet) where dissolved-phase groundwater contamination persists at concentrations above the cleanup levels.

In review of the Deep Zone *in situ* bioremediation progress, monitoring data have shown that contaminant concentrations in monitoring wells have decreased between 40 and 50 percent, from 2009 to 2019. However, progress in the Deep Zone has been slower than that in the Shallow Aquifer, and some monitoring wells show fluctuating or increasing concentrations. This may reflect the inability of the currently designed injection system to adequately deliver treatment materials (organic substrate amendments) throughout the entire plume area, due to aquifer characteristics such as low hydraulic conductivity (the ease at which water can move through the aquifer) or permeability (the ability of porous rock or sediments to allow water to pass through it). The decreasing concentrations support continuation of the *in situ* bioremediation remedy for the Deep Zone aquifers. However, additional measures are needed to improve its effectiveness and efficiency in meeting the RAOs for the Deep Zone.

The NMED has evaluated ways to enhance the performance of the bioremediation systems for the Source Area and Deep Zone, including conducting a pilot study on new and improved types of organic substrate amendments that may be better (less viscous than the regular emulsified vegetable oil) at flowing through an aquifer and reaching more areas of groundwater contamination.

The NMED has developed a plan to implement an enhanced treatment strategy that will address the Deep Zone, as well as residual contamination in the Source Area. In March 2020, the NMED initiated injection pilot testing of improved substrate amendments in the Deep Zone and the NMED has deployed directional injections to increase the distribution of substrate amendments through the areas of residual contamination at the Source Area.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

In performing the 2017-2019 Focused RI for indoor air vapor intrusion, the EPA did not target homes that overlay the Deep Zone plumes, because the greater depths of the plumes (45 feet to 265 feet) and the presence of finer grained sediment layers (clay and sandy clay layers) above

the plumes would likely prevent or limit the upward movement of vapors through the soils and into homes or other structures. However, EPA's soil gas survey performed to investigate the Shallow Plume along the western end of Calle Chavez did overlie a portion of the Deep Zone plumes. The results of the soil gas survey showed the presence of PCE in soil gas at concentrations that were significantly lower than the minimal amount that would be needed to enter homes at unsafe levels. In other words, they did not exceed the soil gas VISLs. Based on these results, the EPA and NMED do not consider an investigation of potential indoor air vapors in homes across the entire Site to be warranted at this time. If additional information is obtained that indicates a potential for vapor intrusion sourced from the Deep Zone plumes, the NMED would consider performing such an investigation.

No other information has come to light that could call into question the current short-term protectiveness of the groundwater remedy.

VI. ISSUES/RECOMMENDATIONS

<table>
<tr><th colspan="5">Issues/Recommendations</th></tr>
<tr><td colspan="5">Issues and Recommendations Identified in the Five-Year Review:</td></tr>
<tr><td rowspan="3">OU(s): 1</td><td colspan="4">Issue Category: Remedy Performance</td></tr>
<tr><td colspan="4">Issue: Residual Source Area contamination has been detected at concentrations above the cleanup levels in a small area (approximately 1,000 square feet), where Tetrachloroethene (PCE) contamination persists in the Shallow Aquifer at depths of 25 feet to 35 feet below ground surface, following targeted substrate injections that were completed at the Source Area and Hotspot in April and September 2017.</td></tr>
<tr><td colspan="4">Recommendation: Shallow Aquifer performance monitoring will need to be conducted to determine the effectiveness of the enhanced treatment strategy work plan implementation in March 2020, that included the pilot testing of directional injections to improve the distribution of micro-emulsion carbon substrate amendments in the area where residual PCE contamination persists at the Source Area.

Based on the Shallow Aquifer performance monitoring results, additional Shallow Aquifer treatments may be needed to achieve the Remedial Action Objectives for the Source Area.</td></tr>
<tr><td>Affect Current Protectiveness</td><td>Affect Future Protectiveness</td><td>Party Responsible</td><td>Oversight Party/Support Agency</td><td>Milestone Date</td></tr>
<tr><td>No</td><td>Yes</td><td>NMED</td><td>EPA</td><td>6/30/2021</td></tr>
</table>

OU(s): 1	Issue Category: Remedy Performance			
	Issue: Remedial progress in the Deep Zone aquifer has been slower than that in the Shallow Aquifer, and some monitoring wells show fluctuating or increasing concentrations of contaminants. Additional measures are needed to improve the *in situ* bioremediation treatment system's effectiveness and efficiency in meeting the Remedial Action Objectives for the Deep Zone.			
	Recommendation: Deep Zone remedy performance monitoring will need to be conducted to determine the effectiveness of the enhanced treatment strategy work plan initiated in March 2020, that included the pilot testing and injections of micro-emulsion carbon substrate amendments in the D1 and D2 zones, where PCE contamination persists at concentrations above the cleanup levels. Based on the Deep Zone performance monitoring results, an expanded enhanced reductive dechlorination (ERD) treatment plan that includes additional substrate amendments injections in the I1 and I2 zones, and possibly the installation of additional injection wells in the D1 and D2 zones, may be needed to achieve the Remedial Action Objectives for the Deep Zone.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party /Support Agency**	**Milestone Date**
No	Yes	NMED	EPA	6/30/2022

OTHER FINDINGS

In addition, the following are recommendations have been identified during this FYR that may improve public outreach efforts, but do not affect current and/or future protectiveness:

- A public meeting was held on December 11, 2019, to discuss the completion of the 2019 Deep Zone investigation activities and the planned implementation of an enhanced treatment strategy to address residual contamination at the Source Area, in addition to pilot testing of improved enhanced reductive dichlorination amendments for treatment of the Deep Zone. Public notices were published in the local paper and posted at the public library, and paper notices were mailed out to individuals on EPA's mailing list. An availability session was also held (immediately before the public meeting) to discuss remedial progress at the Site, where individuals were able to ask questions and express concerns. Additional public meetings will be scheduled in the future as needed to ensure the public is provided with status updates on Site activities.

- Increase the frequency of public updates and dissemination of information concerning the progress of the remedy at the Site. In addition, communication of NMED's continued commitment to complete the cleanup of the Deep Zone, may alleviate some concerns that cleanup will not be hindered by EPA's transfer of financial responsibility

to the State of New Mexico for future operation and maintenance activities, following the 10-year, long-term response action for groundwater that ended on June 30, 2019.

- Re-sample private wells that were previously sampled during or prior to the 2001 RI/FS and that previously had detections below the cleanup levels. Also, arrange for notices to inform or remind property owners and well owners of the New Mexico Office of the State Engineer well drilling moratorium.

VII. PROTECTIVNESS STATEMENT

Sitewide Protectiveness Statement	
Protectiveness Determination: Short-term Protective	*Planned Addendum Completion Date:* Click here to enter a date
Protectiveness Statement: For the groundwater exposure pathway, there is currently no known human exposure. An institutional control is in place that restricts permitting of new groundwater wells over the area of the contaminant plume while remediation is ongoing. The institutional control limits exposure to contaminated groundwater. Based on future groundwater performance monitoring results, follow-up actions (i.e. expanded enhanced reductive dichlorination treatments) may be needed to achieve long-term protectiveness if the current remedy for the Deep Zone aquifer does not meet the Remedial Action Objectives and cleanup levels for the Site.	

VIII. NEXT REVIEW

The next five-year review report for the North Railroad Avenue Plume Superfund Site will be completed five years from the completion date of this review.

APPENDIX A – REFERENCES

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APPENDIX B – ADDITIONAL SITE INFORMATION

SITE CHRONOLOGY

Event	Date
Initial discovery of contamination - chlorinated solvent contamination was discovered in groundwater samples collected from two City of Española municipal supply wells	1989
Pre-NPL responses - Preliminary Assessment (PA) was performed by the New Mexico Environmental Improvement Division (predecessor to NMED)	July 1990
Screening Site Inspection (SSI) Report was submitted to the EPA by NMED GWQB SOS for additional site work performed in September through November 1991	March 1992
Listing Site Inspection (LSI) Report was submitted to the EPA by NMED-SOS	April 1993
Removal actions - NMED performed State-lead removal action to remove material from the Norge Town dry cleaner facility's lint trap and perform additional Source Area investigation adjacent to the Norge Town dry cleaner facility.	June 1997
Final NPL listing	January 1999
Remedial Investigation complete	January 2001
Feasibility Study complete	June 2001
ROD signature	September 2001
Enforcement documents (Consent Decree, Administrative Order on Consent, Unilateral Administrative Order)	Not applicable
Remedial Design complete	December 2003
Superfund State Contract, Cooperative Agreement, or Federal Facility Agreement signature	
On-site Remedial Action construction start	July 2005
Explanation of Significant Difference signed – replace Surfactant Enhanced Aquifer Recovery system with ERD; soil vapor extraction replaced with soil removal, if needed	March 2008
Full-scale operation begins - initial substrate injections to all four treatment systems	April 2008
Construction completion date - Preliminary Close Out Report issued for site construction completion	June 2008
Operational and Functional determination	June 2009
First Five-Year Review completed	June 2010
Substrate injections completed to various parts of the aquifer: April/May 2008 – Source Area (SA), Hotspot (HS), Biocurtain (BC), Deep Zone (DZ); October 2008 – SA, HS, BC, DZ; April 2009 – SA, HS, BC; August 2009 – SA, HS, BC, DZ; March 2010 – BC; October 2010 – BC, DZ; July 2011 – BC; November 2012 – April 2013 – SA, BC, DZ	April 2008 – April 2013

Event	Date
Long-term groundwater monitoring events: February 2006, December 2006, October 2007, July 2008, March 2009, October 2009, June 2010, February 2011, August 2011, March 2012, April 2013, and June 2014	February 2006 – June 2014
Second five-year review completed	July 14, 2010
Carbon substrate injections at Source Area/Hotspot	April 2017 and September 2017
Additional investigation of Deep Zone completed	August 11, 2019
Evaluation of carbon substrate injections at Source Area and Hotspot completed	September 11, 2019
Deep Zone Monitored Natural Attenuation Study completed	October 17, 2019
Enhanced Treatment Strategy – downgradient Deep Zone drilling and well installations (I1/I2 and D2 zones)	March 2020
Enhanced Treatment Strategy – Source Area and Hotspot directional injection well installations and injections; and Deep Zone (D1/D2 zone) injections completed	March 2020
Decommissioning & Demolition of Source Area and Hotspot infrastructure	March 2020

SITE BACKGROUND

This section describes the physical setting of the Site, a description of land and resource use, the history of contamination and initial response actions taken at the Site and the basis for actions taken.

Physical Characteristics

The Site is in the downtown area of the City of Española, Rio Arriba County, New Mexico and was listed on the U.S. EPA's National Priorities List (#NMD986670156) in January 1999. The Site consists of an approximately 58-acre, 260-foot deep groundwater plume that extends approximately 0.75 miles south/southeast from the source. The source of contamination has been identified as the former Norge Town Laundry and Dry Cleaners facility (Norge Town facility) located at 113 North Railroad Avenue in the downtown area of Española. The Site is in Township 20N, Range 8E, Section 3 of the United States Geologic Survey, Española Quadrangle map with coordinates of Latitude 35°59'31" North, and Longitude 106°04'53" West. The Norge Town facility was occupied and operated by various individuals as a dry cleaner from 1970 until June 2007, when it ceased operations. The Site is located on fee lands within the City of Española and within the boundary of Santa Clara Pueblo. The groundwater plume impacts the sole-source drinking water aquifer for the City of Española, the Santa Clara Pueblo, and nearby rural populations (Figures B-1 and B-5).

Hydrology

The groundwater contaminant plumes are located within the alluvial fill and Santa Fe Group aquifer in the Northern Rio Grande Basin. The shallow groundwater contaminant plume (Shallow Plume) extends approximately 0.75 miles (3,700 feet) south/southeast from the source to within the boundaries of the Santa Clara Pueblo trust lands and close to the west bank of the Rio Grande

(Figure 5). The Shallow Aquifer is comprised of a high-permeability sand/gravel/cobble unit extending from near surface to approximately 20 feet below ground surface (gs) and a five- to seven-foot thick sequence of interbedded fine-grained sands and sandy clay layers from approximately 20 to 27 feet bgs. Beneath the Shallow Aquifer is a 20 to 40-ft thick clay layer that is generally continuous across the Site, which separates the Shallow Aquifer and multiple zones of the deep aquifer (collectively the "Deep Zone"). The lithology below the Shallow Aquifer consists of thick sequences of silts and clays with the Deep Zone primarily consisting of 10 to 20-ft thick fine-grained silty sand and sand units.

The Deep Zone has been divided into four (4) hydro-stratigraphic units (intermediate zones – I1 and I2, and deep zones – D1 and D2) based on the stratigraphy and contaminant occurrence. The Deep Zone contamination occurs in 10 to 20-foot thick fine-grained sands between depths of approximately 50 to 70 feet bgs (I1 zone), 80 to 100 feet bgs (I2 zone), 155 to 200 feet bgs (D1 zone), and 225 to 265 feet bgs (D2 zone). The vertical extent of contamination within the Deep Zone is defined by an aquifer zone (D3) with a single non-contaminated well, R-09(D3), which is screened from 340 to 360 feet bgs. This well was installed within the highest contaminant concentration area of the Deep Zone near the impacted Jemez supply well (Jemez Well). The Deep Zone dissolved-phase plume is off set from the Shallow Aquifer groundwater flow direction towards the southwest. The mechanisms for the transport of contamination from the Shallow Aquifer to the Deep Zone identified during the Remedial Investigation (RI) include: 1) greater vertical hydraulic gradients associated with pumping of the two municipal wells; 2) vertical migration down the borehole annulus at the Jemez Well; and 3) lateral discontinuity of the shallow clay layer (from 25 and 40 ft-bgs) that occurs beneath the source area. The discontinuity of the clay layer was confirmed during the Cone Penetrometer Testing investigation (RI Report, 2001).

The groundwater flow direction and gradients within each aquifer zone have remained relatively unchanged during this FYR period. The groundwater flow directions in the Shallow Aquifer and Deep Zone are generally to the south/southeast (Figures 6-10).

The groundwater elevations are lower in the deeper screened wells indicating a vertical downward gradient between the Shallow Aquifer and Deep Zone. There has been minimal groundwater fluctuation within the Shallow and the I1 and I2 zones of the Deep Zone. Vertical flow gradients are evaluated at five locations where two or more nested wells are completed into the different aquifer zones. There is no significant difference in water level elevations between the Shallow Zone and upper I1 zone wells completed to less than 70 feet bgs. Differences in water level elevations between wells in the I1 and I2 zones and D1 and D2 zones range from 27.48 feet to 34.99 feet. The vertical downward gradient between the I1/I2 zones and the D1/D2 zones ranges from 0.15 to 0.24 feet per foot; the vertical downward gradient between the upper D1 zone (155 to 200 feet bgs) and the lower D2 zone (225 to 265 feet bgs) ranges from 0.05 to 0.10 feet per foot.

Land and Resource Use

The Site is in an area that is a mix of residential, light industrial and commercial properties within the City of Española, Rio Arriba County, New Mexico. Santa Clara Pueblo is located one mile to the south of Española.

Numerous commercial and residential buildings are situated above the groundwater plume. The three buildings at and near the source include the former Norge Town facility with an unpaved parking area surrounding it. South of the Norge Town building are two office buildings (El Centro Health Clinic and Annex), which are both surrounded by paved parking lots. All three (3) of these buildings were vacated during this FYR and are currently unoccupied. Several residences are located approximately 250 feet east/northeast of the Norge Town facility. The Las Cumbres Community Services (LCCS) facility, which is a community learning center with outdoor play area, and a former middle school are located one block to the east and south of the Norge Town facility. The city plaza and residential area are located west of the Site and over the Deep Zone plumes. To the north of the Site is a mostly residential area, with a community center with a swimming pool and library located a few blocks to the northwest of the Norge Town facility. To the south are several businesses and a residential neighborhood.

The southern portion of the Shallow Plume crosses onto the tribal boundaries of the Santa Clara Pueblo and beneath riparian woodlands (or bosque), pastureland, and small-scale agricultural areas along the Rio Grande. The river and adjacent bosque is used for obtaining natural resources such as fishing and gathering of edible and medicinal plants. The Rio Grande is also used for recreational swimming.

The Deep Zone aquifer in this area is a sole source drinking water supply for the City of Española and for the Santa Clara Pueblo and surrounding rural area. Each community has their own public water supply systems. The City of Española currently has six production wells. Three of the wells are located approximately 1 to 1.5 miles north/northwest of the Site and three wells are located on the east side of the Rio Grande approximately 2 to 2.5 miles northeast of the Site. The total volume of groundwater extracted by the City of Española in 2014 was 292 million gallons based on New Mexico Office of the State Engineer (NMOSE) records. Santa Clara Pueblo has two (2) public supply wells located approximately 1.5 and 2 miles southwest of the ground water plume. Total annual groundwater extraction volumes were not obtained for these wells; however, they serve approximately 450 homes (~2000 people) according to personal communications with Santa Clara Pueblo's Office of Environmental Affairs. In addition to the two (2) former impacted City of Española supply wells, eighteen private wells were identified within the 1,000-foot radius of the Site boundaries during or prior to the New Mexico Environment Department's (NMED's) remedial investigation and feasibility study (RI/FS). Most of these wells are no longer in use, or used for limited irrigation purposes only, and are not used for domestic drinking water purposes. Ten of these wells were sampled during the Screening Site Inspection (SSI) between September and November 1991. Only one of the private irrigation wells was impacted with Site contaminants above the Site cleanup levels. In addition, residences to the south of the Site, in the Guachupangue area, use private wells for their drinking water supply. In 1998 and 1999, twelve wells (ranging in depth from 50 to 240 feet bgs) in the northern portion of the area were sampled to determine if the community was affected by the plume. No Site contaminants of concern (COCs) were detected in any of these wells.

According to the 2010 census data, the population of Española is 10,220. According to personal communication with Mr. Dino Chavarria of the Santa Clara Pueblo's Office of Environmental Affairs, the population of Santa Clara Pueblo is approximately 2,000 people. A large percentage of

the City of Española's population is Hispanic (87%), and Santa Clara Pueblo's population is Native American (less than 90%).

History of Contamination

Groundwater contamination was first discovered in 1989 when tetrachloroethene (also known as perchloroethene or PCE) and one of its degradation by-products, trichloroethene (TCE) were detected in two (2) municipal drinking water supply wells for the City of Española. The wells were taken off-line and have been removed from the drinking water supply system since the discovery. The New Mexico Environmental Improvement Division (NMEID) and NMED Ground Water Quality Bureau (GWQB) conducted several investigations between 1990 and 1998 to determine the source and extent of the contamination.

The source of the contamination was determined to originate from the Norge Town facility, which operated from approximately 1970 until it closed in August 2007. The suspected release point of the dry-cleaner solvent PCE was a lint trap, which was centrally located against the eastern edge of the former dry-cleaner building. Most of the contaminant mass occurred as residual-phase dense non-aqueous phase liquid (DNAPL) trapped between soil particles in the Shallow Aquifer (between approximately six and 25 feet bgs) and within an approximate 1600 square-foot area immediately adjacent to the eastern edge of the Norge Town facility. The RI report estimated the volume of DNAPL to be approximately 27 gallons (365 pounds) in the source area. The interpreted presence of DNAPL within the source area was based on the high soil concentrations (as high as 800,000 milligram per kilogram (mg/kg)) and high dissolved-phase PCE concentrations in groundwater (as high as 110,000 micrograms per liter (µg/L) in cone penetrometer sample CPT-65 and 40,000 µg/L in well EWMW-4B) within the vicinity of the lint trap (RI, 2001). However, free-phase DNAPL was not observed during the remedial action (RA) construction work, which included the advancement of 11 sonic borings within an approximate 2,000 square-foot area east of the Norge Town facility, or in the groundwater extracted from wells installed in four of these 11 borings.

REMEDIAL ACTION

Remedy Selection

The Remedial Action Objectives (RAOs) and Remediation Goals (cleanup levels) in the EPA's 2001 Record of Decision (ROD) were established after considering all federal, state and tribal Applicable or Relevant and Appropriate Requirements (ARARs). The contaminants of potential concern (COPCs) were defined as PCE and degradation products TCE, cis-1,2 dichloroethylene (cDCE), trans-1,2-dichloroethylene (tDCE) and vinyl chloride (VC) that have not been observed to exceed their respective MCLs but may occur as part of the treatment process. As stated in the ROD, the RAOs include:

- Prevent human ingestion, inhalation, or dermal contact of ground water containing Site related Contaminants of Concern (COCs) at concentrations that exceed their corresponding non-zero Maximum Contaminant Level Goals (MCLGs) or Maximum Contaminant Levels (MCLs) where their corresponding MCLGs are zero as established under the Safe Drinking

Water Act (SDWA).

- Restore the ground water at the Site such that concentrations of COCs and Contaminants of Potential Concern (COPCs) are less than the MCLs.
- Prevent residual-phase PCE, DNAPL, from causing concentrations of COCs in ground water to exceed their MCLs.
- Prevent the transport of COCs from ground water to surface water at concentrations that may exceed the Applicable or Relevant and Appropriate Requirements (ARARs) in the receiving surface water body.
- Prevent the degradation of surface water by ensuring that the concentrations of ground water COCs and COPCs are in compliance with applicable surface water standards.

The Remediation Goals for the COCs and COPCs in ground water are based on the more restrictive of the Federal Safe Drinking Water Act Maximum Contaminant Levels (MCLs) or the New Mexico Water Quality Control Commission (NMWQCC) regulation standards for VC, 1,1-dichloroethene (1,1 DCE), iron and manganese. The COCs and cleanup levels for groundwater and surface water are summarized in the table below.

Contaminants	Ground water (µg/L)	Surface water (µg/L)
PCE	5.0	5.0
TCE	5.0	5.0
cis- 1,2 DCE	70*	70
trans- 1,2 DCE	100*	100
VC	2.0*	2.0
1,1 DCE	7.0*	7.0
arsenic	10*	NS
manganese	200*	50
iron	1000*	NS

Notes:
* constituents not listed as COCs in the ROD
The surface water cleanup levels are based on the Water Quality Code for the Pueblo of Santa Clara.
NS No standard has been established

The RAO and Remediation Goal for PCE in soil are to prevent ground water from being impacted above MCLs through transport from the unsaturated zone soils at levels greater than 0.019 mg/kg PCE.

There were no RAOs or cleanup levels for air established in the ROD because the Baseline Human Health Risk Assessment determined the potential risk from indoor vapor intrusion was within an acceptable risk range to protect human health. To further support this determination the ROD recommended that additional evaluation and monitoring be performed as part of the site monitoring program.

Remedy Implementation

The Site consists of one operable unit, defined as the following areas; the Source Area soil and

groundwater, the Hotspot, and the downgradient dissolved-phase Shallow Plume and dissolved-phase groundwater plumes of the Deep Zone. The remedy described in the ROD was intended to address the entire operable unit and consisted of five components (or phases) of treatment listed as follows:

1. In-situ treatment of saturated soils in the source area using surfactant or co-solvent treatment to remove residual DNAPL;
2. Enhanced in-situ bioremediation of hot spots to destroy chlorinated solvent compounds;
3. Enhanced in-situ bioremediation of the dissolved-phase plume;
4. Soil vapor extraction to treat unsaturated soils in the Source Area;
5. Monitoring of groundwater quality to assess performance of the remedial action.

The remedial design (RD) was completed in December 2003 by INTERA Inc., contractor to NMED. The EPA funding for the RA was awarded in September 2004 and the RA construction contract was awarded to AMEC Earth and Environmental, Inc. in June 2005. Construction of the four RA systems began in July 2005 and was completed in June 2008.

In January 2006, the construction schedule was revised due to the unforeseen geologic conditions encountered in the source area and work shifted to the ERD pilot test. The revised schedule caused an approximate two-year delay in completion of the RA construction while the proposed ERD pilot test was revised to incorporate a test cell within the DNAPL source area and additional investigation of the Source Area and engineering evaluation of the Surfactant Enhanced Aquifer Remediation (SEAR) system was performed. The additional technical analyses included:

- Investigation of the hydrologic clay layer that was originally intended to capture the DNAPL released during the SEAR flood operation,
- Aquifer test on the lower fine-grained sand unit,
- Re-evaluation of the original SEAR design to determine if other modifications could optimize the remedial plans.
- Modification of the original ERD pilot test criteria to include a test cell in the DNAPL source area to evaluate the effectiveness of treating the residual phase liquid or DNAPL through enhanced bioremediation.
- Nine-month long pilot test was initiated on May 1, 2007, and concluded on January 8, 2008.
- Results of the pilot test determined that emulsified vegetable oil could be used to remediate both the high concentration DNAPL Source Area and the dissolved-phase portion of contaminant plume.

The EPA issued an Explanation of Significant Difference (ESD) in March 2008 to refine the treatment alternatives for the Source Area**.** This decision was based on the technical limitations associated with the hydrogeologic conditions and the associated technical uncertainty and increased cost associated with continuing with the original SEAR remedy, along with the positive results from the ERD pilot test. The changes that were implemented as part of the ESD included:

- Elimination of operation of the SEAR system in the Source Area. Geologic conditions, including significant tilting of the clay unit as well as a less permeable fine-grained sand layer observed during installation of the SEAR wells, were incompatible for implementation of SEAR.
- Alternative Source Area treatment – Use of bioremediation through ERD in the Source Area. Pilot testing demonstrated that ERD was effective in treating the high concentration of PCE in the Source Area. The infrastructure, including installed wells and conveyance piping, could be converted for use in the ERD system.
- Elimination of soil vapor extraction system for treating soil. During well installation, the delineated extent of soil contamination was greatly reduced. The residual PCE in the soil matrix was sampled and determined to be within acceptable soil screening levels. The limited area of affected soil will be addressed through excavation and disposal or in-situ ERD at a later date.

Ground Water Remediation Systems

The ERD systems are designed to include the injection of an electron donor substrate (emulsified vegetable oil (EVO)) into the aquifer formation, followed by recirculation of the groundwater through the extraction and injection wells, to accelerate the distribution of the electron donor substrate through the contaminated portion of the aquifer. The injection and extraction wells are installed over a grid pattern in the Source Area/Hotspot systems, with one extraction well surrounded by four injection wells. The Biocurtain is designed with alternating extraction and injection wells. Wells in both systems are installed on approximately 30- to 40-foot centers, with tighter 10-foot spacing in the Source Area. The electron donor substrate and other nutrients are metered into the injection lines with a chemical feed pump and mixed with extracted groundwater. The substrate solution is then routed to a manifold used to split flow to injection wells. The system's instrumentation and controls have been designed for unmanned operation, and remote monitoring. Two 21-foot by 21-foot steel-fabricated treatment buildings were erected at the upgradient Source Area/Hotspot and the downgradient Biocurtain. These treatment buildings house the injection and extraction well manifold systems, amendment tanks, and electrical and supervisory control and data acquisition (SCADA) systems.

Installation of the treatment system wells was completed between July 2005 and November 2005. Wells were installed using rotosonic drilling method incorporating two drill rigs and crews. A total of 73 shallow zone (generally less than 34 feet) wells were installed in the Source Area (SEAR system), Hotspot and Biocurtain treatment systems. The injection and extraction wells were constructed using four-inch inside diameter schedule 40 PVC or stainless-steel screens. Screens length varied in the Shallow Aquifer according to depth of the clay aquitard and were generally completed to just above the top of the water table. In addition, 17 wells ranging from 70 to 270 feet deep were installed for the Deep Zone treatment system.

Construction of the treatment system buildings and piping began in late August 2005, with most of the below-grade piping and electrical lines installed to the treatment buildings by January 2006. Following postponement of the SEAR operations, final construction of the remaining manifold

systems, piping, instrumentation and electrical terminations, other than modifications required for the ERD pilot test, were delayed until completion of the ERD field pilot test in January 2008.

Source Area System

The Source Area treatment system was designed to address the high-level adsorbed DNAPL and dissolved-phase contamination in the approximately 1,600 square foot area at the Norge Town facility release area (Figure 2). Most of the below-grade portion of the SEAR system was constructed prior to the determination to abandon implementation of the SEAR component as discussed above. This included installation of six groundwater extraction wells around the perimeter of the Source Area. Three injection wells within the central portion of the source, two hydraulic control wells at each end of the source and twelve monitoring wells (nested completions). The three center injection wells were modified to include nested wells with screens in discrete upper and lower zones. All the SEAR system wells were incorporated into the Source Area ERD system, which consists of four 4-inch diameter extraction wells, three pairs of nested 2-inch diameter injection wells, and four 4-inch diameter injection wells. The wells are oriented with the extraction wells forming the corners of a square and the injection wells forming a cross pattern through the square. The system controls, amendment delivery system, piping manifold and associated instrumentation for the Source Area are shared with the Hotspot system and located in the Hotspot treatment building, located east of the Norge Town facility. The 12 nested monitoring wells were installed to monitor the shallow sand and gravel unit and the deeper fine-grained sand and clayey-sand unit of the Shallow Aquifer in the Source Area.

Hotspot System

The Hotspot treatment system is an ERD recirculation system designed to address the dissolved-phase plume between the Source Area and Hunter Street and encompasses an area of approximately 34,000 square feet (Figure 2). The Hotspot system consists of fourteen 4-inch diameter extraction wells and eighteen 4-inch diameter injection wells. The wells are oriented with the injection wells forming a rough grid with the extraction wells at the center of the grid squares. The system controls, substrate delivery system, piping manifold, and associated instrumentation are in the Hotspot treatment building. A total of 1,150 feet of trenching and 6,000 feet of 1-inch high density polyethylene (HDPE) piping, along with electrical and data lines, were installed to connect the wells to the treatment building.

The Hotspot system was modified in February 2010 after an accumulation of biogenic gasses was discovered at the Source Area/Hotspot treatment areas. High levels (50%+ of the LEL) of explosive biogenic gas were detected in several of the Source Area/Hotspot system remediation well vaults. The accumulation of the biogenic gasses, including methane and hydrogen sulfide, presented a health and safety concern with respect to exposure to toxic and explosive atmospheres. As a result of the discovery, the NMED's RA contractor, AMEC Earth and Environmental, Inc., performed a soil gas investigation, which included the installation of 13 shallow SVE drive point wells within the existing Hotspot extraction/Hotspot injection (HSE/HSI) well vaults.

The SVE drive points consisted of a 1-inch diameter, 18-inch long stainless-steel drive point with

0.10 slot screen. The tip of the extraction point was installed to a depth of approximately two feet below the vault floor and approximately four feet bgs. The vaults where extraction points were installed are HSE-14, HSE- 12, HSE-11, HSE-10, HSI-4, HSI-7, HSI-14, HSI-17, HSI-19, HSI-19, HSI-13, SAE-6, and SAI-4. The drive points were connected to the existing groundwater treatment lines with 1-inch diameter PVC hose and routed through the existing Hotspot manifold. In April 2011, AMEC installed a permanent SVE system using the 13 drive points, the existing Hotspot groundwater extraction piping and manifold system, and a new SVE vacuum blower. The SVE blower was connected to the main trunk line of the manifold. The SVE system was operated in a pulsed mode from late May to October 2011, from June through July 2012, and from November 2012 through January 2013.

Biocurtain System

The Biocurtain treatment system is an ERD recirculation system designed to address the dissolved-phase Shallow Plume near the midpoint of the Shallow Plume approximately 1,500 feet southeast of the Source Area/Hotspot systems. The Biocurtain system is approximately 700 feet across and consists of alternating extraction and injection wells oriented in a line roughly perpendicular to the groundwater flow direction and parallel with U.S. Highway 84/285 (also referred to as State Road 102 (201), Santa Clara Bridge Road and Stanley A. Griego Bridge Road in earlier reports). The system consists of ten 4-inch diameter extraction wells and nine 4-inch diameter injection wells, which are typically screened from approximately nine feet bgs to between 27 to 36 feet bgs depending on the depth of the underlying clay unit. A total of 700 feet of trench and 6,700 feet of one-inch diameter HDPE piping and electrical wiring were installed to connect the wells to the treatment building. The control system, amendment delivery system, piping manifold, and associated instrumentation are in the Biocurtain treatment building, which is located on Santa Clara Pueblo lands at the eastern end of the Biocurtain wells. Five monitoring wells were installed approximately 30 feet downgradient of the Biocurtain in order to observe remediation performance (Figure 3).

Deep Zone System

The original RD specifications for the Deep Zone treatment system called for implementation in a phased approach due to the lack of complete characterization and uncertainty that existed in the four aquifer zones (I1, I2, D1, and D2) of the Deep Zone. Information obtained during the initial phase of treatment would be used to determine the optimum injection rates, the injection periods, the spacing of injection and monitoring wells, and the optimum formulation of electron donor substrate that would be used to install the remaining injection wells and expand the treatment system. It was also anticipated that active dispersal of the substrate (i.e. recirculation) would be designed and implemented for the Deep Zone after the initial steps described in this section produce a more firm basis for design. The initial implementation phase did not emphasize the I1 and I2 zones due to the relatively low contaminant concentrations (less than 20 µg/L) as compared to the D1 and D2 zones (less than 500 µg/L) at the time of the RD and RA implementation. As a result, only two ERD substrate injection wells were installed and both ended up being installed outside of the high concentration area.

The Deep Zone treatment system included installation of six Deep Zone substrate injection wells, conversion of four existing wells for injection purposes, and installation of 10 additional monitoring wells that would be used to measure remedial progress near each of the injection wells. Well construction for the Deep Zone was generally consistent with the design drawings. The Deep Zone ERD injection wells are intended to address the contamination present in the deeper areas of the aquifer. The shallowest wells (I1 wells) have screen sections that span 50-70 feet bgs, whereas the deeper wells in the D1 and D2 zones are screened between intervals from 155-200 feet and 225-265 feet bgs, respectively. The Deep Zone injection wells consists of four 3-inch diameter and six 2-inch diameter wells. The injection wells are mostly situated in the Plaza de Española: DI-1(I1, D1 and D2) and DI-2 (I1, D1, and D2), R-20 and R-21, and one injection well to the south (R-15) and two to the southeast: R-09 (D1 & D2) (Figure 4).

In contrast to the other three systems, the Deep Zone does not have a constructed amendment delivery system (i.e., piping, controls, etc.). Substrate delivery for the Deep Zone is performed at the individual wellhead using a mobile system consisting of a 3,000-gallon water truck and a water-powered dose metering pump (Dosatron®) that proportionally mixes the amendment (from an undiluted source) into water from a tanker truck. The truck is moved between individual wells for injection of the substrate solution. Construction details for each of the remedy components are included in the Remedial Action Construction As-Built Report, dated December 2009. The Site achieved construction completion status when the Preliminary Close-Out Report was signed by the EPA on June 30, 2008.

System Operation/Operation and Maintenance

This section discusses historical Site operations and operation and maintenance (O&M) activities that were performed prior to the beginning of this FYR. The Site operated for approximately two full years prior to FYR period following the completion of a seven-month long ERD pilot test that was conducted at the Source Area/Hotspot treatment areas beginning in June 2007. The pilot test was conducted at four separate test cells using four different electron donor substrates – ethyl lactate, dairy whey, emulsified vegetable oil (EVO) and EVO plus hydrogen gas infusion. Based on the pilot test results, EVO plus a nutrient mixture was selected for full-scale operations. Full-scale operation of the four treatment systems (Source Area, Hotspot, Biocurtain and Deep Zone) began in April 2008. To date, there have been four rounds of electron donor substrate injections completed in the Hotspot area, five rounds at both the Source Area and Deep Zone, and eight rounds of injections completed at the Biocurtain. The last substrate injection at the Hot Spot area was completed in August 2009 with termination of the Hot Spot groundwater recirculation in February 2010. The last Deep Zone and Source Area injections were completed in November 2012 and April 2013, respectively. The last round of substrate injections at the Biocurtain were completed between December 2012 and April 2013.

A total of 2,186,000 gallons of groundwater were recirculated at the Source Area between April 2008 and June 2010. The Source Area groundwater recirculation was limited to shorter periods during and immediately following substrate injections due to the shared manifold system between the Source Area and Hot Spot treatment systems. A total of 5,271,000 gallons of groundwater was recirculated in the Hot Spot treatment area and 13,775,000 gallons was recirculated at the Biocurtain system from April 2008 to June 2010.

The recirculation systems have required extensive maintenance to prevent biological fouling and clogging of the pumps, wells, and associated conveyance piping and manifolds. Soon after injection of the first dose in April 2008, the lines in the extraction and injection manifolds at the Hot Spot area and Biocurtain started to become clogged due to biological fouling and the flow rates through the manifold could not be maintained as designed. Initial modifications to the Source Area/Hot Spot and downgradient Biocurtain treatment systems involved replacing the Kates® flow controllers with gate valves and replacing the 50-micron strainer elements with 500 micron elements.

The galvanized drop tube lines on the extraction pumps had shown signs of corrosion and were replaced with HDPE piping and quick connections. The new connections allowed for easier access for pump maintenance and removal, and assisted in reducing maintenance costs by allowing for pumps to be removed by hand and cleaned when not in use.

Servicing of the lines and pumps included a high-pressure jetting of the injection and extraction well screens, removal and cleaning of the pumps, and flushing the extraction/injection lines and manifold systems with an OxiClean® solution, followed by freshwater purge to remove bacterial growth and clogging. The well rehabilitation and cleaning will be required prior to each round of amendment injections.

Operational and Performance Monitoring

Operational system performance monitoring, as well as overall plume monitoring, have been performed at the Site. The RA contractor performed six groundwater and system sampling events during the first eighteen (18) months of LTRA to evaluate system performance in meeting the RAOs and cleanup levels established in the ROD. The monitoring events occurred after approximately 60, 90 and 120 days of system operations, as established in the contactors performance demonstration work plan and at the end of the first year LTRA operations and quarterly during the subsequent six months of LTRA. In addition, NMED has conducted semi-annual to annual groundwater monitoring throughout the plumes since February 2006.

Construction and LTRA Costs

The costs discussed in this section reflect construction and LTRA contractor costs only in order to compare project costs with the ROD and RD estimates. The table below provides a summary of the costs for each major component and a comparison of the actual costs with the ROD estimate of the project costs.

Summary of Construction and LTRA Costs

Cost Item	ROD Estimate (2000 $$)	ROD Estimate (2005 $$) [1]	Remedial Design Costs (2002)	Actual Cost
RA Capital Costs	$3,049,000	$4,276,380	$3,837,072	$3,613,000

SEAR evaluation and ERD Pilot Test	Not Included	Not included	Not included	$ 730,000
LTRA Costs (per year)	$206,500	$290,000	$482,382 (yrs. 1-5) $355,490 (yrs. 6–30)	1st yr. - $510,000 [2] 2nd yr. - $506,400 $450,000 (yrs. 3-10)

Notes:

[1] ROD costs adjusted from FY2000 dollar costs to FY2005 dollar costs using 7% annual inflation rate.

[2] First year LTRA based on system shakedown and modifications and 3 amendment injections

The original cost estimate to implement the RA as presented in the ROD was $5.82 million dollars (net present worth for year 2000). This was broken out to include $3.0 million dollars for construction and $206,500 for annual LTRA. Updating the ROD estimate to 2005 net present worth using a 7% inflation rate increased the construction costs estimate to $4.28 million dollars and $290,000 for annual LTRA. The total capital construction cost, including the NMED's engineering oversight contactor, was $3,613,000.

The NMED has been performing the LTRA groundwater monitoring program with Superfund Oversight Section staff and utilizing the EPA's contract laboratory program for sample analysis. The average annual cost for the NMED's groundwater monitoring and project management oversight is approximately $100,000 per year.

Figure B-1 - Project Location, Site Area, and Pertinent Details Maps

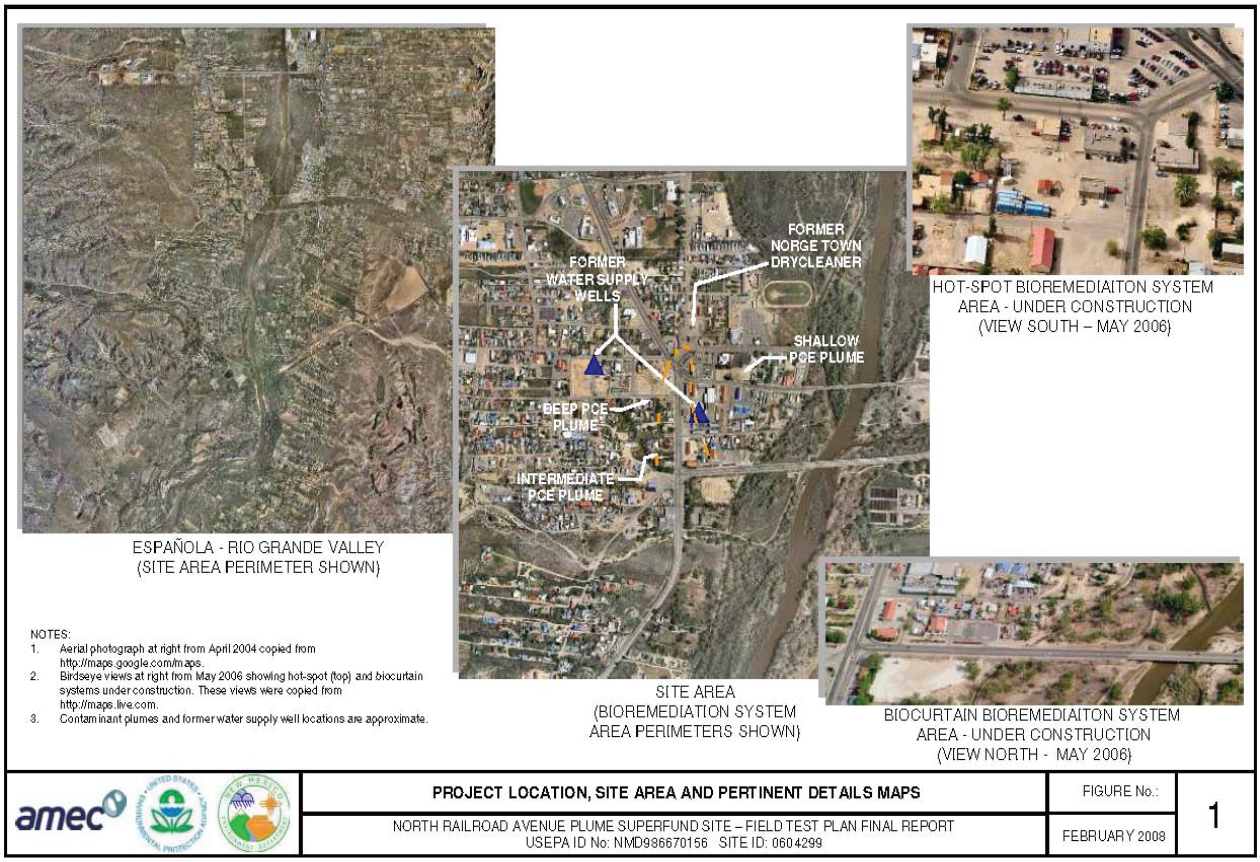
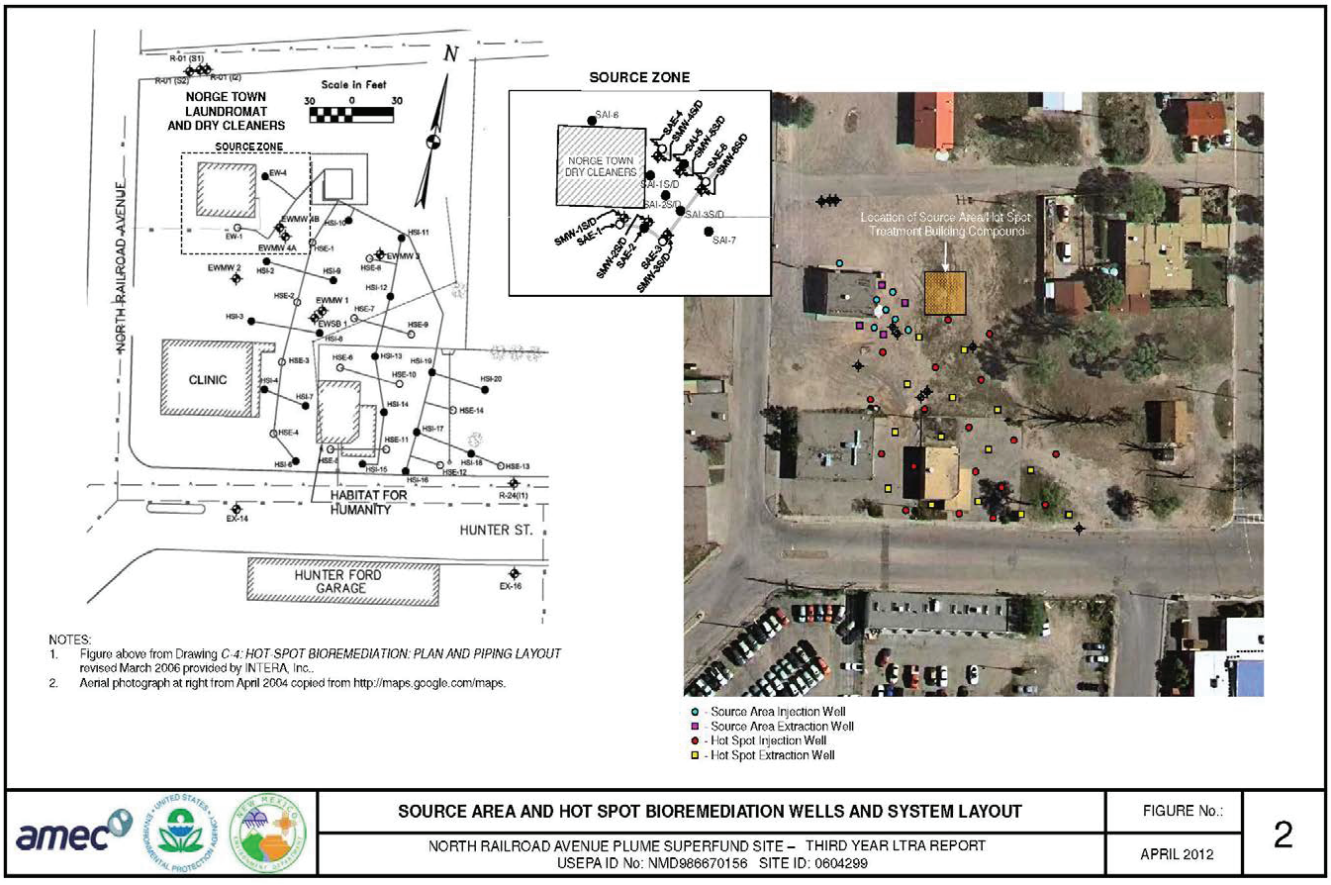


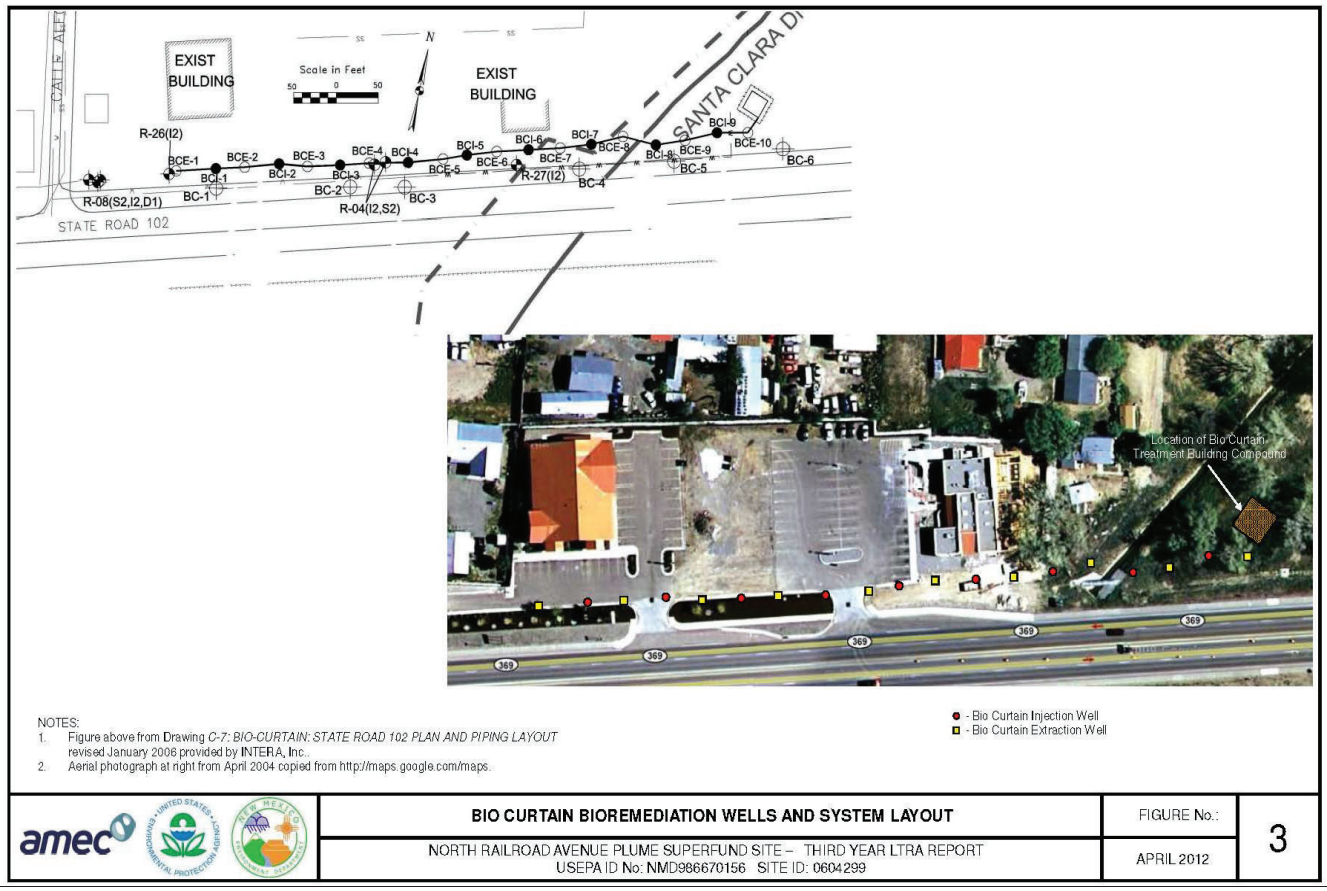
Figure B-2 - Source Area and Hotspot Bioremediation Wells and System Layout



NOTES:
1. Figure above from Drawing *C-4: HOT SPOT BIOREMEDIATION: PLAN AND PIPING LAYOUT* revised March 2006 provided by INTERA, Inc..
2. Aerial photograph at right from April 2004 copied from http://maps.google.com/maps.

amec	SOURCE AREA AND HOT SPOT BIOREMEDIATION WELLS AND SYSTEM LAYOUT	FIGURE No.: 2
	NORTH RAILROAD AVENUE PLUME SUPERFUND SITE – THIRD YEAR LTRA REPORT USEPA ID No: NMD986670156 SITE ID: 0604299	APRIL 2012

Figure B-3 - Bio Curtain Bioremediation Wells and System Layout

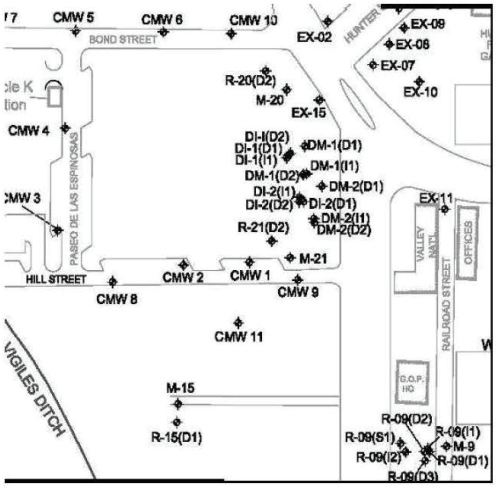


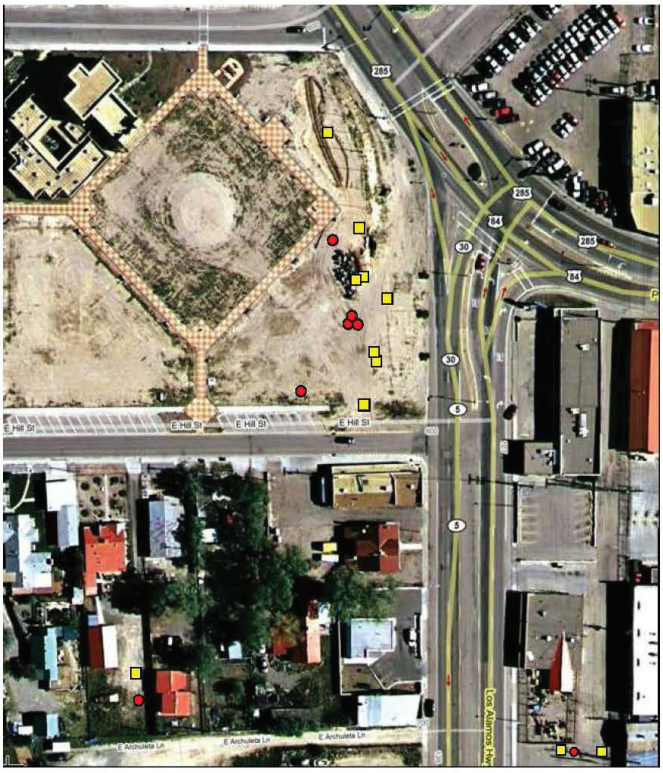
NOTES:
1. Figure above from Drawing *C-7: BIO-CURTAIN: STATE ROAD 102 PLAN AND PIPING LAYOUT* revised January 2006 provided by INTERA, Inc.
2. Aerial photograph at right from April 2004 copied from http://maps.google.com/maps.

- Bio Curtain Injection Well
- Bio Curtain Extraction Well

amec	BIO CURTAIN BIOREMEDIATION WELLS AND SYSTEM LAYOUT	FIGURE No.: 3
	NORTH RAILROAD AVENUE PLUME SUPERFUND SITE – THIRD YEAR LTRA REPORT USEPA ID No: NMD986670156 SITE ID: 0604299	APRIL 2012

Figure B-4 - Deep Zone Bioremediation Wells Layout



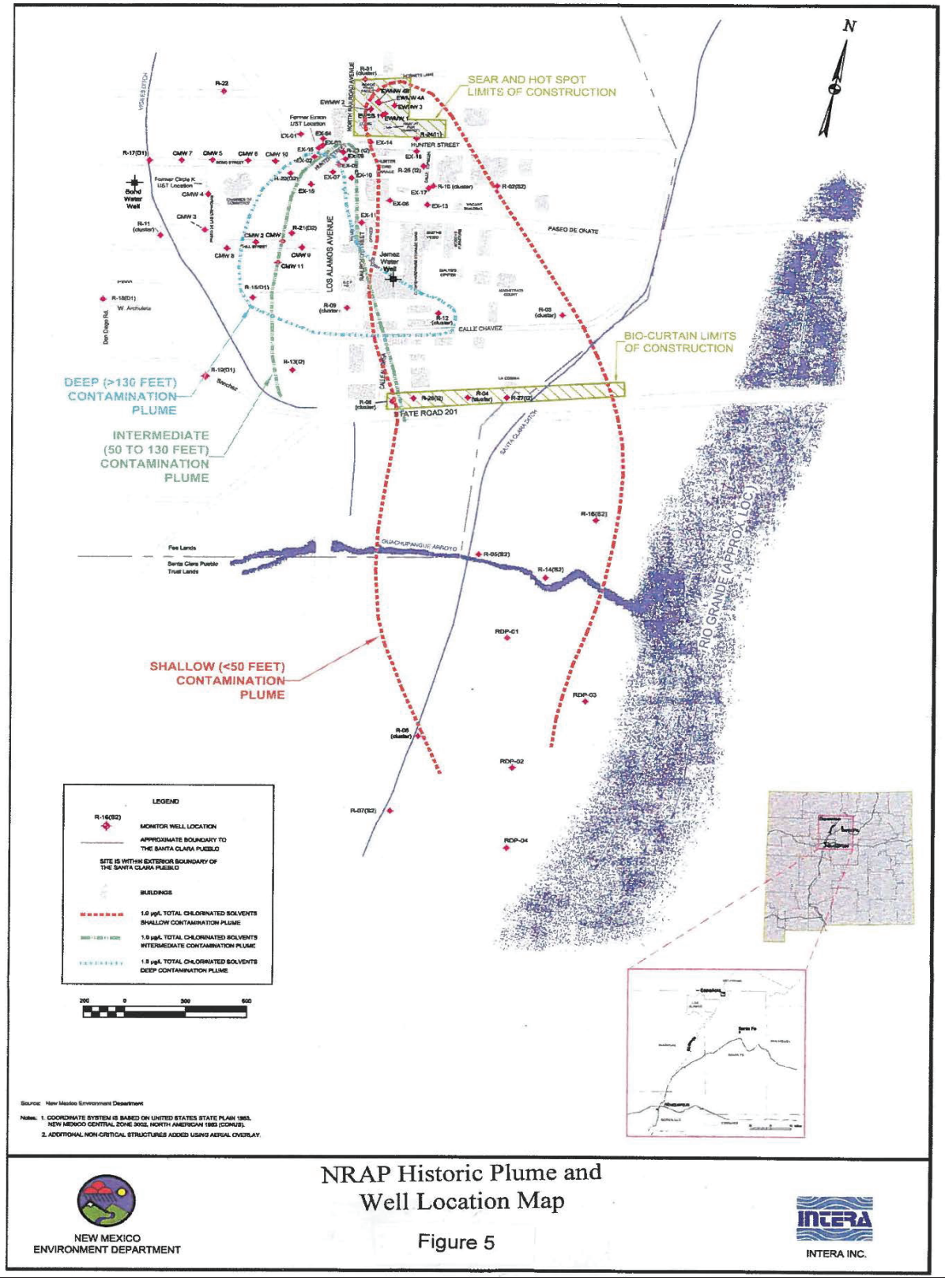


NOTES:
1. Figure above from *North Railroad Avenue Plume Basemap, Sections 2 & 3* revised January 2008 provided by INTERA, Inc.
2. Aerial photograph at right from April 2004 copied from http://maps.google.com/maps.

- Deep Zone Injection Well
- Deep Zone Monitoring Well

amec	**DEEP ZONE BIOREMEDIATION WELLS LAYOUT**	FIGURE No.: 4
	NORTH RAILROAD AVENUE PLUME SUPERFUND SITE – THIRD YEAR LTRA REPORT USEPA ID No: NMD986670156 SITE ID: 0604299	APRIL 2012

Figure B-5 - North Railroad Avenue Plume Monitor Well Location Map



NRAP Historic Plume and Well Location Map

Figure 5

NEW MEXICO ENVIRONMENT DEPARTMENT

INTERA INC.

Figure B-6 - Shallow Aquifer Potentiometric Surface Contour Map

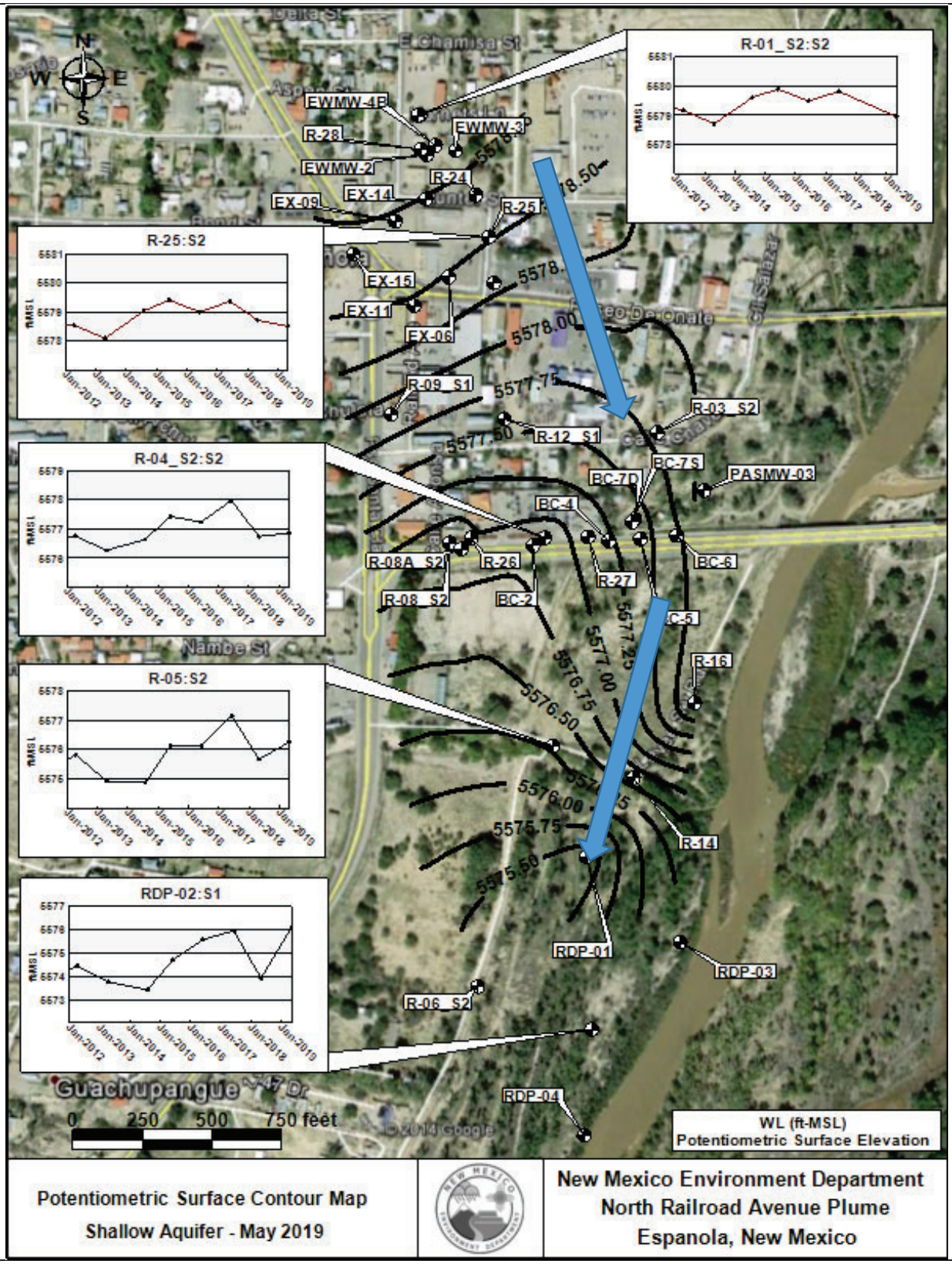


Figure B-7 - Intermediate (I1) Aquifer Potentiometric Surface Contour Map

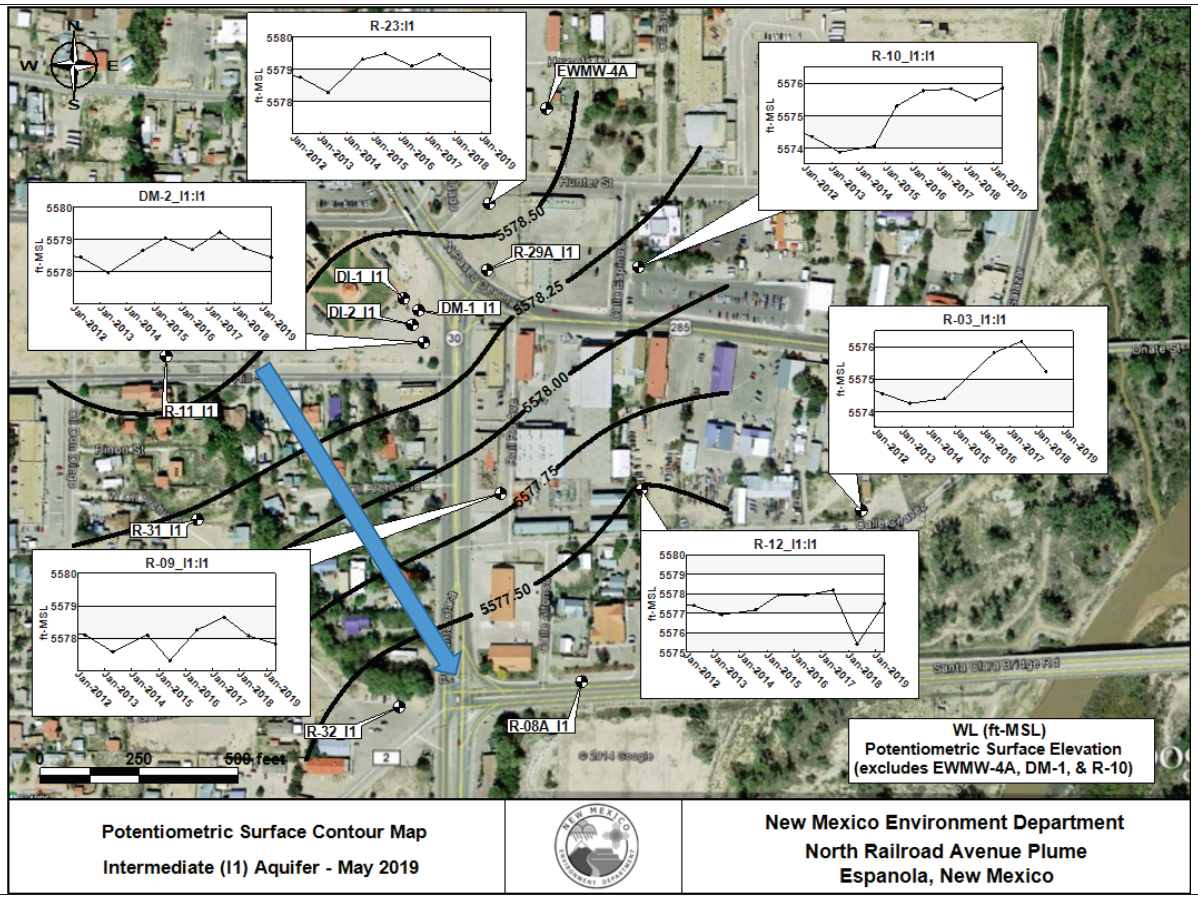


Figure B-8 - Intermediate (I2) Aquifer Potentiometric Surface Contour Map

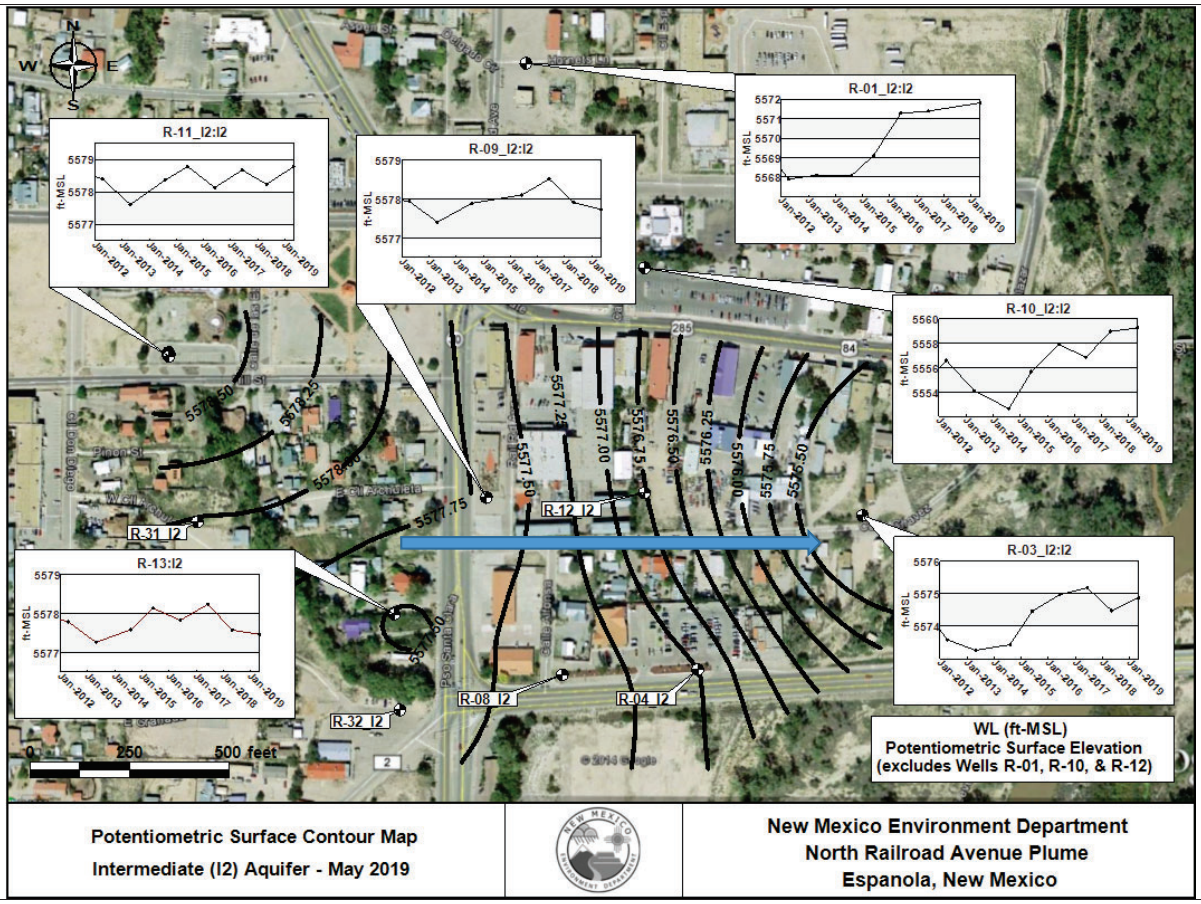


Figure B-9 - Deep (D1) Aquifer Potentiometric Surface Contour Map

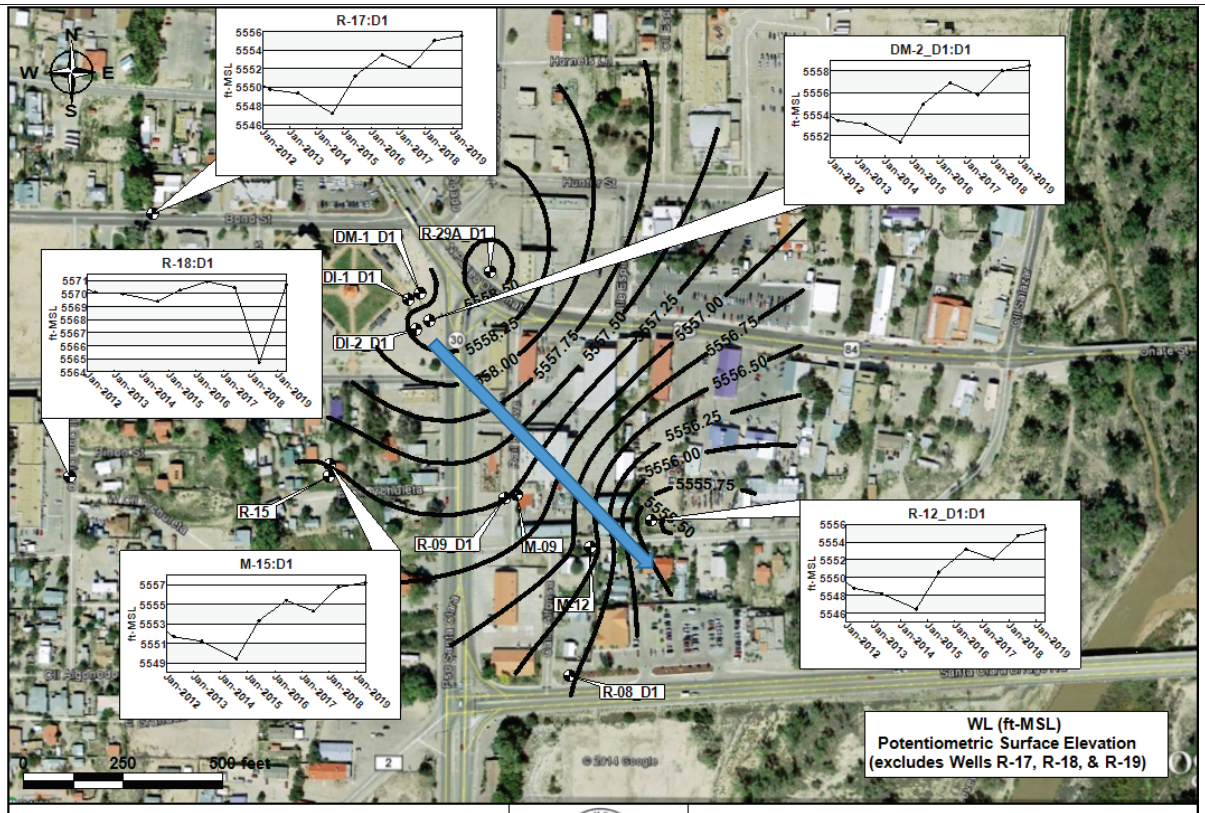
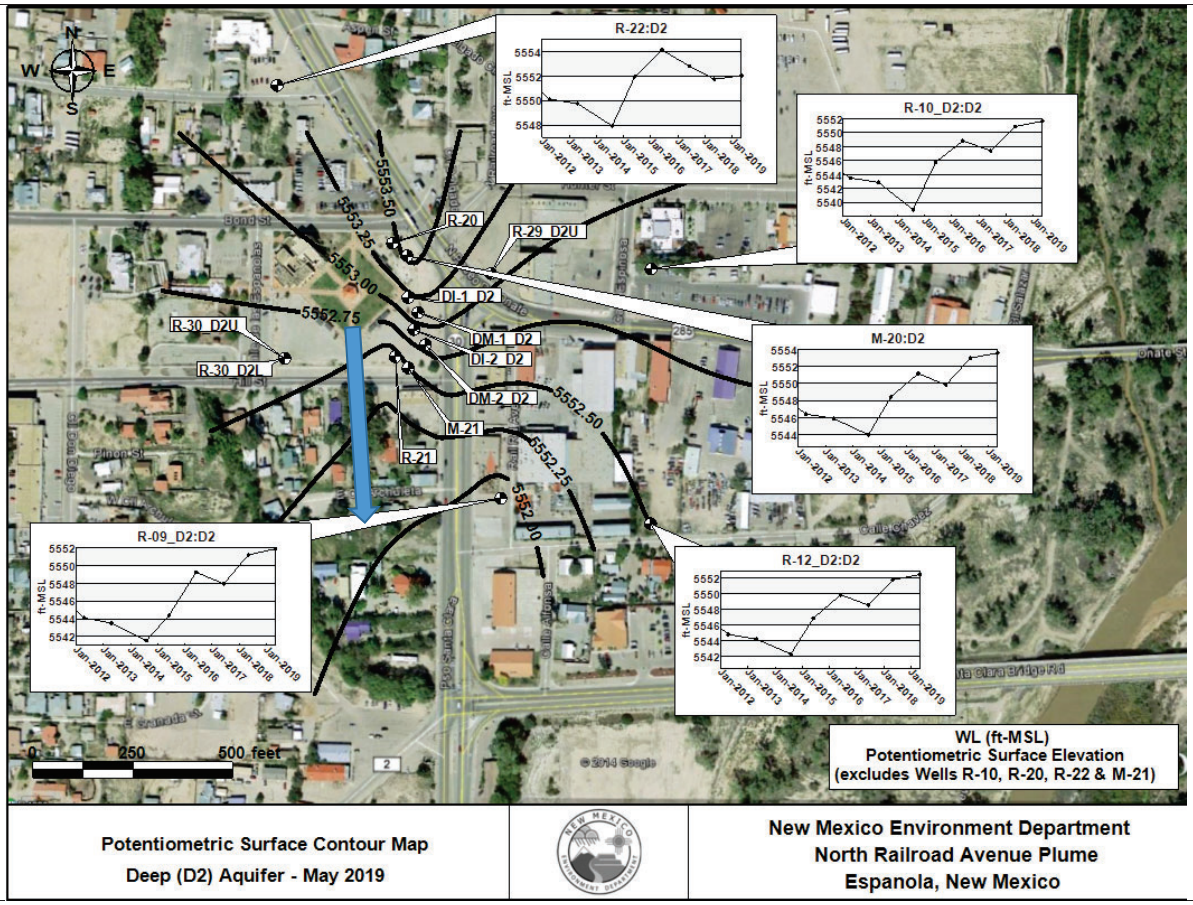


Figure B-10 - Deep (D2) Aquifer Potentiometric Surface Contour Map



Potentiometric Surface Contour Map Deep (D2) Aquifer - May 2019		New Mexico Environment Department North Railroad Avenue Plume Espanola, New Mexico

APPENDIX C – DATA REVIEW

Data Review

Data reviewed for the FYR consisted of review and interpretation of all analytical results for performance monitoring of the ERD treatment systems and the annual Site wide groundwater monitoring program and the indoor air monitoring program. The shallow groundwater monitoring program during this FYR period included up to: 12 wells within the Source Area; 5 wells within the Hotspot treatment area; 10 wells within the Biocurtain treatment area, and 22 additional wells distributed across the Shallow Plume. In addition, up to 18 I1 and I2 wells and up to 19 D1 and D2 wells are included in the Deep Zone groundwater monitoring program. The following sections provide information on the groundwater and indoor air monitoring data that were collected and reviewed for this FYR.

Shallow Aquifer Plume

Shallow Aquifer wells (S1 and S2 zones) were sampled in June 2015, June 2016, June 2017, May 2018, and May 2019. Additional sampling of a limited number of wells occurred in January and September 2019. Based on comparison of historical data (Figure B-5) and the 2019 results (Figure C-1), the Shallow Aquifer plume is not expanding. Overall, the areal extent of the Shallow Plume has been reduced particularly in the northern third of the plume where concentrations within the Shallow Plume have decreased significantly since the ERD treatment began in April 2008. The Shallow Aquifer plume is undergoing active biodegradation through ERD within and downgradient of both the Source Area/Hotspot and Biocurtain treatment systems. Rebound in contaminant concentrations in the Shallow Aquifer at the Source Area, in a limited number of monitoring wells, is discussed below. Shallow Aquifer sampling and analysis is discussed in the following subsections.

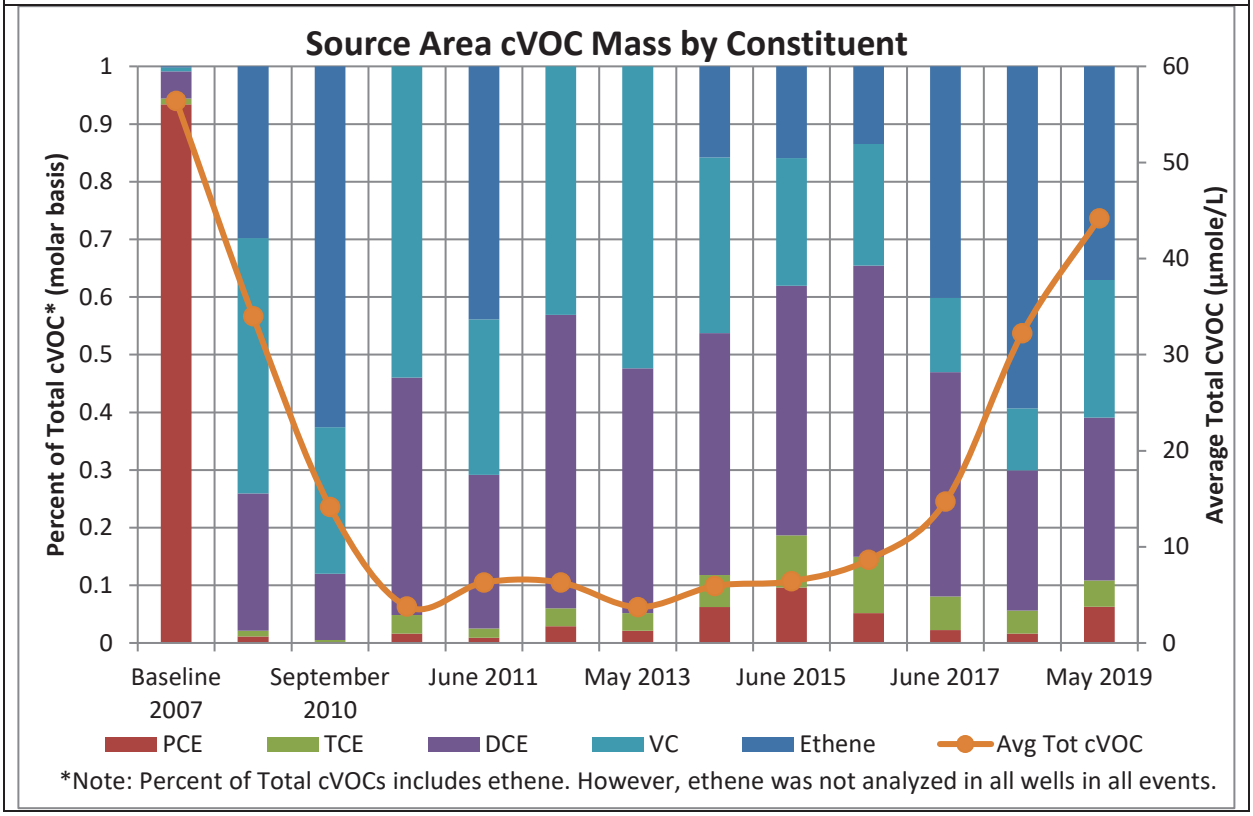
Source Area GroundWater

Source Area monitoring is performed at nine monitoring wells that were installed during the RA phase. These wells are completed within two stratigraphic units within the Shallow Aquifer. Two wells (SMW-3S and SMW-4S) are screened within the shallow coarse-grained sand and gravel unit from approximately 8 to 18 feet bgs, and six wells (SMW-1D, 2D, 3D, 4D, 5D, and 6D) are screened within the fine-grained sand and clay from approximately 20 to 25 feet bgs. In addition, one historic well, EWMW-4B, installed during the Site Inspection phase, is used to monitor the ERD remediation progress within the Source Area. Additional monitoring wells (SMW-7D, SMW-8D and SMW-29D) were installed in April 2017, September 2017 and May 2017, respectively, and were included in the Source Area monitoring for the May 2018 and May 2019 groundwater sampling events.

Historically, PCE concentrations greater than 40,000 µg/L (40,000 µg/L in EWMW-4B (May 2002), 47,000 µg/L in SMW-3D, and 65,000 µg/L in SAI-2D (January 2007)) were detected in the Source Area, with the highest concentrations and mass occurring within the deeper, less permeable fine-grained unit. In addition, an estimated 27 gallons (365 lbs) of residual DNAPL was present in the Source Area, based on the RI investigation. Prior to the start of remediation efforts in June 2007 (pilot test), the January 2007 baseline groundwater sampling results indicated the total average COC mass from the 12 monitoring wells was 56.4 micro moles per liter (µmole/L). By the beginning of this FYR period (July 2015), the contaminant mass had been reduced by 89% to 6.4 µmole/L. A trend reversal from

decreasing to increasing contaminant mass is observed beginning in 2016, due primarily to a rebound in contaminant concentrations in monitoring wells SMW-2D, SMW-3D, and SMW-8D. As of May 2019, the Source Area contaminant mass has increased to approximately 44 µmole/L, which is believed to be due to "back diffusion" of adsorbed and dissolved-phase PCE in the Shallow Aquifer at the Source Area, from approximately 20 to 28 feet bgs. The composition of the contaminant constituents has also changed because of the ERD treatment, and indicates that complete dechlorination is occurring. The results from the 2007 baseline sampling showed approximately 93% of the contamination was comprised of PCE. By February 2011, approximately 95% of the mass was characterized as PCE daughter products DCE (41%) and VC (54%). During the May 2019 sampling event, the PCE mass was 6.3% and TCE mass was 4.6% of the total. Approximately 52% of the mass in 2019 remains as PCE daughter products created by the ERD treatment, DCE (28.2%) and VC (23.9%), with the remaining 37% of the mass as the final nonhazardous breakdown constituent of ethene (Graph C-1).

Graph C-1 – Source Area cVOC Mass by Constituent



The highest COC concentrations within the Source Area occur in the less permeable lower unit of the Shallow Aquifer from approximately 20 to 28 feet bgs. During the baseline sampling in January 2007, PCE concentrations ranged from 2.0 µg/L to 65,000 µg/L and TCE ranged from less than 1.0 µg/L to 260 µg/L. Cis-1,2-dichloroethylene concentrations were below 10 µg/L and tDCE and VC concentrations were below the laboratory method detection limits (Table 4). By November 2009, PCE concentrations had decreased to 350 µg/L (SMW-6D), while the PCE daughter products, cDCE and VC, had increased to 5,600 µg/L (SMW-6D) and 11,000 µg/L (SMW-1D), respectively.

Analytical results from the FYR period show that most of the contamination occurs in four wells (SMW-1D, SMW-3D, SMW-6D, and SMW-8D). Since the end of the last FYR period, PCE concentrations increased from 140 µg/L to 4,900 µg/L in SMW-3D but decreased from 256 µg/L to 29 µg/L in SMW-1D and decreased from 87 µg/L to 24 µg/L in SMW-6D. Trichloroethene concentrations decreased from 134 µg/L to 28 µg/L in SMW-1D, increased from 100 µg/L to 2,900 µg/L in SMW-3D, and decreased from 110 µg/L to 24 µg/L in SMW-6D. The cDCE concentrations increased from 156 µg/L to 160 µg/L in SMW-1D, increased from 560 µg/L to 10,000 µg/L in SMW-3D, and decreased from 480 µg/L to 26 µg/L in SMW-6D. Trans-1,2-chloroethylene concentrations during the FYR period were below 100 µg/L, except for SMW-3D, which increased from 43 µg/L to 310 µg/L. Finally, VC concentrations decreased from 464 µg/L to 71 µg/L in SMW-1D, increased from 220 µg/L to 6,300 µg/L in SMW-3D, and decreased in SMW-6D from 210 µg/L to 16 µg/L (Figure C-12). In addition, an increase in daughter product concentrations is noted in SMW-2D, with cDCE and VC increasing from non-detect to 2,070 µg/L and 1,190 µg/L, respectively. Tetrachloroethene and TCE were not detected (above the laboratory method detection limit) in SMW-2D during the FYR period except for a J-flagged (estimated) detection of TCE (0.12 µg/L) in June 2017. Well SMW-8D was installed approximately 25 feet downgradient of SMW-3D and was included in the 2018 and 2019 events. Between May 2018 and May 2019, PCE in SMW-8D increased from 55 µg/L to 570 µg/L, TCE increased from 82 µg/L to 210 µg/L, cDCE increased from 210 µg/L to 1,700 µg/L, tDCE decreased from 38 µg/L to 33 µg/L, and VC increased from 82 µg/L to 270 µg/L.

The current Source Area/Hotspot Shallow Aquifer cVOC isoconcentration contour map is shown on Figure C-12. Within the Shallow Aquifer, PCE, TCE and cDCE were detected in samples from five of the six monitoring wells during the January 2007 baseline sampling. Tetrachloroethene concentrations ranged from 1.2 µg/L to 1,400 µg/L, TCE concentrations ranged from 1.8 µg/L to 280 µg/L, and cDCE ranged from 4 µg/L to 2,200 µg/L. Trans-1,2-dichloroethylene and VC were not detected above the laboratory method detection limits. Results from the six shallow zone wells over the six sampling events, beginning in November 2009 through May 2013, showed that all cVOCs were below the Site cleanup levels except VC. Consequently, beginning in June 2014, only two of the six shallow zone monitoring wells have been sampled. As of May 2019, PCE was not detected above the Remediation Goal of 5.0 µg/L for PCE and VC was detected at 6.1 µg/L in the sample from SMW-3S. The concentrations of all other COCs were below the Site cleanup levels.

Although there has been an increase in cVOC concentrations and mass during this reporting period, the continued presence of ethene indicates that complete dechlorination is sustained within the Source Area treatment zone (Graph C-1). However, although ERD is sustained, rebound in concentrations in some Source Area wells indicates that additional substrate is needed to increase the ERD effectiveness within the Source Area.

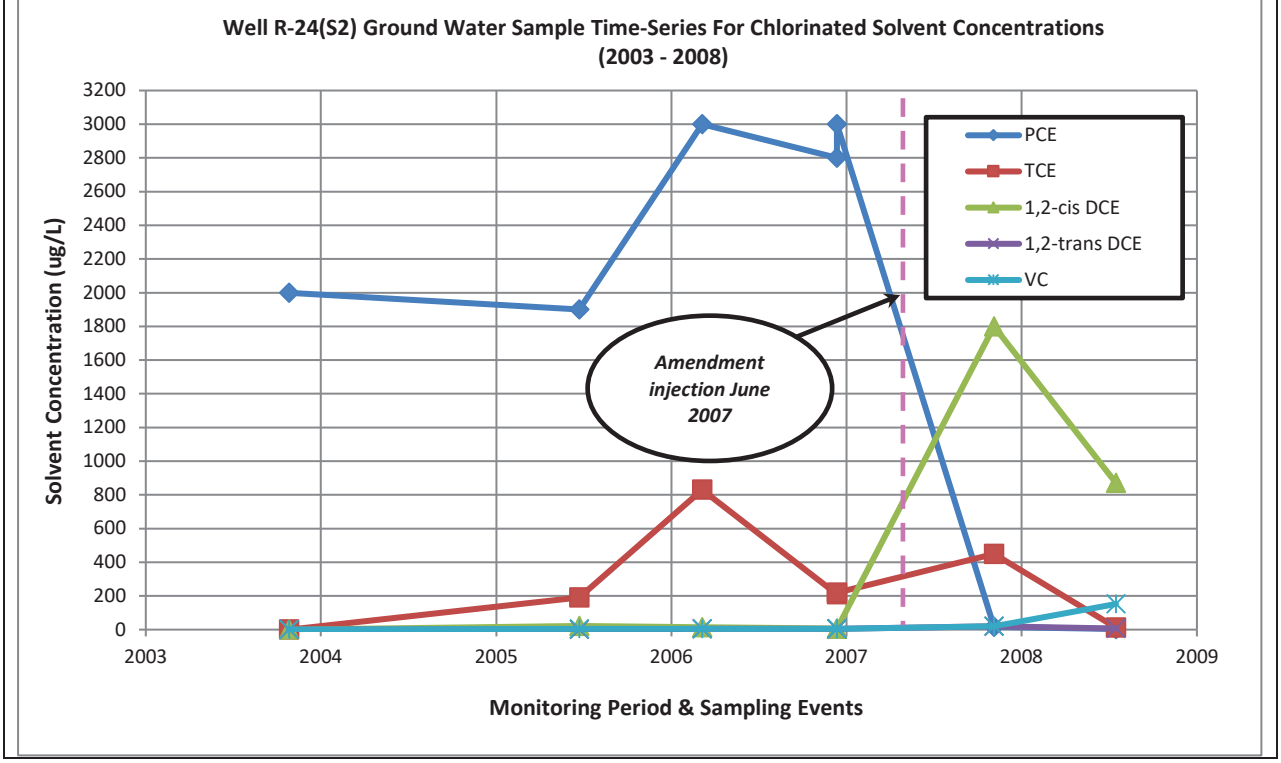
Hotspot Ground Water

The current primary objective of the Hotspot monitoring program is to determine if rebound of cVOCs is occurring within this treatment area where the last substrate injection was performed in August 2009. The current Hotspot monitoring program consists of five former treatment system wells (HSI-7, HSI-9, HSE-6, HSE-10, and HSE-14) that transect the middle of the Hotspot treatment area and two monitoring wells, EWMW-2 and EWMW-3 (Figure 2 and Figure 11a).

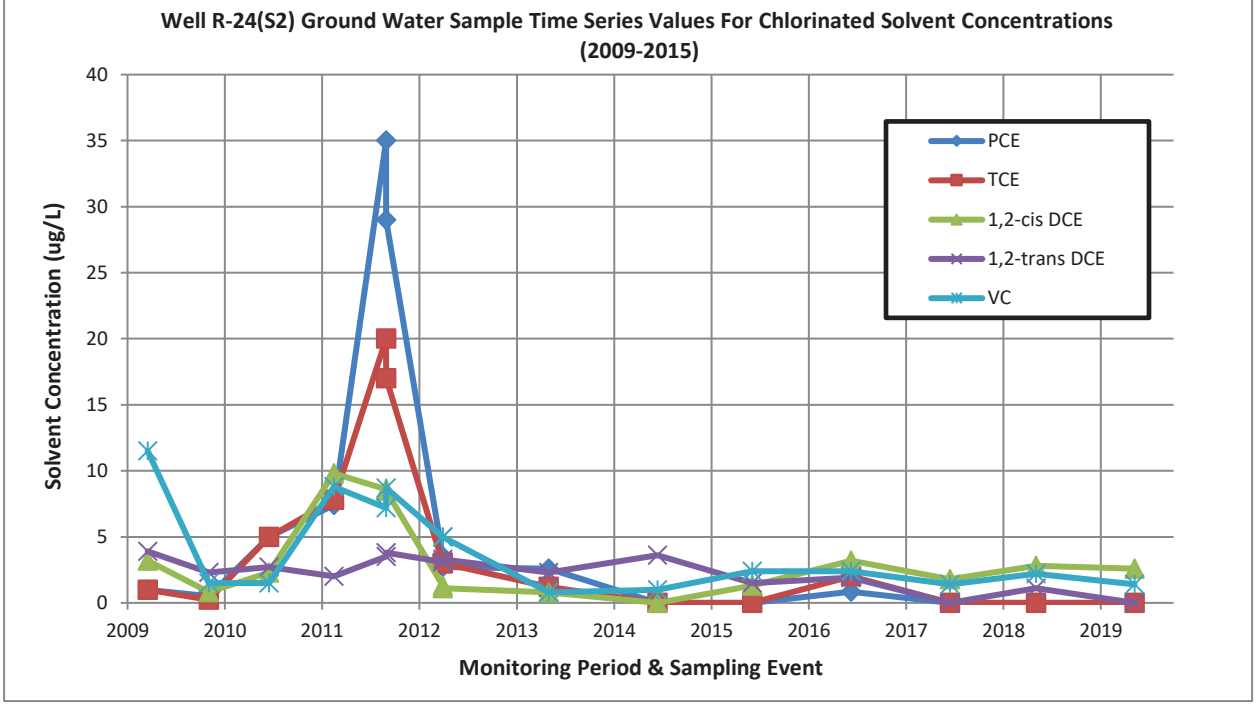
In October 2009, a comprehensive round of sampling of 22 of the Hotspot extraction (HSE) and injection (HSI) wells showed that all cVOCs except VC were below Site cleanup levels. Tetrachloroethene and TCE were below the laboratory method detection limit of 1.0 µg/L, cDCE was detected in two (2) wells at less than 10 µg/L, and tDCE was detected in all 22 wells at less than 11 µg/L. Vinyl chloride was detected above the Remediation Goal of 1.0 µg/L in five of the 22 wells at a maximum concentration of 3.8 µg/L. In the most recent sampling (June 2014) prior to this FYR, analytical results indicated that all cVOCs remained below the cleanup levels. During this FYR period, VC was detected above the Site Remediation Goal of 2.0 µg/L for VC, at a maximum of 3.4 µg/L, in one of the five Hotspot remediation wells sampled and at a maximum of 120 µg/L in EWMW-2 (both in June 2016). Results from the June 2017 sampling event detected VC in two Hotspot remediation wells at 1.2 and 2.6 µg/L. All cVOC constituents were detected at EWMW-2 during the June 2017 event. Tetrachloroethene and TCE were detected below the cleanup levels at 1.2 µg/L and 3.6 µg/L, respectively, while cDCE (76.5 µg/L) and VC (101 µg/L) were detected above their cleanup levels. The June 2017 data are consistent with results dating back to October 2009 except for EWMW-2. Results from the May 2018 groundwater sampling showed the detection of VC in two Hotspot remediation wells at 1.6 µg/L (HSE-6) and 2.6 µg/L (HSI-9). Other cVOC constituents were either non-detect or below the cleanup levels during the May 2018 event. Wells HSI-9 and EMMW-2 were the only Hotspot wells sampled during the May 2019 sampling event. No cVOCs were detected in HSI-9. Cis-1,2-dichloroethylene (1.5 µg/L), tDCE (2.8 µg/L) and VC (1.3 µg/L) were detected in EMMW-2. Analytical results continue to indicate that rebound is not occurring in the Hotspot area. The increased concentrations of cVOCs at EWMW-2 observed in June 2017 were not observed during the 2018 or 2019 sampling events.

The effects from the ERD Hotspot treatment have been observed as far south as Paseo de Oñate, approximately 400 feet downgradient from the Hotspot treatment area. Changes in concentrations and contaminant profiles in samples collected from four wells (R-24(S2), EX-16, R-25(S2), and EX-13), at increasing distances from the Hotspot treatment area have been observed (Table C-3). Graph C-2, Graph C-3, and Graph C-4 provide visual presentation of contaminant trends over time at well R-24(S2), located just downgradient of the Hotspot treatment area, and well EX-13, located approximately 400 feet downgradient from the Hotspot.

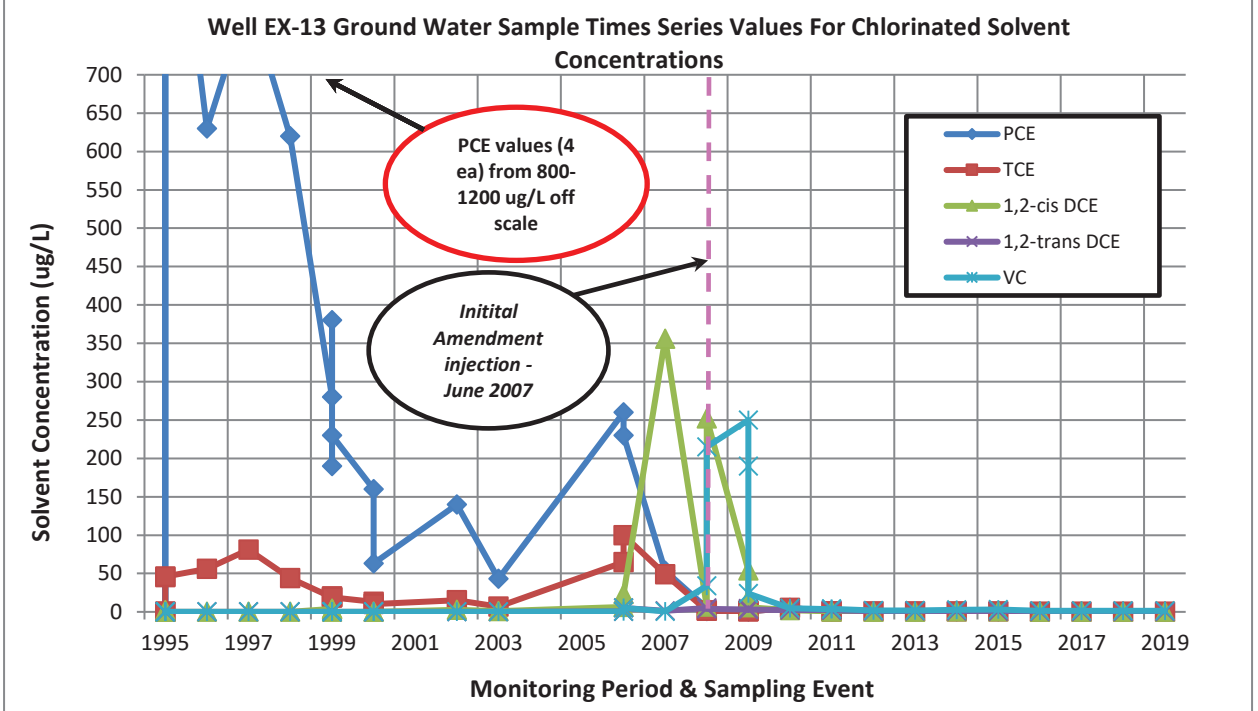
Graph C-2 – Well R-24(S2) Chlorinated Solvent Concentrations (2003-2008)



Graph C-3 - Well R-24(S2) Chlorinated Solvent Concentrations (2009-2019)



Graph C-4 – Well EX-13 Chlorinated Solvent Concentrations



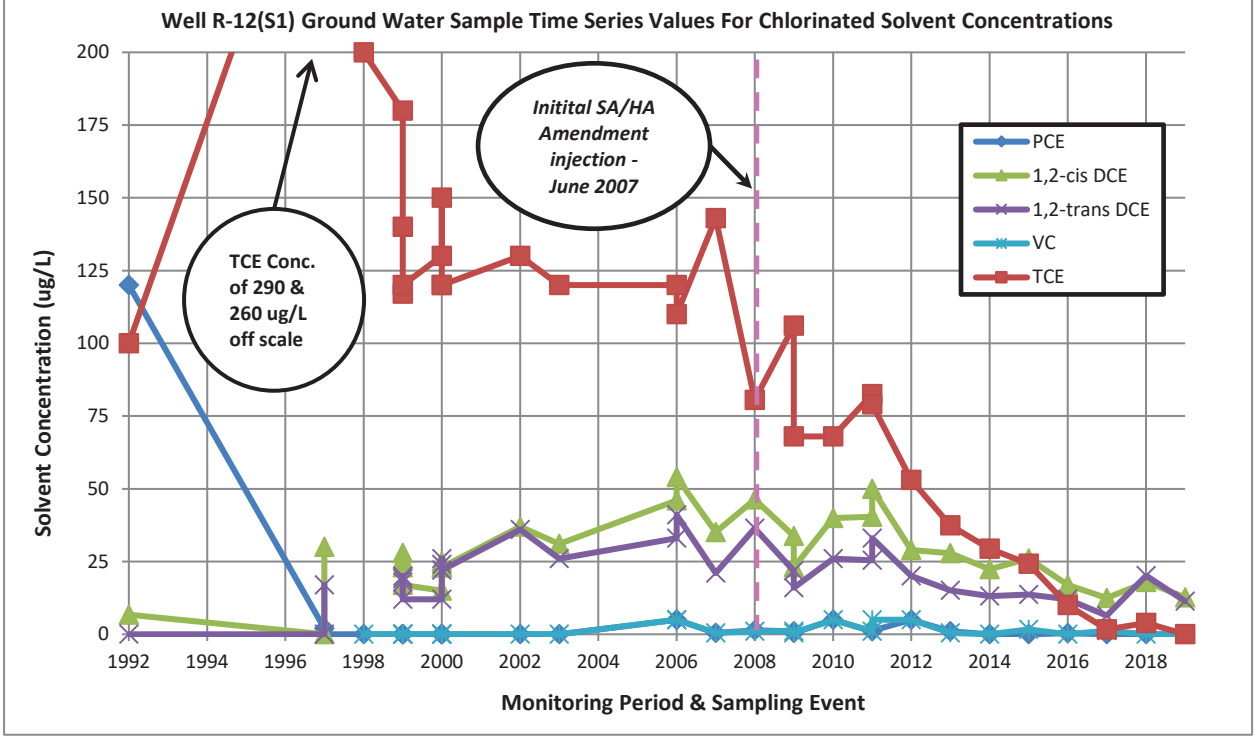
Tetrachloroethene concentrations historically exceeded 200 µg/L in all four wells prior to ERD substrate injections in May/June 2007 (Field Test Plan), but PCE levels are currently less than 1.0 µg/L. Trichloroethene has also decreased from between 36 µg/L and 830 µg/L prior to ERD treatment in 2007 to less than 1.0 µg/L in all wells with the exception is R-25(S2) with TCE of 5.0 µg/L (May 2018). The cDCE concentrations, which initially increased to as high as 1,800 µg/L after initiation of the ERD remediation system, have decreased to less than 10 µg/L in all wells. Vinyl chloride concentrations, which had increased in all four wells from less than 0.5 µg/L to between 143 µg/L to 660 µg/L shortly after remediation began, have decreased during the last nine sampling events except for R-25(S2), which increased in 2015 to 9.7 µg/L. Vinyl chloride concentrations in R-25(S2) has since decreased to 1.2 µg/L as of May 2018. Vinyl chloride was detected in three of the four wells during the most recent sampling event at concentrations ranging from 1.2 µg/L to 1.8 µg/L. The increase in PCE daughter products, followed by a decrease in the same daughter product concentrations, indicates complete ERD is occurring downgradient of the Source Area and Hotspot treatment areas.

Central Shallow Plume

Monitoring well R-12(S1) is the only well located in the middle portion of the Shallow Plume, approximately 1,000 feet downgradient of the Source Area and 500 feet upgradient of the Biocurtain treatment system. Historically, PCE has nearly completely degraded to TCE, cDCE and tDCE daughter products at this well location. Trichloroethene concentrations from samples collected from this well have continued to decrease while the cDCE and tDCE concentrations have remained consistent over time. Vinyl chloride was detected for the first time in the June 2015 sampling event above the laboratory method detection limit and above the Remediation Goal of 2.0 µg/L and is an indication that

groundwater treated at the Hotspot was beginning to migrate (flow) past this location. The May 2019 sample results showed PCE at less than 1.0 µg/L, TCE at less than 1.0 µg/L, cDCE at 12.7 µg/L, tDCE at 11.4 µg/L and VC at less than 1.0 µg/L. Trichloroethene has been below the Remediation Goal of 5.0 µg/L since the June 2017 sampling event (Table C-3 and Graph C-5).

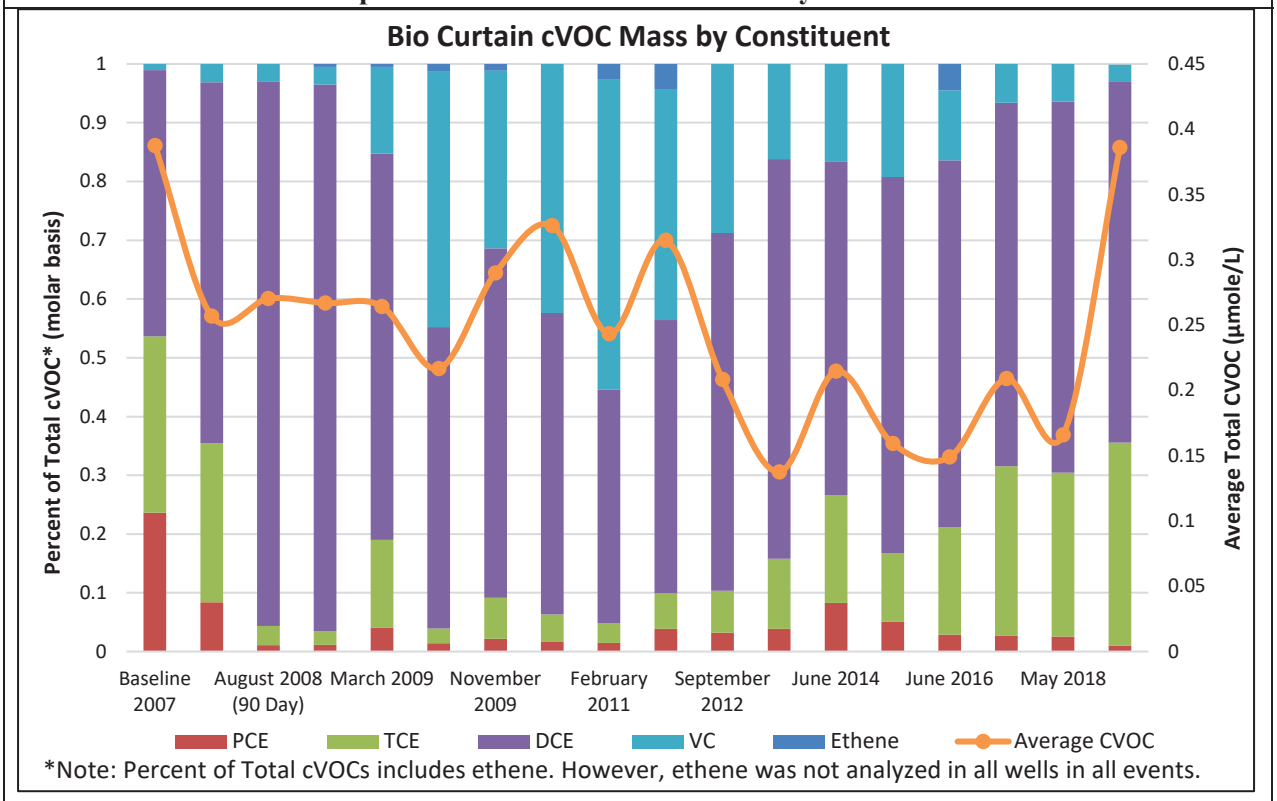
Graph C-5 – Well R-12(S1) Chlorinated Solvent Concentrations



Biocurtain Groundwater

Approximately 1,500 feet downgradient from the Source Area, active ERD is occurring in the Biocurtain treatment area. Nine groundwater monitoring wells (BC-2, BC-3, BC-4, BC-5, BC-6, BC-7S, BC-7D, R-04(S2) and R-27(S2)) and three remediation wells (BCE-5, BCE-7, BCE-9) are used to monitor shallow groundwater conditions in the Biocurtain area. Prior to the start of remediation in May 2008, the January 2007 baseline groundwater sampling results indicated the average total cVOC mass from the four monitoring wells sampled (BC-2, BC-3, BC-4 and BC-5) was 0.39 µmole/L. The average cVOC mass from 5 wells (BC-2, BC-3, BC-4, BC-5, and BC-6) sampled in May 2019 was 0.39 µmole/L and represents an average total cVOC mass similar to the average baseline sampling mass values from 2007; however, the observed rebound is attributed almost entirely to an increase in TCE, cDCE and tDCE concentrations in BC-6. Chlorinated VOC concentrations in the remaining Biocurtain wells sampled in 2019 have remained relatively consistent. The results from the 2007 baseline sampling showed approximately 24% of the contamination as PCE, 30% as TCE, 45% as DCE and 1% as VC. During the May 2019 sampling event, PCE represented 1% of the mass, TCE 35%, DCE 61%, and VC 3% (Graph C-2).

Graph C-6 - Biocurtain cVOC Mass by Constituent



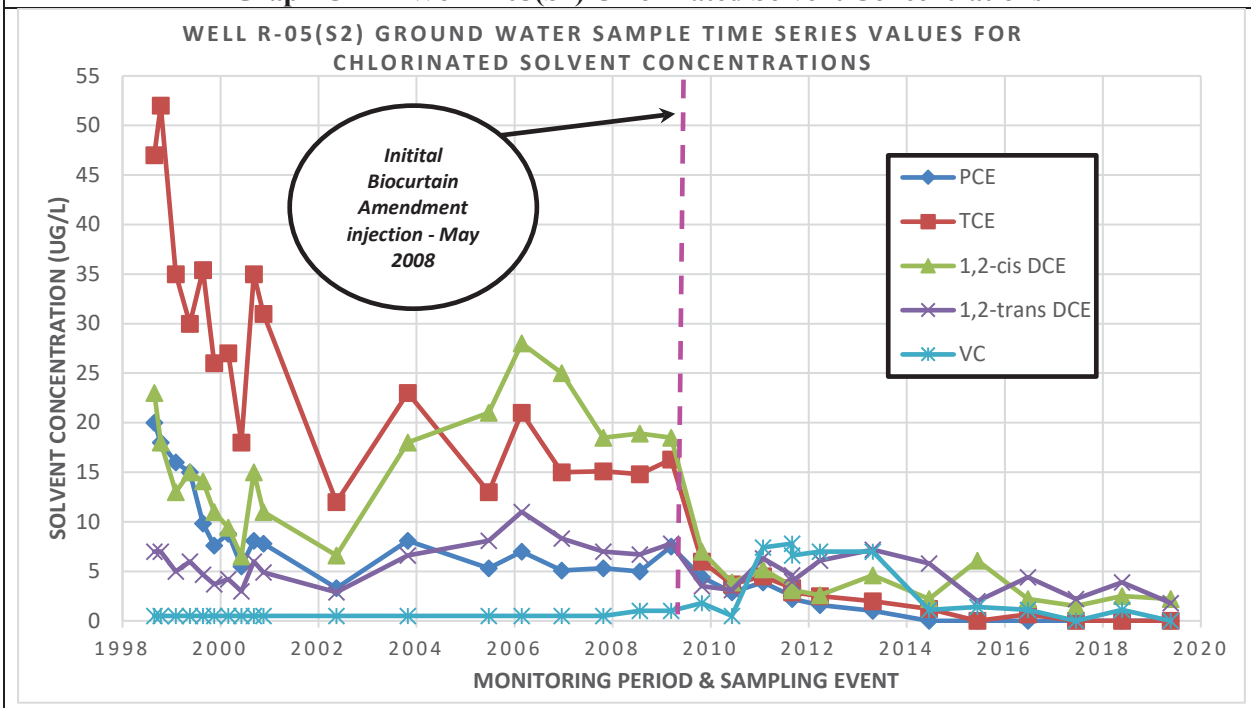
Tetrachloroethene concentrations ranged between 3.2 µg/L to 30 µg/L and TCE concentrations were between 5.4 µg/L to 31 µg/L prior to the RA implementation. The PCE concentrations have decreased to less than 1.0 µg/L in samples collected from four of the five wells sampled in May 2019 and all wells are below the Remediation Goal of 5 µg/L. The TCE concentration was less than 3.0 µg/L in four of the five wells sampled in May 2019 and was detected at 85.7 µg/L in BC-6. Vinyl chloride was detected in one of the five wells sampled during the May 2019 event at 1.7 µg/L (BC-3).

The analytical results from one well (BC-6) have shown an increase in PCE and TCE since the 2012 sampling event. This well is situated at the eastern extent of the Biocurtain where cVOCs had not been detected prior to the September 2012 sampling event when TCE was detected at 6.6 µg/L. Since September 2012, PCE concentrations have ranged from a maximum of 20.0 µg/L in June 2014 to a minimum of 1.2 µg/L in May 2019. Trichloroethene concentrations have ranged from 6.6 µg/L in September 2012 to 85.7 µg/L in May 2019. Additional investigation around BC-6 was performed in August 2015 by NMED's contractor, CDM Smith Inc. During this investigation, five boreholes were installed to the north and east of BC-6. A total of 11 groundwater grab samples were collected from depths between 12 and 27 feet bgs and at least one sample from each boring exceeded the Site cleanup levels for both PCE and TCE. Three additional monitoring wells, PASMW-01, PASMW-02 and PASMW-03, were installed to the northeast of BC-6 in December 2018, and were sampled in January 2019. Tetrachloroethene, TCE and cDCE were detected at concentrations of up to 160 µg/L, 380 µg/L and 130 µg/L, respectively, in PASMW-01. Based on these results and the location of PASMW-01, the

increase in cVOC concentrations observed in BC-6 since 2012 appears to be the result of a release from a separate off-site source.

Historical PCE and TCE concentrations at well R-05(S2), approximately 2,300 feet downgradient of the Source Area and 700 feet downgradient of the Biocurtain, show a decreasing trend while VC increased following the RA implementation (Figure C-11 and Graph C-7). Tetrachloroethene and TCE have been below the cleanup levels since June 2010 and non-detect since June 2017. Vinyl chloride was first detected (1.8 µg/L) in a sample collected from this well in October 2009, and was consistently detected at levels between 6.6 µg/L to 7.4 µg/L from 2011 to 2013. In 2014, VC decreased to 1.1 µg/L and was less than 1.0 µg/L during the May 2019 sampling event. Vinyl chloride was also detected at concentrations ranging from 1.7 µg/L to 15 µg/L in samples collected from R-14(S2), located approximately 300 feet east-southeast of R-05(S2), between 2010 and 2013 and has decreased to less than 1.0 µg/L since 2014. Vinyl chloride was also detected farther downgradient in samples collected from wells RDP-2 (2.6 µg/L) and RDP-4 (2.1 µg/L) in April 2013 and has since decreased to less than 1.0 µg/L since June 2015. The trend graph for R-05(S2) was used in this report as it had the highest historical groundwater concentrations in this area of the plume.

Graph C-7 - Well R-05(S2) Chlorinated Solvent Concentrations



The detection of VC in samples from these downgradient wells indicates that groundwater initially treated at the Biocurtain has migrated from 700 to 2,100 feet south of the Biocurtain treatment system. The VC detections at these downgradient wells also indicate that incomplete dechlorination was occurring within the Biocurtain system. The incomplete dechlorination is likely due, in part, to the high groundwater flow which reduces the residence time within the ERD treatment zone. This issue has been resolved since the 2013 substrate amendment injection, when a higher substrate dose was applied at the

Biocurtain; this injection resulted in the lower VC detections observed downgradient during the subsequent sampling events.

Deep Zone – Intermediate I1 and I2

Of the 18 pre-existing groundwater monitoring wells installed in the Intermediate Zone I1 and Intermediate I2 Zone of the Deep Zone, up to 16 were sampled during this FYR period. In addition, eight new monitoring wells (R-08A(I1), R-29A(I1), R-31(I1), R-31(I2), R-32(I1), R-32(I2), R-29(I1 & I2) and R-30(I1 & I2) were installed in the I1 and I2 zones between November 2018 and January 2019, and were sampled during the January and May 2019 sampling events. Monitoring wells completed in the I1 and I2 zones are typically screened from approximately 50 to 70 feet bgs in the I1 zone and from 80 to 100 feet bgs in the I2 zone.

In general, both PCE and TCE concentrations in samples collected from wells completed within the contaminant plume boundaries of the I1 and I2 zones have historically shown an increasing trend through June 2016, followed by a decreasing trend through May 2019. The exception to this observation is the downgradient monitoring well R-08(I2), which has consistently shown an increasing trend through 2019. Contaminants of concern have not been observed in the I1 or I2 zones beneath or immediately downgradient of the Source Area, as indicated by the historical results from samples collected from monitoring wells EWMW-4A and R-23(I1). However, COCs have reached the I1 and I2 zones approximately 500 feet south/southwest of the Source Area near the newly-installed R-29A(I1), and are highest approximately 1,000 feet south/southwest of the Source Area at the R-09 well cluster, located at the northwest corner of Calle Chavez and the Los Alamos Highway (Figure B-5, Figure C-13 and Figure C-15).

During the May 2019 sampling event, maximum PCE concentrations were detected in samples collected from wells R-09(I1) and R-09(I2) at 64.4 µg/L and 48.4 µg/L, respectively. The PCE concentrations in samples from both wells show an increasing trend through 2015/2016 followed by a decreasing trend through 2019 (Graph C-8). Historical PCE concentrations in samples collected from the R-09(I1) well indicate an increasing trend starting at less than 20 µg/L prior to year 2000, and increasing to greater than 100 µg/L for the June 2015 and June 2016 sampling events, before decreasing to 61.5 µg/L in 2017. Similar increasing and decreasing PCE trends are also observed from samples collected at R-13(I2), the furthest southwest well completed in the I1 or I2 zones. Tetrachloroethene concentrations increased from less than 10 µg/L prior to 2000 to 40 µg/L in June 2015, followed by a decreasing trend during the 2016 through 2019 sampling events, with the current PCE concentration at 25.9 µg/L (Graph C-9). Trichloroethene was also detected at concentrations above the Site Remediation Goal of 5 µg/L in samples collected from these three wells, ranging from 8.7 µg/L to 19.5 µg/L, while the remaining COCs were below their respective cleanup levels.

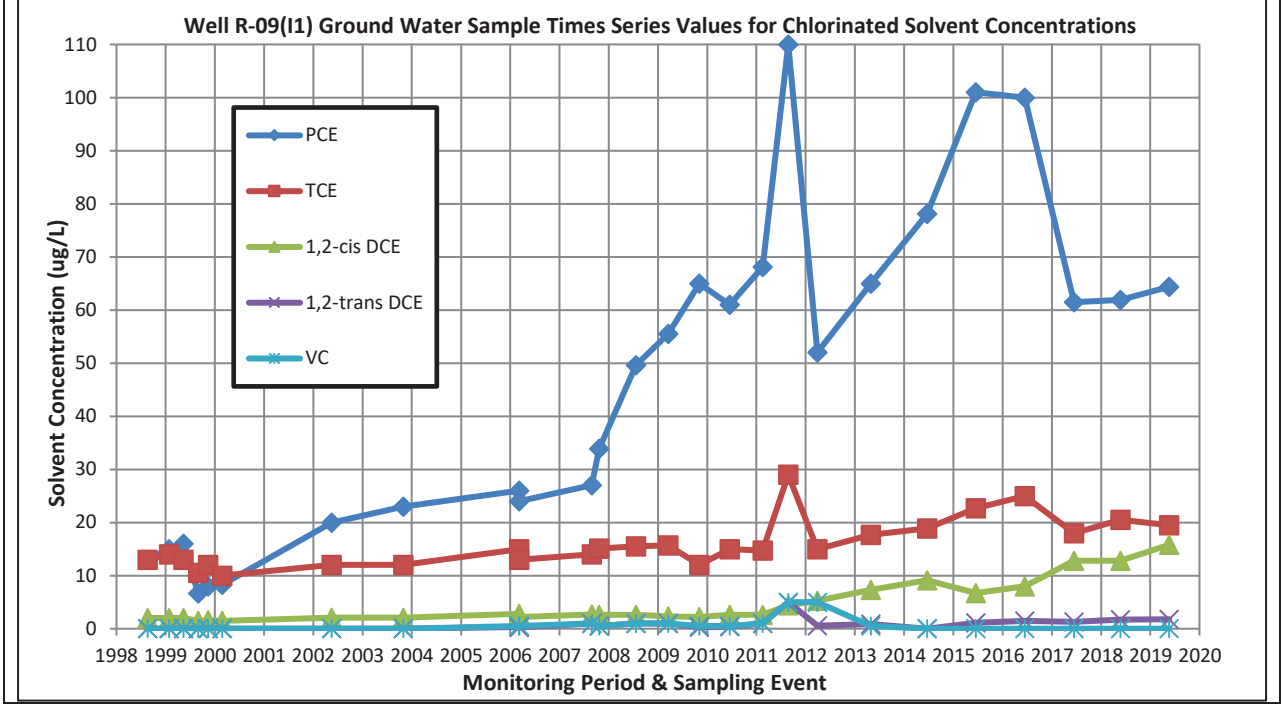
Monitoring wells R-08(I2) and R-08A(I1), located along U.S. Highway 84/285 (Santa Clara Bridge Road), are the southernmost wells completed in the I1 and I2 zones. The PCE concentrations from R-08(I2), which have historically been measured at less than 3.5 µg/L prior to 2012, have increased consistently since then. The PCE concentrations have exceeded the Site Remediation Goal at this well since June 2014 and was 26 µg/L during the May 2019 event. The TCE concentration also exceeded the Remediation Goal for the first time at 5.7 µg/L during the June 2015 sampling and was at 9.3 µg/L

during the May 2019 event. All other COCs remain below the cleanup levels in samples collected from this well. Tetrachloroethene, TCE and cDCE were detected in monitoring well R-08A(I1) at 17.5 µg/L, 9.5 µg/L and 1.1 µg/L, respectively, during the May 2019 sampling event.

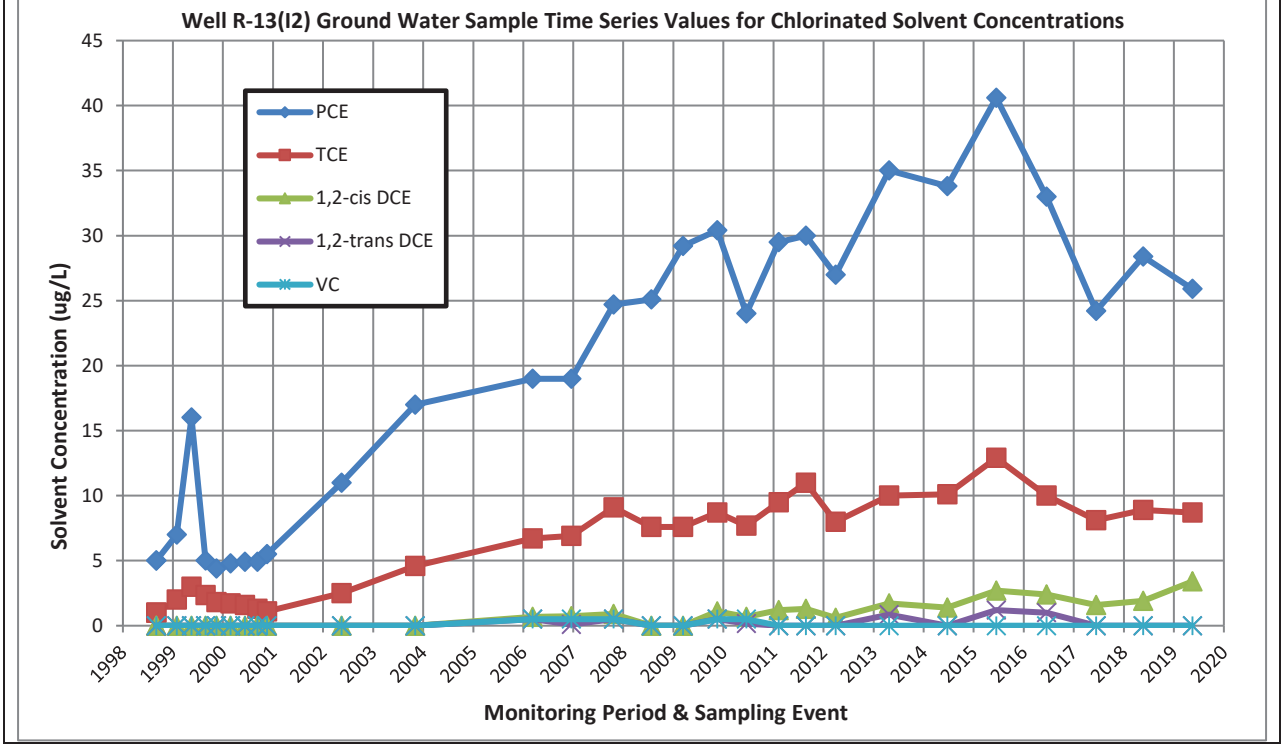
Monitoring wells R-31(I1), R-31(I2), R-32(I1) and R-32(I2) define the western and southwestern limits of the I1 and I2 zones contaminant plumes. All cVOC sampling results from these wells in May 2019 were non-detect except for PCE in R-31(I2), which was detected below the Remediation Goal at 3.6 µg/L.

Two ERD injection wells and two monitoring wells were installed in the I1 and I2 zones at the Plaza de Española, located approximately 750 feet from the Source Area, as part of the RA construction. Analytical results for samples collected from monitoring wells, DM-1(I1) and DM-2(I1), are lower than the R-09 well results with the highest PCE detected at 13.0 µg/L in 2007. Cis-1,2-dichloroethylene (1.3 µg/L in DM-1(I1)) was the only COC detected from the two samples collected in May 2019. Vinyl chloride was detected in DM-1(I1) at concentrations of 1.8 µg/L to 5.4 µg/L from 2011 through 2014 and was reported below 1.0 µg/L since 2015. The recent low detections of VC are likely the result of the ERD substrate injections at an adjacent injection well located approximately 40 feet upgradient. The substrate injection at these two I1 zone wells was suspended after the September 2009 injection event due to the low contaminant concentrations detected in this area.

Graph C-8 - Well R-09(I1) Chlorinated Solvent Concentrations



Graph C-9 – Well R-13(I2) Chlorinated Solvent Concentrations



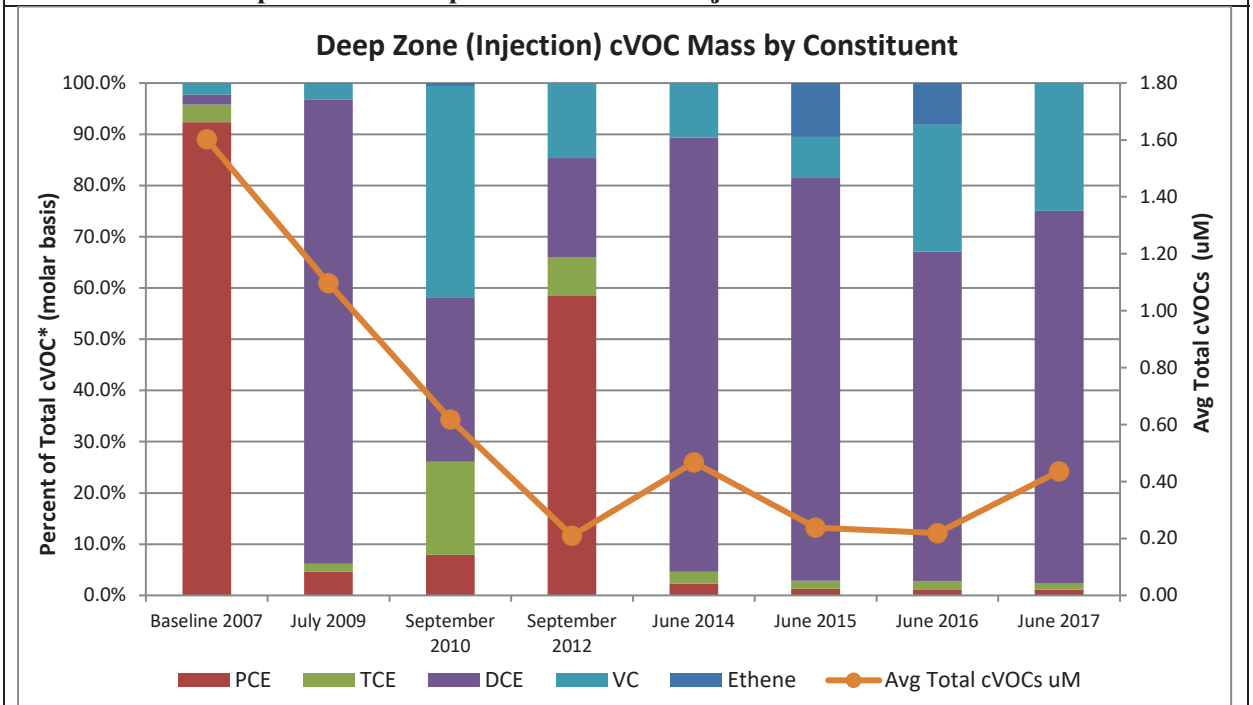
Deep Zone – D1 and D2

Of the 25 groundwater monitoring wells installed in the deeper aquifer zones at the Site, a maximum of 19 wells were sampled during this FYR period. The deeper aquifer zones consist of two contaminated zones, designated D1 an D2, and one uncontaminated zone, designated D3. The D1 zone ranges in depths from approximately 155 to 200 feet bgs and the D2 zone ranges from between approximately 225 to 265 feet bgs. The uncontaminated D3 zone ranges from approximately 340 to 360 feet bgs. Results from the June 2017 through May 2019 sampling events continue to indicate that the highest COC concentrations in the D1 and D2 zones occur approximately 750 feet south/southwest of the Source Area, around the DM well clusters located in the Plaza de Española, and at the R-09 well cluster (Figure B-5, Figure C-17 and Figure C-19). The lateral extent of deep aquifer contamination within the D1 and D2 zones is not well defined to the south.

Sampling results from the injection wells show near complete degradation of PCE following the substrate injections that has been sustained for a few years after the injection. Tetrachloroethene, which accounted for greater than 90% of the contaminant mass prior to the injections, was reduced to less than 10% through September 2010 (Graph C-10). As expected during the ERD process, PCE daughter products initially increased from less than 5 µg/L to between 190 µg/L and 230 µg/L in the treatment wells, with TCE representing 18%, DCE 32% and VC 41% of the contaminant mass by September 2010. The PCE mass rebounded during the September 2012 sampling event following a two-year period in which EVO injections had not occurred. A review of the September 2012 data indicates that most the rebound occurred in the DI-1(D1) injection well, which also exhibited the lowest substrate levels as

measured by total organic carbon (TOC) (Table 4). Following the November 2012 substrate injection, the June 2014 sampling results showed the PCE and TCE had been reduced to less than 5% of the mass, with DCE and VC representing approximately 85% and 10% of the mass respectively. This trend continued to hold, with the June 2017 results showing PCE and TCE at less than 3% of the mass and DCE and VC representing 72% and 23% of the mass, respectively. Deep Zone D1 and D2 injection wells were not sampled during the 2018-2019 events.

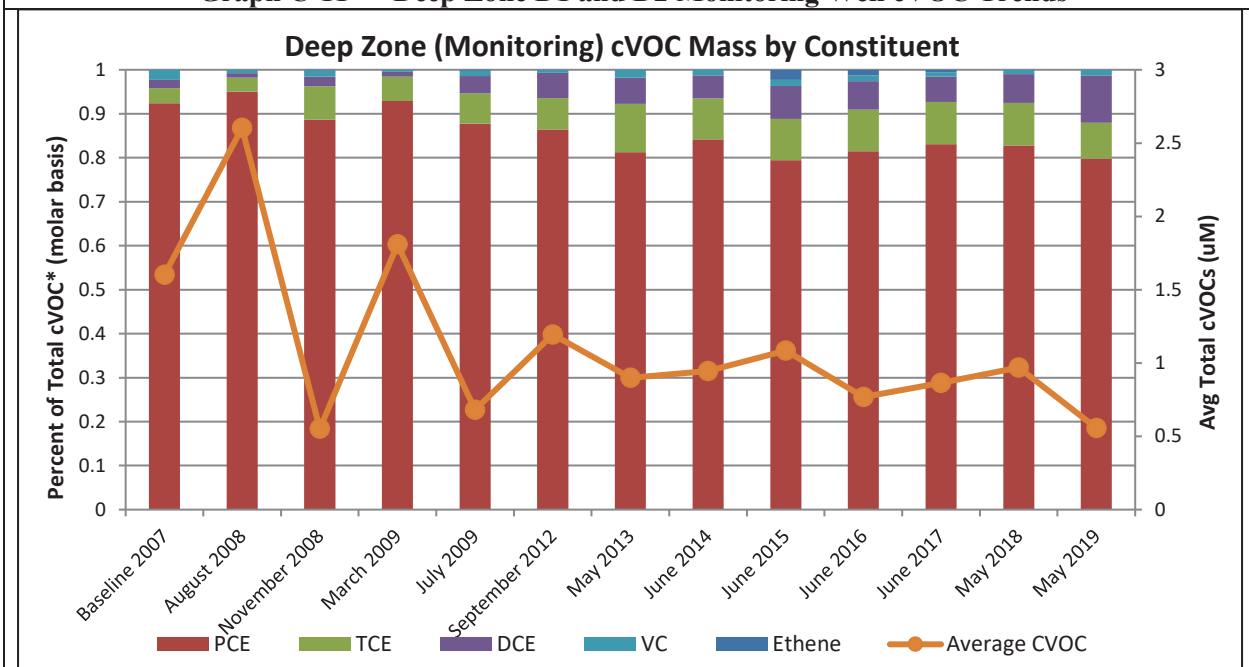
Graph C-10 – Deep Zone D1 and D2 Injection Well cVOC Trends



*Note: Percent of Total cVOCs includes ethene. However, ethene was not analyzed in all wells in all events.

All cVOCs except VC are below the Site cleanup levels in the injection wells as of the most recent sampling in 2017. Vinyl chloride concentrations ranged from 1.6 µg/L to 12 µg/L. However, the cVOC mass remains relatively unchanged in the Deep Zone monitoring wells which are located within approximately 40 feet of the injection wells. Tetrachloroethene in the monitoring wells represents approximately 80% of the contaminant mass (Graph C-11).

Graph C-11 – Deep Zone D1 and D2 Monitoring Well cVOC Trends

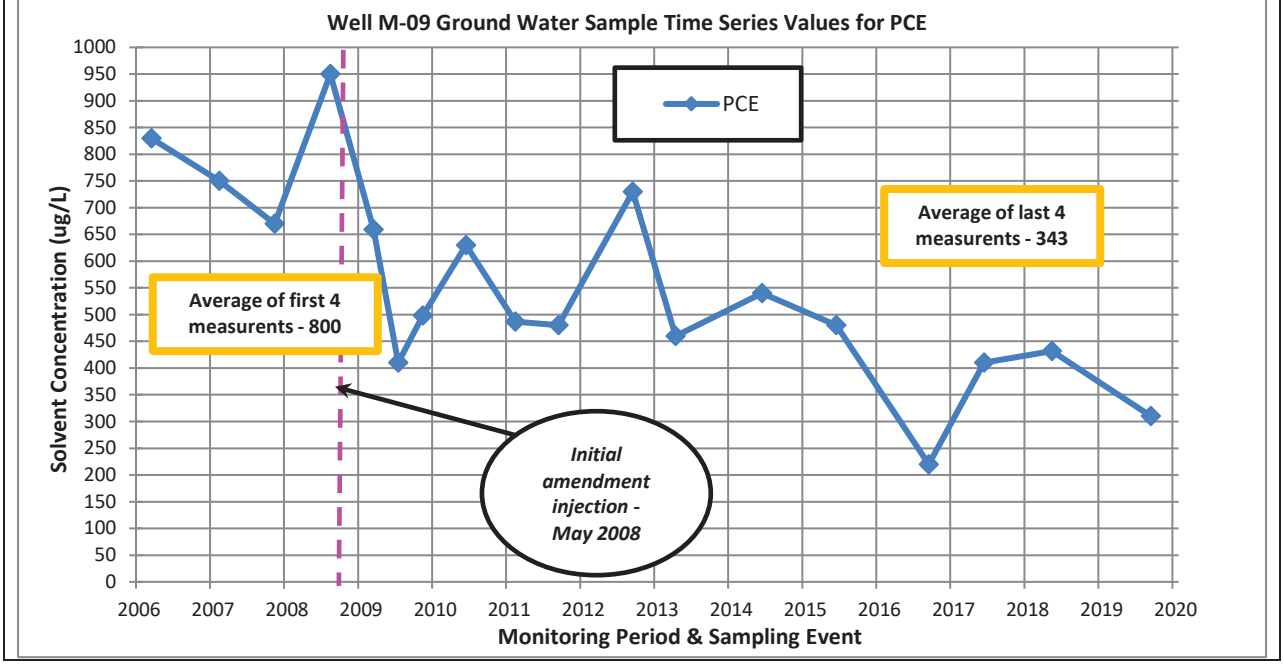


*Note: Percent of Total cVOCs includes ethene. However, ethene was not analyzed in all wells in all events.

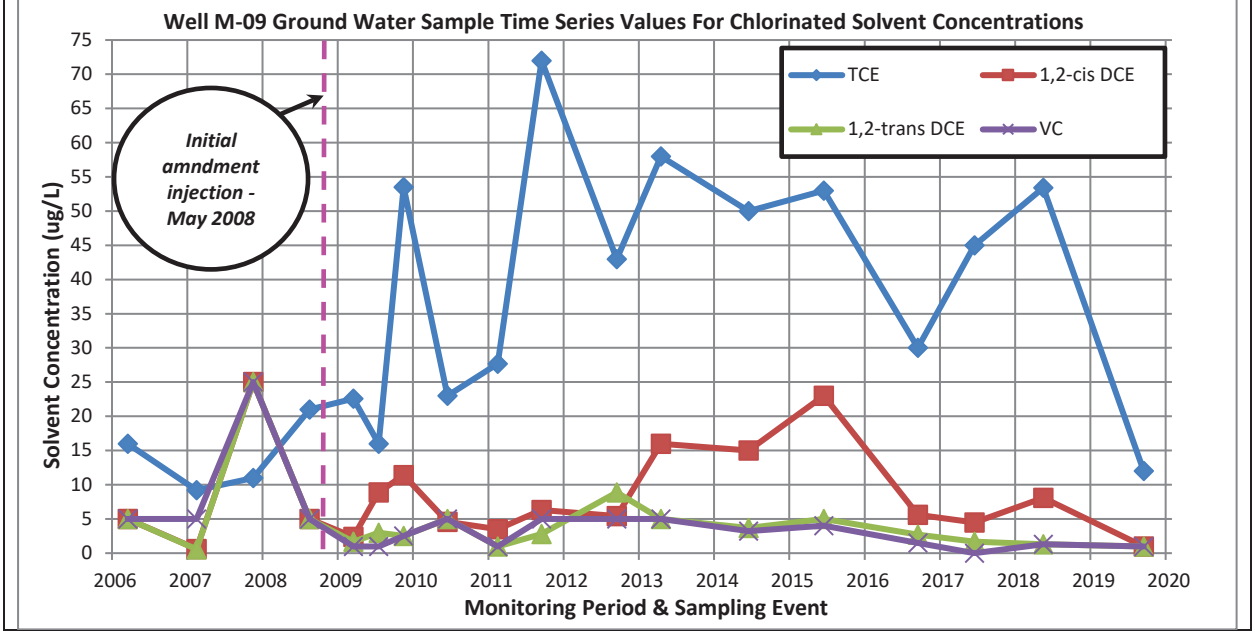
The May-September 2019 PCE concentrations in samples collected from the D1 Zone monitoring wells ranged from 1.5 µg/L in the sample from R-12(D1) to 310 µg/L in M-09. The highest PCE concentrations within the D1 Zone were in samples from wells M-09 (310 µg/L), R-29A(D1) (208 µg/L) and M-15 (172 µg/L), located southeast, east and south of the plaza, respectively. Tetrachloroethene concentrations in samples from DM-1(D1) and DM-2(D1), located in the Plaza de Española, were 132 µg/L and 22 µg/L, respectively. Trichloroethene concentrations in samples collected from the D1 Zone monitoring wells are less than 17 µg/L. Compared to the June 2014 analytical results, PCE concentrations remained consistent in all the wells except monitoring well M-09, where PCE has fluctuated from a maximum of 540 µg/L in June 2014 to a minimum of 220 µg/L in June 2016. The September 2019 PCE concentration in M-09 was 310 µg/L. At M-09, the increasing levels of PCE daughter products, TCE, cDCE, tDCE and VC, following the most recent substrate injection in 2012 at R-09(D1), suggests degradation effects at this downgradient monitoring well through 2015 (Graph C-12 and Graph C-13). However, PCE degradation product concentrations have decreased or remained stable since 2015.

Tetrachloroethene concentrations in samples collected from the D2 Zone wells (R-09(D2), M-20, DM-1(D2), DM-2(D2), R-29(D2U), R-30(D2L) and R-30(D2U)) in May 2019 ranged from non-detect in R-30(D2L) to 85.3 µg/L in DM-2(D2). Compared to the June 2014 analytical results, PCE concentrations have remained consistent in samples collected from D2 Zone wells. Trichloroethene concentrations in the D2 Zone samples were less than 10 µg/L. Cis-1,2-dichloroethylene, tDCE and VC were not detected above the laboratory method detection limits of 1.0 µg/L and 5.0 µg/L in any of the samples collected from the D2 Zone wells.

Graph C-12 - M-09 Time Series Values for PCE



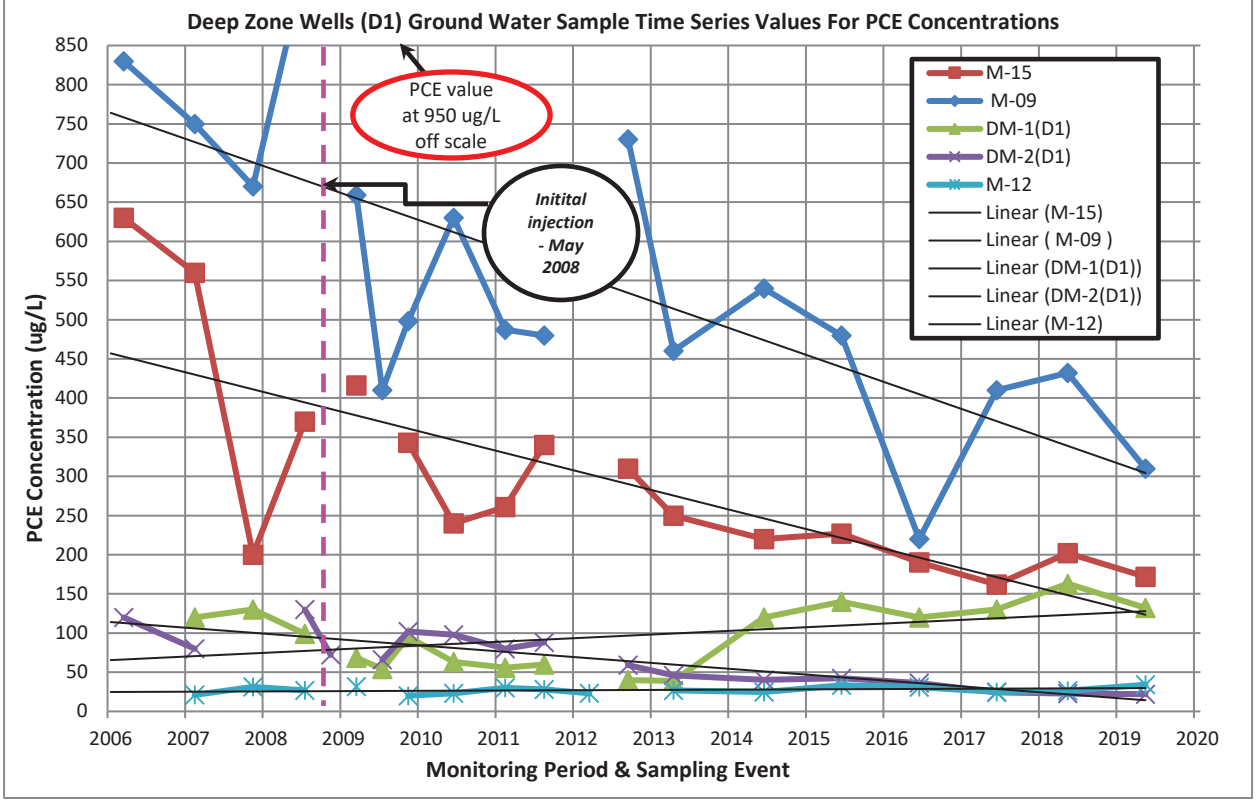
Graph C-13 - Well M-09 Time Series Values cVOCS



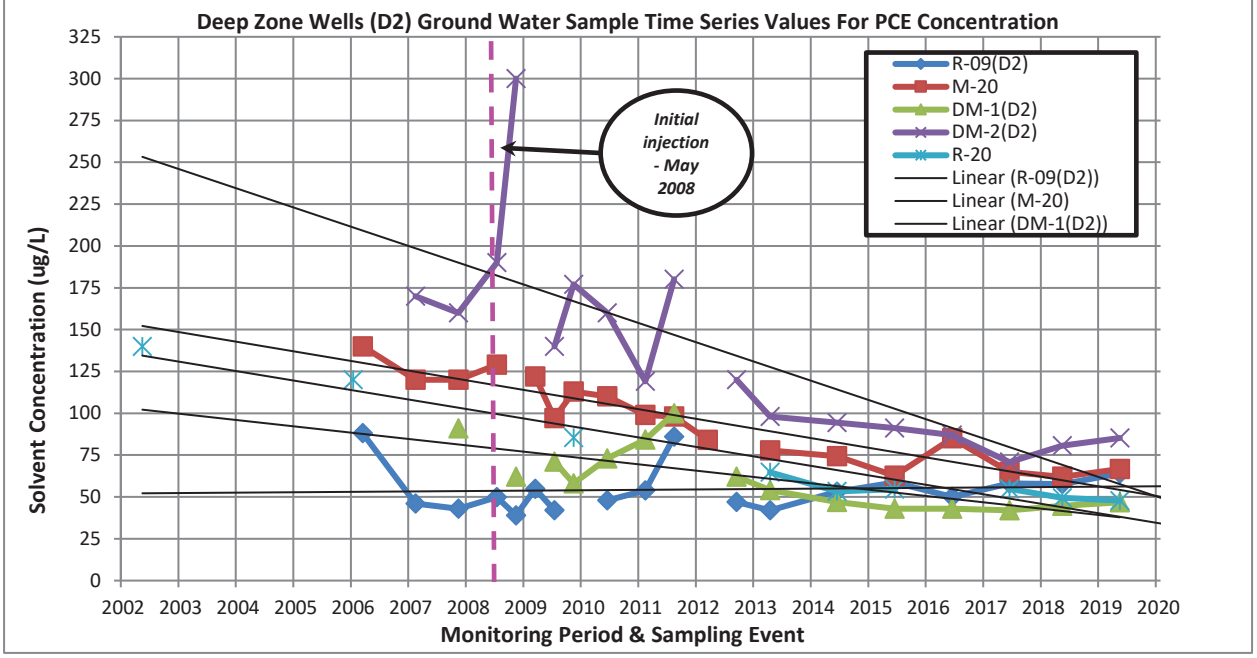
Analytical results for PCE from samples collected from the D1 Zone and D2 Zone wells show an overall decreasing trend since 2007, as shown in Graph C-4 and Graph C-5. The average PCE concentrations detected in samples from ten wells in 2007 was 217 µg/L. The average PCE concentration detected in samples from the same ten wells in May-September 2019 was 103 µg/L. This represents an

approximate 52% decrease in the PCE concentrations since 2007. The PCE average concentration from the same ten (10) wells decreased from 135 µg/L in 2014 to 103 µg/L in 2019. This represents an approximate 24% decrease in PCE concentrations compared to the end of the last FYR period (Figure C-21).

Graph C-14 - Deep Zone Wells (D1) Time Series Values for PCE



Graph C-15 - Deep Zone Wells (D2) Time Series Values for PCE



Supply Wells

Santa Clara Pueblo's public supply well (SCTW-2), located approximately 1 mile downgradient from the plume, is no longer in use. Analytical results from previous samples collected from this well between 2006 and 2009 were non-detect for all COCs. Therefore, a sample was not collected from this well during this FYR period.

The Cook Estate private well, located south of Plaza de Española, is used for irrigation purposes only. Historical results from the Cook Estate private well showed PCE and TCE concentrations ranging from 15 µg/L to 74 µg/L through the March 2009 sampling event. Contaminants of concern in samples collected from this well have been below the Site cleanup levels since the November 2009 sampling event. Furthermore, a concerned citizen requested the sampling of his/her domestic well in 2015. The well identified as 820a HWY 30 is located west of the Santa Clara ditch in the general area of the R-07(S2) well. The private well serves five residences and was reportedly installed in 2007-2008. Well completion information was not available at the time of sampling. Analytical results from a sample collected from the well during the June 2016 sampling event were non-detect for all COCs. Tetrachloroethene was detected in the Cook Estate private well in May 2018 at below the Site cleanup levels at 1.1 µg/L. All COCs were non-detect in the May 2019 sample. No additional samples have been collected from the 820a HWY 30 well (Figure C-22).

Figure C-11 - Shallow Aquifer - Isoconcentration Contours Map

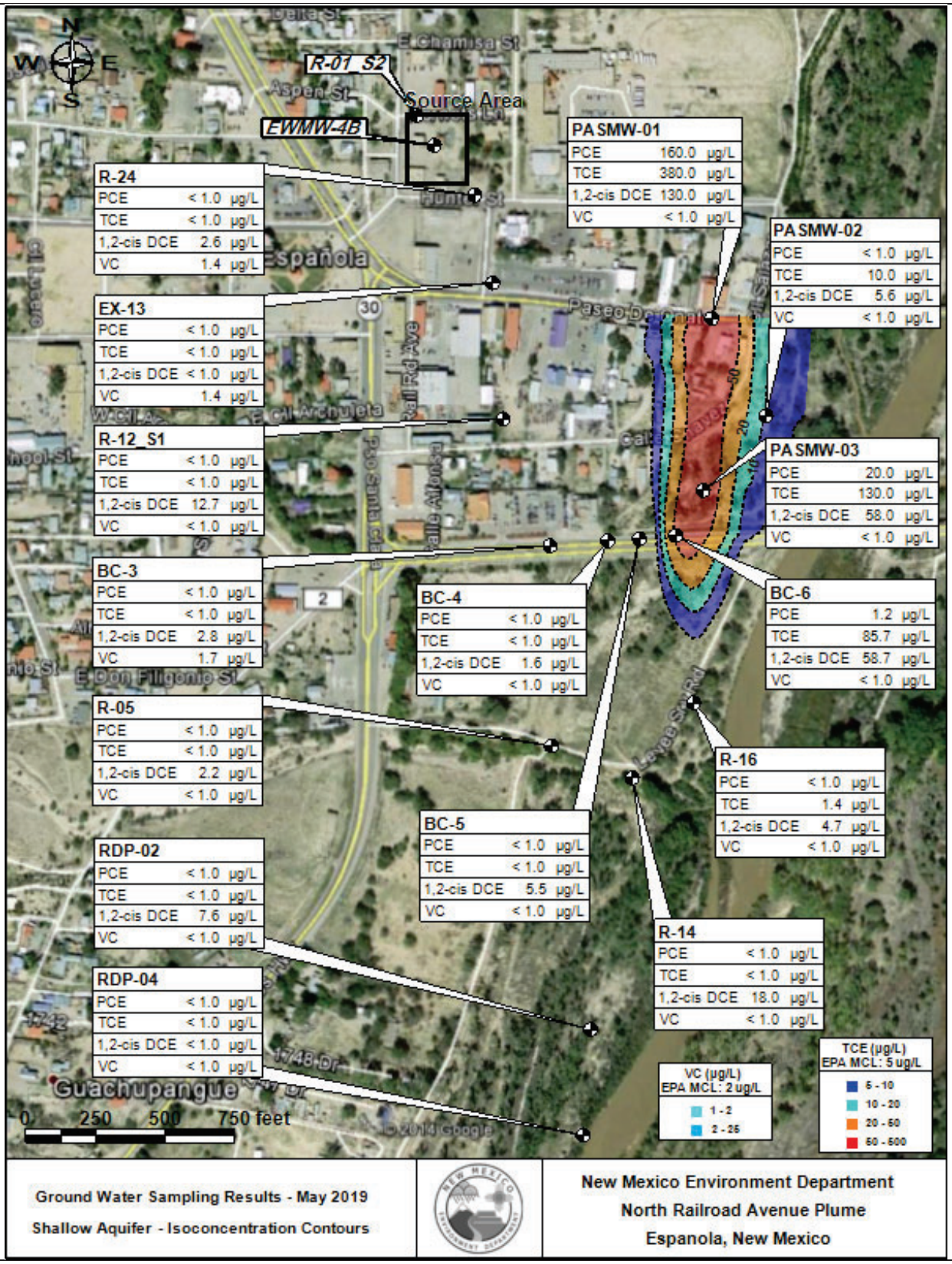
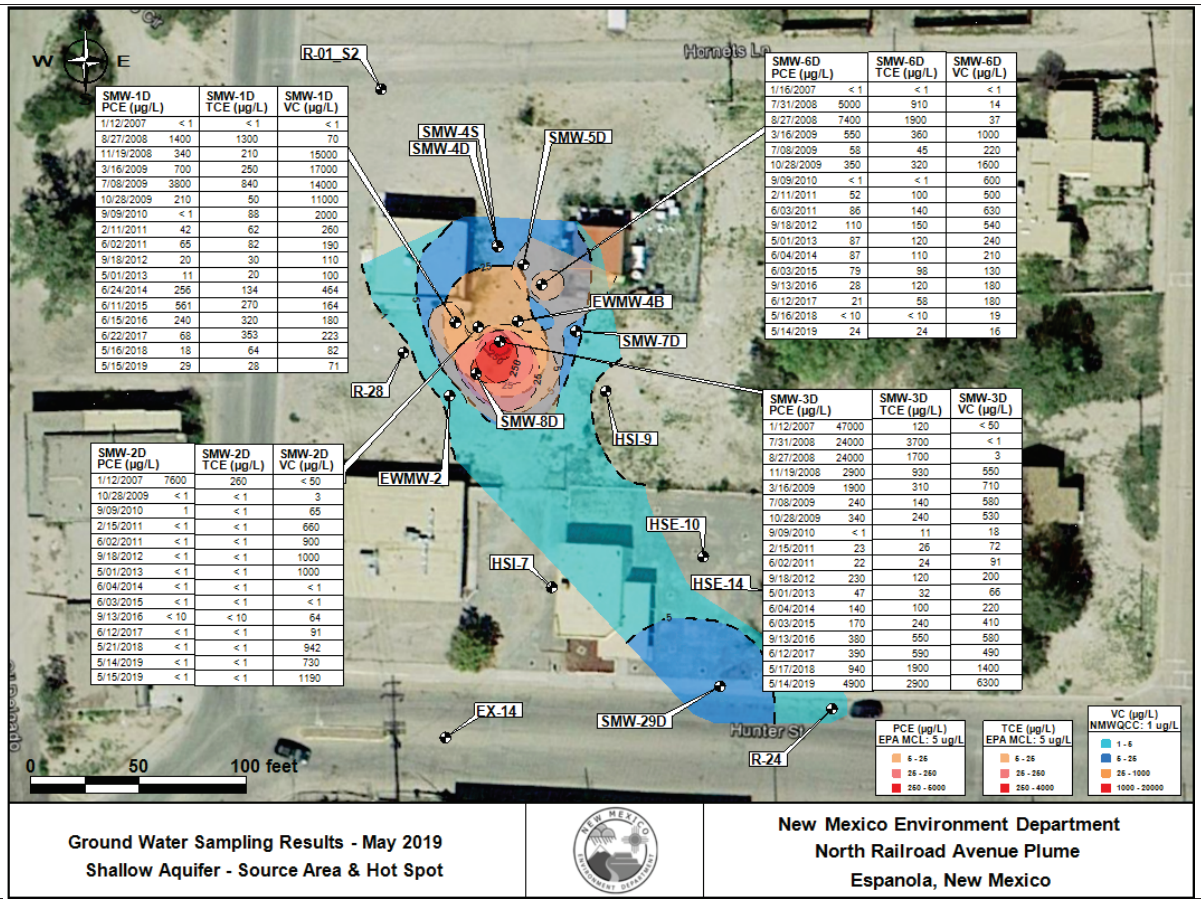


Figure C-12 - Shallow Aquifer - Source Area & Hotspot Isoconcentration Contour Map



SMW-1D PCE (µg/L)		SMW-1D TCE (µg/L)	SMW-1D VC (µg/L)
1/12/2007	< 1	< 1	< 1
8/27/2008	1400	1300	70
11/19/2008	340	210	15000
3/16/2009	700	250	17000
7/08/2009	3800	840	14000
10/28/2009	210	50	11000
9/09/2010	< 1	88	2000
2/11/2011	42	62	260
6/02/2011	65	82	190
9/18/2012	20	30	110
5/01/2013	11	20	100
6/24/2014	256	134	464
6/11/2015	561	270	164
6/15/2016	240	320	180
6/22/2017	68	353	223
5/16/2018	18	64	82
5/15/2019	29	28	71

SMW-6D PCE (µg/L)		SMW-6D TCE (µg/L)	SMW-6D VC (µg/L)
1/16/2007	< 1	< 1	< 1
7/31/2008	5000	910	14
8/27/2008	7400	1900	37
3/16/2009	550	360	1000
7/08/2009	58	45	220
10/28/2009	350	320	1600
9/09/2010	< 1	< 1	600
2/11/2011	52	100	500
6/03/2011	86	140	630
9/18/2012	110	150	540
5/01/2013	87	120	240
6/04/2014	87	110	210
6/03/2015	79	98	130
9/13/2016	28	120	180
6/12/2017	21	58	180
5/16/2018	< 10	< 10	19
5/14/2019	24	24	16

SMW-2D PCE (µg/L)		SMW-2D TCE (µg/L)	SMW-2D VC (µg/L)
1/12/2007	7600	260	< 50
10/28/2009	< 1	< 1	3
9/09/2010	1	< 1	65
2/15/2011	< 1	< 1	660
6/02/2011	< 1	< 1	900
9/18/2012	< 1	< 1	1000
5/01/2013	< 1	< 1	1000
6/04/2014	< 1	< 1	< 1
6/03/2015	< 1	< 1	< 1
9/13/2016	< 10	< 10	64
6/12/2017	< 1	< 1	91
5/21/2018	< 1	< 1	942
5/14/2019	< 1	< 1	730
5/15/2019	< 1	< 1	1190

SMW-3D PCE (µg/L)		SMW-3D TCE (µg/L)	SMW-3D VC (µg/L)
1/12/2007	47000	120	< 50
7/31/2008	24000	3700	< 1
8/27/2008	24000	1700	3
11/19/2008	2900	930	550
3/16/2009	1900	310	710
7/08/2009	240	140	580
10/28/2009	340	240	530
9/09/2010	< 1	11	18
2/15/2011	23	26	72
6/02/2011	22	24	91
9/18/2012	230	120	200
5/01/2013	47	32	66
6/04/2014	140	100	220
6/03/2015	170	240	410
9/13/2016	380	550	580
6/12/2017	390	590	490
5/17/2018	940	1900	1400
5/14/2019	4900	2900	6300

Ground Water Sampling Results - May 2019
Shallow Aquifer - Source Area & Hot Spot

New Mexico Environment Department
North Railroad Avenue Plume
Espanola, New Mexico

Figure C-13 - Intermediate (I1) Aquifer – PCE Isoconcentration Map

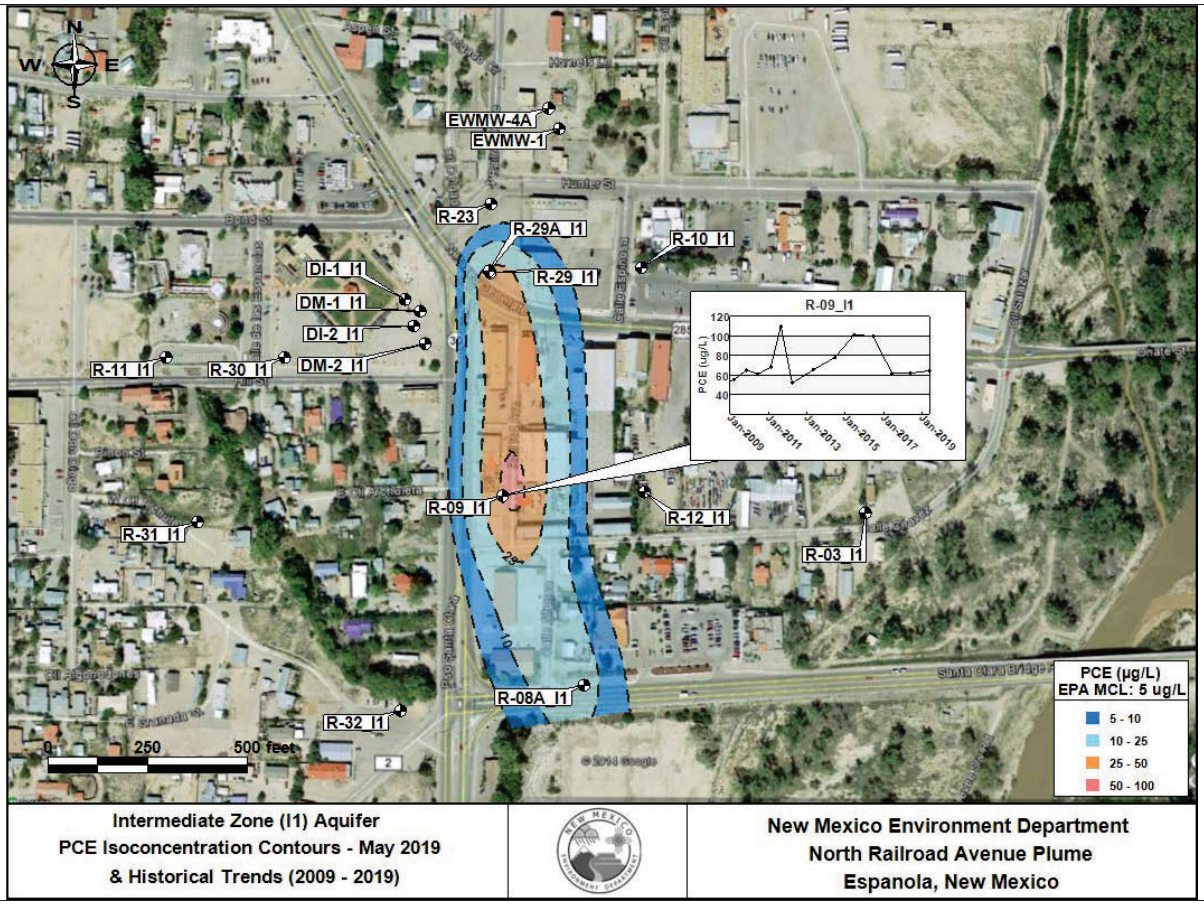


Figure C-14 - Intermediate (I1) Aquifer – TCE Isoconcentration Map

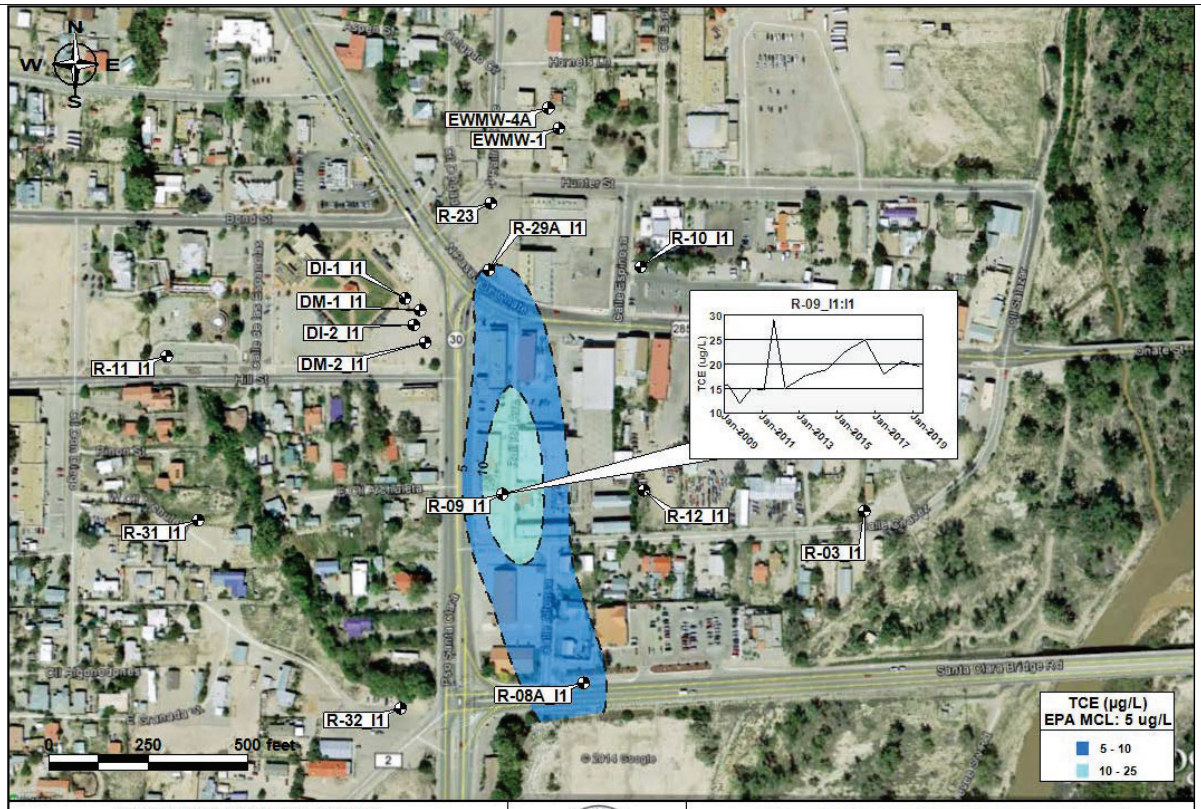


Figure C-15 - Intermediate (I2) Aquifer – PCE Isoconcentration Map

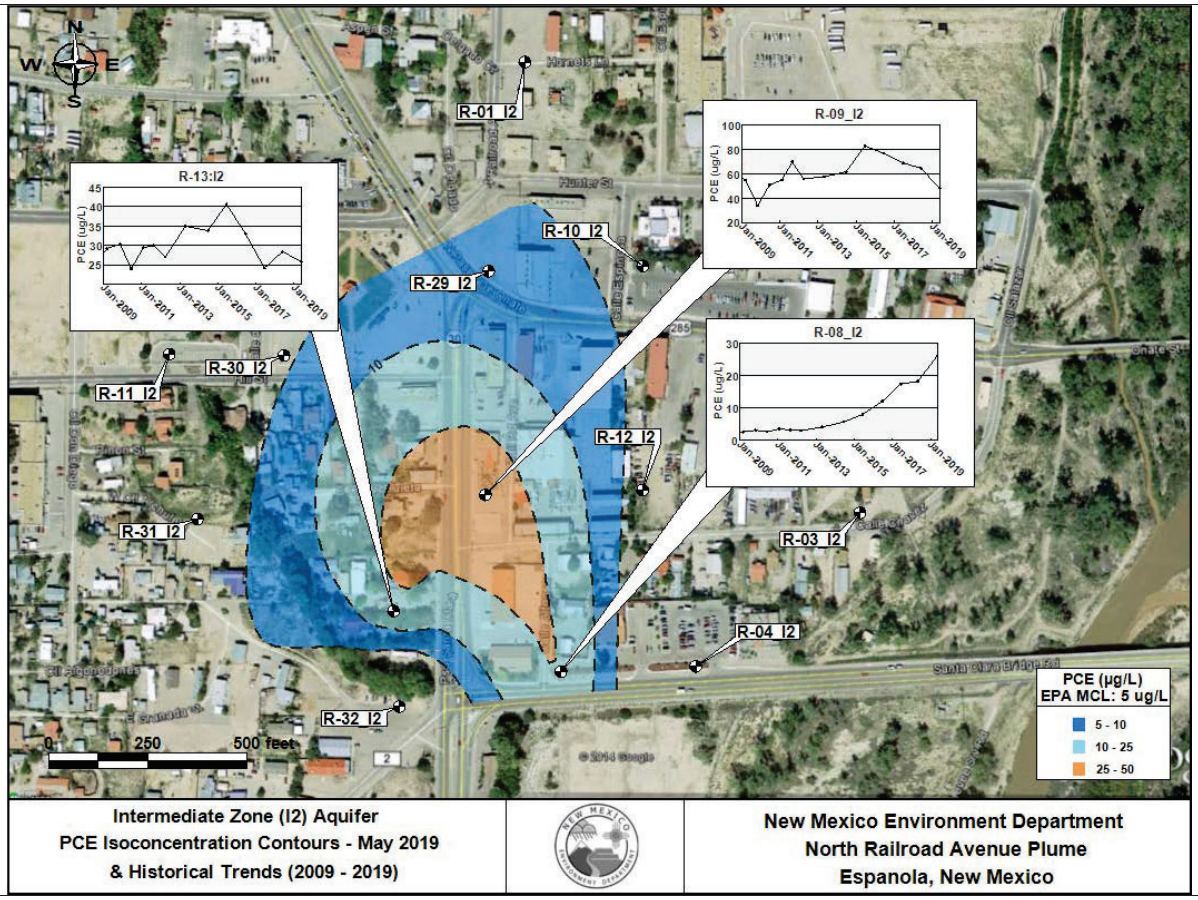


Figure C-16 - Intermediate (I2) Aquifer – TCE Isoconcentration Contour Map

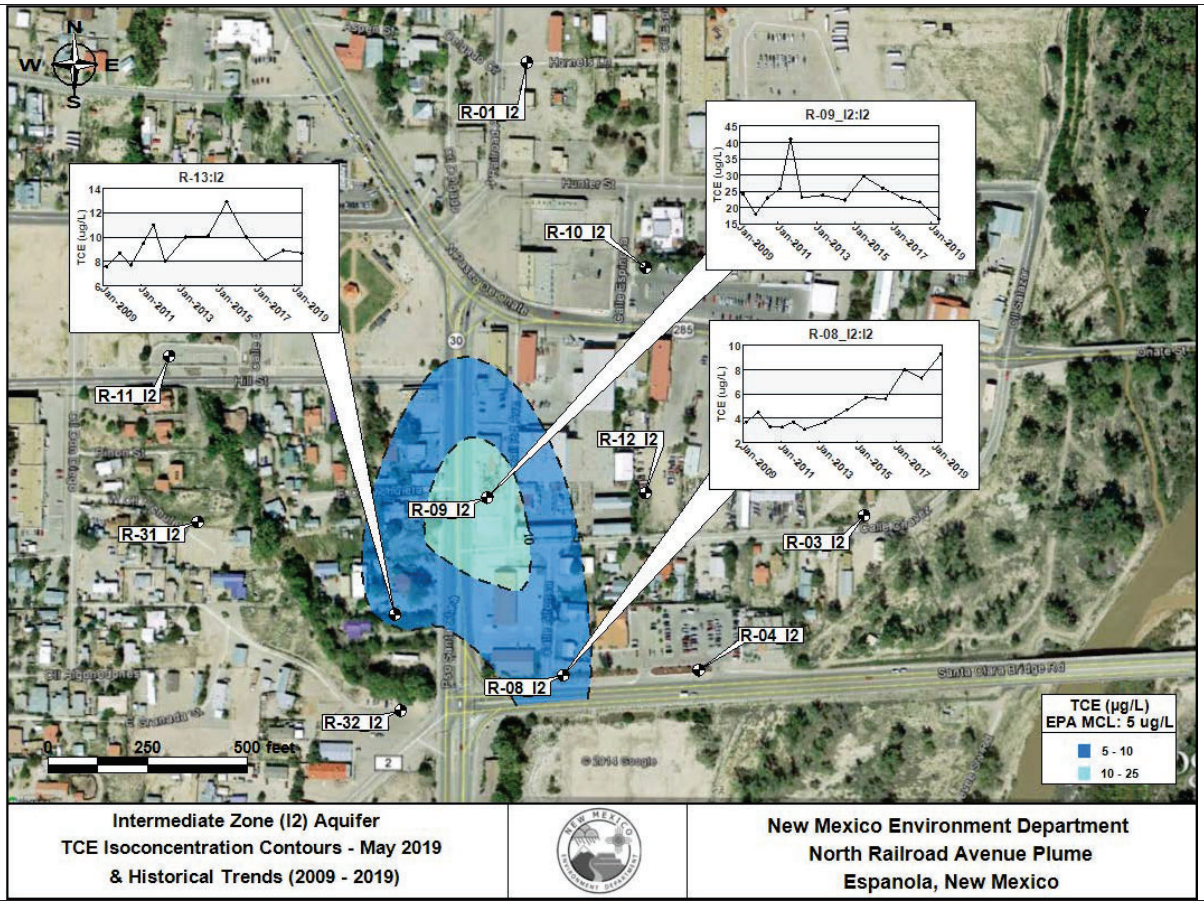
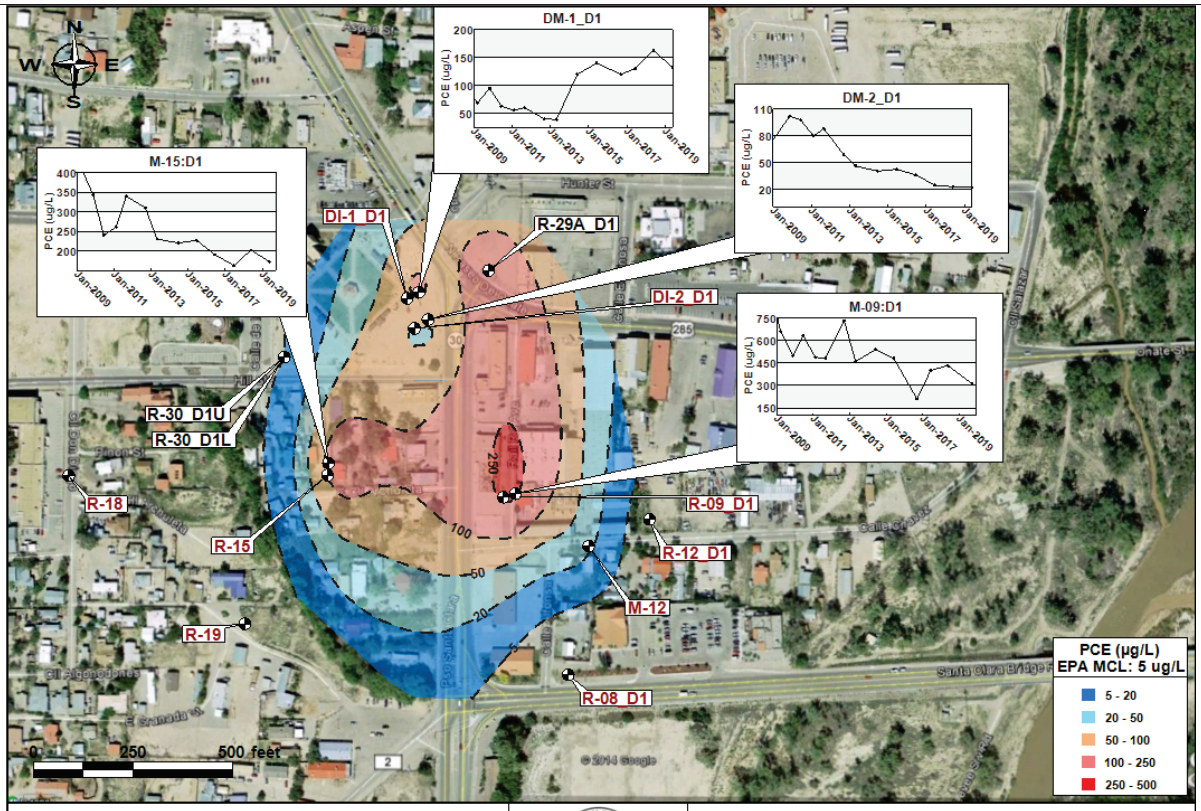


Figure C-17 - Deep (D1) Aquifer – PCE Isoconcentration Contour Map



Deep Zone (D1) Aquifer PCE Isoconcentration Contours - May 2019 & Historical Trends (2009 - 2019)		New Mexico Environment Department North Railroad Avenue Plume Espanola, New Mexico

Figure C-18 - Deep (D1) Aquifer – TCE Isoconcentration Contour Map

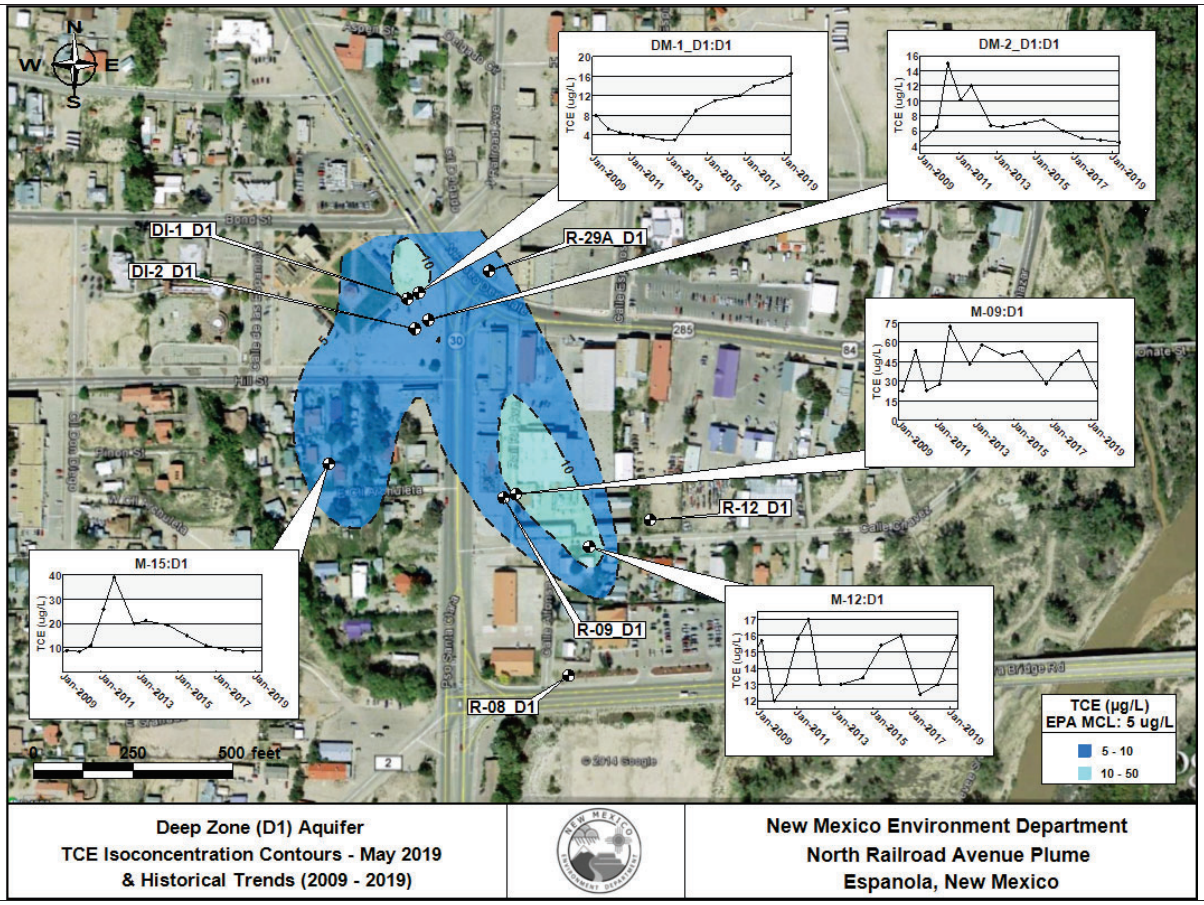


Figure C-19 - Deep (D2) Aquifer – PCE Isoconcentration Contour Map

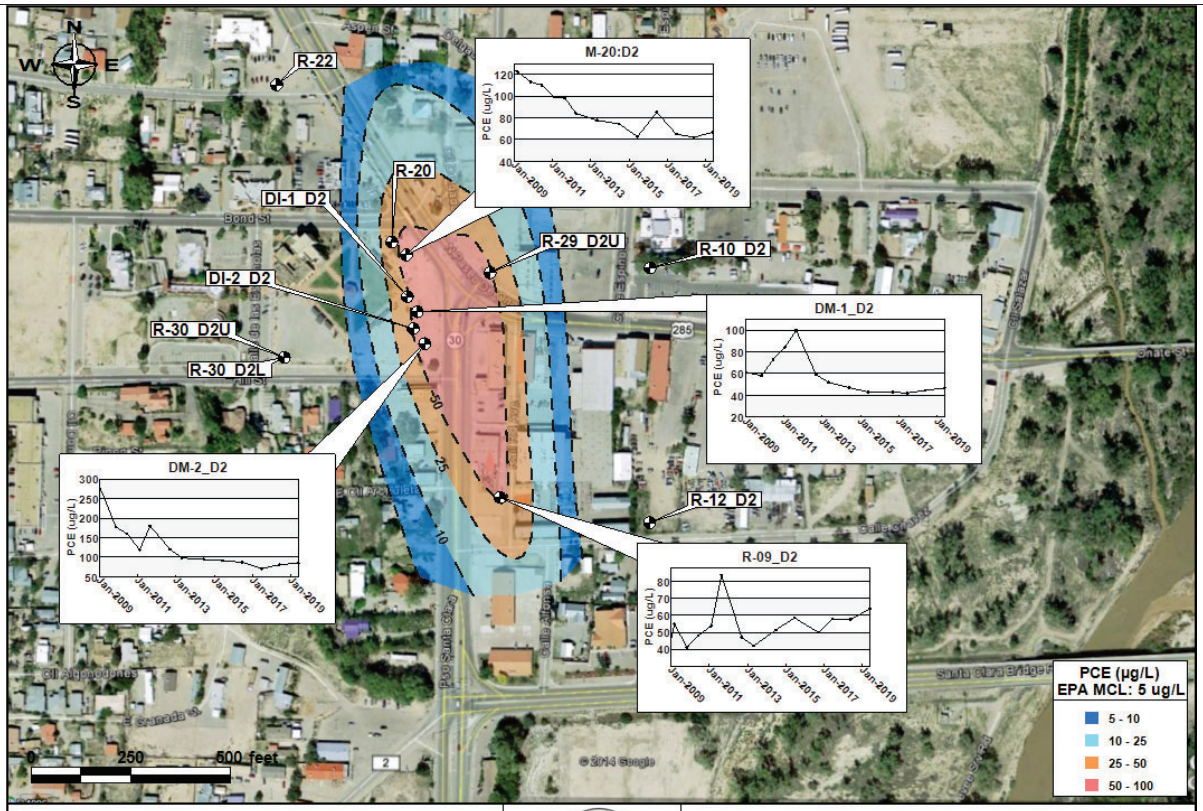


Figure C-20 - Deep (D2) Aquifer – TCE Isoconcentration Contour Map

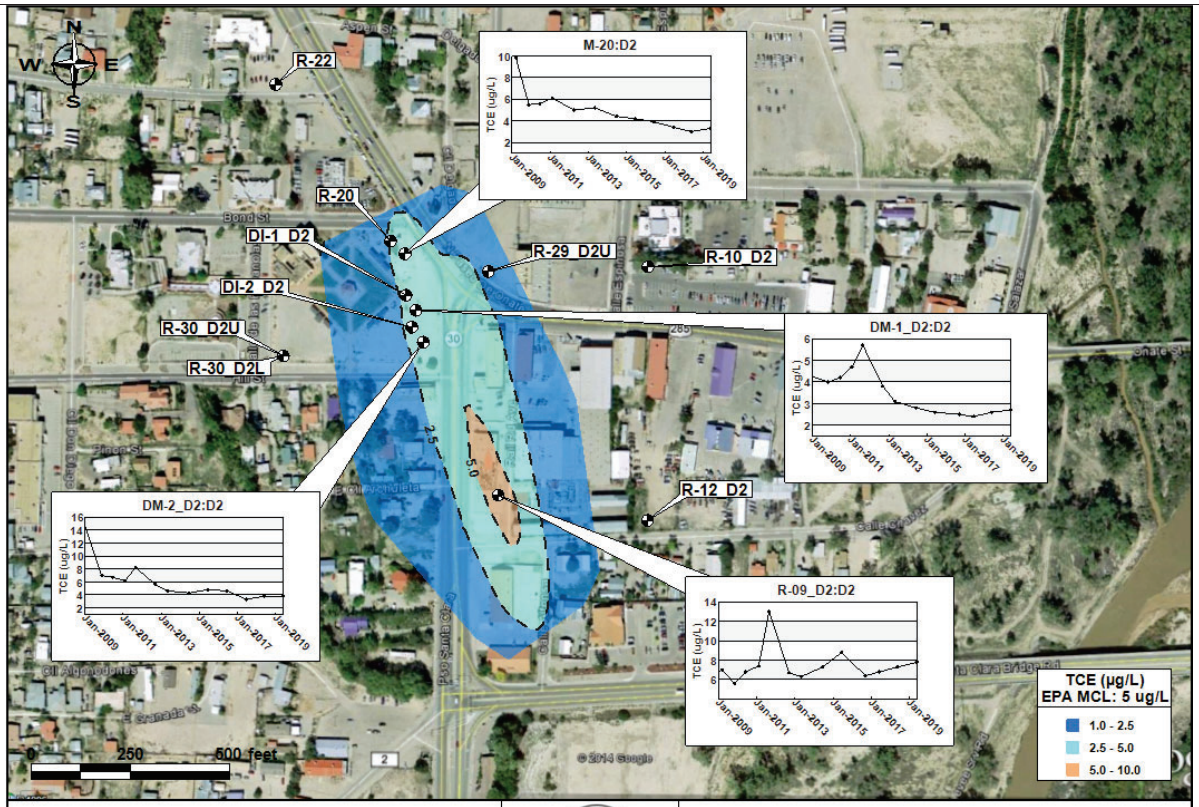


Figure C-21 – Deep Zone (D1) Aquifer PCE Isoconcentration Contours – 2014 to 2019

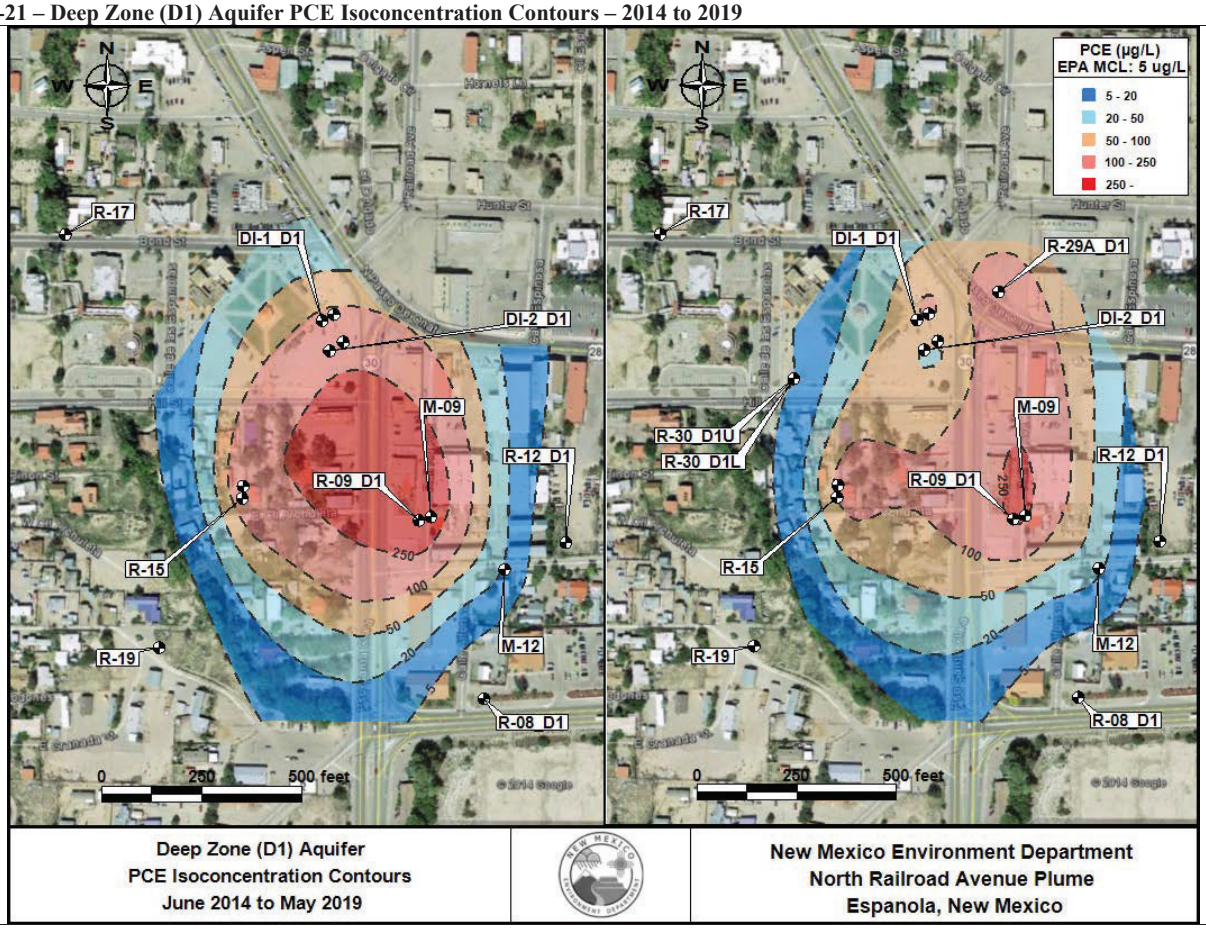


Figure C-22 - North Railroad Avenue Plume Private and Municipal Supply Wells

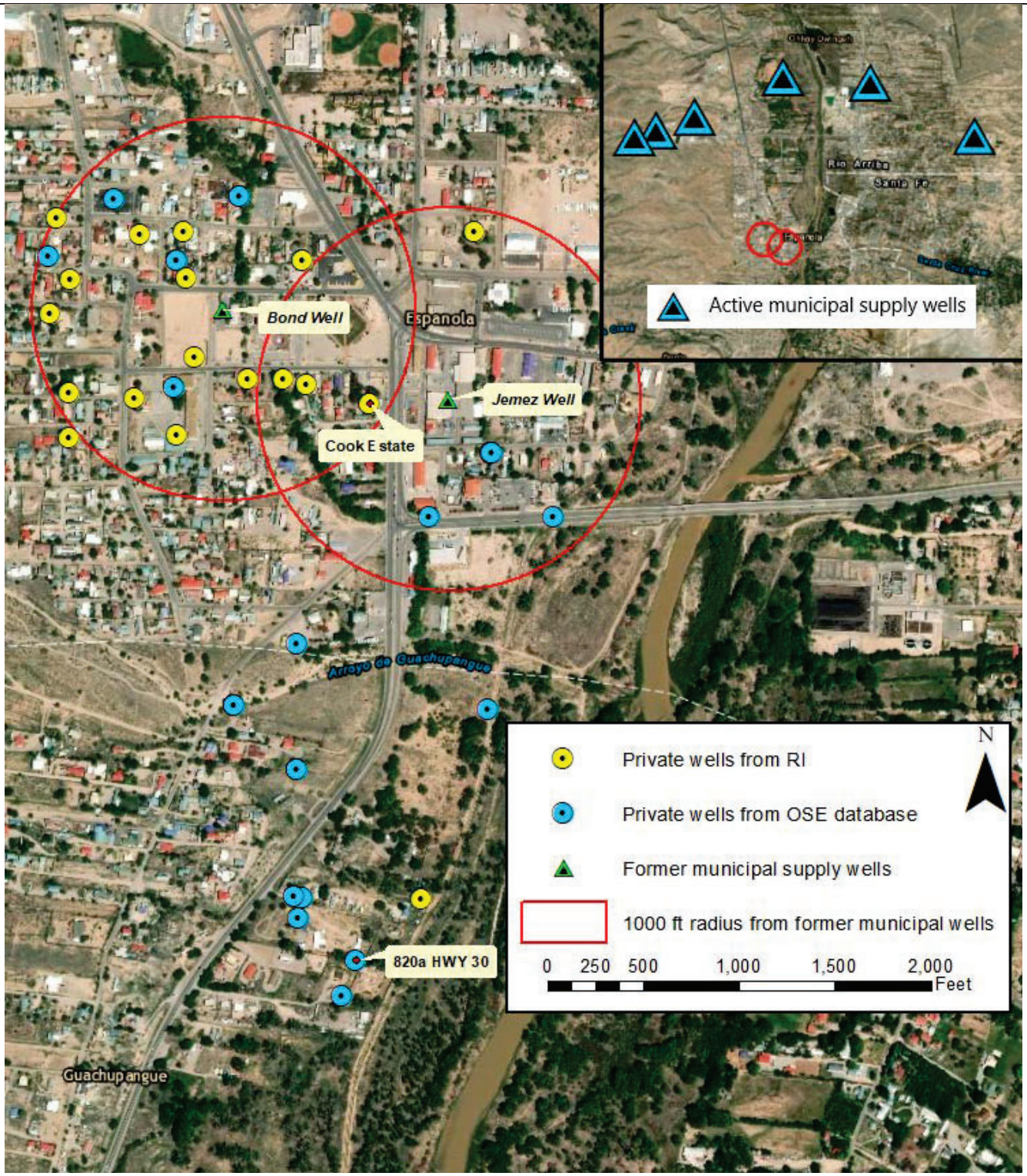


Table C-1 - GroundWater Monitor Well Information														
1Well ID	Well Diameter (inches)	Total Depth (ft. BTOC)	Screen Interval	Est. Purge volume (gal)	Purge Method	Treatment		Trace VOCs	low/med VOCs	Dissolved Metals	TOC and dissolved gases	Biological parameters (DNA/qprc)	Data quality objective
Shallow and Intermediate Background Wells													
R-01(S1)	2	13.5	4.0 - 14.0	5	peristaltic	no							shallow aquifer upgradient background well
R-01(S2)	2	21.25	13.3 - 23.3	4	peristaltic	no		x		x			monitors shallow aquifer background water quality conditions
R-01(I2)	2	109.1	95.0 - 110.0	24	peristaltic/ Monsoon	no		x		x			intermediate aquifer upgradient background well
Shallow Aquifer - Source Area													
SMW-1S	2	22.5	7.5 - 22.5	7.5	peristaltic								not sampled
SMW-1D	2	31	26-31	5.75	peristaltic	yes			x				monitors source area remediation progress
SMW-2S	2	?	??		peristaltic								not sampled
SMW-2D	2	?	??		peristaltic	yes			x		x	x	monitors source area remediation progress
SMW-3S	2	21	6 - 21	7.5	peristaltic	yes			x		x		monitors source area remediation progress
SMW-3D	2	29	24 - 29	5.25	peristaltic	yes			x		x	x	monitors source area remediation progress
SMW-4S	2	16.5	6.5 - 16.5	5	peristaltic	yes			x				monitors source area remediation progress
SMW-4D	2	25	20 - 25	4.5	peristaltic	yes			x				monitors source area remediation progress
SMW-5S		18	8-18	5.5	peristaltic								not sampled
SMW-5D	2	25.5	20.5 - 25.5	4.75	peristaltic	yes			x				monitors source area remediation progress
SMW-6S	2	17	7- 17	5	peristaltic								not sampled
SMW-6D	2	26	21 - 26	5	peristaltic	yes			x		x	x	monitors source area remediation progress
SMW-7D	2	26	21 - 26		peristaltic	yes			x		x	x	monitors source area remediation progress

Table C-1 - GroundWater Monitor Well Information													
1Well ID	Well Diameter (inches)	Total Depth (ft. BTOC)	Screen Interval	Est. Purge volume (gal)	Purge Method	Treatment		Trace VOCs	low/med VOCs	Dissolved Metals	TOC and dissolved gases	Biological parameters (DNA/qprc)	Data quality objective
SMW-8D	2	33	23 - 33		peristaltic	yes			x		x	x	monitors source area remediation progress
EWMW-4B	4	28.34	18 - 28.0	35	whale	no		x					monitors remediation progress at Source Area - Historic rapid changes observed
R-28	4	33	8 - 33	50	whale	no		x					monitors plume boundary downgradient of Source Area treatment
Shallow Aquifer - Hotspot													
HSE-6	4	33	8 - 33	49	whale	no		x					monitors Hotspot remediation for rebound
HSE-10	4	32	7 - 32	49	whale	no		x					monitors Hotspot remediation for rebound
HSE-14	4	27	7 - 27	39	whale	no		x					monitors Hotspot remediation for rebound
HSI-7	4	37	7 - 37	58	whale	no		x					monitors Hotspot remediation for rebound
HSI-9	4	21.7	6.7 - 21.7	29	whale	no		x					Dual purpose - monitors Hotspot remediation for rebound and migration from Source Area
HSI-11	4	20.5	5.5 - 20.5	26									no longer in sampling program
HSI-14	4	26.5	6.5 - 26.5	39									no longer in sampling program
HSI-19	4	29.75	7.25 - 29.75	44									no longer in sampling program
EWMW-2	4	28.17	17.5 - 28.0	41	whale	no		x		x			monitors side gradient plume expansion associated w/ Hotspot treatment - increasing metals concentrations
EWMW-3	4	21.96	11.5 - 22.0	32	whale	no		x					monitors side gradient plume associated w/ Hotspot treatment- historic COC variablity
Shallow Aquifer - between Hotspot &Biocurtain													

Table C-1 - GroundWater Monitor Well Information													
1Well ID	Well Diameter (inches)	Total Depth (ft. BTOC)	Screen Interval	Est. Purge volume (gal)	Purge Method	Treatment		Trace VOCs	low/med VOCs	Dissolved Metals	TOC and dissolved gases	Biological parameters (DNA/qprc)	Data quality objective
SMW-29D	2	35	30 - 35		peristaltic				x		x	x	monitors treatment area in southeastern portion of Source Area
EX-06	Abandoned	13.4	5 - 13.2	3	peristaltic	no		x					monitors plume boundary downgradient of Hotspot
EX-09	2	13.7	5 - 13.0	3	peristaltic	no		x					shallow aquifer boundary definition well
EX-13	2	13.8	5 - 13.2	3	peristaltic	no		x		x			monitors remediation progress downgradient of Hotspot treatment area; significant increase in daughter products since remediation began; increasing metals observed
EX-14	Abandoned	?	5 - 13.0	3	peristaltic	No		x					monitors plume boundary downgradient of Hotspot - slight increasing trend
EX-16	2	17.96		6	peristaltic	no		x					monitors remediation progress downgradient of Hotspot treatment area; monitoring residual daughter products since remediation began
EX-17	lost well	11.67		2	peristaltic	no		x					
R-24(S2)	2	24.7	9.8 - 24.4	10	peristaltic	no		x		x			monitors remediation progress and metals downgradient of Hotspot treatment area - fluctuating VOC and increasing metals conc. observed
R-25(S2)	2	~25	25-Oct	10	peristaltic	no		x		x			monitors remediation progress downgradient of Hotspot treatment area; monitoring residual daughter products since remediation began; increasing metals conc. observed
R-03(S2)	2	24.67	14.0 - 23.9	9	peristaltic	no		x					shallow aquifer boundary definition well
R-09(S1)	2	16.77		5	peristaltic	no		x					shallow aquifer boundary definition well

Table C-1 - GroundWater Monitor Well Information													
1Well ID	Well Diameter (inches)	Total Depth (ft. BTOC)	Screen Interval	Est. Purge volume (gal)	Purge Method	Treatment		Trace VOCs	low/med VOCs	Dissolved Metals	TOC and dissolved gases	Biological parameters (DNA/qprc)	Data quality objective
R-12(S1)	2	19.9	9 - 19	6	peristaltic	no			x				monitors central portion of shallow plume upgrade of biocurtain - used to determine when BC treatment can be terminated
Shallow Aquifer - Biocurtain													
BCE-3	4	30	10 - 30	39									No longer included in sampling program
BCE-5	4	32	12 - 32	42	Whale			x			x		monitors remediation progress within biocurtain treatment system
BCE-7	4	34	9- 34	48	Whale			x			x		monitors remediation progress within biocurtain treatment system
BCE-9	4	27	7 - 27	39	Whale			x			x		monitors remediation progress within biocurtain treatment system
BCE-10	4	29.6	9.6 - 29.6	40									no longer included in sampling program
BC- 2	2	30	10.0 - 30.0	11	peristaltic	no		x		x			monitors remediation within biocurtain treatment area
BC-3	2	28	8.0 - 28.0	10	peristaltic	no		x					monitors remediation within biocurtain treatment area
BC-4	2	33.5	10.0 - 35.0	13	peristaltic	no		x			x		monitors remediation progress within biocurtain treatment system
BC-5	2	28.1	9.0 - 29.0	12	peristaltic	no		x		x	x		monitors remediation progress within biocurtain treatment system
BC-6	2	28.4	9.0 - 29.0	12	peristaltic	no		x			x		monitors remediation progress within biocurtain treatment system - recent increase in concentrations
BC-7S	2	17	7 - 17	5	peristaltic	no		x					upgradient of BC system - monitors incoming water to the biocurtain system for determining when system can be terminated

Table C-1 - GroundWater Monitor Well Information													
1Well ID	Well Diameter (inches)	Total Depth (ft. BTOC)	Screen Interval	Est. Purge volume (gal)	Purge Method	Treatment		Trace VOCs	low/med VOCs	Dissolved Metals	TOC and dissolved gases	Biological parameters (DNA/qprc)	Data quality objective
BC-7D	2	25.5	20.5 - 25. 5	4.75	peristaltic	no		x					upgradient of BC system - monitors incoming water to the biocurtain system for determining when system can be terminated
R-04(S2)	2	27.94	18.0 - 28.0	10	peristaltic	no		x		x			monitors remediation within biocurtain treatment area - increase in VC
R-08(S2)	2	22.92	13.0 - 23.0	6	peristaltic	no		x					monitors side gradient impacts from biocurtain treatment area
R-08A(S2)	1.5	43.2	32.5 - 42.5										assess contaminant extent and concentrations within the shallow Tesque formation in the southern portion of the plume
R-26(S2)	2	40	15 - 40	16	peristaltic	no		x					monitors remediation at edge biocurtain treatment area
R-27(S2)	2	39.3	20 - 35 (5' sump)	16	bailer	no		x					monitors remediation within biocurtain treatment area
Shallow Aquifer - Downgradient of Biocurtain													
R-05(S2)	2	28.07	18.0 - 28.0	8	peristaltic	no		x		x			monitors remediation progress and plume migration downgradient of biocurtain - recent increase in VC & metals
R-06(S1)	lost well	?	5.0 - 15.0		peristaltic	no							
R-06(S2)	2	24.06	15.0 - 25.0	3	peristaltic	no		x					monitors downgradient plume boundary
R-07(S2)	Lost well	23.43	14.0 - 24.0	8	peristaltic	no		x					shallow aquifer boundary definition well
R-14(s2)	2	24.2	15 - 25	9	peristaltic	no		x					monitors remediation progress and plume migration downgradient of biocurtain - recent increase in VC

Table C-1 - GroundWater Monitor Well Information													
1Well ID	Well Diameter (inches)	Total Depth (ft. BTOC)	Screen Interval	Est. Purge volume (gal)	Purge Method	Treatment		Trace VOCs	low/med VOCs	Dissolved Metals	TOC and dissolved gases	Biological parameters (DNA/qprc)	Data quality objective
R-16(S2)	2	30		9	peristaltic	no		x					monitors plume boundary along Rio Grande for potential surface water impacts
RDP-1	2*	12.4	?	0.4	bailer	no		x					monitors plume migration downgradient of biocurtain; recent detection of VC
RDP-2	2*	8.9	?	0.3	bailer	no		x					monitors plume downgradient of biocurtain - recent detection of VC
RDP-3	1.25"	9.1	?	0.5	bailer	no		x					monitors plume boundary and potential surface water impacts along Rio Grande
RDP-4	1.25"	10.1	?	0.5	bailer	no		x					monitors plume boundary and potential surface water impacts along Rio Grande; recent detection of VC
Intermediate Zone Aquifer Wells													
EWMW-4A	4	60.17	47.5 - 57.5	56	Monsoon/ Grundfos	no		x		x			monitors potential migration/impacts to intermediate zone below Source Area
R-03(I1)	2	85.12	70.0 - 85.0	21	peristaltic/Mon-soon/Grundfos	no		x					intermediate aquifer boundary definition well
R-03(I2)	2	108	93.0 - 108.0	25	Monsoon/ Grundfos	no		x					intermediate aquifer boundary definition well
R-04(I2)	2	96.87	80.0 - 95.0	23	Monsoon/ Grundfos	no		x		x			monitors potential migration/impacts on intermediate zone from Biocurtain treatment
R-08(I2)	2	96.07	80.0 - 95.0	23	Monsoon/ Grundfos	no		x					monitors leading edge of intermediate plume - low PCE/TCE concentrations observed
R-08A(I1)	2	60.3	50 - 60										assess contaminant extent and concentrations within the shallow Tesque formation in the southern portion of the plume

Table C-1 - GroundWater Monitor Well Information													
1Well ID	Well Diameter (inches)	Total Depth (ft. BTOC)	Screen Interval	Est. Purge volume (gal)	Purge Method	Treatment		Trace VOCs	low/med VOCs	Dissolved Metals	TOC and dissolved gases	Biological parameters (DNA/qprc)	Data quality objective
R-09(I1)	2	70.17	54.5 - 69.5	19	peristaltic/ Monsoon	R-09(D1)			x				monitors intermediate plume core - increasing PCE concentrations observed
R-09(I2)	2	103.15	90-100 (5' sump)	24	peristaltic/ Monsoon	R-09(D1)			x				monitors intermediate plume core - increasing PCE concentrations observed
R-10(I1)	2	88	73.0 - 88.0	22	peristaltic/Monsoon/Grundfos	no		x					intermediate aquifer boundary definition well
R-10(I2)	2	134.1	118.0 - 133.0	27	Monsoon/ Grundfos	no		x					intermediate aquifer boundary definition well
R-11(I1)	2	70	55.0 - 70.0	17	Peristaltic/ Monsoon	no		x					intermediate aquifer boundary definition well
R-11(I2)	2	98	83.0 - 98.0	22	Monsoon/ Grundfos	no		x					intermediate aquifer boundary definition well
R-12(I1)	2	~71.7	43 - 63 (10' sump)	18	peristaltic/Monsoon/Grundfos	no		x					intermediate aquifer boundary definition well
R-12(I2)	2	97	82 - 92 (5' sump)	23	peristaltic/Monsoon/Grundfos								intermediate aquifer boundary definition well
R-13(I2)	2	98	83 - 98	23	Monsoon/ Grundfos	no			x				monitors leading edge of intermediate plume - increasing PCE concentrations observed
R-23(I1)	2	65	50 65	18	peristaltic/whale	no		x					intermediate aquifer boundary definition well
R-29(I1)	7.5		53 - 58										FLUTe well port monitors northern intermediate zone
R-29(I2)	7.5	?	90 - 95										FLUTe well port monitors northern intermediate zone
R-29A(I1)	2	60.3	40 - 60										Installed adjacent to R-29 due to complications with FLUTe well installation
R-30(I1)	3	255.4	55.8 - 60.7										FLUTe well port monitors western intermediate zone

Table C-1 - GroundWater Monitor Well Information													
1Well ID	Well Diameter (inches)	Total Depth (ft. BTOC)	Screen Interval	Est. Purge volume (gal)	Purge Method	Treatment		Trace VOCs	low/med VOCs	Dissolved Metals	TOC and dissolved gases	Biological parameters (DNA/qprc)	Data quality objective
R-30(I2)	3	255.4	80.7 - 85.6										FLUTe well port monitors western intermediate zone
R-31(I1)	2	95.3	75 - 95	32									monitors western intermediate zone plume
R-31(I2)	2	131.1	111 - 131	50									monitors western intermediate zone plume
R-32(I1)	2	80.3	65 - 80	16									monitors southern intermediate zone plume
R-32(I2)	2	98.8	88.5 - 98.5	40									monitors southern intermediate zone plume
DM-1(I1)	2	71.5	51.5 - 71.5	20	peristaltic/whale	no		x		x			Monitors intermediate aquifer near former injection location
DM-2(I1)	2	71	51.5 - 71.5	20	peristaltic/whale	no		x					Monitors intermediate aquifer near former injection location
Deep Zone Aquifer Wells													
DI-1(D1)	3	190	170 -190	84	Grundfos				x		x	x	monitors deep zone remediation progress within the ERD injection well
DI-1(D2)	3	266	226 - 266	112									deep zone injection well - dropped from sampling program
DI-2(D1)	3	192	156 - 192	83									deep zone injection well - dropped from sampling program
DI-2(D2)									x		x		monitors deep zone remediation progress within the ERD injection well
R-09(D1)	2	190.3	175 - 190	36	Grundfos	YES			x		x	x	monitors deep zone remediation progress within the ERD injection well
R-15	2	205	185-205										deep zone injection well - dropped from sampling program
R-21	2	238	213 - 238	43	Monsoon	DI-2(D1)			x		x	x	monitors deep zone remediation progress within the ERD injection well
R-08(D1)	2	192.3	175 - 190	35	Grundfos	no		x					deep aquifer boundary definition well

Table C-1 - GroundWater Monitor Well Information													
1Well ID	Well Diameter (inches)	Total Depth (ft. BTOC)	Screen Interval	Est. Purge volume (gal)	Purge Method	Treatment		Trace VOCs	low/med VOCs	Dissolved Metals	TOC and dissolved gases	Biological parameters (DNA/qprc)	Data quality objective
M-09	3	191	166 - 191	91	Grundfos	R-09(D1)			x	x	x	x	monitors deep zone remediation progress at nearby monitor well
R-09(D2)	4	264.8 (261.3) mud 254	242 - 252	178	Grundfos	R-09(D1)			x	x			monitors D2 zone adjacent to D1 injection well for possible influence
R-09(D3)	4	357	342.0 - 357.0	244	Grundfos	no		x					Vertical definition well in D3 of deep zone
R-10(D2)	4	258	244.0 - 259.0	180	Grundfos	no		x					deep aquifer boundary definition well
R-12(D1)	2	189	170.0 - 185.0	35	Grundfos	no		x					monitors eastern downgradient edge of deep zone - low concentrations observed
R-12(D2)	4	260	243 - 258	180	Grundfos	no		x					deep aquifer boundary definition well
M-12	3	195	165 - 195	98	Grundfos	no			x	x			monitors SE portion of deep zone plume outside of treatment well influence
M-15	3	205	185 - 205	91	Grundfos	R-15(D1)			x	x			monitors deep zone remediation progress at nearby monitor well
R-17(D1)	2	224	200 - 220	42	Grundfos	no		x					deep aquifer boundary definition well
R-18(D1)	2	232	217 - 232	41	Grundfos	no		x					deep aquifer boundary definition well
R-19(D1)	2	227	207 - 222	40	Grundfos	no		x					deep aquifer boundary definition well
R-20(D1)	2	230	210 - 225	40	Grundfos	DI-1(D2)			x				monitors potential source area remediation effects on the deep zone
R-29(D2U)	7.5	?	229 - 234										FLUTe well port monitors northern deep zone
R-29A(D1)	2	165.3	150 - 165										Installed adjacent to R-29 due to complications with FLUTe well installation
R-30(D1U)	3	255.4	105.6 - 110.4										FLUTe well port monitors western deep zone

Table C-1 - GroundWater Monitor Well Information													
1Well ID	Well Diameter (inches)	Total Depth (ft. BTOC)	Screen Interval	Est. Purge volume (gal)	Purge Method	Treatment		Trace VOCs	low/med VOCs	Dissolved Metals	TOC and dissolved gases	Biological parameters (DNA/qprc)	Data quality objective
R-30(D1L)	3	255.4	130.4 - 135.3										FLUTe well port monitors western deep zone
R-30(D2U)	3	255.4	193.3 - 200.2										FLUTe well port monitors western deep zone
R-30(D2L)	3	255.4	240.1 - 245										FLUTe well port monitors western deep zone
M-20	3	227	202 - 227	100	Grundfos	DI-1(D2)			x	x			monitors potential source area remediation effects on the deep zone
M-21	3	229.5	215 - 230	91	Grundfos	R-21		x					Well not representative of COC conc. in surrounding aquifer
R-22	2	227	205 - 220 (10' sump)	42	Grundfos	no		x					deep aquifer boundary definition well
DM-1(D1)	3	194	175 - 195	86	Grundfos	DI-1(D2)			x	x	x	x	monitors deep zone remediation progress at nearby monitor well
DM-1(D2)	3	262	230 - 265	116	Grundfos	DI-1(D2)			x			x	monitors deep zone remediation progress at nearby monitior well
DM-2(D1)	3	184	155.5 - 185.5	94	Grundfos	DI-2(D1)			x				monitors deep zone remediation progress at nearby monitor well
DM-2(D2)	3	258	230 - 260	120	Grundfos	DI-2(D2)			x	x			monitors deep zone remediation progress at nearby monitor well
Private / Public Supply Wells													
SCTW-2	2				Tap	no		x					Well no longer in use, dropped from sampling program
Cook Estate					Outside Tap	no		x					well used for irrigation - fluctuating PCE/TCE concentrations observed

In general - Wells <100 ft used peristaltic pump; wells >100 ft used Monsoon or Grundfos pump

-- Wells included in June 2017-May 2019 sampling events

-- Wells included in June 2017-May 2019 sampling events - sampled by NMED's contractor for ERD system performance & outside lab analysis (TOC, dissolved gases & biological parameters)

- Wells sampled on Triennial schedule - sampled during 2018 event

Table C-2 - Groundwater Elevation Data 2017-2019								
WELL ID	TOTAL DEPTH (ft below TOC)	TOC ELEVATION (ft above MSL)	DEPTH TO WATER					
			2017		2018		2019	
			ft below TOC	ft above MSL	ft below TOC	ft above MSL	ft below TOC	ft above MSL
BC-2	30.0	5586.62	8.45	5578.17	9.67	5576.95	9.51	5577.11
BC-3	28.0	5586.38	NM		NM		NM	
BC-4	33.5	5588.72	10.56	5578.16	12.03	5576.69	11.49	5577.23
BC-5	28.1	5586.39	8.15	5578.24	9.44	5576.95	9.00	5577.39
BC-6	28.4	5586.37	8.02	5578.35	NM		8.66	5577.71
BC-7S	17.4	5582.69	4.42	5578.27	5.94	5576.75	5.29	5577.40
BC-7D	25.5	5582.53	4.29	5578.24	5.77	5576.76	5.15	5577.38
DI-1(D1)	190.0	5590.02	34.69	5555.33	32.54	5557.48	32.05	5557.97
DI-1(D2)	258.0	5589.72	40.90	5548.82	37.71	5552.01	NM	
DI-1(I1)	71.0	5590.07	NM		NM		11.75	5578.32
DI-2(D1)	190.0	5589.26	34.50	5554.76	32.18	5557.08	31.91	5557.35
DI-2(D2)	258.0	5589.22	40.15	5549.07	37.00	5552.22	36.31	5552.91
DI-2(I1)	73.0	5589.36	-		10.60	5578.76	10.89	5578.47
DM-1(D1)	194.0	5589.44	34.26	5555.18	31.90	5557.54	31.35	5558.09
DM-1(D2)	262.0	5589.70	40.49	5549.21	37.23	5552.47	36.56	5553.14
DM-1(I1)	71.0	5589.65	10.76	5578.89	11.08	5578.57	11.37	5578.28
DM-2(D1)	184.0	5589.23	33.45	5555.78	31.22	5558.01	30.77	5558.46
DM-2(D2)	258.0	5588.81	39.90	5548.91	36.63	5552.18	35.96	5552.85
DM-2(I1)	71.0	5588.97	9.74	5579.23	10.24	5578.73	10.52	5578.45
EWMW-1	60.7	5585.15	NM		NM		NM	
EWMW-2	28.2	5585.80	6.11	5579.69	6.61	5579.19	6.97	5578.83
EWMW-3	22.0	5585.01	5.31	5579.70	5.78	5579.23	6.14	5578.87
EWMW-4A	60.2	5585.10	5.32	5579.78	5.80	5579.30	6.18	5578.92
EWMW-4B	28.3	5585.31	5.61	5579.70	6.29	5579.02	6.47	5578.84
EX-06	13.4	5585.77	NM		NM		NM	
EX-09	13.7	5586.44	6.94	5579.50	7.35	5579.09	NM	
EX-11	13.8	5586.24	6.94	5579.30	7.43	5578.81	7.77	5578.47
EX-13	13.6	5585.28	6.10	5579.18	9.75	5575.53	6.97	5578.31
EX-14	13.1	5585.90	NM		NM		NM	
EX-15	13.4	5587.01	7.54	5579.47	7.92	5579.09	8.32	5578.69
EX-16	18.0	5585.72	6.25	5579.47	6.87	5578.85	7.07	5578.65
EX-17	11.7	5585.62	NM		NM		NM	
M-09	191.0	5585.01	30.85	5554.16	28.40	5556.61	27.77	5557.24

Table C-2 - Groundwater Elevation Data 2017-2019								
WELL ID	TOTAL DEPTH (ft below TOC)	TOC ELEVATION (ft above MSL)	DEPTH TO WATER					
			2017		2018		2019	
			ft below TOC	ft above MSL	ft below TOC	ft above MSL	ft below TOC	ft above MSL
M-12	195.0	5584.04	30.57	5553.47	28.08	5555.96	27.37	5556.67
M-15	205.0	5585.00	30.72	5554.28	28.27	5556.73	27.77	5557.23
M-20	227.0	5589.20	39.37	5549.83	36.19	5553.01	35.62	5553.58
M-21	229.0	5586.91	37.91	5549.00	34.65	5552.26	NM	
R-01(I2)	109.1	5585.79	14.41	5571.38	13.85	5571.94	13.99	5571.80
R-01(S1)	14.0	5585.83	6.00	5579.83	6.43	5579.40	6.88	5578.95
R-01(S2)	21.3	5585.79	5.98	5579.81	6.40	5579.39	6.84	5578.95
R-02(S2)	21.1	5586.21	NM		NM		NM	
R-03(I1)	85.1	5583.47	7.30	5576.17	8.23	5575.24	NM	
R-03(I2)	108.0	5583.58	8.40	5575.18	9.10	5574.48	8.70	5574.88
R-03(S2)	24.7	5583.66	5.40	5578.26	6.52	5577.14	5.88	5577.78
R-04(I2)	96.9	5586.52	8.69	5577.83	9.72	5576.80	9.49	5577.03
R-04(S2)	27.9	5586.59	8.61	5577.98	9.84	5576.75	9.73	5576.86
R-05(S2)	28.1	5587.57	10.41	5577.16	11.90	5575.67	11.30	5576.27
R-06(S1)	15.0	5580.95	NM		NM		NM	
R-06(S2)	24.1	5580.94	6.30	5574.64	7.64	5573.30	7.00	5573.94
R-07(S2)	23.4	5580.06	NM		NM		NM	
R-08(D1)	192.3	5588.01	34.83	5553.18	32.42	5555.59	31.74	5556.27
R-08(I2)	96.1	5588.47	10.52	5577.95	11.28	5577.19	11.03	5577.44
R-08(S2)	22.9	5588.07	10.04	5578.03	11.00	5577.07	11.25	5576.82
R-08A(I1)	60.3	5588.83	-		-		11.51	5577.32
R-08A(S2)	43.2	5588.85	-		-		11.91	5576.94
R-09(D1)	190.3	5585.77	32.25	5553.52	29.62	5556.15	28.94	5556.83
R-09(D2)	264.8	5585.51	37.57	5547.94	34.33	5551.18	33.63	5551.88
R-09(D3)	357.0	5586.10	39.40	5546.70	35.81	5550.29	35.08	5551.02
R-09(I1)	70.2	5586.00	7.35	5578.65	7.93	5578.07	8.18	5577.82
R-09(I2)	103.2	5587.08	8.57	5578.51	9.17	5577.91	9.35	5577.73
R-09(S1)	16.8	5587.06	NM		NM		NM	
R-10(D2)	258.0	5586.45	39.04	5547.41	35.56	5550.89	34.81	5551.64
R-10(I1)	88.0	5586.57	10.74	5575.83	11.08	5575.49	10.72	5575.85
R-10(I2)	134.1	5587.19	30.31	5556.88	28.20	5558.99	27.91	5559.28
R-11(I1)	70.0	5597.86	17.93	5579.93	18.28	5579.58	19.23	5578.63
R-11(I2)	98.0	5597.27	18.60	5578.67	19.04	5578.23	18.49	5578.78

Table C-2 - Groundwater Elevation Data 2017-2019								
WELL ID	TOTAL DEPTH (ft below TOC)	TOC ELEVATION (ft above MSL)	DEPTH TO WATER					
			2017		2018		2019	
			ft below TOC	ft above MSL	ft below TOC	ft above MSL	ft below TOC	ft above MSL
R-12(D1)	189.0	5583.41	31.34	5552.07	28.70	5554.71	27.97	5555.44
R-12(D2)	258.0	5583.70	35.11	5548.59	31.88	5551.82	31.19	5552.51
R-12(I1)	71.2	5583.38	5.20	5578.18	7.99	5575.39	5.90	5577.48
R-12(I2)	95.5	5586.70	15.29	5571.41	15.22	5571.48	NM	
R-12(S1)	19.9	5585.64	7.10	5578.54	8.02	5577.62	8.04	5577.60
R-13(I2)	98.0	5585.98	7.75	5578.23	8.41	5577.57	8.52	5577.46
R-14(S2)	24.2	5586.33	9.18	5577.15	10.83	5575.50	9.72	5576.61
R-15(D1)	205.0	5584.90	30.25	5554.65	27.55	5557.35	27.03	5557.87
R-16(S2)	30.0	5587.62	9.50	5578.12	11.48	5576.14	9.58	5578.04
R-17(D1)	224.0	5592.84	40.69	5552.15	37.85	5554.99	37.35	5555.49
R-18(D1)	232.0	5611.25	40.79	5570.46	46.55	5564.70	40.56	5570.69
R-19(D1)	227.0	5607.99	38.02	5569.97	37.68	5570.31	37.70	5570.29
R-20(D2)	230.0	5588.75	37.35	5551.40	34.65	5554.10	NM	
R-21(D2)	238.0	5589.53	41.14	5548.39	37.77	5551.76	37.19	5552.34
R-22(D2)	227.0	5588.41	35.60	5552.81	32.39	5556.02	32.10	5556.31
R-23(I1)	65.0	5585.65	6.19	5579.46	6.63	5579.02	7.00	5578.65
R-24(S2)	24.7	5585.38	5.85	5579.53	6.42	5578.96	6.70	5578.68
R-25(S2)	25.2	5585.83	6.46	5579.37	7.11	5578.72	7.31	5578.52
R-26(S2)	40.0	5587.06	NM		10.09	5576.97	10.06	5577.00
R-27(S2)	39.3	5587.22	9.30	5577.92	10.71	5576.51	10.27	5576.95
R-28(S2)	33.0	5586.16	6.47	5579.69	6.90	5579.26	7.32	5578.84
R-29A(I1)	60.3	5586.83	-		-		8.48	5578.35
R-29A(D1)	165.3	5586.85	-		-		28.20	5558.65
R-31(I1)	95.3	5604.10	-		-		25.88	5578.22
R-31(I2)	131.3	5604.12	-		-		26.15	5577.97
R-32(I1)	80.3	5592.00	-		-		14.68	5577.32
R-32(I2)	98.8	5592.11	-		-		14.55	5577.56
RDP-01	12.4	5584.45	8.58	5575.87	10.11	5574.34	9.12	5575.33
RDP-02	8.9	5579.93	3.98	5575.95	6.01	5573.92	3.85	5576.08
RDP-03	9.1	5580.70	5.05	5575.65	7.43	5573.27	4.42	5576.28
RDP-04	10.1	5580.27	NM		NM		NM	

Table C-3 - Historical Groundwater Analytical Results (2010-2019) – VOCs							
Sample Location	**Sample ID #**	**Date Sampled**	**PCE**	**TCE**	**1,2-cis DCE**	**1,2-trans DCE**	**Vinyl Chloride**
EWMW-2	F3H94	6/7/2010	<0.5	0.10 LJ	0.07 LJ	60.0	**5.0**
EWMW-2		1/25/2011	<1.0	<1.0	<1.0	18.8	<1.0
EWMW-2	F4BR6	8/24/2011	<5.0	<5.0	<5.0	8.2	<5.0
EWMW-2	F5H00	3/21/2012	<0.5	<0.5	<0.5	3.9	<0.5
EWMW-2	F5H60	3/21/2012	<0.5	<0.5	<0.5	4.0	<0.5
EWMW-2	F7BE2	4/24/2013	<0.5	0.11 LJ	<0.5	3.1	0.22 LJ
EWMW-2		6/11/2014	<1.0	<1.0	<1.0	10.6	<1.0
EWMW-2	1506003-01	6/1/2015	<1.0	<1.0	5.9	11.1	**27.9**
EWMW-2	F1C02	6/9/2016	<0.5	0.44 LJ	**170.0**	15.0	**120.0**
EWMW-2		6/7/2017	1.2	3.6	**76.5**	16.4	**101.0**
EWMW-2		4/30/2018	<1.0	<1.0	<1.0	2.4	<1.0
EWMW-2		5/6/2019	<1.0	<1.0	1.5	2.8	1.3
EWMW-3	F3H95	6/7/2010	<0.5	0.076 LJ	0.06 LJ	1.2	<0.5
EWMW-3		1/25/2011	<1.0	<1.0	<1.0	<1.0	<1.0
EWMW-3	F4BR7	8/23/2011	<0.5	<0.5	<0.5	<0.5	<0.5
EWMW-3	F5H01	3/19/2012	<0.5	<0.5	0.08 LJ	0.16 LJ	0.13 LJ
EWMW-3	F7BE3	4/22/2013	<0.5	<0.5	<0.5	0.11 LJ	<0.5
EWMW-3	1506003-02	6/1/2015	<1.0	<1.0	<1.0	<1.0	<1.0
EWMW-3		5/1/2018	<1.0	<1.0	<1.0	<1.0	<1.0
EWMW-4A	F3H96	6/7/2010	<0.5	<0.5	<0.5	<0.5	<0.5
EWMW-4A		1/26/2011	1.5	<1.0	<1.0	<1.0	<1.0
EWMW-4A	F4BR8	8/23/2011	<0.5	<0.5	<0.5	<0.5	<0.5
EWMW-4A	F5H02	3/29/2012	<0.5	<0.5	<0.5	<0.5	<0.5
EWMW-4A	F7BE4	4/22/2013	<0.5	<0.5	<0.5	<0.5	<0.5
EWMW-4A		6/11/2014	<1.0	<1.0	<1.0	<1.0	<1.0
EWMW-4A	1506003-03	6/1/2015	<1.0	<1.0	<1.0	<1.0	<1.0
EWMW-4A	F1C06	6/7/2016	<0.5	<0.5	<0.5	<0.5	<0.5
EWMW-4A		6/12/2017	<1.0	<1.0	<1.0	<1.0	<1.0
EWMW-4A		4/30/2018	<1.0	<1.0	<1.0	<1.0	<1.0
EWMW-4A		5/6/2019	<1.0	<1.0	<1.0	<1.0	<1.0
EWMW-4B	R-45	10/28/2010	<0.5	<0.5	0.38 LJ	7.4	0.7
EWMW-4B	F3HD4	6/16/2010	<5.0	<5.0	<5.0	8.1	<5.0
EWMW-4B		2/8/2011	<0.5	<0.5	<0.5	17.4	**4.6**
EWMW-4B	F4BR9	8/29/2011	<5.0	<5.0	<5.0	38	**5.5**
EWMW-4B	F5H03	3/28/2012	<5.0	<5.0	<5.0	25.0	<5.0
EWMW-4B	F7BE5	4/22/2013	<0.5	0.7	0.66	24.0	<0.5
EWMW-4B		6/11/2014	<1.0	<1.0	<1.0	6.5	<1.0
EWMW-4B	1506003-04	6/1/2015	<1.0	<1.0	<1.0	6.9	**3.2**
EWMW-4B	F1C15	6/7/2016	<0.5	0.4 LJ	<0.5	8.5	0.5
EWMW-4B		6/12/2017	<1.0	<1.0	<1.0	6.9	<1.0
EWMW-4B		4/30/2018	<1.0	<1.0	42.10	11.8	**18.6**
EWMW-4B		5/6/2019	<1.0	<1.0	46.0	19.5	**37.8**
EX-06	F3HC7	6/8/2010	<0.5	<0.5	0.23 LJ	0.06 LJ	<0.5
EX-06		1/27/2011	<0.5	<0.5	<0.5	<0.5	<0.5
EX-06	F4BS0	8/23/2011	<0.5	<0.5	<0.5	<0.5	<0.5
EX-06	F5H04	3/20/2012	<0.5	<0.5	0.29 LJ	0.09 LJ	<0.5
EX-06 (Well Abandoned)	1304036-01	4/29/2013	<0.5	<0.5	0.80	<0.5	<0.5
EX-09	F5H05	3/20/2012	<0.5	<0.5	0.36 LJ	<0.5	<0.5
EX-09	1506008-01	6/3/2015	<1.0	<1.0	<1.0	<1.0	<1.0
EX-09		5/2/2018	<1.0	<1.0	<1.0	<1.0	<1.0
EX-09	R-103(Dup)	5/2/2018	<1.0	<1.0	<1.0	<1.0	<1.0
EX-13	F3HD5	6/15/2010	<5.0	<5.0	2.4 LJ	2.4 LJ	**4.9 LJ**
EX-13		2/7/2011	<0.5	<0.5	<0.5	2.8	**3.4**
EX-13	F4BS1	8/24/2011	<5.0	<5.0	<5.0	2.0 LJ	**3.9 LJ**
EX-13	F5H06	3/22/2012	<0.5	<0.5	0.23 LJ	1.0	1.8
EX-13	F7BE7	4/25/2013	<0.5	<0.5	0.24 LJ	0.9	1.9
EX-13		6/12/2014	<1.0	<1.0	<1.0	1.0	**2.6**
EX-13	1506005-03	6/2/2015	<1.0	<1.0	<1.0	<1.0	**2.9**

Table C-3 - Historical Groundwater Analytical Results (2010-2019) – VOCs							
Sample Location	**Sample ID #**	**Date Sampled**	**PCE**	**TCE**	**1,2-cis DCE**	**1,2-trans DCE**	**Vinyl Chloride**
EX-13	F1C03	6/13/2016	<0.5	0.12 LJ	0.20 LJ	0.49 LJ	1.2
EX-13		6/7/2017	<1.0	<1.0	<1.0	<1.0	1.4
EX-13		5/3/2018	<1.0	<1.0	<1.0	<1.0	1.4
EX-13		5/7/2019	<1.0	<1.0	<1.0	<1.0	1.4
EX-13	R-101(Dup)	5/7/2019	<1.0	<1.0	<1.0	<1.0	1.4
EX-14	F3HC8	6/17/2010	2.0	0.40 LJ	0.39 LJ	0.20 LJ	0.28 LJ
EX-14		1/25/2011	2.2	<1.0	<1.0	<1.0	<1.0
EX-14	F4BS2	8/24/2011	**6.3**	<5.0	<5.0	<5.0	<5.0
EX-14	F5H07	3/20/2012	1.4	0.32 LJ	0.15 LJ	<0.5	<0.5
EX-14	F7BE8	4/24/2013	3.0	0.23 LJ	<0.5	<0.5	<0.5
EX-14 (Well Abandoned)		6/12/2014	1.6	<1.0	<1.0	<1.0	<1.0
EX-16	F3HD7	6/15/2010	<5.0	<5.0	<5.0	2.4 LJ	1.4 LJ
EX-16		2/7/2011	<1.0	<1.0	<1.0	2.2	**5.4**
EX-16	F4BS3	8/24/2011	<5.0	<5.0	<5.0	1.7 LJ	**2.2 LJ**
EX-16	F5H08	3/22/2012	<0.5	<0.5	<0.5	0.80	1.2
EX-16	F5H61	3/22/2012	<0.5	<0.5	<0.5	0.84	1.3
EX-16	1304036-0	4/29/2013	<0.5	<0.5	<0.5	0.60	<0.5
EX-16		6/12/2014	<1.0	<1.0	<1.0	<1.0	<1.0
EX-16	1506005-04	6/2/2015	<1.0	<1.0	<1.0	<1.0	<1.0
EX-16	F1C21	6/9/2016	<0.5	0.1 LJ	0.33 LJ	0.18 LJ	0.5
EX-16		6/8/2017	<1.0	<1.0	<1.0	<1.0	<1.0
EX-16		5/2/2018	<1.0	<1.0	<1.0	<1.0	<1.0
EX-17	F3HD8	6/15/2010	2.0 LJ	1.6 LJ	4.7 LJ	<5.0	**2.7 LJ**
EX-17 (Well Lost)		2/7/2011					
R-01(I2)	F5H10	3/21/2012	<0.5	<0.5	<0.5	<0.5	<0.5
R-01(I2)	1506008-04	6/3/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-01(I2)		4/30/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-01(S1)		6/2/2015	ND	ND	ND	ND	ND
R-01(S1)		4/30/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-01(S2)	F3H97	6/7/2010	<0.5	<0.5	<0.5	<0.5	<0.5
R-01(S2)		1/25/2011	<1.0	<1.0	<1.0	<1.0	<1.0
R-01(S2)	F4BS9	8/22/2011	<0.5	<0.5	<0.5	<0.5	<0.5
R-01(S2)	F5H09	3/21/2012	<0.5	<0.5	<0.5	<0.5	<0.5
R-01(S2)	F7BF6	4/24/2013	0.08 LJ	<0.5	<0.5	<0.5	<0.5
R-01(S2)		6/11/2014	<1.0	<1.0	<1.0	<1.0	<1.0
R-01(S2)	1506005-06	6/2/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-01(S2)	F1C01	6/7/2016	0.32 LJ	<0.5	<0.5	<0.5	<0.5
R-01(S2)		6/7/2017	<1.0	<1.0	<1.0	<1.0	<1.0
R-01(S2)		4/30/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-01(S2)	R-101(Dup)	4/30/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-01(S2)		5/6/2019	<1.0	<1.0	<1.0	<1.0	<1.0
R-03(I1)	F5H12	3/21/2012	<0.5	<0.5	<0.5	<0.5	<0.5
R-03(I1)	1506011-03	6/4/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-03(I1)		5/14/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-03(I2)	F5H13	3/21/2012	<0.5	<0.5	<0.5	<0.5	<0.5
R-03(I2)	1506011-04	6/4/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-03(I2)		5/14/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-03(I2)	R-104(Dup)	5/14/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-03(S2)	F5H11	3/21/2012	0.24 LJ	0.48 LJ	0.27 LJ	<0.5	<0.5
R-03(S2)	1506011-05	6/4/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-03(S2)		5/14/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-04(I2)	F3HE0	6/16/2010	<0.5	<0.5	<0.5	<0.5	<0.5
R-04(I2)		2/7/2011	3.1	<1.0	<1.0	<1.0	<1.0
R-04(I2)	F4BT0	8/22/2011	0.46 LJv	<0.5	<0.5	<0.5	<0.5
R-04(I2)	F5H15	3/27/2012	<0.5	<0.5	<0.5	<0.5	<0.5
R-04(I2)	F7BF7	4/23/2013	<0.5	<0.5	<0.5	<0.5	<0.5

Table C-3 - Historical Groundwater Analytical Results (2010-2019) – VOCs							
Sample Location	**Sample ID #**	**Date Sampled**	**PCE**	**TCE**	**1,2-cis DCE**	**1,2-trans DCE**	**Vinyl Chloride**
R-04(I2)		6/16/2014	<1.0	<1.0	<1.0	<1.0	<1.0
R-04(I2)	1506014-05	6/8/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-04(I2)	F1C07	6/9/2016	<0.5	<0.5	<0.5	<0.5	<0.5
R-04(I2)		6/8/2017	<1.0	<1.0	<1.0	<1.0	<1.0
R-04(I2)		5/22/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-04(I2)		5/14/2019	<1.0	<1.0	<1.0	<1.0	<1.0
R-04(S2)	F3HD9	6/16/2010	<0.5	0.34 LJ	4.9	9.0	**12.0**
R-04(S2)		2/7/2011	<1.0	<1.0	9.7	7	**7.2**
R-04(S2)	F4BT1	8/22/2011	<5.0	<5.0	3.7 LJ	15	**23**
R-04(S2)	F5H14	3/27/2012	<0.5	0.16 LJ	8.9	7.6	0.47 LJ
R-04(S2)	F7BF8	4/23/2013	<0.5	1.2	7.4	8.5	0.24 LJ
R-04(S2)		6/16/2014	<1.0	1.4	9.5	10.4	<1.0
R-04(S2)	1506014-06	6/8/2015	<1.0	1.9	8.4	11.0	1.2
R-04(S2)	F1C04	6/9/2016	0.9	2.7	7.7	8.3	0.3 LJ
R-04(S2)		6/12/2017	<1.0	<1.0	6.1	5.4	<1.0
R-04(S2)		5/15/2018	<1.0	2.1	3.8	3.6	<1.0
R-04(S2)	R-105(Dup)	5/15/2018	<1.0	1.9	3.6	3.3	<1.0
R-04(S2)		5/8/2019	<1.0	1.2	4.3	4.3	<1.0
R-05(S2)	F3H98	6/9/2010	2.9	3.7	3.9	3.1	<0.5
R-05(S2)		1/26/2011	3.9	4.5	5.2	6.3	**7.4**
R-05(S2)	F4BT2	8/30/2011	2.5 LJ	3.3 LJ	3.5 LJ	4.6 LJ	**7.8**
R-05(S2)	F4BX5	8/30/2011	2.2 LJ	2.9 LJ	3.1 LJ	4.0 LJ	**6.6**
R-05(S2)	F5H16	3/26/2012	1.6	2.5	2.6	6.1	**7.0**
R-05(S2)	F7BF9	4/23/2013	1.0	2.0	4.6	7.2	**7.0**
R-05(S2)		6/17/2014	<1.0	1.2	2.2	5.8	1.1
R-05(S2)	Dup R-41	6/17/2014	<1.0	1.2	2.2	5.8	1.1
R-05(S2)	1506018-17	6/10/2015	<1.0	<1.0	6.1	2.0	1.4
R-05(S2)	F1C05	6/21/2016	<0.5	0.7	2.2	4.4	1.1
R-05(S2)		6/15/2017	<1.0	<1.0	1.5	2.2	<1.0
R-05(S2)		5/24/2018	<1.0	<1.0	2.5	3.9	1.1
R-05(S2)		5/22/2019	<1.0	<1.0	2.2	1.8	<1.0
R-06(S2)	F3H99	6/9/2010	0.29 LJ	0.7	0.48 LJ	0.20 LJ	<0.5
R-06(S2)		1/26/2011	<1.0	<1.0	<1.0	<1.0	<1.0
R-06(S2)	F4BT3/F4L32	8/30/2011	<0.5	0.28 LJ	<0.5	<0.5	<0.5
R-06(S2)	F5H17	3/26/2012	<0.5	<0.5	<0.5	<0.5	<0.5
R-06(S2)	F7BG0	4/23/2013	0.068 LJ	0.82 LJ	<0.5	<0.5	<0.5
R-06(S2)		6/17/2014	<1.0	<1.0	<1.0	<1.0	<1.0
R-06(S2)	1506018-18	6/10/2015	<1.0	<1.0	<1.0	1.1	<1.0
R-06(S2)		5/24/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-06(S2)		5/22/2019	<1.0	<1.0	1.1	1.3	<1.0
R-08(D1)	F5H21	3/22/2012	<0.5	<0.5	<0.5	<0.5	<0.5
R-08(D1)	1506008-05	6/3/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-08(D1)		5/1/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-08(D1)		5/7/2019	<1.0	<1.0	<1.0	<1.0	<1.0
R-08(I2)	F3HB4	6/8/2010	2.7	3.3	0.64	<0.5	<0.5
R-08(I2)		1/26/2011	3.5	3.3	<1.0	<1.0	<1.0
R-08(I2)	F4BT4	8/22/2011	3.2 LJ	3.7 LJ	<5.0	<5.0	<5.0
R-08(I2)	F5H20	3/22/2012	3.0	3.1	0.54	<0.5	<0.5
R-08(I2)	F7BG1	4/23/2013	4.1	3.7	0.71	0.17 LJ	<0.5
R-08(I2)		6/12/2014	**5.7**	4.7	<1.0	<1.0	<1.0
R-08(I2)	1506018-08	6/9/2015	**8.0**	**5.7**	<1.0	<1.0	<1.0
R-08(I2)	F1C34	6/16/2016	**12.0**	**5.6**	0.66	<0.5	<0.5
R-08(I2)	F1C46 (Dup R-41)	6/16/2016	**11.0**	**5.4**	0.7	<0.5	<0.5
R-08(I2)		6/8/2017	**17.4**	**8.0**	<1.0	<1.0	<1.0
R-08(I2)		5/1/2018	**18.2**	**7.3**	<1.0	<1.0	<1.0
R-08(I2)	R-102 (Dup)	5/1/2018	**16.9**	**7.3**	<1.0	<1.0	<1.0
R-08(I2)		5/7/2019	**26.0**	**9.3**	<1.0	<1.0	<1.0
R-08(S2)	F3HB3	6/8/2010	<0.5	0.075 LJ	0.24 LJ	<0.5	<0.5

Table C-3 - Historical Groundwater Analytical Results (2010-2019) – VOCs							
Sample Location	**Sample ID #**	**Date Sampled**	**PCE**	**TCE**	**1,2-cis DCE**	**1,2-trans DCE**	**Vinyl Chloride**
R-08(S2)		1/26/2011	<1.0	<1.0	<1.0	<1.0	<1.0
R-08(S2)	F4BT5	8/22/2011	<0.5	<0.5	<0.5	<0.5	<0.5
R-08(S2)	F5H19	3/22/2012	<0.5	<0.5	0.18 LJ	<0.5	<0.5
R-08(S2)	F7BG2	4/23/2013	<0.5	0.061 LJ	<0.5	<0.5	<0.5
R-08(S2)	1506018-09	6/9/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-08(S2)		5/15/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-08(S2)		1/17/2019	<1.0	<1.0	<1.0	<1.0	<1.0
R-08(S2)		5/7/2019	<1.0	<1.0	<1.0	<1.0	<1.0
R-08A(I1)		1/14/2019	18.0	7.0	<1.0	<1.0	<1.0
R-08A(I1)	R-208 (Dup)	1/14/2019	18.0	7.2	<1.0	<1.0	<1.0
R-08A(I1)		5/7/2019	17.5	9.5	1.1	<1.0	<1.0
R-09(D1)		9/11/2012	<1.0	<1.0	0.85 J	2.3	0.86 J
R-09(D1)	FLD Dup 3	9/11/2012	<1.0	<1.0	0.69 J	2.5	0.85 J
R-09(D1)		6/3/2014	<1.0	<1.0	5.2	<1.0	1.1
R-09(D1)	Duplicate 3	6/3/2014	<1.0	<1.0	5.7	<1.0	1.2
R-09(D1)		6/2/2015	<1.0	<1.0	2.6	<1.0	1.3
R-09(D1)		9/9/2016	<1.0	<1.0	0.36 J	1.3	0.78 J
R-09(D1)		6/6/2017	<1.0	<1.0	56.0	19.0	**12.0**
M-09	F3HE3	6/16/2010	**630.0**	**23.0**	4.6 LJ	<5.0	<5.0
M-09		2/15/2011	**487**	**27.7**	3.5	<1.0	<1.0
M-09	F4BS4	9/1/2011	**480**	**72.0**	6.3	2.8 LJ	<5.0
M-09		9/12/2012	**730**	**43.0**	5.4	8.9	<5.0
M-09		4/30/2013	**460**	**58.0**	16	<5.0	<5.0
M-09		6/3/2014	**540**	**50.0**	15	3.7	**3.2**
M-09	Hall	6/2/2015	**480**	**53.0**	23	5.0	**4.0**
M-09	Hall	9/9/2016	**210**	**28.0**	5.4	2.6	1.5
M-09	M-101 Field Dup	9/9/2016	**220**	**30.0**	5.6	2.7	1.5
M-09		6/8/2017	**400**	**43.0**	4.3	1.6	0.99 J
M-09	M-101 Field Dup	6/8/2017	**410**	**45.0**	4.5	1.7	0.98 J
M-09		5/17/2018	**432**	**53.4**	8.1	1.3	1.3
M-09		9/18/2019	**310**	**12**	<0.20	<0.25	<0.35
M-09	M-209 Field Dup	9/18/2019	**280**	**15**	0.46	<0.30	<0.35
R-09(D2)	F3HD6	6/8/2010	**48.0**	**6.8**	0.41 LJ	0.15 LJ	<0.5
R-09(D2)		2/8/2011	**53.9**	**7.4**	<1.0	<1.0	<1.0
R-09(D2)	F4BT6	8/25/2011	**84**	**13.0**	<5.0	<5.0	<5.0
R-09(D2)	F4BX9	8/25/2011	**86**	**14.0**	<5.0	<5.0	<5.0
R-09(D2)		9/12/2012	**47**	**6.7**	<5.0	<5.0	<5.0
R-09(D2)		6/19/2014	**51.3**	**7.3**	<1.0	<1.0	<1.0
R-09(D2)	1506022-08	6/11/2015	**58.6**	**8.8**	<1.0	<1.0	<1.0
R-09(D2)	1506022-12 dup	6/11/2015	**56.3**	**8.6**	<1.0	<1.0	<1.0
R-09(D2)		9/9/2016	**50**	**6.4**	0.35 J	<1.0	<1.0
R-09(D2)		6/8/2017	**58**	**6.8**	0.42 J	0.22 J	<1.0
R-09(D2)		5/17/2018	**57.7**	**7.3**	<1.0	<1.0	<1.0
R-09(D2)	R-106(Dup)	5/17/2018	**55.3**	**6.9**	<1.0	<1.0	<1.0
R-09(D2)		5/21/2019	**63.9**	**7.8**	<1.0	<1.0	<1.0
R-09(D2)	R-106(Dup)	5/21/2019	**69**	**8.7**	<1.0	<1.0	<1.0
R-09(D3)	F5H25	3/21/2012	0.44 LJ	<0.5	<0.5	<0.5	<0.5
R-09(D3)	1506011-06	6/4/2015	0.44 LJ	<1.0	<1.0	<1.0	<1.0
R-09(D3)		5/14/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-09(I1)	F3HE1	6/16/2010	**61**	**15.0**	2.6	0.41 J	<0.5
R-09(I1)		2/15/2011	**68.1**	**14.7**	2.6	<1.0	<1.0
R-09(I1)	F4BT7	8/25/2011	**110**	**29.0**	4.4 LJ	<5.0	<5.0
R-09(I1)	F5H23	3/28/2012	**52**	**15.0**	5.3	0.59 LJ	<5.0
R-09(I1)	130406-04	4/29/2013	**65**	**17.7**	7.3	0.9	<0.5
R-09(I1)		6/19/2014	**78.1**	**18.9**	9.1	<1.0	<1.0
R-09(I1)	1506028-04	6/16/2015	**101.0**	**22.7**	6.7	1.1	<1.0
R-09(I1)	F1C41	6/14/2016	**100.0**	**25.0**	8.0	1.5 LJ	<5.0
R-09(I1)		6/15/2017	**61.5**	**18.0**	12.8	1.3	<1.0

Table C-3 - Historical Groundwater Analytical Results (2010-2019) – VOCs							
Sample Location	**Sample ID #**	**Date Sampled**	**PCE**	**TCE**	**1,2-cis DCE**	**1,2-trans DCE**	**Vinyl Chloride**
R-09(I1)		5/23/2018	**61.9**	**20.5**	12.8	1.7	<1.0
R-09(I1)		5/21/2019	**64.4**	**19.5**	15.8	1.8	<1.0
R-09(I2)	F3HE2	6/16/2010	**51.0**	**23.0**	1.6 LJ	<5.0	<5.0
R-09(I2)		2/8/2011	**55.1**	**25.8**	2.5	0.5	0.5
R-09(I2)	F4BT8	8/29/2011	**70**	**41.0**	3.3 LJ	<5.0	<5.0
R-09(I2)	F5H24	3/29/2012	**56.0**	**23.0**	1.5 LJ	<5.0	<5.0
R-09(I2)	130406-05	4/29/2013	**57.8**	**23.8**	1.7	<0.5	<0.5
R-09(I2)		6/24/2014	**61.9**	**22.3**	2.6	<1.0	<1.0
R-09(I2)	1506028-05	6/16/2015	**83.2**	**29.6**	2.7	<1.0	<1.0
R-09(I2)	F1C40	6/15/2016	**77.0**	**26.0**	2.9 LJ	<5.0	<5.0
R-09(I2)		6/14/2017	**69.1**	**23.0**	2.8	<1.0	<1.0
R-09(I2)		5/22/2018	**64.8**	**21.7**	4.1	<1.0	<1.0
R-09(I2)		5/21/2019	**48.4**	**16.6**	6.0	1.2	<1.0
R-09(S1)	F5H22	3/29/2012	0.31 LJ	0.27 LJ	0.21 LJ	<0.5	<0.5
R-09(S1)	1506022-09	6/11/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-09(S1)		5/14/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-10(D2)	F5H28	3/20/2012	<0.5	<0.5	<0.5	<0.5	<0.5
R-10(D2)	1506005-07	6/2/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-10(D2)		5/3/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-10(I1)	F5H26	3/20/2012	<0.5	<0.5	<0.5	<0.5	<0.5
R-10(I1)	1506008-06	6/3/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-10(I1)		5/3/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-10(I2)	F5H27	3/20/2012	0.11 LJ	<0.5	<0.5	<0.5	<0.5
R-10(I2)	1506011-07	6/4/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-10(I2)		5/3/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-11(I1)	F5H29	3/27/2012	<0.5	<0.5	<0.5	<0.5	<0.5
R-11(I1)	1506011-08	6/4/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-11(I1)		5/23/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-11(I2)	F5H30	3/27/2012	<0.5	<0.5	<0.5	<0.5	<0.5
R-11(I2)	1506011-09	6/4/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-11(I2)		5/23/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-12(D1)	F3HA0	6/7/2010	0.6	1.7	0.87	1.4	<0.5
R-12(D1)		1/25/2011	2.20	1.6	1	1.5	<1.0
R-12(D1)	F4BT9	8/23/2011	1.8 LJ	2.8 LJ	1.7 LJ	2.6 LJ	<5.0
R-12(D1)	F5H33	3/26/2012	0.72	1.0	0.75	1.4	<0.5
R-12(D1)	F7BG5	4/24/2013	0.86	0.9	1.0	1.4	<0.5
R-12(D1)		6/16/2014	<1.0	<1.0	<1.0	<1.0	<1.0
R-12(D1)	1506008-07	6/3/2015	1.2	1.0	1.8	2.5	<1.0
R-12(D1)	F1C36	6/16/2016	1.6	1.2	1.6	1.5	<0.5
R-12(D1)		6/8/2017	1.3	1.6	2.1	2.2	<1.0
R-12(D1)		5/17/2018	<1.0	1.0	1.5	1.3	<1.0
R-12(D1)		5/14/2019	1.5	1.1	1.4	1.4	<1.0
M-12	F3DH0	6/8/2010	**22**	**13.0**	2.3	0.39 LJ	<0.5
M-12	R-30 F3HB5	6/8/2010	**23**	**13.0**	2.2	0.37 LJ	<0.5
M-12		1/27/2011	**29.9**	**15.8**	1.8	0.5	0.5
M-12	F4BS5	8/24/2011	**28**	**17.0**	2.5 LJ	<5.0	<5.0
M-12	F5H35	3/28/2012	**23**	**13.0**	1.5 LJ	<5.0	<5.0
M-12	F7BH9	4/25/2013	**27**	**14.0**	2.1 LJ	0.65 LJ	<5.0
M-12	F7BF4	4/25/2013	**25.0**	**13.0**	1.8 LJ	0.69 LJ	<5.0
M-12		6/18/2014	**24.9**	**13.4**	1.9	<1.0	<1.0
M-12	1506008-03	6/3/2015	**32.2**	**15.4**	2.5	<1.0	<1.0
M-12	1506008-09	6/3/2015	**33.4**	**15.7**	2.4	1.0	<1.0
M-12	F1C10	6/13/2016	**31.0**	**16.0**	2.8 LJ	<5.0	<5.0
M-12	Dup R-50M	6/13/2016	**31.0**	**15.0**	2.7 LJ	1.0 LJ	<5.0
M-12		6/12/2017	**24.8**	**12.4**	2.2	<1.0	<1.0
M-12		5/15/2018	**26.4**	**13.0**	2.3	<1.0	<1.0
M-12		5/14/2019	**34.0**	**15.9**	2.9	<1.0	<1.0

Table C-3 - Historical Groundwater Analytical Results (2010-2019) – VOCs							
Sample Location	**Sample ID #**	**Date Sampled**	**PCE**	**TCE**	**1,2-cis DCE**	**1,2-trans DCE**	**Vinyl Chloride**
M-12	R-103(Dup)	5/14/2019	**34.0**	**16.3**	2.9	1.0	<1.0
R-12(D2)	F5H34	3/26/2012	<0.5	<0.5	<0.5	<0.5	<0.5
R-12(D2)	1506008-08	6/2/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-12(D2)		5/17/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-12(I1)	F3HC9	6/7/2010	<0.5	<0.5	<0.5	<0.5	<0.5
R-12(I1)		1/25/2011	<1.0	<1.0	<1.0	<1.0	<1.0
R-12(I1)	F4BW0	8/23/2011	<0.5	<0.5	<0.5	<0.5	<0.5
R-12(I1)	F5H32	3/27/2012	<0.5	<0.5	<0.5	<0.5	<0.5
R-12(I1)	1506011-10	6/3/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-12(I1)		5/17/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-12(I2)	1506026-02	6/15/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-12(I2)	NS	5/15/2018	NS	NS	NS	NS	NS
R-12(S1)	F3HE4	6/15/2010	<5.0	**68.0**	40	26	<5.0
R-12(S1)		2/8/2011	<1	**82.5**	40.4	25.4	<1.0
R-12(S1)	F4BW1	8/29/2011	1.2 LJ	**79.0**	50	33	<5.0
R-12(S1)	F5H31	3/28/2012	<5.0	**53.0**	29.0	20.0	<5.0
R-12(S1)	1304036-06	4/29/2013	1.0	**37.4**	27.9	15.1	<0.5
R-12(S1)		6/23/2014	<1.0	**29.4**	22.4	13.1	<1.0
R-12(S1)	'1506026-03	6/15/2015	<1.0	**24.2**	26.0	13.7	1.7
R-12(S1)	1506026-05	6/15/2015	<1.0	**24.8**	25.9	13.3	1.7
R-12(S1)	F1C42	6/14/2016	0.36 LJ	**10.0**	17.0	12.0	<0.5
R-12(S1)		6/19/2017	<1.0	1.7	12.5	6.4	1.2
R-12(S1)	R-43 (Dup)	6/19/2017	<1.0	1.8	11.9	5.9	1.1
R-12(S1)		5/17/2018	<1.0	3.9	18.0	20.2	<1.0
R-12(S1)		5/14/2019	<1.0	<1.0	12.7	11.4	<1.0
R-13(I2)	F3HE5	6/17/2010	**24.0**	**7.7**	0.68	0.17 LJ	<0.5
R-13(I2)		2/7/2011	**29.5**	**9.5**	1.2	<1.0	<1.0
R-13(I2)	F4BW2	8/24/2011	**30**	**11.0**	1.3 LJ	<5.0	<5.0
R-13(I2)	F5H36	3/28/2012	**27.0**	**8.0**	0.61 LJ	<5.0	<5.0
R-13(I2)	F7BG7	4/24/2013	**35.0**	**10.0**	1.7 LJ	0.86 LJ	<5.0
R-13(I2)		6/23/2014	**33.8**	**10.1**	1.4	<1.0	<1.0
R-13(I2)	Dup R-42-06-2014	6/23/2014	**32.0**	**9.5**	1.4	<1.0	<1.0
R-13(I2)	1506026-04	6/15/2015	**40.6**	**12.9**	2.7	1.2	<1.0
R-13(I2)	1506026-06	6/15/2015	**39.1**	**12.5**	2.6	1.2	<1.0
R-13(I2)		6/13/2017	**24.2**	**8.1**	1.6	<1.0	<1.0
R-13(I2)		5/22/2018	**28.4**	**8.9**	1.9	<1.0	<1.0
R-13(I2)	R-107(Dup)	5/22/2018	**27.6**	**9.0**	2.0	<1.0	<1.0
R-13(I2)		5/15/2019	**25.9**	**8.7**	3.4	<1.0	<1.0
R-14(S2)	F3HA1	6/14/2010	0.5	1.8	6.7	3.2	1.7
R-14(S2)		1/26/2011	<1	1.6	9.3	7	**9.3**
R-14(S2)	F4BW3	8/30/2011	<5.0	2.0 LJ	8.9	7.6	**15**
R-14(S2)	F5H37	3/26/2012	<0.5	0.9	5.7	6.0	**8.1**
R-14(S2)	F7BG8	4/23/2013	0.08 LJ	0.40 LJ	3.3	2.6	**2.4**
R-14(S2)		6/17/2014	<1.0	<1.0	5.5	2.3	<1.0
R-14(S2)	1506018-19	6/10/2015	<1.0	3.6	13.4	7.6	<1.0
R-14(S2)	F1C32	6/21/2016	<0.5	2.4	15.0	8.7	<0.5
R-14(S2)		6/15/2017	<1.0	<1.0	7.9	4.8	<1.0
R-14(S2)		5/24/2018	<1.0	1.8	22.2	10.6	<1.0
R-14(S2)		5/22/2019	<1.0	<1.0	18.0	8.5	<1.0
M-15	F3HE6	6/15/2010	**240**	**11.0**	<5.0	<5.0	<5.0
M-15		2/14/2011	**261**	**25.9**	1	<1.0	<1.0
M-15	F4BS6	8/31/2011	**340**	**39.0**	<5.0	<5.0	<5.0
M-15		9/12/2012	**310**	**20.0**	2.8 J	1.7 J	<5.0
M-15		4/30/2013	**230**	**21.0**	<5.0	<5.0	<5.0
M-15	Duplicate 3	4/30/2013	**250**	**19.0**	<1.0	<1.0	<1.0
M-15		6/23/2014	**220**	**19.3**	<1.0	1.2	<1.0
M-15	1506026-01	6/15/2015	**227**	**15.0**	6.3	1.3	<1.0
M-15	F1C11	6/15/2016	**190**	**11.0**	9.1	<5.0	<5.0

Table C-3 - Historical Groundwater Analytical Results (2010-2019) – VOCs							
Sample Location	**Sample ID #**	**Date Sampled**	**PCE**	**TCE**	**1,2-cis DCE**	**1,2-trans DCE**	**Vinyl Chloride**
M-15	F1C44 (Dup R-51M)	6/15/2016	**190**	**11.0**	8.7	<5.0	<5.0
M-15		6/22/2017	**162**	**9.3**	6.1	<1.0	<1.0
M-15		5/23/2018	**202**	**8.6**	4.5	<1.0	<1.0
M-15	R-109(Dup)	5/23/2018	**207**	**8.6**	4.1	<1.0	<1.0
M-15		5/23/2019	**172**	**8.8**	5	<1.0	<1.0
R-16(S2)	F3HA2	6/9/2010	<0.5	<0.5	0.084 LJ	<0.5	<0.5
R-16(S2)		1/26/2011	<1.0	<1.0	<1.0	<1.0	<1.0
R-16(S2)	F4BW4	8/30/2011	<0.5	<0.5	<0.5	<0.5	<0.5
R-16(S2)	F5H38	3/26/2012	<0.5	<0.5	0.32 LJ	<0.5	<0.5
R-16(S2)	F7BG9	4/2/2013	<0.5	0.066 LJ	0.45 LJ	0.067 LJ	<0.5
R-16(S2)		6/17/2014	<1.0	<1.0	<1.0	<1.0	<1.0
R-16(S2)	1506018-20	6/10/2015	<1.0	1.5	2.2	<1.0	<1.0
R-16(S2)	F1C33	6/21/2016	<0.5	3.1	4.4	0.29 LJ	<0.5
R-16(S2)		6/15/2017	<1.0	1.6	2.3	<1.0	<1.0
R-16(S2)		5/24/2018	<1.0	<1.0	3.5	<1.0	<1.0
R-16(S2)		5/22/2019	<1.0	1.4	4.7	<1.0	<1.0
R-16(S2)	R-107(Dup)	5/22/2019	<1.0	1.4	4.4	<1.0	<1.0
R-17(D1)	F5H39	3/20/2012	<0.5	<0.5	<0.5	<0.5	<0.5
R-17(D1)	1506018-10	6/9/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-17(D1)		5/1/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-18(D1)	F5H40	3/19/2012	<0.5	<0.5	<0.5	<0.5	<0.5
R-18(D1)	1506018-11	6/9/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-18(D1)		5/2/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-19(D1)	F5H41	3/19/2012	0.097 LJ	<0.5	<0.5	<0.5	<0.5
R-19(D1)	1506018-12	6/9/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-19(D1)		5/2/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-20	1305001-04	4/29/2013	**64.7**	3.7	<0.5	<0.5	<0.5
R-20		6/24/2014	**53.3**	3.3	<1.0	<1.0	<1.0
R-20	1506022-10	6/11/2015	**54.6**	3.5	<1.0	<1.0	<1.0
R-20		6/14/2017	**54.8**	3.0	<1.0	<1.0	<1.0
R-20		5/22/2018	**49.4**	2.8	<1.0	<1.0	<1.0
R-20		5/21/2019	**47.8**	2.7	<1.0	<1.0	<1.0
M-20	F3HE8	6/15/2010	**110**	**5.6**	<5.0	<5.0	<5.0
M-20		2/10/2011	**99**	**6.1**	<1.0	<1.0	<1.0
M-20	F4BS7	8/29/2011	**98**	**6.4**	<5.0	<5.0	<5.0
M-20	F5H42	3/29/2012	**84**	**5.0 LJ**	0.75 LJ	<5.0	<5.0
M-20	1305001-0	4/30/2013	**77.7**	**5.2**	1.5	<0.5	<0.5
M-20		6/23/2014	**74.4**	4.4	<1.0	<1.0	<1.0
M-20	1506022-06	6/10/2015	**62.7**	4.2	<1.0	<1.0	<1.0
M-20	F1C12	6/14/2016	**85.0**	3.9 LJ	<5.0	<5.0	<5.0
M-20		6/19/2017	**65.0**	3.4	<1.0	<1.0	<1.0
M-20		5/15/2018	**62.0**	3.0	<1.0	<1.0	<1.0
M-20		5/13/2019	**66.6**	3.3	<1.0	<1.0	<1.0
R-21		9/11/2012	<5.0	2.0 J	3.1 J	2.2 J	**4.4 J**
R-21		6/3/2014	<5.0	<5.0	74.0	<5.0	**8.5**
R-21		6/2/2015	<5.0	<5.0	20.0	<5.0	<5.0
R-21		9/8/2016	0.21 J	0.81 J	15.0	6.7	**6.1**
R-21		6/8/2017	<1.0	0.46 J	11.0	7.2	**7.1**
M-21	F3HF9	6/14/2010	3.3	1.4	0.24 LJ	<0.5	<0.5
M-21		9/13/2012	3.3 J	<5.0	2.8 J	<5.0	<5.0
M-21		4/30/2013	2.0	1.1	<1.0	<1.0	<1.0
R-22	F5H43	3/19/2012	<0.5	<0.5	<0.5	<0.5	<0.5
R-22	1506003-05	6/1/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-22		5/3/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-23(I1)	F5H44	3/20/2012	4.3	0.47 LJ	0.17 LJ	0.097 LJ	<0.5
R-23(I1)	1506022-11	6/11/2015	1.8	<1.0	<1.0	<1.0	<1.0
R-23(I1)		5/17/2018	1.3	<1.0	<1.0	<1.0	<1.0

Table C-3 - Historical Groundwater Analytical Results (2010-2019) – VOCs							
Sample Location	**Sample ID #**	**Date Sampled**	**PCE**	**TCE**	**1,2-cis DCE**	**1,2-trans DCE**	**Vinyl Chloride**
R-23(I1)		5/8/2019	1.4	<1.0	<1.0	<1.0	<1.0
R-24(S2)	F3HF0	6/15/2010	<5.0	<5.0	2.3 LJ	2.7 LJ	1.5 LJ
R-24(S2)		2/14/2011	**7.4**	**7.8**	9.8	2	**8.8**
R-24(S2)	F4BW6	8/29/2011	**35.0**	**20.0**	8.6	3.5 LJ	**7.2**
R-24(S2)	F4BY0	8/29/2011	**29.0**	**17.0**	8.5	3.8 LJ	**8.7**
R-24(S2)	F5H45	3/28/2012	3.5 LJ	3.0 LJ	1.3 LJ	3.1 LJ	<5.0
R-24(S2)	F5H66	3/28/2012	2.7 LJ	2.4 LJ	1.1 LJ	3.3 LJ	<5.0
R-24(S2)	1305001-05	4/30/2013	2.6	1.2	0.8	2.3	0.8
R-24(S2)	1305001-07	4/30/2013	2.7	1.3	0.9	2.3	0.9
R-24(S2)		6/12/2014	<1.0	<1.0	<1.0	3.6	1.0
R-24(S2)	1506005-08	6/2/2015	<1.0	<1.0	1.3	1.5	**2.4**
R-24(S2)	1506005-10 Dup	6/2/2015	<1.0	<1.0	1.3	1.5	**2.5**
R-24(S2)	F1C14	6/7/2016	0.9	2.0	3.2	1.9	**2.4**
R-24(S2)		6/14/2017	<1.0	<1.0	1.8	<1.0	1.4
R-24(S2)		5/3/2018	<1.0	<1.0	2.8	1.1	**2.2**
R-24(S2)		5/7/2019	<1.0	<1.0	2.6	<1.0	1.4
R-24(S2)		5/15/2019	<1.0	<1.0	6.6	<1.0	1.8
R-25(S2)	F3HF1	6/15/2010	<5.0	<5.0	1.1 LJ	2.6 LJ	**5.1**
R-25(S2)		2/7/2011	<1.0	<1.0	<1.0	2.8	**3.4**
R-25(S2)	F4BW7	9/1/2011	<5.0	<5.0	<5.0	2.1 LJ	**4.9 LJ**
R-25(S2)	F5H46	3/29/2012	<0.5	<0.5	0.20 LJ	1.4	1.6
R-25(S2)	F5H63	3/29/2012	<0.5	<0.5	0.19 LJ	1.5	1.7
R-25(S2)	1305001-06	4/30/2013	<0.5	<0.5	<0.5	1.1	1.5
R-25(S2)	1506005-09	6/2/2015	1.9	**25.4**	15.3	2.1	**9.7**
R-25(S2)	F1C73	6/13/2016	0.6	**21.0**	16.0	4.0	**5.9**
R-25(S2)		6/13/2017	<1.0	**5.4**	15.9	3.6	**3.3**
R-25(S2)		5/3/2018	<1.0	**5.0**	2.5	<1.0	1.2
R-26(S2)	F3HF2	6/16/2010	1.8	1.5	0.7	0.07 LJ	<0.5
R-26(S2)		2/15/2011	2.3	1.7	<1.0	<1.0	<1.0
R-26(S2)	F4BW8	8/22/2011	<0.5	0.53 Jv	0.34 LJv	<0.5	<0.5
R-26(S2)	F5H47	3/22/2012	1.4	1.7	0.47 LJ	<0.5	<0.5
R-26(S2)	F7BH2	4/25/2013	0.29 LJ	1.2	1.5	<0.5	<0.5
R-26(S2)	1506018-13	6/9/2015	<1.0	<1.0	1.5	<1.0	<1.0
R-27(S2)	F3HF3	6/16/2010	0.8	**6.4**	10.0	9.0	**6.3**
R-27(S2)		2/15/2011	0.5	**8.1**	22.3	12	**3.5**
R-27(S2)	F4BW9	8/23/2011	<5.0	1.3 LJ	11	17	**12**
R-27(S2)	F5H48	3/22/2012	1.7	**13.0**	25	13	**2.7**
R-27(S2)	F7BH3	4/25/2013	2.8	**21.0**	39	16	**2.7**
R-27(S2)	F7BH6	4/25/2013	3.1	**23.0**	40	15	**2.1**
R-27(S2)		6/16/2014	<1.0	**6.8**	18.2	12.0	**2.7**
R-27(S2)	1506014-07	6/8/2015	1.7	**8.2**	22.6	13.6	**8.1**
R-27(S2)	Dup R-40	6/9/2016	3.5	**19.0**	23.0	13.0	**3.2**
R-27(S2)	F1C26	6/9/2016	2.6	**14.0**	25.0	11.0	**3.0**
R-27(S2)		6/8/2017	<1.0	2.8	9.2	5.9	**4.8**
R-27(S2)	R-41 (Dup)	6/8/2017	<1.0	2.7	9.3	6.5	**5.0**
R-27(S2)		5/15/2018	<1.0	2.3	9.6	4.3	1.4
R-27(S2)		5/13/2019	<1.0	<1.0	1.7	1.3	1.0
R-28(S2)	F3HA3	6/14/2010	0.6	<0.5	<0.5	<0.5	<0.5
R-28(S2)		1/27/2011	1.0	<1.0	<1.0	<1.0	<1.0
R-28(S2)	F4BX0	8/25/2011	1.3 Jv	<0.5	<0.5	<0.5	<0.5
R-28(S2)	F5H49	3/19/2012	0.5	<0.5	<0.5	<0.5	<0.5
R-28(S2)	1506003-06	6/1/2015	<1.0	<1.0	<1.0	<1.0	<1.0
R-28(S2)		4/30/2018	<1.0	<1.0	<1.0	<1.0	<1.0
R-29(D2U)		1/24/2019	76.0	3.1	<1.0	<1.0	<1.0
R-29(D2U)		5/16/2019	53.6	2.7	<1.0	<1.0	<1.0
R-29(I1)		1/24/2019	6.9	1.9	<1.0	<1.0	<1.0
R-29(I1)		5/16/2019	5.2	1.7	<1.0	<1.0	<1.0
R-29(I2)		1/24/2019	24.0	3.5	<1.0	<1.0	<1.0

Table C-3 - Historical Groundwater Analytical Results (2010-2019) – VOCs							
Sample Location	**Sample ID #**	**Date Sampled**	**PCE**	**TCE**	**1,2-cis DCE**	**1,2-trans DCE**	**Vinyl Chloride**
R-29(I2)		5/16/2019	28.6	3.5	<1.0	<1.0	<1.0
R-29A(D1)		1/24/2019	190.0	5.8	<1.0	<1.0	<1.0
R-29A(D1)	R-229A(D1-Dup)	1/24/2019	190.0	5.7	<1.0	<1.0	<1.0
R-29A(D1)		5/16/2019	208.0	6.5	<1.0	<1.0	<1.0
R-29A(D1)	R-105(Dup)	5/16/2019	195.0	6.6	<1.0	<1.0	<1.0
R-29A(I1)		1/24/2019	70.0	11.0	1.4	<1.0	<1.0
R-29A(I1)		5/16/2019	51.9	7.6	1.2	<1.0	<1.0
R-30(D1L)		1/24/2019	7.6	<1.0	<1.0	<1.0	<1.0
R-30(D1L)		5/16/2019	2.2	<1.0	<1.0	<1.0	<1.0
R-30(D1U)		1/24/2019	48.0	<1.0	<1.0	<1.0	<1.0
R-30(D1U)		5/16/2019	11.0	<1.0	<1.0	<1.0	<1.0
R-30(D2L)		1/24/2019	3.7	<1.0	<1.0	<1.0	<1.0
R-30(D2L)		5/16/2019	<1.0	<1.0	<1.0	<1.0	<1.0
R-30(D2U)		1/24/2019	8.3	<1.0	<1.0	<1.0	<1.0
R-30(D2U)		5/16/2019	31.9	1.3	<1.0	<1.0	<1.0
R-30(I1)		1/24/2019	<1.0	<1.0	<1.0	<1.0	<1.0
R-30(I1)		5/16/2019	<1.0	<1.0	<1.0	<1.0	<1.0
R-30(I2)		1/24/2019	2.9	<1.0	<1.0	<1.0	<1.0
R-30(I2)		5/16/2019	1.2	<1.0	<1.0	<1.0	<1.0
R-31(I1)		1/15/2019	<1.0	<1.0	<1.0	<1.0	<1.0
R-31(I1)		5/8/2019	<1.0	<1.0	<1.0	<1.0	<1.0
R-31(I2)		1/17/2019	4.4	1.2	<1.0	<1.0	<1.0
R-31(I2)		5/8/2019	3.6	<1.0	<1.0	<1.0	<1.0
R-32(I1)		1/24/2019	<1.0	<1.0	<1.0	<1.0	<1.0
R-32(I1)		5/8/2019	<1.0	<1.0	<1.0	<1.0	<1.0
R-32(I2)		1/16/2019	<1.0	<1.0	<1.0	<1.0	<1.0
R-32(I2)		5/8/2019	<1.0	<1.0	<1.0	<1.0	<1.0
R-32(I2)	R-102(Dup)	5/8/2019	<1.0	<1.0	<1.0	<1.0	<1.0
RDP-1	F3HA4	6/9/2010	<0.5	1.0	5.1	0.90	<0.5
RDP-1		1/26/2011	<1.0	<1.0	<1.0	<1.0	<1.0
RDP-1	F4BX1	8/30/2011	<0.5	<0.5	<0.5	<0.5	<0.5
RDP-1	F5H50	3/26/2012	<0.5	0.6	1.6	0.92	0.59
RDP-1	F7BH5	4/23/2013	<0.5	0.34 LJ	2.3	0.53	0.20 LJ
RDP-1	F7BE3	4/23/2013	<0.5	0.30 LJ	2.0	0.44 LJ	0.19 LJ
RDP-1		6/17/2014	<1.0	<1.0	2.6	<1.0	<1.0
RDP-1	1506018-21	6/10/2015	<1.0	1.0	5.0	<1.0	<1.0
RDP-1	F1C27	6/21/2016	<0.5	1.8	10.0	1.4	<0.5
RDP-1		6/15/2017	<1.0	1.1	4.6	1.5	<1.0
RDP-1		5/24/2018	<1.0	<1.0	3.9	1.0	<1.0
RDP-1		5/22/2019	<1.0	<1.0	13.8	4.4	<1.0
RDP-1	R-108(Dup)	5/22/2019	<1.0	<1.0	13.0	4.6	<1.0
RDP2	F3HA5	6/9/2010	<0.5	0.45 LJ	6.6	4.1	<0.5
RDP2		1/26/2011	<1.0	<1.0	9.8	6.0	<1.0
RDP-2	F4BX2	8/30/2011	<5.0	<5.0	9.3	6.0	**3.8 LJ**
RDP-2	F5H51	3/26/2012	<0.5	0.6	4.5	4.1	1.5
RDP-2		6/17/2014	<1.0	<1.0	3.1	2.4	1.0
RDP-2	1506018-22	6/10/2015	<1.0	<1.0	4.8	3.1	<1.0
RDP-2	F1C8	6/21/2016	<0.5	0.5	6.5	3.7	<0.5
RDP-2		6/15/2017	<1.0	<1.0	2.8	1.7	<1.0
RDP-2		5/24/2018	<1.0	<1.0	7.5	3.9	<1.0
RDP-2		5/22/2019	<1.0	<1.0	7.6	3.6	<1.0
RDP-3	F3HA6	6/9/2010	<0.5	<0.5	<0.5	<0.5	<0.5
RDP-3		1/26/2011	<1.0	<1.0	<1.0	<1.0	<1.0
RDP-3	F4BX3	8/30/2011	<0.5	<0.5	<0.5	<0.5	<0.5
RDP-3	F5H52	3/26/2012	<0.5	<0.5	<0.5	<0.5	<0.5
RDP-3	F7BJ2	4/23/2013	<0.5	<0.5	<0.5	<0.5	<0.5
RDP-3		6/17/2014	<1.0	<1.0	<1.0	<1.0	<1.0
RDP-3	1506018-23	6/10/2015	<1.0	<1.0	<1.0	<1.0	<1.0

Table C-3 - Historical Groundwater Analytical Results (2010-2019) – VOCs							
Sample Location	**Sample ID #**	**Date Sampled**	**PCE**	**TCE**	**1,2-cis DCE**	**1,2-trans DCE**	**Vinyl Chloride**
RDP-3	F1C29	6/21/2016	<0.5	<0.5	<0.5	<0.5	<0.5
RDP-3		6/15/2017	<1.0	<1.0	<1.0	<1.0	<1.0
RDP-3		5/24/2018	<1.0	<1.0	<1.0	<1.0	<1.0
RDP-3		5/22/2019	<1.0	<1.0	<1.0	<1.0	<1.0
RDP-4	F3HA7	6/9/2010	<0.5	<0.5	0.9	0.51	<0.5
RDP-4		1/26/2011	<1.0	<1.0	7.6	4.30	<1.0
RDP-4	F4BX4	8/30/2011	<5.0	<5.0	3.0 LJ	1.8 LJ	<5.0
RDP-4	F5H53	3/26/2012	<0.5	<0.5	4.4	3.9	1.8
RDP-4	F7BJ3	4/23/2013	<0.5	<0.5	3.0	2.4	**2.1**
RDP-4		6/17/2014	<1.0	<1.0	1.4	<1.0	<1.0
RDP-4	1506028-06	6/16/2015	<1.0	<1.0	<1.0	<1.0	<1.0
RDP-4	F1C30	6/21/2016	<0.5	<0.5	<0.5	<0.5	<0.5
RDP-4		6/15/2017	<1.0	<1.0	<1.0	<1.0	<1.0
RDP-4		5/24/2018	<1.0	<1.0	<1.0	<1.0	<1.0
RDP-4		5/22/2019	<1.0	<1.0	<1.0	<1.0	<1.0
BC-2	F3HD1	6/14/2010	<0.5	0.086 LJ	8.2	9.8	**10.0**
BC-2		1/27/2011	<1	<1	1.8	5.4	**15.1**
BC-2	F4BQ4	8/22/2011	<5.0	2.0 LJ	9.6	14	**13**
BC-2		9/17/2012	<1.0	<1.0	<1.0	<1.0	<1.0
BC-2		5/6/2013	<1.0	<1.0	1.9	3.0	<1.0
BC-2		6/16/2014	<1.0	<1.0	7.6	5.2	<1.0
BC-2	1506014-01	6/8/2015	<1.0	<1.0	14.7	10.6	**3.1**
BC-2	F1C00	6/9/2016	<0.5	<0.5	7.5	13.0	0.67
BC-2		6/12/2017	<1.0	<1.0	4.7	6.6	<1.0
BC-2		5/15/2018	<1.0	<1.0	5.2	1.7	<1.0
BC-2		5/13/2019	<1.0	<1.0	7.5	4.0	<1.0
BC-3	F3HD2	6/14/2010	<0.5	0.38 LJ	1.4	9.4	**16.0**
BC-3		2/7/2011	<1.0	<1.0	<1.0	7.5	**14.4**
BC-3	F4BQ5	8/24/2011	<5.0	<5.0	1.2 LJ	9	**8.8**
BC-3		9/14/2012	<5.0	<5.0	2.9 J	8	**3.9 J**
BC-3		5/3/2013	<1.0	<1.0	<1.0	6.4	<1.0
BC-3		6/12/2014	<1.0	<1.0	1.4	14.1	**3.3**
BC-3 (dup)	R-40	6/12/2014	<1.0	<1.0	2.1	14	**3.6**
BC-3	1506014-02	6/8/2015	<1.0	<1.0	2.2	7.2	**4.6**
BC-3	F1C22	6/13/2016	<0.5	<0.5	1.3	6.7	1.6
BC-3		6/8/2017	<1.0	<1.0	<1.0	6.2	**2.3**
BC-3		5/22/2018	<1.0	<1.0	2.8	4.3	1.3
BC-3		5/14/2019	<1.0	<1.0	2.8	6.6	1.7
BC-4	F3HD3	6/9/2010	<0.5	0.19 LJ	9.3	8.8	**8.3**
BC-4	R-40 F3HB6	6/9/2010	<0.5	0.19 LJ	9.0	8.9	**8.7**
BC-4		1/26/2011	<1.0	<1.0	3.6	9.0	**20.4**
BC-4	F4BQ6	8/30/2011	<5.0	<5.0	2.7 LJ	14.0	**19.0**
BC-4		9/17/2012	<1.0	<1.0	17.0	7.1	**6.6**
BC-4		5/6/2013	<1.0	<1.0	19.0	5.0	**7.0**
BC-4		6/4/2014	<1.0	<1.0	22.0	4.4	**6.5**
BC-4		6/3/2015	<1.0	<1.0	14.0	2.7	**2.4**
BC-4		9/13/2016	0.24 J	0.84 J	9.2	2.0	1.4
BC-4		6/9/2017	<1.0	0.20 J	1.4	0.97 J	0.51 J
BC-4		5/15/2018	<1.0	<1.0	5.0	1.1	<1.0
BC-4		5/13/2019	<1.0	<1.0	1.6	1.9	<1.0
BC-5	F3HA8	6/9/2010	<0.5	1.6	12.0	7.3	**5.9**
BC-5		1/26/2011	<1.0	<1.0	5.7	7.2	**13.9**
BC-5	F4BQ7	8/31/2011	<5.0	<5.0	7.4	8.3	**11.0**
BC-5		9/14/2012	<5.0	<5.0	13.0	2.4 J	**3.3 J**
BC-5		5/3/2013	<1.0	1.0	4.4	1.6	<1.0
BC-5		6/4/2014	<1.0	<1.0	2.8	1.1	<1.0
BC-5		6/3/2015	<1.0	<1.0	1.6	<1.0	<1.0
BC-5		9/1/2016	<1.0	0.19 J	0.85 J	0.46 J	<1.0

Table C-3 - Historical Groundwater Analytical Results (2010-2019) – VOCs							
Sample Location	**Sample ID #**	**Date Sampled**	**PCE**	**TCE**	**1,2-cis DCE**	**1,2-trans DCE**	**Vinyl Chloride**
BC-5		6/6/2017	<1.0	3.6	18.0	4.1	0.42 J
BC-5		5/24/2018	<1.0	<1.0	<1.0	<1.0	<1.0
BC-5		5/22/2019	<1.0	<1.0	5.5	1.8	<1.0
BC-6	F3HA9	6/9/2010	0.097 LJ	0.8	1.90	1.0	<0.5
BC-6		1/26/2011	<1.0	<1.0	1.40	<1.0	<1.0
BC-6	F4BQ8	8/30/2011	<5.0	<5.0	1.4 LJ	<5.0	<5.0
BC-6		9/14/2012	<5.0	**6.6**	6.8	<5.0	<5.0
BC-6		5/3/2013	**6.8**	**14.0**	8.0	<1.0	<1.0
BC-6		6/4/2014	**20.0**	**38.0**	12.0	2.1	<1.0
BC-6		6/3/2015	**7.3**	**16.0**	5.7	1.0	<1.0
BC-6		9/12/2016	2.9	**26.0**	11.0	5.1	<1.0
BC-6		6/6/2017	4.1	**57.0**	31.0	11.0	0.37 J
BC-6		5/24/2018	1.5	**28.4**	21.4	8.3	<1.0
BC-6		5/22/2019	1.2	**85.7**	58.7	24.3	<1.0
BC-7S		11/2/2011	1.9	4.7	43.0	7.6	**9.2**
BC-7S		9/17/2012	1.4	**5.6**	32.0	5.1	**3.8**
BC-7S		5/3/2013	<1.0	4.3	19.0	3.8	1.5
BC-7S		6/18/2014	<1.0	2.7	14.2	3.2	<1.0
BC-7S	1506022-02	6/11/2015	<1.0	1.8	6.5	1.7	<1.0
BC-7S	F1C24	6/21/2016	0.51 UMJ	1.8	6.7	2.2	0.16 LJ
BC-7S		6/15/2017	<1.0	<1.0	2.1	<1.0	<1.0
BC-7S		5/24/2018	<1.0	1.2	2.6	<1.0	<1.0
BC-7S		5/22/2019	<1.0	1.1	1.8	<1.0	<1.0
BC-7D		11/2/2011	<1.0	3.8	41.0	9.1	**2.2**
BC-7D		9/17/2012	<1.0	4.2	29.0	6.2	1.3
BC-7D		5/3/2013	<1.0	2.1	17.0	4.3	<1.0
BC-7D		6/17/2014	<1.0	1.6	15.2	3.6	<1.0
BC-7D	1506022-01	6/11/2015	<1.0	1.7	16.3	5.1	<1.0
BC-7D	F1C25	6/21/2016	<0.5	1.4	9.7	3.5	0.19 LJ
BC-7D		6/15/2017	<1.0	<1.0	4.1	1.9	<1.0
BC-7D		5/24/2018	<1.0	<1.0	7.9	3.2	<1.0
BC-7D		5/22/2019	<1.0	1.0	3.3	1.7	<1.0
DI-1(D1)		9/11/2012	**60**	3.7 J	2.9 J	<5.0	<5.0
DI-1(D1)	Post injection	6/2/2014	3.6	2.2	64.0	1.2	**2.3**
DI-1(D1)	Duplicate 1	6/2/2014	3.8	2.4	67.0	1.3	**2.6**
DI-1(D1)	Hall	6/1/2015	<1.0	<1.0	32.0	<1.0	1.4
DI-1(D1)	Duplicate 1 Hall	6/1/2015	<1.0	1.2	35.0	<1.0	1.4
DI-1(D1)		9/8/2016	<1.0	0.28 J	13.0	2.4	**4.9**
DI-1(D1)		6/7/2017	<1.0	<1.0	10.0	2.0	**3.0**
DM-1(I1)	F3HB0	6/8/2010	0.9	0.30 LJ	8.8	0.5	<0.5
DM-1(I1)		1/27/2011	<1	1.4	0.5	3.1	<1
DM-1(I1)	F4BR2	8/25/2011	<0.5	0.24 LJv	0.78 Jv	<0.5	**2.3 J**
DM-1(I1)	F5H54	3/27/2012	<0.5	0.12 LJ	0.79	0.36 LJ	**2.6**
DM-1(I1)	F5H62	3/27/2012	<0.5	0.14 LJ	0.79	0.37 LJ	**2.7**
DM-1(I1)	1305001-01	4/30/2013	<0.5	<0.5	1.1	<0.5	1.8
DM-1(I1)		6/23/2014	<1.0	<1.0	2.7	<1.0	**5.4**
DM-1(I1)	1506028-01	6/16/2015	<1.0	<1.0	2.4	<1.0	<1.0
DM-1(I1)	F1C47 (dup)	6/22/2016	<0.5	0.34 LJ	2.2	0.21 LJ	0.6
DM-1(I1)	F1C08	6/22/2016	<0.5	0.36 LJ	2.2	0.2. LJ	0.6
DM-1(I1)		6/21/2017	<1.0	<1.0	1.2	<1.0	<1.0
DM-1(I1)		5/22/2018	<1.0	<1.0	1.1	<1.0	<1.0
DM-1(I1)	R-108(Dup)	5/22/2018	<1.0	<1.0	<1.0	<1.0	<1.0
DM-1(I1)		5/15/2019	<1.0	<1.0	1.3	<1.0	<1.0
DM-1(D1)	F3HF4	6/14/2010	**63.0**	4.4 LJ	<5.0	2.1 LJ	<5.0
DM-1(D1)		2/10/2011	**55.6**	4.1	<1.0	1.4	<1.0
DM-1(D1)	F4BR0	8/31/2011	**60**	3.7 LJ	<5.0	1.0 LJ	<5.0
DM-1(D1)		9/12/2012	**40**	3.0 J	<5.0	<5.0	<5.0
DM-1(D1)		4/29/2013	**39**	3.0	<1.0	<1.0	<1.0

Table C-3 - Historical Groundwater Analytical Results (2010-2019) – VOCs							
Sample Location	**Sample ID #**	**Date Sampled**	**PCE**	**TCE**	**1,2-cis DCE**	**1,2-trans DCE**	**Vinyl Chloride**
DM-1(D1)	Duplicate 2	4/29/2013	**39**	2.9	<1.0	<1.0	<1.0
DM-1(D1)		6/2/2014	**120**	**9.0**	<1.0	<1.0	<1.0
DM-1(D1)	Duplicate 2	6/2/2014	**120**	**9.4**	<1.0	<1.0	<1.0
DM-1(D1)	DM-1(D1) Hall	6/1/2015	**140**	**11.0**	<1.0	<1.0	<1.0
DM-1(D1)	Duplicate 2	6/1/2015	**140**	**12.0**	<1.0	<1.0	<1.0
DM-1(D1)		9/8/2016	**120**	**12.0**	0.65 J	1.4	<1.0
DM-1(D1)		6/7/2017	**130**	**14.0**	0.73 J	1.2	<1.0
DM-1(D1)		5/23/2018	**163**	**14.8**	1.7	2.5	<1.0
DM-1(D1)		5/20/2019	**132**	**16.6**	3.6	4.6	<1.0
DM-1(D2)	F3HB1	6/14/2010	**73.0**	4.2 LJ	<5.0	<5.0	<5.0
DM-1(D2)		1/27/2011	**84.3**	4.7	<1	<1.0	<1.0
DM-1(D2)	F4BR1	8/25/2011	**100.0**	**5.7**	<5.0	<5.0	<5.0
DM-1(D2)		9/10/2012	**59.0**	3.8 J	3.0 J	<5.0	<5.0
DM-1(D2)	FLD Dup 2	9/10/2012	**62.0**	4.0	<5.0	<5.0	<5.0
DM-1(D2)		4/29/2013	**52.0**	3.1	<1.0	<1.0	<1.0
DM-1(D2)	Duplicate 1	4/29/2013	**54.0**	3.2	<1.0	<1.0	<1.0
DM-1(D2)		6/3/2014	**47.0**	2.8	<1.0	<1.0	<1.0
DM-1(D2)	Hall	6/1/2015	**43.0**	2.6	<1.0	<1.0	<1.0
DM-1(D2)		9/7/2016	**43.0**	2.5	0.25 J	<1.0	<1.0
DM-1(D2)		6/7/2017	**42.0**	2.4	0.36 J	<1.0	<1.0
DM-1(D2)		5/21/2018	**44.6**	2.6	1.2	<1.0	<1.0
DM-1(D2)		5/21/2019	**46.7**	2.7	<1.0	<1.0	<1.0
DM-2(I1)	F3HB2	6/8/2010	2.4	0.6	0.40 LJ	0.28 LJ	<0.5
DM-2(I1)		2/10/2011	1.7	<1.0	<1.0	<1.0	<1.0
DM-2(I1)	F4L44	8/31/2011	1.2	0.5	0.41 LJ	0.47 LJ	<0.5
DM-2(I1)	F4BR5 Dup	8/31/2011	1.9 LJ	<5.0	<5.0	<5.0	<5.0
DM-2(I1)	F5H55	3/29/2012	0.59	0.38 LJ	0.43 LJ	0.7	<0.5
DM-2(I1)	1305001-02	4/30/2013	0.6	<0.5	0.6	0.5	<0.5
DM-2(I1)	1506028-02	6/16/2015	1.7	1.0	<1.0	<1.0	<1.0
DM-2(I1)	F1C35	6/22/2016	1.4 J	1.2	0.9	0.8	<0.5
DM-2(I1)		6/19/2017	1.4 FB	<1.0	<1.0	<1.0	<1.0
DM-2(I1)		5/13/2019	<1.0	<1.0	<1.0	<1.0	<1.0
DM-2(D1)	F3HF5	6/14/2010	**98.0**	**15.0**	1.3 LJ	2.4 LJ	<5.0
DM-2(D1)		2/10/2011	**79.9**	**10.1**	4.3	7.3	<0.5
DM-2(D1)	F4BR3	8/30/2011	**88.0**	**12.0**	8.5	11.0	<5.0
DM-2(D1)		9/10/2012	**59.0**	**6.7**	17.0	5.6	<5.0
DM-2(D1)	FLD Dup 1	9/10/2012	**59.0**	**6.4**	8.8	5.8	<5.0
DM-2(D1)		4/29/2013	**46.0**	**6.5**	6.3	6.9	<1.0
DM-2(D1)		6/18/2014	**40.2**	**7.0**	8.4	9.4	<1.0
DM-2(D1)	1506018-15	6/10/2015	**42.2**	**7.5**	10.0	12.2	<1.0
DM-2(D1)	F1C38	6/13/2016	**36.0**	**6.0**	14.0	1.0	<5.0
DM-2(D1)	R-42 (Dup)	6/13/2017	**25.1**	**5.1**	11.6	9.7	<1.0
DM-2(D1)		6/13/2017	**24.4**	**5.0**	11.2	9.3	<1.0
DM-2(D1)		5/21/2018	**22.6**	4.8	13.4	12.7	<1.0
DM-2(D1)		5/20/2019	**22.0**	4.5	13.4	15.5	<1.0
DM-2(D2)	F3HF6	6/15/2010	**160.0**	**6.7**	<5.0	<5.0	<5.0
DM-2(D2)	R-70 F3HF8	6/15/2010	**160.0**	**6.8**	<5.0	<5.0	<5.0
DM-2(D2)		2/10/2011	**119.0**	**6.2**	<0.5	<0.5	<0.5
DM-2(D2)	F4BR4	8/30/2011	**180.0**	**8.2**	<5.0	<5.0	<5.0
DM-2(D2)		9/12/2012	**120.0**	**5.6**	2.8 J	<5.0	<5.0
DM-2(D2)		4/29/2013	**98.0**	4.6	<1.0	<1.0	<1.0
DM-2(D2)		6/18/2014	**94.4**	4.3	<1.0	<1.0	<1.0
DM-2(D2)	1506018-16	6/10/2015	**91.1**	4.8	<1.0	<1.0	<1.0
DM-2(D2)	F1C13	6/15/2016	**87.0**	4.6LJ	<5.0	<5.0	<5.0
DM-2(D2)		6/21/2017	**70.8**	3.3	<1.0	<1.0	<1.0
DM-2(D2)	R-44 (Dup)	6/21/2017	**69.1**	3.4	<1.0	<1.0	<1.0
DM-2(D2)		5/22/2018	**80.7**	3.8	<1.0	<1.0	<1.0
DM-2(D2)		5/20/2019	**85.3**	3.8	<1.0	<1.0	<1.0

Table C-3 - Historical Groundwater Analytical Results (2010-2019) – VOCs							
Sample Location	**Sample ID #**	**Date Sampled**	**PCE**	**TCE**	**1,2-cis DCE**	**1,2-trans DCE**	**Vinyl Chloride**
Cook Estate	F4BQ9	8/31/2011	1.9 LJ	1.3 LJ	1.8 LJ	<5.0	<5.0
Cook Estate		6/24/2014	<1.0	<1.0	<1.0	<1.0	<1.0
Cook Estate	1506022-03	6/11/2015	<1.0	<1.0	<1.0	<1.0	<1.0
Cook Estate		5/23/2018	1.1	<1.0	<1.0	<1.0	<1.0
Cook Estate		5/15/2019	<1.0	<1.0	<1.0	<1.0	<1.0
820a HWY 30	F1C78	6/16/2016	<0.5	<0.5	<0.5	<0.5	<0.5

Legend

1,2-cis DCE-1,2-cis Dichloroethene

1,2-trans DCE-1,2-trans Dichloroethene

PCE- Tetrachloroethene

TCE - Trichloroethene

VC - Vinyl Chloride

NA - Not analyzed

NR - Not reported

NS - Not Sampled

ND - Not detected above laboratory quantitation limits

J - Estimated value

LJ - Estimated value - Reported concentration below contract required quantitation limit value

C - Result biased low

* Well resampled due to mislabeling of original samples

Wells IDs switched during sampling

Table C-4 - Source Area Groundwater Sampling Analytical Results

Source Area Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			mS/cm³
Baseline 2007	**SAI-2D**	1/17/07	12:30	27	65000	<500	<500	<500	<500	20	13.48	0.18	7.47	68.7	1.831
	SAI-2S	1/17/07	12:05	<2.0	39	7.5	4.0	<1.0	<1.0	2.4	14.05	0.15	7.51	51.3	1.304
	SMW-1D	1/12/07	10:35	<2.0	<1.0	<1.0	1	<1.0	<1.0	1.5	16.68	0.10	7.60	46.8	1.409
	SMW-1S	1/12/07	10:00	<2.0	1.2	1.8	8.9	<1.0	<1.0	2.4	16.87	0.01	7.29	-98.7	1.314
	SMW-2D	1/12/07	12:00	<2.0	7600	260	<50	<50	<50	2.3	15.84	0.07	7.44	177.2	1.350
	SMW-2S	1/12/07	11:30	<2.0	1400	280	2200	<50	<50	2.5	14.54	0.24	7.35	117.6	1.235
	SMW-3D	1/12/07	12:50	<2.0	47000	120	<50	<50	<50	1.9	14.61	0.11	7.40	222.4	1.877
	SMW-3S	1/12/07	12:25	<2.0	880	66	530	<20	<20	2.2	13.60	0.04	7.21	216.2	1.213
	SMW-4D	1/16/07	9:00	<2.0	2	2.8	3.3	<1.0	<1.0	2.1	14.86	0.16	7.30	174.6	1.547
	SMW-4S	1/16/07	10:00	<2.0	190	21	180	<5.0	<5.0	2.4	14.32	0.08	7.32	220.5	1.086
	SMW-5D	1/16/07	10:30	<2.0	11	3.6	2.9	<1.0	<1.0	2.2	12.30	0.34	7.64	230	1.327
	SMW-5S	1/16/07	11:00	<2.0	240	6.4	44	<5.0	<5.0	2.5	12.54	0.38	7.68	181.6	1.248
	SMW-6D	1/16/07	11:50	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.6	14.66	0.07	7.22	168.4	1.990
	SMW-6S	1/16/07	10:30	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.1	14.74	0.09	7.31	107	1.081
July 2008 (60 Day)	**SMW-1S**	7/31/08	10:25	**	<1.0	<1.0	4400	59	19	13	18.16	0.05	7.26	-144	1.122
	SMW-3S	7/31/08	11:00	**	1.6	<1.0	7000	84	150	11	20.72	0.06	7.37	-144.1	1.243
	SMW-3D	7/31/08	11:30	**	24000	3700	7800	28	<1.0	1.2	17.13	0.02	8.02	-58	1.166
	SMW-6S	7/31/08	12:05	**	69	23	610	6.9	15	2.5	19.13	0.04	7.61	-186.6	0.989
	SMW-6D	7/31/08	12:32	**	5000	910	1500	19	14	2	16.80	0.03	7.80	-74.5	1.175
August 2008 (90 Day)	**SMW-1D**	8/27/08	11:35	**	1400	1300	49000	1300	70	100	17.28	1.10	8.15	-288.5	1.088
	SMW-3S	8/27/08	12:25	**	<2.0	<2.0	570	18	590	22	21.37	0.38	7.11	-201.1	1.119
	SMW-3D	8/27/08	13:55	**	24000	1700	2000	39	<5.0	1.7	17.63	0.03	6.35	-14.8	1.053
	SMW-6S	8/27/08	14:30	**	35	36	870	15	320	15	21.31	0.12	6.68	-180.5	1.152
	SMW-6D	8/27/08	14:55	**	7400	1900	3100	43	37	4.4	17.57	0.05	7.69	-156.6	0.974
November 2008 (120 Day)	**SMW-1D**	11/19/08	14:25	790	340	210	16000	850	15000	210	20.11	0.53	6.91	-235.5	1.662
	SMW-3S	11/19/08	13:35	130	<1.0	<1.0	1.2	13	1.1	160	19.93	0.15	6.94	-116.7	1.530
	SMW-3D	11/19/08	14:00	6.5	2900	930	2900	52	550	3.1	19.62	0.07	6.89	-77.5	1.190
	SMW-4S	11/19/08	13:00	110	<1.0	<1.0	<1.0	15	1	120	19.93	0.14	6.93	-113.8	1.557

Table C-4 - Source Area Groundwater Sampling Analytical Results

Source Area Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			mS/cm³
March 2009	**SMW-1D**	3/16/09	11:15	2300	700	250	13000	560	17000	120	17.26	0.04	7.44	-140.3	1.510
	SMW-3S	3/16/09	12:05	11	1	<1.0	3.4	14	1.6	29	14.71	0.13	6.82	-71.9	1.536
	SMW-3D	3/16/09	12:35	14	1900	310	4100	67	710	2.2	17.13	0.04	6.76	41.9	1.149
	SMW-6S	3/16/09	13:15	57	1.9	<1.0	2.0	3.8	<1.0	2.4	14.34	0.05	6.65	-34.6	1.041
	SMW-6D	3/16/09	13:50	290	550	360	2000	58	1000	3.3	16.34	0.05	6.70	-28.9	1.203
July 2009	**SMW-1D**	7/8/09	16:25	3000	3800	840		710	14000	150	**	**	**	**	**
	SMW-3S	7/8/09	15:50	5.5	<1.0	<1.0	1.8	5.9	1.2	11	**	**	**	**	**
	SMW-3D	7/8/09	16:10	120	240	140	1200	34	580	3.1	**	**	**	**	**
	SMW-6S	7/8/09	14:05	4.8	<1.0	<1.0	<1.0	5.8	<1.0	21	**	**	**	**	**
	SMW-6D	7/8/09	15:25	420	58	45	340	38	220	24	**	**	**	**	**
November 2009	**SAI-2S**	10/27/09	12:45	31	<1.0	<1.0	2.3	9.9	9.7	33	**	**	**	**	**
	SAI-2D	10/27/09	11:35	16	<1.0	<1.0	2.3	8.9	16	140	**	**	**	**	**
	SMW-1S	10/28/09	12:45	9.9	<1.0	<1.0	<1.0	16	<1.0	55	**	**	**	**	**
	SMW-1D	10/28/09	13:30	2600	210	<50	3400	290	11000	96	**	**	**	**	**
	SMW-2S	10/28/09	11:35	0.3	<1.0	<1.0	<1.0	4.9	<1.0	85	**	**	**	**	**
	SMW-2D	10/28/09	12:45	210	<1.0	<1.0	0.5	25	2.7	170	**	**	**	**	**
	SMW-3S	10/28/09	15:14	130	<1.0	<1.0	<1.0	4.3	<1.0	68	**	**	**	**	**
	SMW-3D	10/28/09	15:25	0.61	340	240	1300	33	530	3.6	**	**	**	**	**
	SMW-4S	10/29/09	12:00	0.57	<1.0	<1.0	<1.0	8.8	<1.0	120	**	**	**	**	**
	SMW-4D	10/29/09	11:35	5.9	<1.0	<1.0	<1.0	20	<1.0	200	**	**	**	**	**
	SMW-5S	10/29/09	10:50	1.9	<1.0	<1.0	<1.0	9.2	<1.0	8.8	**	**	**	**	**
	SMW-5D	10/29/09	10:20	3.6	<1.0	<1.0	<1.0	17	<1.0	8.8	**	**	**	**	**
	SMW-6S	10/28/09	15:15	21	<1.0	<1.0	3.4	9.4	8.8	6.9	**	**	**	**	**
	SMW-6D	10/28/09	14:40	950	350	320	5600	220	1600	5.7	**	**	**	**	**
September 2010	**SMW-1S**	9/9/10	10:05	5.6	<1.0	<1.0	2.3	3.7	5.4	4.4	20.83	0.09	6.91	-104.3	2.443
	SMW-1D	9/9/10	10:40	1500	<1.0	88	530	130	2000	2.6	18.89	0.10	7.27	-99.9	2.145
	SMW-2S	9/9/10	11:55	**	<1.0	<1.0	1.1	1.3	1.2	**	22.86	0.40	6.98	-121.8	3.083
	SMW-2D	9/9/10	12:10	**	1.2	<1.0	4.1	57	65	**	20.30	0.11	6.89	-111	3.730

Table C-4 - Source Area Groundwater Sampling Analytical Results

Source Area Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			mS/cm³
	SMW-3S	9/9/10	12:45	670	<1.0	<1.0	1.4	33	1.6	4.5	23.16	0.07	6.82	-113.6	2.659
	SMW-3D	9/9/10	12:30	64	<1.0	11	23	15	18	2.7	20.44	0.07	7.00	-93.9	2.466
	SMW-4S	9/9/10	13:25	3	1.2	<1.0	4.1	<1.0	3.4	**	22.12	0.05	7.28	-141.6	2.401
	SMW-4D	9/9/10	13:10	6.9	<1.0	<1.0	1.4	6.7	1.1	**	20.05	0.05	6.98	-116.6	2.797
	SMW-5S	9/9/10	14:00	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	21.32	0.04	7.10	-135.2	2.264
	SMW-5D	9/9/10	13:45	**	<1.0	<1.0	2.0	7.3	<1.0	**	19.78	0.04	6.91	-100.6	2.949
	SMW-6S	9/9/10	14:30	95	<1.0	<1.0	2.2	2	1	**	21.53	0.06	6.97	-127.2	1.996
	SMW-6D	9/9/10	14:20	640	<1.0	<1.0	990	76	600	**	20.45	0.14	7.16	174.9	2.547
February 2011	**SMW-1S**	2/11/11	15:05	**	<1.0	<1.0	4.8	1.2	<1.0	**	15.92	0.06	7.11	-116.2	1.463
	SMW-1D	2/11/11	15:35	**	42	62	130	39	260	**	18.70	0.06	7.25	-117.4	1.476
	SMW-2S	2/15/11	11:20	**	<1.0	<1.0	<1.0	<1.0	<1.0	7.1	14.28	0.08	6.89	-99.2	1.374
	SMW-2D	2/15/11	11:55	**	<1.0	<1.0	14	66	660	120	16.40	0.10	6.86	-95.8	1.884
	SMW-3S	2/15/11	13:25	**	<1.0	<1.0	14	28	40	3.6	13.84	0.04	7.07	-75.2	1.331
	SMW-3D	2/15/11	13:55	**	23	26	120	17	72	2.9	10.46	0.04	7.04	-74.1	1.524
	SMW-4S	2/11/11	12:05	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	13.80	0.05	7.53	-135.3	1.348
	SMW-4D	2/11/11	12:35	**	<1.0	<1.0	<1.0	4.5	<1.0	**	15.70	0.06	7.10	-101.1	1.628
	SMW-5S	2/11/11	13:05	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	13.85	0.08	7.21	-104.8	1.335
	SMW-5D	2/11/11	13:35	**	<1.0	<1.0	<1.0	7.7	2.6	**	15.69	0.07	6.88	-95.9	1.752
	SMW-6S	2/11/11	14:05	**	<1.0	<1.0	<1.0	1.5	<1.0	**	14.36	0.04	7.00	-87	1.317
	SMW-6D	2/11/11	14:35	**	52	100	1300	66	500	**	10.06	0.12	6.93	-94.8	1.617
June 2011	**SMW-1S**	6/2/2011	13:40	0.92	<1.0	<1.0	<1.0	<1.0	<1.0	3.2	16.76	0.11	7.41	-101.1	1.742
	SMW-1D	6/2/2011	13:55	540	65	82	150	18	190	3	16.53	0.06	7.38	-94.8	1.727
	SMW2S	6/2/2011	14:20	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	17.29	0.06	7.18	-101.8	1.928
	SMW-2D	6/2/2011	14:30	**	<1.0	<1.0	150	130	900	**	16.50	0.07	6.99	-100.6	2.312
	SMW-3S	6/2/2011	12:55	540	<1.0	<1.0	31	45	220	4	17.19	0.20	7.47	-80.5	1.898
	SMW-3D	6/2/2011	13:10	66	22	24	73	16	91	2.9	16.91	0.06	7.14	-77.8	1.838
	SMW-4S	6/3/2011	13:05	0.48	8.2	2.2	1.4	<1.0	1.8	**	15.68	0.18	7.91	-116.5	1.708
	SMW-4D	6/3/2011	13:05	4	<1.0	<1.0	<1.0	4.3	1	**	15.42	0.04	7.31	-106.9	1.909

Table C-4 - Source Area Groundwater Sampling Analytical Results

Source Area Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			mS/cm³
	SMW-5S	6/3/2011	13:15	**	<1.0	<1.0	<1.0	<1.0	1.3	**	15.92	0.03	7.48	-95.5	1.679
	SMW-5D	6/3/2011	13:25	**	<1.0	<1.0	<1.0	12	4.6	**	15.73	0.03	7.16	-87	1.990
	SMW-6S	6/3/2011	13:45	21	<1.0	<1.0	<1.0	2.6	1.7	**	16.24	0.03	7.61	-65.2	1.726
	SMW-6D	6/3/2011	13:50	320	86	140	2400	93	630	**	15.96	0.03	7.14	-72.4	1.848
September 2012	**SMW-1S**	9/18/2012	12:12	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	20.50	0.15	6.9	129.9	1.410
	SMW-1D	9/18/2012	11:25	**	20	30	58	12	110	**	18.80	0.70	6.8	106.9	1.580
	SMW2S	9/18/2012	14:00	**	<1.0	<1.0	2.7	<1.0	1.8	**	22.40	0.12	6.8	121.1	1.440
	SMW-2D	9/18/2012	13:00	**	<1.0	<1.0	1600	89	1000	**	19.30	0.25	6.5	105.4	1.740
	SMW-3S	9/18/2012	15:46	**	<1.0	<1.0	10	16	170	**	22.48	0.09	6.6	-91.9	1.530
	SMW-3D	9/18/2012	14:56	**	230	120	330	30	200	**	19.78	0.19	6.5	-68.4	1.618
	SMW-4S	9/18/2012	10:05	**	1.3	1.7	2.6	<1.0	1.2	**	21.24	0.19	7.1	-141.2	1.510
	SMW-4D	9/18/2012	9:23	**	<1.0	<1.0	<1.0	3.7	<1.0	**	18.69	0.35	6.65	-110.7	1.670
	SMW-5S	9/18/2012	11:59	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	21.44	0.09	6.9	-72.9	1.510
	SMW-5D	9/18/2012	11:06	**	<1.0	<1.0	1.5	12	4	**	19.23	0.21	6.46	-83.4	1.770
	SMW-6S	9/18/2012	13:08	**	<1.0	<1.0	1.2	1	4.9	**	21.49	0.13	6.7	-92.2	1.570
	SMW-6D	9/18/2012	14:05	**	110	150	1400	150	540	**	19.18	0.14	6.5	-77	1.740
May 2013	**SMW-1S**	5/1/2013	13:56	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	16.90	0.01	6.6	298	1.580
	SMW-1D	5/1/2013	13:12	**	11	20	52	11	100	**	17.40	0.01	6.6	118	1.630
	SMW2S	5/1/2013	15:36	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	16.60	0.02	4.9	112	2.800
	SMW-2D	5/1/2013	16:17	**	<1.0	<1.0	920	41	1000	**	16.70	0.01	5.2	130	2.990
	SMW-3S	5/1/2013	15:34	**	<5.0	<5.0	27	19	45	**	16.20	45.00	5.5	-108	2.800
	SMW-3D	5/1/2013	16:20	**	47	32	130	18	66	**	17.10	42.00	6.6	-45	1.600
	SMW-4S	5/1/2013	11:47	**	6.9	<1.0	3.9	1	<1.0	**	15.20	49.00	5.9	-158	1.660
	SMW-4D	5/1/2013	12:33	**	<1.0	<1.0	<1.0	4.4	<1.0	**	16.40	44.60	6.8	-175	1.600
	SMW-5S	5/1/2013	13:15	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	17.70	40.20	5.1	-99	3.200
	SMW-5D	5/1/2013	14:18	**	<1.0	<1.0	<1.0	1.7	4.5	**	17.20	41.00	5.5	-109	3.800
	SMW-6S	5/1/2013	12:17	**	<1.0	<1.0	<1.0	<1.0	5.4	**	15.50	0.01	5.70	177	2.120
	SMW-6D	5/1/2013	11:40	**	87	120	560	48	240	**	16.40	0.02	6.20	222	2.100

Table C-4 - Source Area Groundwater Sampling Analytical Results

Source Area Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			mS/cm³
June 2014	**SMW-1S**	6/1/2014		**	NS	NS	NS	NS	NS	**	NS	NS	NS	NS	NS
	SMW-1D	6/24/2014	10:32	**	256	134	156	623	464	**	16.80	1.10	6.6	-82	2.380
	SMW2S	6/1/2014		**	NS	NS	NS	NS	NS	**	NS	NS	NS	NS	NS
	SMW-2D	6/4/2014	10:53	<13	<1.0	<1.0	<1.0	12	<1	56	17.30	46.00	6.5	-134	2.000
	SMW-3S	6/4/2014	10:29	22	<1.0	<1.0	8.8	6	7.8	10	17.00	5.40	6.3	-61	1.370
	SMW-3D	6/4/2014	9:18	120	140	100	560	43	220	8.4	16.60	4.20	6.3	-57	1.610
	SMW-4S	6/24/2014	9:43	**	3.4	2.5	1.1	<1.0	<1.0	**	16.80	**	6.9	-96	1.300
	SMW-4D	6/24/2014	10:32	**	1	<1.0	<1.0	3	<1.0	**	16.20	**	6.5	-88	1.700
	SMW-5S	6/1/2014		**	NS	NS	NS	NS	NS	**	NS	NS	NS	NS	NS
	SMW-5D	6/24/2014	9:36	**	<1.0	<1.0	<1.0	1.6	<1.0	**	16.40	5.80	6.5	-127	3.110
	SMW-6S	6/1/2014		**	NS	NS	NS	NS	NS	**	NS	NS	NS	NS	NS
	SMW-6D	6/4/2014	9:35	68	87	110	480	32	210	2.5	16.60	29.00	6.60	-96	1.700
June 2015	**SMW-1D**	6/11/2015	12:06	**	561	270	222	25.4	164	**	18.00	0.00	6.4	-118.4	1.833
	SMW-2D	6/3/2015	11:00	20	<1.0	<1.0	<1.0	5.2	<1.0	28	17.20	0.50	4.9	344	1.700
	SMW-3S	6/3/2015	11:45	29	<1.0	<1.0	4.1	1.7	5.1	8.2	17.00	0.01	6.4	-71	1.123
	SMW-3D	6/3/2015	9:29	140	170	240	1500	57	410	2.6	17.60	0.34	6.3	-52	1.604
	SMW-4S	6/9/2015	17:00	**	**11.5**	2.3	<1.0	2.0	<1.0	**	16.50	0.05	6.9	-79	1.198
	SMW-4D	6/11/2015	11:33	**	2.0	<1.0	<1.0	2.8	<1.0	**	18.00	1.94	6	147	1.583
	SMW-5D	6/11/2015	13:03	**	<1.0	<1.0	<1.0	1.6	<1.0	**	18.00	4.90	5.5	1.31	2.480
	SMW-6D	6/3/2015	9:41	40	79	98	310	19	130	2.3	16.40	0.40	5.70	290	1.748
June 2016	**SMW-1D**	6/15/2016		**	240	320	320	9.9	180	**	18.68	0.32	6.26	-81	1.437
	SMW-2D	9/13/2016		120	<10.0	<10.0	66	13	64	20	19.32	4.04	6.77	-90	1.352
	SMW-3S	9/13/2016		35	0.19 J	0.45 J	15	3.4	19	8	21.34	0.47	6.64	-89	1.236
	SMW-3D	9/13/2016		97	380	550	2800	67	580	2.6	18.74	0.84	6.53	-54	1.544
	SMW-4S	6/15/2016		**	11	1.8 LJ	1.1 LJ	<5.0	<5.0	**	18.09	0.57	6.51	-67	1.015
	SMW-4D	6/14/2016		**	<5.0	<5.0	<5.0	2.7 LJ	<5.0	**	16.69	0.18	6.37	-86	1.202
	SMW-5D	6/15/2016		**	<5.0	<5.0	1.3 LJ	2.4 LJ	1.6 LJ	**	19.46	0.23	6.04	-109	1.804
	SMW-6D	9/13/2016		42	28	120	490	21	180	1.9	18.68	6.62	6.61	-48	1.676

Table C-4 - Source Area Groundwater Sampling Analytical Results

Source Area Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			mS/cm³
June 2017	**SMW-1D**	6/22/2017		**	67.8	353	806	8.3	223	**	19.02	0.46	6.76	-168	1.246
	SMW-2D	6/12/2017		694	<1.0	0.12 J	38	24.0	91	14	18.56	0.26	6.88	-120	1.397
	SMW-3S	6/12/2017		532	<1.0	0.17 J	29	5.0	72	6.3	19.38	0.27	6.71	-75	1.381
	SMW-3D	6/12/2017		204	390	590	3400	75.0	490	2.4	18.58	6.70	6.70	-59	1.580
	SMW-4S	6/14/2017		**	13.4	<10	<1.0	<1.0	<1.0	**	17.92	1.52	7.12	-74	0.735
	SMW-4D	6/14/2017		**	1.2	<1.0	<1.0	1.4	1.7	**	16.98	0.29	7.01	-101	0.618
	SMW-5D	6/21/2017		**	<1.0	1.3	18.1	2.9	10.3	**	21.37	5.57	6.83	-126	1.385
	SMW-6D	6/12/2017		62	21	58	570	14.0	180	2	18.42	1.15	6.77	-51	1.705
May 2018	**SMW-1D**	5/16/2018		284	18	64	260	4.7	82	2.9	18.39	1.30	6.86	-102	1.250
	SMW-2D	5/21/2018		1740	<1.0	<1.0	513	75.6	942	15	18.22	0.30	6.94	-218	1.234
	SMW-3S	5/21/2018		42	<1.0	<1.0	9.4	19.9	37.7	240	18.51	0.37	5.96	-123	1.062
	SMW-3D	5/17/2018		3870	940	1900	7600	150.0	1400	3.7	17.72	1.32	6.72	-169	1.575
	SMW-4S	5/21/2018		**	7.4	1.3	<1.0	<1.0	<1.0	**	17.01	0.41	7.26	-94	1.191
	SMW-4D	5/21/2018		**	<1.0	<1.0	3.4	1.5	6.2	**	16.30	0.35	7.04	-86	1.108
	SMW-5D	5/22/2018		**	<1.0	<1.0	19	3.4	16.3	**	16.39	2.00	5.70	28	1.354
	SMW-6D	5/16/2018		29	<10	<10	150	<10	19	3300	17.27	3.27	5.07	4	3.713
	SMW-7D	5/16/2018		<13	<1.0	<1.0	18	3.2	7.8	2.5	17.63	1.04	6.86	-85.6	1.477
	SMW-8D	5/17/2018		464	55	82	210	38	82	27	18.96	1.70	6.44	-148.5	1.955
	SMW-29D	5/17/2018		<13	1.4	2.4	17	2.1	6.1	3.6	19.77	1.20	6.66	-60.2	1.813
May 2019	**SMW-1D**	5/15/2019		64	29	28	160	<5	71	2.9	16.90	**	6.77	**	1.321
	SMW-2D	5/15/2019		941	<1	<1	2070	76.5	1190	1.2	15.79	0.28	6.92	-151	1.050
	SMW-3S	5/15/2019		**	<1	<1	11	11.8	6.1	**	14.96	0.33	6.54	-111	1.242
	SMW-3D	5/14/2019		4390	4900	2900	10000	310.0	6300	2.7	16.26	**	6.52	**	1.530
	SMW-4S	5/15/2019		**	3.6	<1	2	<1	<1	**	16.00	4.58	7.42	-82	1.580
	SMW-4D	5/15/2019		**	<1	<1	6	1.9	11.8	**	15.90	0.62	7.05	-88	1.640
	SMW-5D	5/15/2019		**	<1	18.6	56.6	5.2	25.2	**	15.70	3.90	6.74	-55	1.920
	SMW-6D	5/14/2019		<13	24	24	26	8.7	16	450	15.95	**	6.45	**	2.651
	SMW-7D	5/15/2019		<13	<1.0	<1.0	15	2	7.6	2.2	16.00	**	6.81	**	1.635
	SMW-8D	5/15/2019		99	570	210	1700	33	270	15	16.52	**	6.40	**	1.784

Table C-4 - Source Area Groundwater Sampling Analytical Results

Source Area Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			mS/cm³
	SMW-29D	5/15/2019		<13	1.3	<1	17	2.8	15	4.1	0.89	**	6.55	**	1.722

** No data available

Table C-5 – Hot Spot Groundwater Sampling Analytical Results

Hot Spot Sampling Results				Laboratory Data								Field Data				
					Volatiles					TOC	YSI Readings					
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
Baseline 2007	**HSI-15**	5/31/07	12:50	<2.0	1300	320	82	<5.0	<5.0	2.4	17.99	0.03	7.69	130.1	1.330
	HSI-16	5/31/07	13:10	<2.0	1900	110	21	<5.0	<5.0	2.9	18.02	0.04	7.31	130.3	1.449
	HSI-18	5/31/07	14:40	<2.0	970	180	95	8.1	<5.0	3.2	15.87	0.05	7.38	49.8	1.462
	HSI-20	5/31/07	14:05	<2.0	7.3	<1.0	<1.0	<1.0	<1.0	4.2	15.07	0.05	7.30	40.0	1.790
	HSI-6	6/1/07	10:30	<2.0	67	3.9	11	<1.0	<1.0	2.4	17.08	0.03	7.23	-104.9	1.327
	HSI-7	6/1/07	11:20	<2.0	2000	430	100	<5.0	<5.0	2.2	16.40	0.01	7.48	31.9	1.257
July 2008 (60 Day)	**HSI-6**	8/5/08	14:30	**	<1.0	<1.0	<1.0	<1.0	17	67	22.57	0.05	7.81	-132.6	1.506
	HSI-15	8/5/08	15:30	**	<1.0	<1.0	<1.0	<1.0	11	59	22.99	0.07	8.14	-164.3	1.495
	HSI-16	8/5/08	16:45	**	<1.0	<1.0	<1.0	<1.0	20	120	22.58	0.09	8.04	-178.3	1.484
	HSE-1	8/6/08	15:00	**	<5.0	<5.0	700	8.2	<5.0	4.2	20.16	0.09	8.64	-127.8	0.949
	HSE-7	8/6/08	15:15	**	25	36	860	10	70	35	20.16	0.12	8.41	-117.7	1.167
	HSE-9	8/6/08	15:30	**	<5.0	<5.0	540	5.4	9.4	52.0	18.88	0.05	8.55	-110.3	1.165
	HSE-10	8/6/08	15:45	**	62	38	680	8.9	170	17	21.19	0.14	8.72	-123.4	1.222
	HSE-12	8/6/08	16:00	**	<5.0	<5.0	1000	11	200	53.0	21.39	0.05	8.80	-111.4	1.339
	HSE-14	8/6/08	16:10	**	55	16	520	5.2	93	59	20.84	0.09	8.87	-122.8	1.368
	EX-16	7/31/08	13:40	**	11	1.1	410	2.2	470	4.8	18.54	0.04	6.76	-60.9	1.374
	Manifold	8/6/08	16:20	**	30	16	700	8.8	100	36	20.44	0.03	8.90	-111.6	1.221
August 2008 (90 Day)	**HSI-6**	8/26/08	14:20	**	<1.0	<1.0	<1.0	<1.0	20	52	22.64	0.12	7.66	-169.2	1.588
	HSI-15	8/26/08	15:20	**	<1.0	<1.0	<1.0	<1.0	9.0	35	22.10	0.14	8.02	-164.9	1.382
	HSI-16	8/26/08	15:00	**	<1.0	<1.0	<1.0	<1.0	21	110	22.62	0.11	7.94	-176.1	1.352
	HSE-1	8/26/08	12:40	**	25	28	600	7.4	240	22	21.46	0.07	8.47	-174.5	1.230
	HSE-7	8/26/08	12:40	**	15	25	480	9.3	370	39	20.71	0.05	8.41	-152.0	1.264
	HSE-9	8/26/08	13:15	**	15	19	610	7.4	160	46	21.36	0.05	8.34	-180.4	1.131
	HSE-10	8/28/08	13:00	**	17	36	550	11	450	29	21.08	0.10	8.44	-160.1	1.244
	HSE-14	8/26/08	13:00	**	12	33	420	7.0	310	8.1	22.19	0.04	8.36	-171.3	1.251
	EX-16	8/28/08	15:55	**	<1.0	<1.0	57	2.5	460	5.0	19.70	0.06	6.95	-98.9	1.296
	Manifold	8/26/08	14:35	**	18	27	500	8.8	350	27	**	**	**	**	**

Table C-5 – Hot Spot Groundwater Sampling Analytical Results

Hot Spot Sampling Results				Laboratory Data								Field Data				
					Volatiles					TOC	YSI Readings					
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					5 µg/L	5 µg/L	70 µg/L	100 µg/L	2 µg/L						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
November 2008 (120 Day)	HSI-6	11/18/08	12:00	3.3	<1.0	<1.0	<1.0	4.7	<1.0	38	20.31	0.19	5.92	-125.1	1.684
	HSI-15	11/18/08	12:40	1.7	<1.0	<1.0	<1.0	4.1	<1.0	12	20.42	0.19	5.55	-116.3	1.750
	HSI-16	11/18/08	13:15	12	<1.0	<1.0	<1.0	5.0	15	21	20.61	0.19	5.71	-122.6	1.763
	HSE-1	11/14/08	12:15	140	<1.0	<1.0	8.4	11	45	87	20.58	0.05	6.40	-141.3	1.513
	HSE-7	11/14/08	12:25	140	<1.0	<1.0	<1.0	11	9.4	110	20.17	0.04	6.39	-126.5	1.519
	HSE-9	11/14/08	12:30	73	<1.0	<1.0	17	10	490	120	20.57	0.02	6.41	-130.5	1.576
	HSE-10	11/14/08	12:35	160	<1.0	<1.0	2.4	11	47	100	20.27	0.03	6.43	-117.0	1.519
	HSE-14	11/14/08	12:40	79	4.1	5.1	44	10	190	74	19.97	0.03	6.42	-140.6	1.529
	EX-16	11/19/08	11:50	13	<10	<10	35	<10	490	4.8	19.20	0.07	6.90	-104.0	1.550
	R-25	11/19/08	11:05	40	1.0	32	46	3.4	600	3.7	19.60	0.05	7.03	-126.5	1.473
	EX-17	11/19/08	10:30	4.7	5.1	3.8	130	3.3	310	2.6	20.34	0.02	7.02	-30.4	1.411
	Manifold	11/14/08	12:45	140	<1.0	<1.0	7.7	11	170	110	19.98	0.03	6.42	-129.1	1.530
March 2009	HSE-1	3/18/09	12:00	81	<1.0	<1.0	1.8	5.6	5.3	15	14.61	0.05	6.99	-95.3	1.278
	HSE-3	3/18/09	12:15	60	<1.0	<1.0	1.5	10	1.9	11	14.58	0.06	6.97	-112.9	1.425
	HSE-5	3/18/09	12:40	51	<1.0	<1.0	8.1	6.4	23	24	16.17	0.11	7.01	-121.8	1.480
	HSE-7	3/18/09	12:55	1.1	<1.0	<1.0	<1.0	4.8	<1.0	36	14.74	0.11	7.04	-120.3	1.621
	HSE-9	3/18/09	13:15	29	<1.0	<1.0	<1.0	7.7	<1.0	43	14.56	0.07	7.06	-99.3	1.445
	HSE-10	3/18/09	13:30	13	<1.0	<1.0	<1.0	6.6	<1.0	30	15.89	0.05	7.07	-124.9	1.566
	HSE-14	3/18/09	13:45	16	<1.0	<1.0	1.5	8.3	5.6	23	14.94	0.07	7.07	-109.1	1.482
	EX-13	3/17/09	12:30	12	<1.0	1.0	54	3.1	250	2.8	15.38	0.03	6.98	-24.2	1.153
	EX-16	3/17/09	15:40	44	<1.0	<1.0	4.9	2.8	170	3.5	14.21	0.05	6.35	26.2	1.253
	R-25	3/17/09	14:55	33	<1.0	12	17	3.7	290	3.1	15.55	0.04	6.31	30.0	1.234
	EX-17	3/17/09	14:20	3.8	4.0	2.8	120	1.9	150	2.5	15.20	0.02	6.06	71.5	1.240
	Manifold	3/18/09	14:15	39	<1.0	<1.0	2.7	7.0	5.6	40	15.19	0.07	7.08	-117.5	1.474
July2009	HSE-1	7/6/09	13:00	5.4	<1.0	5.8	13	6.9	6.3	21	**	**	**	**	**
	HSE-3	7/6/09	11:55	1.6	<1.0	<1.0	<1.0	7.6	<1.0	5.4	**	**	**	**	**
	HSE-5	7/6/09	12:25	14	<1.0	1.6	7.6	7.0	5.0	5.7	**	**	**	**	**
	HSE-7	7/6/09	12:55	7.8	<1.0	<1.0	4.7	8.1	4.4	18	**	**	**	**	**

Table C-5 – Hot Spot Groundwater Sampling Analytical Results

Hot Spot Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
	HSE-9	7/6/09	13:40	3.2	<1.0	<1.0	<1.0	6.7	<1.0	31	**	**	**	**	**
	HSE-10	7/6/09	13:55	2.7	<1.0	<1.0	<1.0	5.9	<1.0	17	**	**	**	**	**
	HSE-14	7/6/09	14:15	5.0	<1.0	1.3	7.6	6.9	6.0	19	**	**	**	**	**
	EX-13	7/8/09	11:10	54	<1.0	<1.0	17	4.4	190	3.3	**	**	**	**	**
	EX-16	Not sampled		**	**	**	**	**	**	**	**	**	**	**	**
	R-25	7/8/09	12:20	68	<1.0	13	17	4.1	170	3.6	**	**	**	**	**
	EX-17	7/8/09	11:45	16	2.9	2.0	35	2.0	66	3.0	**	**	**	**	**
	Manifold	7/6/09	14:35	11	2.2	1.5	9.7	6.9	5.7	13	**	**	**	**	**
October 2009	**HSE-1**	10/29/09	10:45	1.4	<1.0	<1.0	<1.0	11	<1.0	24	**	**	**	**	**
	HSE-2	10/29/09	11:05	4.8	<1.0	<1.0	<1.0	4.3	<1.0	220	**	**	**	**	**
	HSE-3	10/29/09	12:52	3.7	<1.0	<1.0	<1.0	1.4	<1.0	38	**	**	**	**	**
	HSE-4	10/29/09	11:12	1.1	<1.0	<1.0	<1.0	5	<1.0	6.1	**	**	**	**	**
	HSE-5	10/29/09	12:15	1.7	<1.0	<1.0	<1.0	4	<1.0	7.6	**	**	**	**	**
	HSE-6	10/29/09	12:00	1	<1.0	<1.0	<1.0	4	<1.0	42	**	**	**	**	**
	HSE-7	10/29/09	12:08	5.5	<1.0	<1.0	<1.0	5.2	1.1	38	**	**	**	**	**
	HSE-8	10/29/09	11:50	1.3	<1.0	<1.0	<1.0	4.1	<1.0	12	**	**	**	**	**
	HSE-9	10/29/09	13:38	0.36	<1.0	<1.0	<1.0	3.3	<1.0	49	**	**	**	**	**
	HSE-10	10/29/09	13:24	0.29	<1.0	<1.0	<1.0	3.7	<1.0	31	**	**	**	**	**
	HSE-11	10/29/09	13:31	4.2	<1.0	<1.0	<1.0	3.8	1.2	23	**	**	**	**	**
	HSE-12	10/29/09	13:13	3.7	<1.0	<1.0	<1.0	3.8	1	470	**	**	**	**	**
	HSE-13	10/30/09	10:55	4.7	<1.0	<1.0	<1.0	1.4	<1.0	18	**	**	**	**	**
	HSE-14	10/29/09	14:01	1.7	<1.0	<1.0	<1.0	4.3	<1.0	83	**	**	**	**	**
	HSI-4	10/27/09	11:45	0.41	<1.0	<1.0	<1.0	2	<1.0	9.6	**	**	**	**	**
	HSI-6	10/28/09	10:15	1.5	<1.0	<1.0	<1.0	2.1	<1.0	14	**	**	**	**	**
	HSI-7	10/28/09	11:00	0.93	<1.0	<1.0	10	4.7	3.8	97	**	**	**	**	**
	HSI-11	10/27/09	11:00	3.1	<1.0	<1.0	5.9	4.7	3.8	63	**	**	**	**	**
	HSI-15	10/27/09	13:25	0.35	<1.0	<1.0	<1.0	1.7	<1.0	12	**	**	**	**	**

Table C-5 – Hot Spot Groundwater Sampling Analytical Results

Hot Spot Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					5 µg/L	5 µg/L	70 µg/L	100 µg/L	2 µg/L						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
	HSI-16	10/27/09	14:05	11	<1.0	<1.0	<1.0	2.3	<1.0	18	**	**	**	**	**
	HSI-18	10/27/09	15:35	0.31	<1.0	<1.0	<1.0	1.5	<1.0	32	**	**	**	**	**
	HSI-20	10/27/09	14:45	0.14	<1.0	<1.0	<1.0	2.2	<1.0	7.8	**	**	**	**	ND***
	EX-13	11/2/09	13:27	**	<0.5	0.41 LJ	5.9	3.2	24	**	21.48	0.07	8.20	-33.2	1.049
	EX-16	11/3/09	14:09	**	<0.5	<0.5	0.42 LJ	2.8	7.5	**	19.46	3.31	7.04	-157.5	2.177
	EX-17	11/2/09	12:44	**	1.9	1	9.4	0.95	11	**	20.35	0.07	8.17	-13.4	1.068
	R-24	11/2/09	15:05	**	<0.5	0.23 LJ	0.81	2.3	1.5	**	20.38	1.53	6.89	-80	2.439
	R-25	11/2/09	14:23	**	0.5	1.3	1.9	3.4	15	**	19.40	0.11	8.18	-42.3	1.075
December 2010	**HSE-10**	12/20/2010	12:05	**	<1.0	<1.0	<1.0	1.5	<1.0	**	17.02	0.16	7.11	-92.3	2.629
	HSI-14	12/20/2010	12:40	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	17.85	0.03	7.12	-176.2	3.409
	HSE-14	12/20/2010	13:00	**	<1.0	<1.0	<1.0	2.5	<1.0	**	17.78	0.02	7.04	-122.1	2.233
	HSI-7	12/20/2010	13:25	**	<1.0	<1.0	<1.0	2.6	<1.0	**	16.84	0.04	7.14	-129.5	1.843
February 2011	**HSI-9**	2/15/2011	14:30	**	<1.0	<1.0	<1.0	<1.0	<1.0	8.1	14.31	0.35	6.99	-129.0	1.279
	HSI-7	2/15/2011	15:05	**	<1.0	<1.0	<1.0	3.2	<1.0	4.1	14.66	0.09	7.13	-117.0	1.406
	HSE-6	2/16/2011	10:10	**	<1.0	<1.0	<1.0	1.7	<1.0	5.4	12.98	0.13	6.93	-107.4	1.318
	HSE-10	2/16/2011	10:45	**	<1.0	<1.0	<1.0	1.9	<1.0	7.7	14.67	0.14	7.01	-100.5	1.790
	HSI-19	2/16/2011	11:10	**	<1.0	<1.0	<1.0	<1.0	<1.0	37	15.56	0.20	6.99	-102.9	2.209
	HSE-14	2/16/2011	11:14	**	<1.0	<1.0	<1.0	3.0	<1.0	5.6	15.26	0.09	7.04	-96.8	1.575
	HSI-14	2/16/2011	12:05	**	<1.0	<1.0	<1.0	<1.0	<1.0	17	15.39	0.23	7.11	-173.1	2.605
	HSI-11	2/16/2011	12:40	**	<1.0	<1.0	<1.0	<1.0	<1.0	3.1	12.64	0.06	7.45	-145.2	1.025
	EX-13	2/7/2011	12:25	**	<0.5	<0.5	<0.5	2.8	3.4	**	16.49	0.56	6.45	-44.3	1.482
	EX-16	2/7/2011	14:42	**	<1.0	<1.0	<1.0	2.2	5.4	**	15.74	-	6.57	-77.8	1.775
	R-24	2/14/2011	13:45	**	7.4	7.8	9.8	2	8.8	**	16.25	2.73	6.48	-75.4	1.424
	R-25	2/7/2011	13:55	**	<1.0	<1.0	<1.0	2.80	3.40	**	16.10	0.56	6.46	-63.8	1.614
June/Aug 2011	**HSE-6**	6/1/2011	14:20	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	16.14	0.08	7.21	-124.3	1.854
	HSE-10	6/1/2011	15:10	**	<1.0	<1.0	<1.0	3	<1.0	**	18.16	0.13	7.17	-121.5	2.636
	HSE-14	6/2/2011	12:10	**	<1.0	<1.0	<1.0	3.2	<1.0	5	17.27	0.19	7.07	-106.6	2.539

Table C-5 – Hot Spot Groundwater Sampling Analytical Results

Hot Spot Sampling Results				Laboratory Data								Field Data				
					Volatiles					TOC	YSI Readings					
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
	HSI-7	6/1/2011	12:40	**	<1.0	<1.0	<1.0	1.3	<1.0	3.8	17.52	0.02	7.19	-152.4	1.985
	HSI-9	6/1/2011	13:45	**	<1.0	<1.0	<1.0	<1.0	<1.0	8.5	16.53	0.07	7.09	-138.5	1.889
	HSI-11	6/1/2011	13:15	**	<1.0	<1.0	<1.0	<1.0	<1.0	3.3	16.14	0.02	7.5	-172.8	1.627
	HSI-14	6/1/2011	14:45	**	<1.0	<1.0	<1.0	<1.0	<1.0	14	17.69	0.17	7.23	-181.2	3.962
	HSI-19	6/2/2011	11:40	**	<1.0	<1.0	<1.0	<1.0	<1.0	45	17.3	0.07	7.07	-121.9	3.476
	EX-13	8/24/2011	10:23	**	<5.0	<5.0	<5.0	2	3.9	**	23.3	0.20	6.69	55.4	1.556
	EX-16	8/24/2011	11:48	**	<5.0	<5.0	<5.0	1.7	2.2	**	22.12	0.41	6.31	50.0	1.859
	R-24	8/29/2011	14:15	**	35	20	8.6	3.5	7.2	**	21.87	0.10	**	**	1.874
	R-25	9/1/2011	14:00	**	<5.0	<5.0	<5.0	2.1	4.9	**	20.75	0.13	6.92	-87.8	1.722
March 2012	**EX-13**	3/22/2012	15:20	**	<0.5	<0.5	0.23	1	1.8	**	16.34	**	6.55	-142.7	1.255
	EX-16	3/22/2012	15:20	**	<0.5	<0.5	<0.5	0.84	1.30	**	15.82	**	6.64	**	1.667
	R-24	3/28/2012	11:52	**	3.5	3	1.3	3.1	<5.0	**	16.29	0.49	6.62	-218.9	1.793
	R-25	3/29/2012	12:06	**	<0.5	<0.5	0.2	1.5	1.7	**	16.36	0.48	6.79	-217	1.455
September 2012	**HSI-7**	9/19/2012	18:05	**	<1.0	<1.0	<1.0	1.5	<1.0	**	21.3	0.35	6.8	133	1.430
	HSI-9	9/19/2012	10:03	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	19.6	0.37	6.6	95.4	1.690
	HSI-11	9/19/2012	9:55	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	20.36	0.17	7.1	-171.3	1.467
	HSI-14	9/19/2012	15:06	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	21.2	0.23	6.4	119	2.500
	HSI-19	9/19/2012	13:05	**	<1.0	<1.0	2.1	<1.0	<1.0	**	21.33	0.2	6.7	-107.3	2.310
	HSE-6	9/19/2012	12:59	<0.001	<1.0	<1.0	<1.0	<1.0	<1.0	**	20.8	0.17	6.6	122.5	1.570
	HSE-10	9/19/2012	16:04	<0.001	<1.0	<1.0	<1.0	3	12	**	21.93	0.25	6.7	-116.6	1.845
	HSE-14	9/19/2012	14:32	<0.001	<1.0	<1.0	<1.0	3	<1.0	**	21.3	0.47	6.6	-117.7	1.974
May 2013	**HSE-6**	5/2/2013	14:30	0.0013	<1.0	<1.0	8.3	1.7	7.6	**	14.9	0.01	6.7	101	1.560
	HSE-10	5/2/2013	14:58	0.0012	<1.0	<1.0	<1.0	1.7	1.6	**	16.3	0.2	6.7	-62	1.800
	HSE-14	5/2/2013	16:50	<0.001	<1.0	<1.0	<1.0	1.5	<1.0	**	16.3	0.18	6.5	-59	2.200
	HSI-7	5/2/2013	13:09	**	<1.0	<1.0	3.4	1.7	5.2	**	15.7	0.2	6.9	-103	1.400
	HSI-9	5/2/2013	11:23	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	14.8	0.5	6.8	-48	1.500
	HSI-11	5/2/2013	12:06	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	14.4	0.05	7.1	128	1.640

Table C-5 – Hot Spot Groundwater Sampling Analytical Results

Hot Spot Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
	HSI-14	5/2/2013	16:20	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	16.2	0.01	6.4	107	2.470
	HSI-19	5/2/2013	18:02	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	16.6	0.01	6.5	89	2.350
	HSE-6	6/19/2014	12:12	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	16.4	**	6.7	-120	1.820
	HSE-10	6/19/2014	13:14	**	<1.0	<1.0	<1.0	1	<1.0	**	17.6	**	6.4	-101	1.600
June 2014	**HSE-14**	6/19/2014	13:12	**	<1.0	<1.0	<1.0	1.2	<1.0	**	17.4	**	6.6	-108	1.590
	HSI-7	6/19/2014	10:48	**	<1.0	<1.0	<1.0	1.1	<1.0	**	17	**	6.7	-132	1.520
	HSI-9	6/19/2014	11:16	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	16.3	**	6.6	-128	0.300
	HSE-6	6/8/2015	12:52	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	16.3	0.09	6.7	-102	1.227
	HSE-10	6/8/2015	15:30	**	<1.0	<1.0	<1.0	1.7	**1.6**	**	17.3	0	6.5	-68	1.544
	HSE-14	6/14/2015	16:48	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	16.8	0	6.5	-81	1.513
June 2015	**HSI-7**	6/8/2015	13:09	**	<1.0	<1.0	1.1	1.2	**2.1**	**	16.6	0.04	6.7	-113	1.324
	HSI-9	6/8/2015	18:10	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	15.7	0	6.5	-121	1.461
	HSI-11	Not sampled		**	**	**	**	**	**	**	**	**	**	**	**
	HSI-14	Not sampled		**	**	**	**	**	**	**	**	**	**	**	**
	HSI-19	Not sampled		**	**	**	**	**	**	**	**	**	**	**	**
	HSE-6	6/16/2016		**	0.10 LJ	0.10 LJ	2.1	<0.50	0.75	**	16.33	0.31	6.98	-121	0.940
	HSE-10	6/16/2016		**	<0.5	<0.5	<0.5	<0.5	<0.5	**	17.16	0.17	6.82	-115	1.090
June 2016	**HSE-14**	6/16/2016		**	<0.5	<0.5	<0.5	<0.5	<0.5	**	17.17	0.15	6.85	-111	1.111
	HSI-7	6/7/2016		**	<0.5	<0.5	2.7	0.87	**3.4**	**	16.36	0.27	6.55	-109	0.767
	HSI-9	6/22/2106		**	<0.50	<0.50	<0.50	0.14 LJ	<0.50	**	16.57	0.34	7.00	-126	0.819
	HSE-6	6/22/2017		**	<1.0	<1.0	9.2	<1.0	**2.6**	**	17.26	0.36	7.00	-178	0.855
	HSE-10	6/19/2017		**	<1.0	<1.0	<1.0	<1.0	<1.0	**	17.99	0.16	6.90	-130	0.920
June 2017	**HSE-14**	6/15/2017		**	<1.0	<1.0	<1.0	<1.0	<1.0	**	17.43	0.18	6.72	-103	1.042
	HSI-7	6/13/2017		**	<1.0	<1.0	<1.0	1.1	**1.2**	**	16.9	0.29	6.67	-134	1.013
	HSI-9	6/12/2017		**	<1.0	<1.0	<1.0	<1.0	<1.0	**	16.43	0.33	7.01	-138	0.756
	HSE-6	5/1/2018		**	<1.0	<1.0	4.9	<1.0	1.6	**	14.48	0.28	6.93	-106	1.043
May 2018	**HSE-10**	5/1/2018		**	<1.0	<1.0	<1.0	<1.0	<1.0	**	15.85	0.19	6.86	-153	1.061
	HSE-14	5/1/2018		**	<1.0	<1.0	<1.0	<1.0	<1.0	**	15.5	0.2	6.88	-207	0.931

Table C-5 – Hot Spot Groundwater Sampling Analytical Results

Hot Spot Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
	HSI-7	5/3/2018		**	<1.0	<1.0	<1.0	<1.0	<1.0	**	15.95	0.2	6.43	-102	1.138
	HSI-9	5/2/2018		**	<1.0	<1.0	2.3	<1.0	1.2	**	14.85	0.32	6.69	-127	1.118
May 2019	**HSI-9**	5/6/2019		**	<1.0	<1.0	<1.0	<1.0	<1.0	**	13.7	0.39	6.69	-118	0.998

Notes:
Remedial Goals are standards for groundwater as defined under 20.6.2.3103 NMAC New Mexico Water Quality Commission Regulations

** No data available

Table C-6 – Biocurtain Groundwater Sampling Analytical Results

Biocurtain Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
Baseline 2007	**BC-2**	10/22/07	N/A	**	4.9	5.6	1.6	0.6	<0.5	**	**	**	**	**	**
	BC-3	10/23/07	N/A	**	30.4	28.7	6.8	4.4	<0.5	**	**	**	**	**	**
	BC-4	10/23/07	N/A	**	22.2	21.2	38.4	7.6	<0.5	**	**	**	**	**	**
	BC-5	10/23/07	N/A	**	3.2	5.6	6.9	1.8	<0.5	**	**	**	**	**	**
July 2008 (60 Day)	**BC-2**	7/30/08	11:15	**	<1.0	<1.0	9.8	1.2	<1.0	46.0	19.70	0.03	7.38	-146.9	1.27
	BC-3	7/30/08	12:10	**	11	20	8.0	4.8	<1.0	3.0	18.40	0.03	7.17	44.0	1.09
	BC-4	7/30/08	13:15	**	5.0	19	32	7.2	<1.0	10.0	16.76	0.02	7.09	-113.9	1.24
	BC-5	7/30/08	14:15	**	<1.0	5.6	15	3.8	<1.0	21.0	15.63	0.05	7.06	-65.7	1.32
	BC-6	7/30/08	15:10	**	<1.0	<1.0	<1.0	<1.0	<1.0	5.1	14.97	0.03	7.71	41.9	1.58
	BCE-2	8/5/08	17:20	**	<1.0	1.1	1.1	<1.0	<1.0	6.0	20.12	0.08	8.18	-109.5	1.07
	BCE-5	8/5/08	17:40	**	6.6	22	17	12.0	<1.0	4.0	19.80	0.11	8.36	-103.0	1.07
	BCE-9	8/5/08	17:50	**	3.9	4.4	7.4	1.5	<1.0	4.4	15.58	0.14	8.41	-69.0	1.14
	Manifold	8/5/08	18:05	**	4.5	9.8	16	5.4	<1.0	9.2	16.60	0.06	8.47	-121.8	1.19
August 2008 (90 Day)	**BC-2**	8/28/08	13:50	**	<1.0	<1.0	25	4.7	<1.0	39.0	20.08	0.05	6.29	-253.4	1.18
	BC-3	8/28/08	14:35	**	<1.0	<1.0	27	4.8	<1.0	57.0	19.62	0.07	6.32	-106.2	1.17
	BC-4	8/28/08	15:10	**	<1.0	3.1	26	5.2	<1.0	30.0	18.16	0.06	6.72	-134.0	1.24
	BC-5	8/28/08	12:15	**	<1.0	1.2	23	4.7	<1.0	29.0	18.01	0.07	7.70	-207.7	1.17
	BC-6	8/28/08	12:55	**	<1.0	<1.0	<1.0	<1.0	<1.0	3.7	15.10	0.04	7.04	30.2	1.11
	Manifold	8/28/08	13:15	**	2.1	5.8	21	4.7	<1.0	19.0	19.71	0.11	6.68	-134.1	1.18
November 2008 (120 Day)	**BC-2**	11/13/08	14:35	0.022	<1.0	<1.0	22	6.2	<1.0	18.0	18.46	0.08	6.52	-232.0	1.40
	BC-3	11/13/08	14:00	0.029	<1.0	<1.0	24	5.8	<1.0	21.0	18.79	0.04	6.64	-200.0	1.41
	BC-4	11/13/08	13:20	0.032	<1.0	2.1	27	7.6	<1.0	6.1	18.38	0.03	6.49	-174.7	1.62
	BC-5	11/13/08	12:40	0.036	<1.0	<1.0	21	5.7	<1.0	8.5	18.83	0.05	6.65	-275.8	1.45
	BC-6	11/13/08	12:00	0.063	<1.0	<1.0	<1.0	<1.0	<1.0	6.8	16.24	0.02	6.56	-106.8	2.29
	Manifold	11/13/08	15:00	0.018	3.2	7.9	18	5.0	<1.0	7.6	18.41	0.04	6.53	-163.9	1.47
March 2009	**BCE-3**	3/18/09	15:30	0.040	<1.0	2.3	9.6	6.1	3.6	4.0	15.40	0.04	7.04	-109.7	1.32
	BCE-5	3/18/09	15:15	0.030	9.5	25	15	6.8	<1.0	3.2	16.23	0.11	7.06	-20.1	1.33
	BC-2	3/12/09	13:25	**	<1.0	1.9	10.2	7.4	1.4	3.7	13.81	0.31	6.95	-172.0	1.47

Table C-6 – Biocurtain Groundwater Sampling Analytical Results

Biocurtain Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
	BC-3	3/16/09	16:25	0.064	<1.0	2.0	6.8	5.8	5.2	3.6	13.91	0.02	6.17	4.0	1.33
	BC-4	3/16/09	15:55	0.057	<1.0	2.5	17	15 (10)	3.4	3.7	14.15	0.02	5.94	39.9	1.41
	BC-5	3/11/09	15:30	**	<1.0	2.1	14	8.1	2.5	4.3	13.77	-	7.19	-140.2	1.66
	BC-6	3/16/09	15:10	0.068	<1.0	<1.0	<1.0	<1.0	<1.0	3.6	13.12	0.01	6.30	63.7	1.30
	Manifold	3/18/09	15:05	0.025	3.2	5.9	7.5	3.7	1.0	3.5	14.93	0.05	7.07	-44.1	1.32
July 2009	**BC-2**	7/7/09	15:40	0.071	<1.0	<1.0	4.6	8	4.7	3.8	**	**	**	**	**
	BC-3	7/7/09	15:05	0.12	<1.0	<1.0	1.5	7.5	9.3	4.1	**	**	**	**	**
	BC-4	7/7/09	14:30	0.058	<1.0	<1.0	11	8.3	5.1	5.2	**	**	**	**	**
	BC-5	7/7/09	12:20	0.075	<1.0	<1.0	4.4	7.5	9.9	5.3	**	**	**	**	**
	BC-6	7/7/09	13:05	0.045	<1.0	1.6	<1.0	<1.0	<1.0	6.5	**	**	**	**	**
	Manifold	7/7/09	13:40	0.10	1.8	4.2	7.2	6.2	4.8	4.6	**	**	**	**	**
November 2009	**BCE-1**	11/2/09	12:30	0.28	<1.0	2.9	5.6	6.6	6.3	3.0	**	**	**	**	**
	BCE-3	10/30/09	13:30	0.18	<1.0	<1.0	1.3	1.9	2	11.0	**	**	**	**	**
	BCE-5	10/30/09	11:45	0.28	5.6	14	11	8.6	4.8	9.3	**	**	**	**	**
	BCE-7	10/30/09	11:45	0.16	<1.0	1.4	4.6	1.4	5.4	3.5	**	**	**	**	**
	BCE-9	10/30/09	13:00	0.041	2.4	5.4	18	3.6	<1.0	3.4	**	**	**	**	**
	BCE-10	10/30/09	11:30	0.086	<1.0	1.5	4.9	5.3	5.1	3.5	**	**	**	**	**
	BC-2	10/29/09	11:59	**	<0.5	<0.5	0.4 LJ	2.9	3.7	**	19.12	0.35	9.29	-175.6	2.22
	BC-3	10/29/09	11:29	**	<0.5	0.16 LJ	2	11	16	**	19.45	0.38	9.27	-187	1.82
	BC-4	10/29/09	10:55	**	0.48 LJ	1.9	35	32	16	**	18.2	0.48	8.71	-173.4	2.18
	BC-5	10/27/09	11:51	**	<0.5	0.45 LJ	19	7.9	<0.5	**	17.53	0.36	8.04	-189	3.03
	BC-6	10/27/09	11:07	**	<0.5	0.69	0.59	<0.5	<0.5	**	16.3	0.46	8.03	-148.1	2.33
June/September 2010	**BCE-3**	9/7/2010	11:10	**	<1.0	<1.0	<1.0	2.0	2.4	3.0	21.16	0.13	7.13	8.4	2.74
	BCE-5	9/7/2010	11:00	**	4.3	10	10	11	6.1	4.1	20.27	0.22	7.42	22.9	2.44
	BCE-7	9/7/2010	11:05	**	<1.0	<1.0	21.0	17.0	27.0	4.3	19.71	0.13	7.40	-61.7	2.53
	BCE-9	9/7/2010	10:50	**	2.0	4.8	15	3.4	<1.0	3.3	16.82	0.17	7.30	30.1	2.59
	BCE-10	9/7/2010	12:35	**	<1.0	1.1	6.1	7.0	9.5	3.1	16.54	0.16	7.31	-30.2	2.43
	BC-2	6/14/2010	14:53	**	<0.5	0.09 LJ	8	9.8	10	**	16.75	0.55	6.80	-171.6	1.66

Table C-6 – Biocurtain Groundwater Sampling Analytical Results

Biocurtain Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
	BC-3	6/14/2010	15:16	**	<0.5	0.38 LJ	1	9.4	16	**	16.54	0.51	6.84	-153.6	1.66
	BC-4	6/9/2010	11:15	**	<0.5	0.19 LJ	9	8.9	8.7	**	15.77	0.53	7.14	-197	1.41
	BC-5	6/9/2010	10:38	**	<0.5	1.6	12	7.3	5.9	**	14.32	1.12	6.61	-193.4	1.66
	BC-6	6/9/2010	10:28	**	0.1 LJ	0.8	1.9	1.0	<0.5	**	13.02	0.65	7.18	-170	1.15
January/February 2011	**BCE-3**	2/10/2011	11:50	0.061	<1.0	<1.0	<1.0	1.6	3.3	4.2	16.02	0.21	7.39	-139	1.53
	BCE-5	2/15/2011	14:00	0.071	<1.0	<1.0	2.8	5.6	4.6	6.7	15.71	0.06	7.41	-153.4	1.65
	BCE-7	2/10/2011	14:00	0.440	<1.0	2.3	6.4	7.2	7.2	6.8	16.16	0.04	7.65	-133	2.13
	BCE-9	2/10/2011	14:40	1.100	1.5	4.4	19	3.2	<1.0	4.2	13.95	0.02	7.53	-49	1.96
	BCE-10	2/10/2011	15:20	0.100	<1.0	<1.0	4.2	<1.0	<1.0	7.5	13.56	0.03	7.52	-62	2.48
	BC-2	1/27/2011	13:09	**	<1.0	<1.0	1.8	5.4	15.1	**	14.48	0.18	7.21	-95.8	1.49
	BC-3	2/7/2011	11:03	**	<1.0	<1.0	<1.0	7.5	14.4	**	15.36	0.60	6.80	-31.7	1.47
	BC-4	1/26/2011	15:32	**	<1.0	<1.0	3.6	9	20.4	**	15.16	1.52	6.80	-75.6	1.80
	BC-5	1/26/2011	11:20	**	<1.0	<1.0	5.7	7.2	13.9	**	16.05	0.64	6.71	-87	1.53
	BC-6	1/26/201	10:55	**	<1.0	<1.0	1.4	<1.0	<1.0	**	13.18	-	7.18	-46.9	1.92
June/Aug 2011	**BCE-3**	6/3/2011	11:15	1.400	<1.0	<1.0	<1.0	2.9	1.9	3.5	19.24	0.12	7.76	-118.5	2.07
	BCE-5	6/7/2011	16:15	0.310	4.5	5.8	5	8.2	3.4	3.8	18.72	0.30	7.65	-57.9	2.11
	BCE-7	6/7/2011	13:55	1.800	<1.0	<1.0	3	15	15	5.6	18.23	0.06	7.73	-107.5	2.21
	BCE-9	6/3/2011	11:25	0.200	1.6	5.3	24	5.3	2.2	3.2	14.70	0.12	7.62	-67.9	2.08
	BCE-10	6/3/2011	11:45	0.066	<1.0	1	4.8	3.1	<1.0	3.4	14.56	0.08	7.66	-90.4	2.03
	BC-2	8/22/2011	15:25	**	<5.0	2.0 LJ	9.6	14	13	**	22.33	0.16	6.59	-12	1.61
	BC-3	8/24/2011	15:10	**	<5.0	<5.0	1.2 LJ	9	8.8	**	21.62	0.11	6.35	27.4	1.62
	BC-4	8/30/2011	14:30	**	<5.0	<5.0	2.7 LJ	14	19	**	19.56	0.11	7.01	-141.5	1.71
	BC-5	8/31/2011	11:50	**	<5.0	<5.0	7.4	8.3	11	**	19.24	0.70	7.14	-84.8	1.93
	BC-6	8/30/2011	10:15	**	<5.0	<5.0	1.4 LJ	<5.0	<5.0	**	16.85	0.19	7.25	-37.4	1.87
September 2012	**BCE-3**	9/17/2012	10:30	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	20.9	0.45	7	135	1.54
	BCE-5	9/17/2012	11:01	**	4.5	5.1	6.1	11	4.4	**	23	1.7	6.9	102	1.66
	BCE-7	9/17/2012	11:08	**	<1.0	<1.0	11	9.8	16	**	21.3	0.95	7	155	1.69
	BCE-9	9/17/2012	11:25	**	2.6	3.7	15	2.2	1.2	**	19	2.5	7.1	117	1.94

Table C-6 – Biocurtain Groundwater Sampling Analytical Results

Biocurtain Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
	BCE-10	9/17/2012	11:34	**	<1.0	1.1	5.9	2.2	<1.0	**	18.4	0.47	7.1	89	1.89
	BC-2	9/17/2012	13:30	**	<1.0	<1.0	<1.0	<1.0	<1.0	**	21.72	0.98	6.9	-113	1.72
	BC-3	9/14/2012	10:43	**	<1.0	<1.0	2.9	8	3.9	**	20.9	0.3	7	145	1.65
	BC-4	9/17/2012	13:10	**	<1.0	<1.0	17	7.1	6.6	**	20.2	0.22	6.9	125.2	2.12
	BC-5	9/14/2012	12:30	**	<1.0	<1.0	13	2.4	3.3	**	17.7	0.97	7	110.8	1.17
	BC-6	9/14/2012	14:00	**	<1.0	6.6	6.8	<1.0	<1.0	**	17.6	0.21	7	-78.3	2.56
	BC-7S	9/17/2012	15:20	**	1.4	5.6	32	5.1	3.8	3.1	17.9	0.56	7	23	1.97
	BC-7D	9/17/2012	15:22	**	<1.0	4.2	29	6.2	1.3	3.1	17	0.24	7.2	-155.7	1.88
May 2013	**BCE-3**	5/6/2013	17:03	**	<1.0	<1.0	<1.0	<1.0	<1.0	4900.0	16.7	0.1	5.3	68	3.15
	BCE-5	5/6/2013	13:24	**	<1.0	3.1	3.8	3.2	<1.0	2700.0	16.9	0.26	5.2	33	2.2
	BCE-7	5/7/2013	10:21	**	<1.0	1.8	13	6.1	6.4	2800.0	17.1	0.01	5.4	-102	2.5
	BCE-9	5/6/2013	11:27	**	<1.0	1.2	3.2	<1.0	<1.0	2200.0	15.1	0.07	5.6	68	2
	BCE-10	5/7/2013	11:48	**	<1.0	<1.0	<1.0	<1.0	<1.0	3200.0	14.8	0.01	5.6	-83	2.5
	BC-2	5/6/2013	14:07	**	<1.0	<1.0	1.9	3	<1.0	5.3	15.4	0.01	6.8	197	1.67
	BC-3	5/3/2013	13:09	**	<1.0	<1.0	<1.0	6.4	<1.0	50.0	15.8	0.02	6.5	171	1.97
	BC-4	5/6/2013	13:00	**	<1.0	<1.0	19	5	7	3.1	15	0.01	6.8	98	1.82
	BC-5	5/3/2013	10:34	**	<1.0	1	4.4	1.6	<1.0	130.0	13.2	0.02	6.5	303	2.17
	BC-6	5/3/2013	10:48	**	6.8	14	8.2	<1.0	<1.0	**	14	0.3	7.2	77	1.5
	BC-7S	5/3/2013	11:45	**	<1.0	4.3	19	3.8	1.5	3.1	13.8	0.17	7	81	2
	BC-7D	5/3/2013	11:48	**	<1.0	2.1	17	4.3	<1.0	2.9	14.5	0.02	7.2	141	1.98
June 2014	**BCE-3**	Not sampled		**	**	**	**	**	**	**	**	**	**	**	**
	BCE-5	6/4/2014	19:15	**	<1.0	<1.0	1.9	6.2	1.2	200.0	17.2	9.4	6.4	-102	1.99
	BCE-7	6/4/2014	17:10	**	<1.0	<1.0	6.5	3.9	4.5	15.0	16.9	**	6.9	-185	1.7
	BCE-9	6/4/2014	16:47	**	<1.0	<1.0	3.7	1.1	<1.0	15.0	13.5	23.6	6.6	-271	1.64
	BCE-10	Not sampled		**	**	**	**	**	**	**	**	**	**	**	**
	BC-2	6/16/2014	12:35	**	<1.0	<1.0	7.6	5.2	<1.0	**	19.31	??	7.03	-97	1.55
	BC-3	6/12/2014	11:55	**	<1.0	<1.0	2.1	14.1	3.6	**	17.4	3.22	7.02	-127	1.37
	BC-4	6/4/2014	13:56	**	<1.0	<1.0	22	4.4	6.5	2.9	16.8	37	7	-113	1.7

Table C-6 – Biocurtain Groundwater Sampling Analytical Results

Biocurtain Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
	BC-5	6/4/2014	14:45	**	<1.0	<1.0	2.8	1.1	<1.0	3.7	13.7	9.6	6.6	-97	1.96
	BC-6	6/4/2014	12:35	**	20	38	12	2.1	<1.0	2.9	14.3	5.5	6.9	5.2	1.65
	BC-7S	6/18/2014	11:34	**	<1.0	2.7	14.2	3.2	<1.0	**	16	0.47	7.1	16	1.57
	BC-7D	6/17/2014	16:06	**	<1.0	1.6	15.2	3.6	<1.0	**	14.9	0.24	7.34	-130	1.49
June 2015	**BCE-3**	Not sampled		**	**	**	**	**	**	**	**	**	**	**	**
	BCE-5	6/4/2015	9:52	**	<1.0	<1.0	2	3.1	1.2	36.0	16.8	0	6.3	-87	1.191
	BCE-7	6/4/2015	10:12	**	<1.0	<1.0	7.9	1.6	2.5	4.6	19.3	1.1	5.6	352	2.239
	BCE-9	6/4/2015	12:14	**	<1.0	<1.0	3.7	<1.0	<1.0	5.7	13.4	-0.1	6.7	-103	1.744
	BCE-10	Not sampled		**	**	**	**	**	**	**	**	**	**	**	**
	BC-2	6/8/2015		**	<1.0	<1.0	14.7	10.6	3.1	5.3	17.35	2	6.99	-97.6	1.266
	BC-3	6/8/2015		**	<1.0	<1.0	2.2	7.2	4.6	50.0	16.9	0.24	7.07	-184.4	1.191
	BC-4	6/3/2015	17:12	ND	<1.0	<1.0	14	2.7	2.4	3.5	16.5	0.3	5.8	432	2.082
	BC-5	6/3/2015	15:50	ND	<1.0	<1.0	1.6	<1.0	<1.0	3.5	14.8	0.4	5.4	369	2.118
	BC-6	6/3/2015	15:45	ND	7.3	16	5.7	1	<1.0	2.6	14.7	0.04	6.6	15.7	1.532
	BC-7S	6/11/2015		**	<1.0	1.8	6.5	1.7	<1.0	3.1	15	0.49	7.32	-43	2.626
	BC-7D	6/11/2015		**	<1.0	1.7	16.3	5.1	<1.0	2.9	14.72	0.03	7.49	-94.9	1.656
June 2016	**BCE-3**	Not sampled		**	**	**	**	**	**	**	**	**	**	**	**
	BCE-5	9/14/2016		**	<1.0	<1.0	2.0	3.0	1.5	27.0	20.6	0.07	6.45	-109	1.404
	BCE-7	9/14/2016		**	<1.0	0.32 J	5.5	2.0	2.2	4.6	21.02	0.23	6.76	-106	1.924
	BCE-9	9/12/2016		**	<1.0	0.29 J	1.6	0.70 J	<1.0	4.1	14.99	0.53	6.8	-115	1.781
	BCE-10	Not sampled		**	**	**	**	**	**	**	**	**	**	**	**
	BC-2	6/9/2016		**	<0.5	<0.5	7.5	13.0	0.7	**	16.9	0.17	7.04	-101	1.288
	BC-3	6/13/2013		**	<0.5	<0.5	1.3	6.7	1.6	**	16.96	0.12	6.67	-101	1.258
	BC-4	9/13/2016		<1.0	0.24 J	0.84 J	9.2	2.0	1.4	3.6	19.44	32	6.73	15	2.036
	BC-5	9/12/2016		<1.0	<1.0	0.19 J	0.85 J	0.46	<1.0	2.8	17.05	2.49	6.83	-104	1.966
	BC-6	9/12/2016		<1.0	2.9	26	11	5.1	<1.0	2.9	15.53	0.48	6.89	-37.3	1.79
	BC-7S	6/21/2016		**	0.51 UMJ	1.8	6.7	2.2	<0.5	**	16.04	3.47	7.2	102	1.396

Table C-6 – Biocurtain Groundwater Sampling Analytical Results

Biocurtain Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
	BC-7D	6/21/2016		**	<0.5	1.4	9.7	3.5	0.19 LJ	**	15.32	0.24	7.27	-94	1.55
June 2017	**BCE-3**	Not sampled		**	**	**	**	**	**	**	**	**	**	**	**
	BCE-5	6/9/2017		**	<1.0	<1.0	1.4	2.9	1.2	30.0	17.28	0.1	6.88	-134	1.559
	BCE-7	6/9/2017		**	<1.0	0.54 J	6.1	1.8	1.2	3.7	17.1	0.22	7.04	-48	1.961
	BCE-9	6/6/2017		**	<1.0	0.42 J	2.8	0.75 J	0.38 J	3.8	14.83	0.48	7.14	-137	1.885
	BCE-10	Not sampled		**	**	**	**	**	**	**	**	**	**	**	**
	BC-2	6/12/2017		**	<1.0	<1.0	4.7	6.6	<1.0	**	18.37	0.31	6.84	-93	1.152
	BC-3	6/8/2017		**	<1.0	<1.0	<1.0	6.2	2.3	**	19	0.73	6.94	-120	1.198
	BC-4	6/9/2017		<13	<1.0	0.20 J	1.4	0.97 J	0.51 J	3.4	16.88	0.2	7.03	-108	1.923
	BC-5	6/6/2017		<13	<1.0	3.6	18.0	4.1	0.42 J	4.0	15.21	0.97	7.12	-115	2.294
	BC-6	6/6/2017		<13	4.1	57	31	11	0.37 J	3.4	15.14	0.65	7.17	-49	1.881
	BC-7S	6/15/2017		**	<1.0	<1.0	2.1	<1.0	<1.0	**	16.68	1.81	7.25	83	1.212
	BC-7D	6/15/2017		**	<1.0	<1.0	4.1	1.9	<1.0	**	15.63	0.28	7.48	-100	1.222
May 2018	**BC-2**	5/15/2018		**	<1.0	<1.0	5.2	1.7	<1.0	**	17.38	0.43	6.02	-59	1.429
	BC-3	5/22/2018		**	<1.0	<1.0	2.8	4.3	1.3	**	16.54	0.43	7.22	-97	1.095
	BC-4	5/15/2018		**	<1.0	<1.0	5	1.1	<1.0	**	17.42	0.3	6.32	39	1.748
	BC-5	5/24/2018		<13	<1.0	<1.0	<1.0	<1.0	<1.0	3	14.53	0.68	7.24	-106	1.326
	BC-6	5/24/2018		**	1.5	28.4	21.4	8.3	<1.0	**	16.24	0.55	7.31	64	1.226
	BC-7S	5/24/2018		**	<1.0	1.2	2.6	<1.0	<1.0	**	14.84	2.13	7.36	56	1.176
	BC-7D	5/24/2018		**	<1.0	<1.0	7.9	3.2	<1.0	**	15.01	0.88	7.47	115	1.239
May 2019	**BC-2**	5/13/2019		**	<1.0	<1.0	4	7.5	<1.0	**	15.89	0.29	7.17	-83	1.092
	BC-3	5/14/2019		**	<1.0	<1.0	2.8	6.6	1.7	**	15.5	0.56	7.13	-91	1.129
	BC-4	5/13/2019		**	<1.0	<1.0	1.6	1.9	<1.0	**	14.3	2.78	7.28	-11	1.221
	BC-5	5/22/2019		**	<1.0	<1.0	5.5	1.8	<1.0	**	14	1.67	7.42	-51.9	1.42
	BC-6	5/22/2019		**	1.2	85.7	58.7	24.3	<1.0	**	14.15	0.92	7.24	10.5	1.332
	BC-7S	5/22/2019		**	<1.0	1.1	1.8	<1.0	<1.0	**	14.65	1.67	7.09	33.3	1.136
	BC-7D	5/22/2019		**	<1.0	1	3.3	1.7	<1.0	**	14.88	1.29	7.45	-35.6	1.522

Notes:

Table C-6 – Biocurtain Groundwater Sampling Analytical Results

Biocurtain Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³

Remedial Goals are standards for groundwater as defined under 20.6.2.3103 NMAC New Mexico Water Quality Commission Regulations

** No data available

Table C-7 – Deep Zone Groundwater Sampling Analytical Results

Deep Zone Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
Baseline 2007	**M-15**	2/5/07	**	**	560	8.4	0.3	<5.0	<5.0	**	**	**	**	**	**
	DM-1 (D1)	2/7/07	**	**	120	8	<5.0	<5.0	<5.0	**	**	**	**	**	**
	DM-1 (D2)	2/7/07	**	**	77.7	4.4	0.37	<5.0	<5.0	**	**	**	**	**	**
	DM-2 (D1)	2/7/07	**	**	80	5.3	1	1.9	<5.0	**	**	**	**	**	**
	DM-2 (D2)	2/7/07	**	**	170	13	1.9	5.7	<5.0	**	**	**	**	**	**
	DM-2 (I1)	1/22/07	**	**	1.2	0.6	0.6	<0.5	<0.5	**	**	**	**	**	**
	M-09	2/5/07	**	**	750	9.2	0.61	0.57	<5.0	**	**	**	**	**	**
	M-20	2/7/07	**	**	120	7.3	0.45	0.28	<5.0	**	**	**	**	**	**
	R-09 (D2)	2/5/07	**	**	46	6	0.42	<5.0	<5.0	**	**	**	**	**	**
	R-21	2/6/07	**	**	530	10	0.34	<5.0	<5.0	**	**	**	**	**	**
July 2008 (60 Day)	**M-20**	7/28/08	11:40	**	**	**	**	**	**	2.0	**	**	**	**	**
	R-09 (D1)	7/25/08	10:25	**	<1.0	<1.0	5.9	<1.0	<1.0	710	18.22	0.04	7.34	-166.7	1.72
	R-15	7/28/08	15:15	**	20	1.9	<1.0	<1.0	<1.0	210	19.04	0.07	7.47	-223.0	1.16
	R-21	7/28/08	11:50	**	<1.0	2.1	2.5	<1.0	<1.0	200	18.06	0.05	7.16	-219.0	1.00
	DI-1 (I1)	7/23/08	14:00	**	<1.0	<1.0	<1.0	<1.0	<1.0	690	21.37	0.08	7.31	-135.2	1.59
	DI-2 (I1)	7/24/08	10:50	**	<1.0	<1.0	<1.0	<1.0	<1.0	330	17.33	0.08	6.25	-131.8	0.98
	DI-2 (D1)	7/24/08	13:40	**	<1.0	<1.0	<1.0	<1.0	<1.0	740	17.63	0.03	6.87	-114.0	1.56
	DI-2 (D2)	7/29/08	12:10	**	2.9	4.5	<1.0	<1.0	<1.0	43	19.30	0.06	7.75	-218.9	1.03
August 2008 (90 Day)	**M-09**	8/27/08	12:33	**	950	21	<5.0	<5.0	<5.0	1.8	17.86	0.58	8.15	-116.3	0.88
	M-15	8/27/08	14:20	**	370	7.5	<2.0	<2.0	<2.0	1.2	17.30	0.69	8.47	-117.0	0.72
	R-15	9/4/08	11:50	**	34	5.5	16	<1.0	<1.0	240	17.02	0.02	7.91	-145.3	1.23
	R-21	9/4/08	13:35	**	2.5	1.3	340	<1.0	1.5	140	17.94	0.01	7.60	-191.7	1.15
	R-09 (D1)	9/3/08	11:50	**	<1.0	<1.0	4.9	<1.0	<1.0	540	16.78	0.03	6.97	-68.0	1.73
	DI-1 (I1)	8/29/08	12:30	**	<1.0	<1.0	<1.0	<1.0	<1.0	660	16.83	0.07	7.31	-42.2	1.20
	DI-2 (I1)	9/2/08	11:40	**	<1.0	<1.0	<1.0	<1.0	<1.0	240	17.36	0.06	6.66	-75.0	1.18
	DI-2 (D1)	9/2/08	14:55	**	2.7	<1.0	1.2	<1.0	<1.0	770	17.63	0.04	6.04	-31.1	1.69
	DI-2 (D2)	9/3/08	15:10	**	56	4.8	5.1	<1.0	<1.0	69	17.22	0.03	6.84	-106.9	1.08

Table C-7 – Deep Zone Groundwater Sampling Analytical Results

Deep Zone Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
	DM-2 (D1)	8/28/08	13:35	**	130	4.1	<1.0	<1.0	<1.0	2.1	19.70	**	7.08	**	**
	DM-2 (D2)	8/26/08	14:45	**	190	12	<2.0	2.0	<2.0	2.0	**	**	**	**	**
November 2008 (120 Day)	**R-15**	11/11/08	14:50	0.055	4.3	2.2	46	<1.0	1.2	220	15.16	0.06	6.54	-179.0	1.36
	R-21	11/12/08	12:25	0.11	<5.0	5.1	440	<5.0	7.7	270	16.21	0.03	6.46	-129.5	1.54
	R-09 (D2)	11/14/08	13:48	0.024	39	6.7	<1.0	<1.0	<1.0	1.4	17.32	0.13	8.67	-28.6	0.79
	R-09 (D1)	11/11/08	11:50	0.076	<1.0	<1.0	12	<1.0	<1.0	980	17.57	0.06	6.43	-102.4	2.54
	DI-1 (I1)	11/7/08	12:55	0.052	<1.0	<1.0	<1.0	<1.0	<1.0	450	13.17	0.03	6.18	-86.1	1.40
	DI-2 (I1)	11/10/08	11:05	0.021	<1.0	<1.0	<1.0	<1.0	<1.0	270	15.64	0.03	6.37	-56.2	1.40
	DI-2 (D1)	11/10/08	16:00	0.13	<1.0	<1.0	46	<1.0	<1.0	920	14.91	0.04	6.56	-68.4	2.20
	DI-2 (D2)	11/12/08	15:10	0.12	<1.0	27	59	<1.0	1.2	93	10.29	0.03	6.63	-120.4	1.17
	DM-1 (I1)	11/10/08	14:57	0.020	12	1.3	1.3	<1.0	<1.0	1.7	16.41	0.11	7.11	-18.5	1.06
	DM-1 (D2)	11/7/08	13:15	0.012	62	4.3	<1.0	<1.0	<1.0	1.8	16.84	0.13	7.20	45.6	1.10
	DM-2 (I1)	11/10/08	12:42	0.046	1.2	<1.0	<1.0	<1.0	<1.0	1.9	16.24	0.51	7.17	-11.7	1.04
	DM-2 (D1)	11/25/08	11:58	0.015	72	4.3	<1.0	<1.0	<1.0	2.0	16.76	0.18	7.23	130.4	1.44
	DM-2 (D2)	11/10/08	12:51	0.015	300	16	<1.0	<1.0	<1.0	1.7	16.70	0.09	7.33	-4.2	1.08
March 2009	**M-09**	3/18/09	14:50	**	659	22.6	2.4	1.7	<1.0	3.9	**	**	**	**	**
	R-15	3/20/09	12:00	**	**	**	**	**	**	170	16.19	0.02	7.15	-80.2	1.34
	R-09 (D2)	3/19/09	12:05	**	54.8	7.0	<1.0	<1.0	<1.0	140	17.38	0.02	7.13	-88.2	2.49
	DI-2 (D1)	3/19/09	13:30	**	**	**	**	**	**	340	17.51	0.04	7.03	-60.5	1.07
	DI-2 (D2)	3/18/09	15:15	**	**	**	**	**	**	49	16.82	0.03	6.16	-35.4	1.22
	M-20	3/17/09	**	**	122	9.8	<1.0	<1.0	<1.0	**	**	**	**	**	**
July 2009	**M-20**	7/9/09	11:22	0.034	97	5.6	<1.0	<1.0	<1.0	2.5	**	**	**	**	**
	M-09	7/9/09	15:35	0.076	410	16	8.9	3.0	<1.0	4.5	**	**	**	**	**
	R-15	7/10/09	10:30	0.019	40	4.7	210	<1.0	1.3	75	**	**	**	**	**
	R-21	7/10/09	10:50	0.039	<1.0	2.0	190	<1.0	7.1	160	**	**	**	**	**
	R-09 (D2)	7/9/09	15:33	0.023	42	6.9	<1.0	<1.0	<1.0	1.8	**	**	**	**	**
	R-09 (D1)	7/10/09	12:45	0.024	<1.0	0.0	230	<1.0	3.4	150	**	**	**	**	**
	DI-1 (I1)	7/9/09	10:40	0.015	1	<1.0	<1.0	<1.0	<1.0	100	**	**	**	**	**

Table C-7 – Deep Zone Groundwater Sampling Analytical Results

Deep Zone Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
	DI-2 (I1)	7/9/09	11:55	0.023	<1.0	<1.0	2.3	2.4	<1.0	150	**	**	**	**	**
	DI-2 (D1)	7/9/09	15:30	0.037	7.7	1.4	11	5.2	<1.0	160	**	**	**	**	**
	DI-2 (D2)	7/13/09	12:55	0.079	8.6	6.8	15	5.2	2	21	**	**	**	**	**
	DM-1 (I1)	7/8/09	15:15	0.074	11	4.3	1.7	1.0	<1.0	8.1	**	**	**	**	**
	DM-1 (D1)	7/8/09	14:05	0.034	54	4.8	<1.0	1.9	<1.0	1.5	**	**	**	**	**
	DM-1 (D2)	7/8/09	11:40	0.015	71	4.3	<1.0	<1.0	<1.0	2.3	**	**	**	**	**
	DM-2 (I1)	7/7/09	12:20	0.061	1.2	<1.0	<1.0	<1.0	<1.0	2.4	**	**	**	**	**
	DM-2 (D1)	7/9/09	11:31	0.020	66	5.4	<1.0	<1.0	<1.0	2.5	**	**	**	**	**
	DM-2 (D2)	7/7/09	14:20	0.028	140	7.7	<1.0	1.1	<1.0	2.2	**	**	**	**	**
November 2009	**DI-1 (I1)**	11/6/09	10:15	**	<1.0	<1.0	<1.0	<1.0	<1.0	1200	**	**	**	**	**
	DI-2 (I1)	11/9/09	11:25	**	<1.0	<1.0	1.2	1.0	<1.0	130	**	**	**	**	**
	R-21	9/16/10	10:40	0.370	8.7	74	12	<1.0	52	16	17.08	1.19	6.97	-236.4	1.62
	DI-2 (I1)	9/16/10	11:35	0.062	9.9	2.6	2.3	3.6	<1.0	77	17.28	0.35	6.89	-154.8	1.75
	DI-1 (I1)	9/16/10	13:00	0.027	<1.0	<1.0	<1.0	<1.0	<1.0	69	17.11	0.13	6.55	-152.4	2.15
September 2010	**DI-2 (D2)**	9/14/10	10:25	0.047	16	7.0	2.5	19	5.5	2.6	16.91	0.61	7.62	-195.1	1.85
	R-09	9/14/10	12:40	0.160	2.3	<1.0	1.3	<1.0	51	59	22.17	0.09	6.56	-139.7	3.42
	DI-2 (D1)	9/13/10	14:50	0.025	<1.0	<1.0	1.5	3.9	<1.0	18	17.48	0.27	6.59	-102.8	2.12
	R-15	9/14/10	12:40	0.024	19	18	86	<1.0	1.4	17	16.35	0.95	6.75	-164.1	1.51
	R-09(D1)	9/10/2012	16:00	**	<1.0	<1.0	0.85	2.3	0.86	15	17.72	0.15	6.01	-136.6	1.556
	M-09	9/12/2012	13:20	**	730	43	5.4	8.9	<1.0	**	17.2	0.05	8	-217.3	1.05
	R-09(D2)	9/12/2012	11:25	**	47	6.7	<1.0	<1.0	<1.0	**	17.1	0.06	8.6	12	0.86
	M-15	9/13/2012	11:37	**	310	20	2.8	1.7	<1.0	**	16.4	0.08	8.3	207	0.99
September 2012	**R-21**	9/11/2012	11:07	**	<1.0	2	3.1	2.2	4.4	38	17.18	0.03	6.38	-162.6	1.269
	M-21	9/13/2012	12:43	**	3.3	<1.0	2.8	<1.0	<1.0	**	18.1	0.09	8.6	-145.3	0.62
	DI-1(D1)	9/11/2012	12:00	**	60	3.7	2.9	<1.0	<1.0	2.3	17.2	0.4	7.7	16.6	1.29
	DM-1(D1)	9/12/2012	16:59	**	40	3	<1.0	<1.0	<1.0	**	17.2	0.07	8.6	45.5	0.69
	DM-1(D2)	9/10/2012	14:30	**	59	3.8	3	<1.0	<1.0	**	17.4	0.04	6.9	73.6	1.26
	DM-2(D1)	9/10/2012	14:27	**	59	6.7	17	5.6	<1.0	**	17.34	0.5	7.72	-79.9	1.15

Table C-7 – Deep Zone Groundwater Sampling Analytical Results

Deep Zone Sampling Results				Laboratory Data								Field Data				
					Volatiles						TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
	DM-2(D2)	9/12/2012	17:15	**	120	5.6	2.8	<1.0	<1.0	**	17.2	0.13	7.3	0.5	1.32
May 2013	**M-09**	4/30/2013	17:14	**	460	58	16	<5.0	<5.0	**	17.6	0.24	7	274	1.07
	R-09(D2)	4/30/2013	17:50	**	42	6.3	<1.0	<1.0	<1.0	**	17.2	0.04	8.5	93	0.88
	M-15	4/30/2013	11:25	**	230	21	<5.0	<5.0	<5.0	**	16.5	0.13	8.1	144	1.06
	M-21	4/30/2013	12:39	**	2	1.1	<1.0	<1.0	<1.0	**	18.4	0.05	8.7	2.4	0.61
	DM-1(D1)	4/29/2013	16:20	**	39	3	<1.0	<1.0	<1.0	**	17.4	0.11	8.8	130	0.67
	DM-1(D2)	4/29/2013	13:25	**	52	3.1	<1.0	<1.0	<1.0	**	17.4	0.17	7.5	123	1.27
	DM-2(D1)	4/29/2013	12:54	**	46	6.5	6.3	6.9	<1.0	**	17.3	0.05	7.3	-69.1	1.29
	DM-2(D2)	4/29/2013	17:57	**	98	4.6	<1.0	<1.0	<1.0	**	17.4	0.08	7.4	109	1.25
June 2014	**R-09(D1)**	6/3/2014	13:45	<13	<1.0	<1.0	5.2	<1.0	1.1	3300	19.4	12.7	5.7	-127	4.9
	M-09	6/3/2014	16:25	<13	540	50	15	3.7	3.2	4.8	17.3	6.1	7.7	-113	1.1
	R-09(D2)	6/19/2014	13:50	**	51.3	7.3	<1.0	<1.0	<1.0	**	18.66	0.15	8.79	-165	0.75
	M-15	6/23/2014	13:30	**	220	19.3	<1.0	1.2	<1.0	**	16.4	0.7	8.2	-162	1
	M-20	6/23/2014	15:04	**	74.4	4.4	<1.0	<1.0	<1.0	**	17.9	0.69	7.1	57	1.4
	R-21	6/3/2014	18:38	<13	<5.0	<5.0	74	<5.0	8.5	10,000	18.1	108	4.8	-64	7.9
	M-21	Not sampled		**	**	**	**	**	**	**	**	**	**	**	**
	DI-1(D1)	6/2/2014	14:10	<13	3.6	2.2	64	1.2	2.3	5500	17	0.3	4.8	68	0.3
	DM-1(D1)	6/2/2014	17:23	<13	120	9	<1.0	<1.0	<1.0	1.4	17.2	0.9	7.9	68	0.52
	DM-1(D2)	6/3/2014	11:42	<13	47	2.8	<1.0	<1.0	<1.0	**	17.3	0.07	6.9	107	1.3
	DM-2(D1)	6/18/2014	15:44	**	40.2	7	8.4	9.4	<1.0	**	17.4	1.82	7.1	-75	1.45
	DM-2(D2)	6/18/2014	13:15	**	94.4	4.3	<1.0	<1.0	<1.0	**	17.5	5	7.4	46	1.41
	DI-2(D2)	6/2/2014	16:30	<13	<1.0	<1.0	1.4	4.6	<1.0	440	17.9	0.32	6.3	-47	0.15
June 2015	**R-09(D1)**	6/2/2015	17:30	1.3	<1.0	<1.0	2.6	<1.0	1.3	590	17.6	1.4	5.3	78	3.511
	M-09	6/2/2015	16:40	5.6	480	53	23	5	4	3.9	18	0	7.8	-106	1.066
	R-09(D2)	6/11/2015		**	56.3	8.6	<1.0	<1.0	<1.0	**	17.54	0.4	8.65	-66.7	0.742
	M-15	6/15/2015		**	227	15	6.3	1.3	<1.0	**	17.03	0.09	8.12	-162.1	0.877
	M-20	6/10/2015	15:04	**	62.7	4.2	<1.0	<1.0	<1.0	**	17.9	0.16	6.9	56.2	1.34

Table C-7 – Deep Zone Groundwater Sampling Analytical Results

Deep Zone Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
	R-21	6/2/2015	11:58	<1.0	<1.0	<1.0	20	<1.0	<1.0	2,100	17.3	1.78	5.3	-92	5.32
	M-21	Not sampled		**	**	**	**	**	**	**	**	**	**	**	**
	DI-1(D1)	6/1/2015	13:15	<1.0	<1.0	<1.0	32	<1.0	1.4	900	17.6	0.19	6.1	-105	2.194
	DM-1(D1)	6/1/2015		<1.0	140	11	<1.0	<1.0	<1.0	1.1	17.5	0	8.1	-68	0.76
	DM-1(D2)	6/1/2015		**	43	2.6	<1.0	<1.0	<1.0	**	17.6	0.14	6.9	-182	1.121
	DM-2(D1)	6/10/2015		**	42.2	7.5	10.0	12.2	<1.0	**	**	**	**	**	**
	DM-2(D2)	6/10/2015		**	91.1	4.8	<1.0	<1.0	<1.0	**	**	**	**	**	**
	DI-2(D2)	6/1/2015	14:20	<1.0	<1.0	<1.0	1.4	15	1.5	40	17.4	0.15	5.9	-219	1.087
June 2016	**R-09(D1)**	9/9/2016		<1.0	<1.0	<1.0	0.36	1.3	0.78	360	19.09	0.05	6.87	-144	3.022
	M-09	9/9/2016		1.7	220	30	5.6	2.7	1.5	8.9	17.9	0.08	8.19	-175	0.79
	R-09(D2)	9/9/2016		**	50	6.4	0.35	<1.0	<1.0	**	17.6	0.11	8.66	-135	0.894
	M-15	6/15/2016		**	190	11	9.1	<5.0	<5.0	**	17.68	0.12	8.12	-180	0.848
	M-20	6/14/2016		**	85	3.9	<5.0	<5.0	<5.0	**	18.32	0.19	7.2	69.9	1.125
	R-21	9/8/2016		<1.0	0.21	0.81	15	6.7	6.1	1400	17.87	0.03	5.97	-108.3	2.603
	M-21	Not sampled		**	**	**	**	**	**	**	**	**	**	**	**
	DI-1(D1)	9/8/2016		<1.0	<1.0	0.28	13	2.4	4.9	360	17.59	0.03	6.11	-127	2.074
	DM-1(D1)	9/8/2016		<1.0	120	12	0.65	1.4	<1.0	1.1	17.68	0.08	7.84	-90	0.891
	DM-1(D2)	9/7/2016		**	43	2.5	0.25	<1.0	<1.0	**	17.31	0.11	6.98	18.1	1.288
	DM-2(D1)	6/13/2016		**	36	6	14	1	<5.0	**	18.85	0.15	6.99	-49.4	1.18
	DM-2(D2)	6/15/2016		**	87	4.6	<5.0	<5.0	<5.0	**	18.13	0.16	7.38	97.7	1.129
	DI-2(D2)	9/8/2016		<1.0	<1.0	0.21	1	15	1.8	14	18.26	0.05	7.01	-144	1.087
June 2017	**R-09(D1)**	6/6/2017		<13	<1.0	<1.0	56	19	12	230	17.88	0.25	6.18	-157	1.963
	M-09	6/8/2017		<13	400	43	4.3	1.6	0.99 J	5.2	17.2	0.2	8.12	-173	0.938
	R-09(D2)	6/8/2017		**	58	6.8	0.42 J	0.22 J	<1.0	**	17.75	0.12	8.74	-78	0.882
	M-15	6/22/2017		**	162	9.3	6.1	<1.0	<1.0	**	17.27	0.29	8.16	-219	0.834
	M-20	6/19/2017		**	65	3.4	<1.0	<1.0	<1.0	**	19.66	0.2	7.82	95	1.136
	R-21	6/8/2017		<13	<1.0	0.46 J	11	7.2	7.1	570	17.55	0.11	6.24	-126	1.948
	M-21	Not sampled		**	**	**	**	**	**	**	**	**	**	**	**

Table C-7 – Deep Zone Groundwater Sampling Analytical Results

Deep Zone Sampling Results				Laboratory Data								Field Data				
					Volatiles						TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
	DI-1(D1)	6/7/2017		<13	<1.0	<1.0	10	2.3	3	230	17.02	0.32	6	-106	1.488
	DM-1(D1)	6/7/2017		<13	130	14	0.73 J	1.2	<1.0	1.5	17.27	0.37	8.32	-21	0.893
	DM-1(D2)	6/7/2017		**	42	2.4	0.36 J	<1.0	<1.0	**	17.81	0.26	7.2	-40	1.315
	DM-2(D1)	6/13/2017		**	24.4	5	11.2	9.3	<1.0	**	19	0.14	7.48	-63	1.153
	DM-2(D2)	6/21/2017		**	70.8	3.4	<1.0	<1.0	<1.0	**	18.64	0.28	7.39	-176	1.102
	DI-2(D2)	6/7/2017		<13	<1.0	<1.0	1.4	16	1.6	5.7	17.32	0.21	7.34	-266	1.316
May 2018	**R-09(D1)**	NS		**	NS	NS	NS	NS	NS	**	NS	NS	NS	NS	NS
	M-09	5/17/2018		**	432	53.4	8.1	1.3	1.3	4.6	18.49	0.17	7.75	-221	0.81
	R-09(D2)	5/17/2018		<13	57.7	7.3	<1.0	<1.0	<1.0	1.2	17.26	0.12	8.45	22	0.717
	M-15	5/23/2018		**	202	8.6	4.5	<1.0	<1.0	**	16.41	0.12	7.93	-178	0.773
	M-20	5/15/2018		**	62	3	<1.0	<1.0	<1.0	**	17.82	0.18	7.07	163	1.064
	R-21	NS		**	NS	NS	NS	NS	NS	**	NS	NS	NS	NS	NS
	M-21	NS		**	NS	NS	NS	NS	NS	**	NS	NS	NS	NS	NS
	DI-1(D1)	NS		**	NS	NS	NS	NS	NS	**	NS	NS	NS	NS	NS
	DM-1(D1)	5/23/2018		<13	163	14.8	1.7	2.5	<1.0	1	17.65	0.14	8.07	-132	0.809
	DM-1(D2)	5/21/2018		**	44.6	2.6	1.2	<1.0	<1.0	**	18.3	0.29	7.08	-123	1.207
	DM-2(D1)	5/21/2018		<13	22.6	4.8	13.4	12.7	<1.0	1.7	12.5	0.09	6.83	-157	1.3
	DM-2(D2)	5/22/2018		<13	80.7	3.8	<1.0	<1.0	<1.0	1.9	17.54	0.15	7.28	74	1.3
	DI-2(D2)	NS		**	NS	NS	NS	NS	NS	**	NS	NS	NS	NS	NS
2019	**R-09(D1)**	NS		**	NS	NS	NS	NS	NS	**	NS	NS	NS	NS	NS
	M-09	9/18/2019		**	310	12	<0.30	<0.30	<0.35	**	17.6	0.74	7.64	-234	0.62
	R-09(D2)	5/21/2019		**	63.9	7.8	<1.0	<1.0	<1.0	**	15.52	0.25	8.54	45	0.66
	M-15	5/23/2019		**	172	8.8	5	<1.0	<1.0	**	16	0.04	8.21	-172	0.77
	M-20	5/13/2019		**	66.6	3.3	<1.0	<1.0	<1.0	**	18.4	0.08	7.35	97	1.54
	R-21	NS		**	NS	NS	NS	NS	NS	**	NS	NS	NS	NS	NS
	M-21	NS		**	NS	NS	NS	NS	NS	**	NS	NS	NS	NS	NS
	DI-1(D1)	NS		**	NS	NS	NS	NS	NS	**	NS	NS	NS	NS	NS
	DM-1(D1)	5/20/2019		**	132	16.6	3.6	4.6	<1.0	**	17	0.04	8.42	-164	0.77
	DM-1(D2)	5/21/2019		**	46.7	2.7	<1.0	<1.0	<1.0	**	15.77	0.28	7.05	6	0.989

Table C-7 – Deep Zone Groundwater Sampling Analytical Results

Deep Zone Sampling Results				Laboratory Data							Field Data				
					Volatiles					TOC	YSI Readings				
				Ethene	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	Total Organic Carbon	Temperature	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Conductivity
Remedial Goals:					**5 µg/L**	**5 µg/L**	**70 µg/L**	**100 µg/L**	**2 µg/L**						
Event	Well	Date	Time	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	°C	mg/L			ms/cm³
	DM-2(D1)	5/20/2019		**	22	4.5	13.4	15.5	<1.0	**	15.64	0.18	6.99	-145	1.014
	DM-2(D2)	5/20/2019		**	85.3	3.8	<1.0	<1.0	<1.0	**	16.18	0.3	7.3	96	0.999
	DI-2(D2)	NS		**	NS	NS	NS	NS	NS	**	NS	NS	NS	NS	NS

Notes:
Remedial Goals are standards for groundwater as defined under 20.6.2.3103 NMAC New Mexico Water Quality Commission Regulations

** No data available

Table C-8 - Historical Groundwater Analytical Results (2010-2019) – Dissolved Metals					
Sample Location	**Lab ID#**	**Date Sampled**	**Fe (ug/L)**	**Mn (ug/L)**	**As (ug/L)**
MCLs			1,000	200	10.0
Shallow Aquifer					
R-01(S2)		6/8/2010	25.0 U	**419**	2.5
		8/22/2011	302	**475**	3.1
		3/21/2012	100 U	196	4.5
		4/24/2013	25.0 U	**227**	2.9
		6/11/2014	25.0 U	**314**	2.0
	1506005-06	6/2/2015	25.0 U	**248**	3.0
	MF1C01 / H3482-01	6/7/2016	20.3 LJ	186	3.0
		6/7/2017	25 U	**242**	5.0 U
		4/30/2018	100 U	164	2.3 LJ
	R-110 (Dup)	4/30/2018	100 U	163	2.8 LJ
		5/6/2019	25 U	119	3.3
EWMW-2		6/8/2010	**29,200**	**5,680**	**11.0**
		8/24/2011	**12,700**	**2,530**	6.7
		3/21/2012	**11,600**	**2,420**	8.6
		4/24/2013	**6,870**	**1,460**	3.7
		6/11/2014	**8,060**	**1,560**	3.0
	1506005-01	6/1/2015	**7,790**	**1,610**	3.5
	MF1C02 / H3482-08	6/9/2016	**5,980**	**1,520**	3.0
		6/7/2017	**3,200**	**1,300**	<5.0
		4/30/2018	**13,000**	**2,330**	10.0 U
		5/6/2019	**7,920**	**1,890**	2.5 U
R-24-(S2)		6/8/2010	**NS**	**NS**	**NS**
		8/29/2011	**8,500**	**3,100**	3.7
		3/28/2012	**14,700**	**3,800**	1.9
		4/30/2013	**10,800**	**3,570**	1.3
		6/12/2014	**9,660**	**3,820**	2.0 U
	1506005-08	6/2/2015	**4,530**	**2,730**	2.0 U
	1506005-11 Dup	6/2/2015	**3,560**	**2,710**	2.0 U
	MF1C14 / H3482-05	6/7/2016	**4,660**	**2,870**	2.0 U
	MF1C56 / R-60DM Dup	6/7/2016	**4,720**	**2,830**	0.77 LJ
		6/14/2017	**3,120**	**2,160**	5.0 U
	R-61DM (Dup)	6/14/2017	**3,360**	**2,090**	5.0 U
		5/3/2018	**2,400**	**1,990**	10.0 U
		5/7/2019	**2,450**	**2,140**	2.5 U
R-25(S2)		6/15/2010	**4,370**	**3,470**	**20.2**
		8/29/2011	**NS**	**NS**	**NS**
		3/29/2012	**7,090**	**3,600 J**	**17.2**
	Dup R-61 DM	3/29/2012	**7,080**	**3,670**	**17.1**
		4/30/2013	**6,010**	**3,190**	**12.6**
		6/12/2014	**NS**	**NS**	NS
	1506005-09	6/2/2015	681	**1,260**	2.4
	MF1C73 / H3610-07	6/13/2016	412	**1,310**	3.5
		6/13/2017	456	**1,470**	5.3

Table C-8 - Historical Groundwater Analytical Results (2010-2019) – Dissolved Metals					
Sample Location	**Lab ID#**	**Date Sampled**	**Fe (ug/L)**	**Mn (ug/L)**	**As (ug/L)**
		5/3/2018	539	**846**	3.5 LJ
EX-13		6/15/2010	**2,380**	**1,910**	**11.2**
		8/24/2011	**3,340**	**2,210**	**14.7**
	Dup R-60DM	8/24/2011	**3,330**	**2,200**	**13.9**
		3/22/2012	**3,710**	**2,470**	**14.2**
	Dup R-60 DM	3/22/2012	**3,730**	**2,400**	**14.2**
		4/25/2013	**3,040**	**2,050**	**11.7**
		6/12/2014	**4,640**	**2,790**	**14.3**
	Dup R-60 DM 06-2014	6/12/2014	**4,620**	**2,830**	**15.4**
	1506005-03	6/2/2015	**4,060**	**2,790**	**13.1**
	MF1C03 / H3610-01	6/13/2016	**3,130**	**2,270**	**13.8**
		6/7/2017	**1,750**	**1,710**	8.0
		5/3/2018	**1,980**	**1,730**	**11.0**
		5/7/2019	**1,990**	**1,920**	**11.4**
	R-101 (Dup)	5/7/2019	**2,070**	**2,010**	**12.6**
R-04(S2)		6/16/2010	**1,690**	**1,710**	6.7
		8/22/2011	**2,580**	**2,180**	**10.4**
		3/27/2012	**2,890**	**2,530 J**	9.6
		4/23/2013	**1,500**	**2,150**	3.6
	Dup R-61DM	4/23/2013	**1,430**	**2,160**	3.5
		6/16/2014	**1,770**	**1,260**	2.3
	1506018-07	6/8/2015	968	**1,010**	2.0 U
	MF1C04 / H3482-09	6/9/2016	603	**1,050**	1.2
		6/12/2017	589	**1,190**	5.0 U
		5/15/2018	154	**731**	10.0 U
		5/8/2019	208	**665**	2.5 U
BC-2		6/14/2010	**1,870**	**2,670**	4.7
		8/22/2011	**1,890**	**2,030**	5.1
		6/16/2014	**3,400**	**2,610**	2.0 U
	1506014-01	6/8/2015	**3,710**	**2,050**	2.0 U
	MF1C00 / H3482-07	6/9/2016	**4,210**	**2,120**	0.56 LJ
		6/12/2017	**2,540**	**1,650**	5.0 U
		5/16/2018	**3,770**	**1,760**	10.0 U
		5/13/2019	**1,580**	**1,640**	2.5 U
BC-5		6/9/2010	**1,970**	**1,620**	7.0
	Dup R-90DM	6/9/2010	**2,000**	**1,620**	6.9
		6/4/2014	**3,200**	**2,300**	20.0 U
	BC-5 Hall	6/3/2015	**4,100**	**2,400**	5.2
	1609789-11C	9/12/2016	**3,600**	**1,600**	3.4
		6/6/2017	**4,400**	**1,700**	2.4
		5/24/2018	**3,330**	**2,490**	10.0 U
		5/22/2019	**2,500**	**2,150**	2.5 U
R-05(S2)		6/9/2010	30	**873**	2.0 U
		8/30/2011	317	**1,040**	2.1
		3/26/2012	100 U	**1,490 J**	2.4

Table C-8 - Historical Groundwater Analytical Results (2010-2019) – Dissolved Metals					
Sample Location	**Lab ID#**	**Date Sampled**	**Fe (ug/L)**	**Mn (ug/L)**	**As (ug/L)**
		4/23/2013	25.0 U	**1,340 J**	1.1
		6/17/2014	25.0 U	**2,070**	2.0 U
	Dup R-61DM	6/17/2014	25.0 U	**2,010**	2.0 U
	1506022-07	6/10/2015	75	**3,590**	3.2
	MF1C05 / H3755-01	6/21/2016	74	**6,350**	1.8
	MF1C57 /Dup R-61DM	6/21/2016	71	**6,310**	1.7
		6/15/2017	80	**3,700**	5.0 U
		5/24/2018	115	**3,200**	10.0 U
		5/22/2019	157	**2,450**	2.9
Intermediate Aquifer					
R-01(I2)		3/21/2012	100 U	0.72 LJ	8.7
R-01(I2)	1506011-02	6/3/2015	100 U	0.72 LJ	6.0
R-01(I2)		4/30/2018	100 U	15.0 U	6.7 LJ
EWMW-4A		6/8/2010	31	63.8	2.0 U
		8/23/2011	450	59.7	1.0 U
		3/29/2012	100 U	61.6	0.77 LJ
		4/22/2013	25.0 U	58.4	1.0 U
		6/11/2014	25.0 U	62.3	2.0 U
	1506005-02	6/1/2015	25.0 U	64.8	2.0 U
	MF1C06 / H3482-04	6/7/2016	1.0 U	61.2	0.14 LJ
		6/12/2017	25 U	53.7	5.0 U
		4/30/2018	100 U	51.7	10.0 U
		5/6/2019	27	55.9	2.5 U
R-04(I2)		6/16/2010	25.0 U	5.0 U	2.0 U
		8/22/2011	27.1 LJ	1.7 J	2.3
		3/27/2012	100 U	1.9 J	2.7
		4/23/2013	25.0 U	5.0 U	1.5
		6/16/2014	25.0 U	5.0 U	2.0 U
	1506018-06	6/8/2015	25.0 U	5.0 U	2.0 U
	MF1C07 / H3482-10	6/9/2016	200 U	1.0 U	2.0 U
		6/8/2017	25 U	5.0 U	5.0 U
	R-60DM (Dup)	6/8/2017	25 U	5.0 U	5.0 U
		5/22/2018	100 U	2.1 LJ	10.0 U
		5/14/2019	25 U	5.0 U	2.8
R-29A(I1)		5/16/2019	176	**1,040**	2.5 U
DM-1(I1)		6/8/2010	**1,880**	**1,350**	3.5
		8/25/2011	**1,730**	**1,470**	4.1
		3/27/2012	**1,790**	**1,890 J**	3.9
		4/30/2013	**1,520**	**2,370**	3.0
		6/23/2014	527	**1,940**	2.5
		6/23/2014	527	**1,940**	2.5
	1506028-01	6/16/2015	567	**1,800**	2.8
	MF1C08 / H3755-04	6/22/2016	649	**1,820**	3.4
		6/21/2017	521	**1,460**	3.0
		5/22/2018	513	**1,670**	10.0 U

Table C-8 - Historical Groundwater Analytical Results (2010-2019) – Dissolved Metals					
Sample Location	**Lab ID#**	**Date Sampled**	**Fe (ug/L)**	**Mn (ug/L)**	**As (ug/L)**
Deep aquifer					
M-12		6/8/2010	25.0 U	5.0 U	2.3
		8/24/2011	1.0 U	2.0 J	1.7 J
		3/28/2012	100 U	2.9 J	2.0
		4/25/2013	25.0 U	5.0 U	1.2
		6/18/2014	25.0 U	5.0 U	2.0 U
	1506011-01	6/3/2015	25.0 U	5.0 U	2.0 U
	MF1C10 / H3610-05	6/13/2016	13.6 LJ	4	1.5
		6/12/2017	25 U	5.0 U	5.0 U
		5/15/2018	100 U	3.7 LJ	5.4 LJ
		5/14/2019	25 U	5.0 U	2.5 U
	R-103 (Dup)	5/14/2019	25 U	5.0 U	2.5 U
M-15		6/15/2010	31	12.1	3.6
		6/23/2014	26.8	19.2	2.2
	1506028-09	6/15/2015	45.2	26.5	2.3
	1506028-10 Dup	6/15/2015	41.3	26.7	2.0 U
	MF1C11 / H3610-06	6/15/2016	217.0	39.8 LJ	2.0 U
		6/22/2017	49.4	29.7	2.0
		5/23/2018	42.2 LJ	31.1	10.0 U
		5/23/2019	46.9	29.9	2.5 U
M-20		6/15/2010	25.0 U	52	2.0 U
		8/29/2011	233	49	1.0 U
		3/29/2012	100 U	51.7 J	0.62 LJ
		4/30/2013	114	57	1.0 U
		6/23/2014	25.0 U	50	2.0 U
	1506022-06	6/10/2015	25.0 U	51	2.0 U
	MF1C12 / H3610-06	6/15/2016	16.2 LJ	52	2.0 U
		6/19/2017	25 U	46	2.0 U
		5/16/2018	100 U	52	3.8 LJ
		5/13/2019	25 U	48	2.5 U
M-09		6/16/2010	74	131	2.0 U
		6/3/2014	66	77	20 U
	M-09 Hall	6/2/2015	30	66	1.0 U
	1609629-005d	6/9/2016	42	64	0.79 J
		6/8/2017	38	75	0.66 J
	M-101 (Dup)	6/8/2017	37	74	0.66 J
		5/17/2018	34.5 LJ	101	7.8 LJ
		5/21/2019	212	105	2.5 U
R-09(D2)		6/8/2010	25.0 U	5.0 U	2.0 U
		8/25/2011	13.0 LJ	1.1 J	1.0 U
		6/19/2014	25.0 U	5.0 U	2.0 U
	1506022-08	6/11/2015	25.0 U	5.0 U	2.0 U
	1609629-007B	9/9/2016	20.0 U	0.94 J	0.86 J
		6/8/2017	20.0 U	1.3 J	0.64 J
		5/17/2018	100 U	15.0 U	5.0 LJ

Table C-8 - Historical Groundwater Analytical Results (2010-2019) – Dissolved Metals					
Sample Location	**Lab ID#**	**Date Sampled**	**Fe (ug/L)**	**Mn (ug/L)**	**As (ug/L)**
	R-111 (Dup)	5/17/2018	100 U	15.0 U	2.6 LJ
		5/21/2019	25 U	5.0 U	2.5 U
	R-106 (Dup)	5/21/2019	25 U	5.0 U	2.5 U
R-29A(D1)		5/16/2019	168	72	2.5 U
DM-2(D2)		6/15/2010	25.0 U	21.4	2.0 U
		8/30/2011	118 LJ	21.1	1.0 U
		6/18/2014	25.0 U	19.3	2.0 U
	1506022-04	6/10/2015	25.0 U	19.0	2.0 U
	MF1C13 / H3610-09	6/15/2106	8.1 LJ	19.5	0.18 LJ
		6/21/2017	25 U	17.8	2.0 U
		5/22/2018	100 U	19.3	10.0 U
		5/20/2019	25 U	20.1	2.5 U
DM-1(D1)		6/14/2010	25.0 U	9	2.0 U
		6/2/2014	21	7	20.0 U
	DM-1(D1) Hall	6/1/2015	20 U	7	1.4
	Duplicate 2 Hall	6/1/2015	20 U	7	1.4
		9/8/2016	NS	NS	NS
		5/23/2018	17.2 LJ	10.0 LJ	10.0 U
		5/20/2019	25 U	10.6	2.5 U

Legend

Fe - Iron

Mn - Manganese

As - Arsenic

U - Not detected above the specified laboratory quantitation/reporting limits

C - Result biased low

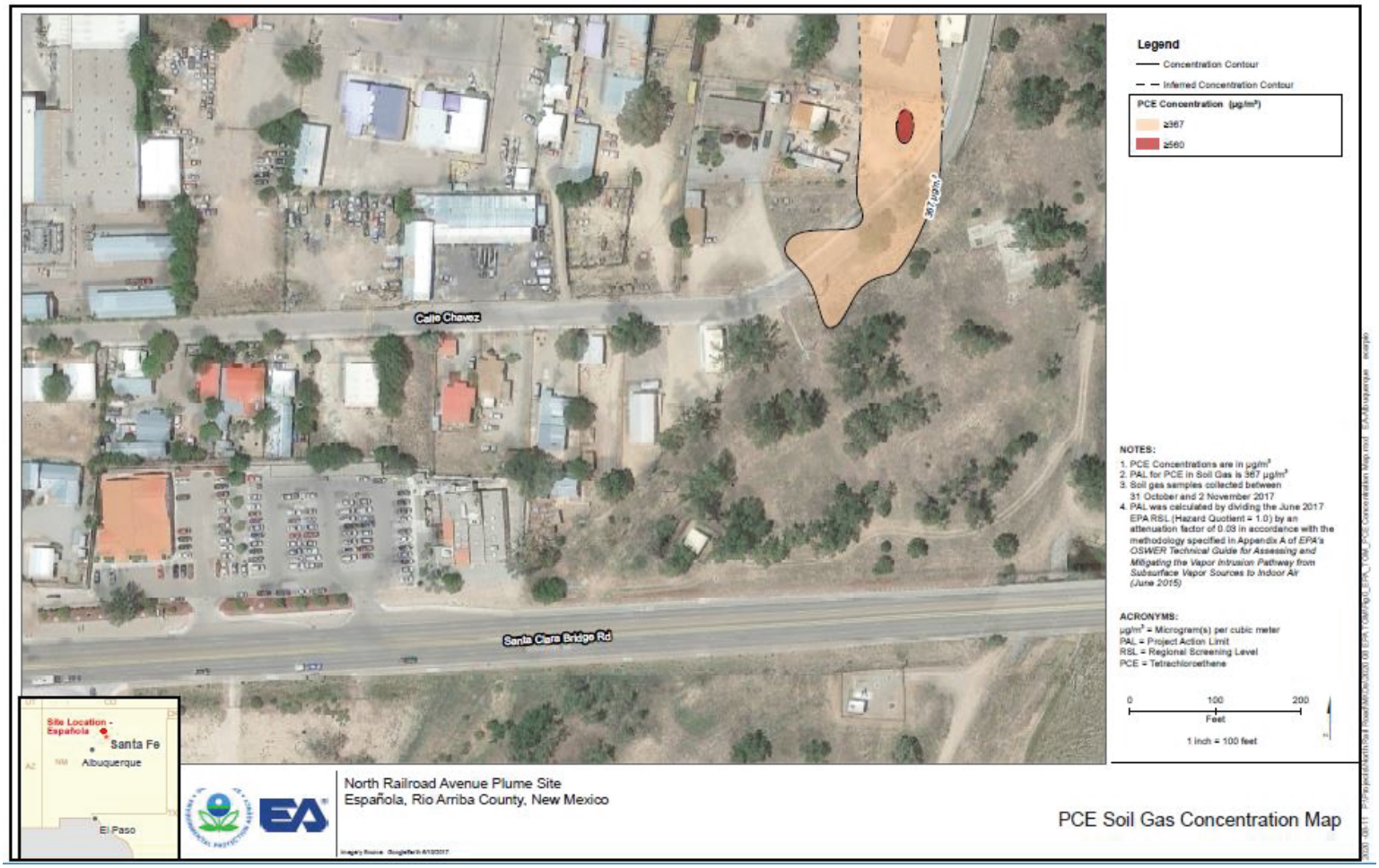
Table C-9 – Indoor Air Sampling Results

Sample Date	Sample Location	Contaminant Concentrations compared to VISLs (µg/m^3)				Reference Action Levels	Notes
		PCE	TCE	Cis-1,2 DCE	Vinyl Chloride		
5/17/18	Dry Cleaner Building (Inside)	20.5	<1.07	<0.793	<0.511		
5/17/18	ECHC Annex Building (Office)	43.0	1.78	<0.793	<0.511		
5/17/18	ECHC Annex Building (Outside)	<1.36	<1.07	<0.793	<0.511		
5/17/18	LCCS Building (Conference)	<1.36	<1.07	<0.793	<0.511		Detection limits exceed residential TCR=1E-06 for TCE and VC
5/17/18	LCCS Building (File)	<1.36	<1.07	<0.793	<0.511		
5/17/18	LCCS Building (Outside)	<1.36	<1.07	<0.793	<0.511		
6/7/2017	Dry Cleaner Building (Kitchen)	45.1	0.15	<0.08	<0.05		
6/7/2017	Dry Cleaner Building (Outside)	<0.14	<0.11	<0.08	<0.05		
6/7/2017	ECHC Annex Building (Office)	0.359	<0.11	<0.08	<0.05		
6/7/2017	ECHC Annex Building (Outside)	<0.54	<0.43	<0.32	<0.08		
6/7/2017	LCCS Building (Conference)	0.392	<0.11	<0.08	0.103		
6/7/2017	LCCS Building (File)	0.346	<0.11	<0.08	0.134		
6/7/2017	LCCS Building (Outside)	0.956	<0.11	<0.08	<0.03		
9/7/2016	Dry Cleaner Building (Former)	**162**	0.267	<0.08	<0.05		PCE concentration exceeds the TCR=1E-06
9/7/2016	ECHC Annex Building	0.95	<0.11	<0.08	<0.05		
6/3/2015	Dry Cleaner Building (Former)	**63**	<1.1	<0.8	<0.52		PCE concentration exceeds the TCR=1E-06
6/3/2015	ECHC Annex Building	1.4	<1.0	<0.75	<0.48		
6/5/2014	Dry Cleaner Building (Norge town)	<0.14	<0.11	0.16	<0.051		
6/5/2014	ECHC Annex Building	0.62	<0.11	0.19	<0.70		
5/9/2013	Dry Cleaner Building (Motorcycle shop)	**94**	<1.3	<0.69	<0.63		PCE concentration exceeds the TCR=1E-06
5/9/2013	ECHC Annex Building	<2.0	<1.2	<0.65	<0.59		
9/18/2012	Dry Cleaner Building (Norge Town)	**190**	<1.1	<0.79	<0.51		PCE concentration exceeds the TCR=1E-06 and Target Hazard Quotient (THQ)=1; Building was unoccupied during this event
9/18/2012	ECHC Annex Building (HC Annex)	3.9	<1.1	<0.79	<0.51		
6/8/2011	Dry cleaner Building (MC Shop)	15	<0.22	<0.16	<0.051		
6/8/2011	ECHC Annex Building (Former ECHC)	0.91	<0.18	<0.13	<0.042		
2/10/2011	ECHC Annex Building (ECFH-1)	1.9	<0.22	<0.16	<0.051		
9/14/2010	ECHC Main Building	0.84	<0.20	<0.15	<0.049		
9/14/2010	ECHC Annex Building	2.2	0.34	0.19	<0.048		
Commercial Vapor Intrusion Screening Levels (VISL) Carcinogenic VISL: Target Cancer Risk (TCR)=1E-06		47.2	2.99	--	2.79	Regional Screening	Evaluate the need for additional sampling to establish concentration and trends and evaluate

Commercial Vapor Intrusion Screening Levels (VISL) Non-carcinogenic VISL: Target Hazard Quotient (THQ)=1	175	8.76	--	438	Levels (RSLs) November 2019	need for sampling at other nearby structures.
Commercial Vapor Intrusion Screening Levels (VISL) Carcinogenic VISL: Target Cancer Risk (TCR)=1E-04	4,720	299	--	279		Evaluate the need for mitigation measures at the structure such as sealing of cracks, soil vapor extraction or installation of sub-slab depressurization systems.
Residential Vapor Intrusion Screening Levels (VISL) Carcinogenic VISL: Target Cancer Risk (TCE)=1E-06	10.8	0.478	--	0.168	Regional Screening Levels (RSLs) November 2019	
Residential Vapor Intrusion Screening Levels (VISL) Non-carcinogenic VISL: Target Hazard Quotient (THQ)=1	41.7	2.09	--	104		

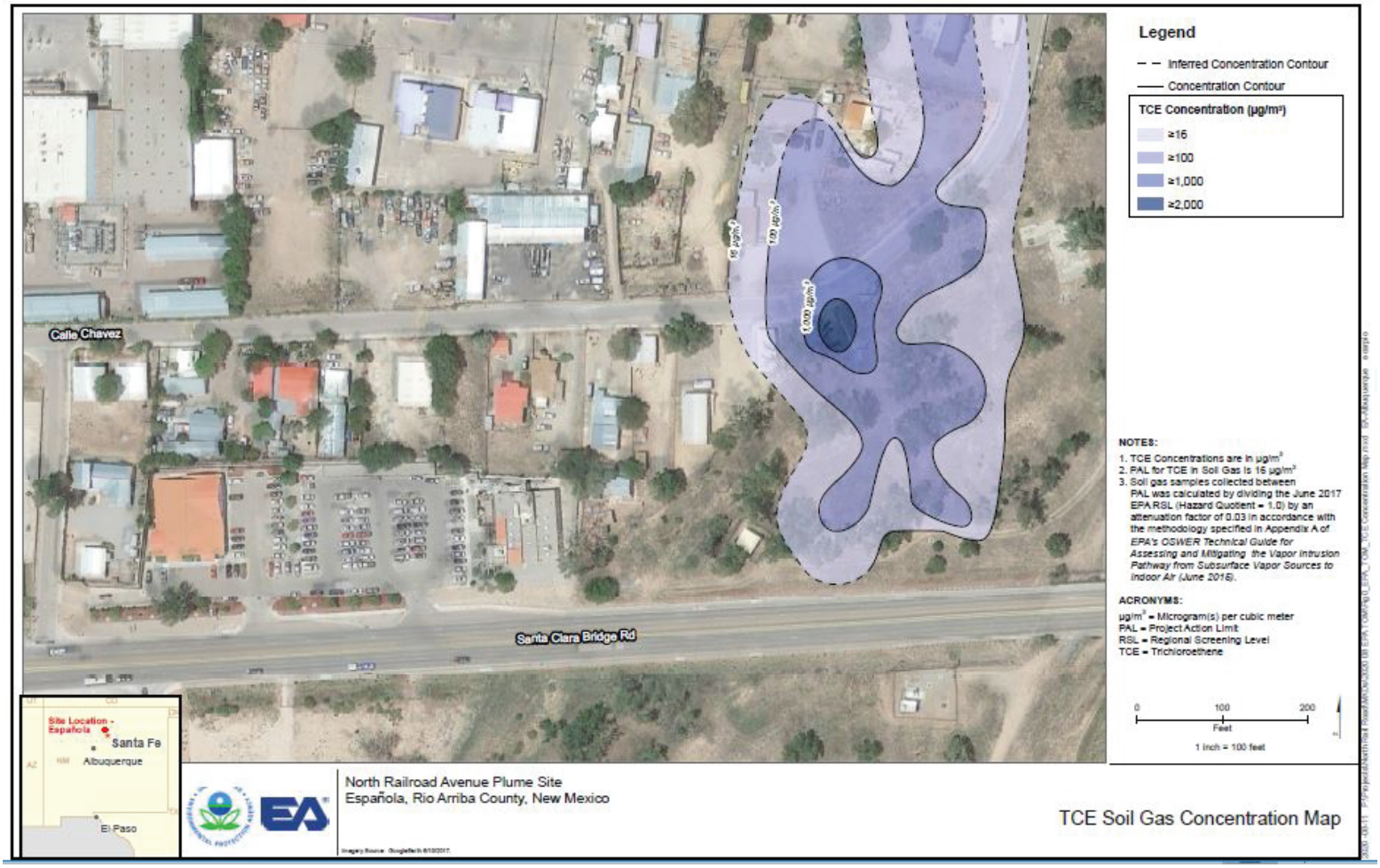
APPENDIX D – FIGURES FROM
EPA'S FOCUSED REMEDIAL INVESTIGATION REPORT
NORTH RAILROAD AVENUE PLUME SUPERFUND SITE
ESPAÑOLA, RIO ARRIBA COUNTY, NEW MEXICO

FIGURE D-1
PCE SOIL GAS CONCENTRATION MAP



Soil gas sampling locations not depicted.

FIGURE D-2
TRICHLOROETHENE (TCE) SOIL GAS CONCENTRATION MAP



Soil gas sampling locations not depicted.

APPENDIX E – INTERVIEW RECORDS

INTERVIEW RECORD

Site Name: North Railroad Avenue Plume		**EPA ID No.: NMD986670156**
Subject: Third Five-Year Review	**Time:** **3:15 PM**	**Date: 11/5/2019**
Type: Visit **Location of Visit:** Santa Clara Pueblo – Office of Environmental Affairs		

Contact Made By:

Name: Mark Purcell	**Title:** Remedial Project Manager	**Organization:** EPA Region 6
Name: Angelo Ortelli	**Title:** Project Manager	**Organization:** NMED-Superfund Oversight Section

Individual Contacted:

Name: Dino Chavarria	**Title:** Environmental Director	**Organization:** Santa Clara Pueblo Office of Environmental Affairs

Telephone No: 505-753-7326 x1239 **Fax No:** **E-Mail Address:** dinoc@santaclarapueblo.org	**Street Address: 578 Kee Street** **City, State, Zip: Espanola, NM 87532**

Summary Of Conversation

Question 1 - What is your overall impression of the project? (General sentiment)

Based on the last five years of groundwater monitoring at the bio-curtain and down-gradient monitoring wells on Santa Clara Pueblo (SCP) Tribal Land, the remedy for the shallow aquifer, has been effective in reducing contamination concentrations and migration of the shallow groundwater plume.

The groundwater monitoring aspects of the project have provided a great learning experience for the Environmental Affairs Office staff, and they have welcomed the opportunity to be involved in the project, and to interact with the NMED Superfund Oversight Section staff during sampling events.

Question 2 - What effects have the site operations had on the surrounding community?

The Environmental Affairs Office involvement in the project has increased their knowledge of Superfund site remediation issues and requirements. Technical staff have expanded their knowledge of groundwater sampling procedures and methods through the interactions with NMED.

Question 3 - Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

The community would like to gain a better understanding of the clean-up status and activities going on at the site. The Environmental Affairs Office is concerned about the deep-zone groundwater plume issues and the future steps needed to meet the remedial goals for the site.

Question 4 - Are you aware of any complaints, incidents or activities at the Site such as vandalism, trespassing, or emergency response from local authorities? If so, please provide details.

Trespasses across the SCP Tribal Land through the area toward the Rio Grande is not uncommon. When trespass was observed by members of the community, the Environmental Affairs Office and SCP police have been contacted to report suspect activities. In the past, some graffiti has appeared at the biocurtain treatment building, and "No Trespassing" signs were posted on the treatment building compound fence. The Environmental Affairs Office staff have maintained the grounds within the treatment building compound.

Question 5 - Do you feel well informed about the Site's activities and progress?

NMED, EPA, and Santa Clara Pueblo interact regularly, and the Environmental Affairs Office feels well informed of planned site activities. NMED typically provides notification of sampling activities well in advance so schedules can be coordinated. Although the sampling report takes some time to complete, NMED provides laboratory results for the Santa Clara wells in a timely manner before issuance of the report.

Question 6 - Do you have any comments, questions, or recommendations regarding the Site's management or operations?

A Government-to-Government stakeholders meeting was recommended to discuss the site clean-up status and next steps in the remedial action process, and future operation and maintenance (O&M). EPA plans to hold a Government-to-Government meeting during the morning of December 11th, 2019, prior to an evening community meeting to be held in Espanola.

NMED/EPA are in the process of completing the Third Five-Year Review (FYR) for the site. EPA plans to conduct a follow-up meeting after publication of the 2020 FYR.

INTERVIEW RECORD

Site Name: North Railroad Avenue Plume Superfund Site		**EPA ID #: NMD986670156**
Subject: Third Five-Year Review	**Time:** 1:30pm.	**Date:** 11/5/19
Type: Visit **Location of Visit:** City Hall, 405 N. Paseo de Oñate, Española, NM		

Contact Made By:

Name: Mr. Mark Purcell	**Title:** Remedial Project Manager	**Organization:** EPA Region 6
Name: Mr. Angelo Ortelli	**Title: Project Manager**	**Organization: NMED**

Individual Contacted:

Name: Mr./Ms. ALISON GILLETTE	**Title:** CITY PLANNER	**Organization:** CITY OF ESPAÑOLA
Telephone No: 505-747-6082 **Fax No:** **E-Mail Address:** agillette@espanolanm.gov	**Street Address:** 405 N. Paseo de Oñate Española, NM 87532	

Summary Of Conversation

Question 1: What is your overall impression of the project? (general sentiment)

None. We have hardly heard anything. What ~~was~~ was the feedback from the last 5-year review?

It doesn't appear like there's much activity going on there, despite the fact that 2 of the 3 plumes a growing.

Question 2: What effects have the site operations had on the surrounding community?

No one seems to know it's there. We're unclear as to whether local residents near ground zero have been notified.

We have questions as to ~~a~~ how well previous outreach was completed.

Question 3: Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

Most folks in the area are not aware of the site or the issues around it. it's a poor, somewhat transient community which does not have the time to pay attention to these sorts of things. Anything that can be done to better communicate w/ the community members would be appreciated.

Question 4: Are you aware of any complaints, incidents or activities at the Site such as vandalism, trespassing, or emergency response from local authorities? If so, please provide details.

NO.

Question 5: Do you feel well informed about the Site's activities and progress?

NO.

Question 6: Do you have any comments, questions, or recommendations regarding the Site's management or operation?

Pleas be more forthcoming with information to the city (beyond scientific reports which are basically gobbledy-gook) and residences/businesses in the area

INTERVIEW RECORD

Site Name: North Railroad Avenue Plume Superfund Site	**EPA ID #: NMD986670156**	
Subject: Third Five-Year Review	**Time:**	**Date:**
Type: Visit **Location of Visit:**		

Contact Made By:

Name: Mr. Mark Purcell	**Title:** **Remedial Project Manager**	**Organization:** **EPA Region 6**
Name: Mr. Angelo Ortelli	**Title: Project Manager**	**Organization: NMED**

Individual Contacted:

Name: Mr. /Ms. Xavier Martinez	**Title:** Interim City Manager	**Organization:** City of Española
Telephone No: 505-470-6971 **Fax No:** **E-Mail Address:** xmartinez@espanolanm.gov	**Street Address:** 405 N. Paseo De Oñate Española, NM 87532	

Summary Of Conversation

Question 1: What is your overall impression of the project? (general sentiment)

I was not too familiar with the Superfund site until I began working for the city three years ago. What little information I received in that time was pretty vague and uninformative. Unfortunately, as I educate myself on this issue, there are a lot of city residents that feel the same way when I reach out to gather information.

Question 2: What effects have the site operations had on the surrounding community?

I can only speak on behalf of the city in regards to this question. The city has been coordinating with the contractors hired by EPA to allow access to certain city properties so that they may dig monitoring wells throughout the superfund plum sight.

Question 3: Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

I am not familiar with community concerns at this time. Since becoming Interim City Manager this year, I have been getting myself more familiar with this issue, however, I have also learned that many people in the community are as unfamiliar as I am.

Question 4: Are you aware of any complaints, incidents or activities at the Site such as vandalism, trespassing, or emergency response from local authorities? If so, please provide details.

Since my time with the City (three years), I have not been aware of any vandalism, trespassing, or emergency response to the sites.

Question 5: Do you feel well informed about the Site's activities and progress?

Not so much, as I stated on the above questions.

Question 6: Do you have any comments, questions, or recommendations regarding the Site's management or operation?

I feel that more information and education to the public should be better.

INTERVIEW RECORD

Site Name: North Railroad Avenue Plume Superfund Site		**EPA ID #:** NMD986670156
Subject: Third Five-Year Review		**Time:** 1:00pm **Date:** 11/14/19
Type: ~~Visit~~ Site **Location of Visit:** Runnels - N2262		
Contact Made By:		
Name: Mr. Mark Purcell	**Title:** Remedial Project Manager	**Organization:** EPA Region 6
Name: Mr. Angelo Ortelli	**Title:** Project Manager	**Organization:** NMED
Individual Contacted:		
Name: Mr. (Ms.) Mary Parraca	**Title:** Manager Former H&S manager	**Organization:** El Castro H/C
Telephone No: **Fax No:** **E-Mail Address:**		**Street Address:**

Summary Of Conversation

Question 1: What is your overall impression of the project? (general sentiment)

Community hasn't known what was going on, until recent events w/ Navi USW research.
Community not involved

Question 2: What effects have the site operations had on the surrounding community?

Community has no idea of health hazards
Well informed public is important!

Question 3: Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

Development has been hindered on Main St. area

Question 4: Are you aware of any complaints, incidents or activities at the Site such as vandalism, trespassing, or emergency response from local authorities? If so, please provide details.

No.

Question 5: Do you feel well informed about the Site's activities and progress?

No discussion w/ Senior Team @ El Centro during RA implementation.
EPA-RPM described public notice & comment periods
Public outreach needs to be updated (i.e. social media, emails, etc).

Question 6: Do you have any comments, questions, or recommendations regarding the Site's management or operation?

Public meeting will be at Senior Center on Vietnam Veterans Memorial Dr.
Concern about LTRA ending 6/30/19.
Can LTRA be continued? What are circumstances?

INTERVIEW RECORD

Site Name: North Railroad Avenue Plume Superfund Site	**EPA ID #:** NMD986670156	
Subject: Third Five-Year Review	**Time:** 10:35	**Date:** **11/7/2019**
Type: completed form **Location of Visit:**		

Contact Made By:

Name: Mr. Mark Purcell	**Title:** Remedial Project Manager	**Organization:** EPA Region 6
Name: Mr. Angelo Ortelli	**Title:** Project Manager	**Organization:** NMED

Individual Contacted:

Name: Ms. Lore Pease	**Title: CPA, CEO**	**Organization: El Centro Family Health**

Telephone No: 505-929-1749 **Fax No:** **E-Mail Address: lore.pease@ecfh.org**	**Street Address:** **538 N Paseo de Onate** **Espanola, NM 87532**

Summary Of Conversation

Question 1: What is your overall impression of the project? (general sentiment)
I heard a presentation on the process used for this project and there are 2 methods that could be used to minimize the plume and Espanola received the cheapest method which was not as effective.

Question 2: What effects have the site operations had on the surrounding community?
While we used the 111 N Railroad office space I was very concerned with the health outcomes of my staff. We have therefore moved our offices to 538 N Paseo de Onate which is out of the plume area.

Question 3: Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. Yes – as a member of the Rio Arriba Community Health Commons we heard a presentation on the details of the plume and operation to mediate the effects of the plume. The community is concerned of health effects – especially cancer - one of the key members contracted breast cancer and her home is in the plume area – so there is grave concerns.

Question 4: Are you aware of any complaints, incidents or activities at the Site such as vandalism, trespassing, or emergency response from local authorities? If so, please provide details. No.

Question 5: Do you feel well informed about the Site's activities and progress? We are not receiving any updates regarding activities since we left the 111 N Railroad site. They would come and test the area on a regular basis.

Question 6: Do you have any comments, questions, or recommendations regarding the Site's management or operation? If there are 2 systems to use to mitigate the damage and Espanola gets the cheaper system – my question is why? The people here are just as important as any other community even if it is smaller. Discrimination comes to mind.
Thank you for listening.

INTERVIEW RECORD

Site Name: North Railroad Avenue Plume Superfund Site	**EPA ID #: NMD986670156**	
Subject: Third Five-Year Review	**Time:1:00**	**Date: 11/6/19**
Type: Visit **Location of Visit: 404 Hunter Street, Española, NM 87532**		

Contact Made By:

Name: Mr. Mark Purcell	**Title:** **Remedial Project Manager**	**Organization:** **EPA Region 6**
Name: Mr. Angelo Ortelli	**Title: Project Manager**	**Organization: NMED**

Individual Contacted:

Name: Mr. /Ms. Megan Delano	**Title: Executive Director**	**Organization: Las Cumbres Community Services, Inc.**
Telephone No: 505-753-4123 **Fax No: 505-747-4124** **E-Mail Address: megan.delano@lccs-nm.org**	**Street Address: 404 Hunter Street, Española NM 87532**	

Summary Of Conversation

Question 1: What is your overall impression of the project? (general sentiment)

Working with vulnerable and under-resourced populations, particularly children with social/emotional and/or developmental disabilities, on a superfund site has always been a concern to the organization. We don't hold a comprehensive historical narrative for the entirety of the project as many of the prior administrators and staff have retired or no longer work at the Hunter Street location.

Question 2: What effects have the site operations had on the surrounding community?

We aren't necessarily aware of the overall effects the site operations have had on the surrounding community due to lack of coordinated community conversations, and/or low outreach and participation rates.

Question 3: Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

General concern related to community health and personal well-being arise when anyone learns that they are working on or near a superfund site. Organizations committed to public health and early childhood well-being and learning have been impacted by operating on a superfund site. Largely because real-estate is difficult to obtain and once established, organizations are loathe to move. Therefore, agency leadership have expressed dismay at being stuck on toxic ground. Additionally and

specifically, staff at Las Cumbres have been distressed and confused that testing has been limited to the conference room and a file room when children are exposed to potentially contaminated soil on the playground, drinking water, and air in classrooms that were never tested.

It seems our RDL has changed from 2008-2017, compared against Tier 1-residential, to VISLs-Commercial use for May 2018 testing. There is concern for the change in RDL comparison and lack of sensitivity for our childcare facility on-site.

Question 4: Are you aware of any complaints, incidents or activities at the Site such as vandalism, trespassing, or emergency response from local authorities? If so, please provide details.

There have been complaints of trespassing.

Question 5: Do you feel well informed about the Site's activities and progress?

Angelo Ortelli has been very communicative and open regarding sharing details of the work conducted at the site and the overall levels of contamination within Las Cumbres' testing environments. However, communication has varied in frequency and effectiveness since I have been involved with the organization in May of 2008. We were not aware that the EPA's oversight was coming to an end and being transferred to the New Mexico Environment Department, a detail that would have been of great interest to our community. Additionally, we recently learned of a similar superfund site in Albuquerque which was treated with a pump and filter methodology instead of the bio-remediation offered to the N. Railroad site. We feel like our community was not offered a long term remediation effort and was offered the least expensive methodology. Knowing that contamination has not been effectively remediated in the deep water aquifer leaves us with a feeling of unease and disappointment, especially because we are unaware of the long-term consequences of the ongoing contamination of the aquifer. We do not feel like our concerns when voiced to contractors in the past were adequately addressed and we received answers like "you have nothing to worry about." This is particularly disconcerting when we have begun to anecdotally collate various health concerns impacting the population of Las Cumbres employees who have worked long-term at the Hunter location.

In addition, from correspondence received, there has been ground water testing, however those results have not been shared with our organization.

Question 6: Do you have any comments, questions, or recommendations regarding the Site's management or operation?

- Now that the site has been turned over to NMED, what are the long-term plans for remediating the site? We are particularly concerned with the levels of vinyl chloride in the air samples.
- Have other outdoor air samples been collected other than in 2018?
- Why were all of the contaminant levels in May 2018 sample the same, for indoor and outdoor?
- Contamination of the shallow aquifer, new hotspots that have emerged, what does that mean going forward?
- Why is there no RDL for cis-1,2 DCE?
- What recourse does our community have to ensure that long-term steps are taken to ensure the safety of our groundwater, soil and air quality?
- Our community would have benefitted from more regular communication with the EPA (outside of yearly testing and letters summarizing testing results) regarding the progress of the superfund site.

• We are curious about why testing was performed at different times through the years. It doesn't seem that there was consistency, ie every June, every 6 months, or quarterly. Why was there such variation? February, March, May, June, September.

INTERVIEW RECORD

Site Name: North Railroad Avenue Plume Superfund Site		**EPA ID #:** NMD986670156
Subject: Third Five-Year Review	**Time:**	**Date:**
Type: Visit **Location of Visit:**		

Contact Made By:

Name: Mr. Mark Purcell	**Title:** Remedial Project Manager	**Organization:** EPA Region 6
Name: Mr. Angelo Ortelli	**Title:** Project Manager	**Organization:** NMED

Individual Contacted:

Name: Mr. /Ms. Christopher Madrid	**Title: Economic Development Director**	**Organization: Rio Arriba County**

Telephone No: 575-770-0040 **Fax No:** **E-Mail Address: clmadrid@rio-arriba.org**	**Street Address:** 1122 Industrial Park Road, Espanola, NM 87532

Summary Of Conversation

Question 1: What is your overall impression of the project? (general sentiment)

Initially, it was my perception that the mitigation efforts were running their course and the plume was effectively dissipating. I did not have the benefit of reviewing any formal reports from EPA or NMED. Rather, I've been made aware of anecdotal information on the site primarily through conversations with community stakeholders and county staff. Over the past few months I was informed that while parts of the plume have improved, the results in other parts (the deep and intermediate plumes) continue to contaminate our water supply. Also, levels of contamination appear to have been detected in the air at certain facilities near the plume.

Question 2: What effects have the site operations had on the surrounding community?

The area is consistently referred to and publicly displayed as a "Superfund Site" which automatically raises concerns for prospective developers and real estate sales. The additional risk and costs involved to mitigate or address both actual and perceived risk makes it difficult to both promote development of the area and attract potential developers. Investors can simply find other areas of opportunity without having to address additional barriers. Navigating the development of a Superfund site is not a common, nor easy task for developers and entrepreneurs. Furthermore, I have seen local property owners within the Superfund site experience additional challenge trying to sell or lease their property.

Question 3: Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

More recently I have heard public concerns voiced about the remediation which has not addressed the deeper and intermediate plumes. I was also made aware that the EPA has handed off responsibility to the State of NM before the remediation was fully competed. Some in the community have expressed concern that more effective methods of treatment were not used and that the remediation costs for the site may prove burdensome for the State and the site remediation may be downgraded or stopped before being fully cleaned up.

Question 4: Are you aware of any complaints, incidents or activities at the Site such as vandalism, trespassing, or emergency response from local authorities? If so, please provide details.

None that I am aware of.

Question 5: Do you feel well informed about the Site's activities and progress?

I have only been somewhat informed primarily through my collaborations over the years with the New Mexico Environmental Department on some specific projects located within the plume. However, I have not had the benefit of hearing directly from any EPA representative until recently during the Five-year review.

Question 6: Do you have any comments, questions, or recommendations regarding the Site's management or operation?

It does appear that upcoming community meetings are scheduled and there is an effort to identify individuals and organizations that may want to provide public input on the site. A lack of public awareness about the actual state of the site and remediation efforts impacts the ability of the public to comment. Therefore, I do recommend a robust information sharing and public awareness effort in conjunction with these community outreach efforts.

INTERVIEW RECORD

Site Name: North Railroad Avenue Plume Superfund Site		**EPA ID #:** NMD986670156
Subject: Third Five-Year Review	**Time:** 09:00	**Date:** 11/6/19
Type: Visit **Location of Visit:**		

Contact Made By:

Name: Mr. Mark Purcell	**Title:** Remedial Project Manager	**Organization:** EPA Region 6
Name: Mr. Angelo Ortelli	**Title:** Project Manager	**Organization:** NMED

Individual Contacted:

Name: Mr./Ms. Lauren Reichelt	**Title:** Director	**Organization:** Rio Arriba Health & Human Services
Telephone No: **Fax No:** **E-Mail Address:**	**Street Address:**	

Lauren will provide a completed form.

Summary Of Conversation

Question 1: What is your overall impression of the project? (general sentiment)

Inadequate response for drop-zone clean-up.
Why is EPA withdrawing support under transition to O&M?
Can EPA funding continue into O&M activities, if there is community demand.

Question 2: What effects have the site operations had on the surrounding community?

Hindered economic development & revitalization
Hunter Ford Property redevelopment has been side-lined. Need to involve NMED & EPA Brownfield Programs.

Question 3: Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

Question 4: Are you aware of any complaints, incidents or activities at the Site such as vandalism, trespassing, or emergency response from local authorities? If so, please provide details.

None.

Question 5: Do you feel well informed about the Site's activities and progress?

Need to improve outreach to the community.
EPA's CIC will work w/ Rio Arriba Cty. Hlth Services and City Manager (Solve Health Council, Tewa Women United, Santa Clara Pueblo.

Question 6: Do you have any comments, questions, or recommendations regarding the Site's management or operation?

Concerned about zoning regulation that can isolate dry cleaners and other businesses that can impact the environment & community.

INTERVIEW RECORD

Site Name: North Railroad Avenue Plume Superfund Site		**EPA ID #: NMD986670156**	
Subject: Third Five-Year Review		**Time:**	**Date:**
Type (visit, phone, email, mail): **Location of Visit:**			
Contact Made By:			
Name: Mr. Mark Purcell	**Title:** **Remedial Project Manager**	**Organization:** **EPA Region 6**	
Name: Mr. Angelo Ortelli	**Title: Project Manager**	**Organization: NMED**	
Individual Contacted:			
Name: Ms. Sabra Moore	**Title:** Manager	**Organization: Espanola Farmers Market**	
Telephone No: (505)685-4842 **Fax No:** **E-Mail Address:** **sabramoore25@windstream.net**		**Street Address: (Market site)** 1105 N. Railroad Avenue Espanola, NM 87532	

X☐ I consent to my questionnaire being included in the Third Five-Year Review.

Comments

Question 1: What is your overall impression of the project? (general sentiment)

I first learned about this project about twenty years ago, when our outdoor farmers' market was on the Plaza of Espanola, directly under parts of the plume that have been migrating from the former dry cleaning business. Two scientists stopped by the market and explained that they would be digging test wells and trying some bioremediation to clean the plume. My general impression is that the efforts to neutralize and clean up the toxic chemicals has not succeeded during this long period of time.

Question 2: What effects have the site operations had on the surrounding community?

The toxic plume extends under family homes and businesses. Dry cleaning chemicals are cancer-causing agents and many people have continued in their daily routines in an unsafe environment. At one point, when we were trying to find a permanent site for Espanola Farmers' Market, we considered a county –owned piece of land near the old bridge. It seemed ideal, but then we became concerned about having a farmers market above a Superfund site and looked for another location.

Question 3: Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

Yes, many people in the community are concerned. I gave one example of the not-for-profit farmers' market that I work with, but the recent efforts to develop the so-called Food Hub building by a different group failed partly based on the expense of remediation not only of the Toxic plume but of asbestos in this building, unrelated to the plume.

Question 4: Are you aware of any complaints, incidents or activities at the Site such as vandalism, trespassing, or emergency response from local authorities? If so, please provide details.

No.

Question 5: Do you feel well informed about the Site's activities and progress?

The Rio Grande Sun has recently published two articles that have given me more information about the lack of progress at remediation of this Site and the possibility that the EPA plans to withdraw from its obligations to clean up the toxic materials and dump that responsibility onto the State of New Mexico.

Question 6: Do you have any comments, questions, or recommendations regarding the Site's management or operation?

My primary comment is that the EPA should honor its obligation to clean up this toxic site. It is in the heart of the historic district of Espanola. Espanola Farmers Market is now on N. Railroad Avenue, but north of this site and not above contaminated property, but we are nearby and are affected by the lack of progress. I should note that Espanola is a predominately Hispanic and Pueblo community and I wonder if the lack of attention and urgency in addressing the needs of this community might reflect institutional racism.

INTERVIEW RECORD

Site Name: North Railroad Avenue Plume Superfund Site		**EPA ID #:** NMD986670156
Subject: Third Five-Year Review		**Time:** 3:30 pm **Date:** 11/12/19
Type: ~~Visit~~ Telephone **Location of Visit:**		
Contact Made By:		
Name: Mr. Mark Purcell	**Title:** Remedial Project Manager	**Organization:** EPA Region 6
Name: Mr. Angelo Ortelli	**Title:** Project Manager	**Organization:** NMED
Individual Contacted:		
Name: Mr. (Ms.) Tana Berbrayk-Abonda	**Title:** Business owner	**Organization:** Fitness Studio
Telephone No: 505-927-9516 **Fax No:** **E-Mail Address:**		**Street Address:**

Summary Of Conversation

Question 1: What is your overall impression of the project? (general sentiment)

Didn't know anything about site operations.

Question 2: What effects have the site operations had on the surrounding community?

How is indoor air monitoring data distributed? Generally, it is sent to the property owner. No information was provided to employees at El Centro where Tana worked until 2015 at the NRAP location.

Question 3: Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

Question 4: Are you aware of any complaints, incidents or activities at the Site such as vandalism, trespassing, or emergency response from local authorities? If so, please provide details.

None

Question 5: Do you feel well informed about the Site's activities and progress?

How is community outreach handled?
EPA described the mailing/notification process.

Question 6: Do you have any comments, questions, or recommendations regarding the Site's management or operation?

Interviewee will provide a completed form.

INTERVIEW RECORD

Site Name: North Railroad Avenue Plume Superfund Site		**EPA ID #:** NMD986670156
Subject: Third Five-Year Review	**Time:** 09:30	**Date:** 11/24/19
Type: ~~Visit~~ Telephone conference call **Location of Visit:**		

Contact Made By:

Name: Mr. Mark Purcell	**Title:** Remedial Project Manager	**Organization:** EPA Region 6
Name: Mr. Angelo Ortelli	**Title:** Project Manager	**Organization:** NMED

Individual Contacted:

Name: Mr. (Ms.) Mira Yorbrough	**Title:** 2020 Graduate	**Organization:** UNM-Law
Telephone No: **Fax No:** **E-Mail Address:**	**Street Address:**	

Mira will provide a completed form

Summary Of Conversation

Question 1: What is your overall impression of the project? (general sentiment)

Mira became aware of contamination to Jemez y Bonanza when she was a teenager. Followed-up on pitfalls in law school.

Question 2: What effects have the site operations had on the surrounding community?

Question 3: Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

Question 4: Are you aware of any complaints, incidents or activities at the Site such as vandalism, trespassing, or emergency response from local authorities? If so, please provide details.

None.

Question 5: Do you feel well informed about the Site's activities and progress?

Disappointed to find little information on-line @ EPA website. Hard to access information efficiently. Good to see that Admin. Record was brought up-to-date.
Outreach efforts in the past have been lacking.

Question 6: Do you have any comments, questions, or recommendations regarding the Site's management or operation?

Concern about O&M takeover and 100% funding by State.
Pump & Treat vs. bio-treatment for deep-zone discussed. Enhanced Treatment Strategy described for next year

INTERVIEW RECORD

Site Name: North Railroad Avenue Plume Superfund Site		EPA ID #: NMD986670156
Subject: Third Five-Year Review	Time: 1332	Date: 12-7-19
Type: Email Location of Visit: Española, NM		

Contact Made By:

Name: Mr. Mark Purcell	Title: Remedial Project Manager	Organization: EPA Region 6
Name: Mr. Angelo Ortelli	Title: Project Manager	Organization: NMED

Individual Contacted:

Name: Mr. /Ms. BENJAMIN PEARCE	Title:	Organization:
Telephone No: (505) 903-3666 Fax No: E-Mail Address: benjamin.pearce02@gmail	Street Address: 312 N RAILROAD AVE	

☒ I consent to my questionnaire being included in the Third Five-Year Review.

Comments

Question 1: What is your overall impression of the project? (general sentiment)

BARE MINIMAL CLEAN UP & NO INFORMATION MADE READILY AVAILABLE

Question 2: What effects have the site operations had on the surrounding community?

WHAT SITE OPERATIONS?

Question 3: Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

YES, IT'S A SUPER FUND SITE THAT HASN'T BEEN REMEDIATED

Question 4: Are you aware of any complaints, incidents or activities at the Site such as vandalism, trespassing, or emergency response from local authorities? If so, please provide details.

NO

Question 5: Do you feel well informed about the Site's activities and progress?

NO

Question 6: Do you have any comments, questions, or recommendations regarding the Site's management or operation?

NO KNOWLEDGE OF EFFECTIVE CLEAN UP & REMEDIATION OF THE SITE.

INTERVIEW RECORD

Site Name: North Railroad Avenue Plume Superfund Site	**EPA ID #: NMD986670156**
Subject: Third Five-Year Review	**Time:** 1:10 pm **Date:** 12/07/18
Type: Email **Location of Visit: Española, NM**	

Contact Made By:

Name: Mr. Mark Purcell	**Title:** Remedial Project Manager	**Organization:** EPA Region 6
Name: Mr. Angelo Ortelli	**Title: Project Manager**	**Organization: NMED**

Individual Contacted:

Name: Mr. /Ms. Flor E. Hernandez	**Title:** Store Lead Shift	**Organization:** Co-op Española Community Market

Telephone No: 505 747 3006 **Fax No:** **E-Mail Address:** Feh920@gmail.com	**Street Address:** 312 S. Paseo de Oñate Española, NM 87532

☒ **I consent to my questionnaire being included in the Third Five-Year Review.**

Comments

Question 1: What is your overall impression of the project? (general sentiment)

My first impression is that I am not well informed on the whole project.

Question 2: What effects have the site operations had on the surrounding community?

We strive to bring our customers the freshest and cleanest products and keeping it fresh on site can be challenging. In the past before we changed our fausits we had alot of waste.

Question 3: Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. Some of our customers and volunteers have shared concerns about feeling unwell when in the store for long periods. I am the lead that is here the most and I'm often nauseous, headaches are frequent, I get dizzy spells and get latargic after 2-3 hours in the store.

Question 4: Are you aware of any complaints, incidents or activities at the Site such as vandalism, trespassing, or emergency response from local authorities? If so, please provide details. The store was broken into 2 times this year.

Question 5: Do you feel well informed about the Site's activities and progress? last year the co-op was tested for air quality and I never heard about the results leaving me uneasy all this time not knowing if the air is what contributes to myself and our volunteers not feeling well.

Question 6: Do you have any comments, questions, or recommendations regarding the Site's management or operation? I would like to see more efforts on informing the community when we should be cautious whether it be because of contaminated water, air, soil.

INTERVIEW RECORD

Site Name: North Railroad Avenue Plume Superfund Site		**EPA ID #: NMD986670156**
Subject: Third Five-Year Review		**Time:** 10:30 AM **Date:** 11/23/19
Type: Email **Location of Visit: Española, NM**		
Contact Made By:		
Name: Mr. Mark Purcell	**Title:** **Remedial Project Manager**	**Organization:** **EPA Region 6**
Name: Mr. Angelo Ortelli	**Title: Project Manager**	**Organization: NMED**
Individual Contacted:		
Name: Mr./Ms. Gerald Friedman	**Title:**	**Organization:**
Telephone No: (505) 753-1946 **Fax No:** **E-Mail Address:** jerry_friedman@yahoo.com		**Street Address:** 125 N. Railroad, #3 Española, NM 87532

☑ **I consent to my questionnaire being included in the Third Five-Year Review.**

Comments

Question 1: What is your overall impression of the project? (general sentiment)

Don't know much. I hear things are worse than we've been told.

Question 2: What effects have the site operations had on the surrounding community?

Little good or bad.

Question 3: Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. No.

Question 4: Are you aware of any complaints, incidents or activities at the Site such as vandalism, trespassing, or emergency response from local authorities? If so, please provide details. No.

Question 5: Do you feel well informed about the Site's activities and progress?

No. Trying to understand why EPA is withdrawing funding when site isn't cleaned up.

Question 6: Do you have any comments, questions, or recommendations regarding the Site's management or operation? What chlorine compounds are left by bioremediation?
What will happen if EPA leaves?
Is EPA just trying to walk away from a failure?

INTERVIEW RECORD

Site Name: North Railroad Avenue Plume Superfund Site	**EPA ID #: NMD986670156**	
Subject: Third Five-Year Review	**Time:**	**Date:**
Type: Email **Location of Visit: Española, NM**		

Contact Made By:

Name: Mr. Mark Purcell	**Title:** **Remedial Project Manager**	**Organization:** **EPA Region 6**
Name: Mr. Angelo Ortelli	**Title: Project Manager**	**Organization: NMED**

Individual Contacted:

Name: Mr/(Ms) Isabel Becker-Hudson	**Title:**	**Organization:**

Telephone No: (505) 930-2318 **Fax No:** **E-Mail Address:**	**Street Address:** 1106 Camino Vuelta Española, NM 87532

☑ **I consent to my questionnaire being included in the Third Five-Year Review.**

Comments

Question 1: What is your overall impression of the project? (general sentiment)

I have limited knowledge, but I understand that the cleanup has not been successful and has been somewhat stalled.

Question 2: What effects have the site operations had on the surrounding community?

The agricultural hub that was to have been located in the old Hunter building and site has not moved forward because of continuing concerns with the plume. Certainly groundwater and irrigation water from the river is affected, contributing to health concerns.

Question 3: Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

Question 4: Are you aware of any complaints, incidents or activities at the Site such as vandalism, trespassing, or emergency response from local authorities? If so, please provide details.

No.

Question 5: Do you feel well informed about the Site's activities and progress?

Not at all.

Question 6: Do you have any comments, questions, or recommendations regarding the Site's management or operation?

More community outreach is needed and especially those in the effected area need to be informed.

INTERVIEW RECORD

Site Name: North Railroad Avenue Plume Superfund Site		EPA ID #: NMD986670156
Subject: Third Five-Year Review	Time:	Date: 11-23-19
Type: Email Location of Visit: Española, NM		

Contact Made By:

Name: Mr. Mark Purcell	Title: Remedial Project Manager	Organization: EPA Region 6
Name: Mr. Angelo Ortelli	Title: Project Manager	Organization: NMED

Individual Contacted:

Name: Mr. /Ms. Nina Zeleznikar	Title:	Organization:
Telephone No: 505-753-3976 Fax No: E-Mail Address: nina z@earthlink.net	Street Address:	16 Vereda Juanita Española, NM 87532

☑ I consent to my questionnaire being included in the Third Five-Year Review.

Comments

Question 1: What is your overall impression of the project? (general sentiment)

I am new to area and active in the Espanola community Market. I have noticed getting ill when in the store for more than a few minutes. I have experienced dizziness, flushing, heart palpitations

Question 2: What effects have the site operations had on the surrounding community?

Plume from spill has traveled South and has contaminated structures in its path. Proper clean up has not been done, and needs to be. I am also concerned about water supply in area

Question 3: Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

Yes. Community is concerned about incomplete remediation

Question 4: Are you aware of any complaints, incidents or activities at the Site such as vandalism, trespassing, or emergency response from local authorities? If so, please provide details.

Not aware

Question 5: Do you feel well informed about the Site's activities and progress?

Learning about it.

Question 6: Do you have any comments, questions, or recommendations regarding the Site's management or operation?

More testing needs to be done under structures and over wider area.

APPENDIX F – SITE INSPECTION CHECKLIST AND PHOTOS

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION

Site name: North Railroad Avenue Plume Superfund Site	**Date of inspection:** November 7, 2019
Location and Region: Espanola, New Mexico EPA Region 6	**EPA ID:** NMD986670156
Agency, office, or company leading the five-year review: New Mexico Environment Department (NMED)	**Weather/temperature:** Seasonally cool. Partly cloudy to overcast.

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Other EDR
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ (Name) _____ (Title) _____ (Date)
   Interviewed: ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached

2. **O&M staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed: ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached

3. **RD/RA consultant** _____ (Name) _____ (Title) _____ (Date)
   Interviewed: ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached

4. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency: Santa Clara Pueblo
Contact: Dino Chavarria | Environmental Director | 505-929-0934
Name | Title | Date Phone no.
Problems, suggestions; ☒ Report attached

Agency:
Contact:
Name | Title | Date Phone no.
Problems, suggestions; ☐ Report attached

Agency:
Contact:
Name | Title | Date Phone no.
Problems, suggestions; ☐ Report attached

Agency:
Contact:
Name | Title | Date Phone no.
Problems, suggestions; ☐ Report attached

5. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - ☐ O&M manual — ☐ Readily available — ☐ Up to date — ☒ N/A
   - ☒ As-built drawings — ☒ Readily available — ☐ Up to date — ☐ N/A
   - ☐ Maintenance logs — ☐ Readily available — ☐ Up to date — ☒ N/A

   Remarks: There are no routine treatment activities performed at the site that require reference to O&M documents. Applicable documents are retained at the NMED's office and are available to their contractors.

2. **Site-Specific Health and Safety Plan** — ☒ Readily available — ☐ Up to date — ☐ N/A
   - ☐ Contingency/emergency response plan — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks: There are no routine treatment activities performed on site. NMED and its contractors maintain SSHSPs that are updated for specific tasks. These plans are brought to the site with field teams rather than maintaining a single site copy.

3. **O&M and OSHA Training Records** — ☒ Readily available — ☐ Up to date — ☐ N/A

   Remarks: Training records are maintained at NMED and contractor offices.

4. **Permits and Service Agreements**
   - ☐ Air discharge permit — ☐ Readily available — ☐ Up to date — ☒ N/A
   - ☐ Effluent discharge — ☐ Readily available — ☐ Up to date — ☒ N/A
   - ☒ Waste disposal, POTW — ☒ Readily available — ☐ Up to date — ☐ N/A
   - ☒ Other permits: See below — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks: Access agreements, NMDOT ROW permits, and OSE permits are current. The documentation is maintained at the NMED office in Santa Fe. Arrangements with the local POTW are made for periodic discrete discharge of treated water to the sewer.

5. **Gas Generation Records** — ☒ Readily available — ☐ Up to date — ☐ N/A

   Remarks: Indoor air quality and methane in confined spaces are periodically measured to ensure public safety. Records of gas monitoring are maintained at the NMED's office in Santa Fe.

6. **Settlement Monument Records** — ☐ Readily available — ☐ Up to date — ☒ N/A

   Remarks:

7. **Groundwater Monitoring Records** — ☒ Readily available — ☐ Up to date — ☐ N/A

   Remarks: Groundwater monitoring and sampling results and records are maintained at the NMED office in Santa Fe. A database of groundwater well construction details, and groundwater elevation and quality results is maintained by the NMED.

8. **Leachate Extraction Records** — ☐ Readily available — ☐ Up to date — ☒ N/A

   Remarks:

9. **Discharge Compliance Records**
   - ☐ Air — ☐ Readily available — ☐ Up to date — ☒ N/A
   - ☐ Water (effluent) — ☒ Readily available — ☐ Up to date — ☐ N/A

   Remarks: Reports submitted to the OSE are available at the OSE or the NMED office in Santa Fe.

10. **Daily Access/Security Logs** — ☐ Readily available — ☐ Up to date — ☒ N/A

    Remarks: Field logbook entries are routinely maintained by the NMED and its contractors during execution of field work. There are no formal daily access or security logs maintained, as no active routine treatment activities are being performed at this time.

IV. O&M COSTS

1. **O&M Organization**

- [x] State in-house
- [x] Contractor for State
- [ ] PRP in-house
- [ ] Contractor for PRP
- [ ] Federal Facility in-house
- [ ] Contractor for Federal Facility
- [ ] Other

2. **O&M Cost Records**

- [ ] Readily available
- [ ] Up to date
- [ ] Funding mechanism/agreement in place

Original O&M cost estimate: $482,000 based on 2003 RD — [ ] Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	Breakdown attached
		See Appendix B	[ ]
			[ ]
			[ ]
			[ ]
			[ ]

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons:

V. ACCESS AND INSTITUTIONAL CONTROLS [ ] Applicable [ ] N/A

A. Fencing

1. **Fencing damaged** [ ] Location shown on site map [x] Gates secured [ ] N/A

Remarks: Several cuts in the fencing at the hot spot enclosure were observed during the inspection. The cuts were on east side of the enclosure. See the attached photograph log from the site inspection. Fencing at biocurtain in good condition

B. Other Access Restrictions

1. **Signs and other security measures** [ ] Location shown on site map [ ] N/A

Remarks: Metal signs are mounted at the hot spot building and at the biocurtain building. . Buildings are locked. Well caps and remediation vaults are fitted with padlocks.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☐ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by) NA

Frequency

Responsible party/agency NM Office of the State Engineer maintains the temporary prohibition for permitting of domestic wells.

Contact	Name	Title	Date	Phone no.
	Ms. Jerri Pohl	Northern Rio Grande Manager	2/10/2010	(505) 827-6120

Reporting is up-to-date ☐ Yes ☐ No ☐ N/A

Reports are verified by the lead agency ■ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ■ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ■ No ☐ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ▣ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☐ No vandalism evident

Remarks Cuts in the hot spot enclosure fence.

2. **Land use changes on site** ☐ N/A

Remarks The building of the former Norge Town Cleaners and several other buildings at the hot spot have changed use and occupancy. The structures have not changed on the outside. NMDOT has notified NMED of planned roadway improvements in the vicinity of R-29 Flute well.

3. **Land use changes off site** ☐ N/A

Remarks There have not been any significant developments or land use changes that have impacted existing infrastructure (e.g. groundwater monitoring wells).

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ▣ Roads adequate ☐ N/A

Remarks

B. Other Site Conditions

Remarks

VII. LANDFILL COVERS ☐ Applicable ▣ N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ▣ N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☒ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A
   Remarks: Remediation equipment is all currently existing and unused; however, the NMED/EPA have impending plans to decommission remediation system infrastructure and only retaining groundwater monitoring wells.

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☒ Good condition ☐ Needs Maintenance
   Remarks: Existing remediation infrastructure exists much as it had when installed. The groundwater circulation infrastructure has not operated as designed for some time. Periodic injections of EVO have occurred in the hot spot and source areas.

3. **Spare Parts and Equipment**
   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks: The remediation system is inoperable and is scheduled for decommissioning. No spare parts are needed.

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps, and Electrical**
   ☐ Good condition ☐ Needs Maintenance
   Remarks:

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐ Good condition ☐ Needs Maintenance
   Remarks:

3. **Spare Parts and Equipment**
   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks:

C. Treatment System ☒ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal ☐ Oil/water separation ☒ Bioremediation
   ☐ Air stripping ☐ Carbon adsorbers
   ☐ Filters
   ☒ Additive (*e.g.*, chelation agent, flocculent) EVO amendment and nutrient mix
   ☐ Others
   ☐ Good condition ☐ Needs Maintenance
   ☐ Sampling ports properly marked and functional
   ☐ Sampling/maintenance log displayed and up to date
   ☐ Equipment properly identified
   ☒ Quantity of groundwater treated annually: Treatment is in-situ, not quantifiable
   ☐ Quantity of surface water treated annually:
   Remarks: Periodic injection of EVO into source area/hot spot shallow aquifer where back diffusion is occurring.

2. **Electrical Enclosures and Panels** (properly rated and functional)
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks

3. **Tanks, Vaults, Storage Vessels**
☐ N/A ☒ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
Remarks Mixing tanks in the buildings are lightly used. The DNAPL separator is no longer used. Other containers are mobile for temporary use at the site.

4. **Discharge Structure and Appurtenances**
☒ N/A ☐ Good condition ☐ Needs Maintenance
Remarks

5. **Treatment Building(s)**
☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks The utilities to the buildings are no longer providing service. The buildings are now used only for storage and staging during groundwater monitoring, site investigation, or other reclamation activities.

6. **Monitoring Wells** (pump and treatment remedy)
☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☒ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks

D. Monitoring Data

1. Monitoring Data
☒ Is routinely submitted on time ☒ Is of acceptable quality

2. Monitoring data suggests:
☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☒ N/A
Remarks An MNA assessment was completed in 2019, which suggested that natural attenuation was occurring in some hydrostratigraphic units at the site.

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

Enhanced bioremedation of the shallow aquifer was executed to reduce COC concentrations to compliance levels. The RA for the shallow plume has been executed with expected results. There are isolated areas where back diffusion is occurring in the source area and hot spot that are being addressed with occasional discrete applications of carbon substrate to enhance reductive dechlorination of COCs. The areas where residual contamination occurs is in the tighter geologic units in the bottom of the shallow aquifer intervals. There is no longer a need to operate the installed remediation systems as designed. Future actions will need to target indicated areas and the plume in the deeper zones.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Routine O&M does not occur at this site, as the remediation systems are no longer being operated. Periodic spot applications are followed by focused groundwater monitoring. Routine compliance groundwater monitoring is also being conducted.

After application of carbon substrate into injection wells, clean water is flushed into these wells to mitigate biofouling.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

The next large expenditure planned for the site is the decommissioning of the remediation systems installed at the source area/hot spot and the biocurtain. Additional aggressive targeting of sources of back diffusion in the source area and injection of amendments into the deep zone aquifer are also being planned.

These isolated injection events in the source area require drilling and other capital expenditures.

Enhancements to the ERD remedy in the SA/HS and deep zone are being evaluated.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Photo 1: Biocurtain Building. Photo looking north.

Photo 2: Biocurtain remediation well located southeast of La Cocina restaurant. Photo looking west.

Photo 3: Biocurtain remediation well located south of La Cocina restaurant. Photo looking west.

Photo 4: Biocurtain remediation well located southwest of La Cocina restaurant. Photo looking west.

Photo 5: Biocurtain remediation well located east of La Cocina restaurant. Photo looking east.

Photo 6: Hot Box over the backflow preventer installed on the water line that formerly serviced the Source Area/Hot Spot (SA/HS) building. Photo looking northeast. Note that bollards protected the box from damage.

Photo7: Section of Fence on east side of the SA/HS enclosure that was cut by vandals and temporarily repaired with bailing wire. Photo looking west, DNAPL separator and building in background.

Photo 8: Existing (unrepaired) hole cut in the SA/HS Fence in the northeast end of the enclosure. Photo looking east.

Photo 9: Interior of the SA/HS building, showing overhead conveyance pipe and conduit (looking south).

Photo 10: Tanks, DNAPL separator, and building inside of the SA/HS enclosure. Photo looking west.

Photo 11: Interior of SA/HS building looking east from roll-up door entrance.

Photo 12: Placarded SVE/hydrogen storage enclosure on south side of SA/HS building. Photo looking west.

Photo 13: Existing unused injection pump in the SA/HS building. Photo looking southeast.

Photo 14: Normally locked access gate and SA/HS building. Photo looking east-southeast. Note location of hole in the fence (at white tote) that is shown in Photo 8.

Photo 15: South side of the SA/HS building and enclosure. Photo looking northwest.

Photo 16: Tanks and SVE enclosure on the south side of the SA/HS Building. Photo looking north-northeast.

Photo 17: Southwest corner of the SA/HS Building, looking northeast.

Photo 18: Interior (SE corner) of the SA HS building. The hydrogen injection system is shown in the center of the photograph. Photo looking southeast.

Photo 19: Southeast corner of SA/HS building. Note mixing tanks and mixers. Photo looking southeast.

Photo 20: SA/HS building interior. Note injection and extraction manifolds mounted on the walls. The boxes in the corner contain auto samplers from the unexecuted SEAR. Photo looking south-southwest.

Photo 21: SA/HS building and enclosure with Source Area remediation and monitoring well vaults in the foreground. Photo looking northeast.

Photo 22: From left, manifold, SCADA cabinet with HMI panel, and breaker boxes/pump control cabinets in the SA/HS building. Photo looking west.