FOURTH FIVE-YEAR REVIEW REPORT

29TH and MEAD GROUNDWATER CONTAMINATION SITE

WICHITA, KANSAS

Prepared by

U.S. Environmental Protection Agency
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List of Abbreviations and Acronyms

AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
cis-1,2-DCE	*Cis*-1,2-dichloroethene
trans-1,2-DCE	*Trans*-1,2-dichloroethene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
EPA	U.S. Environmental Protection Agency
EUC	Environmental Use Covenant
FS	Feasibility Study
ft.	feet
FYR	Five Year Review
IC	Institutional Control
KDHE	Kansas Department of Health and Environment
MCL	Maximum Contaminant Level
ND	Non-Detect
NIC	North Industrial Corridor
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&M	Operations and Maintenance
OU	Operable Unit
PCE	Tetrachloroethene
PRP	Potentially Responsible Party
RA	Remedial Action
RAOs	Remedial Action Objectives
RD	Remedial Design
RI	Remedial Investigation
RML	Removal Management Level
ROD	Record of Decision
RO	Responsible Party
SLERA	Streamlined Ecological Risk Assessment
SVE	Soil vapor extraction
TCE	Trichloroethene
VI	Vapor intrusion
VOC	Volatile Organic Compound
$\mu g/m^3$	Micrograms per cubic meter
µg/kg	Micrograms per kilogram
µg/L	Micrograms per liter
UU/UE	Unlimited use and unrestricted exposure

1.0 INTRODUCTION

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

The U.S. Environmental Protection Agency has prepared this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, 42 U.S.C. § 9621, consistent with the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. §300.430(f)(4)(ii), and considering EPA policy.

This is the fourth FYR for the 29th and Mead Groundwater Contamination Site (Site). The triggering action for this statutory review is the signature date of the Third FYR, September 21, 2015. The FYR has been prepared because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE). Although the Site consists of six Operable Units (OUs), only the Coleman Operable Unit (OU2) is addressed in this FYR. OU2 addresses contamination associated with the former Coleman property. The five OUs that are not addressed in this FYR are part of the North Industrial Corridor (NIC, discussed below) which is managed by the city of Wichita, Kansas, and the Kansas Department of Health and Environment (KDHE).

This FYR for OU2 of the Site was led by Clint Sperry, EPA Region 7. Additional EPA Region 7 participants included Todd Phillips, human health risk assessor; Catherine Wooster-Brown, ecological risk assessor; Jessica Kidwell, hydrogeologist; Kristen Nazar, attorney; and Ben Washburn, community involvement coordinator. The KDHE participants included Austin Clapp, Superfund Unit Manager; and Joe Dom, Superfund Section Chief. A public notice of FYR initiation was posted in November 2019; relevant entities, including the potentially responsible parties (PRPs), were notified directly. The review began on November 19, 2019.

Site Background

The Site is located in north central Wichita, Sedgwick County, Kansas. The Site, a 1,440-acre industrial area, is located in the north central part of the NIC. The NIC is an area of mixed industrial, commercial, residential, recreational, and agricultural properties that extends over 4,000 acres in north central Wichita. A long history of industrialization has left a legacy of volatile organic compounds (VOCs) and other contaminants in soil and groundwater throughout the area, including chlorinated solvents such as tetrachloroethene (PCE), trichloroethene (TCE), and carbon tetrachloride; petroleum hydrocarbon-related compounds; and others.

The Site was officially listed on the Superfund National Priorities List (NPL) on February 21, 1990. In 1994, the city of Wichita filed a petition requesting that the EPA reopen the record for the NPL listing process to have the Site deleted. The requested delisting occurred in April 1995, on the condition that the city and KDHE enter into an agreement requiring the city to ensure cleanup of the Site. The city and KDHE signed an Administrative Order on Consent (AOC) in October 1995, under which the city is responsible for addressing site-wide groundwater contamination, and the parties responsible for causing the contamination retain responsibility for addressing contamination source areas. The boundaries of the Site were expanded to include additional source areas and the Site was renamed as the North Industrial Corridor. (Site boundaries of the NIC are shown in Appendix B.) Deletion of the Site from the NPL was

proposed (61 Fed Reg. 3365), and the comment period closed on March 1, 1996. The Site was deleted from the NPL by Federal Notice dated April 29, 1996, (61 Fed. Reg. 18684).

Prior to the site deletion, the EPA took response actions at OU2, which triggered the requirement for this FYR. The other OUs did not have CERCLA response actions implemented and will not be discussed or reviewed in this document. Once all of the PRPs have completed their source area investigations for the areas deleted from the NPL, a final sitewide groundwater remedy (including OU2) will need to be completed; at that time, the CERCLA FYR may include a review of other OUs at the Site.

OU2

OU2 is occupied by Johnson Controls, Inc. (JCI) at 801 East 37th Street North, and by Airxcel (formerly known as Recreational Vehicle [RV] Products, Inc.) at 3010 North Mead Street. The southern boundary of OU2 is approximately 300 feet south of East 30th Street North. (See Appendix C for a site location figure.)

The OU2 property has been used primarily for industrial purposes since 1887. Early operations included the manufacture of railway cars, automobiles, light aircraft, and electronically-controlled aircraft. The Coleman Company purchased the property in 1947 and started the manufacture of household furnace and air conditioning units in 1949. Since then, York and RV Products, Inc. purchased portions of the property. Current property ownership resides with New Coleman Holdings, Inc. (NCH).

OU2 remains an industrial use facility and is surrounded by other industrial facilities, such as a cardboard box manufacturer, a meat packing facility, a structural concrete manufacturer, grain elevators, a chemical manufacturing company, railroad tracks, a petroleum products packaging facility, and the location of a former metals fabricating company. There have been no homes in this industrial area for more than 50 years, and land use is expected to remain industrial for the foreseeable future.

The groundwater remedy is an interim remedy since it is part of a larger contaminant plume. The final groundwater remedy will be completed once the remedial actions are completed at the other OUs.

History of the NIC Site

The EPA negotiated a Consent Decree with the Coleman Company, Inc.; Evcon, Inc.; and RV Products, Inc. for OU2. The Consent Decree was entered in the federal district court for the district of Kansas in February 1994. The EPA is the lead agency for OU2.

In 1994, the city of Wichita filed a petition requesting that the EPA reopen the record for the NPL listing process to have the Site deleted. The requested delisting occurred in April 1995, on the condition that the city and KDHE enter into an agreement requiring the city to ensure cleanup of the Site. The city and KDHE signed an Administrative Order on Consent (AOC) in October 1995, under which the city is responsible for addressing site-wide groundwater contamination, and the parties responsible for causing the contamination retain responsibility for addressing contamination source areas. The boundaries of the Site were expanded to include additional source areas, and the Site was renamed as the North Industrial Corridor (NIC). (Site boundaries of the NIC are shown in Appendix B.) Deletion of the Site from the NPL was proposed (61 Fed Reg. 3365) and the comment period closed on March 1, 1996. The Site was deleted from the NPL by Federal Notice dated April 29, 1996, (61 Fed. Reg. 18684).

Under the 1995 AOC, the city of Wichita is responsible for conducting a site-wide Remedial Investigation (RI), a Feasibility Study (FS), developing a Remedial Design (RD), and implementing the chosen Remedial Action (RA) to address site-wide groundwater contamination. The parties responsible for causing the contamination retained responsibility for addressing contamination source areas.

In December 2006, KDHE approved the RI and RI Addendum, and in March 2007 approved the Baseline Risk Assessment for the Site. In August 2011, KDHE approved the city's Site-Wide Groundwater FS which evaluated remedial alternatives for the Site. On March 28, 2012, a Corrective Action Decision was approved which identifies the various sources and responsible parties (RPs), and provides an interim remedy for the site-wide groundwater plume. Below is a list of the NIC RPs and the status of implementation of their respective soil and groundwater remedies. Three of the RPs have source areas that are still being investigated and the remedy has not begun. Eleven of the RPs have remedies that are currently being implemented, and eight RPs have remedies that have met their Remedial Action Objectives (RAOs).

- Aero Space Controls - Interim Remedial Measures: excavation, barrier at base of excavation, long-term monitoring, needs environmental use covenant (EUC). (This Site does not have a formal Consent Order.);
- Apex Engineering - Corrective Action Study Phase with IRM pilot test in progress with air stripper/soil vapor extraction (AS/SVE);
- Barnsdall Refinery - Corrective Action Study Phase
- Brenntag Southwest, Inc. - Excavation, chemical oxidation injections. Closed with restrictions;
- Burlington Northern RR - Corrective Action Study Phase;
- Cargill Flour Milling - Corrective Action Phase: two permeable reactive barriers were installed, long-term monitoring;
- Coastal Boneyard - EUC and monitoring, then closed with restrictions;
- Coastal Derby Refinery - Corrective Action Phase: multi-phase extraction, excavation, interceptor trenches/groundwater recovery, long-term monitoring, EUC and soil-waste management plan;
- Coleman Northeast - Corrective Action Phase: soil shredding (excavation, treatment, returned to excavation), EUC, hydraulic containment with air stripper, enhanced reductive dechlorination;
- Farmland Elevator W - excavation, bankrupt site with trust fund, funds were depleted so transferred to Orphan Sites Program;
- Golden Rule Refinery - will close with restrictions after EUC is revised and has been filed with the county;
- Johns Sludge Pond - excavation/removal, liner, monitoring - overseen by EPA's Emergency Response Branch, closed with restrictions;
- Kansas Plating - Corrective Action Study phase;
- Novick Iron & Metal - Excavation and EUCs completed, closed with restrictions;
- Safety-Kleen/Clean Harbors (overseen by EPA's RCRA Corrective Action program);
- Unocal - Corrective Action Phase: phytoremediation, monitored natural attenuation, enhanced reductive dechlorination, EUCs;
- USD 259 - Corrective Action Phase: permeable reactive barriers, enhanced in situ bioremediation, monitored natural attenuation, excavation, EUCs;
- Van Waters & Rogers North – Closed;
- Via Christi - excavation, EUCs. Closed with restrictions;
- VIM Trailer - Corrective Action Study Phase with IRM pilot test in progress (AS/SVE);

- Waco Handi Wash – Dry cleaning Program; and
- Western Uniform – Closed.

The NIC Site has completed the RA Design Phase and is currently initiating implementation of the following remedial actions:

- Remedial Design Report (7/17/2018)
- Monitored Natural Attenuation Study for GWU-1 (10/1/2018)
- Monitoring and Performance Evaluation Work Plan for GWU-1 (9/2018)
- Monitoring and Performance Evaluation Work Plan for GWUs 2, 3, 4 (4/1/2019)

Once all the RPs have completed their source area investigations, a final sitewide groundwater remedy (including OU2) will need to be completed. A Record of Decision (ROD) amendment for OU2 will also need to be completed. Once the amended ROD becomes final, a Preliminary Close-Out Report will need to be written, which will then allow the entire 29th and Mead site to become Construction Complete and reach the Site-Wide Ready for Anticipated Use status. The remainder of this FYR focuses solely on OU2.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: OU2 (also known as the Coleman OU) of the 29th and Mead Superfund Site		
EPA ID: KSD007241656		
Region: 7	**State:** KS	**City/County:** Wichita/Sedgewick
SITE STATUS		
NPL Status: Deleted		
Multiple OUs? Yes	**Has the site achieved construction completion?** No	
REVIEW STATUS		
Lead agency: EPA		
Author name (Federal or State Project Manager): Clint Sperry		
Author affiliation: EPA		
Review period: 9/22/2015 – 8/28/2020		
Date of site inspection: 11/19/2019		
Type of review: Statutory		
Review number: 4		
Triggering action date: 9/21/2015		
Due date *(five years after triggering action date)*: 9/21/2020		

2.0 RESPONSE ACTION SUMMARY

2.1 Basis for Taking Action

The EPA, the U.S. Geological Survey, and KDHE began investigating groundwater contamination in the 29th and Mead area in 1983. These investigations revealed the presence of several VOCs including TCE, carbon tetrachloride, toluene, benzene, ethylbenzene, methylene chloride, trans-1,2-dichloroethene (trans-1,2-DCE), cis-1,2- dichloroethene (cis-1,2-DCE), vinyl chloride, and 1,1,1-trichloroethane (TCA). In May 1987, several water samples were collected at the Coleman facility from the effluent of cooling water sourced from two on-site industrial water wells. The results of this sampling included elevated levels of TCE, TCA and 1,1-dichloroethene (1,1-DCE). These results prompted an investigation at OU2 to determine the source, magnitude and extent of these contaminants.

Successive investigations conducted between 1987 and 1991 supported the completion of a RI/FS, and included soil sampling, monitoring well installation and sampling, soil gas surveys, soil ventilation tests, aquifer pumping tests, aquifer sparging tests, and pilot tests. These investigations identified several potential VOC source areas at the Coleman facility, including degreaser pits and general areas located in both the north and south fields of the OU2 property. The primary soil contaminants and their associated concentration ranges were: TCE at non-detect (ND) to 13,000 micrograms per kilogram (µg/kg); 1,1,1-TCA from ND to 6,100 µg/kg; PCE from ND to 41 µg/kg; cis-1,2-DCE from ND to 370 µg/kg; and toluene from ND to 140,000 µg/kg (EPA, 1992). The primary groundwater contaminants and their associated concentration ranges were: TCE from ND to 15,000 micrograms per liter (µg/L); TCA from ND to 3,500 µg/L; PCE from ND to 100 µg/L; cis-1,2-DCE from ND to 2,500 µg/L; 1,1-DCE from ND to 1,110 µg/L; and vinyl chloride from ND to 250 µg/L (EPA, 1992).

A baseline risk assessment completed in November 1991 assessed potential non-carcinogenic and carcinogenic risks posed by identified contaminants in the various environmental media at OU2. The baseline risk assessment identified 22 organic contaminants of concern (COCs), with 1,1-DCA, 1,1-DCE, 1,2-DCE, TCE, and PCE contributing the most significant impact. Primary release mechanisms included discharge of contaminants to surface soils, leaching from soil to groundwater, and volatilization of contaminants to air. Significant exposure scenarios included ingestion of groundwater, inhalation of volatiles, and ingestion of soils. Additionally, under future conditions, the baseline risk assessment identified potentially significant risks to human populations using groundwater at OU2 as a drinking water source (EPA, 1992).

Based on an issue identified in the Third FYR Report, it was determined that a Streamlined Ecological Risk Assessment (SLERA) needed to be completed for the Wichita Drainage Ditch to supplement the results of the 1991 Baseline Risk Assessment. In October 2016, a SLERA was conducted to evaluate the potential impacts on surface water (ecological receptors) related to contamination in OU2 groundwater. The SLERA determined that site COCs (TCE, 1,1,1-TCA, PCE, cis-1,2-DCE, 1,1-DCE, vinyl chloride) and toluene in groundwater are not expected to adversely impact surface water aquatic biota or area wildlife that may consume surface water.

2.2 Response Actions

In 1988, before the RI/FS was initiated, Coleman and KDHE agreed that a groundwater recovery and treatment program and soil vapor extraction (SVE) program should be designed and implemented to control further migration of contaminants from OU2. The SVE system became operational in 1988, had 62 extraction points located in the northern section of the Site, and treated contaminated soils in a

65,000 square-foot area. The groundwater treatment system consisted of an industrial production well, one recovery well and two column air strippers. This system discharged to the Wichita Drainage Canal under a National Pollutant Discharge Elimination System (NPDES) permit.

A ROD for OU2 was signed by the EPA in 1992. Remedy selection was based on the following RAOs:

- Prevent on-site ingestion of contaminated groundwater that would exceed respective Maximum Contaminant Levels (MCLs) or Kansas Action Levels (KALs) for individual contaminants.
- Prevent off-site migration of contaminated groundwater that would exceed respective MCLs or KALs for individual contaminants.

The ROD further states that the preferred alternative will address contamination by restoring groundwater to acceptable quality (MCLs or KALs) through the extraction and treatment of contaminated groundwater. The ROD also states that the selected remedy will reduce the threat of continued contamination of the groundwater from soil source areas by SVE technology.

Major components of the selected remedy, as described by the ROD, are:

- Enhancement of the existing groundwater extraction and treatment system by the addition of a withdrawal well on the south boundary of the OU connected to the existing groundwater treatment system;
- Monitoring of the groundwater collection/treatment system and groundwater contaminant plume during groundwater remediation activities;
- Expansion of the existing SVE system to remediate other source areas within the OU;
- Monitoring of the SVE system to determine performance and establish its maximum attainable goals; and
- Monitoring of the emissions from the groundwater treatment system and the SVE system to ensure the health and safety of on-site personnel and to determine whether additional treatment of emissions is necessary.

The ROD states that the selected remedy represents an interim remedy with respect to groundwater because the plume of contaminated groundwater at OU2 has merged with the contaminated groundwater from other sources in the 29th and Mead Site. Therefore, the final remedy for the 29th and Mead Site will include the groundwater in OU2.

The ROD further states that the SVE remedy is a final remedy for the contaminated soils. The performance criteria for the expanded SVE system will be developed during the RD, and the operating life of the selected alternative is 18 years.

2.3 Status of Implementation

Soil Remedy

The selected soil remedy called for expansion of the existing SVE system to remediate other source areas within the OU, as well as monitoring of SVE system performance and emissions. Cleanup criteria for the COCs were established by soil type, using a leachate model developed during the RD (Appendix D, Table 4).

At the time of the ROD, the existing SVE system had been installed in 1988 as part of an agreement between Coleman and KDHE to control further migration of contaminants from OU2. This North Field SVE system had 62 extraction points located in the northern section of the Site which treated contaminated soils in a 65,000 square-foot area. This SVE system operated through August 25, 1996, when it was decommissioned after having removed an estimated 8,990 to 14,323 pounds of VOCs (EPA, 2000).

Based upon data from site investigations and predesign data acquisition, ten additional SVE systems were designed for installation at Sumps 1 through 9 and the South Field. The SVE systems were designed to address areas requiring remediation in each source area. Each SVE system had one to three extraction wells, except Sumps 4 and 5, which relied on the existing horizontal SVE pilot well. Vapor monitoring points were installed at each SVE system to monitor system performance. Construction of the SVE systems was initiated on March 9, 2000 and completed on May 3, 2000. The systems were started on May 15, 2000. No vapor emissions control equipment has been required.

The SVE systems that addressed Sumps 1 through 9 were decommissioned in June 2006 after achievement of RD objectives was demonstrated, and the EPA provided approval in correspondence dated May 25, 2006. These SVE systems removed an additional 2,092 pounds or more of VOCs (Shaw, 2006).

The South Field SVE system remains in place and consists of one blower, two vapor extraction wells (VEW-SFW, VEW-SFE), and two vapor monitoring points, which monitor vacuum at two depths (SF-VMP-W-D, SF-VMP-W-S; SF-VMP-E-D, SF-VMP-E-S). Figure 3 in Appendix C depicts the location of the South Field SVE system. The operational area of treatment within the effective radius of influence is approximately 70 by 150 feet (IT Corporation, 1999). Operation of the South Field SVE system was discontinued in October 2014 when electrical issues, followed by incorrect installation of a new power drop and blower failures, prevented operation (Aptim, 2017). The South Field SVE system has been returned to operation as of January 16, 2020.

Interim Groundwater Remedy

When the ROD was signed, the groundwater treatment system consisted of an industrial production well, one recovery well (RW-1), and two column air strippers. The primary objective of the RD/RA for the interim groundwater remedy was to design and install an additional recovery well to enhance hydraulic control at the southern boundary of OU2, ensure the system is providing hydraulic control, and ensure that the recovered groundwater is being adequately treated prior to discharge.

An additional recovery well (RW-2) was constructed and completed October 14, 1996 (Appendix C, Figure 2 and Appendix I, Photos 15-17) at the southern boundary of the Site. The screened interval of the well extends from 21 to 41 feet below ground surface. System startup was in April 1997. At system startup, RW-2 operated at a pumping rate of approximately 90 gallons per minute (gpm), with the effluent discharged to air stripper AS-2. The treated effluent gravity flows to the Wichita Drainage Canal under Kansas NPDES Permit No. I-AR94-PO21.

A third recovery well (RW-3) was constructed and completed on February 19, 2016, to eliminate a possible stagnation zone between the South Industrial Well and RW-2. This was a recommendation from the last FYR due to the low hydraulic gradient present between the wells.

2.4 Institutional Controls Summary Table

No groundwater or soil institutional control (IC) is required by the 1992 ROD for OU2. The city of Wichita Municipal Code of Ordinances, Title 7, Chapter 7.30, Section 7.30.105 prohibits the installation of new and use of pre-existing water wells for personal use in contaminated areas (such as the Site). Continued enforcement of this ordinance will help ensure protection of human health until site cleanup is complete. All drinking water is supplied by the city of Wichita. All contaminated soil is located under buildings or concrete parking lots. Presently, there are no ICs or facility guidance/restrictions for working in contaminated areas.

Table 2-1: Summary of Planned and/or Implemented ICs

Media	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	No	OU2	Restrict the installation or use of groundwater wells within the Site for drinking purposes	City of Wichita Municipal Code of Ordinances, Title 7, Chapter 7.30, Section 7.30.105 12/19/2014
Soils	Yes	No	OU2	Restrict residential land use. Restrict soil disturbance. Require notice to construction worker. Restrict building construction.	

2.5 System Operations/Operation and Maintenance

2.5.1 SVE System

Operation

As noted above, the South Field SVE system remains in place, but operation was discontinued in October 2014 when electrical issues, followed by incorrect installation of a new power drop and blower failures, prevented operation (Aptim, 2017). During 2014 operations, photoionization detector readings ranged from 1.5 to 5.2 parts per million vapor, and removal was estimated at 0.9 to 3.53 pounds of total VOCs each month (SCS, 2020). Between May 2000 and October 2014, the South Field SVE system removed an estimated 2,312 pounds of VOCs (SCS, 2000). The South Field SVE system has been returned to operation as of January 16, 2020. (Table 2 in Appendix D provides tabulated performance data.) Further evaluation of the soil remedy in the South Field area will be necessary to determine whether operation of the SVE system should be continued, optimized, or decommissioned. (Appendix C Figure 3 depicts the location of the South Field SVE system.)

Maintenance

Routine system checks and operations and maintenance (O&M) activities have occurred throughout this FYR period (see table below).

2.5.2 Groundwater Extraction System

Operation

The groundwater extraction system operates full-time and currently consists of the Recovery Wells RW-2, RW-3, and air stripper AS-2. RW-1 was abandoned in 2008 in response to the EPA's identification of a stagnation zone downgradient of RW-1. At that time, the north air stripper was also abandoned and the pumping rates of the South Industrial Well and RW-2 were adjusted. Groundwater monitoring is conducted on a semiannual basis utilizing 44 groundwater monitoring wells.

RW-2 currently pumps at a rate of approximately 80 gpm and RW-3 has a rate of 120 gpm. Both wells discharge through AS-2 and gravity flows to the Wichita Drainage Canal. During this FYR period, reported monthly flow rates exhibited wide ranging variability, ranging from a low of 80 gpm to a high of 445 gpm. Calendar year 2017 experienced eight months where discharge rates were reported as being between 80 gpm and 129 gpm. (AS-2 flow rate data, as reported by the PRP in semiannual RD/RA reports, is provided in Appendix D, Table 3.)

A groundwater compliance program was developed and is described in the RD/RA Groundwater Monitoring Plan dated May 3, 1996. The purpose of the groundwater monitoring compliance program is to confirm hydraulic control of the groundwater contaminant plume. Two techniques are used for confirming hydraulic control: evaluation of water elevation data on and near OU2 to verify the direction of groundwater flow and the extent of hydraulic control exerted by the operating recovery wells; and collection of groundwater quality data from specified point-of-compliance wells along with a statistical assessment of the groundwater quality data to evaluate the effectiveness of the hydraulic control. Groundwater elevations are measured at all wells and samples collected from 26 wells for analysis of chlorinated VOCs and toluene.

The following wells were approved by the EPA on June 6, 2018, to be removed from semi-annual and annual gauging and sampling: MW-08, MW-15, MW-16, MW-17, MW-20, MW-24, MW-30, MW-32, MW-36, MW-40, MW-41, MW-43, MW-45, MW-47, MW-51, MW-52, MW-54, MW-69D, MW-69S, MW- 70D, VEW-05D, VEW-22D. MW-49, MW-50, VEW-13D, and VEW-21D. The city of Wichita has granted access to SCS Engineers, consultant to New Coleman Holdings, to gauge and sample WNC-23D during semi-annual events. This well is located to the southeast of the property and addresses a data gap identified in the previous FYR.

A total of seven pairs of monitoring wells serve as point-of-compliance wells for the shallow and deep portions of the aquifer, respectively: MW-61/MW-62 and MW-45/MW-15 located at the western boundary of the property; MW-60/MW-59 located off site to the west of the property; MW-52/MW-51 located at the eastern boundary of the property; MW-68/MW-67 located at the southwestern boundary of the property; MW-47/MW-03F located at the southeast corner of the property; and MW-71S/MW-71D located at the western boundary of Airxcel (formerly RV Products, Inc.).

Air emissions at AS-2 are monitored semiannually for all site COCs. Influent and effluent VOC concentrations are monitored on a monthly basis in accordance with the requirements of Kansas NPDES Permit No. I-AR94-PO21. Results of this monitoring have all been below permitted levels.

Maintenance

No significant maintenance issues or malfunctions of the groundwater pump-and-treat system were observed during this FYR period. Maintenance of the groundwater pump-and-treat system has generally focused on replacing items subject to wear and tear such as belts, bearings, and flow meters. Routine system checks and O&M activities were performed during this same time period.

Monthly monitoring performance data was collected during system checks from the South Air Stripper-2 (AS-2). (Table 2 in Appendix D presents the effectiveness of removal and the air emission rates for AS-2.) During the second half of 2019, the effectiveness of removing TCE for AS-2 was approximately 100 percent. The calculated air emission rates for AS-2 were all less than 0.001 grams per cubic meter (g/m^3).

SVE and Air Stripper O&M		
Date	**O&M Performed On:**	**Description**
March-15	SVE	Repair electrical fault
September-15	SVE	Replace power supply lines; determined the SVE blower required replacement
December-15	Groundwater Recovery Wells	South Industrial well decommissioned due to screen failure
March-16	Groundwater Recovery Wells	RW-3 and piping completed and commissioned
October-16	SVE	New power drop installed
October-16	Monitoring Wells	Well head protection maintenance performed at the following wells: MW-03F, MW-12, MW-16, MW-17, MW-20, MW-26, MW-28, MW-29, MW-35, MW-36, MW-37, MW-38, MW-39, MW-43, MW-47, MW-51, MW-53, MW-54, MW-55, MW-56, WND-29S, WND-29D.
March-17	SVE	Westar power drop is incorrect, they are attempting repairs
March-17	Air Stripper	It was determined that the packing in the air stripper is fouled. Plans initiated to replace packing
June-17	SVE	Blower replaced
August-17	Air Stripper	Packing replaced, bearings replaced, chemical sequestering system moved to exterior location and winterized
September-18	Air Stripper	Leaking line (post-treatment) repaired by JCI
2019	Air Stripper	Adjust belts and bearings

2.5.3 Vapor Mitigation Systems

At Building 14, a sub-slab depressurization system was installed in July of 2019. Results from several vapor intrusion (VI) sampling events show TCE levels of the indoor air are below the Removal Management Level (RML) of 6 micrograms per cubic centimeter. No other site COC was detected at a concentration above an RML that could not be attributed to on-site use of the compound.

At Building 12, the evaluation of indoor air remedial options is ongoing. Due to the size, infrastructure, and operations within this building, conventional sub-slab methods were determined not to be viable. Research of historical building diagrams found that this building is the amalgamation of four different buildings, constructed at different times, and the configurations of the building's footers and utilities are unknown. Working with JCI, NCH discovered a system of drain lines crossing the

building from east to west, spanning the full length of the building, that are no longer used. The design of the drains and associated piping suggested they might be suitable components of a viable vapor system.

The drain lines were thoroughly purged of obstructions and a smoke test was performed to determine the viability of pulling a vacuum on the drain lines to remove the contaminated soil vapors from beneath the slab. All tested lines provided positive evidence of the feasibility of using the drain lines for depressurizing the sub-slab. Vacuum pumps were installed on the roof of Building 12 to pull vacuum on the drain lines under the floor of the building. This effort reduced concentrations of TCE in indoor air to less than the RML of 6 micrograms per cubic meter ($\mu g/m^{3)}$, except at one location over the most concentrated portion of the subsurface contamination plume. After additional perforations were made in this drain line to remove additional soil vapors trapped beneath the slab, indoor air results dropped below the RML of 6 $\mu g/m^3$. No other site COCs were detected at levels above their RMLs. Additional quarterly monitoring will be conducted to verify this result.

3.0 PROGRESS SINCE LAST REVIEW

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

Table 3-1: Protectiveness Determinations/Statements from the 2015 FYR

OU #	Protectiveness Determination	Protectiveness Statement
2	Protectiveness Deferred	The protectiveness of the remedy at OU2 cannot be determined at this time until further information is obtained. Further information will be obtained by the PRP producing and implementing a work plan for assessing VI and by implementing an appropriate VI monitoring program. It is expected that these actions will take approximately 6 to 12 months to complete, at which time a protectiveness determination will be made.

Table 3-2: Status of Recommendations from the 2015 FYR

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date
2	High TCE concentrations in relatively shallow groundwater beneath occupied buildings present a potential risk to building occupants from VI.	That a work plan be produced and implemented for assessing VI, and that an appropriate VI monitoring plan be implemented.	Completed	Based on the results of multiple historic sampling events, VI mitigation and mitigation verification activities are required at two JCI buildings (Buildings #12 and #14). A functional sub-slab depressurization system was installed in Building #14 in July 2019. Subsequent indoor sampling shows that the TCE concentrations previously observed are now below the RML. A depressurization system for Building #12 was installed March 2020. The first round of sampling showed TCE levels below the RML.	Completed
2	1,4-dioxane is indicated to potentially be present at the Site and has not been monitored.	The PRP needs to include 1,4-dioxane in their sampling and analysis plan.	Completed	While not added to the SAP, semi-annual groundwater monitoring since 2016 shows 1,4-dioxane below detection levels in all wells.	Began in 2016 and continues semi-annually
2	The monitoring well network in the deeper aquifer may be insufficient to evaluate groundwater pump-and-treat system capture.	Additional monitoring wells should be installed downgradient of RW-2.	Completed	The city of Wichita has monitoring wells immediately south of RW-2. SCS Engineers, consultant to New Coleman Holdings, has requested access, and those wells are now included in the monitoring program.	October 2018
2	Incomplete ecological risk assessment for the Site.	Complete BRA for the Site.	Completed	After further discussion with the EPA, a SLERA was required for OU2 only. In October 2016, a SLERA was conducted to evaluate the potential impacts on surface water (ecological receptors) related to contamination in site groundwater. The SLERA determined that groundwater contaminants did not adversely impact receiving surface water bodies.	12/16/16

2	Stagnation zone appears to be present between the South Industrial Well and RW-2 due to the low hydraulic gradient present between the wells.	Assess whether there is a stagnation zone between the South Industrial Well and RW-2.	Considered and not Implemented	The South Industrial Well has been replaced by RW-3, thus eliminating this concern.	2/19/16
2	Possible accumulation of silt/sediment within the two extraction wells that could limit the effectiveness of the extraction system.	Periodically check if there is accumulation of silt/sediment within the two extraction wells that could limit the effectiveness of the extraction system.	Completed	RW-3 is new. RW-2 continues to be monitored and evaluated for efficiency by flow rate changes.	2/19/16
2	Two flush-mounted monitoring wells are damaged and unable to be sampled.	Repair or properly abandon the two damaged flush-mounted monitoring wells.	Completed	Repairs to these wells and others were completed in June and July 2016.	July 2016

4.0 FIVE-YEAR REVIEW PROCESS

4.1 Community Notification, Involvement, and Site Interviews

4.1.1 Community Notification

A public notice regarding the initiation of the FYR was placed in the Wichita Eagle on November 25, 2019. The completed FYR report will be available at the site information repository at 711 West 2nd Street North, Wichita, Kansas 67203; the EPA Superfund Division Records Center, 11201 Renner Boulevard, Lenexa, Kansas 66219; and the KDHE office, Bureau of Environmental Remediation, Curtis State Office Building, 1000 SW Jackson Street, Suite 410, Topeka, Kansas 66612-1367. A copy of the public notice can be found in Appendix G.

4.1.2 Site Interviews

On November 19, 2019, Clint Sperry (EPA Project Manager), Jesse Kidwell (EPA Hydrogeologist), and Sean Hammersburg (KDHE Project Manager) met on site to conduct interviews with Kevin Hopkins (NCH Contractor) and Fred Wise (JCI Health and Safety Manager). Interviews were not conducted with the general public for this FYR since the EPA had not received any complaints or concerns from the public or businesses adjacent to the Site. None of the interviewees noted any concerns with historical remedy implementation at the Site, and all had a favorable overall impression of the project. Opportunities for improvements and optimization of the existing remedies were not noted.

4.2 Data Review

This FYR included a review of relevant information contained in a variety of site-related documents. The information review primarily focused on documents produced after September 2015 (start of the FYR time frame), but also included older information necessary for an adequate understanding of the site history. COC figures, tables, and trend charts are contained in Appendices C, D, and E, respectively.

Soil

As noted above, the South Field SVE system was not operational during most of the FYR period but was returned to operation as of January 16, 2020. Data will be reviewed during the next FYR period.

Groundwater

Multiple techniques are used to confirm hydraulic control of the groundwater contamination plume by the extraction system. Primarily, water levels are gauged to verify that groundwater is flowing toward the operating recovery wells, and groundwater quality data are collected and trends calculated to verify hydraulic control of groundwater contamination. Twenty-six monitoring wells - including three previously used SVE wells (VEW5D, 8D and 22D), two groundwater recovery wells (extraction wells), and two soil vapor recovery wells (part of SVE system) - are gauged and monitored twice per year. Wells are placed to evaluate capture at multiple depths.

Groundwater gauging confirms that groundwater is generally flowing toward the south, terminating at recovery well RW-2. The potentiometric surface map in Appendix C is a typical presentation of the site potentiometric surface. However, because RW-2 and adjacent monitoring well MW-53 are roughly 750 feet from the nearest monitoring well to the east (MW-47/MW-03F), and because elevated TCE concentrations are present in groundwater to the north central of these wells, an additional multi-level well cluster appears to be needed between these two well clusters to support verification of groundwater capture in this area.

Groundwater quality monitoring indicates TCE is the primary COC, with groundwater at multiple well locations exceeding the MCL of 5 µg/L during the FYR period, including multiple point-of-compliance wells (MW-03F, MW-15, MW-45, MW-59, MW-61, MW-62, MW-67, MW-68, MW-71D). During the FYR period, seven wells showed an upward trend in TCE concentration, 15 showed no trend, and six showed a downward trend. The wells showing an upward trend each had exceedances of the TCE MCL. All three vapor extraction wells VEW-5D, VEW-18D, and VEW-20D, show a stair-stepping upward trend. All three wells are in the shallow vadose zone and may indicate the presence of a continuing shallow soil source in the upgradient portion of the plume. MW-08 is considered a deep well in the upgradient portion of the plume and has shown variability in the past. The 2018 sampling showed TCE at 10,100 µg/L and the 2019 showed TCE at 18,800 µg/L. The depth and concentration of TCE at this well indicate a residual dense non-aqueous phase liquid source may be present. MW-41 is another deep, upgradient well with a slight uptrend. Elevated and increasing concentrations in these upgradient wells, especially considering the remedial timeframe of 18 years suggested in the 1992 ROD, suggest the need for further characterization to evaluate additional source control measures. Further downgradient and west of the central trajectory of the plume, MW-59 is a deep well that is showing a steady uptrend. MW-59 is one of multiple compliance wells with MCL exceedances on the western and southwestern boundaries of the Site. Additional characterization may be warranted to verify that the western and southwestern portions of the plume are fully captured downgradient. MW-67 is a deep well located in the south-central portion of the plume, upgradient of RW-2. Increases in this well likely reflect

migration of the core of the plume toward RW-2. Low or non-detect TCE concentrations at wells WND-29S/WND-29D, MW-47 and newly added WNC-23D further indicate significant capture by recovery well R-2. However, TCE concentrations at downgradient perimeter well MW-03F have shown no trend, but high variability with exceedance of the MCL (non-detect to 11.9 µg/L during the FYR period). Additional characterization may be warranted to verify plume capture in the vicinity of MW-03F.

TCE in Groundwater Results and Trends (reporting results for wells above MCL of 5 µg/L)				
Well ID	**Well Depth**	**2019**	**5-Year Range**	**5-Year Trend**
MW-03F*	40.3	11.9	<1 – 11.9	No Trend
MW-05F	37.46	14.4	14.4 – 24.8	Downward Trend
MW-08	**44.53**	**18,800**	**1,200 – 18,800**	**Upward Trend**
MW-12	42.85	29.1	17.9 – 191	No Trend
MW-15*	40.28	11.7	4.3 – 14.9	No Trend
MW-24	44.88	4.11	4.11 – 16	No Trend
MW-34	23.71	<1	<1 – 6.3	No Trend
MW-36	23.62	110	110 – 180	Downward Trend
MW-38	22.06	4.38	4.38 – 12	Downward Trend
MW-41	**24.50**	**12.1**	**7.3 – 15.5**	**Upward Trend**
MW-42	24.83	16.8	11 – 20	No Trend
MW-45*	45.05	4.52	4.8 – 12	Downward Trend
MW-46	22.86	127	11.4 – 250	No Trend
MW-47*	25.00	<1	<1 – 0.96 J	No Trend
MW-51*	44.85	NS	<1 –0.4 J	No Trend
MW-52*	25.49	NS	1.4 – 3.3	No Trend
MW-53	43.98	9.2	7.7 – 18.9	No Trend
MW-59*	**44.20**	**33.2**	**2.2 – 41.9**	**Upward Trend**
MW-60*	24.65	<1	<1 – <1	No Trend
MW-61*	26.67	20.1	56 – 97	Downward Trend
MW-62*	42.84	4.28	1.7 – 11	No Trend
MW-67*	**45.77**	**42.1**	**<1 – 42.1**	**Upward Trend**
MW-68*	23.25	7.89	7.89 – 133	No Trend
MW-69D	40.81	4.3	4.3 – 11	Downward Trend
MW-70D	44.74	7.86	2.1 – 7.86	No Trend
MW-70S	22.49	455	420 – 990	No Trend
MW-71D*	44.14	<1	<1 – 16	No Trend
MW-71S*	24.8	<1	<1 – 4.5	No Trend
Recovery Well 2	41.00	24.9	14 – 24.9	No Trend
Recovery Well 3	43.00	247	180 – 340	No Trend
Vapor Ext. Well 5D	**17.51**	**560**	**62 – 560**	**Upward Trend**
Vapor Ext. Well 18D	**18.43**	**4,110**	**3,800 – 8,500**	**Upward Trend**
Vapor Ext. Well 22D	**18.87**	**174**	**174 – 2,710**	**Upward Trend**

Note: * Point-of-compliance well

The remaining site COCs (1,1,1-TCA, PCE, cis-1,2-DCE, 1,1-DCE, and vinyl chloride) are all below their respective MCLs except for cis-1,2-DCE (see Appendix E). Monitoring wells MW-08, MW-70S, and VEW-22D were the only wells with cis-1,2-DCE detections above the EPA MCL of 70 µg/L. MW-08 shows an increasing trend from 2,100 to 5,040 µg/L over the last FYR period. MW-70S and VEW-20D show no discernable trend with concentrations ranging from 246 to 778 µg/L (the last result being 246 µg/L) over the same FYR period. As noted above, MW-08 and VEW-22D are within the upgradient portion of the plume; MW-70S is further downgradient.

During this FYR period the pumping configuration at OU2 was altered. Recovery well RW-3 was installed, and the South Industrial Well was idled. The RW-3 location was optimized to capture a significant portion of the most highly impacted water. Increases in concentrations at select wells are attributable to altered flow patterns in the subsurface as contaminant mass is pulled toward RW-3. Groundwater concentrations and flow patterns will continue to be monitored to verify that concentration trends stabilize and demonstrate capture, and to evaluate contaminant reduction rates and progress toward remedy completion.

To verify that extracted groundwater was treated to appropriate levels with acceptable air emissions, monthly monitoring performance data was collected during system checks of the South Air Stripper-2 (AS-2). Table 2 in Appendix D presents the effectiveness of removal efforts and the air emission rates for AS-2. During the second half of 2019, the effectiveness of removing TCE for AS-2 was approximately 100 percent. The calculated air emission rates for AS-2 were all less than 0.001 g/m^3. No vapor emissions control equipment was required.

Vapor Intrusion

In response to issues identified in the previous FYR, multiple phases of VI investigation were completed to evaluate whether high TCE concentrations in relatively shallow groundwater beneath occupied buildings present a potential risk to building occupants. Vapor intrusion sampling has been completed every year from 2016 to 2020. Initial laboratory results associated with Buildings 4, 5, 10, 11, 12, and 14 exceeded the TCE RML of 6 $\mu g/m^3$ for indoor air in a commercial/industrial building (8-hour shift). Ultimately, Building 5 was demolished during plant renovations, and Buildings 4, 10, and 11 were eliminated from further evaluation because sampling results did not indicate a complete pathway for VI by TCE. Buildings 12 and 14 required vapor mitigation (Appendix C).

A sub-slab vapor extraction system was installed in Building 14 to mitigate TCE infiltration. The system was activated on July 16, 2019, and subsequently indoor air samples were collected for TO-15 analysis. All concentrations were below the RMLs. Subsequently, quarterly performance sampling has occurred showing ND for all sampling events.

With the concurrence of the EPA, further sampling was conducted in Building 12. A sampling event on April 11, 2019, provided baseline air data in Building 12. After this sampling event, JCI increased the "make-up" air in the building's HVAC system by ten percent. Historically, TCE concentrations in Building 12 marginally exceeded the RML. It was hoped that modification of the HVAC's operating parameters would adequately address the indoor air TCE detections. After approximately two weeks of modified HVAC operations using the additional make-up air, the sampling event was repeated on May 13, 2019. Due to uncertainty of the data, a repeat sampling event was conducted in Building 12 on May 17, 2019. The results of that sampling showed that two of the three samples collected and analyzed exceeded the RML. Further alteration of the HVAC systems' operational parameters was not possible.

In July of 2019, the EPA sent a letter to JCI on the immediate need to notify workers of the presence of TCE and the potential human health implications of TCE exposures (see Appendix F). An ATSDR fact sheet on the health effects of TCE was also provided to help inform workers of the dangers of TCE. In October 2019, after several rounds of calls between the EPA, JCI and NCH, JCI notified their workers of the presence of TCE in indoor air above RMLs and provided a fact sheet on TCE.

The evaluation of indoor air remedial options for Building 12 is ongoing. Due to the size, infrastructure, and operations within this building, conventional sub-slab methods were determined not to be viable. Historical research of the building diagrams indicates that this building is the amalgamation of four different buildings, constructed at different times, and the configurations of the building's footers and utilities are unknown. Working with JCI, NCH discovered a system of drain lines crossing the building from east to west, spanning the full length of the building, that are no longer used. The design of the drains and associated piping suggest they may be suitable components of a viable vapor system.

The drain lines were thoroughly purged of obstructions and a smoke test was performed to determine the viability of pulling a vacuum on the drain lines to remove the contaminated soil vapors from beneath the subslab. All tested lines provided positive evidence in the feasibility of using the drain lines for depressurizing the sub-slab. Vacuum pumps have been installed on the roof of Building 12 to pull vacuum on the drain lines under the floor of the building. This effort has reduced the indoor air results to less than the RML of 6 $\mu g/m^3$ except for one location. The drain line at this location is over the most concentrated portion of the plume. Additional perforations were made in this drain line in hopes to remove additional soil vapors trapped beneath the sub-slab. After two additional weeks of operating the vacuum pumps, all indoor air results were less than the RML of 6 $\mu g/m^3$. Three additional quarters of indoor air monitoring will be conducted to verify the sampling results. See the VI sampling results for Building 12 and 14.

Building 12 VI Results

Sample #	COC	11/9/16	2/22/17	5/16/18	8/29/18	2/26/19	5/23/19	6/26/19	11/21/19	4/6/20	6/27/20
12-IS-M-05	PCE	190	210	3.4	12	0.5	0.5	0.5	0.5	ND	ND
	TCE	6.2	8.8	7.1	7.3	16	8.1J	18	16	7	ND
12-IS-M-04	PCE	140	200	3.8	12	0.5	0.5	0.5	0.5	ND	ND
	TCE	5	8.6	6.9	5.8	11	9.5J	17	16	5	ND
12-IS-M-03	PCE	220	340	3.7	14	0.5	0.5	0.5	0.5	ND	ND
	TCE	2.5	9.4	7.6	6.4	1.2	1.6	5.7	5.1	ND	1.4

Building 14 VI Results

Sample #	COC	11/9/16	2/22/17	5/16/18	8/29/18	2/26/19	4/17/19	8/05/19	11/21/19
14-IS-O-01	PCE	27	6	2.9	4.7	1.3	0.5	0.5	0.5
	TCE	17	65	9	13	49	47	1.2	0.5
14-IS-O-02	PCE	330	7.5	0.5	7.5	0.5	0.5	0.5	0.5
	TCE	9.7	11	3.6	2.6	10	5.8	1.1	0.5
14-IS-O-03	PCE	580	8	0.5	3.3	0.28	--	--	0.5
	TCE	ND	3	1.2	1.7	8.8	--	--	0.5

PCE is listed in the table above due to detections during early VI sampling investigations. Although PCE is a COC at the Site, the PRP noted several times that they did not believe the low detections of PCE in groundwater would result in the VI results listed above. JCI conducted an audit of their buildings and discovered that a heavy duty degreaser (product) containing PCE was being used throughout the facility. The product was used as an aerosol degreaser composed of up to 90% PCE. The degreaser product has since been removed from the facility and the VI results for PCE now show non-detect throughout the facility (see 2/26/19 – 11/21/19). Although PCE continues to be sampled, TCE remains the primary COC for VI.

4.3 Site Inspection

The inspection of the Site was conducted on November 26, 2019. In attendance were Clint Sperry (EPA), Jessica Kidwell (EPA), Austin Clapp (KDHE), Kevin Hopkins (SCS Engineers), D. Bringer (SCS Engineers), and Fred Wise (JCI). The purpose of the inspection was to assess the protectiveness of the remedy. The site inspection checklist can be found in Appendix H.

5.0 TECHNICAL ASSESSMENT

5.1 OU2

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

Question A Summary

The remedy continues to make progress in remediating the Site using SVE systems to remove soil sources and groundwater extraction-and-treatment systems to capture and treat groundwater. However, based on the data review provided above and recent changes to the configuration of the groundwater extraction system, additional characterization work is necessary to verify containment of the groundwater contamination plume to the east of RW-2 and along the southwestern portion of the plume. This work will be necessary to demonstrate the RAO of preventing off-site migration of contaminated groundwater that would exceed respective MCLs or KALs for individual contaminants. Although no potable wells are known to be present within the current footprint of the plume, the groundwater contamination plume also must be fully delineated to verify the RAO of preventing on-site ingestion of contaminated groundwater that would exceed respective MCLs or KALs for individual contaminants.

In addition, work is necessary to eliminate continued sources of groundwater contamination and restore groundwater to acceptable quality (MCLs or KALs) within a reasonable timeframe. This is especially critical because the remedial timeframe of 18 years, suggested in the 1992 ROD, has been exceeded. Moreover, the persistence of shallow subsurface contamination has presented an additional exposure pathway - VI - as demonstrated and mitigated during the FYR period. Continued sampling will be necessary to confirm mitigation of the VI pathway.

5.1.2 Remedial Action Performance

Soil

The South Field SVE system has not been operational during most of the FYR period due to electrical and motor issues. The system was returned to operation as of January 16, 2020. Further evaluation of the soil remedy in the South Field area will be necessary to determine whether operation of the SVE system should be continued, optimized, or decommissioned. Such assessment might be achieved by collecting soil samples near previous sample locations with high VOC concentrations to evaluate mass reduction. However, because previously remediated areas of soil with decommissioned SVE systems appear to be continuing sources of groundwater contamination (for example, at vapor extraction wells 5D, 18D, 22D), reevaluation of the soil cleanup levels appears warranted.

Groundwater

Groundwater gauging during the FYR period confirms that groundwater is generally flowing toward the south, terminating at recovery well RW-2. However, monitoring points are too broadly spaced to confirm the hydraulic gradient and flow direction between RW-2 and the nearest monitoring well to the east (MW-03F). An additional multi-level well cluster is needed between them to verify groundwater capture. Groundwater analytical data support this need. While TCE data are low level or ND in most downgradient perimeter wells, MW-03F data are variable with high-end results exceeding the MCL.

Groundwater sampling data from the FYR period further indicate that TCE concentrations have exceeded the MCL at multiple other point-of-compliance wells, especially along the western and southwestern boundaries of the plume. Concentrations of TCE in at least one western point-of-compliance well (MW-59) are increasing. Additional characterization is needed to delineate the extent of contamination and verify that the western and southwestern portions of the plume are fully captured.

As noted above, the remedy has not achieved completion within the 18-year remedial timeframe indicated in the 1992 ROD. Critically, groundwater sampling data indicate elevated, upward trending TCE concentrations in the northern part of the plume, suggesting that residual source material persists in both the vadose zone/shallow aquifer and the deep aquifer there. Further characterization is needed to support evaluation of source control measures.

To support remedy optimization and improve containment, the South Industrial Well was idled and recovery well RW-3 was installed during the FYR period. This change in pumping configuration appears to have altered flow patterns and contaminant distribution at the Site. As the system stabilizes, continued monitoring of groundwater concentrations and flow patterns will be necessary to demonstrate capture, contaminant reduction rates, and progress toward remedy completion.

Since maintenance to the air stripper in 2017, VOCs have been successfully removed from effluent prior to discharge with reported effluent concentrations of TCE and other VOCs below the reporting limit of 1 µg/L. Influent concentrations to the air stripper are increasing, suggesting that RW-2 is drawing the core of the plume closer. During the second half of 2019, the effectiveness of removing TCE for AS-2 was approximately 100 percent. The calculated air emission rates for AS-2 were all less than 0.001 g/m^3.

At Building 14, VI mitigation continues via sub-slab depressurization. Performance samples have been ND for all subsequent sampling events. Building 12 has a sub-slab depressurization system in place using in-situ piping and floor drains. Indoor air sample results in June 2020 showed non-detect for TCE. Three more quarterly sampling events will occur through March 2021 to ensure systems are effectively mitigating indoor air issues.

5.1.3 System Operations/Operations and Maintenance

O&M of the implemented remedies is occurring as intended. Identified maintenance performed during this FYR period is categorized as normal wear and tear. The south SVE system was down due to electrical issues and a faulty motor. The system became operational in January 2020 and had its initial results on January 16, 2020. Some remedy optimization may be achieved by cyclical operation of the SVE system to allow rebound and potentially increase the efficiency of its operation.

5.1.4 Implementation of Institutional Controls and Other Measures

No institutional controls are required by the ROD for OU2. The contaminated soil is currently being treated via the south SVE system, but there is no restriction on digging in that area. An IC is needed at the Coleman property that restricts residential land use and will require notification to the EPA, state, and facility personnel before contaminated subsurface soil is disturbed. The groundwater remedy for OU2 represents an interim remedy. Page 26 of the ROD describes the selected remedy for groundwater as follows:

> The selected remedy represents an **interim remedy** with respect to the groundwater at the COU. Because the plume of contaminated ground water at the COU has merged with the contaminated ground water from other sources in the 29th and Mead Site, the final remedy for the 29th and Mead Site will include the ground water in the COU.

The city of Wichita Code of Ordinances, Title 7, Chapter 7.30, Section 7.30.105 restricts the installation or use of groundwater wells within the 29th and Mead Site for drinking purposes. Institutional controls associated with the final groundwater remedy will be covered by the NIC Corrective Action Decision document.

5.1.5 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Question B Summary

Ecological Risk Assessment

During the Third FYR Report for OU2 of the Site, it was determined that a SLERA was never performed at this site. Region 7 ecological risk assessors recommended a SLERA be performed before the 2020 FYR. In December 2016, a SLERA was completed for the Wichita Drainage Ditch to supplement the results of the 1991 Baseline Risk Assessment. The SLERA concluded that the concentrations of site COCs (TCE, 1,1,1-TCA, PCE, cis-1,2-DCE, 1,1-DCE, vinyl chloride) and toluene in groundwater are not expected to be adversely impacting surface water aquatic biota or area wildlife that may consume surface water. However, some non-regulatory TCE benchmarks for the protection of aquatic life were exceeded using site-wide groundwater 95% UCL concentrations. Regarding these exceedances, the SLERA concluded that dilution of those TCE concentrations in groundwater when mixing with surface water would reduce the TCE levels to lower concentrations than the aquatic life benchmarks.

Human Health Risk Assessment

No changes have occurred to Applicable or Relevant and Appropriate Requirements (ARARs) that affect the protectiveness of the remedy. In addition, since the baseline human health risk assessment was conducted, several toxicity values as well as risk assessment methods have changed. However, these changes do not significantly impact the overall conclusions of the risk assessment. The VI pathway was identified as a potentially complete exposure pathway in the previous FYR and continues to be evaluated because indoor air concentrations above levels of health concern for TCE were detected. We are not aware of any changes in land use or physical site conditions since the last FYR was completed.

5.1.6 Changes in Standards and To-Be-Considered Criteria

Consistent with the Third FYR, no changes have occurred in the standards identified as ARARs that affect the protectiveness of the remedy. The previous FYR identified changes in ARARs since the ROD was signed, and no additional changes have occurred in the last five years.

5.1.7 Changes in Toxicity and Other Contaminant Characteristics

The Third FYR identified changes in toxicity values since the previous FYRs. A baseline human health risk assessment was conducted, and the effects of these changes on the overall conclusions of the risk assessment were evaluated. The only changes in toxicity values since the previous FYR were for 1,2-dichloropropane, in which the inhalation unit risk value changed from 1.0E-05 $\mu g/m^3$ to 3.7E-06 $\mu g/m^3$, and the oral chronic reference dose changed from 9.0E-02 to 4.0E-02 in 2017. As was concluded in the previous FYR, the changes in toxicity values since the baseline human health risk assessment was conducted do not change the overall conclusions of the risk assessment and do not adversely affect the protectiveness of the remedy.

5.1.8 Changes in Risk Assessment Methods

Although there have been changes in risk assessment methods since the baseline human health risk assessment was completed, no methods have changed since the previous FYR. The methods of calculating cancer and non-cancer risks by the inhalation exposure route have changed since the baseline human health risk assessment was conducted (EPA, 2009). Additionally, in 2014 the EPA completed an update of standard default exposure factors (EPA, 2014); thus, many of the exposure assessment input parameters in the original risk assessment are different than values currently recommended. However, these changes in risk assessment methodology do not have a significant impact on the conclusions of the risk assessment.

5.1.9 Changes in Exposure Pathways

The VI pathway was identified as a potentially complete exposure pathway in the previous FYR and continues to be evaluated because indoor air concentrations above levels of health concern for TCE were detected.

In addition, the previous FYR determined that there was potential for 1,4-dioxane to be present at the Site. However, 2016 sampling found concentrations of 1,4-dioxane below detection limits in all wells sampled.

We are not aware of any significant changes in land use or physical site conditions since the last FYR was completed.

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

No impacts from natural disasters were identified at the Site, and no other information has come to light that could affect the protectiveness of the remedy.

6.0 Issues/Recommendations

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
N/A

Issues and Recommendations Identified in the Five-Year Review:

OU2	**Issue Category: Other**			
	Issue: Additional data required at two buildings (12 and 14) to confirm VI risks have been adequately addressed.			
	Recommendation: Perform four seasonal samplings of indoor air in Buildings 12 and 14. If sample results continue to remain below the TCE RML, VI sampling will be conducted once during the FYR periods.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	**Yes**	**PRP**	**EPA/State**	**3/31/2021**
OU2	**Issue Category: Other – Institutional Controls**			
	Issue: There are no soil restrictions for OU2.			
	Recommendation: Establish an IC at the Coleman property that restricts residential land use. The IC should also require notification before subsurface soil disturbance or construction and require VI sampling or mitigation for new building construction.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	**Yes**	**PRP**	**EPA/State**	**3/31/2021**
OU2	**Issue Category: Other**			
	Issue: Previously remediated areas of soil with decommissioned SVE systems appear to be continuing sources of groundwater contamination (for example, at vapor extraction wells 5D, 18D, 22D).			
	Recommendation: Further evaluation of the soil remedy in the South Field area will be necessary to determine whether operation of the SVE system should be continued, optimized, or decommissioned.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	**Yes**	**PRP**	**EPA/State**	**12/31/2021**

OU2	Issue Category: Other			
	Issue: MW-03F data are variable with high-end results exceeding the MCL, and monitoring points are too broadly spaced to confirm the hydraulic gradient and flow direction between RW-2 and MW-03F.			
	Recommendation: Either an additional multi-level well cluster is needed between them to verify groundwater capture, or installation of an additional sentinel well downgradient of MW-03F.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	**Yes**	**PRP**	**EPA/State**	**12/31/2021**

6.1 Other Findings

In addition, the following are recommendations that were identified during the FYR, but do not affect current and/or future protectiveness.

As noted above, the Site consists of OU2 and the NIC. Since OU2 is only one portion of the overall Site, the groundwater remedy is an interim remedy. Once all of the RPs have completed their source area investigations, a final site-wide groundwater remedy (including OU2) will need to be completed. A ROD amendment for OU2 will also need to be completed. Once the amended ROD becomes final, a Preliminary Close-Out Report will need to be written, which will then allow the entire Site to become Construction Complete and reach the Site-Wide Ready for Anticipated Use status.

As noted above, the remedy has not achieved completion within the 18-year remedial timeframe indicated in the 1992 ROD. Increasing concentration in wells MW-08 (18,000 µg/L) and VEW-18D (4110 µg/L) are indicative of a residual non-aqueous phase liquid source. Moreover, these results are significantly higher than the other wells. It appears that the contaminant mass is being pulled toward RW-3; however, at the rate the mass is moving and the current mass concentration, the removal rate of this mass will be longer than the timeframe identified in the ROD. Further characterization may be necessary to support evaluation of source control measures.

7.0 PROTECTIVENESS STATEMENTS

Operable Unit: **2**	*Protectiveness Determination:* **Short-term Protective**	*Planned Addendum Completion Date:* **NA**
Protectiveness Statement: The remedy at OU2 of the 29th and Mead Superfund site is protective of human health and the environment in the short term through removal of soil VOC contamination by the SVE system. Contaminated groundwater is treated via two groundwater extraction wells and there are no complete pathways due to a city ordinance to prohibit the installation of drinking water wells in this area. Long-term protectiveness will be completed through the establishment of an Institutional Control for contaminated soil; verification of hydraulic containment by the groundwater remedial system; evaluation of the effectiveness of the SVE system and evaluation of the characterization of soil sources.		

Sitewide Protectiveness Statement
Protectiveness Determination: **NA**

8.0 NEXT REVIEW

The next FYR report for the 29th and Mead (OU2) Superfund Site is required five years from the approval date of this review.

APPENDIX A

REFERENCES

References

USEPA 1991, *Remedial Investigation, Coleman Operable Unit, 29th and Mead Site*

USEPA 1992, *Record of Decision (ROD), Coleman Operable Unit, 29th and Mead Site*

USEPA 2015, *Third Five Year Review (FYR)*

CB&I Environmental & Infrastructure, Inc. 2016, *Screening Level Ecological Risk Assessment, Coleman Operable Unit, 29th and Mead Site*

CB&I Environmental & Infrastructure, Inc. 2018, *Groundwater Monitoring Plan (GWMP)*

SCS Engineers 2019, *Semi-Annual Update Report of RD/RA Activities Coleman Operable Unit*

APPENDIX B

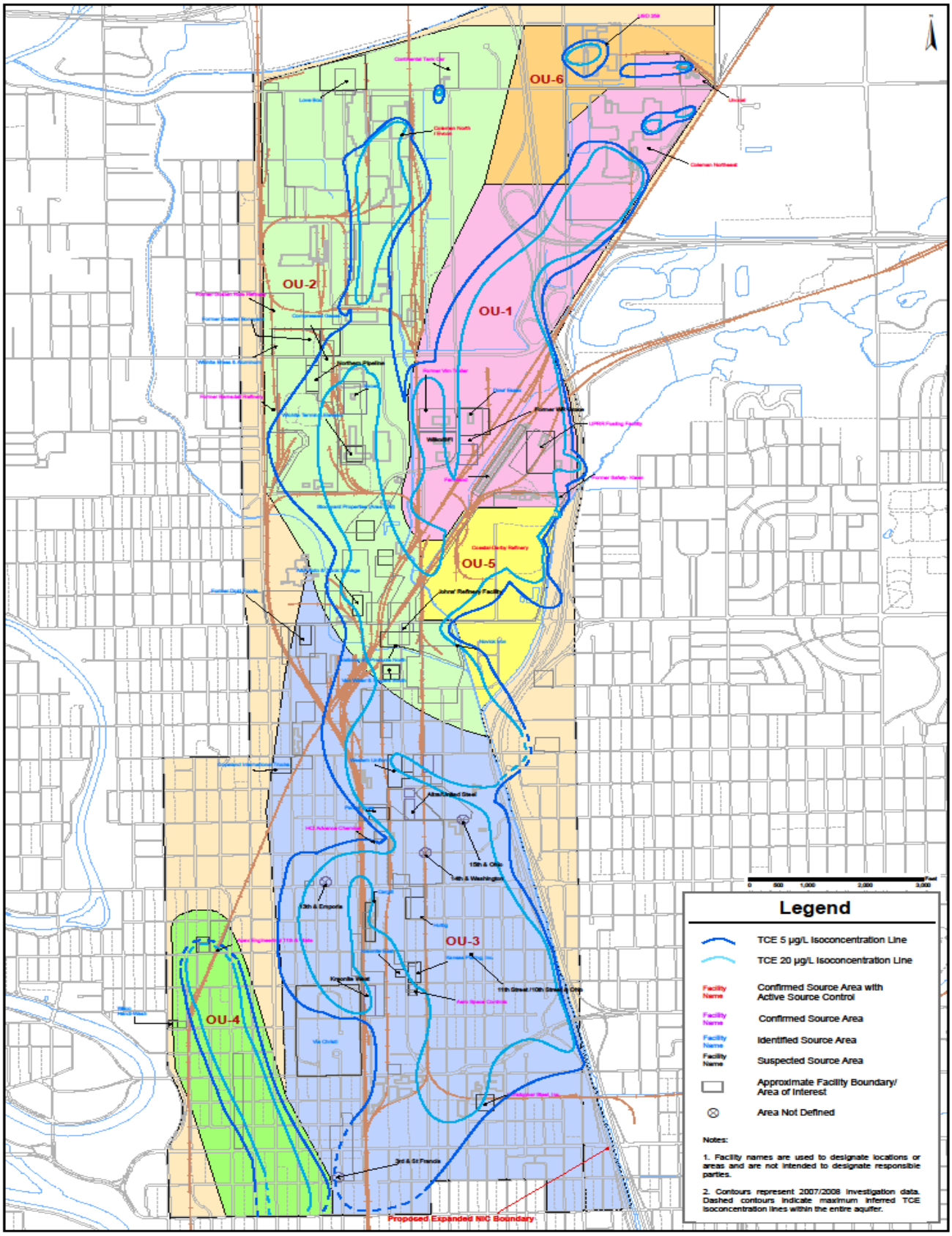
SITE CHRONOLOGY

Site Chronology

Event	Date
Initial Groundwater Investigation	May 1987
Groundwater Pump & Treat and Soil Vapor Extraction (SVE) Initiated	1988
National Priorities List (NPL)	February 21, 1990
Consent Agreement for a Remedial Investigation/Feasibility Study (RI/FS)	June 6, 1991
Record of Decision	September 29, 1992
Consent Decree for Remedial Design/Remedial Action	February 18, 1994
Leachate Model Report	July 13, 1995
North Field SVE System Decommissioned	1996
NPL Delisting	April 29, 1996
Final Remedial Design for Interim Groundwater Remedy	May 3, 1996
Groundwater remedial system start-up	April 1997
Final Remedial Design for Soil Remedy	August 5, 1999
SVE System (Sumps and South Field) Construction Initiated	March 2000
SVE System (Sumps and South Field) Start-up	May 15, 2000
1st Five-Year Review Report	September 2005
SVE System (Sumps) Decommissioned	June 2006
Closure of Extraction Well RW-1 and Air Stripper AS-1	2008
Groundwater Monitoring Sampling Method Change to HydraSleeve	May 2010
2nd Five-Year Review Report	September 2010
3rd Five-Year Review Report	September 2015
Installation of RW3	February 2016
Screening Level Ecological Risk Assessment Completed	December 2016
Approval to Modify Groundwater Monitoring Program	June 2018

APPENDIX C

FIGURES



CDM

Figure 2-10
North Industrial Corridor (NIC) Site
Proposed Revisions to the Operable Unit and NIC Site Boundaries

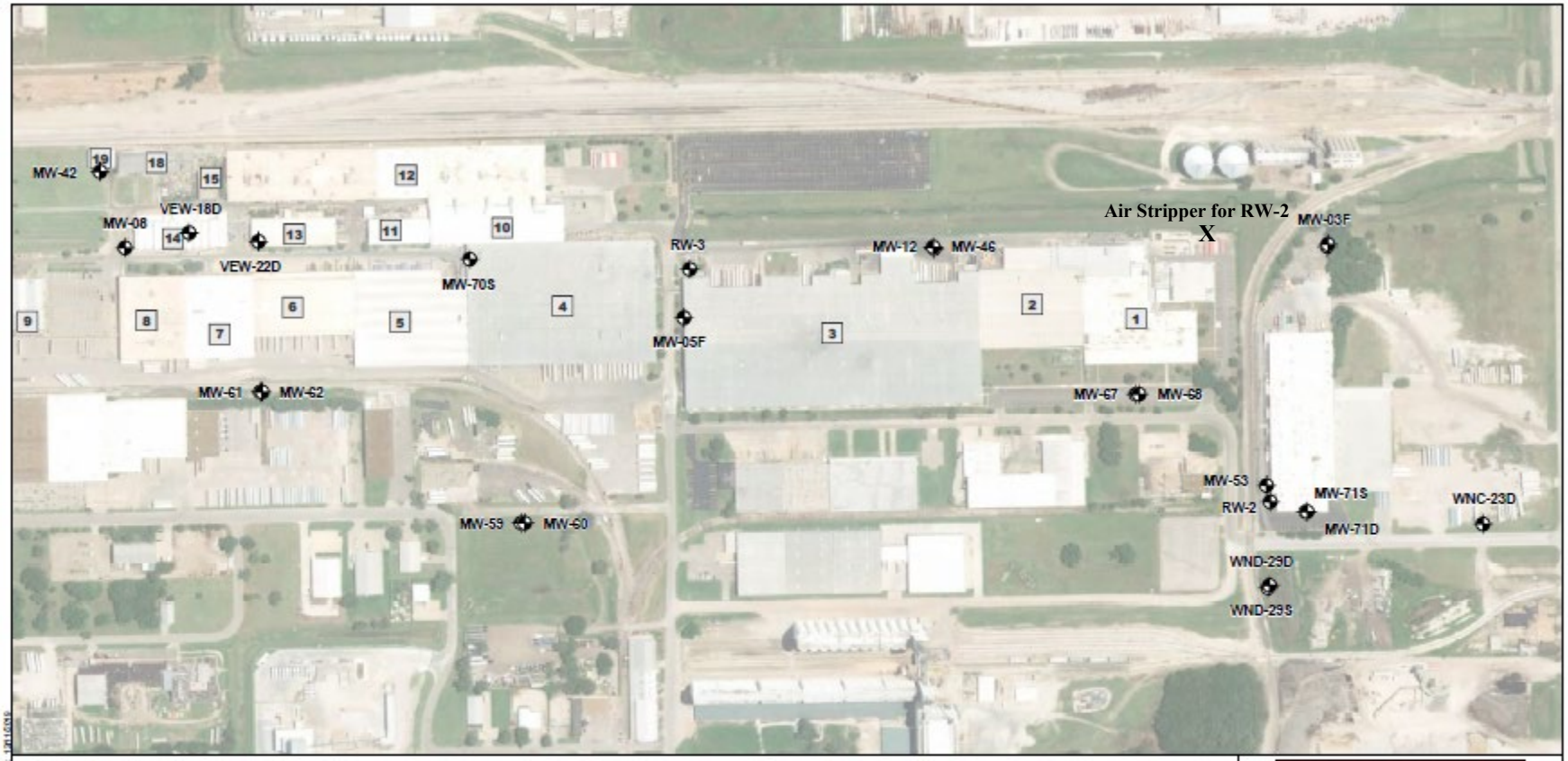
Figure 3.

Trichloroethene (TCE) ug/L
New Coleman Holdings
Coleman Operating Unit
Wichita, Sedgwick County, Kansas
December 20, 2018

0 195 390 780 1,170 1,560
Feet

N

SCS ENGINEERS
CONSULTING ENGINEERS, INC.
11120 E. 26th St. North, Suite 1100
Wichita, Kansas 67226
PH. (316) 315-4501 FAX. (316) 315-4505



LEGEND

- Monitoring Well Location
- [1] Building Number

N

0 300 600

Feet

SCS ENGINEERS

11120 E. 25TH NORTH, SUITE 1100
WICHITA, KANSAS 67226
(316) 315-4501

GROUNDWATER MONITORING
WELL LOCATION MAP
OCTOBER 2019

CLIENT: NEW COLEMAN HOLDINGS

LOCATION: COLEMAN OPERATING UNIT
WICHITA, KANSAS

FIGURE: 1

MW-21
MW-43
MW-20
MW-42
MW-16
MW-38
MW-52
MW-51
MW-32
VEW-18D
VEW-05D
MW-17
MW-70S
MW-08
VEW-22D
MW-36
MW-70D
MW-12
MW-46
RW-3
MW-03F
MW-47
MW-05F
MW-34
MW-40
MW-25
MW-30
MW-24
MW-41
MW-45
MW-15
MW-61
MW-62
MW-68
MW-67
N Mead St
E 37Th St N
E 30Th St N
MW-54
MW-53
MW-69S
MW-71S
RW-2
MW-69D
MW-71D
N Santa Fe St
MW-60
MW-59
E 34Th St N
E 33Rd St N
WND-29D
WND-29S
N Saint Francis St
N Saint Francis St
E 35Th St N
N Emporia St
N Emporia St

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Shallow Well
- Deep Well
- Fully Penetrating Well
- Vapor Extraction Well
- Recovery Well

N

0 350 700

Feet

APTIM
2872 NORTH RIDGE ROAD, SUITE 102B
WICHITA, KANSAS 67205
(316) 220-8020

CURRENT MONITORING PROGRAM

CLIENT: NEW COLEMAN HOLDING

LOCATION: COLEMAN OPERATING UNIT
WICHITA, KANSAS

FIGURE: 4

LEGEND

- Shallow Monitoring Well
- Vapor Extraction Well
- Recovery Well
- TCE Concentration Contour (ug/L)
- TCE Concentration (ug/L)
- NS - Not Sampled
- Maximum Contaminant Level for TCE = 5 ug/L

N

0 350 700

Feet

CBI

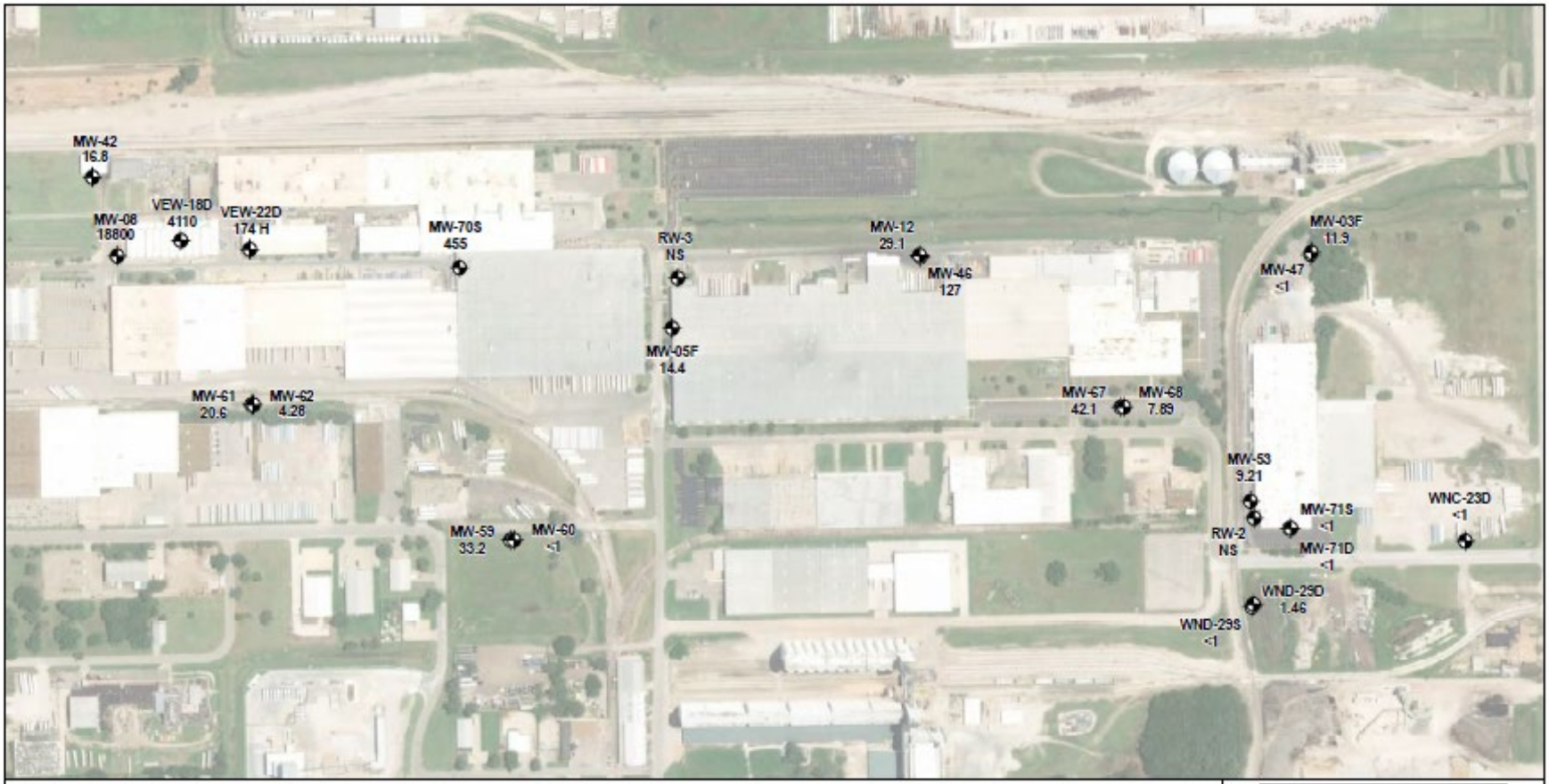
CBI ENVIRONMENTAL & INFRASTRUCTURE, INC.
TEN N. 32ND STREET NORTH, SUITE 100
WICHITA, KANSAS 67226
(316) 320-8025

SHALLOW TCE
ISOCONCENTRATION MAP
DATA COLLECTED OCTOBER 2014

CLIENT: NEW COLEMAN HOLDING

LOCATION: COLEMAN OPERATING UNIT
WICHITA, KANSAS

FIGURE: 5



LEGEND

Monitoring Well Location

N

0 300 600

Feet

Note:
H = Analyzed outside of Holding Time

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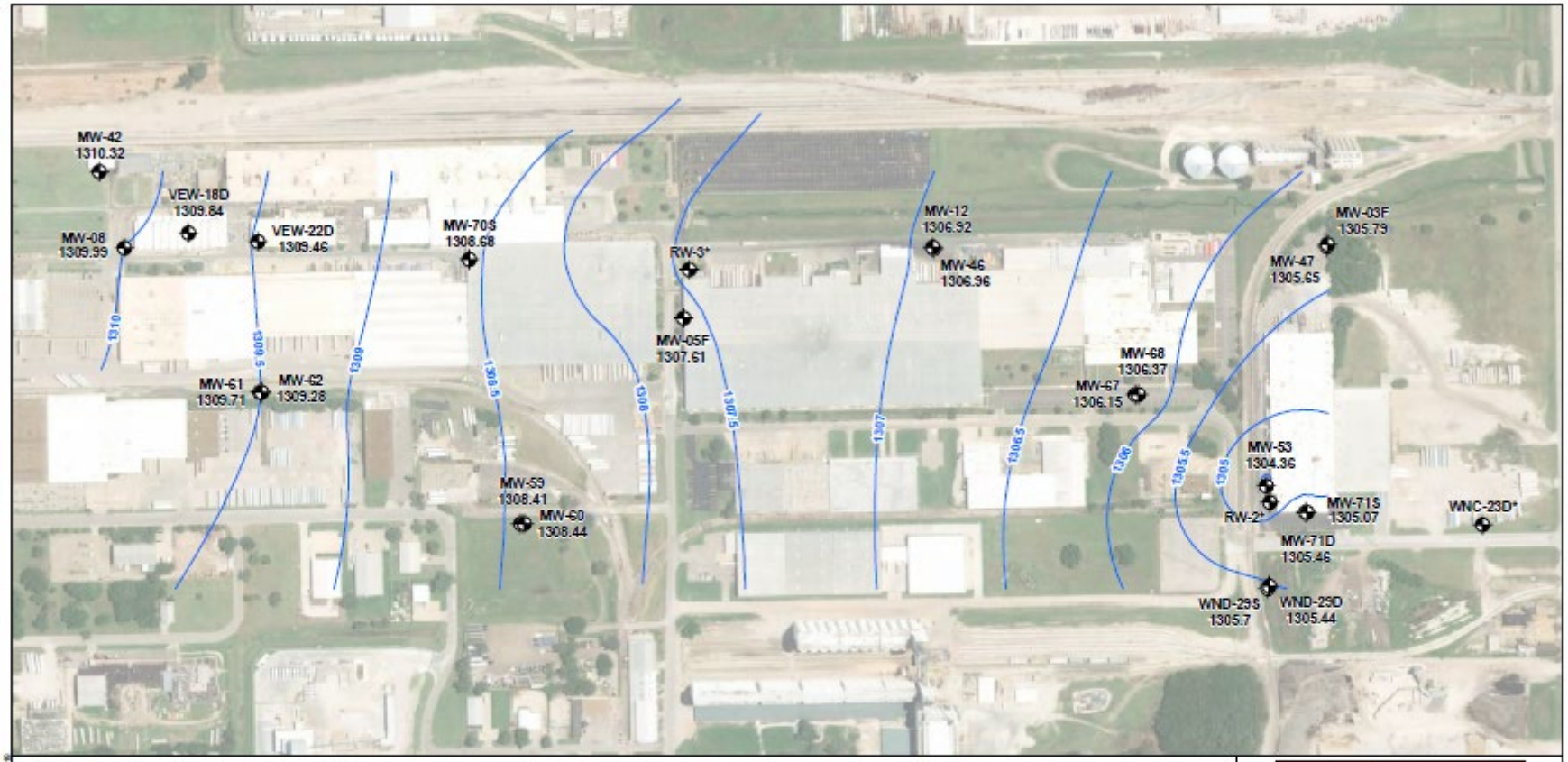
WICHITA, KANSAS 67226
(316) 315-4501

TRICHLOROETHENE (TCE) µG/L
OCTOBER 2019

CLIENT: NEW COLEMAN HOLDINGS

LOCATION: COLEMAN OPERATING UNIT
WICHITA, KANSAS

FIGURE: 6



LEGEND

- Monitoring Well Location
- Groundwater Elevation Contour (In Feet)

* = Not used for generating groundwater contours

N

0 300 600

Feet

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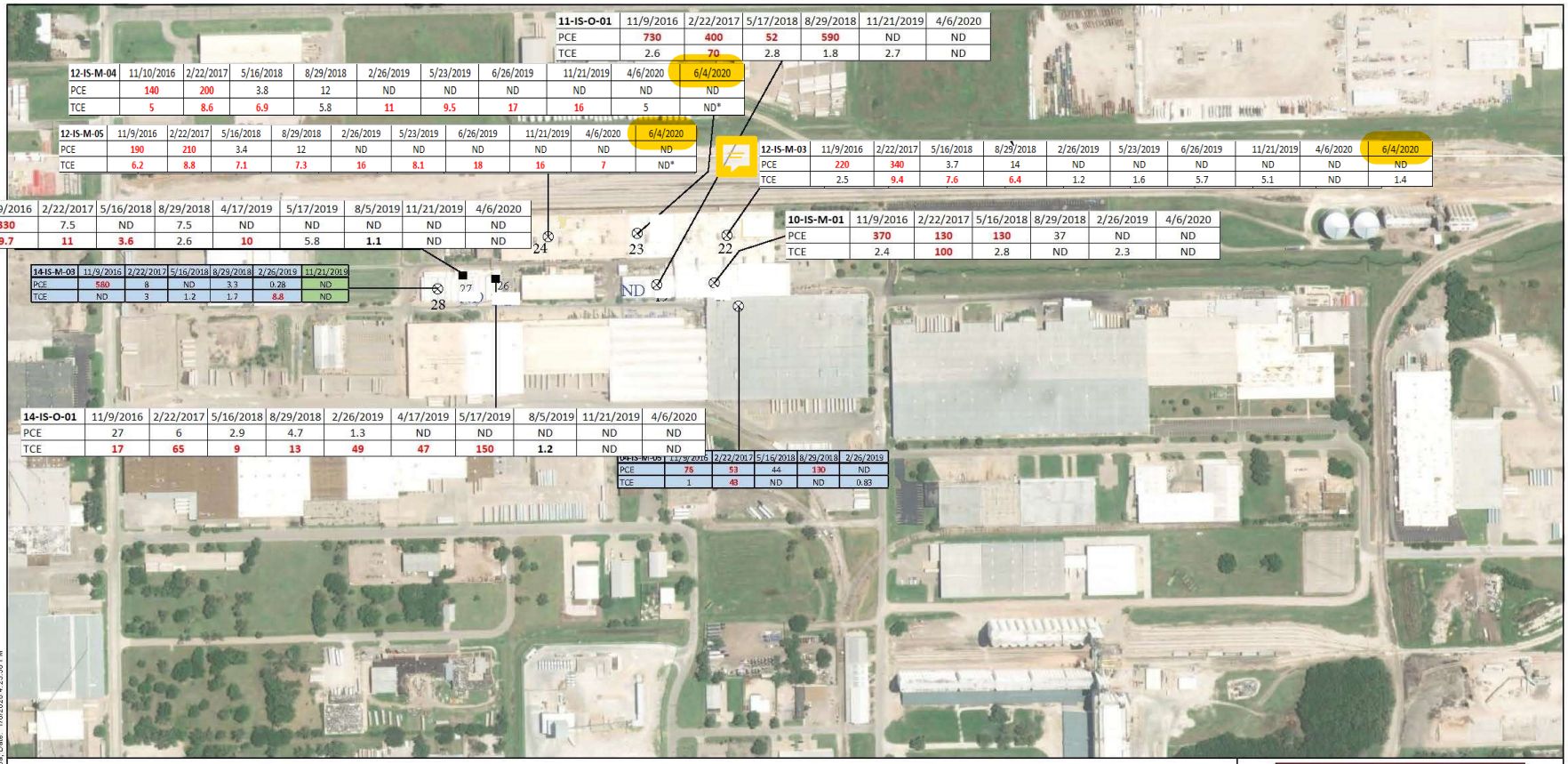
WICHITA, KANSAS 67226
(316) 315-4501

POTENTIOMETRIC SURFACE DIRECTION MAP OCTOBER 2019

CLIENT: NEW COLEMAN HOLDINGS

LOCATION: COLEMAN OPERATING UNIT WICHITA, KANSAS

FIGURE: 7



LEGEND

Indoor Air Sampling Locations

- ■ Office Area and Sample Number Identification
- ⊗ Warehouse/Manufacturing Area and Sample Number Identification

Compound	Industrial Air Screening Level
Tetrachloroethene (PCE)	47 ug/m^3
Trichloroethene (TCE)	6 ug/m^3

For PCE, the values are from Vapor Intrusion Screening Level Calculator Version 3.4, November 2015, Target Indoor Air Concentration at Target Risk for Carcinogens (TCR) = 1E-06 or Target Hazard Quotient for Non-Carcinogens (THQ) = 1. For TCE, value is the U.S. Environmental Protection Agency Region 7 Risk Management Level.

N

0 350 700

Feet

Notes:
- All units are in micrograms per cubic meter (ug/m^3)
- ND = Not Detected
- Bold highlighted results exceed the Industrial Air Screen in Level

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WICHITA, KANSAS 67226
(316) 315-4501

PCE AND TCE INDOOR AIR RESULTS

CLIENT: NEW COLEMAN HOLDING

LOCATION: COLEMAN OPERATING UNIT, WICHITA, KANSAS

FIGURE: 2

APPENDIX D

WELL DATA TABLES

TABLE 1
Groundwater Monitoring Wells
Coleman OU Wichita, KS

Semi-Annual	October 2017 TCE (µg/l)	Total Depth (ft)
MW-03F	4.4	40.43
MW-05F	NS	37.46
MW-12	190	42.85
MW-42	11	24.83
MW-46	250	22.86
MW-53	8.7	43.98
MW-59	15	44.20
MW-60	<1	24.65
MW-61	56	26.67
MW-62	2.6	42.84
MW-67	NS	45.77
MW-68	NS	23.25
MW-70S	690	22.49
MW-71D	16	44.14
MW-71S	4.5	24.80
RW-2	NS	NA
RW-3	340	43.00
VEW-18D	3800	18.43
WND-29D	2.4	49.26
WND-29S	<1	24.99
20		

Annual	October 2017 TCE (µg/l)	Total Depth (ft)
MW-21	<1	45.03
MW-25	2.1	48.41
MW-34	3.7	23.71
MW-38	7.9	22.06
4		

Remove	October 2017 TCE (µg/l)	Total Depth (ft)
MW-08	7400	44.53
MW-15	4.3	40.28
MW-16	<1	45.59
MW-17	0.77	49.02
MW-20	<1	48.69
MW-24	7.3	44.88
MW-30	<1	47.97
MW-32	<1	44.11
MW-36	110	23.62
MW-40	2.4	26.68
MW-41	7.3	24.50
MW-43	<1	25.93
MW-45	9.2	45.05
MW-47	0.96	25.00
MW-49*	NS	NA
MW-50*	NS	NA
MW-51	<1	44.85
MW-52	2.1	25.49
MW-54	<1	18.55
MW-69D	4.3	40.81
MW-69S	1.5	24.60
MW-70D	2.2	44.74
VEW-05D	560	17.51
VEW-13D*	NS	18.13
VEW-21D*	NS	18.25
VEW-22D	1200	18.87
25		

Notes:

* indicates well has been cemented in

Current monitoring program samples all wells on a semi-annual basis

Table 2
System Evaluation for South Treatment System

Coleman Operable Unit
Wichita, Kansas

GROUNDWATER RECOVERY SYSTEM EFFICIENCY					MASS REMOVED				AIR EMISSIONS			
CONSTITUENT	DATE	AS-2-INF (ug/l)	AS-2-EFF (ug/l)	% EFF	Concentration (ug/l)	Flow Rate gal/min	Flow Rate l/min	Mass Removal Rate (ug/min)	Air Flow Rate (cfm)	Air Emissions Rate (g/m3)	Monthly Air Emissions (g)	Monthly Air Emissions (lbs)
TCE	1/15/2016	13.0	<1.0	100	13.0	417.0300	1576.3734	20493	8000	0.0000905	914.81	2.00
PCE	1/15/2016	NA	NA	NC	0.0	417.0300	1576.3734	0	8000	0.0000000	0.00	0.00
TCA111	1/15/2016	NA	NA	NC	0.0	417.0300	1576.3734	0	8000	0.0000000	0.00	0.00
1,1-DCE	1/15/2016	NA	NA	NC	0.0	417.0300	1576.3734	0	8000	0.0000000	0.00	0.00
Vinyl chloride	1/15/2016	NA	NA	NC	0.0	417.0300	1576.3734	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	1/15/2016	NA	NA	NC	0.0	417.0300	1576.3734	0	8000	0.0000000	0.00	0.00
TCE	2/1/2016	17.0	<1.0	100	17.0	399.6800	1510.7904	25683	8000	0.0001134	1035.57	2.28
PCE	2/1/2016	NA	NA	NC	0.0	399.6800	1510.7904	0	8000	0.0000000	0.00	0.00
TCA111	2/1/2016	NA	NA	NC	0.0	399.6800	1510.7904	0	8000	0.0000000	0.00	0.00
1,1-DCE	2/1/2016	NA	NA	NC	0.0	399.6800	1510.7904	0	8000	0.0000000	0.00	0.00
Vinyl chloride	2/1/2016	NA	NA	NC	0.0	399.6800	1510.7904	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	2/1/2016	NA	NA	NC	0.0	399.6800	1510.7904	0	8000	0.0000000	0.00	0.00
TCE	3/1/2016	18.0	<1.0	100	18.0	299.1100	1130.6358	20351	8000	0.0000898	908.50	2.00
PCE	3/1/2016	NA	NA	NC	0.0	299.1100	1130.6358	0	8000	0.0000000	0.00	0.00
TCA111	3/1/2016	NA	NA	NC	0.0	299.1100	1130.6358	0	8000	0.0000000	0.00	0.00
1,1-DCE	3/1/2016	NA	NA	NC	0.0	299.1100	1130.6358	0	8000	0.0000000	0.00	0.00
Vinyl chloride	3/1/2016	NA	NA	NC	0.0	299.1100	1130.6358	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	3/1/2016	NA	NA	NC	0.0	299.1100	1130.6358	0	8000	0.0000000	0.00	0.00
TCE	4/14/2016	250.0	<1.0	100	250.0	404.7600	1529.9928	382498	8000	0.0016885	16524.14	36.44
PCE	4/14/2016	NA	NA	NC	0.0	404.7600	1529.9928	0	8000	0.0000000	0.00	0.00
TCA111	4/14/2016	NA	NA	NC	0.0	404.7600	1529.9928	0	8000	0.0000000	0.00	0.00
1,1-DCE	4/14/2016	NA	NA	NC	0.0	404.7600	1529.9928	0	8000	0.0000000	0.00	0.00
Vinyl chloride	4/14/2016	NA	NA	NC	0.0	404.7600	1529.9928	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	4/14/2016	NA	NA	NC	0.0	404.7600	1529.9928	0	8000	0.0000000	0.00	0.00
TCE	5/6/2016	310.0	<1.0	100	310.0	388.5400	1468.6812	455291	8000	0.0020098	20324.47	44.82
PCE	5/6/2016	NA	NA	NC	0.0	388.5400	1468.6812	0	8000	0.0000000	0.00	0.00
TCA111	5/6/2016	NA	NA	NC	0.0	388.5400	1468.6812	0	8000	0.0000000	0.00	0.00
1,1-DCE	5/6/2016	NA	NA	NC	0.0	388.5400	1468.6812	0	8000	0.0000000	0.00	0.00
Vinyl chloride	5/6/2016	NA	NA	NC	0.0	388.5400	1468.6812	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	5/6/2016	NA	NA	NC	0.0	388.5400	1468.6812	0	8000	0.0000000	0.00	0.00
TCE	6/2/2016	180.0	<1.0	100	180.0	215.0000	812.7000	146286	8000	0.0006458	6319.64	13.93
PCE	6/2/2016	NA	NA	NC	0.0	215.0000	812.7000	0	8000	0.0000000	0.00	0.00
TCA111	6/2/2016	1.0	NA	100	1.0	215.0000	812.7000	813	8000	0.0000036	35.11	0.08
1,1-DCE	6/2/2016	1.8	NA	100	1.8	215.0000	812.7000	1463	8000	0.0000065	63.20	0.14
Vinyl chloride	6/2/2016	NA	NA	NC	0.0	215.0000	812.7000	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	6/2/2016	35.0	NA	100	35.0	215.0000	812.7000	28445	8000	0.0001256	1228.82	2.71
TCE	7/20/2016	130.0	4	97	126.0	445.4100	1683.6498	212140	8000	0.0009365	9470.06	20.88
PCE	7/20/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
TCA111	7/20/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
1,1-DCE	7/20/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
Vinyl chloride	7/20/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	7/20/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
TCE	8/1/2016	160.0	4.8	96	155.2	314.0000	1186.9200	184210	8000	0.0008132	8223.24	18.13
PCE	8/1/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
TCA111	8/1/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
1,1-DCE	8/1/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
Vinyl chloride	8/1/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	8/1/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
TCE	9/1/2016	170.0	8.4	95	161.6	271.0000	1024.3800	165540	8000	0.0007307	7151.42	15.77
PCE	9/1/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
TCA111	9/1/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
1,1-DCE	9/1/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
Vinyl chloride	9/1/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	9/1/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
TCE	10/13/2016	21.0	<1.0	100	21.0	156.0000	585.9000	12304	8000	0.0000543	549.28	1.21
PCE	10/13/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
TCA111	10/13/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00

Table 2
System Evaluation for South Treatment System

Coleman Operable Unit
Wichita, Kansas

GROUNDWATER RECOVERY SYSTEM EFFICIENCY					MASS REMOVED				AIR EMISSIONS			
CONSTITUENT	DATE	AS-2-INF (ug/l)	AS-2-EFF (ug/l)	% EFF	Concentration (ug/l)	Flow Rate gal/min	Flow Rate l/min	Mass Removal Rate (ug/min)	Air Flow Rate (cfm)	Air Emissions Rate (g/m3)	Monthly Air Emissions (g)	Monthly Air Emissions (lbs)
1,1-DCE	10/12/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
Vinyl chloride	10/12/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	10/12/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
TCE	11/3/2016	18.0	<1.0	100	18.0	119.0000	449.8200	8097	8000	0.0000357	349.78	0.77
PCE	11/3/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
TCA111	11/3/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
1,1-DCE	11/3/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
Vinyl chloride	11/3/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	11/3/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
TCE	12/8/2016	18.0	<1.0	100	18.0	104.0000	393.1200	7076	8000	0.0000312	305.88	0.70
PCE	12/8/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
TCA111	12/8/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
1,1-DCE	12/8/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
Vinyl chloride	12/8/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	12/8/2016	NA	NA	NC	0.0	445.4100	1683.6498	0	8000	0.0000000	0.00	0.00
TCE	1/4/2017	19.0	<1.0	100	19.0	129.0000	487.6200	9265	8000	0.0000409	413.59	0.91
PCE	1/4/2017	NA	NA	NC	0.0	129.0000	487.6200	0	8000	0.0000000	0.00	0.00
TCA111	1/4/2017	NA	NA	NC	0.0	129.0000	487.6200	0	8000	0.0000000	0.00	0.00
1,1-DCE	1/4/2017	NA	NA	NC	0.0	129.0000	487.6200	0	8000	0.0000000	0.00	0.00
Vinyl chloride	1/4/2017	NA	NA	NC	0.0	129.0000	487.6200	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	1/4/2017	NA	NA	NC	0.0	129.0000	487.6200	0	8000	0.0000000	0.00	0.00
TCE	2/1/2017	19.0	2.6	86	16.4	126.0000	483.8400	7935	8000	0.0000350	310.94	0.71
PCE	2/1/2017	NA	NA	NC	0.0	126.0000	483.8400	0	8000	0.0000000	0.00	0.00
TCA111	2/1/2017	NA	NA	NC	0.0	126.0000	483.8400	0	8000	0.0000000	0.00	0.00
1,1-DCE	2/1/2017	NA	NA	NC	0.0	126.0000	483.8400	0	8000	0.0000000	0.00	0.00
Vinyl chloride	2/1/2017	NA	NA	NC	0.0	126.0000	483.8400	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	2/1/2017	NA	NA	NC	0.0	126.0000	483.8400	0	8000	0.0000000	0.00	0.00
TCE	3/2/2017	22.0	5.7	74	16.3	89.6000	338.6880	5521	8000	0.0000244	246.44	0.54
PCE	3/2/2017	NA	NA	NC	0.0	89.6000	338.6880	0	8000	0.0000000	0.00	0.00
TCA111	3/2/2017	NA	NA	NC	0.0	89.6000	338.6880	0	8000	0.0000000	0.00	0.00
1,1-DCE	3/2/2017	NA	NA	NC	0.0	89.6000	338.6880	0	8000	0.0000000	0.00	0.00
Vinyl chloride	3/2/2017	NA	NA	NC	0.0	89.6000	338.6880	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	3/2/2017	NA	NA	NC	0.0	89.6000	338.6880	0	8000	0.0000000	0.00	0.00
TCE	4/7/2017	21.0	3	86	18.0	123.0000	464.9400	8369	8000	0.0000369	361.54	0.80
PCE	4/7/2017	NA	NA	NC	0.0	123.0000	464.9400	0	8000	0.0000000	0.00	0.00
TCA111	4/7/2017	NA	NA	NC	0.0	123.0000	464.9400	0	8000	0.0000000	0.00	0.00
1,1-DCE	4/7/2017	NA	NA	NC	0.0	123.0000	464.9400	0	8000	0.0000000	0.00	0.00
Vinyl chloride	4/7/2017	NA	NA	NC	0.0	123.0000	464.9400	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	4/7/2017	NA	NA	NC	0.0	123.0000	464.9400	0	8000	0.0000000	0.00	0.00
TCE	5/4/2017	18.0	4.1	77	13.9	103.0000	389.3400	5412	8000	0.0000239	241.59	0.53
PCE	5/4/2017	NA	NA	NC	0.0	103.0000	389.3400	0	8000	0.0000000	0.00	0.00
TCA111	5/4/2017	NA	NA	NC	0.0	103.0000	389.3400	0	8000	0.0000000	0.00	0.00
1,1-DCE	5/4/2017	NA	NA	NC	0.0	103.0000	389.3400	0	8000	0.0000000	0.00	0.00
Vinyl chloride	5/4/2017	NA	NA	NC	0.0	103.0000	389.3400	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	5/4/2017	NA	NA	NC	0.0	103.0000	389.3400	0	8000	0.0000000	0.00	0.00
TCE	6/16/2017	19.0	5.1	73	13.9	103.0000	389.3400	5412	8000	0.0000239	233.79	0.52
PCE	6/16/2017	<1.0	NA	NC	0.0	103.0000	389.3400	0	8000	0.0000000	0.00	0.00
TCA111	6/16/2017	<1.0	NA	NC	0.0	103.0000	389.3400	0	8000	0.0000000	0.00	0.00
1,1-DCE	6/16/2017	7.2	NA	100	7.2	103.0000	389.3400	2803	8000	0.0000124	121.10	0.27
Vinyl chloride	6/16/2017	<1.0	NA	NC	0.0	103.0000	389.3400	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	6/16/2017	<1.0	NA	NC	0.0	103.0000	389.3400	0	8000	0.0000000	0.00	0.00
TCE	7/13/2017	14.0	5.2	63	8.8	101.0000	381.7800	3360	8000	0.0000148	130.63	0.29
PCE	7/13/2017	NA	NA	NC	0.0	101.0000	381.7800	0	8000	0.0000000	0.00	0.00
TCA112	7/13/2017	NA	NA	NC	0.0	101.0000	381.7800	0	8000	0.0000000	0.00	0.00
1,1-DCE	7/13/2017	NA	NA	NC	0.0	101.0000	381.7800	0	8000	0.0000000	0.00	0.00
Vinyl chloride	7/13/2017	NA	NA	NC	0.0	101.0000	381.7800	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	7/13/2017	NA	NA	NC	0.0	101.0000	381.7800	0	8000	0.0000000	0.00	0.00

Table 2
System Evaluation for South Treatment System

Coleman Operable Unit
Wichita, Kansas

GROUNDWATER RECOVERY SYSTEM EFFICIENCY					MASS REMOVED				AIR EMISSIONS			
CONSTITUENT	DATE	AS-2-INF (ug/l)	AS-2-EFF (ug/l)	% EFF	Concentration (ug/l)	Flow Rate gal/min	Flow Rate l/min	Mass Removal Rate (ug/min)	Air Flow Rate (cfm)	Air Emissions Rate (g/m3)	Monthly Air Emissions (g)	Monthly Air Emissions (lbs)
TCE	8/29/2017	6.2	<1.0	100	6.2	80.0000	302.4000	1875	8000	0.0000083	126.89	0.28
PCE	8/29/2017	NA	NA	NC	0.0	80.0000	302.4000	0	8000	0.0000000	0.00	0.00
TCA113	8/29/2017	NA	NA	NC	0.0	80.0000	302.4000	0	8000	0.0000000	0.00	0.00
1,1-DCE	8/29/2017	NA	NA	NC	0.0	80.0000	302.4000	0	8000	0.0000000	0.00	0.00
Vinyl chloride	8/29/2017	NA	NA	NC	0.0	80.0000	302.4000	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	8/29/2017	NA	NA	NC	0.0	80.0000	302.4000	0	8000	0.0000000	0.00	0.00
TCE	9/20/2017	18.0	<1	100	18.0	145.0000	548.1000	9866	8000	0.0000436	298.35	0.66
PCE	9/20/2017	NA	NA	NC	0.0	145.0000	548.1000	0	8000	0.0000000	0.00	0.00
TCA114	9/20/2017	NA	NA	NC	0.0	145.0000	548.1000	0	8000	0.0000000	0.00	0.00
1,1-DCE	9/20/2017	NA	NA	NC	0.0	145.0000	548.1000	0	8000	0.0000000	0.00	0.00
Vinyl chloride	9/20/2017	NA	NA	NC	0.0	145.0000	548.1000	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	9/20/2017	NA	NA	NC	0.0	145.0000	548.1000	0	8000	0.0000000	0.00	0.00
TCE	10/17/2017	250.0	<1	100	250.0	141.0000	532.9800	133245	8000	0.0005882	5180.64	11.42
PCE	10/17/2017	NA	NA	NC	0.0	141.0000	532.9800	0	8000	0.0000000	0.00	0.00
TCA115	10/17/2017	NA	NA	NC	0.0	141.0000	532.9800	0	8000	0.0000000	0.00	0.00
1,1-DCE	10/17/2017	NA	NA	NC	0.0	141.0000	532.9800	0	8000	0.0000000	0.00	0.00
Vinyl chloride	10/17/2017	NA	NA	NC	0.0	141.0000	532.9800	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	10/17/2017	NA	NA	NC	0.0	141.0000	532.9800	0	8000	0.0000000	0.00	0.00
TCE	11/20/2017	150.0	<1	100	150.0	239.0000	903.4200	135513	8000	0.0005982	6829.95	15.06
PCE	11/20/2017	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCA116	11/20/2017	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
1,1-DCE	11/20/2017	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
Vinyl chloride	11/20/2017	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	11/20/2017	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCE	12/18/2017	30.0	<1	100	30.0	239.0000	903.4200	27103	8000	0.0001196	1092.79	2.41
PCE	12/18/2017	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCA117	12/18/2017	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
1,1-DCE	12/18/2017	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
Vinyl chloride	12/18/2017	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	12/18/2017	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCE	1/8/2018	180.0	<1	100	180.0	239.0000	903.4200	162616	8000	0.0007178	4917.56	10.84
PCE	1/8/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCA117	1/8/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
1,1-DCE	1/8/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
Vinyl chloride	1/8/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	1/8/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCE	2/1/2018	150.0	<1	100	150.0	239.0000	903.4200	135513	8000	0.0005982	4683.39	10.33
PCE	2/1/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCA117	2/1/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
1,1-DCE	2/1/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
Vinyl chloride	2/1/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	2/1/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCE	3/2/2018	140.0	<1	100	140.0	239.0000	903.4200	126479	8000	0.0005583	5281.83	11.65
PCE	3/2/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCA117	3/2/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
1,1-DCE	3/2/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
Vinyl chloride	3/2/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	3/2/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCE	4/4/2018	140.0	<1	100	140.0	239.0000	903.4200	126479	8000	0.0005583	6010.35	13.25
PCE	4/4/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCA117	4/4/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
1,1-DCE	4/4/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
Vinyl chloride	4/4/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	4/4/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCE	5/1/2018	140.0	<1	100	140.0	239.0000	903.4200	126479	8000	0.0005583	4917.56	10.84
PCE	5/1/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCA117	5/1/2018	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00

Table 2
System Evaluation for South Treatment System

Coleman Operable Unit
Wichita, Kansas

GROUNDWATER RECOVERY SYSTEM EFFICIENCY					MASS REMOVED				AIR EMISSIONS			
CONSTITUENT	DATE	AS-2-INF (ug/l)	AS-2-EFF (ug/l)	% EFF	Concentration (ug/l)	Flow Rate gal/min	Flow Rate l/min	Mass Removal Rate (ug/min)	Air Flow Rate (cfm)	Air Emissions Rate (g/m3)	Monthly Air Emissions (g)	Monthly Air Emissions (lbs)
TCE	3/11/2019	53.4	<1	100	53.4	239.0000	903.4200	48243	8000	0.0002130	2292.52	5.06
PCE	3/11/2019	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCA1/7	3/11/2019	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
1,1-DCE	3/11/2019	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
Vinyl chloride	3/11/2019	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	3/11/2019	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCE	4/3/2019	121.0	<1	100	121.0	239.0000	903.4200	109314	8000	0.0004825	3620.52	7.98
PCE	4/3/2019	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCA1/7	4/3/2019	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
1,1-DCE	4/3/2019	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
Vinyl chloride	4/3/2019	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	4/3/2019	NA	NA	NC	0.0	239.0000	903.4200	0	8000	0.0000000	0.00	0.00
TCE	5/6/2019	111.0	<1	100	111.0	205.0000	774.9000	86014	8000	0.0003797	4087.44	9.01
PCE	5/6/2019	<1	<1	NC	0.0	205.0000	774.9000	0	8000	0.0000000	0.00	0.00
TCA1/7	5/6/2019	1.14	<1	NC	1.1	205.0000	774.9000	883	8000	0.0000039	41.98	0.09
1,1-DCE	5/6/2019	2.25	<1	NC	2.3	205.0000	774.9000	1744	8000	0.0000077	82.85	0.18
Vinyl chloride	5/6/2019	<1	<1	NC	0.0	205.0000	774.9000	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	5/6/2019	20.1	<1	NC	20.1	205.0000	774.9000	15575	8000	0.0000688	740.16	1.63
TCE	6/6/2019	288.0	<1	100	288.0	153.0000	578.3400	166562	8000	0.0007353	7435.42	16.40
PCE	6/6/2019	<1	<1	NC	0.0	153.0000	578.3400	0	8000	0.0000000	0.00	0.00
TCA1/7	6/6/2019	1.71	<1	NC	1.7	153.0000	578.3400	989	8000	0.0000044	44.15	0.10
1,1-DCE	6/6/2019	3	<1	NC	3.0	153.0000	578.3400	1735	8000	0.0000077	77.45	0.17
Vinyl chloride	6/6/2019	<1	<1	NC	0.0	153.0000	578.3400	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	6/6/2019	51.8	<1	NC	51.8	153.0000	578.3400	29958	8000	0.0001322	1337.34	2.95
TCE	7/9/2019	99.7	<1	100	99.7	203.0000	767.3400	76504	8000	0.0003377	3635.51	8.02
PCE	7/9/2019	<1	<1	NC	0.0	203.0000	767.3400	0	8000	0.0000000	0.00	0.00
TCA1/7	7/9/2019	1.25	<1	NC	1.3	203.0000	767.3400	959	8000	0.0000042	45.58	0.10
1,1-DCE	7/9/2019	1.88	<1	NC	1.9	203.0000	767.3400	1443	8000	0.0000064	68.55	0.15
Vinyl chloride	7/9/2019	<1	<1	NC	0.0	203.0000	767.3400	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	7/9/2019	16.9	<1	NC	16.9	203.0000	767.3400	12968	8000	0.0000572	616.25	1.36
TCE	8/9/2019	19.4	<1	100	19.4	205.0000	774.9000	15033	8000	0.0000664	671.08	1.48
PCE	8/9/2019	<1	<1	NC	0.0	205.0000	774.9000	0	8000	0.0000000	0.00	0.00
TCA1/7	8/9/2019	<1	<1	NC	0.0	205.0000	774.9000	0	8000	0.0000000	0.00	0.00
1,1-DCE	8/9/2019	<1	<1	NC	0.0	205.0000	774.9000	0	8000	0.0000000	0.00	0.00
Vinyl chloride	8/9/2019	<1	<1	NC	0.0	205.0000	774.9000	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	8/9/2019	4.28	<1	NC	4.3	205.0000	774.9000	3317	8000	0.0000146	148.05	0.33
TCE	9/5/2019	161.0	<1	100	161.0	189.0000	714.4200	115022	8000	0.0005077	4472.10	9.86
PCE	9/5/2019	NA	NA	NC	0.0	189.0000	714.4200	0	8000	0.0000000	0.00	0.00
TCA1/7	9/5/2019	NA	NA	NC	0.0	189.0000	714.4200	0	8000	0.0000000	0.00	0.00
1,1-DCE	9/5/2019	NA	NA	NC	0.0	189.0000	714.4200	0	8000	0.0000000	0.00	0.00
Vinyl chloride	9/5/2019	NA	NA	NC	0.0	189.0000	714.4200	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	9/5/2019	NA	NA	NC	0.0	189.0000	714.4200	0	8000	0.0000000	0.00	0.00
TCE	10/9/2019	145.0	<1	100	145.0	366.0000	1383.4800	200605	8000	0.0008855	9821.73	21.66
PCE	10/9/2019	NA	NA	NC	0.0	366.0000	1383.4800	0	8000	0.0000000	0.00	0.00
TCA1/7	10/9/2019	NA	NA	NC	0.0	366.0000	1383.4800	0	8000	0.0000000	0.00	0.00
1,1-DCE	10/9/2019	NA	NA	NC	0.0	366.0000	1383.4800	0	8000	0.0000000	0.00	0.00
Vinyl chloride	10/9/2019	NA	NA	NC	0.0	366.0000	1383.4800	0	8000	0.0000000	0.00	0.00
cis-1,2-DCE	10/9/2019	NA	NA	NC	0.0	366.0000	1383.4800	0	8000	0.0000000	0.00	0.00

TABLE 1
INFLUENT AND EFFLUENT CONCENTRATION DATA
FOR THE HYDRAULIC CONTROL SYSTEM
2019 SECOND SEMI-ANNUAL GROUNDWATER MONITORING REPORT
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Site	Date	1,1,1-Trichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	Trichloroethene (ug/L)	Vinyl Chloride (ug/L)
AS-2-EFF	7/20/2016	--	--	--	--	--	4	--
AS-2-EFF	8/1/2016	--	--	--	--	--	4.8	--
AS-2-EFF	9/1/2016	--	--	--	--	--	8.4	--
AS-2-EFF	10/12/2016	--	--	--	--	--	<1	--
AS-2-EFF	11/3/2016	--	--	--	--	--	<1	--
AS-2-EFF	12/8/2016	--	--	--	--	--	<1	--
AS-2-EFF	1/4/2017	--	--	--	--	--	<1	--
AS-2-EFF	2/1/2017	--	--	--	--	--	2.6	--
AS-2-EFF	3/2/2017	--	--	--	--	--	5.7	--
AS-2-EFF	4/7/2017	--	--	--	--	--	3	--
AS-2-EFF	5/4/2017	--	--	--	--	--	4.1	--
AS-2-EFF	6/16/2017	--	--	--	--	--	5.1	--
AS-2-EFF	7/13/2017	--	--	--	--	--	5.2	--
AS-2-EFF	8/29/2017	--	--	--	--	--	<1	--
AS-2-EFF	9/20/2017	--	--	--	--	--	<1	--
AS-2-EFF	10/17/2017	--	--	--	--	--	<1	--
AS-2-EFF	11/20/2017	--	--	--	--	--	<1	--
AS-2-EFF	12/18/2017	--	--	--	--	--	<1	--
AS-2-EFF	1/8/2018	--	--	--	--	--	<1	--
AS-2-EFF	2/1/2018	--	--	--	--	--	<1	--
AS-2-EFF	3/2/2018	--	--	--	--	--	<1	--
AS-2-EFF	4/4/2018	--	--	--	--	--	<1	--
AS-2-EFF	5/1/2018	--	--	--	--	--	<1	--
AS-2-EFF	6/22/2018	--	--	--	--	--	<1	--
AS-2-EFF	8/9/2018	--	--	--	--	--	<1	--
AS-2-EFF	10/10/2018	--	--	--	--	--	<1	--
AS-2-EFF	11/9/2018	--	--	--	--	--	<1	--
AS-2-EFF	12/5/2018	--	--	--	--	--	<1	--
AS-2-EFF	1/4/2019	<1	<1	<1	<1	<1	<1	<1
AS-2-EFF	2/6/2019	--	--	--	--	--	<1	--
AS-2-EFF	3/11/2019	--	--	--	--	--	<1	--
AS-2-EFF	4/3/2019	--	--	--	--	--	<1	--
AS-2-EFF	10/9/2019	--	--	--	--	--	<1	--
AS-2-INF	7/20/2016	--	--	--	--	--	130	--
AS-2-INF	8/1/2016	--	--	--	--	--	160	--
AS-2-INF	9/1/2016	--	--	--	--	--	170	--

TABLE 1
INFLUENT AND EFFLUENT CONCENTRATION DATA
FOR THE HYDRAULIC CONTROL SYSTEM
2019 SECOND SEMI-ANNUAL GROUNDWATER MONITORING REPORT
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Site	Date	1,1,1-Trichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	Trichloroethene (ug/L)	Vinyl Chloride (ug/L)
AS-2-INF	10/12/2016	--	--	--	--	--	21	--
AS-2-INF	11/3/2016	--	--	--	--	--	18	--
AS-2-INF	12/8/2016	--	--	--	--	--	18	--
AS-2-INF	1/4/2017	--	--	--	--	--	19	--
AS-2-INF	2/1/2017	--	--	--	--	--	19	--
AS-2-INF	3/2/2017	--	--	--	--	--	22	--
AS-2-INF	4/7/2017	--	--	--	--	--	21	--
AS-2-INF	5/4/2017	--	--	--	--	--	18	--
AS-2-INF	6/16/2017	<1	<1	7.2	<1	<1	19	<1
AS-2-INF	7/13/2017	--	--	--	--	--	14	--
AS-2-INF	8/29/2017	--	--	--	--	--	6.2	--
AS-2-INF	9/20/2017	--	--	--	--	--	18	--
AS-2-INF	10/17/2017	--	--	--	--	--	250	--
AS-2-INF	11/20/2017	--	--	--	--	--	150	--
AS-2-INF	12/18/2017	--	--	--	--	--	30	--
AS-2-INF	1/8/2018	--	--	--	--	--	180	--
AS-2-INF	2/1/2018	--	--	--	--	--	150	--
AS-2-INF	3/2/2018	--	--	--	--	--	140	--
AS-2-INF	4/4/2018	--	--	--	--	--	140	--
AS-2-INF	5/1/2018	--	--	--	--	--	140	--
AS-2-INF	6/22/2018	<1	1.98	30.5	<1	<1	159	<1
AS-2-INF	8/9/2018	--	--	--	--	--	100	--
AS-2-INF	10/10/2019	--	--	--	--	--	141	--
AS-2-INF	11/9/2018	--	--	--	--	--	133	--
AS-2-INF	12/5/2018	--	--	--	--	--	132	--
AS-2-INF	1/4/2019	<1	2.17	22.5	<1	<1	142	<1
AS-2-INF	2/6/2019	--	--	--	--	--	54.1	--
AS-2-INF	3/11/2019	--	--	--	--	--	53.4	--
AS-2-INF	4/3/2019	--	--	--	--	--	121	--
AS-2-INF	5/7/2019	1.14	2.25	20.1	<1	<1	111	--
AS-2-INF	6/8/2019	1.71	3	51.8	<1	<1	288	--
AS-2-INF	7/11/2019	1.25	<1	1.88	<1	<1	99.7	--
AS-2-INF	8/9/2019	<1	<1	4.28	<1	<1	19.4	--
AS-2-INF	9/5/2019	--	--	--	--	--	161	--
AS-2-INF	10/9/2019	--	--	--	--	--	145	--

Notes:
-- Not Analyzed
AS-2-EFF - Effluent of RW-2, S.In

Table 3
Comparison of ARARs and TBCs
Coleman Operable Unit of the 29th & Mead Site
Wichita, Kansas

Contaminant	MCL in ROD[a] (µg/L)	Current MCL[b] (µg/L)	KAL in ROD[c] (µg/L)	Current KAL[d] (µg/L)	Maximum Site Related Detected Concentration[e] µg/L
1,1-Dichloroethane	NA	NA	5	25	75
1,1,1-Trichloroethane	200	200	200	200	3500
Trichloroethene	5	5	5	5	21000
Tetrachloroethene	5	5	7	5	43
Toluene	2000	1000	2000	1000	< 80
1,1-Dichloroethene	7	7	7	7	1300
Trans 1,2-Dichloroethene	NA	100	70	100	3100

(a) Data taken from an EPA memorandum dated April 11, 1991, Subject: Update to Numeric Action Levels for Contaminated Drinking Water Sites.

(b) EPA Safe Drinking Water Standard2012 Edition of the Drinking Water Standards and Health Advisories EPA 822-S-12-001 Office of Water.

(c) Data taken from a Kansas Department of Health and Environment memorandum dated December 5, 1988. Subject: Revised Groundwater Contaminant Cleanup Targe: Revised Groundwater Contaminant Cleanup Target Concentrations For Aluminum and Selenium

(d) KDHE Risk Based Standards for Kansas. RSK Manual - 5th Version. Tier 2 Risk-Based Summary Table, Residential groundwater scenario March 2014.

(e) Data taken from a report by Groundwater Technology Inc. entitled "Report of Remedial Investigation Activities Coleman Operable Unit" Wichita, Kansas - Dated September 3, 1991

APPENDIX E

MONITORING WELL TREND CHARTS

TABLE 4
CONCENTRATION DATA FOR THE
GROUNDWATER MONITORING PROGRAM
2019 SECOND SEMI-ANNUAL GROUNDWATER MONITORING REPORT
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Data Units	MCL	MW-03F 10/13/2016 Result	MW-03F 4/25/2017 Result	MW-03F 10/5/2017 Result	MW-03F 4/25/2018 Result	MW-03F 10/22/2018 Result	MW-03F 4/11/2019 Result	MW-03F 10/10/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethene	ug/L	200	1.5	<1	<1	<1	<1	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	5.1	1.6	1.7	<1	<1	<1	4.35	
Tetrachloroethene	ug/L	5	<1	<1	<1	<1	<1	<1	<1	
Toluene	ug/L	200	–	–	–	<1	<1	<1	<1	
Trichloroethene	ug/L	5	9.5	4.8	4.4	<1	<1	<1	11.9	
Vinyl chloride	ug/L	2	<1	<1	<1	<1	<1	<1	<1	

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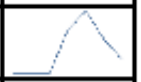
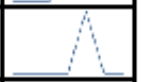
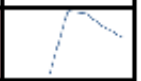
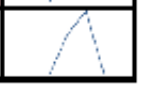
Parameter	Site Sample Date Units	MCL	MW-05F 10/13/2016 Result	MW-05F 4/25/2017 Result	MW-05F 10/5/2017 Result	MW-05F 4/26/2018 Result	MW-05F 10/25/2018 Result	MW-05F 4/12/2019 Result	MW-05F 10/10/20019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	NS	NS	NS	<1	<1	<1	<1	
1,1-Dichloroethene	ug/L	200	NS	NS	NS	<1	<1	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	NS	NS	NS	4.66	6.7	3.6	1.48	
Tetrachloroethene	ug/L	5	NS	NS	NS	<1	1.01	<1	<1	
Toluene	ug/L	200	NS	NS	NS	<1	<1	<1	<1	
Trichloroethene	ug/L	5	NS	NS	NS	24.8	23.7	18.5	14.4	
Vinyl chloride	ug/L	2	NS	NS	NS	1.55	2.43	<1	<1	

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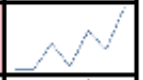
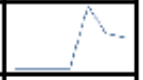
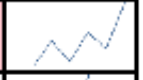
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-08 10/13/2016 Result	MW-08 4/25/2017 Result	MW-08 10/5/2017 Result	MW-08 4/26/2018 Result	MW-08 10/22/2018 Result	MW-08 4/11/2019 Result	MW-08 10/9/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	NS	NS	<5	<1	3.14	2.23	2.34	
1,1-Dichloroethene	ug/L	200	NS	NS	3.6J	88	4.62	33.2	<2	
cis-1,2-Dichloroethene	ug/L	70	NS	NS	2100	249	3100	1590	5040	
Tetrachloroethene	ug/L	5	NS	NS	<5	<1	3.7	2.08	1.81	
Toluene	ug/L	200	NS	NS	-	<1	<1	<1	<1	
Trichloroethene	ug/L	5	NS	NS	7400	1200	10100	5130	18800	
Vinyl chloride	ug/L	2	NS	NS	3J	<1	1.52	<1	<1	

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COLEMAN OPERABLE UNIT
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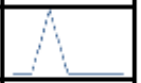
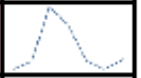
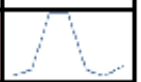
Parameter	Site Sample Date Units	MCL	MW-12 10/14/2016 Result	MW-12 4/25/2017 Result	MW-12 10/5/2017 Result	MW-12 4/26/2018 Result	MW-12 10/22/2018 Result	MW-12 4/11/2019 Result	MW-12 10/10/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	2.5	<1	<1	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	0.45J	5	38	27.2	5.72	<1	6.05	
Tetrachloroethene	ug/L	5	<1	<1	<1	<1	<1	<1	<1	
Toluene	ug/L	200	–	–	–	<1	<1	<1	<1	
Trichloroethene	ug/L	5	1.5	18	190	191	17.9	<1	29.1	
Vinyl chloride	ug/L	2	<1	<1	0.61J	<1	<1	<1	<1	

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COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-15 10/13/2016 Result	MW-15 4/25/2017 Result	MW-15 10/5/2017 Result	MW-15 4/26/2018 Result	MW-15 10/22/2018 Result	MW-15 10/10/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	0.81J	<1	<1	NS	1.15	2.13	
Tetrachloroethene	ug/L	5	0.7J	1.2	<1	NS	<1	<1	
Toluene	ug/L	200	–	–	–	NS	<1	<1	
Trichloroethene	ug/L	5	6.6	5.4	4.3	NS	14.9	11.7	
Vinyl chloride	ug/L	2	0.78J	<1	<1	NS	<1	<1	

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COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-16 10/13/2016 Result	MW-16 4/25/2017 Result	MW-16 10/5/2017 Result	MW-16 4/26/2018 Result	MW-16 10/22/2018 Result	MW-16 10/11/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	NS	<1	<1	
Tetrachloroethene	ug/L	5	<1	<1	<1	NS	<1	<1	
Toluene	ug/L	200	–	–	–	NS	<1	<1	
Trichloroethene	ug/L	5	0.49J	<1	<1	NS	<1	<1	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	<1	<1	

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Parameter	Site Sample Date Units	MCL	MW-17 10/12/2016 Result	MW-17 4/25/2017 Result	MW-17 10/4/2017 Result	MW-17 4/26/2018 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	NS	
Tetrachloroethene	ug/L	5	<1	<1	<1	NS	
Toluene	ug/L	200	–	–	–	NS	
Trichloroethene	ug/L	5	1.1	0.89J	0.77J	NS	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	

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Parameter	Site Sample Date Units	MCL	MW-20 10/13/2016 Result	MW-20 4/25/2017 Result	MW-20 10/4/2017 Result	MW-20 4/26/2018 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	NS	
Tetrachloroethene	ug/L	5	<1	<1	<1	NS	
Toluene	ug/L	200	–	–	–	NS	
Trichloroethene	ug/L	5	0.46J	<1	<1	NS	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	

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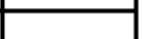
Parameter	Site Sample Date Units	MCL	MW-21 10/12/2016 Result	MW-21 4/25/2017 Result	MW-21 10/4/2017 Result	MW-21 4/26/2018 Result	MW-21 10/22/2018 Result	MW-21 10/9/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	0.85J	<1	NS	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	<1	1.4	<1	NS	<1	<1	
Tetrachloroethene	ug/L	5	<1	<1	<1	NS	<1	<1	
Toluene	ug/L	200	–	–	–	NS	<1	<1	
Trichloroethene	ug/L	5	<1	4	<1	NS	<1	<1	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	<1	<1	

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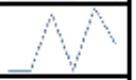
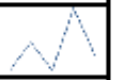
CONCENTRATION DATA FOR THE
GROUNDWATER MONITORING PROGRAM
2019 SECOND SEMI-ANNUAL GROUNDWATER MONITORING REPORT
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-24 10/12/2016 Result	MW-24 4/25/2017 Result	MW-24 10/5/2017 Result	MW-24 4/26/2018 Result	MW-24 10/26/2018 Result	MW-24 10/10/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	NS	NS	<1	NS	<1	<1	
1,1-Dichloroethene	ug/L	200	NS	NS	<1	NS	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	NS	NS	<1	NS	1.15	<1	
Tetrachloroethene	ug/L	5	NS	NS	4	NS	4.42	1.86	
Toluene	ug/L	200	NS	NS	–	NS	<1	<1	
Trichloroethene	ug/L	5	NS	NS	7.3	NS	16	4.11	
Vinyl chloride	ug/L	2	NS	NS	<1	NS	<1	<1	

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COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-25 10/12/2016 Result	MW-25 4/25/2017 Result	MW-25 10/5/2017 Result	MW-25 4/26/2018 Result	MW-25 10/22/2018 Result	MW-25 10/10/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	NS	<1	<1	
Tetrachloroethene	ug/L	5	<1	<1	<1g	NS	<1	<1	
Toluene	ug/L	200	–	–	–	NS	<1	<1	
Trichloroethene	ug/L	5	1.1	2.2	2.1	NS	<1	<1	
Vinyl chloride	ug/L	2	<1	<1	<1g	NS	<1	<1	

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COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-30 10/12/2016 Result	MW-30 4/25/2017 Result	MW-30 10/5/2017 Result	MW-30 4/26/2018 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	
cis-1,2-Dichloroethene	ug/L	70	0.42J	<1	<1	NS	
Tetrachloroethene	ug/L	5	<1	<1	<1	NS	
Toluene	ug/L	200	–	–	–	NS	
Trichloroethene	ug/L	5	3.3	<1	<1	NS	
Vinyl chloride	ug/L	2	<1	<1	<1g	NS	

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COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-32 10/12/2016 Result	MW-32 4/25/2017 Result	MW-32 10/5/2017 Result	MW-32 4/26/2018 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	NS	NS	<1	NS	
1,1-Dichloroethene	ug/L	200	NS	NS	<1	NS	
cis-1,2-Dichloroethene	ug/L	70	NS	NS	<1	NS	
Tetrachloroethene	ug/L	5	NS	NS	<1	NS	
Toluene	ug/L	200	NS	NS	-	NS	
Trichloroethene	ug/L	5	NS	NS	<1	NS	
Vinyl chloride	ug/L	2	NS	NS	<1	NS	

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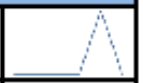
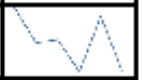
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-34 10/12/2016 Result	MW-34 4/25/2017 Result	MW-34 10/5/2017 Result	MW-34 4/26/2018 Result	MW-34 10/22/2018 Result	MW-34 10/10/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	1.86	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	NS	<1	<1	
Tetrachloroethene	ug/L	5	1.6	0.86J	<1	NS	1.03	<1	
Toluene	ug/L	200	–	–	–	NS	<1	<1	
Trichloroethene	ug/L	5	7.2	3.3	3.7	NS	6.3	<1	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	<1	<1	

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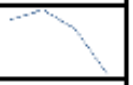
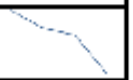
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-36 10/12/2016 Result	MW-36 4/25/2017 Result	MW-36 10/4/2017 Result	MW-36 4/26/2018 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	
cis-1,2-Dichloroethene	ug/L	70	3.1	3.7	2.6	NS	
Tetrachloroethene	ug/L	5	<1	<1	<1	NS	
Toluene	ug/L	200	<1	<1	-	NS	
Trichloroethene	ug/L	5	180	130	110	NS	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	

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COLEMAN OPERABLE UNIT
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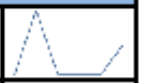
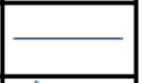
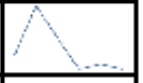
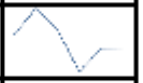
Parameter	Site Sample Date Units	MCL	MW-38 10/13/2016 Result	MW-38 4/25/2017 Result	MW-38 10/5/2017 Result	MW-38 4/26/2018 Result	MW-38 10/22/2018 Result	MW-38 10/11/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	2.3	<1	NS	<1	1.01	
1,1-Dichloroethene	ug/L	200	<1	<1	0.59J	NS	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	3.5	15	7.4	NS	1.29	<1	
Tetrachloroethene	ug/L	5	<1	<1	<1	NS	<1	<1	
Toluene	ug/L	200	–	–	–	NS	<1	<1	
Trichloroethene	ug/L	5	7.1	12	7.9	NS	4.33	4.38	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	<1	<1	

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COLEMAN OPERABLE UNIT
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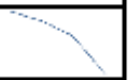
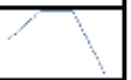
Parameter	Site Sample Date Units	MCL	MW-40 10/12/2016 Result	MW-40 4/25/2017 Result	MW-40 10/4/2017 Result	MW-40 4/26/2018 Result	CONCENTRATION GRAPHA
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	NS	
Tetrachloroethene	ug/L	5	7.2	6.1	4.3	NS	
Toluene	ug/L	200	–	–	–	NS	
Trichloroethene	ug/L	5	1.3	2.4	2.4	NS	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	

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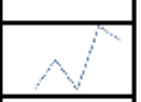
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-41 10/13/2016 Result	MW-41 4/25/2017 Result	MW-41 10/5/2017 Result	MW-41 4/26/2018 Result	MW-41 10/26/2018 Result	MW-41 10/10/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	NS	NS	<1	NS	<1	<1	
1,1-Dichloroethene	ug/L	200	NS	NS	<1	NS	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	NS	NS	<1	NS	1.1	<1	
Tetrachloroethene	ug/L	5	NS	NS	1.8	NS	2.91	2.82	
Toluene	ug/L	200	NS	NS	–	NS	<1	<1	
Trichloroethene	ug/L	5	NS	NS	7.3	NS	15.5	12.1	
Vinyl chloride	ug/L	2	NS	NS	<1	NS	<1	<1	

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Parameter	Site Sample Date Units	MCL	MW-42 10/12/2016 Result	MW-42 4/25/2017 Result	MW-42 10/4/2017 Result	MW-42 4/26/2018 Result	MW-42 10/22/2018 Result	MW-42 4/11/2019 Result	MW-42 10/10/2019 Result	CONCENTRATION GRAP[H
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	<1	<1	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	3.4	2.7	1.9	2.38	1.8	2.15	3.03	
Tetrachloroethene	ug/L	5	<1	<1	<1	<1	<1	<1	<1	
Toluene	ug/L	200	<1	<1	<1	<1	<1	<1	<1	
Trichloroethene	ug/L	5	20	16	11	17	14.2	16.6	16.8	
Vinyl chloride	ug/L	2	<1	<1	<1	<1	<1	<1	<1	

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Parameter	Site Sample Date Units	MCL	MW-43 10/13/2016 Result	MW-43 4/25/2017 Result	MW-43 10/4/2017 Result	MW-43 4/26/2018 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	NS	
Tetrachloroethene	ug/L	5	<1	<1	<1	NS	
Toluene	ug/L	200	–	–	–	NS	
Trichloroethene	ug/L	5	0.95J	<1	<1	NS	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	

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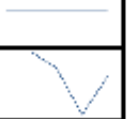
Parameter	Site Sample Date Units	MCL	MW-45 10/13/2016 Result	MW-45 4/25/2017 Result	MW-45 10/5/2017 Result	MW-45 4/26/2018 Result	MW-45 10/22/2018 Result	MW-45 10/10/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	0.55J	0.54J	0.97J	NS	<1	<1	
Tetrachloroethene	ug/L	5	2.7	2.7	2	NS	1.64	1.56	
Toluene	ug/L	200	–	–	–	NS	<1	<1	
Trichloroethene	ug/L	5	12	12	9.2	NS	4.08	4.52	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	<1	<1	

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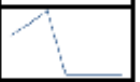
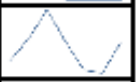
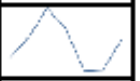
Parameter	Site Sample Date Units	MCL	MW-46 10/13/2016 Result	MW-46 4/25/2017 Result	MW-46 10/5/2017 Result	MW-46 4/26/2018 Result	MW-46 10/22/2018 Result	MW-46 4/11/2019 Result	MW-46 10/10/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	0.61J	<1	<1	<1	<1	<1	
1,1-Dichloroethene	ug/L	200	1.7	2.2	2.8	<1	<1	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	11	29	53	26.5	2.76	<1	26.3	
Tetrachloroethene	ug/L	5	<1	<1	<1	<1	<1	<1	<1	
Toluene	ug/L	200	–	–	–	<1	<1	<1	<1	
Trichloroethene	ug/L	5	60	140	250	173	11.4	8.15	127	
Vinyl chloride	ug/L	2	<1	<1	0.57J	<1	<1	<1	<1	

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Parameter	Site Sample Date Units	MCL	MW-47 10/13/2016 Result	MW-47 4/25/2017 Result	MW-47 10/5/2017 Result	MW-47 4/26/2018 Result	MW-47 10/22/2018 Result	MW-47 10/10/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	NS	<1	<1	
Tetrachloroethene	ug/L	5	<1	<1	<1	NS	<1	<1	
Toluene	ug/L	200	–	–	–	NS	<1	<1	
Trichloroethene	ug/L	5	0.69J	<1	0.96J	NS	<1	<1	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	<1	<1	

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COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-51 10/13/2016 Result	MW-51 4/25/2017 Result	MW-51 10/4/2017 Result	MW-51 4/26/2018 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	NS	
Tetrachloroethene	ug/L	5	<1	<1	<1	NS	
Toluene	ug/L	200	–	–	–	NS	
Trichloroethene	ug/L	5	0.4J	<1	<1	NS	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	

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TABLE 4
CONCENTRATION DATA FOR THE
GROUNDWATER MONITORING PROGRAM
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COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-52 10/13/2016 Result	MW-52 4/25/2017 Result	MW-52 10/5/2017 Result	MW-52 4/26/2018 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	
cis-1,2-Dichloroethene	ug/L	70	0.9J	0.64J	<1	NS	
Tetrachloroethene	ug/L	5	<1	<1	<1	NS	
Toluene	ug/L	200	–	–	–	NS	
Trichloroethene	ug/L	5	1.4	3.3	2.1	NS	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	

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CONCENTRATION DATA FOR THE
GROUNDWATER MONITORING PROGRAM
2019 SECOND SEMI-ANNUAL GROUNDWATER MONITORING REPORT
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-53 10/13/2016 Result	MW-53 4/25/2017 Result	MW-53 10/5/2017 Result	MW-53 4/25/2018 Result	MW-53 10/22/2018 Result	MW-53 4/11/2019 Result	MW-53 10/10/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	<1	<1	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	1.1	0.87J	0.71J	4	1.99	3.22	<1	
Tetrachloroethene	ug/L	5	<1	<1	<1	<1	<1	<1	<1	
Toluene	ug/L	200	–	–	–	<1	<1	<1	<1	
Trichloroethene	ug/L	5	11	8.3	8.7	18.9	7.71	17.6	9.21	
Vinyl chloride	ug/L	2	<1	<1	<1	<1	<1	<1	<1	

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COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-54 10/13/2016 Result	MW-54 4/25/2017 Result	MW-54 10/5/2017 Result	MW-54 4/26/2018 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	NS	
Tetrachloroethene	ug/L	5	<1	<1	<1	NS	
Toluene	ug/L	200	–	–	–	NS	
Trichloroethene	ug/L	5	<1	<1	<1	NS	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	

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COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-59 10/13/2016 Result	MW-59 4/25/2017 Result	MW-59 10/5/2017 Result	MW-59 4/25/2018 Result	MW-59 10/22/2018 Result	MW-59 4/19/2019 Result	MW-59 10/10/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	<1	<1	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	<1	<1	1	<1	
Tetrachloroethene	ug/L	5	<1	<1	<1	<1	<1	<1	<1	
Toluene	ug/L	200	–	–	–	<1	<1	<1	<1	
Trichloroethene	ug/L	5	2.2	5.2	15	21.8	41.9	42.6	33.2	
Vinyl chloride	ug/L	2	<1	<1	<1	<1	<1	<1	<1	

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COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-60 10/13/2016 Result	MW-60 4/25/2017 Result	MW-60 10/5/2017 Result	MW-60 4/25/2018 Result	MW-60 10/22/2018 Result	MW-60 4/11/2019 Result	MW-60 10/10/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	<1	<1	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	<1	<1	<1	<1	
Tetrachloroethene	ug/L	5	<1	<1	<1	<1	<1	<1	<1	
Toluene	ug/L	200	–	–	–	<1	<1	<1	<1	
Trichloroethene	ug/L	5	<1	<1	<1	<1	<1	<1	<1	
Vinyl chloride	ug/L	2	<1	<1	<1	<1	<1	<1	<1	

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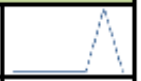
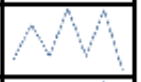
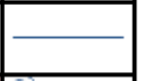
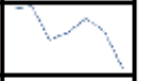
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-61 10/12/2016 Result	MW-61 4/25/2017 Result	MW-61 10/5/2017 Result	MW-61 4/25/2018 Result	MW-61 10/22/2018 Result	MW-61 4/11/2019 Result	MW-61 10/10/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	<1	<1	1.3	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	<1	<1	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	3.9	9.9	4.6	12.7	4.53	12.5	2	
Tetrachloroethene	ug/L	5	<1	0.91J	<1	1.04	<1	1.2	<1	
Toluene	ug/L	200	<1	<1	<1	<1	<1	<1	<1	
Trichloroethene	ug/L	5	93	97	56	64	81.9	66.2	20.6	
Vinyl chloride	ug/L	2	<1	<1	<1	<1	<1	<1	<1	

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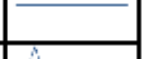
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-62 10/12/2016 Result	MW-62 4/25/2017 Result	MW-62 10/5/2017 Result	MW-62 4/25/2018 Result	MW-62 10/22/2018 Result	MW-62 4/11/2019 Result	MW-62 10/10/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	<1	<1	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	<1	<1	<1	<1	
Tetrachloroethene	ug/L	5	0.9J	1.5	0.6J	1.17	1.09	1.12	1.07	
Toluene	ug/L	200	<1	<1	<1	<1	<1	<1	<1	
Trichloroethene	ug/L	5	1.7	11	2.6	6.38	5.68	6.37	4.28	
Vinyl chloride	ug/L	2	<1	<1	<1	<1	<1	<1	<1	

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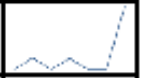
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-67 10/13/2016 Result	MW-67 4/25/2017 Result	MW-67 10/5/2017 Result	MW-67 4/30/2018 Result	MW-67 10/26/2018 Result	MW-67 4/12/2019 Result	MW-67 10/9/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	WNA	<1	<1	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	WNA	<1	<1	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	0.49J	1.7	WNA	1.63	<1	<1	9.22	
Tetrachloroethene	ug/L	5	<1	<1	WNA	<1	<1	<1	<1	
Toluene	ug/L	200	–	–	*	<1	<1	<1	<1	
Trichloroethene	ug/L	5	3.1	8.8	WNA	11.3	<1	<1	42.1	
Vinyl chloride	ug/L	2	<1	<1	WNA	<1	<1	<1	<1	

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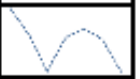
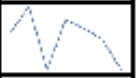
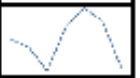
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-68 10/13/2016 Result	MW-68 4/25/2017 Result	MW-68 10/5/2017 Result	MW-68 4/30/2018 Result	MW-68 10/26/2018 Result	MW-68 4/12/2019 Result	MW-68 10/9/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	WNA	<1	<1	<1	<1	
1,1-Dichloroethene	ug/L	200	2.2	1.3	WNA	1.18	1.49	1.13	<2	
cis-1,2-Dichloroethene	ug/L	70	21	36	WNA	28.4	23.5	17.4	<1	
Tetrachloroethene	ug/L	5	<1	<1	WNA	<1	<1	<1	<1	
Toluene	ug/L	200	–	–	WNA	<1	<1	<1	<1	
Trichloroethene	ug/L	5	68	49	WNA	91.7	133	106	7.89	
Vinyl chloride	ug/L	2	<1	<1	WNA	<1	<1	<1	<1	

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COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-69D 10/13/2016 Result	MW-69D 4/25/2017 Result	MW-69D 10/5/2017 Result	MW-69D 4/26/2018 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	
cis-1,2-Dichloroethene	ug/L	70	0.56J	<1	<1	NS	
Tetrachloroethene	ug/L	5	<1	<1	<1	NS	
Toluene	ug/L	200	<1	<1	<1	NS	
Trichloroethene	ug/L	5	11	5.3	4.3	NS	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	

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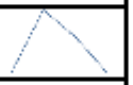
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-69S 10/13/2016 Result	MW-69S 4/25/2017 Result	MW-69S 10/5/2017 Result	MW-69S 4/26/2018 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	NS	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	NS	
Tetrachloroethene	ug/L	5	<1	<1	<1	NS	
Toluene	ug/L	200	<1	<1	<1	NS	
Trichloroethene	ug/L	5	0.57J	2.6	1.5	NS	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	

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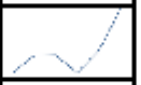
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-70D 10/12/2016 Result	MW-70D 4/25/2017 Result	MW-70D 10/4/2017 Result	MW-70D 4/26/2018 Result	MW-70D 10/22/2018 Result	MW-70D 10/10/2019 Result	CONCENTRATION GRAPH
1,1,1-Trichloroethane	ug/L	200	WNA	<1	<1	NS	<1	<1	
1,1-Dichloroethene	ug/L	200	WNA	<1	<1	NS	<1	2	
cis-1,2-Dichloroethene	ug/L	70	WNA	0.66J	<1	NS	<1	<1	
Tetrachloroethene	ug/L	5	WNA	<1	<1	NS	<1	<1	
Toluene	ug/L	200	WNA	–	–	NS	<1	<1	
Trichloroethene	ug/L	5	WNA	2.1	2.2	NS	2.75	7.86	
Vinyl chloride	ug/L	2	WNA	<1	<1	NS	<1	<1	

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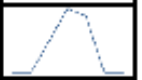
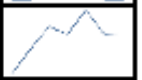
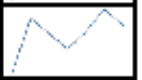
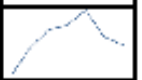
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-70S 10/12/2016 Result	MW-70S 4/25/2017 Result	MW-70S 10/4/2017 Result	MW-70S 4/26/2018 Result	MW-70S 10/22/2018 Result	MW-70S 4/11/2019 Result	MW-70S 10/10/2019 Result	CONCENTRATION GRAPHS
1,1,1-Trichloroethane	ug/L	200	WNA	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethene	ug/L	200	WNA	<1	1.4	2.9	2.56	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	WNA	170	320	266	434	266	273	
Tetrachloroethene	ug/L	5	WNA	3.9	2.8	1.69	2.94	4.58	3.38	
Toluene	ug/L	200	WNA	–	–	<1	<1	<1	<1	
Trichloroethene	ug/L	5	WNA	420	690	759	990	571	455	
Vinyl chloride	ug/L	2	WNA	<1	0.68J	<1	<1	<1	<1	

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2019 SECOND SEMI-ANNUAL GROUNDWATER MONITORING REPORT
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-71D 10/12/2016 Result	MW-71D 4/25/2017 Result	MW-71D 10/5/2017 Result	MW-71D 4/25/2018 Result	MW-71D 10/22/2018 Result	MW-71D 4/11/2019 Result	MW-71D 10/9/2019 Result	CONCENTRATION GRAPHS
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	<1	<1	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	1	<1	<1	<1	<1	
Tetrachloroethene	ug/L	5	<1	<1	<1	<1	<1	<1	<1	
Toluene	ug/L	200	–	–	–	<1	<1	<1	<1	
Trichloroethene	ug/L	5	1	<1	16	<1	1.91	<1	<1	
Vinyl chloride	ug/L	2	<1	<1	<1	<1	<1	<1	<1	

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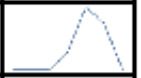
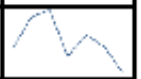
2019 SECOND SEMI-ANNUAL GROUNDWATER MONITORING REPORT
COLEMAN OPERABLE UNIT
WICHITA, KANSAS

Parameter	Site Sample Date Units	MCL	MW-71S 10/12/2016 Result	MW-71S 4/25/2017 Result	MW-71S 10/5/2017 Result	MW-71S 4/25/2018 Result	MW-71S 10/22/2018 Result	MW-71S 4/11/2019 Result	MW-71S 10/9/2019 Result	CONCENTRATION GRAPHS
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	<1	<1	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	2.3	7.99	5.82	<1	
Tetrachloroethene	ug/L	5	<1	<1	<1	<1	<1	<1	<1	
Toluene	ug/L	200	–	–	–	<1	<1	<1	<1	
Trichloroethene	ug/L	5	1.8	4	4.5	1.18	2.73	1.89	<1	
Vinyl chloride	ug/L	2	<1	<1	<1	<1	<1	<1	<1	

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Parameter	Site Sample Date Units	MCL	RW-2 10/12/2016 Result	RW-2 4/25/2017 Result	RW-2 10/5/2017 Result	RW-2 4/25/2018 Result	CONCENTRATION GRAPHS
1,1,1-Trichloroethane	ug/L	200	<1	<1	WNA	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	WNA	<1	
cis-1,2-Dichloroethene	ug/L	70	4.1	6	WNA	7.9	
Tetrachloroethene	ug/L	5	<1	<1	WNA	<1	
Toluene	ug/L	200	–	–	WNA	<1	
Trichloroethene	ug/L	5	16	14	WNA	24.9	
Vinyl chloride	ug/L	2	<1	<1	WNA	<1	

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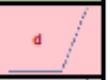
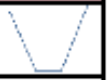
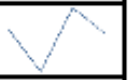
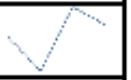
Parameter	Site Sample Date Units	MCL	RW-3 10/13/2016 Result	RW-3 4/25/2017 Result	RW-3 10/5/2017 Result	RW-3 4/25/2018 Result	CONCENTRATION GRAPHS
1,1,1-Trichloroethane	ug/L	200	<1	WNA	<1	1.46	
1,1-Dichloroethene	ug/L	200	2.6	WNA	0.7J	2.86	
cis-1,2-Dichloroethene	ug/L	70	45	WNA	67	39.9	
Tetrachloroethene	ug/L	5	<1	WNA	<1	<1	
Toluene	ug/L	200	–	WNA	–	<1	
Trichloroethene	ug/L	5	180	WNA	340	247	
Vinyl chloride	ug/L	2	0.76J	WNA	<1	<1	

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Parameter	Site Sample Date Units	MCL	VEW-05D 10/12/2016 Result	VEW-05D 4/25/2017 Result	VEW-05D 10/4/2017 Result	VEW-05D 4/26/2018 Result	CONCENTRATION GRAPHS
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	NS	
1,1-Dichloroethene	ug/L	200	<1	2.3	3.7	NS	
cis-1,2-Dichloroethene	ug/L	70	0.9J	16	31	NS	
Tetrachloroethene	ug/L	5	<1	<1	<1	NS	
Toluene	ug/L	200	–	–	–	NS	
Trichloroethene	ug/L	5	62	410	560	NS	
Vinyl chloride	ug/L	2	<1	<1	<1	NS	

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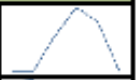
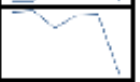
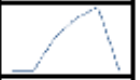
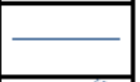
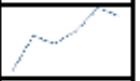
Parameter	Site Sample Date Units	MCL	VEW-18D 10/12/2016 Result	VEW-18D 4/25/2017 Result	VEW-18D 10/4/2017 Result	VEW-18D 4/26/2018 Result	VEW-18D 10/22/2018 Result	VEW-18D 4/19/2019 Result	VEW-18D 10/10/2019 Result	CONCENTRATION GRAPHS
1,1,1-Trichloroethane	ug/L	200	<10	<10	12	21.9	16.8	<50	11.6	
1,1-Dichloroethene	ug/L	200	39	40	29	36.9	37.6	<50	34.1	
cis-1,2-Dichloroethene	ug/L	70	24	31	16	16.5	20.7	<50	17	
Tetrachloroethene	ug/L	5	<10	<10	1.7	2.74	3.32	<50	2.76	
Toluene	ug/L	200	–	–	–	<1	<1	<50	<1	
Trichloroethene	ug/L	5	5500g	4800	3800	5520	8500	7480	4110	
Vinyl chloride	ug/L	2	<10	<10	<1	<1	<1	<50	<1	

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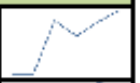
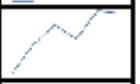
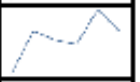
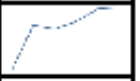
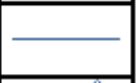
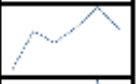
Parameter	Site Sample Date Units	MCL	VEW-22D 10/12/2016 Result	VEW-22D 4/25/2017 Result	VEW-22D 10/4/2017 Result	VEW-22D 4/26/2018 Result	VEW-22D 10/22/2018 Result	VEW-22D 4/11/2019 Result	VEW-22D 10/10/2019 Result	CONCENTRATION GRAPHS
1,1,1-Trichloroethane	ug/L	200	WNA	<1	27	19.1	26.3	32.2	5.54	
1,1-Dichloroethene	ug/L	200	WNA	15	25	17.9	32.4	31.1	9.14	
cis-1,2-Dichloroethene	ug/L	70	WNA	520	410	354	778	514	246	
Tetrachloroethene	ug/L	5	WNA	2.3	2.1	2.49	3.14	3.23	1.33	
Toluene	ug/L	200	WNA	–	–	<1	<1	<1	<1	
Trichloroethene	ug/L	5	WNA	1700	1200	1860	2710	1770	174 H	
Vinyl chloride	ug/L	2	WNA	<1	1.8	<1	2.23	<1	<1	

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Parameter	Site Sample Date Units	MCL	WND-29D Result	WND-29D 4/25/2017 Result	WND-29D 10/5/2017 Result	WND-29D 4/25/2018 Result	WND-29D 10/22/2018 Result	WND-29D 4/11/2019 Result	WND-29D 10/9/2012 Result	CONCENTRATION GRAPHS
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	<1	<1	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	<1	<1	<1	<1	
Tetrachloroethene	ug/L	5	<1	<1	<1	<1	<1	<1	<1	
Toluene	ug/L	200	<1	<1	<1	<1	<1	<1	<1	
Trichloroethene	ug/L	5	1.7	3.2	2.4	3.48	2.65	4.6	1.46	
Vinyl chloride	ug/L	2	<1	<1	<1	<1	<1	<1	<1	

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Parameter	Site Sample Date Units	MCL	WND-296 10/13/2016 Result	WND-296 4/25/2017 Result	WND-296 10/5/2017 Result	WND-296 4/25/2018 Result	WND-296 10/22/2018 Result	WND-296 4/11/2019 Result	WND-296 10/9/2019 Result	CONCENTRATION GRAPHS
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethene	ug/L	200	<1	<1	<1	<1	<1	<1	<2	
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1	<1	<1	<1	<1	
Tetrachloroethene	ug/L	5	<1	<1	<1	<1	<1	<1	<1	
Toluene	ug/L	200	<1	<1	<1	<1	<1	<1	<1	
Trichloroethene	ug/L	5	<1	<1	<1	<1	<1	<1	<1	
Vinyl chloride	ug/L	2	<1	<1	<1	<1	<1	<1	<1	

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Parameter	Site Sample Date Units	MCL	WNC-23D 10/26/2018 Result	WNC-23D 4/11/2019 Result	WNC-23D 10/10/2019 Result
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1
1,1-Dichloroethene	ug/L	200	<1	<1	<2
cis-1,2-Dichloroethene	ug/L	70	<1	<1	<1
Tetrachloroethene	ug/L	5	<1	<1	<1
Toluene	ug/L	200	<1	<1	<1
Trichloroethene	ug/L	5	<1	<1	<1
Vinyl chloride	ug/L	2	<1	<1	<1

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APPENDIX F

EPA LETTERS TO JOHNSON CONTROLS, INC. AND NEW COLEMAN HOLDINGS

Mike Richardson, Plant Manager
Johnson Controls, Inc.
3110 North Mead Street
Wichita, Kansas 67219

Re: 29th and Mead Superfund Site, Coleman Operable Unit 2

Dear Mr. Richardson:

The purpose of this letter is to convey to you the U.S. Environmental Protection Agency's concerns with the continuing levels of trichloroethylene, or TCE, above the EPA's health-based removal management levels, or RMLs, in Buildings 12 and 14 at the referenced site. Specifically, the EPA is requiring that actions be taken to eliminate or reduce the risk of potential adverse health effects for the workers in those buildings by reducing TCE concentrations below the RMLs.

On September 9, 2015, the third Five-Year Review, or FYR, for the Site was finalized by the EPA. Because contaminants were present in the subsurface near occupied buildings, a recommendation of that report was to complete a vapor intrusion assessment to determine if TCE levels in indoor air of Buildings 12 and 14 were above the EPA's RMLs of six micrograms per cubic meter, or $\mu g/m^3$. In general, exceedance of an RML means that action is warranted to reduce exposure to ensure the protection of human health. The Indoor Assessment Workplan sampling was completed in June 2016 and on November 9, 2016, which assessed 31 locations in 16 buildings. The results indicated elevated levels of tetrachloroethylene, or PCE, and TCE in 8 of the 16 buildings. A second round of sampling was conducted on February 22, 2017. Similar results were obtained. In May of 2017, it was discovered that a product called CRC Heavy Duty Degreaser was being used in the plant. According to the Safety Data Sheet, the product is primarily PCE. It was being used in aerosol form throughout the plant as a degreaser. The EPA has been informed that this product has been permanently removed from use at the plant.

Two more sampling events occurred on May 17, 2018 and August 28, 2018. Results from those sampling events identified eight buildings with elevated PCE and TCE levels. Additional surveys of those buildings identified a continued use of the CRC Heavy Duty Degreaser. Those containers were removed, and the eight buildings were resampled on February 21, 2019. The results from that sampling event showed that PCE levels were either non-detect or below the EPA's RMLs in all samples. However, TCE levels remained above the RML within Buildings 12 and 14.

On April 4, 2019, a Pilot Study was approved by the EPA that identified a course of action to remove the TCE from indoor air to below the RMLs. Those actions involved placing mobile air scrubbers in the office and tool crib area of Building 14 and increasing the intake of outdoor air into the ventilation system of Building 12. Sampling occurred in Building 14 on May 13, 2019, and in Building 12 on June 4, 2019.

The results from those sampling events for Building 14 continue to show elevated levels of TCE in indoor air, with a maximum result of 150 $\mu g/m^3$ in the facility's Health and Safety Office. For Building 12, the results are inconclusive due to the high levels of cyclohexane present in the samples. Two of the three samples were above the RML for TCE of 6 $\mu g/m^3$, with estimated TCE concentrations of 8.1 and 9.5 $\mu g/m^3$. However, because high concentrations of cyclohexane compelled the lab to dilute the samples, the results are "J" coded, which means that it is an estimated value. The lab reports these values as "qualified with a high probability of a false positive". The EPA cannot draw any definitive conclusions regarding Building 12 based on the June 4, 2019, sampling results and must rely on the 2018 results until new sample results become available.

Additional action in a timely manner is required to eliminate or reduce the risk of potential adverse health

effects for the workers in those buildings by reducing TCE concentrations below the removal management level of 6 µg/m^3. In the indoor air samples collected from Buildings 12 and 14, TCE exceeded the EPA's RML for commercial buildings. Fetal heart defects, or malformations, could occur if a pregnant woman is exposed to TCE above this level during a few weeks early in pregnancy, which is a critical period when her baby's heart is developing. Additionally, exposure to TCE above the RML over long periods of time, such as years, by a person of any age, could pose other types of health risks, such as to the kidneys or the immune system.

The EPA's greatest concern at this time is for worker exposures in Buildings 12 and 14 because TCE has been detected above the RML. There is an immediate need to notify workers of the presence of TCE and the potential human health implications of TCE exposures. Worker notification can be implemented in multiple ways, such as verbal notification at employee meetings, mailing fact sheets, posting information on the bulletin board by the time-clock where employees clock in and out for work, or providing an employee handbook with information about the presence of TCE at the business. The EPA recognizes the complexities of working with Johnson Controls on this notification. The EPA is willing to discuss any of these proposals with you and New Coleman Holdings and offers its assistance in the development of the scientific/technical language regarding TCE exposures for this outreach effort.

Simultaneously with providing notification to workers, the EPA requests confirmation that actions are being taken currently and/or will be taken in the next 30 days to reduce levels of TCE in Buildings 12 and 14 below the RML. The EPA understands that additional samples were collected in these buildings on Sunday, June 30 and you are awaiting those results. We also understand that work on the installation of a mitigation system was conducted on July 10 and 11 in Building 14.

We recognize the many complexities of this project and we appreciate the efforts made to date to address vapor intrusion at the Site. Within 15 days of your receipt of this letter, please provide a detailed description of the actions underway to reduce the levels of TCE below the RML. Also, within 15 days of your receipt of this letter you should provide proof of notification to employees of the levels of TCE detected in Buildings 12 and 14.

If you have any questions regarding this letter, please contact me either by e-mail at sperry.clint@epa.gov or by phone at (913) 551-7157.

Sincerely,

Clint Sperry
Remedial Project Manager
Site Remediation Branch
Superfund and Emergency Management Division

Enclosures
cc: KDHE

Trichloroethylene (TCE)

What is TCE?

Trichloroethylene (TCE) is a nonflammable, colorless liquid with a somewhat sweet odor and a sweet, burning taste. It's mainly used to remove grease from metal parts. But it's also a part of adhesives, paint removers, and spot removers.

TCE doesn't occur naturally in the environment. It is found in soil and underground water sources when it is manufactured, used, and disposed of improperly. When TCE evaporates from contaminated soil or groundwater, its vapors sometimes move up through the soil and can get into air inside buildings.

How might I be exposed to TCE?

- Drinking, swimming, or showering in water that is contaminated with TCE.
- Direct contact with soil contaminated with TCE (such as near a hazardous waste site) and unintentionally swallowing the soil.
- Breathing air inside homes or other buildings that have been contaminated by TCE as it evaporates from the soil or groundwater underneath the building.

How can I reduce exposure to TCE in my home?

Use Products carefully:

- Make sure rooms are well ventilated with a fan or an open window
- Store household products in a safe place
- Keep household products in the boxes or bottles in which you bought them
- Don't mix one household product with another
- Follow the directions on the boxes or bottles

How is TCE noticed in indoor air?

If TCE is in your in your indoor air you most likely would not be able to smell it. If you think TCE is in your indoor air, you can have that air tested by a professional with air sampling equipment. This test is expensive and may have to be done more than one time.

How can TCE affect my health?

What happens to you when you contact any chemical depends on

- The dose—that is, how much of the chemical gets into your body
- The duration—how long and how often you're exposed to it
- The route—how you're exposed to the chemical (such as breathing air or drinking water that contains TCE)

How a chemical will affect someone is hard to determine. Especially without knowing exactly how much that person was exposed to and for how long and how often. Certain groups of people—such as children, the elderly and particularly unborn babies—may be more vulnerable than other groups to health effects from TCE exposure.

Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation

ATSDR

CS254628

Some facts about TCE exposure:

- The U.S. Environmental Protection Agency and the National Toxicology Program say TCE can cause cancer. Worker exposure to TCE has been associated with liver cancer, non-Hodgkin's lymphoma, and kidney cancer.
- Human and animal studies show that exposure to low levels of TCE may cause heart-related health effects to unborn babies and effects to the immune system.
- Human studies show that people exposed to very high levels of TCE may have headaches, lung irritation, dizziness, poor coordination, and difficulty paying attention.
- Breathing high amounts of TCE (such as what people could be exposed to if they using TCE at work) could cause improper heart function, unconsciousness, and death.

Can any medical test detect TCE exposure?

If you have been exposed to TCE recently, it can be detected in your breath, blood, or urine. For small amounts of TCE, breath testing must occur within an hour or two after exposure. For large amounts of TCE, blood and urine tests can find TCE and its byproducts up to a week after exposure. Because exposure to other chemicals can produce similar byproducts in the body, test results do not absolutely prove exposure to TCE. Only a doctor or other medical professional familiar with these tests should give them.

Can I be treated for TCE exposure?

No medical treatment can remove TCE from your body, but your body does remove TCE on its own. You breathe out TCE. It also leaves your body in your urine. Avoiding TCE exposure is always recommended.

Where can I get more information?

- If you have concerns about your health, call or see your doctor.
- If you would like more information on TCE, call the Centers for Disease Control and Prevention Information Line. The toll-free phone number is **1-800-232-4636**. Let the operator know that you would like to speak to someone about TCE or trichloroethylene.
- If you would like more information on the Agency for Toxic Substances and Disease Registry, visit our Web site at **www.atsdr.cdc.gov**. You will find telephone numbers to contact an ATSDR regional staff member in your state.

References:

1. Forand SP, Lewis-Michl EL, Gomez MI. 2011 Adverse Birth Outcomes and Maternal Exposure to Trichloroethylene and Tetrachloroethylene through Soil Vapor Intrusion in New York State. Environ Health Perspect 120(4): doi:10.1289/ehp.1103834
2. Johnson P, Goldberg S, Mays M, Dawson B. 2003. Threshold of trichloroethylene contamination in maternal drinking waters affecting fetal heart development in the rat. Environ Health Perspect, 111, 289-292.
3. Keil DE, Peden-Adams M M, Wallace S, Ruiz P, Gilkeson G S. 2009. Assessment of trichloroethylene (TCE) exposure in murine strains genetically-prone and non-prone to develop autoimmune disease. J Environ Sci Health A Tox Hazard Subst Environ Eng, 44, 443-453.
4. The Agency for Toxic Substances and Disease Registry. Fact Sheet: How to Reduce Your Exposure to Chemicals at Home, Work, and Play. Atlanta, GA: US Department of Health and Human Services; 2011.
5. The Agency for Toxic Substances and Disease Registry. Toxicological Profiles: Trichloroethylene (TCE). CAS# 000079-01-6. Atlanta, GA. US Department of Health and Human Services; 2010 September.

APPENDIX G

PUBLIC NOTICE

PUBLIC NOTICE

FOURTH FIVE-YEAR REVIEW STARTED

29th and Mead Ground Water Contamination NPL Superfund Site

Wichita, Sedgwick County, Kansas

EPA Region 7: Iowa, Kansas, Missouri, Nebraska, and Nine Tribal Nations

The U.S. Environmental Protection Agency (EPA) Region 7 has started the Fourth Five-Year Review for the 29th and Mead Ground Water Contamination National Priorities List (NPL) Superfund Site. Five-Year Reviews are required by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) when hazardous substances remain on site above levels that permit unrestricted use and unlimited exposure. Five-Year Reviews provide an opportunity to evaluate the site remedy to determine whether it remains protective of human health and the environment. Trichloroethylene (TCE) is the main contaminant of concern. This Five-Year Review should be completed in September 2020. The previous Five-Year Review, conducted in 2014, deferred a protectiveness determination pending the collection of additional data.

EPA has assessed the ability of the public to access site information through an internet-based repository and has determined that the local community has this ability. As a result, the Fourth Five-Year Review and Administrative Records for this site will be available on EPA's website, once completed: www.epa.gov/superfund/29thandmead (see Site Documents & Data).

EPA encourages community members to ask questions and report any concerns about this site. Questions or requests for site information and/or the Five-Year Review process can be submitted to:

Ben Washburn
U.S. EPA Community Involvement Coordinator
Email: washburn.ben@epa.gov

U.S. Environmental Protection Agency, Region 7
11201 Renner Boulevard, Lenexa, KS 66219
Toll-free: 1-800-223-0425

APPENDIX H

SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site name: 29th & Mead	**Date of inspection:** 11/22/19
Location and Region:	**EPA ID:**
Agency, office, or company leading the five-year review:	**Weather/temperature:** Sunny 50°

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☒ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other SVE

- ☒ 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 _____

SEE INTERVIEW SECTION

3. **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 EPA
Contact CLINT SPERRY — RPM — 913-551-7157
Name — Title — Date Phone no.

Problems; suggestions; ☐ Report attached _____

Agency KDHE
Contact SEAN HAMMERSBURG
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 _____

SEE INTERVIEW SECTION

4. **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 _____

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

   Remarks _____

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

   Remarks _____

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 _____ — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks _____

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

   Remarks _____

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

   Remarks _____

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

   Remarks _____

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 _____

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

    Remarks _____

IV. O&M COSTS

1. **O&M Organization**
   - ☐ State in-house
   - ☐ PRP in-house
   - ☐ Federal Facility in-house
   - ☐ Other _____
   - ☐ Contractor for State
   - ☒ Contractor for PRP
   - ☐ Contractor for Federal Facility

2. **O&M Cost Records**
   - ☐ Readily available ☒ Up to date
   - ☒ Funding mechanism/agreement in place
   - Original O&M cost estimate _____ ☐ Breakdown attached

   Total annual cost by year for review period if available

   From _____ (Date) To _____ (Date) _____ (Total cost) ☐ Breakdown attached
   From _____ (Date) To _____ (Date) _____ (Total cost) ☐ Breakdown attached
   From _____ (Date) To _____ (Date) _____ (Total cost) ☐ Breakdown attached
   From _____ (Date) To _____ (Date) _____ (Total cost) ☐ Breakdown attached
   From _____ (Date) To _____ (Date) _____ (Total cost) ☐ Breakdown attached

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 ☒ Gates secured ☐ N/A
   Remarks _____

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☒ N/A
   Remarks _____

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) _____

Frequency _____

Responsible party/agency _____

Contact _____ _____ _____ _____

Name Title Date Phone no.

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 _____

_____

2. **Land use changes on site** ☒ N/A

Remarks _____

_____

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

Remarks _____

_____

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

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent _____ Depth _____
   Remarks _____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths _____ Widths _____ Depths _____
   Remarks _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent _____ Depth _____
   Remarks _____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent _____ Depth _____
   Remarks _____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks _____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks _____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
   Areal extent _____ Height _____
   Remarks _____

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
- ☐ Wet areas ☐ Location shown on site map Areal extent_____
- ☒ Ponding ☐ Location shown on site map Areal extent_____
- ☐ Seeps ☐ Location shown on site map Areal extent_____
- ☐ Soft subgrade ☐ Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability
Areal extent_____
Remarks_____

B. Benches ☐ Applicable ☐ N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

C. Letdown Channels ☐ Applicable ☐ N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☐ No evidence of settlement
Areal extent_____ Depth_____
Remarks_____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
Material type_____ Areal extent_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
Areal extent_____ Depth_____
Remarks_____

E. Gas Collection and Treatment ☐ Applicable ☐ N/A

1. **Gas Treatment Facilities**
   ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
   ☐ Good condition ☐ Needs Maintenance
   Remarks _____

2. **Gas Collection Wells, Manifolds and Piping**
   ☐ Good condition ☐ Needs Maintenance
   Remarks _____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   ☐ Good condition ☐ Needs Maintenance ☐ N/A
   Remarks _____

F. Cover Drainage Layer ☐ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
   Remarks _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
   Remarks _____

G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A

1. **Siltation** Areal extent _____ Depth _____ ☐ N/A
   ☐ Siltation not evident
   Remarks _____

2. **Erosion** Areal extent _____ Depth _____
   ☐ Erosion not evident
   Remarks _____

3. **Outlet Works** ☐ Functioning ☐ N/A
   Remarks _____

4. **Dam** ☐ Functioning ☐ N/A
   Remarks _____

H. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
   ☐ Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** ☐ Functioning ☐ N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring**
   Type of monitoring_____ ☐ Performance not monitored
   Frequency_____ ☐ Evidence of breaching
   Head differential_____
   Remarks_____

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

2. **Extraction 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

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)_____
   - ☐ 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_____
   - ☐ Quantity of surface water treated annually_____
   - Remarks_____

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_____

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_____

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 (SOME)

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

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.).

SVE SYSTEM

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.

NO ISSUES

DOES NOT OPERATE IN WINTER MONTHS

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.

D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

APPENDIX I

INTERVIEW RECORDS

KEVIN HOPKINS
SCS ENGINEERS
11/~~2~~19/19

Some example interview questions are given below.

1. What is your overall impression of the project? (general sentiment) MATURE SITE, REMEDY IS COMPLETE (EXCEPT SOIL) - REMEDY IS SUCCESSFUL FUNCTIONING
2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results. N/A
3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses. NO
4. Do you feel well informed about the site's activities and progress? N/A
5. Do you have any comments, suggestions, or recommendations regarding the site's management or operation? N/A

Construction Considerations

It is important for you to determine the status of construction at the site and to ensure that health and safety concerns are addressed.

Interview	Information Sought
Construction Contractor	– progress of project and changes in design due to field conditions – revisions to the O&M Manual, implementation of the Health and Safety Plan/Contingency Plan – insight into potential O&M problems
Construction Manager	– overview of all contractor construction activities at the site, health and safety issues, site protectiveness during construction, and the quality of the construction
Local Emergency Response Officials	– adequacy of contractor's Health and Safety Plan and the contractor's implementation of the Plan – adequacy of contractor's emergency response duties as outlined in the Contingency Plan or Emergency Response Plan of the Health and Safety Plan

Some example interview questions for remedial actions still under construction are given below.

1. What is your overall impression of the project? (general sentiment)
2. What is the current status of construction (*e.g.*, budget and schedule)? GW REMEDY IS COMPLETE (EXTRACTION ONGOING) SJE SOIL EXTRACTION ONGOING
3. Have any problems been encountered which required, or will require, changes to this remedial design or this ROD? NOT AT THIS TIME

Have any problems or difficulties been encountered which have impacted construction progress or implementability?

Do you have any comments, suggestions, or recommendations regarding the project (i.e., design, construction documents, constructability, management, regulatory agencies, etc.)?

Performance, Operation And Maintenance Problems

The following individuals may provide information to you regarding the performance of the remedy and status of O&M at the site so that the team can assess the progress of the implementation and effectiveness of the remedy, and any O&M problems.

Interview	Information Sought
O&M Manager/Operating Contractor	– O&M status of the remedy, compliance with permit and reporting requirements, and complaints filed – effectiveness of the O&M Plan – information about any potential causes for concern about the remedy progress and performance of the remedy
O&M Staff	– effectiveness of the O&M Manual – information about any potential causes for concern about the remedy Recommendations for adjusting the mode of operation or optimizing the operations protocol
Remedial Design/Remedial Action Consultant	– original concepts behind the O&M of the remedy – questions about remedial design parameters, expected performance and cost, and changes that have occurred during implementation

Some example interview questions are given below.

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

2. Is the remedy functioning as expected? How well is the remedy performing?

3. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? INCREASE IN CIS DCE, INCREASE IN SENTENEL WELLS. CITY MW-WNC 3 (WELL WILL BE REPLACE JAN 2020).

4. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities. CONTINUOUS ONSITE PRESENCE

5. Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.

REPACKED AIR STRIPPER 2016.
RECOVERY WELL #3 INSTALLED IN 2015.

6. Have there been unexpected O&M difficulties or costs at the site since start-up or in the last five years? If so, please give details. NONE

7. Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. CHANGED TO HYDROSLEEVE.

8. Do you have any comments, suggestions, or recommendations regarding the project?

THE OVERALL GROUNDWATER IS PART OF THE NIC SITE. THE NIC SITE CAG USES ALTERNATIVE TREATMENT GOAL OF 20 µg/L AND NOT 5 µg/L FOR TCE.

21 µg/L = 1×10^{-5} (MAYBE).

INTERVIEW RECORD

Site Name: 29th & MEND		**EPA ID No.:**
Subject:		**Time:** **Date:** 11/19/19
Type: 9 Telephone 9 Visit 9 Other **Location of Visit:**		9 Incoming 9 Outgoing

Contact Made By:

Name: KEVIN HOPKINS	**Title:** SCS ENGINEERS	**Organization:**

Individual Contacted:

Name:	**Title:**	**Organization:**
Telephone No: **Fax No:** **E-Mail Address:**	**Street Address:** **City, State, Zip:**	

Summary Of Conversation

Page 1 of ____

FRED WISE
JOHNSON CONTROLS
11/19/19

Some example interview questions are given below.

1. What is your overall impression of the project? (general sentiment)
Process fairly nonintrusive past 10 years; good working relationship
2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.
better w/ SCG lead

3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses.
not for this
4. Do you feel well informed about the site's activities and progress?
yes
5. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?
not at this point; hopeful floor drain will work and not impact work activities/margi

Construction Considerations

It is important for you to determine the status of construction at the site and to ensure that health and safety concerns are addressed.

Interview	Information Sought
Construction Contractor	– progress of project and changes in design due to field conditions – revisions to the O&M Manual, implementation of the Health and Safety Plan/Contingency Plan – insight into potential O&M problems
Construction Manager	– overview of all contractor construction activities at the site, health and safety issues, site protectiveness during construction, and the quality of the construction
Local Emergency Response Officials	– adequacy of contractor's Health and Safety Plan and the contractor's implementation of the Plan – adequacy of contractor's emergency response duties as outlined in the Contingency Plan or Emergency Response Plan of the Health and Safety Plan

Some example interview questions for remedial actions still under construction are given below.

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

2. What is the current status of construction (*e.g.*, budget and schedule)?

3. Have any problems been encountered which required, or will require, changes to this remedial design or this ROD?

4. Have any problems or difficulties been encountered which have impacted construction progress or implementability?

5. Do you have any comments, suggestions, or recommendations regarding the project (i.e., design, construction documents, constructability, management, regulatory agencies, etc.)?

Performance, Operation And Maintenance Problems

The following individuals may provide information to you regarding the performance of the remedy and status of O&M at the site so that the team can assess the progress of the implementation and effectiveness of the remedy, and any O&M problems.

Interview	Information Sought
O&M Manager/Operating Contractor	– O&M status of the remedy, compliance with permit and reporting requirements, and complaints filed – effectiveness of the O&M Plan – information about any potential causes for concern about the remedy progress and performance of the remedy
O&M Staff	– effectiveness of the O&M Manual – information about any potential causes for concern about the remedy Recommendations for adjusting the mode of operation or optimizing the operations protocol
Remedial Design/Remedial Action Consultant	– original concepts behind the O&M of the remedy – questions about remedial design parameters, expected performance and cost, and changes that have occurred during implementation

Some example interview questions are given below.

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

2. Is the remedy functioning as expected? How well is the remedy performing?

3. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?

4. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

5. Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.

6. Have there been unexpected O&M difficulties or costs at the site since start-up or in the last five years? If so, please give details.

7. Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.

8. Do you have any comments, suggestions, or recommendations regarding the project?

INTERVIEW RECORD

Site Name: 29th & MEAD		**EPA ID No.:**
Subject:		**Time:** **Date:** 11/19/19
Type: 9 Telephone (9 Visit) 9 Other **Location of Visit:**		9 Incoming 9 Outgoing
Contact Made By:		
Name: FRED WISE	**Title:** H & S	**Organization:** JOHNSON CONTROLS
Individual Contacted:		
Name:	**Title:**	**Organization:**
Telephone No: **Fax No:** **E-Mail Address:**	**Street Address:** **City, State, Zip:**	

Summary Of Conversation

Page 1 of ____

INTERVIEW DOCUMENTATION FORM

The following is a list of individual interviewed for this five-year review. See the attached contact record(s) for a detailed summary of the interviews.

Name	Title/Position	Organization	Date
Duall Bringer	Assoc. Professional	SCS Engineers	11-19-19
Kevin Hopkins	Project Director	SCS Engineers	11-19-19
Fred Wise	Lead Proj Eng	Johnson Controls	11/19/19
Austin Clapp	DC/Sr Project Programmer	KDHE	11/19/19

APPENDIX J

PHOTOGRAPHS

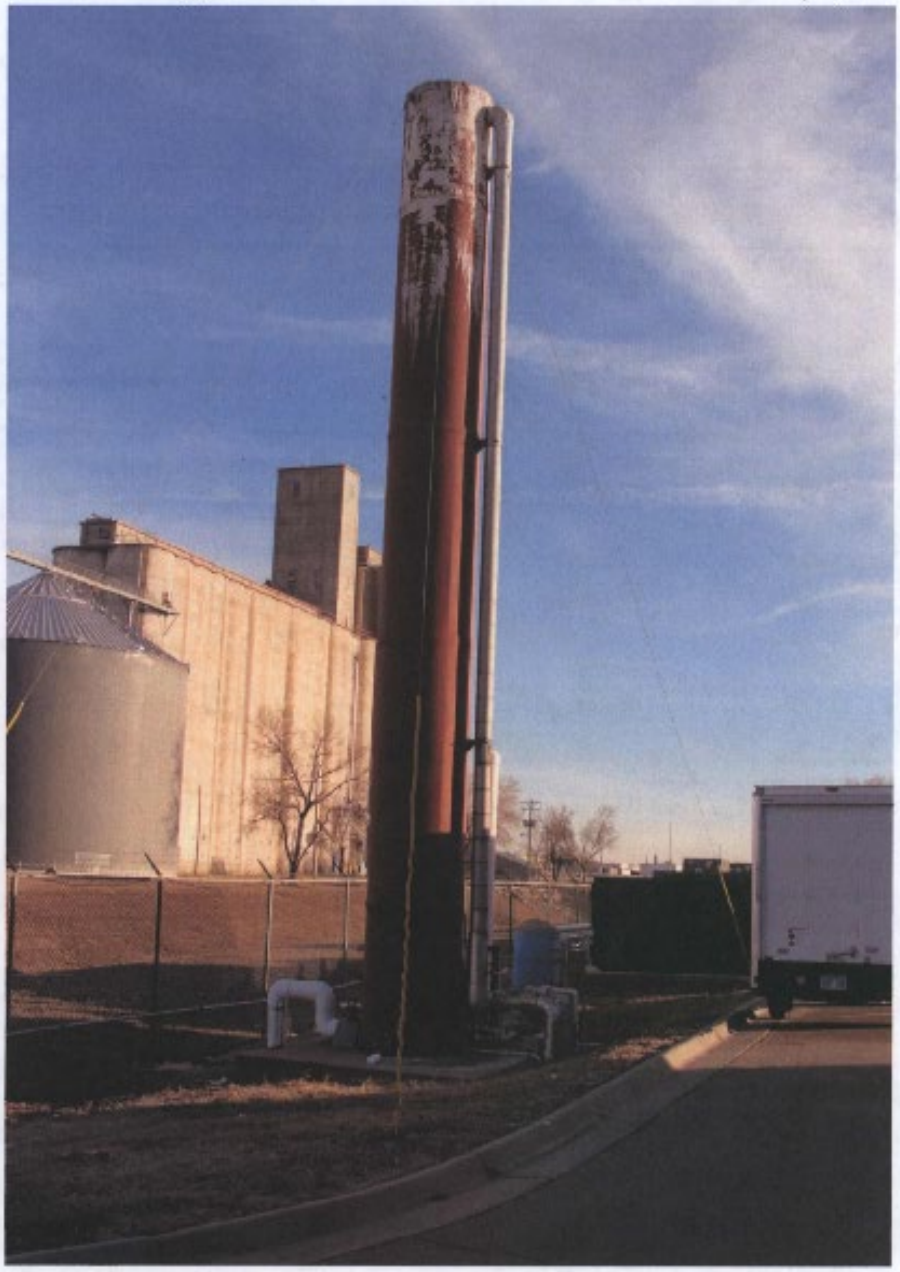
Photo 6. South Field Soil Vapor Extraction System (SVES) **Date:** February 5, 2015

Description: South Field (SF) soil vapor extraction (SVE) system, located in the east central portion of Site. Components of the system visible in the photograph include: 3 horsepower motor; SF west vapor extraction well riser pipe (center of photo, left pipe rising vertically from the ground); SF east vapor extraction well riser pipe (center of photo, right pipe rising vertically from the ground); water vapor knock-out tank (black barrel); emissions riser pipe (vertical brown pipe at far left of photo).

Photo 14. South Industrial Well **Date:** February 5, 2015

Description: South Industrial Well and associated dry wells for valving and pipe access.

Photo 15. Air Stripper "AS-2" **Date:** February 5, 2015



Description: Air Stripper "AS-2", located in the south east portion of Site.

Photo 16. Air Stripper "AS-2" **Date:** February 5, 2015

Description: Air Stripper "AS-2". Visible components: insulated and aluminum cladded pipes are the discharge pipes for RW-2 and the South Industrial Well; air blower located adjacent to the stripper column; electrical switch boxes; influent sampling port (located just above the 90° elbow where the influent pipe becomes vertical); and, water pre-treatment tank (blue tank, located at right edge of photo).

Photo 17. Air Stripper "AS-2" **Date:** February 5, 2015

Description: Air Stripper "AS-2". View is of the discharge side; large white "goosenecked" shaped pipe is the AS-2 effluent discharge pipe. Effluent sampling port is located just before the pipe makes its first 90° bend where it first becomes perpendicular to the ground (after running parallel to the ground a short distance from the stripper column).