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FIFTH FIVE-YEAR REVIEW REPORT
FOR
CHEM-DYNE SUPERFUND SITE
BUTLER COUNTY, OHIO

Prepared by

U.S. Environmental Protection Agency
Region 5
Chicago, Illinois

9/9/2021

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Signed by: DOUGLAS BALLOTTI

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LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
BGS	Below Ground Surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIC	Community Involvement Coordinator
COC	Contaminant of Concern
DCE	Dichloroethylene
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
IC	Institutional Control
ICIAP	Institutional Control Implementation and Assurance Plan
LTS	Long-term Stewardship
MNA	Monitored Natural Attenuation
MCL	Maximum Contaminant Level
µg/L	Microgram per Liter
NCP	National Contingency Plan
NPDES	National Pollutant Discharge Elimination System
Ohio EPA	Ohio Environmental Protection Agency
OU	Operable Unit
O&M	Operation and Maintenance
PCBs	Polychlorinated Biphenyls
PPB	Parts per Billion
PRP	Potentially Responsible Party
RI	Remedial Investigation
RAOs	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RPM	Remedial Project Manager
Site	Chem-Dyne Superfund Site
SVE	Soil Vapor Extraction
TCE	Trichloroethylene
UECA	Uniform Environmental Covenants Act
UU/UE	Unlimited Use and Unrestricted Exposure
VOC	Volatile Organic Compounds

I. INTRODUCTION

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

The United States Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (40 CFR Section 300.430(f)(4)(ii)) and considering EPA policy.

This is the fifth FYR for the Chem-Dyne Superfund Site ("Site"). The triggering action for this policy review is the completion date of the previous FYR. 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).

The Site consists of one (1) operable unit (OU), which encompasses the entire Site and is addressed in this FYR. Sitewide OU1 addresses the contaminated soil and groundwater remedies for the Site.

The Chem-Dyne Superfund Site FYR was led by Lolita Hill, Remedial Project Manager (RPM) for EPA. Chuck Mellon, project manager for the Ohio Environmental Protection Agency (Ohio EPA), also participated in the review. The review began on October 31, 2019. The potentially responsible parties (PRPs) were notified of the initiation of the FYR.

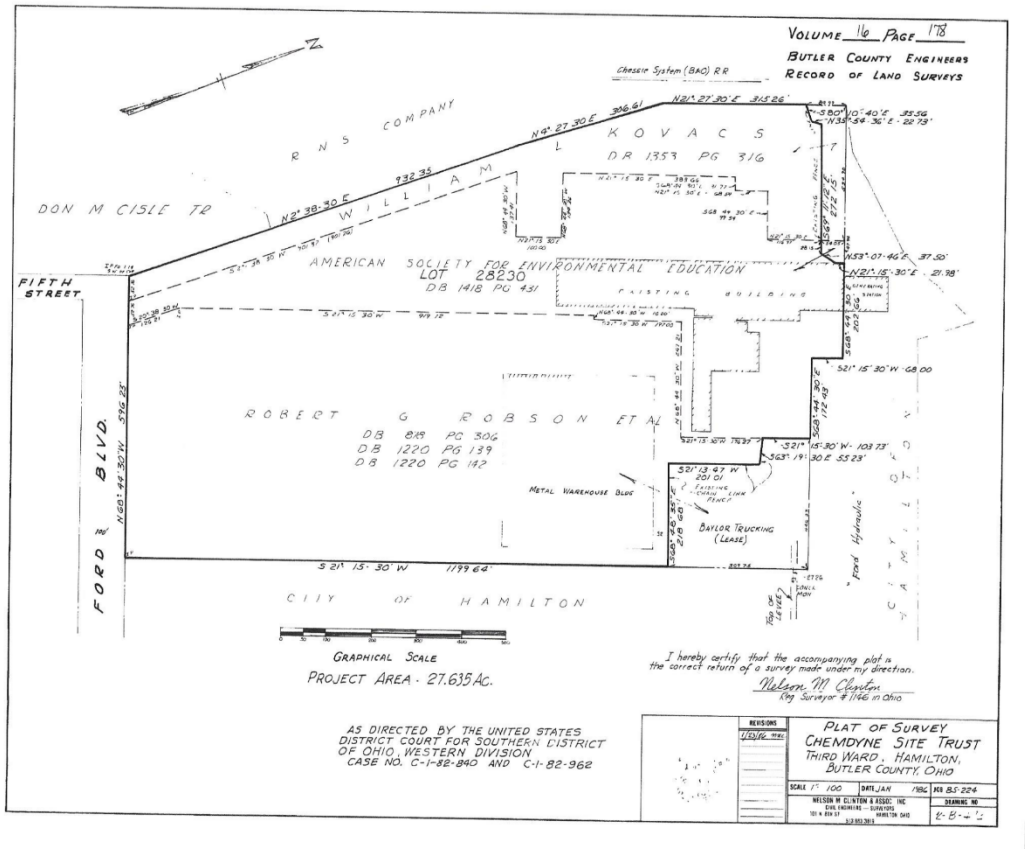
Site Background

Physical Characteristics & Land Use

The Site is located at 500 Joe Nuxhall Boulevard in Hamilton, Ohio, east of the Great Miami River. The Site is 21 acres - bordered to the north by the Ford Hydraulic Canal, which flows westerly into the Great Miami River. Immediately west of the Site lie industrial properties, including the City of Hamilton Municipal Power Plant, Anchor Metals (formerly Ransohoff) and a CSX rail corridor. Softball fields are immediately east of the Site, and residential properties are to the east and south of the Site. Refer to Figures 1 and 2 below. Additional Site maps are provided in Appendix B.

Figure 1. Chem-Dyne Site Aerial View

Figure 2. Chem-Dyne Site Plat of Survey



Ford Motor Company operated a factory at the Site which ceased operations in the late 1950s. Later, between 1974 and 1979, the Chem-Dyne Corporation used the Site for the processing and storage of chemical wastes. During this time, the Site accepted an estimated 112,000 drums of waste from approximately 200 generators. Materials handled included pesticides, chlorinated and non-chlorinated solvents (benzene), waste oils, plastics and resins, polychlorinated biphenyls (PCBs), acids and caustics, metal and cyanide sludges, and laboratory wastes. Over 30,000 drums and 300,000 gallons of bulk materials were on-Site when operations ended in 1980. Other wastes were "stored" in drums and tanks, including at least one old leaking railroad tank car, in buildings and outside on the ground. These operations resulted in the uncontrolled releases of hazardous materials such as volatile organic compounds (VOCs) into the soils and groundwater.

The Site was proposed for inclusion on the EPA National Priorities List (NPL) on October 21, 1981 and finalized on September 8, 1983.

Current land uses surrounding the Site are industrial, residential, and recreational. Public softball fields are located adjacent to the Site. The Site is completely encircled by security fencing, which restricts access. A secured entrance is located at the northeast corner of the property with access along Joe Nuxhall Boulevard.

EPA was notified that Butler County intended to sell several parcels that are part of the Chem-Dyne Site in a forfeited land sale on July 2, 2021. EPA was subsequently notified that the auditor had postponed the sale for 90 days.

Prior to the proposed sale, the City of Hamilton met with Ohio EPA on July 25, 2017 regarding possible redevelopment of the Site. EPA and Ohio EPA met with the City of Hamilton to discuss the redevelopment efforts on April 22, 2020. The City of Hamilton representatives identified six potential reuse options for the Site at that time. However, since the property will be auctioned by the County, it is not certain the City will be the eventual redeveloper of the Site. Therefore, the actual future use for this property is unknown.

Geology and Hydrology

Topography in the Site vicinity is relatively flat. Average depth to water is approximately 25 feet below ground surface (bgs). Groundwater flow beneath the Site is westerly (from east to west) beneath the Site with a change in direction to a southerly flow with the course of the Great Miami River. The 1984 remedial investigation (RI), (CH2M HILL, Inc., 1984), concluded that groundwater flow velocities ranged from 0.5 to 1.5 feet per day. Groundwater flow is heavily influenced by the stage of the Great Miami River and localized pumping. Because of the residential and industrial uses surrounding the Site, active drinking water and industrial pumping wells, including the Hamilton North well field and the Hamilton Power Plant wells, exist near the Site. According to the RI, groundwater flow is being influenced by the Champion Paper Company wells on the west side of the river, and that portion of the plume could migrate westward and downward beneath the river. It appears, therefore, that contaminants from the plume could be taken in by a number of industrial production wells located within a 1-mile radius of the Site, presenting potential near-term exposures due to volatilization of contaminants within these industrial facilities from the use of contaminated water. The City of Hamilton’s north well field is upgradient from the Site while the City of Hamilton’s south well is located downgradient from the Site. The City's south well field is located east of the river and would be in the path of the southerly component of plume migration, resulting in potential long-term exposures due to contamination of the drinking water supply.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Chem-Dyne		
EPA ID: OHD074727793		
Region: 5	**State:** OH	**City/County:** City of Hamilton/ Butler County

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

REVIEW STATUS
Lead agency: EPA
Author name (Federal or State Project Manager): L. Hill
Author affiliation: RPM, EPA Region 5
Review period: 10/31/2019 – 3/19/2021
Date of site inspection: Not performed due to Covid-19 work travel restrictions
Type of review: Policy
Review number: 5
Triggering action date: 9/21/2015
Due date (five years after triggering action date): 9/21/2020

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

Operations of Chem-Dyne resulted in uncontrolled releases of hazardous materials into the environment. Site investigations determined that facility operations had contaminated the soil beneath the Site and groundwater, both within the shallow and intermediate horizons of the underlying aquifer. Further, the 1984 RI identified extensive VOC unsaturated soil contamination, and structures and utilities on-Site were found to be contaminated with a variety of materials, including VOCs and PCBs. The RI also defined a groundwater plume comprised predominantly of chlorinated ethenes and chlorinated ethanes, that was found to emanate from the Site. As a result, the major primary contaminants of concern (COCs) for the Site were determined to be inorganics and VOCs in soil and VOCs in groundwater. See Table 1 below identifying major COCs for the Site by media.

The 1984 Feasibility Study contained an Endangerment Assessment (CH2M HILL, Inc., 1984). The assessment concluded that direct contact with soil contaminants by human receptors presented an unacceptable risk and that groundwater contamination presented an unacceptable risk for potable use by private well users. It also concluded that continued migration of the groundwater plume could present an unacceptable risk to downgradient water supplies and therefore to residential receptors as well.

Additionally, the contaminants from the plume could be taken in by a number of industrial production wells located within a 1-mile radius of the Site, presenting potential near-term exposures due to volatilization of contaminants within these industrial facilities from the use of contaminated water.

Table 1. Summary of Major COCs at the Site

MEDIA	CONTAMINANTS		
Soil	**VOCs**	**Inorganics**	**Pesticides**
	Benzene	Antimony	Dieldrin
	Toluene	Arsenic	Chlordane
	Chlorobenzene	Arsenic	Endrin
	Hexachlorobenzene	Barium	Endosulfan Sulfate
	1,1-Dichloroethane	Beryllium	4, 4'-DDE
	1,1,1-Trichloroethanes	Chromium	Heptachlor Epoxide
	1,1,2-Trichloroethanes	Copper	
	Trans-Dichloroethene	Iron	
	Tetrachloroethene	Lead	
	Trichloroethene	Manganese	
	Vinyl Chloride	Mercury	

Table 1. Summary of Major COCs at the Site			
MEDIA	**CONTAMINANTS**		
Soil	**VOCs**	**Inorganics**	**Pesticides**
	Methylene Chloride	Nickel	
	Ethylbenzene	Silver	
		Tin	
		Zinc	
Groundwater	**VOCs**		
	Benzene		
	Bromomethane		
	Bromodichloromethane		
	Chlorobenzene		
	1,2-Dichlorobenzene		
	1,3-Dichlorobenzene		
	1,4-Dichlorobenzene		
	1,1-Dichloroethane		
	1,2-Dichloroethane		
	1,1-Dichloroethene		
	1,2-Dichloropropane		
	Dibromochloromethane		
	Ethylbenzene		
	Methylene chloride		
	1,1,2,2-Tetrachloroethane		
	Tetrachloroethene		
	Toluene		
	trans-1,2-Dichloroethene		
	trans-1,3-Dichloropropene		
	1,1,1-Trichloroethane		
	1,1,2-Trichloroethane		
	Trichloroethene		
	Vinyl Chloride		

Response Actions

Initial Response

Most of the materials left on Site in 1980 were removed under the supervision of a state court appointed receiver between 1980 and 1981. Subsequent waste removal actions began in 1982. The remaining wastes were removed during a surface cleanup under EPA

removal authority in 1983. (*See:* U.S. Environmental Protection Agency, 1985. *Record of Decision Chem-Dyne*, July 5, pages 3-4 for more information regarding these early actions.)

Decision Document

The Record of Decision (ROD) for the Site was signed on July 5, 1985 (EPA, 1985). The major remedial action objectives (RAOs) for the Site from the ROD are as described below:

- Prevent the further migration of and to remove and treat the groundwater contamination plume emanating from the Site; and

- To prevent contact with or migration of contaminated soils at the Site.

The remedy selected to meet these objectives included the following components:

- Demolition of all Site buildings;
- Removal of "hot spot" soil;
- Installation of a composite cap in accordance with the Resource Conservation Recovery Act (RCRA) and consisting of natural and synthetic materials to isolate the remaining soil contamination and effectively prevent its migration to the groundwater system;
- Installation of a groundwater extraction/re-injection system with treatment of the contaminated groundwater; air emissions from the treatment system shall be treated by carbon adsorption;
- Local institutional controls (ICs) restricting aquifer uses in areas where groundwater quality exceeds background conditions will be established by the State of Ohio; and
- Long-term groundwater monitoring of wells for VOCs and other contaminant compounds to monitor the effectiveness of the system operation and remediation.

Table 2. Chem-Dyne Site Performance & Cleanup Goals

Location/Media	Cleanup Goals
Groundwater at the Site (within the defined 100 parts per billion (ppb) total VOC plume boundary)	The concentration in each monitoring and extraction well shall not exceed a concentration of 100 ppb total priority pollutant VOCs.
Groundwater at the Site (within the defined 100 ppb total VOC plume boundary)	The concentration of total priority pollutant VOCs is effectively constant in each monitoring and extraction well.

Table 2. Chem-Dyne Site Performance & Cleanup Goals			
	Soil	Excavation and off-Site disposal of contaminated soils and installation of RCRA cap	

The ROD also stated that operation of the groundwater extraction/re-injection system may be terminated after 10 years and an alternative concentration limit demonstration may be made if both of the following performance goals identified in Table 2 above, governing groundwater at the Site and within the 100-ppb total VOC plume boundary, are met. If after 20 years of operation of the groundwater extraction/re-injection system, both performance goals are still not met, a determination will be made as to whether further operation and modification of the system would be cost effective. If it is agreed that further operation would not be cost-effective and an alternative concentration limit demonstration may be made, the system may be terminated.

Status of Implementation

The Remedial Action Plan (Conestoga-Rovers & Associates Limited, May 1985) was developed for the Site following negotiations with the PRPs and was incorporated as part of the Consent Decree between EPA, Ohio EPA, and 173 PRPs (EPA, 1985). The Consent Decree was lodged in U.S. District Court, for the Southeastern District of Ohio, Western Division on October 9, 1985. Under the Consent Decree, the PRPs agreed to form the Trust, for the purpose of overseeing implementation of the requirements of the Consent Decree. The Consent Decree is administered jointly by EPA and Ohio EPA.

Contaminated soil was removed and disposed at an approved off-Site facility in the spring of 1985. A total of eight buildings were demolished at the Site. A perimeter utility cutoff trench was excavated around the Site, and all intercepted utilities were sealed. A storm sewer system for draining the capped Site was installed. The cap construction consisted of an impermeable cap and a vegetative cover. Specifically, the cap consisted of a 24-inch layer of clay soil; a permeable sand zone; a synthetic liner; and a sand loam, and topsoil root zone for the vegetative cover. Refer to Appendix C for details of the cap design.

Groundwater monitoring wells were installed to further define the boundaries of the migrating groundwater plume. Groundwater remediation activities began in February 1987 with completion of a groundwater extraction/re-injection system. A total of 25 extraction wells and 8 injection wells were installed. After several modifications, the Trust proposed that the groundwater extraction system be considered fully operational on January 1, 1988.

The ex-situ groundwater treatment system consisted of an air stripper. Approximately 10,000 feet of piping were installed to connect water pumped from extraction wells to the air stripper. Off-gas from the air stripper was directed to three activated carbon beds for treatment. Treated water was either injected into the aquifer to flush VOCs from

subsurface soils or discharged to the Ford Hydraulic Canal in accordance with the National Pollutant Discharge Elimination System (NPDES) permit issued by Ohio EPA. From 1989 to 1992, the Site experienced occasional exceedances of the NPDES permit limits for 1,1,2,2-tetrachloroethane and 1,2-transdichloroethylene. The discharge permit limit was modified in October 1992 and exceedances were no longer observed.

In November 1998, Ohio EPA issued a letter to the Trust indicating that emissions from the air stripper were considered minimal, thereby discontinuing air monitoring of the air stripper effluent.

Groundwater System Performance Modifications

The Consent Decree allowed for modifications to the groundwater system that would improve system performance as provided in the Consent Decree. Therefore, the Trust and the Agencies agreed to numerous changes to improve the performance of the groundwater system. Among other things, pumping rate modifications were made to the groundwater system in 2004, and the system was modified to include a Soil Vapor Extraction (SVE) system in 2008/2009 (with enhancements in 2011). The SVE system consisted of a South SVE system and a North SVE system.

In October 2007, the Trust conducted residual VOC investigations (vertical aquifer sampling and soil gas sampling) in the northern portion of the Site, and in the adjacent, down-gradient Hamilton Power Plant property to the west. (Refer to the *VOC Residuals Investigation Summary Report,* Hull & Associates, February 2008 and the *Third Five-Year Review Report for Chem-Dyne Superfund Site*, EPA, September 2010 for more details). Soil gas concentrations beneath the Site cap were orders of magnitude higher than off-Site soil gas concentrations, indicating the presence of an on-Site source.

As a result of the October 2007 vertical aquifer sampling and soil gas sampling, the Trust expanded the Site treatment system and installed a soil vapor extraction (SVE) system in the northern portion of the Site in November 2008. This northern SVE system (consisted of SVE-1 thru SVE-8) was successful in removing 955 pounds of VOCs from the unsaturated zone by the end of March 2009. (The Northern SVE system was enhanced to include wells SVE-33 thru SVE-38 in 2011). The Trust expanded the Site characterization efforts, and subsequently installed two more SVE systems in the southern portion of the Site in late September 2009. The Southern SVE wells are divided into 2 zones – Zone A (SVE-9 thru SVE-21) and Zone B (SVE-22 thru SVE-32). Within five months, the two southern systems removed a total of 165.32 pounds of VOCs. The combined mass removal from all three SVE systems for year 2009 was 1,361 pounds compared to mass removal of 103 pounds of VOCs from the groundwater extraction/re-injection system alone.

On October 2, 2009, the Trust applied for an NPDES permit modification to discontinue treating the groundwater extracted from the extraction/re-injection system via the air stripper and discharge it directly to the canal. Ohio EPA approved this modification on November 25, 2009 stating that the groundwater influent to the air stripper had been in

compliance with both the daily maximum and monthly average permit limitations since November 2008. The Trust agreed to properly maintain the air stripper for future treatment if compliance sampling indicated treatment was warranted. EPA granted approval of this modification in an email, in March 2010 (EPA, 2010), and the stripper was subsequently deactivated on April 12, 2010.

With the air stripper deactivated, the remedial system no longer generated hazardous waste, and RCRA compliance evaluations were no longer required by Ohio EPA. The last RCRA compliance evaluation occurred on June 7, 2005, and Ohio EPA found the Site in compliance with the terms of a RCRA permit to operate as a generator of RCRA-regulated off-Site shipments of waste produced from the air stripper.

In May 2010, Ohio EPA and EPA approved the Trust's proposal to deactivate the SVE influent carbon treatment vessels (EPA, May 2010). As SVE data indicated, air emissions have never exceeded the 10 pounds per day de minimis limit. Declining VOC mass removal trends continued for the northern SVE system and both the Zone A and B southern SVE systems.

The groundwater treatment system at the Site operated for 27 years (1988 to 2015) with approved system optimizations and enhancements. Most monitoring and extraction wells have achieved the termination criteria (noted in Table 2 of the Response Actions Section) while a few wells have not. MW-15 has the highest documented total VOC level throughout the Site. Both Agencies and the Trust recognize that additional investigations may be needed to reduce the concentrations in this well. As well, both Agencies and the Trust recognize that it may not be possible to reach the termination criteria for each monitoring well and each extraction well without a significant monetary investment for this aged system. The Trust would then be subject to the requirements of Section V, Paragraph B.2.10 of the Consent Decree, which specifies that concentrations of total priority pollutant VOCs within the Site and the plume boundary must be maintained effectively at or below the levels reached at the termination of the extraction system for a period of five years after termination.

In the 2011 and 2012 Annual Reports (Hull & Associates, Inc., May 2012, 2013), the Trust included recommendations to suspend pumping from shallow extraction wells SE-11 and SE-12 since monitoring data demonstrated that the South Plume complied with the Site termination criterion. A formal request, dated July 30, 2014, was submitted to the Agencies petitioning them to allow the Trust to terminate groundwater pumping operations in the South Plume area, as well as to suspend Site-wide SVE operations since removal recoveries were approaching asymptotic conditions (reached its removal limit with the current system), (Hull & Associates, Inc., July 2014). EPA only approved the termination of the South Plume SVE system on October 23, 2014 and requested that the Trust continue to operate the North Plume SVE system to remove mass from the North Plume area. The operation of SE-11 and SE-12 were suspended on November 3, 2014. The North Plume SVE system continued to operate. The Trust also submitted a Monitored Natural Attenuation (MNA) work plan proposal to the Agencies which permitted the suspension of all groundwater extraction and SVE wells at the Site for the next 2 years

(Chem-Dyne Trust, 2015). This proposal was approved in 2015. The Site will continue to operate under the MNA Pilot scenario until EPA amends the ROD, which is projected to happen in 2022.

Institutional Controls

ICs for groundwater use restrictions are required in the 1985 ROD and Consent Decree. Section VII, Paragraph E of the Consent Decree states that "*the State agrees to use its statutory and regulatory authority to prohibit the installation of wells into contaminated groundwater at or near the Chem-Dyne Site with the area marked on Appendix 5, or as it may be enlarged or reduced by Ohio EPA following consultation with U.S. EPA*." This stipulation is consistent with Ohio Administrative Code (OAC) 3745-9-04, which regulates the location of new wells and does not allow installation of wells in areas where contamination may be drawn into the well.

In order to comply with Ohio EPA's obligations under the Consent Decree, Ohio EPA sent letters in the spring of 2002 to the owners of the major industrial and municipal ground water pumping wells near the Site. The letters informed them of the State of Ohio's obligation to use its authority to prohibit pumping which could adversely affect the groundwater extraction system at the Site. These letters were sent to the City of Hamilton, International Paper Co. (owner of the former Beckett Paper Co.), and Smart Paper Co. (formerly Champion Paper Co.).

In November of 2002, the City of Hamilton informed Ohio EPA of its intention to install two new production wells, north of the Chem-Dyne Site, approximately 1,500 feet south of the North Well field. The purpose of the wells was to provide coolant water to the Hamilton power plant. Upon learning of the proposal, Ohio EPA facilitated communication between the city and the Trust for the purpose of identifying means of assuring the groundwater extraction system at the Site would not be adversely affected. The City of Hamilton indicated that their current wellhead protection model was not refined enough to evaluate potential pumping effect on the Chem-Dyne groundwater contaminant plume and extraction network. Later, all parties agreed that a network of groundwater monitoring wells, located along the Ford Hydraulic Canal, would be helpful in evaluating hydraulic containment at Chem-Dyne, should the proposal for the new production wells move forward. In November 2003, the Ohio EPA, Division of Drinking and Ground Waters, met with the City of Hamilton to review their proposal for three monitoring wells along the Ford Hydraulic Canal. This year, the Chem-Dyne Trust contacted the City of Hamilton regarding the status of the monitoring wells and production wells (Chem-Dyne Trust, September 2021). The Chem-Dyne Trust was informed by the City of Hamilton that three well clusters, comprised of two wells each, were installed in about 2003 and were sampled until 2015. With respect to the production wells, 3 production wells were installed between 2005 and 2006. The production wells began operation in 2007 and operated roughly 7 years until about 2014. The production wells are generally kept in an idle status, but the City of Hamilton runs them periodically to keep the pumps workable for preventive maintenance.

The Trust agreed to work with the Agencies in the development of an Institutional Controls and Implementation Assurance Plan (ICIAP). After an initial meeting with EPA on June 6, 2016, the Trust developed and submitted a draft of the ICIAP on August 23, 2016. Several communications between EPA and the Trust led to two additional drafts of the ICIAP. However, this ICIAP was not finalized by the Trust nor was it approved by EPA. The Trust plans to finalize and EPA to approve the ICIAP by the end of 2022.

In addition, the Trust prepared and submitted the information needed to prepare Ohio Uniform Environmental Covenants Act (UECA) restrictions for the Site. Such information included Site parcel numbers, size, owners, and updated contaminant concentrations on the parcels. This information is provided in Table 3 and Table 4 below.

Table 3. Chem-Dyne Site Parcels (On-Site)

Parcel Identification Number	Property Owner	Parcel Size (acres)	Total VOC Priority Pollutant Concentration Range (ppb)
P6431013000006	Chem-Dyne Corporation	0.034	8 to 27
P6431013000007	Chem-Dyne Corporation	3.035	2 to 9
P6431013000008	Chem-Dyne Corporation	1.034	3 to 32
P6431013000012	State of Ohio (06-01-2016)	2.573	5 to 29
P6431013000009	State of Ohio (06-01-2016)	7.421	8 to 14
P6431013000011	State of Ohio (06-01-2016)	9.204	11 to 19
		Total 23.301	

Table 4. Chem-Dyne Site Parcels (Off-Site)

Parcel Identification Number	Property Owner	Parcel Size (acres)	Total Priority Pollutant Concentration Range (ppb)
P6431013000001	Kornylak Corporation	0.407	2 to 12
P6431013000019	Seilkop R. E. Holdings, LLC	3.565	2 to 20
P6431005000012	City of Hamilton	7.176	5 to 12
P6431004000031	City of Hamilton	0.567	20 to 27
P6431004000032	City of Hamilton	0.567	8 to 1300
P6431004000033	City of Hamilton	2.029	2 to 170
P6431004000029	Miami Conservancy District	0.097	5 to 140
		Total 14.408	

The approximate IC boundaries for the Site are shown in Figure 3 below. Detailed boundaries of on-Site and off-Site parcels are provided in Appendix B. Further, Table 5 below shows a summary of the planned or implemented ICs for the Site.

Figure 3. Chem-Dyne Trust Parcels with Exceedances

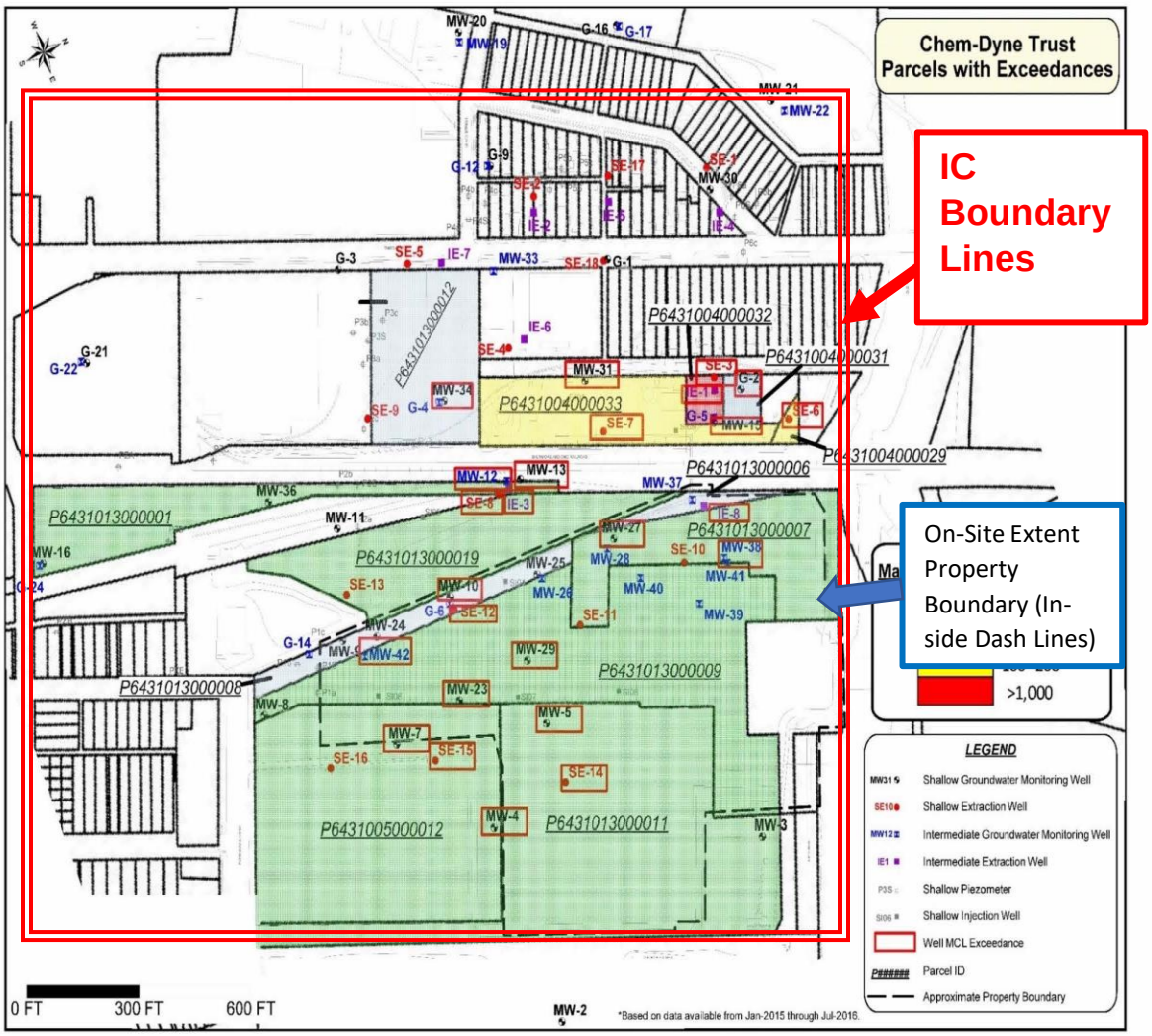


Table 5: Summary of Planned and/or Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
On-Site groundwater	Yes	Yes	Area defined as the Site. See Site Map Figure 3 (within the dashed lines) above and Appendix B.	Prohibit use of groundwater at the Site	Ohio Administrative Code (OAC) 3745-9-04; UECA Environmental Covenant (planned)
Off-Site groundwater	Yes	Yes	Area defined as Off-Site. See Site Map Figure 3 (outside the dashed lines) above and Appendix B.	Prohibit use of groundwater off-Site	Ohio Administrative Code (OAC) 3745-9-04 UECA Environmental Covenant (planned)
Chem Dyne Site Property	Yes	No	Area defined as the Site. See Site Map Figure 3 above and Appendix B.	Prohibit residential use and prevent damage to remedy components	UECA Environmental Covenant (planned)

Current Compliance: Even though the planned UECA Environmental Covenant ICs have not been implemented yet, there are currently no known uses of the Site which would be considered inconsistent with the objectives to be achieved by the ICs. No actions have been taken at the Site that would be inconsistent with or potentially damaging to the implemented remedy based on the annual reports prepared by the Trust.

Long-Term Stewardship (LTS): Since compliance with ICs is necessary to assure the protectiveness of the remedy, planning for long-term stewardship is important to help ensure that the ICs are maintained, monitored, and enforced. LTS involves assuring effective procedures are in place to properly maintain and monitor ICs for the Site. The LTS Plan is a component of the ICIAP. The plan identifies the entities responsible for implementation, verification, and long-term stewardship of the ICs at the Site. The Trust plans to finalize and EPA to approve the ICIAP by the end of 2022.

IC Follow up Actions Needed:

The required ICs in the form of Environmental Covenants will be prepared by the Trust and provided to the Agencies for review. EPA expects the Environmental Covenants to be signed and recorded by the end of 2022. In addition, EPA expects the ICIAP with the LTS Plan to be completed by the end of 2022. A decision document including ICs as part of the Site remedy is expected to be completed by the end of 2022.

Systems Operations/Operation & Maintenance (O&M)

Post remedial action system operations and O&M included groundwater monitoring at the Site and annual reporting. After decades of groundwater monitoring, active groundwater and soil remediation, including the groundwater extraction/re-injection and SVE systems, were suspended as part of the MNA Pilot Study in June 2015. The groundwater extraction and SVE system infrastructure remained in place in case the systems required reactivation during the 2015 MNA Pilot Study. The MNA Pilot Study continued through this FYR period.

The MNA Pilot Study consisted of quarterly sampling of wells for a two-year period in which MNA parameters (dissolved oxygen, oxidation-reduction potential, iron, methane, ethane, ethene, and total organic carbon) were evaluated to assist in determining whether natural attenuation was occurring at the Site. Annual progress reports were submitted at the end of each year which included, among other things, plume stability analysis, trend analysis, and recommendations. After the two-period of operating the MNA Pilot Study, the Agencies permitted the Chem-Trust to continue to operate the Site remedy under the MNA scenario and collect MNA data.

In preparation for the continuation of MNA operations at the Site, the Trust submitted a revised Sampling and Contingency Plan on October 28, 2019 and a new Quality Assurance Project Plan (QAPP) on May 27, 2020. It has also submitted a request to decommission certain monitoring wells and piezometers on October 28, 2019. Finally, it has requested approval to decommission the idle surface treatment facilities.

During this review period the Chem-Dyne Site QAPP (Environmental Standards, Inc., 2020) was updated and approved by EPA on November 17, 2020.

In an October 2019 conference, EPA stated that there are several wells that no longer serve their original, intended purpose e.g., delineating the original extent of the plume. The Trust recommended decommissioning the unused wells to close the unnecessary pathways to the subsurface. Both Agencies agreed to decommissioning certain wells at the Site and requested that the PRPs submit data for the wells recommended for decommissioning. EPA formally approved the decommissioning of these wells, in a memorandum (dated March 27, 2020) and in a follow-up email (dated May 19, 2021). The wells scheduled to be decommissioned are listed in Table 6.

Table 6. Wells Scheduled To Be Decommissioned						
	Monitoring Wells	**Piezometers**	**Extraction Wells**	**Re-Injection Wells**	**Soil Vapor Extraction Wells**	
	G-3	P1a	SE-2	SI-1	SVE-1	
	G-4	P1b	SE-5	SI-2	SVE-2	
	G-5	P1c	SE-8	SI-3	SVE-3	
	G-6	P1I	SE-9	SI-4	SVE-4	
	G-9	P1S	SE-10	SI-5	SVE-5	
	G-10	P2a	SE-11	SI-6	SVE-6	
	G-12	P2b	SE-12	SI-7	SVE-7	
	G-13	P2c	SE-13	SI-8	SVE-8	
	G-14	P2I	SE-15	SI-9	SVE-9	
	G-16	P2S	SE-16		SVE-10	
	G-17	P3a	SE-17		SVE-11	
	G-21	P3b	SE-18		SVE-12	
	G-22	P3c	IE-1		SVE-13	
	G-24	P3I	IE-2		SVE-14	
	MW-1	P3S	IE-3		SVE-15	
	MW-11	P4a	IE-4		SVE-16	
	MW-14	P4b	IE-5		SVE-17	
	MW-16	P4c	IE-6		SVE-18	
	MW-19	P4I	IE-7		SVE-19	
	MW-2	P4S	IE-8		SVE-20	
	MW-3	P5a			SVE-21	
	MW-4	P5b			SVE-22	
	MW-6	P5c			SVE-23	
	MW-7	P5I			SVE-24	
	MW-8	P5S			SVE-25	
	MW-9	P6a			SVE-26	
	MW-20	P6b			SVE-27	
	MW-21	P6c			SVE-28	
	MW-22	P6I			SVE-29	
	MW-26	P6S			SVE-30	
	MW-28	SVEPZ-1D			SVE-31	
	MW-30	SVEPZ-1S			SVE-32	
	MW-33	SVEPZ-2D			SVE-33	
	MW-35	SVEPZ-2S			SVE-34	
	MW-36	SVEPZ-3D			SVE-35	
	MW-37	SVEPZ-3S			SVE-36	
	MW-38				SVE-37	
	MW-39				SVE-38	
	MW-40					
	MW-41					
	MW-42					

Table 6. Wells Scheduled To Be Decommissioned						
	Monitoring Wells	**Piezometers**	**Extraction Wells**	**Re-Injection Wells**	**Soil Vapor Extraction Wells**	
	G-3	P1a	SE-2	SI-1	SVE-1	
	G-4	P1b	SE-5	SI-2	SVE-2	
	G-5	P1c	SE-8	SI-3	SVE-3	
	G-6	P1I	SE-9	SI-4	SVE-4	
	G-9	P1S	SE-10	SI-5	SVE-5	
	G-10	P2a	SE-11	SI-6	SVE-6	
	G-12	P2b	SE-12	SI-7	SVE-7	
	G-13	P2c	SE-13	SI-8	SVE-8	
	G-14	P2I	SE-15	SI-9	SVE-9	
	G-16	P2S	SE-16		SVE-10	
	G-17	P3a	SE-17		SVE-11	
	G-21	P3b	SE-18		SVE-12	
	G-22	P3c	IE-1		SVE-13	
	G-24	P3I	IE-2		SVE-14	
	MW-1	P3S	IE-3		SVE-15	
	MW-11	P4a	IE-4		SVE-16	
	MW-14	P4b	IE-5		SVE-17	
	MW-16	P4c	IE-6		SVE-18	
	MW-19	P4I	IE-7		SVE-19	
	MW-2	P4S	IE-8		SVE-20	
	MW-3	P5a			SVE-21	
	MW-4	P5b			SVE-22	
	MW-6	P5c			SVE-23	
	MW-7	P5I			SVE-24	
	MW-8	P5S			SVE-25	
	MW-9	P6a			SVE-26	
	MW-20	P6b			SVE-27	
	MW-21	P6c			SVE-28	
	MW-22	P6I			SVE-29	
	MW-26	P6S			SVE-30	
	MW-28	SVEPZ-1D			SVE-31	
	MW-30	SVEPZ-1S			SVE-32	
	MW-33	SVEPZ-2D			SVE-33	
	MW-35	SVEPZ-2S			SVE-34	
	MW-36	SVEPZ-3D			SVE-35	
	MW-37	SVEPZ-3S			SVE-36	
	MW-38				SVE-37	
	MW-39				SVE-38	
	MW-40					
	MW-41					
	MW-42					

III. PROGRESS SINCE THE LAST REVIEW

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

Table 7. Protectiveness Determinations/Statements from the 2015 FYR

OU #	Protectiveness Determinations	Protectiveness Statement
OU1 & Sitewide	Short-term Protective	The remedy at the Chem-Dyne Superfund Site currently protects human health and the environment because it was constructed in accordance with the requirements of the 1985 ROD. The groundwater treatment system, the SVE systems, and other remedy components such as the cap function as intended by the ROD. Exposure pathways that could result in unacceptable risks are being controlled by preventing exposure to, or the ingestion of, contaminated groundwater. However, in order for the remedy to be protective in the long term, the following actions need to be taken: ICs need to be implemented; an ICIAP needs to be developed; LTS procedures need to be developed and implemented via an LTS Plan or amendment to the O&M Plan; and the remedy decision document needs to be modified to incorporate ICs as a component of the remedy.

Table 8. Status of Recommendations from the 2015 FYR

OU	Issue	Recommendation	Current Status	Current Implementation Status Description	Completion Date (if applicable)
OU1/ Sitewide	ICs are not fully implemented at the Site.	Implement ICs at the Site.	On-going	Site reuse is being considered and appropriate UECA environmental covenants will be drafted. EPA expects to have them signed and recorded by the end of December 2022.	N/A

OU1/ Sitewide	ICs requirements need to be evaluated.	Develop an ICIAP	On-going	The Trust completed an IC Study with EPA and drafted an ICIAP for the Site. The ICIAP needs to be revised and finalized before it is approved by EPA, which is expected by the end of 2022.	N/A
OU1/ Sitewide	LTS procedures are needed.	Develop an LTS Plan or amend the O&M Plan to incorporate LTS procedures.	Addressed in next FYR	The LTS Plan is part of the ICIAP, which is expected to be completed by the end of 2022.	N/A
OU1/ Sitewide	Remedy decision document needs to be updated to incorporate ICs as a component of the remedy.	Modify remedy decision document to incorporate ICs.	On-going	A decision document to amend the remedy to incorporate ICs (such as use restrictions/UECA environmental covenants) is being drafted. EPA expects to sign the decision document by the end of 2022.	N/A

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

A public notice was published in the *Hamilton Journal News,* a local newspaper, on May 15, 2020, stating that EPA was undertaking a FYR and inviting the public to submit any comments to EPA. No comments were received from the public. The results of the review and the report will be made available at the Site information repository located at 500 Joe Nuxhall Boulevard in Hamilton, Ohio 45011. Additional information about the Site can be obtained from the EPA website at www.epa.gov/superfund/chemdyne.

Interviews

Due to COVID-19, in-person interviews were not conducted during the review period by the Agencies.

Data Review

This FYR consisted of a review of relevant documents including monitoring data and applicable groundwater cleanup standards, including monthly operating reports (Chem-Dyne Trust, 2021), and annual reports (EarthCon Consultants, Inc., 2016).

During this review period, the Site operated under the MNA Pilot workplan. The PRPs collected MNA parameters to document the occurrence of natural attenuation at the Site and the performance of the remedy. Plume maps were created for the Site, which provided plume characteristics and concentrations for VOCs. Groundwater monitoring was performed for the shallow and intermediate zones, and degradation products were analyzed from June 2015 through April 2020. Figure 4 illustrates the Site plume during 1984 and can be compared to the Site plumes in June 2015 and September 2019 in Figure 5 and Figure 6, respectively. Figure 7 shows the Site plume in June 2020.

Figure 4. Shallow Zone Total VOCs - June 1984

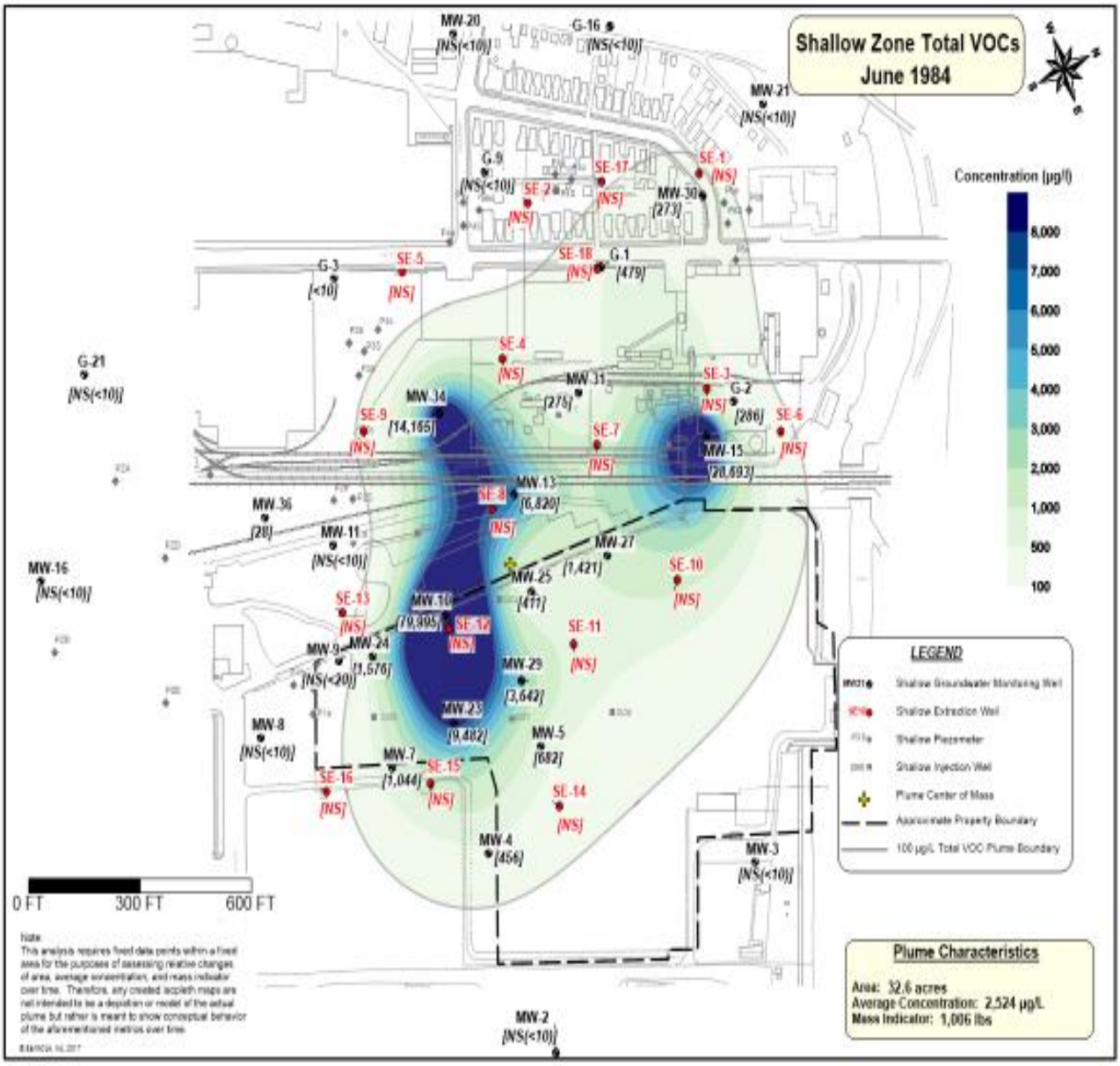
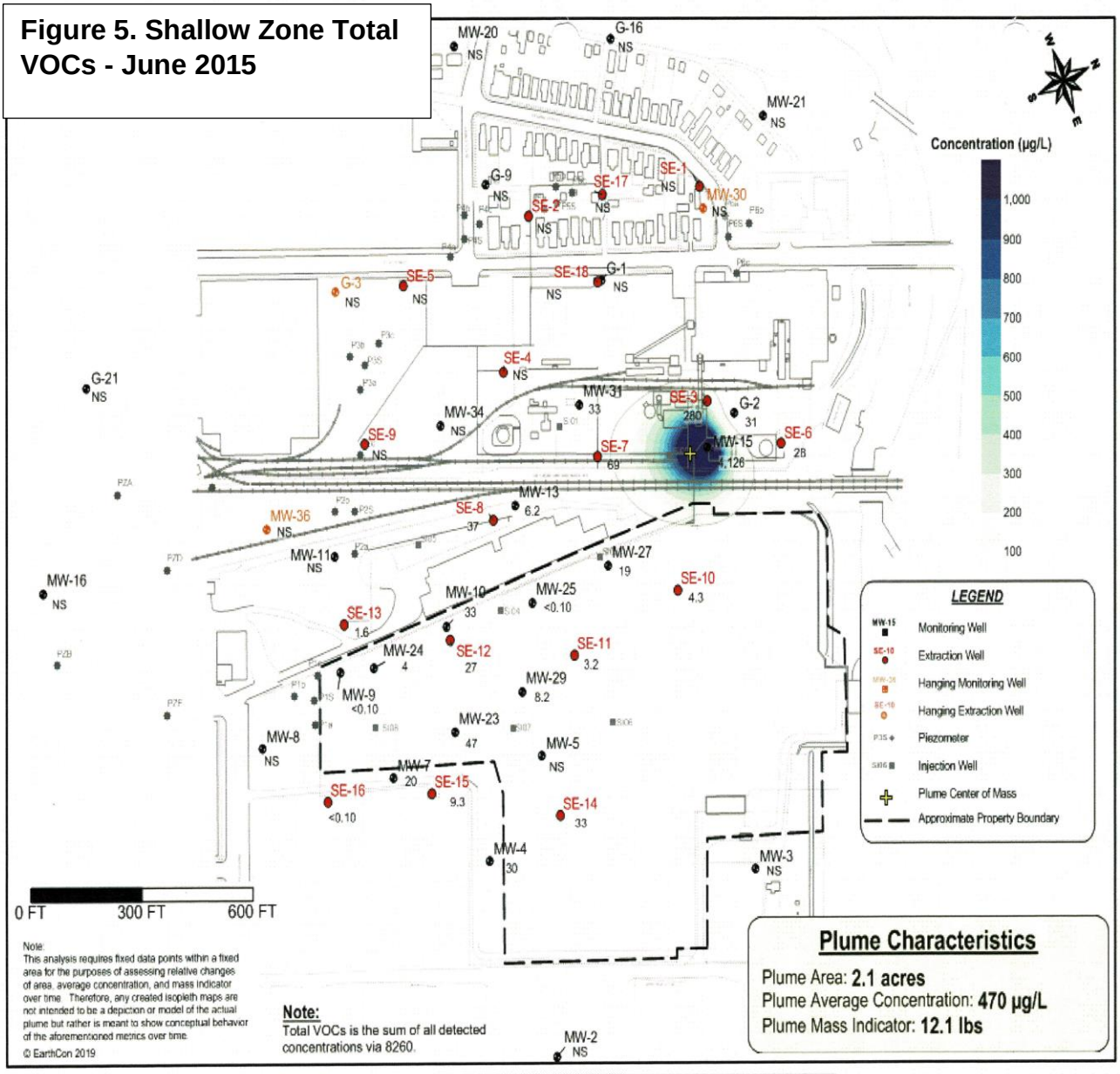


Figure 5. Shallow Zone Total VOCs - June 2015



5

Figure 6. Shallow Zone Total VOCs - 2019

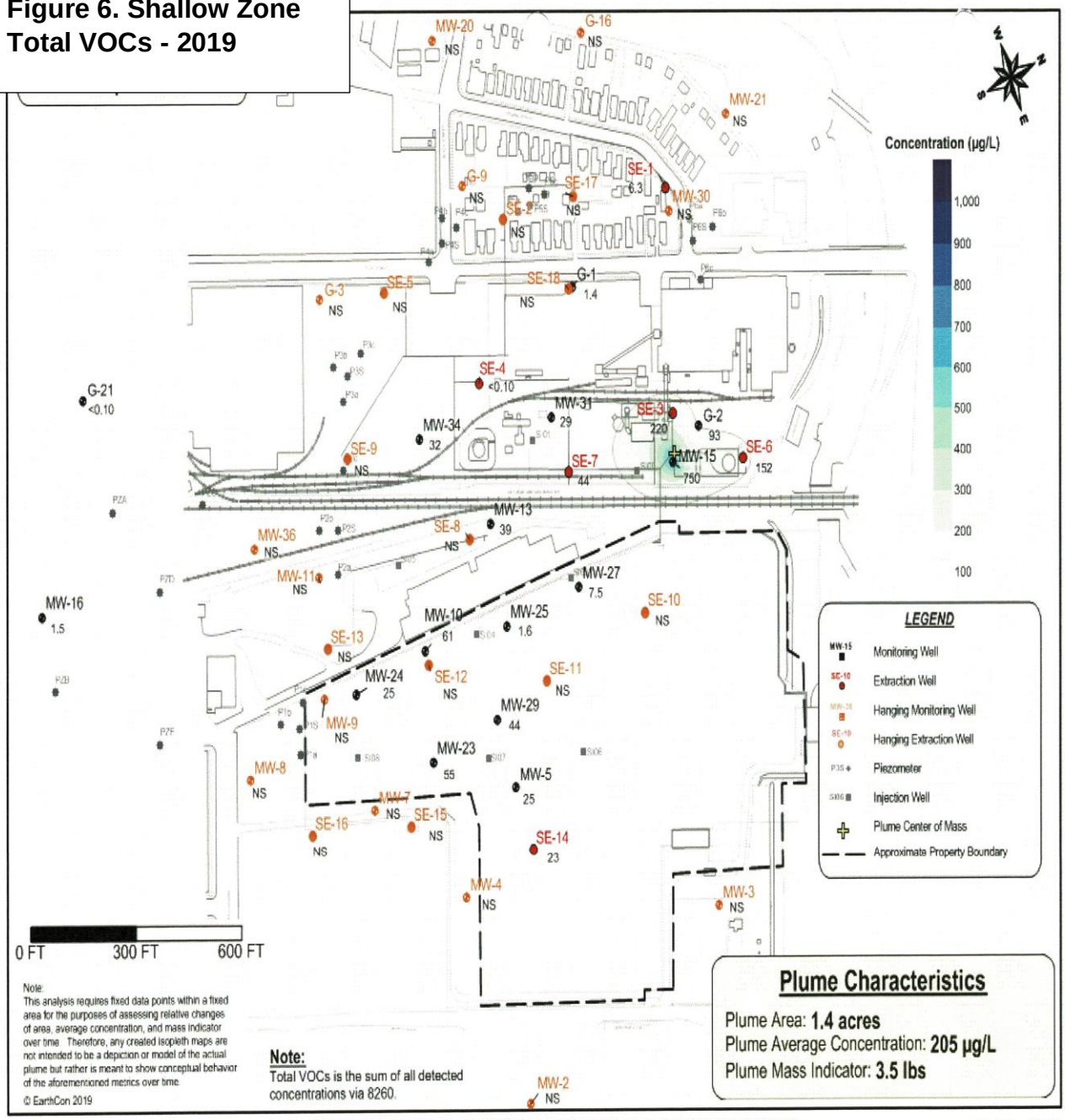
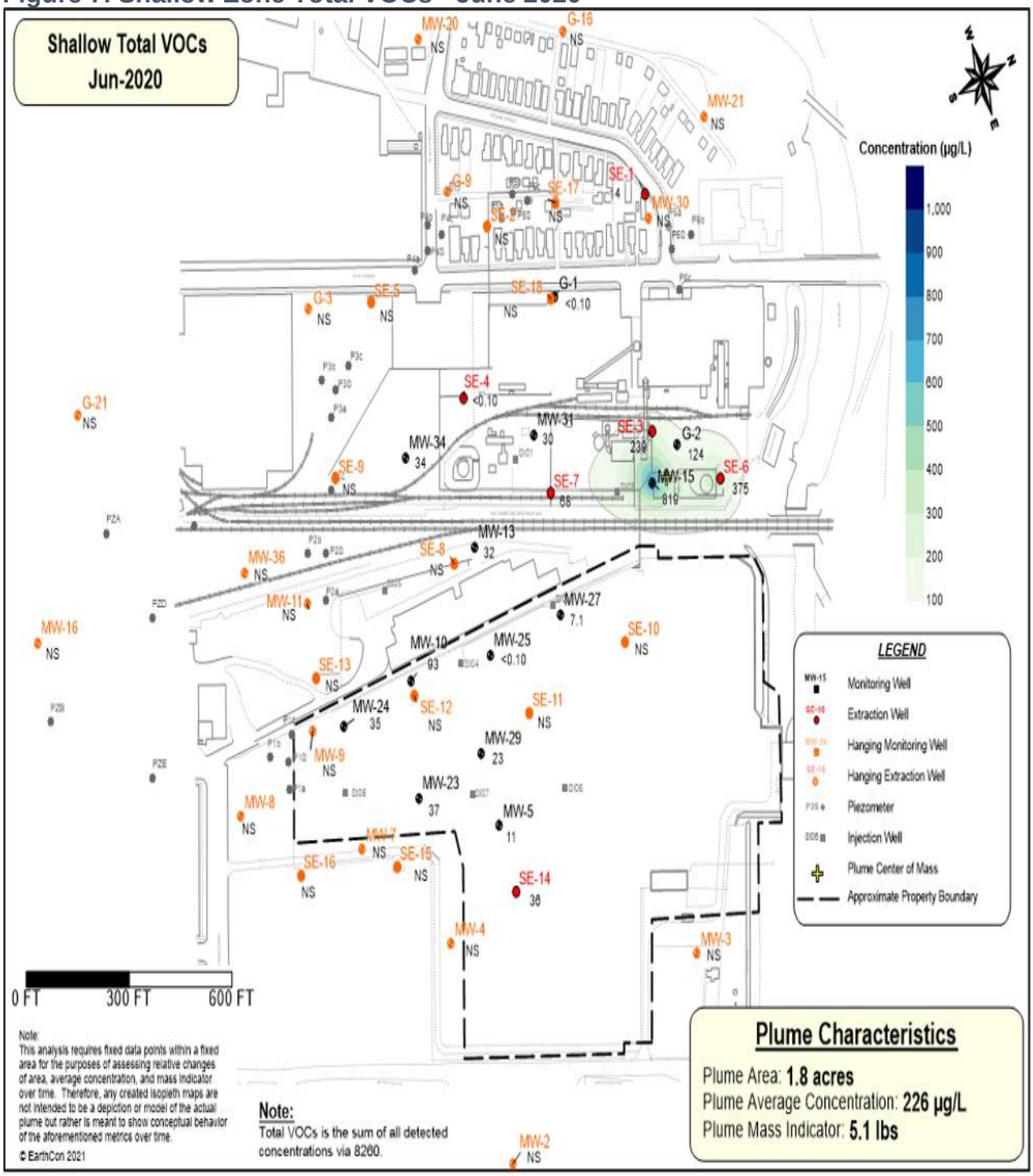


Figure 7. Shallow Zone Total VOCs - June 2020



At the start of the MNA Pilot study in June 2015, the VOCs plume in the intermediate zone covered 0.003 acres of the Site and the average plume concentration was approximately 109 µg/L. From 2017 to 2019, the intermediate zone plume area diminished further, and the average plume concentration was less than 100 µg/L.

A summary of 2019 analytical sampling results is included in Appendix E, Site Monitoring Data and Trend Analysis Data. The sampling results indicated that natural attenuation is occurring at the Site at all wells. However, three wells, all located on the Power Plant property, continue to experience elevated levels of contaminants above the 100 µg/L total priority pollutant cleanup criteria. These wells are MW-15, SE-3 and SE-6, with MW-15 having the highest concentration of total VOCs, as shown on Figures 4 through 7 above. In a conference call with the Agencies on October 16, 2019, the Trust presented a correlation that showed that a negative correlation exists between contaminant concentration and groundwater gradient in the area of MW-15, showing that the contamination at MW-15 is in the groundwater and not from the vadose zone.

On February 2, 2020, the Trust submitted to the Agencies the 2019 Annual Report/MNA Progress Report, Chem Dyne Superfund Site, Hamilton, Ohio. The report was reviewed by EPA's Center for Environmental Solutions and Emergency Response Technical Support Coordination Division in Ada, Oklahoma. Dr. Randall Ross, Dr. Daniel Pope (CSS) and Dr. Milovan Beljin (subcontractor to CSS) provided groundwater technical support for this review (*see* Appendix D).

EPA's Comments to the 2019 Annual Report/MNA Progress Report

1. Overall, concentrations appear to be declining such that the 100 ppb total VOCs goal has been met in most sampling locations at the Site. Mechanisms of natural attenuation (e.g., biological degradation, dispersion and dilution) appear to be operating to decrease contaminant concentrations.

2. The primary exception is the area around MW-15, where concentrations suggest the presence of some potential source material near the well. However, concentrations of dissolved contaminants are decreasing at MW-15, and this trend is expected to continue, indicating that natural attenuation appears to be usefully active even at this well.

3. The Trust's time projections for meeting Site goals appear to be reasonable, though of course with relatively high uncertainty common to such projections. Therefore, the current MNA remedy should continue, with appropriate performance monitoring and a contingency plan should conditions at the Site change significantly.

4. Remedy performance monitoring should continue until Site contaminant concentration goals are met at every sampling location, and for an agreed upon time afterwards to ensure completion of the remedy.

5. A contingency remedy should be developed for use if MNA does not achieve Site remedial goals. The contingency remedy can be triggered by exceedance of an agreed upon timeframe, increases in contaminant concentrations in select wells (e.g., MW-15), or by contaminant appearance in sentinel wells. To date, sentinel wells have not shown any indication that contaminants are moving toward receptors at concentrations above the Site goals.

Site Inspection

Due to the COVID-19 work travel restrictions, the FYR Site inspection could not be completed by the Agencies. The Trust employs an individual who oversees the Site daily and ensures that there are no issues at the Site. During 2020, there were no reported events at the Site that were inconsistent with or potentially damaging to the implemented remedy. EPA will conduct a Site inspection once it is feasible to do so and complete the Inspection Checklist to include in the Site files.

V. TECHNICAL ASSESSMENT

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

Yes. The review of documents, ARARs, risk assumptions, and the results of groundwater sampling results indicate that the remedy is functioning as intended by the ROD. It should be noted though that the remedy decision document needs to be amended to include MNA as the final groundwater remedy for the Site as well as include ICs as part of the Site remedy. EPA expects to sign the decision document by the end of 2022. With the placement of the landfill cap, prior operation of the groundwater treatment system, and the implementation of the MNA pilot program, the remedy has achieved most of the RAOs. There has been a decline in VOC concentrations on the South area of the Site due to the addition of the SVE systems. All the wells in the South Plume area have reached the Site cleanup goals. Many of the North Plume area wells have reached the Site cleanup goals. Specifically, monitoring well MW-15 has not reached the cleanup goal. Overall, contaminant concentrations in monitoring and extraction wells on the North area of the Site are showing decreasing trends. There are no issues with the cap or Site security based on observations made by the Chem-Dyne Trust personnel who works at the Site 4 to 5 days per week.

ICs are needed to ensure the long-term protectiveness of the remedy. State governmental ICs are in place for helping ensure groundwater use restrictions, and the Site is completely encompassed by security fencing to restrict access. There are currently no known uses of the Site which would be considered inconsistent with the goals to be achieved by the ICs. The PRPs have evaluated the ICs and identified the appropriate additional ICs that need to be implemented. UECA environmental covenants will be drafted, and EPA expects to have them signed and recorded by the end of December 2022. A draft ICIAP has been prepared and is expected to be finalized and approved by the end of 2022. A LTS Plan will be included in the ICIAP.

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

Yes. There have been no changes in the physical conditions of the Site or that would affect the protectiveness of the remedy.

Changes in Standards and Things To Be Considered

There have been no changes in the ARARs nor have there been new standards affecting the protectiveness of the remedy during this review period. Most of the cleanup goals cited in the ROD have been met at the Site.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

The exposure assumptions used to develop the Human Health Risk Assessment included both current exposures and potential future exposures. There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment. These assumptions are considered conservative and reasonable in evaluating risk and developing risk based cleanup levels. Change is not warranted from these assumptions or the cleanup levels developed from them. There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There has been no change in the physical Site conditions that could affect the protectiveness of the remedy.

Although there are VOCs as contaminants of concern at the Site, no further evaluation of vapor intrusion is warranted at the Site at this time because monitoring wells off-Site in the residential areas did not exhibit concentrations of contaminants of concern.

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

No. There is no additional information that could call into question the protectiveness of the remedy. There are no impacts from natural disasters that would call into question the protectiveness of the remedy. Currently, there are no Site issues related to climate change impacts not apparent during the remedy selection, remedy implementation, or O&M that would interfere with the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
None.

Issues and Recommendations Identified in the Five-Year Review:

OU(s): OU1 (Sitewide)	Issue Category: Other			
	Issue: Remedy decision document needs to be amended to include MNA as the final groundwater remedy for the Site.			
	Recommendation: Modify the decision document to include MNA as the groundwater remedy.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	12/31/2022

OU(s): OU1 (Sitewide)	Issue Category: Institutional Controls			
	Issue: Remedy decision document needs to be updated to incorporate ICs as a component of the remedy.			
	Recommendation: Modify remedy decision document to incorporate ICs.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	12/31/2022

OU(s): OU1 (Sitewide)	Issue Category: Other			
	Issue: Interim SVE system enhancements (and air stripper termination) need to be formally documented in the ROD/files.			
	Recommendation: Formally document interim SVE system enhancements (and air stripper termination) in the decision document or Site files.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	12/31/2022

OU(s): OU1 (Sitewide)	Issue Category: Institutional Controls			
	Issue: ICs requirements need to be evaluated.			
	Recommendation: Develop an ICIAP.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	12/31/2022

OU(s): OU1 (Sitewide)	Issue Category: Institutional Controls			
	Issue: ICs are not fully implemented.			
	Recommendation: Implement ICs at the Site.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	12/31/2022

OU(s): OU1 (Sitewide)	Issue Category: Institutional Controls			
	Issue: LTS procedures are needed.			
	Recommendation: Complete the LTS Plan as part of the ICIAP.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	12/31/2022

OU(s): OU1 (Sitewide)	Issue Category: Other			
	Issue: Due to COVID-19 work travel restrictions, a FYR Site inspection was not conducted at the Site.			
	Recommendation: EPA will conduct a FYR Site inspection once COVID-19 work travel restrictions are removed and will complete the Inspection Checklist to include in Site files.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	4/30/2022

VII. PROTECTIVENESS STATEMENT

OU1 and Sitewide Protectiveness Statement
Protectiveness Determination: Short-Term Protective
Protectiveness Statement: The remedy at the Chem-Dyne Superfund Site currently protects human health and the environment. The groundwater treatment system was shut down but the SVE system enhancements, the installation of a cap, and MNA assisted in the remedy functioning as intended by the ROD. Exposure pathways that could result in unacceptable risks are being controlled by preventing exposure to, or the ingestion of, contaminated groundwater. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness: • Modify the decision document to include MNA as the groundwater remedy. • Modify remedy decision document to incorporate ICs. • Formally document interim SVE system enhancements (and air stripper termination) in the decision document or Site files. • Develop an ICIAP. • Implement ICs at the Site. • Complete the LTS Plan as part of the ICIAP. • EPA will conduct a FYR Site inspection once COVID-19 work travel restrictions are removed and will complete the Inspection Checklist to include in Site files.

VIII. NEXT REVIEW

The next FYR report for the Chem Dyne Superfund Site is required five years from the completion date of this review.

APPENDIX A

REFERENCE LIST

REFERENCE LIST

- U.S. Environmental Protection Agency, 1985. *Record of Decision Chem-Dyne*, July 5.

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- Hull & Associates, Inc., 2012. *2011 Annual Report, May.*

- Hull & Associates, Inc., 2013. *2013 Annual Report, May*.

- Environmental Standards, Inc., 2020. *Quality Assurance Project Plan Chem-Dyne Site Long-Term Monitoring Plan U.S.EPA Region 5 Hamilton, Butler County, Ohio*, November 17.

APPENDIX B

CHEM-DYNE SITE MAPS

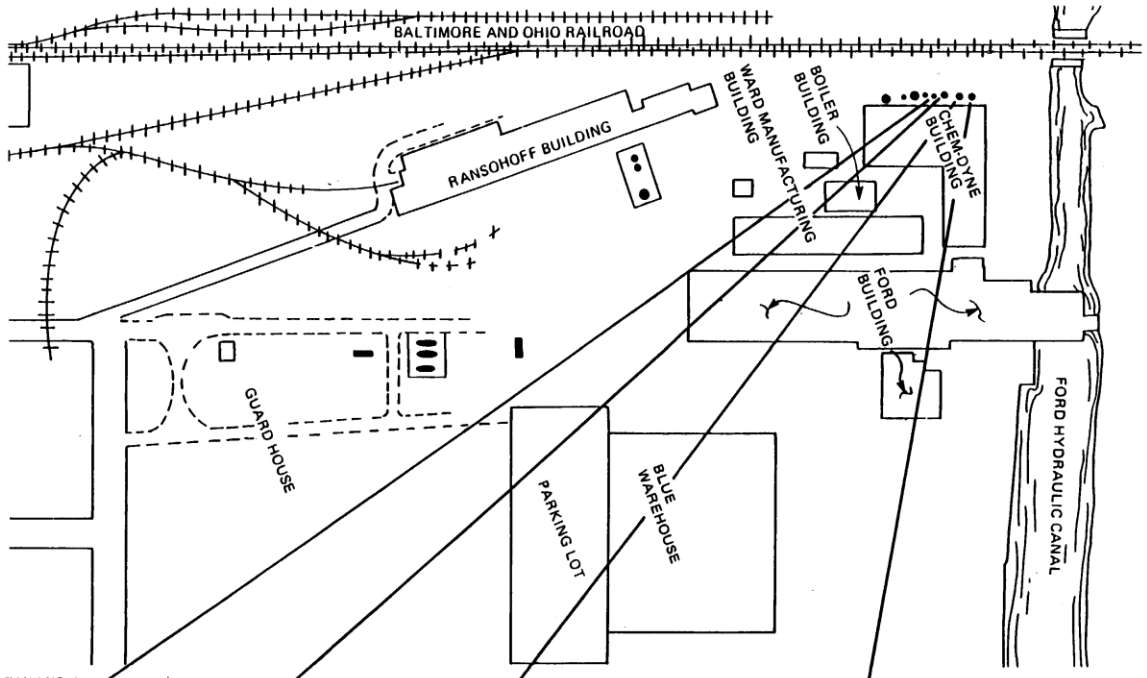
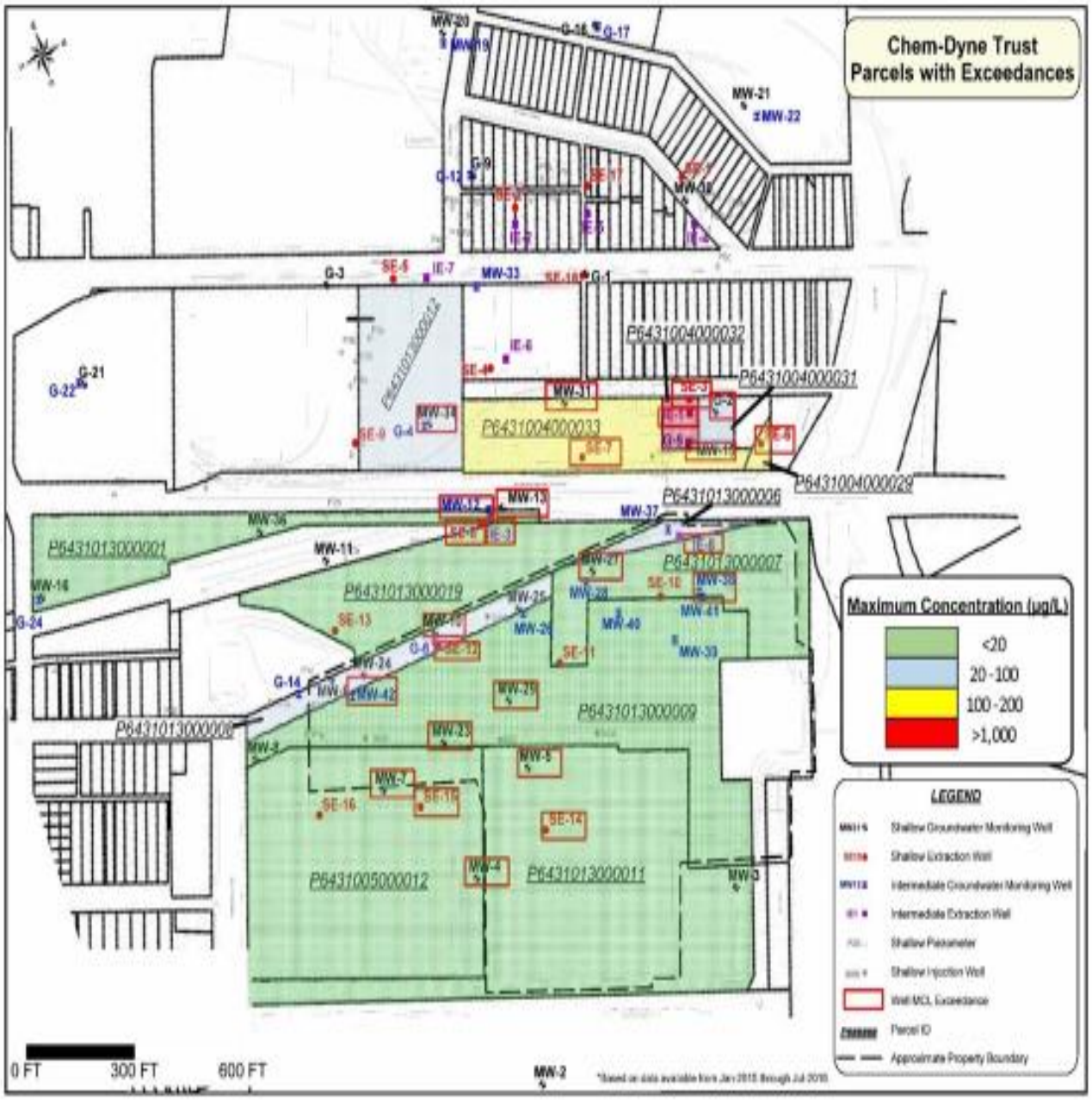


FIGURE 12
REPORTED BULK TANK WASTE COMPONENTS
TM TASK 1


Chem-Dyne Trust
Parcels with Exceedances
P6431004000032
P6431004000031
P6431004000033
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P6431013000026
P6431013000001
P6431013000019
P6431013000007
P6431013000009
P6431013000008
P6431005000012
P6431013000011
Maximum Concentration (ug/L)
<20
20 - 100
100 - 200
>1,000
LEGEND
Shallow Groundwater Monitoring Well
Shallow Extraction Well
Intermediate Groundwater Monitoring Well
Intermediate Extraction Well
Shallow Piezometer
Shallow Injection Well
Well MCL Exceedance
Parcel ID
Approximate Property Boundary
0 FT
300 FT
600 FT

Chem-Dyne Corporation
Parcel ID: P6431013000006
0.034 Acres

Chem-Dyne Corporation
Parcel ID: P6431013000007
3.035 Acres


St. Clair
N 2ND ST
N 3RD ST
BLACK ST
N 3RD ST
City of Hamilton
3RD ST
VINE ST
N 4TH ST
N 5TH ST
N 6TH ST
MIAMI ST
STOUT ST
VINE ST


St. Clair
N 2ND ST
N 3RD ST
BLACK ST
N 3RD ST
City of Hamilton
3RD ST
VINE ST
N 4TH ST
N 5TH ST
N 6TH ST
MIAMI ST
STOUT ST
VINE ST

State Of Ohio
Parcel ID: P6431013000011
9.204 Acres

20

State of Ohio
Parcel ID: P6431013000012
7.176 Acres

21

OFF-SITE PARCELS

State of Ohio
Parcel ID: P6431013000012
7.176 Acres

26

City Of Hamilton
Parcel ID: P6431013000024
1.589 Acres

27

Parcel ID: P6431013000001
Owner: Kornylak Corp
5.24 acres

28

Parcel ID: P64310130000019
Owner: Seilkop R E Holdings LLC; DBA Hamilton Precision LLC
3.565 acres

29

Parcel ID: P6431005000012
Owner: City of Hamilton
2.57 acres

30

Parcel ID: P6431004000031
Owner: City of Hamilton
0.597 acres

31

Parcel ID: P6431004000032
Owner: City of Hamilton
0.567 acres

32

Parcel ID: P6431004000033
Owner: City of Hamilton
2.029 acres

33

Parcel ID: P6431004000029
Owner: Miami Conservancy District
0.097 acres

34

APPENDIX C

CHEM-DYNE SITE CAP DESIGN

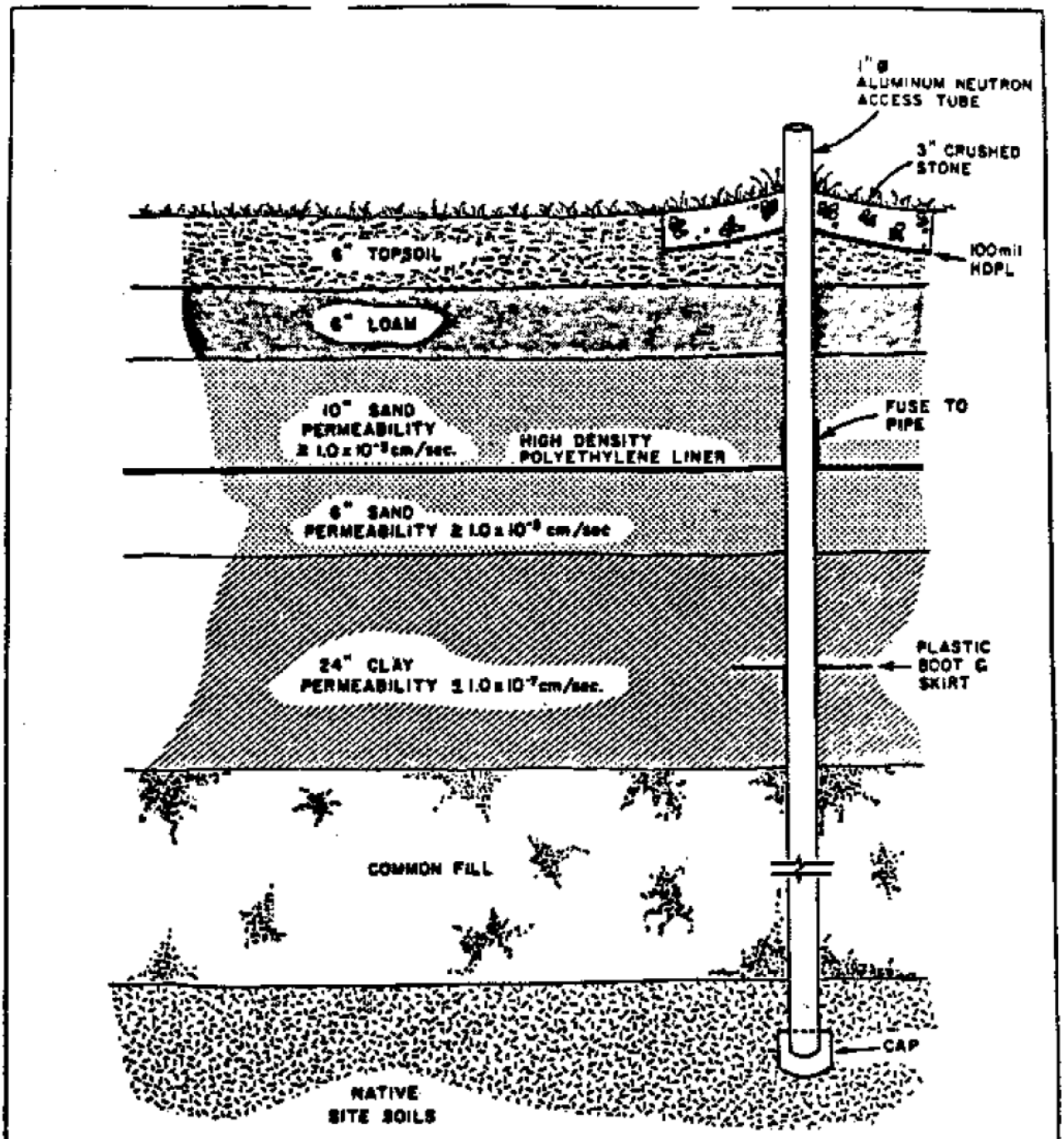

FIGURE 1

COMPOSITE CAP CONSTRUCTION
CHEM-DYNE GENERATORS
REMEDIAL ACTION PLAN
Chem-Dyne Site

4486 - 11/01/89

Cap Construction

The site was covered with a cap consisting of the following composite construction: 24 inches of clay soil (with a maximum coefficient of permeability of 10^{-7} cm/sec); a permeable sand zone; a synthetic liner; and a sand, loam, and topsoil root zone for vegetative cover. The cap was graded to promote run-off and to minimize soil losses due to erosion.

Monitoring and long-term maintenance of the cap are essential to proper remediation. Detailed monitoring, maintenance and contingency provisions are contained in the Consent Decree.

Appendix D

Monitored Natural Attenuation

Request and Approvals

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CENTER for ENVIRONMENTAL SOLUTIONS and EMERGENCY RESPONSE
TECHNICAL SUPPORT COORDINATION DIVISION
P.O. Box 1198 Ada, OK 74820

March 27, 2020

OFFICE OF
RESEARCH AND DEVELOPMENT

MEMORANDUM

SUBJECT: 2019 Annual Report/MNA Progress Report, Chem Dyne Superfund Site, Hamilton, Ohio (20-RO5-02)

FROM: Randall R. Ross, Director
Groundwater Technical Support Center

TO: Lolita Hill, Remedial Project Manager
EPA Region V

Per your request for continued technical support, the 2019 Annual Report/MNA Progress Report, Chem Dyne Superfund Site, Hamilton, Ohio, was reviewed by Drs. Daniel Pope (CSS), Milovan Beljin (subcontractor to CSS) and me. The following comments are provided for your consideration. If you have any questions or would like to discuss these matters further, please contact me at your convenience (580-436-8611).

Comments

1. Overall, concentrations appear to be declining such that the 100 ppb total VOCs goal has been met in most sampling locations at the site. Mechanisms of natural attenuation (e.g., biological degradation, dispersion and dilution) appear to be operating to decrease contaminant concentrations.
2. The primary exception is the area around MW-15, where concentrations suggest the presence of some potential source material near the well. However, concentrations of dissolved contaminants are decreasing at MW-15, and this trend is expected to continue, indicating that natural attenuation appears to be usefully active even at this well.

3. The Trust's time projections for meeting site goals appear to be reasonable, though of course with relatively high uncertainty common to such projections. Therefore, the current MNA remedy should continue, with appropriate performance monitoring and a contingency plan should conditions at the site change significantly.
4. Remedy performance monitoring should continue until site contaminant concentration goals are met at every sampling location, and for an agreed upon time afterwards to ensure completion of the remedy.
5. A contingency remedy should be developed for use if MNA does not achieve site remedial goals. The contingency remedy can be triggered by exceedance of an agreed upon timeframe, increases in contaminant concentrations in select wells (e.g., MW-15), or by contaminant appearance in sentinel wells. To date, sentinel wells have not shown any indication that contaminants are moving toward receptors at concentrations above the site goals.

cc: Charles Maurice, Region 5
Conor Neal, Region 5
Zachary Sasnow, Region 5
David Wilson, Region 5
David Bartenfelder, HQ
Linda Fiedler, HQ

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Laurie A. Stevenson, Director

September 9, 2020

Transmitted Electronically

Mr. Chuck Hanson
3535 Kirby Parkway
Apartment K423
Memphis, Tennessee 38115

Re: Chem-Dyne Corp, Hamilton
Remediation Response
Correspondence
Remedial Response
Butler County
509000160001

Subject: 2019 Annual Report/MNA Progress Report – Chem-Dyne Site, Hamilton, Ohio

Dear Mr. Hanson:

The Ohio Environmental Protection Agency (Ohio EPA) reviewed the above-referenced document dated February 5, 2020. Ohio EPA concurs with the conclusions presented in Section 5 of the report, that the plumes are attenuating under natural conditions. Ohio EPA approves the recommendations presented in Section 6 of the report. These recommendations are as follows:

- Monitored natural attenuation (MNA) should continue as the remedy at the site until either the Consent Decree ground water criteria are met, or until such a time that MNA is believed to be insufficient as a sole remedy to achieve the ground water criteria in the Consent Decree.

- Proceed with the MNA ground water monitoring program outlined in Table 1 of the report and update the MNA effectiveness evaluations as data becomes available.

- Proceed with the decommissioning of wells and equipment no longer needed for site remediation.

In addition, Ohio EPA approves the MNA Contingency Measures Plan dated July 17, 2020.

Southwest District Office • 401 East Fifth Street • Dayton, OH 45402-2911
epa.ohio.gov • (937) 285-6357 • (937) 285-6249 (fax)

If you have any questions, please feel free to contact me at (937) 285-6056 or Charles.Mellon@epa.ohio.gov.

Sincerely,

Charles C. Mellon
Senior Site Coordinator
Division of Environmental Response and Revitalization

ec: Lolita Hill, U.S. EPA
Kurtis Herlocher, DERR-CO
Kenneth Dupuis, Chem-Dyne Trust
Bill Damschroder, Ohio EPA Legal

CCM/tp

APPENDIX E

MONITORED NATURAL ATTENUATION

PILOT STUDY RESULTS

[redacted] - Summary of 2019 Analytical Results

Well ID	Sample Date		1,1,1-Trichloroethane (µg/L)	1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	1,1-Dichloroethene (µg/L)	1,2-Dichlorobenzene (µg/L)	1,2-Dichloroethane (µg/L)	1,2-Dichloropropane (µg/L)	1,3-Dichlorobenzene (µg/L)	1,4-Dichlorobenzene (µg/L)	2-Chloroethyl vinyl ether (µg/L)	Acrolein (µg/L)	Acrylonitrile (µg/L)	Benzene (µg/L)	Bromodichloromethane (µg/L)	Bromoform (µg/L)	Bromomethane (µg/L)
G-1	01/07/2019		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	03/12/2019		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U*	10 U	1 U	1 U	1 U	1 U
	09/09/2019		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
G-2	09/20/2019		2 U	3	19	2 U	3.8	2 U	2 U	2 U	2 U	2 U	20 U	100 U	20 U	2 U	2 U	2 U	2 U
G-6	09/09/2019		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
G-21	09/09/2019		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	09/09/2019	DUP	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
G-22	09/09/2019		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
G-24	09/09/2019		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
IE-3	09/09/2019		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U*	1 U	1 U
MW-5	06/03/2019		1.1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	09/20/2019		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
MW-10	01/07/2019		1 U	1 U	2.3	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U*	10 U	1 U	1 U	1 U	1 U
	03/12/2019		1 U	1 U	1.6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	04/03/2019		1 U	1.1	3.1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U*	10 U	26 F1	1 U	1 U	1 U
	05/06/2019		1 U	1 U	4.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U*	1 U	1 U
	06/03/2019		1 U	1.6	8.3	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U*
	08/05/2019		1 U	1 U	5.9	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	09/09/2019		1 U	2.4	9.4	1	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U*
MW-12	06/04/2019		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	09/20/2019		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U*	1 U	1 U
MW-13	06/03/2019		1 U	1 U	4.2	1.3	1.1	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	09/09/2019		1 U	1	4.9	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
MW-15	01/07/2019		5 U	260	250	5 U	39	5 U	5 U	5 U	5 U	5 U	50 U	250 U	50 U	6.2	5 U	5 U	5 U
	03/12/2019		1 U	99	94	1.3	29	1 U	1.4	1 U	1 U	1 U	10 U	50 U*	10 U	3	1 U	1 U	1 U
	04/03/2019		1 U	190	120	1.1	20	1	1.5	1 U	1.2	1 U	10 U	50 U	10 U	3	1 U	1 U	1 U
	05/06/2019		1 U	68	64	1.2	17	1 U	1.3	1 U	1 U	1 U	10 U	50 U*	10 U	2	1 U	1 U	1 U
	08/05/2019		1 U	56	47	1.4	15	1 U	1.2	1 U	1 U	1 U	10 U	50 U	10 U	1.6	1 U	1 U	1 U*
	09/09/2019		10 U	84	59	10 U	20	10 U	10 U	10 U	10 U	10 U	100 U	500 U	100 U	10 U	10 U	10 U	10 U
MW-16	09/09/2019		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U

1

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[redacted] - Summary of 2019 Analytical Results

Well ID	Sample Date	1,1,1-Trichloroethane (µg/L)	1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	1,1-Dichloroethene (µg/L)	1,2-Dichlorobenzene (µg/L)	1,2-Dichloroethane (µg/L)	1,2-Dichloropropane (µg/L)	1,3-Dichlorobenzene (µg/L)	1,4-Dichlorobenzene (µg/L)	2-Chloroethyl vinyl ether (µg/L)	Acrolein (µg/L)	Acrylonitrile (µg/L)	Benzene (µg/L)	Bromodichloromethane (µg/L)	Bromoform (µg/L)	Bromomethane (µg/L)
MW-23	06/03/2019	1.1	1 U	1 U	1.2	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U*	1 U	1 U
	09/09/2019	1.7 U	1.7 U	1.7 U	3.2	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	17 U	84 U	17 U	1.7 U	1.7 U	1.7 U	1.7 U
MW-24	06/03/2019	1 U	1 U	1.6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U*	1 U	1 U
	09/09/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
MW-25	06/03/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U*	1 U	1 U
	09/09/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
MW-27	01/07/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U F1	10 U	4.2	1 U	1 U	1 U
	03/12/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U*	10 U	9.5	1 U	1 U	1 U
	04/03/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	13	1 U	1 U	1 U
	05/06/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U*	10 U	13	1 U	1 U	1 U
	06/03/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	15	1 U*	1 U	1 U
	08/05/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	22	1 U	1 U	1 U*
	09/09/2019	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	130 U	25 U	7.5	2.5 U	2.5 U	2.5 U
MW-29	06/03/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U F1*	1 U	1 U
	09/20/2019	1 U	1 U	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
MW-31	01/07/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	03/12/2019	1 U	1 U	1.3	1 U	1.1	1 U	1 U	1 U	1 U	1 U	10 U	50 U*	10 U	1 U	1 U	1 U	1 U
	09/09/2019	1 U	1 U	1.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
MW-34	01/07/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	03/12/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U*	10 U	1 U	1 U	1 U	1 U
	09/09/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
SE-1	01/07/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	03/12/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U*	10 U	1 U	1 U	1 U	1 U
	04/03/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	05/06/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U*	10 U	1 U	1 U	1 U	1 U
	09/09/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U

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[redacted] Summary of 2019 Analytical Results

Well ID	Sample Date		1,1,1-Trichloroethane (µg/L)	1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	1,1-Dichloroethene (µg/L)	1,2-Dichlorobenzene (µg/L)	1,2-Dichloroethane (µg/L)	1,2-Dichloropropane (µg/L)	1,3-Dichlorobenzene (µg/L)	1,4-Dichlorobenzene (µg/L)	2-Chloroethyl vinyl ether (µg/L)	Acrolein (µg/L)	Acrylonitrile (µg/L)	Benzene (µg/L)	Bromodichloromethane (µg/L)	Bromoform (µg/L)	Bromomethane (µg/L)
SE-3	01/07/2019		1 U	20	29	1 U	16	1 U	1.3	1 U	1 U	1 U	10 U	50 U	10 U	1.1	1 U	1 U	1 U
	03/12/2019		1 U	14	17	1 U	16	1 U	1 U	1 U	1 U	1 U	10 U	50 U*	10 U	1 U	1 U	1 U	1 U
	04/03/2019		1 U	17	17	1 U	14	1 U	1.1	1 U	1 U	1 U	10 U	50 U*	10 U	1 U	1 U	1 U	1 U
	05/06/2019		1 U	11	14	1 U	16	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	08/05/2019		1 U	8.9	11	1 U	13	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U*
	09/09/2019		5 U	9.5	8.5	5 U	10	5 U	5 U	5 U	5 U	5 U	50 U	250 U	50 U	5 U	5 U	5 U	
SE-4	09/09/2019		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
SE-6	01/07/2019		1 U	3.1	11	1.2	11	1 U	8.1	1 U	1 U	1 U	10 U	50 U*	10 U	1 U	1 U	1 U	1 U
	03/12/2019		1 U	1.5	9.5	1.4	12	1 U	7.1	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	04/03/2019		1 U	3.3	11	1.2	11	1 U	7.4	1 U	1 U	1 U	10 U	50 U*	10 U	1 U	1 U	1 U	1 U
	05/06/2019		1 U	1.3	8.7	1.2	11	1 U	7.2	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U*
	08/05/2019		1 U	2.1	9.6	1 U	12	1 U	5.1	1 U	1 U	1 U	10 U	250 U	50 U	5 U	5 U	5 U	5 U
	09/09/2019		5 U	5 U	14	5 U	12	5 U	5 U	5 U	5 U	5 U	50 U	50 U	10 U	1 U	1 U	1 U	1 U
SE-7	01/07/2019		1 U	15	32	1 U	3.2	1 U	1 U	1 U	1 U	1 U	10 U	50 U*	10 U	1 U	1 U	1 U	1 U
	03/12/2019		1 U	6.1	11	1 U	1.6	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	04/03/2019		1 U	7.1	10	1 U	1.2	1 U	1 U	1 U	1 U	1 U	10 U	50 U*	10 U	1 U	1 U	1 U	1 U
	05/06/2019		1 U	3.6	6.9	1 U	1.1	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U*
	08/05/2019		1 U	2.3	3.7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	09/09/2019		1 U	3.9	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U*
SE-8	06/03/2019		1 U	1 U	2.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U*
	06/03/2019	DUP	1 U	1 U	1.9	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U*	1 U	1 U
SE-14	06/03/2019		1 U	1 U	1 U	2	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	09/09/2019		1 U	1 U	1 U	2	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U
	09/09/2019	DUP	1 U	1 U	1 U	2.1	1 U	1 U	1 U	1 U	1 U	1 U	10 U	50 U	10 U	1 U	1 U	1 U	1 U

3

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[redacted] - Summary of 2019 Analytical Results

Well ID	Sample Date	Carbon tetrachloride (µg/L)	Chlorobenzene (µg/L)	Chloroethane (µg/L)	Chloroform (µg/L)	Chloromethane (µg/L)	cis-1,2-Dichloroethene (µg/L)	cis-1,3-Dichloropropene (µg/L)	Dibromochloromethane (µg/L)	Ethylbenzene (µg/L)	Methylene chloride (µg/L)	Tetrachloroethene (µg/L)	Toluene (µg/L)	trans-1,2-Dichloroethene (µg/L)	trans-1,3-Dichloropropene (µg/L)	Trichloroethene (µg/L)	Trichlorofluoromethane (µg/L)	Vinyl Chloride (µg/L)
G-1	01/07/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	03/12/2019	1 U	1 U	1 U	1 U	1 U	1.2	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	09/09/2019	1 U	1 U	1 U	1 U	1 U	1.4	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
G-2	09/20/2019	2 U	2 U	2 U	2 U	2 U	41	2 U	2 U	2 U	10 U	19	2 U	2 U	2 U	6.8	2 U	2 U
G-6	09/09/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
G-21	09/09/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	09/09/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
G-22	09/09/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
G-24	09/09/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	8
IE-3	09/09/2019	1 U	1 U	1 U	1 U	1 U	27	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	8.3	1 U	1 U
MW-5	06/03/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	25	1 U	1 U
	09/20/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	16	1 U	1 U
MW-10	01/07/2019	1 U	1 U	1 U	2.1	1 U	4.3	1 U	1 U	1 U	5 U	24	1 U	1 U	1 U	15	1 U	1 U
	03/12/2019	1 U	1 U	1 U	2.8	1 U	2.4	1 U	1 U	1 U	5 U	22	1 U	1 U	1 U	15	1 U	1 U
	04/03/2019	1 U	1 U	1 U	3.9	1 U	3.3	1 U	1 U	1 U	5 U	26	1 U	1 U	1 U	19	1 U	1 U
	05/06/2019	1.2	1 U	2.3	5.1	3.7	5.5	1 U	1 U	1 U	5 U	34	1 U	1 U	1 U	19	1 U	1 U
	06/03/2019	1.6	1 U	1 U	4.8	1 U	6.9	1 U	1 U	1 U	5 U	32	1 U	1 U	1 U	16	1 U	1 U
	08/05/2019	1 U	1 U	1 U	2.5	1 U	6	1 U	1 U	1 U	5 U	28	1 U	1 U	1 U	14	1 U	1 U
	09/09/2019	1 U	1 U	1 U	3.3	1 U	7.6	1 U	1 U	1 U	5 U	23	1 U	1 U	1 U	1.8	1 U	4.4
MW-12	06/04/2019	1 U	1 U	1 U	1 U	1 U	7.5	1 U	1 U	1 U	5 U	1.4	1 U	1 U	1 U	1.8	1 U	3.1
	09/20/2019	1 U	1 U	1 U	1 U	1 U	7.2	1 U	1 U	1 U	5 U	1.1	1 U	1 U	1 U	14	1 U	1 U
MW-13	06/03/2019	1 U	1 U	1 U	1.6	1 U	7.5	1 U	1 U	1 U	5 U	12	1 U	1 U	1 U	11	1 U	1 U
	09/09/2019	1 U	1 U	1 U	1.5	1 U	6.8	1 U	1 U	1 U	5 U	14	1 U	1 U	1 U	150	5 U	69
MW-15	01/07/2019	5 U	5 U	5 U	5 U	5 U	470	5 U	5 U	5 U	25 U	420	5 U	16	5 U	99	1 U	32
	03/12/2019	1 U	1.2	1 U	1.2	1 U	220	1 U	1 U	1 U	5 U	360	1 U	14	1 U	110	1 U	31
	04/03/2019	1 U	2.6	1 U	1.1	1 U	180	1 U	1 U	1 U	5 U	360	1 U	9.3	1 U	90	1 U	20
	05/06/2019	1 U	1.4	1 U	1.1	1 U	150	1 U	1 U	1 U	5 U	360	1 U	8.6	1 U	80	1 U	25
	08/05/2019	1 U	1.2	1 U	1.2	1 U	140	1 U	1 U	1 U	5 U	310	1 U	7.1	1 U	74	1 U	43
	09/09/2019	10 U	10 U	10 U	10 U	10 U	200	10 U	10 U	10 U	50 U	270	10 U	10 U	10 U	1.5	1 U	1 U
MW-16	09/09/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U			

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[redacted] - Summary of 2019 Analytical Results

Well ID	Sample Date	Carbon tetrachloride (µg/L)	Chlorobenzene (µg/L)	Chloroethane (µg/L)	Chloroform (µg/L)	Chloromethane (µg/L)	cis-1,2-Dichloroethene (µg/L)	cis-1,3-Dichloropropene (µg/L)	Dibromochloromethane (µg/L)	Ethylbenzene (µg/L)	Methylene chloride (µg/L)	Tetrachloroethene (µg/L)	Toluene (µg/L)	trans-1,2-Dichloroethene (µg/L)	trans-1,3-Dichloropropene (µg/L)	Trichloroethene (µg/L)	Trichlorofluoromethane (µg/L)	Vinyl Chloride (µg/L)
MW-23	06/03/2019	3	1 U	1 U	2.6	1 U	9.4	1 U	1 U	1 U	5 U	24	1 U	1 U	1 U	8.3	1 U	1 U
	09/09/2019	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	37	1.7 U	1.7 U	1.7 U	8.4 U	11	1.7 U	1.7 U	1.7 U	4.2	1.7 U	1.7 U
MW-24	06/03/2019	4.6	1 U	1 U	4.7	1 U	1 U	1 U	1 U	1 U	5 U	17	1 U	1 U	1 U	5.8	1 U	1 U
	09/09/2019	3.8	1 U	1 U	4.7	1 U	1 U	1 U	1 U	1 U	5 U	13	1 U	1 U	1 U	3	1 U	1 U
MW-25	06/03/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	09/09/2019	1 U	1 U	1 U	1 U	1 U	1.6	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-27	01/07/2019	1 U	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1.7	1 U	1 U
	03/12/2019	1 U	2.6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	04/03/2019	1 U	3.1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	05/06/2019	1 U	2.1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	06/03/2019	1 U	1.7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	08/05/2019	1 U	2.1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	09/09/2019	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	13 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
MW-29	06/03/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	09/20/2019	1 U	1 U	1 U	1 U	1 U	22	1 U	1 U	1 U	5 U	5.4	1 U	1 U	1 U	16	1 U	1 U
MW-31	01/07/2019	1 U	1 U	1 U	1 U	1 U	24	1 U	1 U	1 U	5 U	5.6	1 U	1 U	1 U	4.4	1 U	1.6
	03/12/2019	1 U	1 U	1 U	1 U	1 U	19	1 U	1 U	1 U	5 U	8.1	1 U	1 U	1 U	5.4	1 U	1.1
	09/09/2019	1 U	1 U	1 U	1 U	1 U	15	1 U	1 U	1 U	5 U	6.2	1 U	1 U	1 U	4.8	1 U	1.3
MW-34	01/07/2019	1 U	1 U	1 U	1 U	1 U	22	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	9.5
	03/12/2019	1 U	1 U	1 U	1 U	1 U	11	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1.2
	09/09/2019	1 U	1 U	1 U	1 U	1 U	24	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	7.6
SE-1	01/07/2019	1 U	1 U	1 U	1 U	1 U	2.5	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	3.8	1 U	1 U
	03/12/2019	1 U	1 U	1 U	1 U	1 U	4.8	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	5.4	1 U	1 U
	04/03/2019	1 U	1 U	1 U	1 U	1 U	2.6	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	3.1	1 U	1 U
	05/06/2019	1 U	1 U	1 U	1 U	1 U	3.2	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	3.1	1 U	1 U
	09/09/2019	1 U	1 U	1 U	1 U	1 U	3.7	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	2.6	1 U	1 U

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[redacted] - Summary of 2019 Analytical Results

Well ID	Sample Date	Carbon tetrachloride (µg/L)	Chlorobenzene (µg/L)	Chloroethane (µg/L)	Chloroform (µg/L)	Chloromethane (µg/L)	cis-1,2-Dichloroethene (µg/L)	cis-1,3-Dichloropropene (µg/L)	Dibromochloromethane (µg/L)	Ethylbenzene (µg/L)	Methylene chloride (µg/L)	Tetrachloroethene (µg/L)	Toluene (µg/L)	trans-1,2-Dichloroethene (µg/L)	trans-1,3-Dichloropropene (µg/L)	Trichloroethene (µg/L)	Trichlorofluoromethane (µg/L)	Vinyl Chloride (µg/L)
SE-3	01/07/2019	1 U	7.4	1 U	1 U	1 U	230	1 U	1 U	1 U	5 U	42	1 U	6.8	1 U	17	1 U	61
	03/12/2019	1 U	7	1 U	1 U	1 U	200	1 U	1 U	1 U	5 U	45	1 U	9.2	1 U	16	1 U	52
	04/03/2019	1 U	7.5	1 U	1 U	1 U	170	1 U	1 U	1 U	5 U	38	1 U	7.3	1 U	13	1 U	68
	05/06/2019	1 U	6.9	1 U	1 U	1 U	200	1 U	1 U	1 U	5 U	56	1 U	9.2	1 U	18	1 U	54
	08/05/2019	1 U	6	1 U	1 U	1 U	160	1 U	1 U	1 U	5 U	40	1 U	7.2	1 U	14	1 U	57
	09/09/2019	5 U	5.6	5 U	5 U	5 U	120	5 U	5 U	5 U	25 U	17	5 U	5 U	5 U	6.6	5 U	43
SE-4	09/09/2019	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
SE-6	01/07/2019	1 U	4.4	1 U	1 U	1 U	130	1 U	1 U	1 U	5 U	8.1	1 U	2.5	1 U	4.3	1 U	15
	03/12/2019	1 U	5.4	1 U	1 U	1 U	130	1 U	1 U	1 U	5 U	4.9	1 U	3.4	1 U	2.7	1 U	16
	04/03/2019	1 U	6	1 U	1 U	1 U	110	1 U	1 U	1 U	5 U	6.3	1 U	2.5	1 U	3.4	1 U	17
	05/06/2019	1 U	5.6	1 U	1 U	1 U	120	1 U	1 U	1 U	5 U	3.8	1 U	3.3	1 U	2.5	1 U	11
	08/05/2019	1 U	5.3	1 U	1 U	1 U	110	1 U	1 U	1 U	5 U	2.8	1 U	2.5	1 U	2.9	1 U	12
	09/09/2019	5 U	6.1	5 U	5 U	5 U	110	5 U	5 U	5 U	25 U	5 U	5 U	5 U	5 U	5 U	5 U	9.4
SE-7	01/07/2019	1 U	1 U	1 U	1 U	1 U	46	1 U	1 U	1 U	5 U	43	1 U	2	1 U	25	1 U	3
	03/12/2019	1 U	1 U	1 U	1 U	1 U	19	1 U	1 U	1 U	5 U	27	1 U	1.3	1 U	11	1 U	1.7
	04/03/2019	1 U	1 U	1 U	1 U	1 U	15	1 U	1 U	1 U	5 U	24	1 U	1 U	1 U	10	1 U	1.6
	05/06/2019	1 U	1 U	1 U	1 U	1 U	13	1 U	1 U	1 U	5 U	24	1 U	1	1 U	9.5	1 U	1.5
	08/05/2019	1 U	1 U	1 U	1 U	1 U	8.2	1 U	1 U	1 U	5 U	17	1 U	1 U	1 U	6.1	1 U	1.3
	09/09/2019	1 U	1 U	1 U	1 U	1 U	10	1 U	1 U	1 U	5 U	17	1 U	1 U	1 U	6.8	1 U	1.1
SE-8	06/03/2019	1 U	1 U	1 U	1 U	1 U	3.8	1 U	1 U	1 U	5 U	14	1 U	1 U	1 U	6	1 U	1 U
	06/03/2019	1 U	1 U	1 U	1 U	1 U	3.7	1 U	1 U	1 U	5 U	13	1 U	1 U	1 U	5.9	1 U	1 U
SE-14	06/03/2019	1 U	1 U	1 U	1 U	1 U	16	1 U	1 U	1 U	5 U	1 U	1 U	1	1 U	5.2	1 U	1 U
	09/09/2019	1 U	1 U	1 U	1 U	1 U	16	1 U	1 U	1 U	5 U	1 U	1 U	1	1 U	5.4	1 U	1 U
	09/09/2019	1 U	1 U	1 U	1 U	1 U	16	1 U	1 U	1 U	5 U	1 U	1 U	1	1 U	5.3	1 U	1 U

Prepared By: DCW 01/07/20
Checked By: JAR 01/08/20

Notes:

U - not detected at detection limit shown

F1 -associated Matrix Spike and/or Matrix Spike Duplicate is outside acceptable limits

* - Lab control sample is outside acceptance limits

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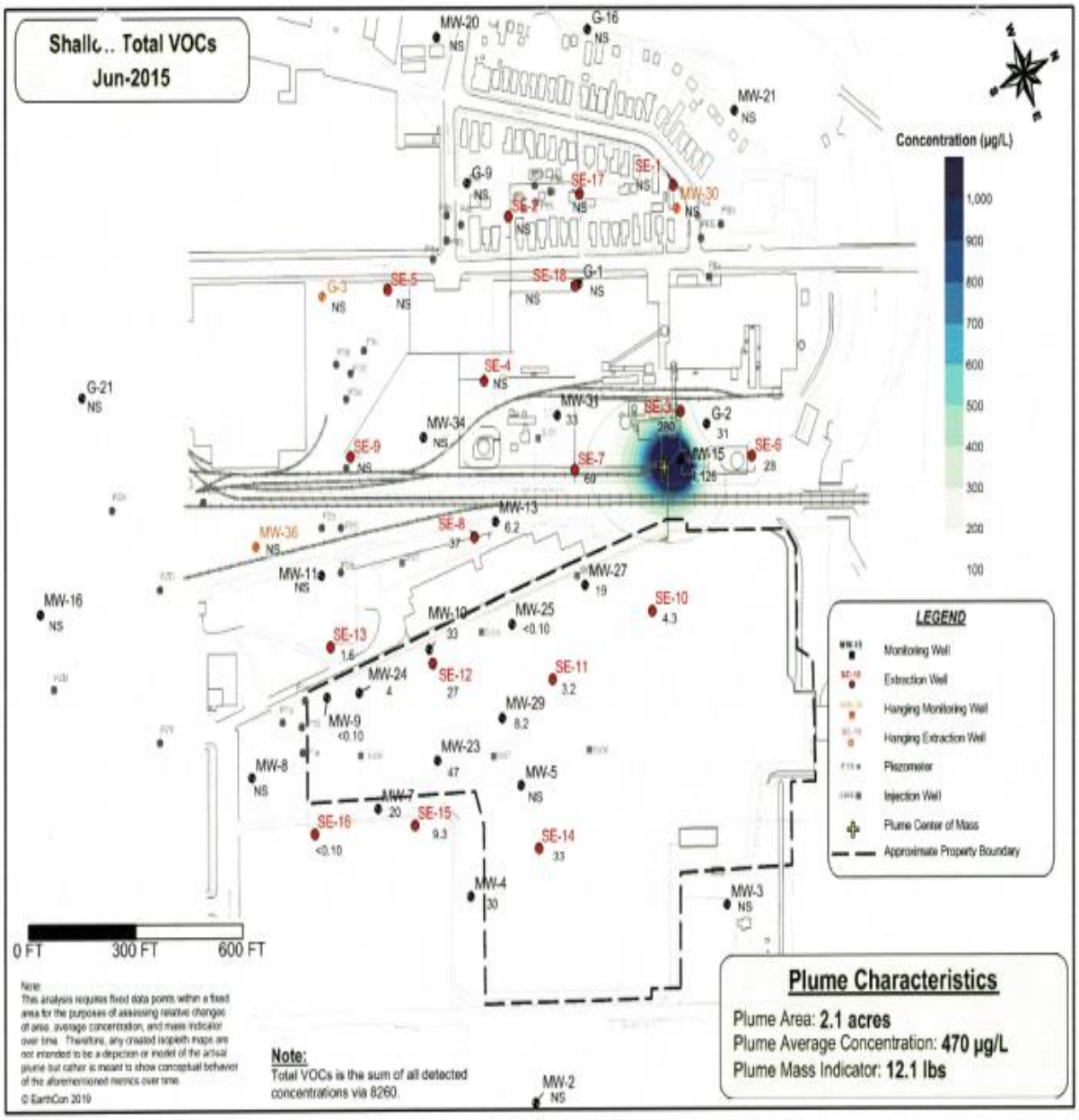

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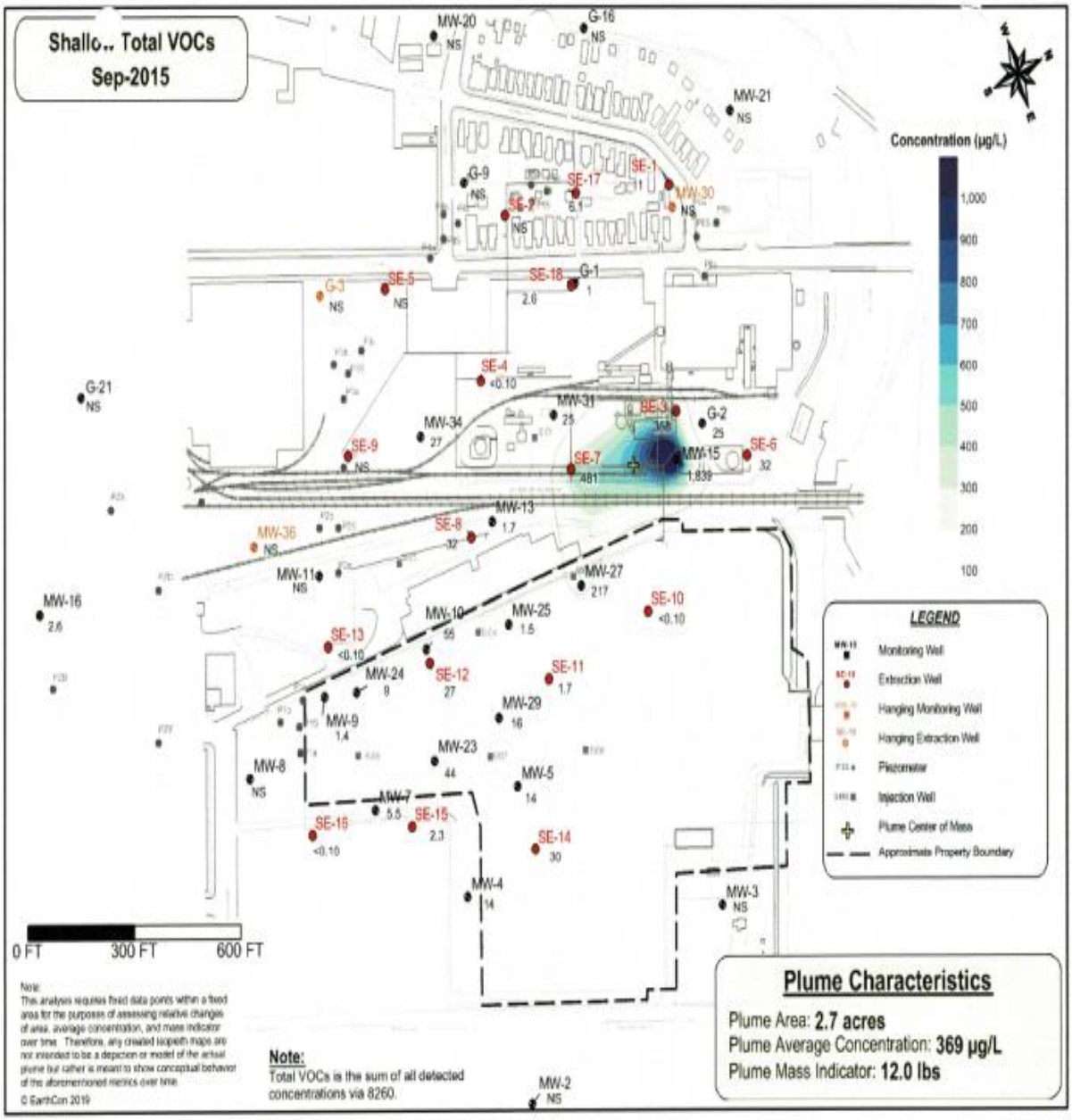

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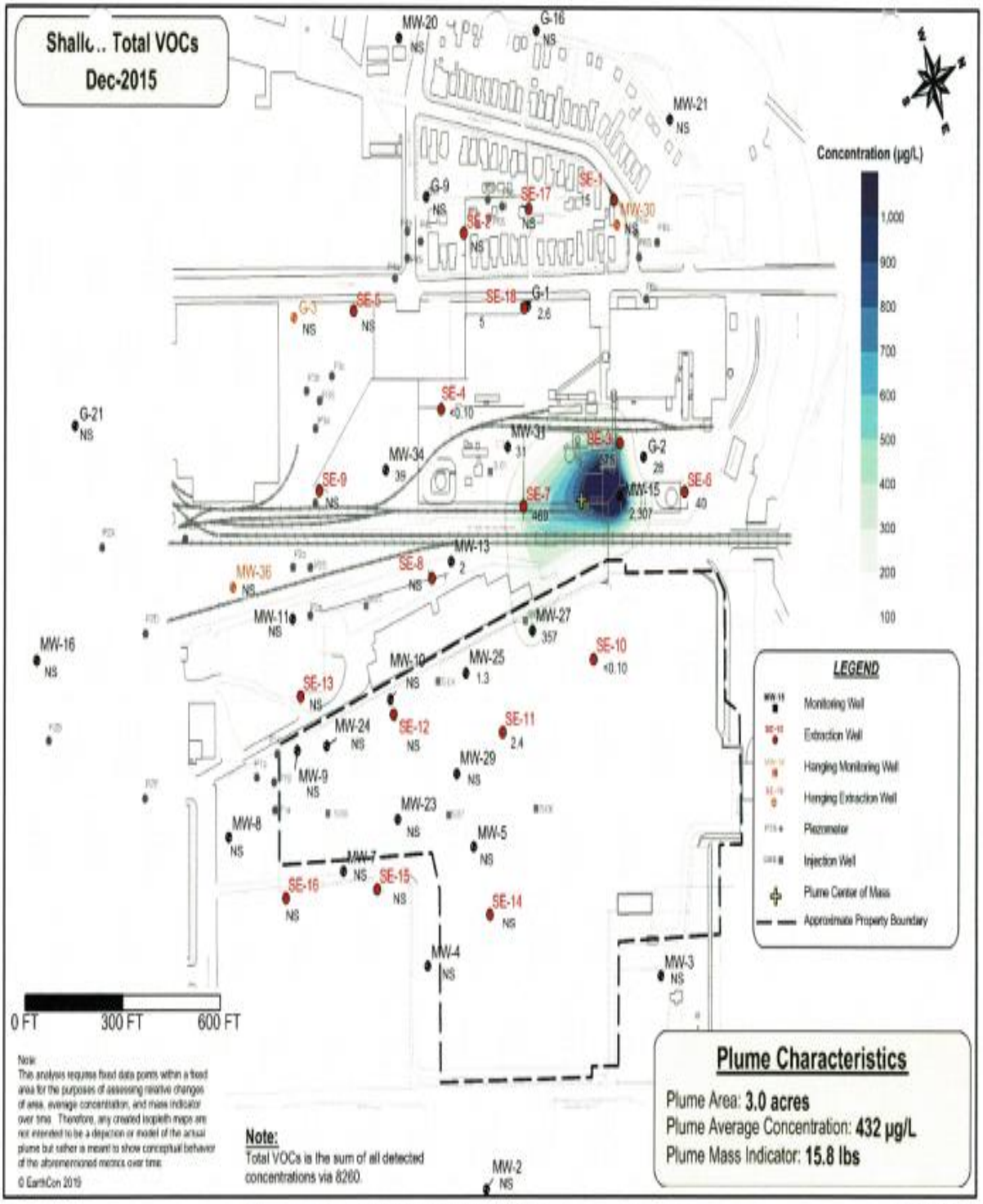

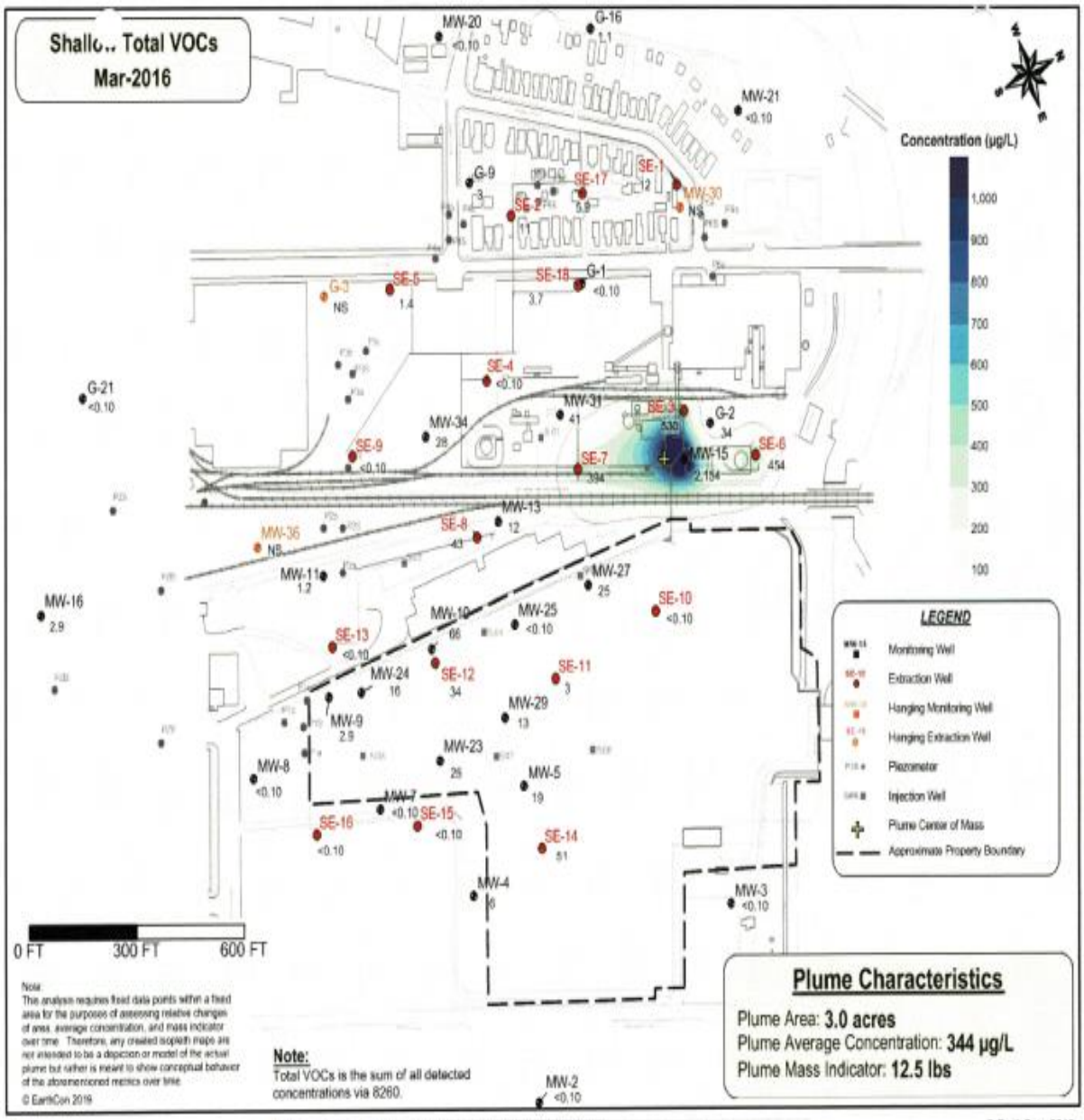

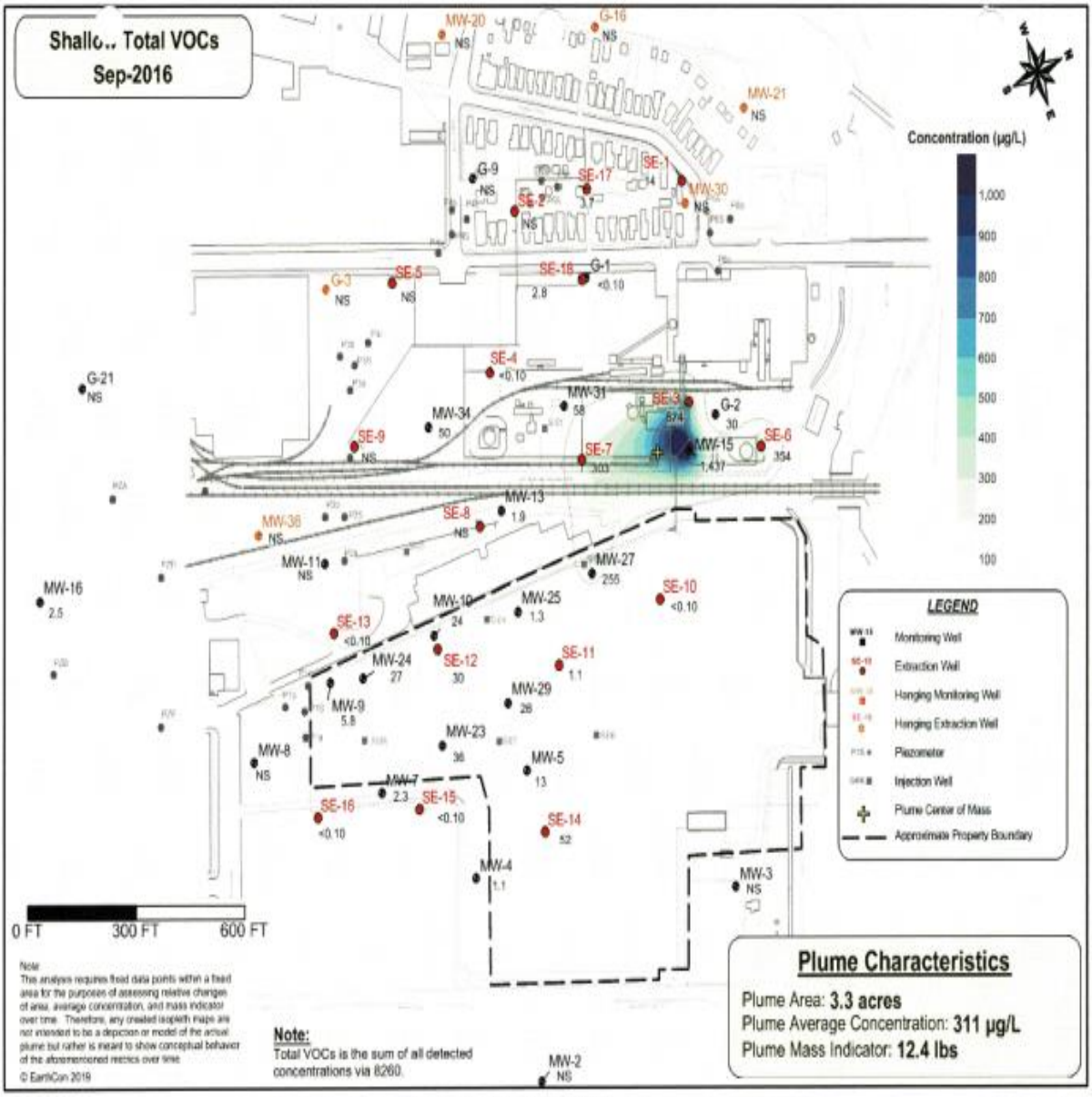

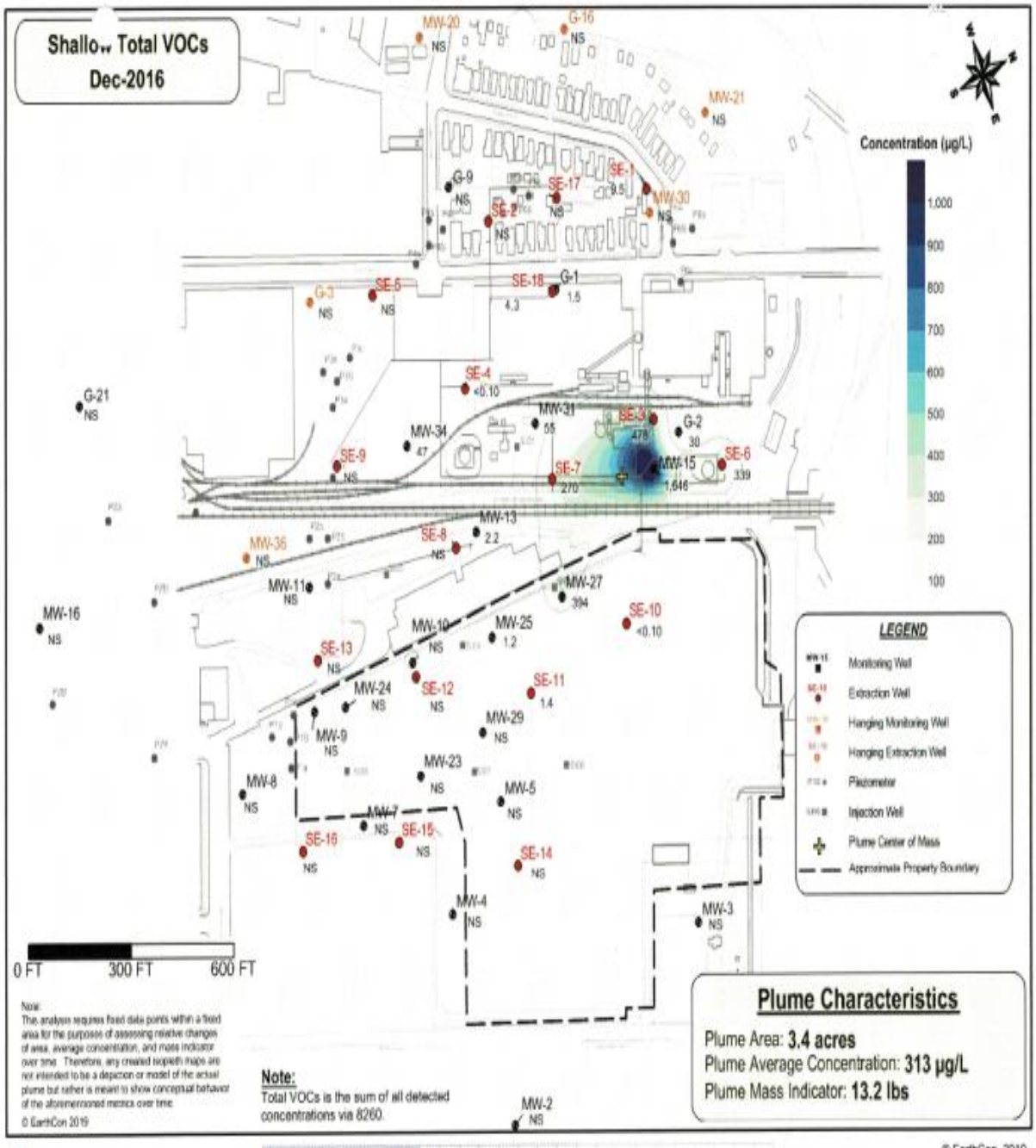

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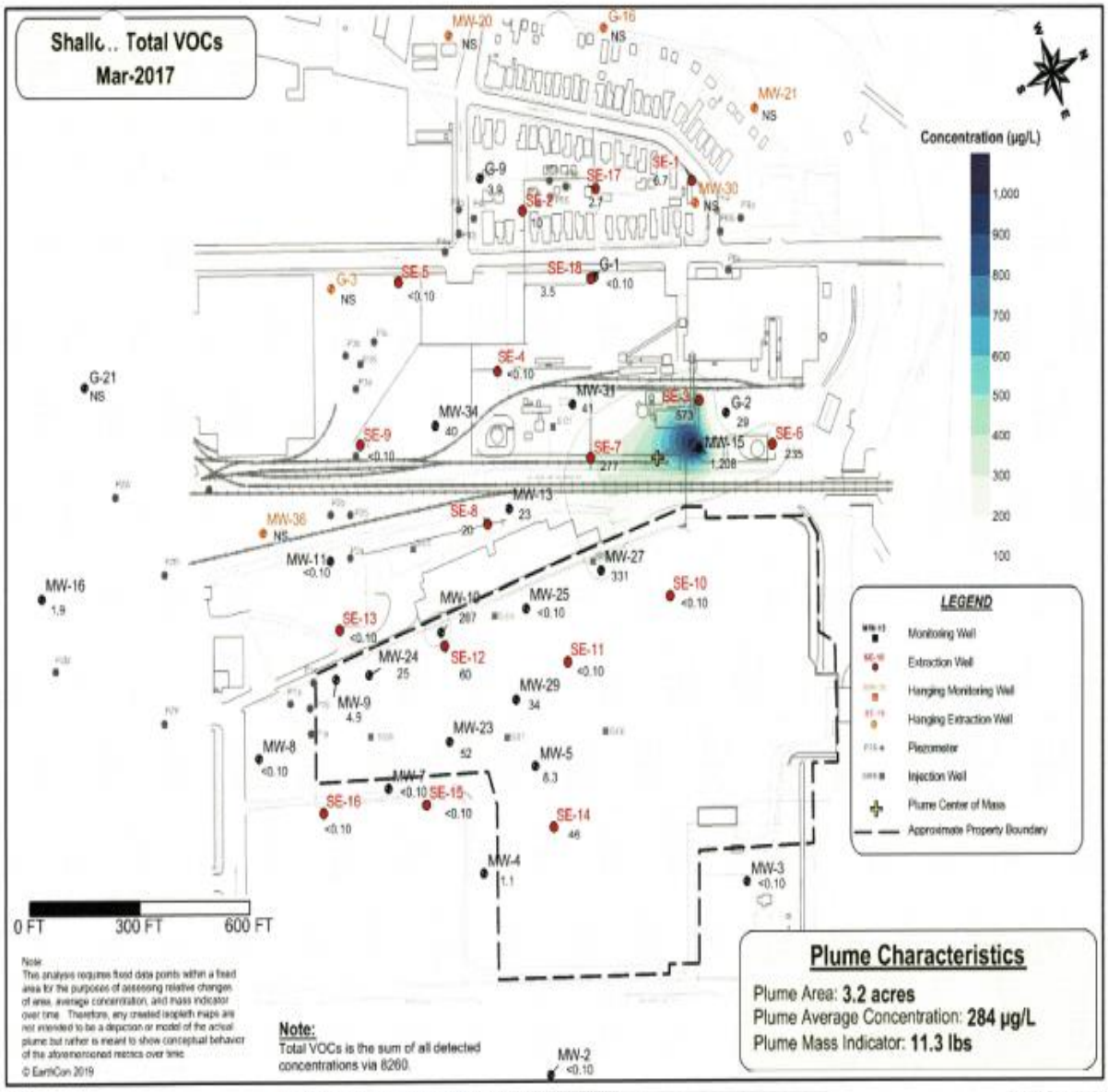

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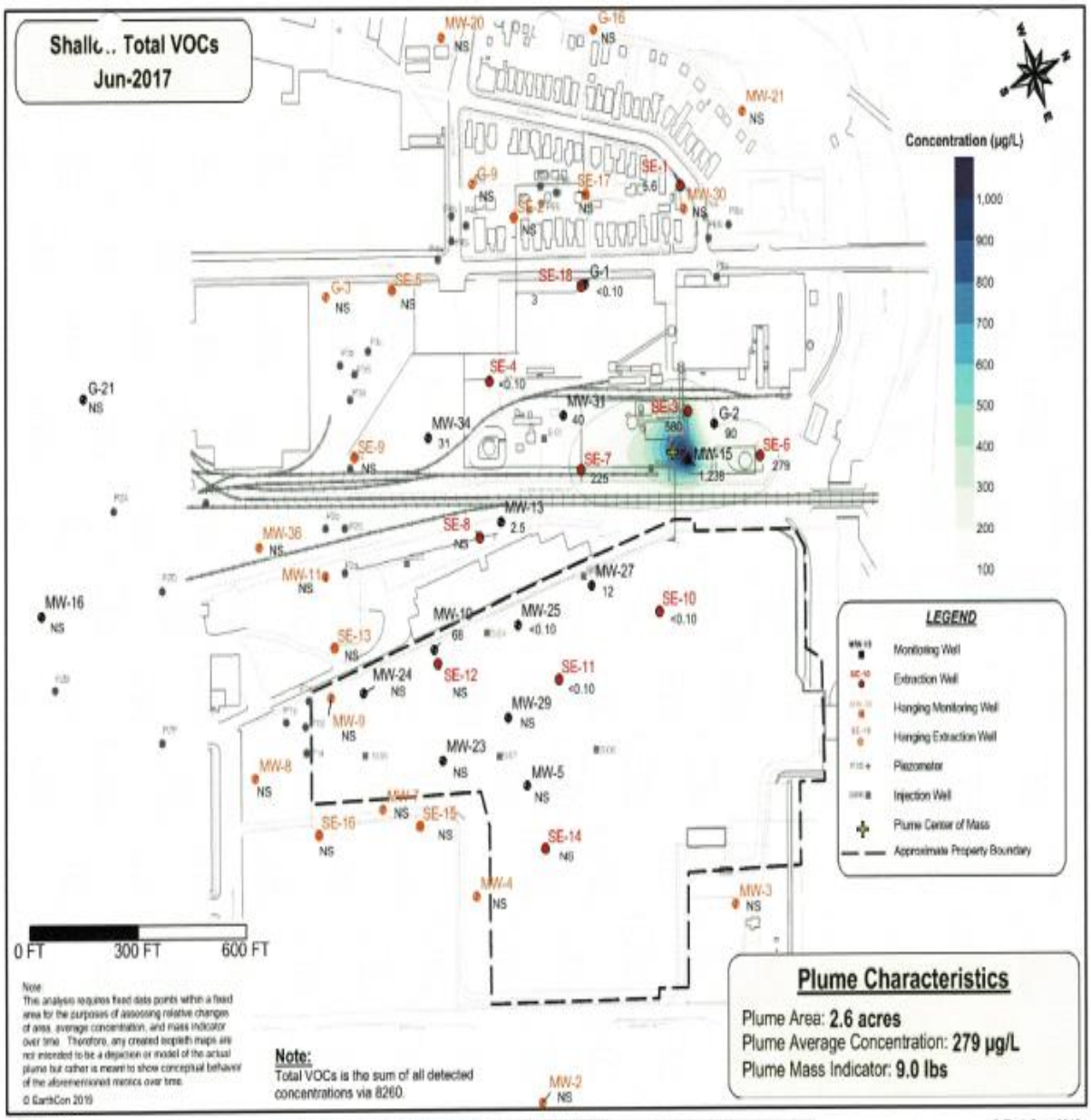
Shallo.. Total VOCs
Jun-2017
Concentration (µg/L)
1,000
900
800
700
600
500
400
300
200
100
LEGEND
Monitoring Well
Extraction Well
Hanging Monitoring Well
Hanging Extraction Well
Piezometer
Injection Well
Plume Center of Mass
Approximate Property Boundary
MW-20 NS
G-16 NS
MW-21 NS
G-9 NS
SE-17 NS
SE-1 5.6
MW-30 NS
SE-2 NS
G-3 NS
SE-5 NS
SE-18 3
G-1 <0.10
SE-4 <0.10
G-21 NS
MW-31 40
SE-3 580
G-2 90
MW-34 31
SE-9 NS
MW-15 1,238
SE-6 279
SE-7 225
MW-13 2.5
SE-8 NS
MW-36 NS
MW-11 NS
MW-27 12
SE-10 <0.10
MW-16 NS
MW-10 68
MW-25 <0.10
SE-13 NS
MW-24 NS
SE-12 NS
SE-11 <0.10
MW-29 NS
MW-9 NS
MW-23 NS
MW-8 NS
MW-5 NS
MW-7 NS
SE-15 NS
SE-16 NS
SE-14 NS
MW-4 NS
MW-3 NS
MW-2 NS
0 FT
300 FT
600 FT
Note
This analysis requires fixed data points within a fixed area for the purposes of assessing relative changes of area, average concentration, and mass indicator over time. Therefore, any created isopleth maps are not intended to be a depiction or model of the actual plume but rather is meant to show conceptual behavior of the aforementioned metrics over time.
© EarthCon 2019
Note:
Total VOCs is the sum of all detected concentrations via 8260.
Plume Characteristics
Plume Area: 2.6 acres
Plume Average Concentration: 279 µg/L
Plume Mass Indicator: 9.0 lbs
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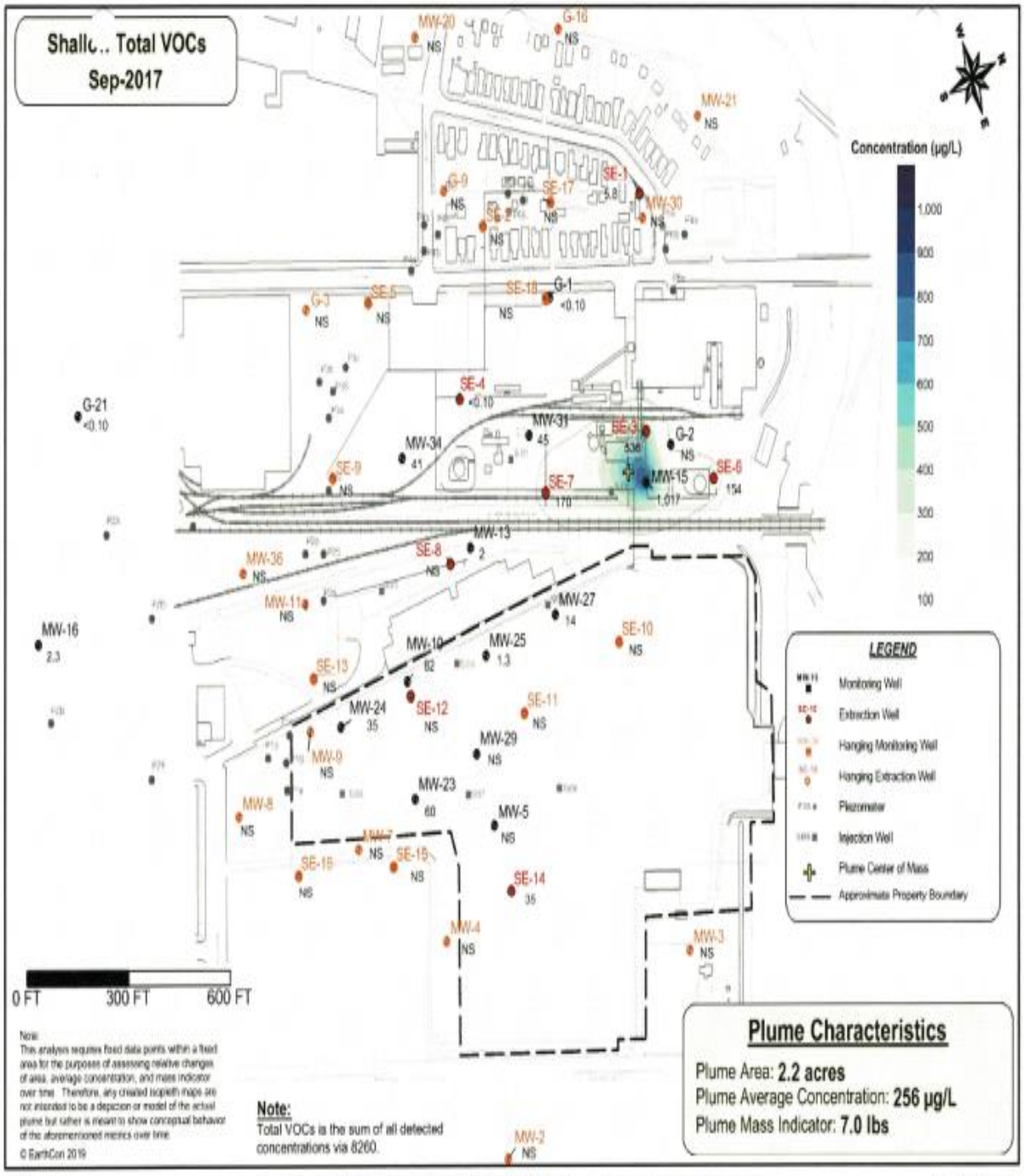

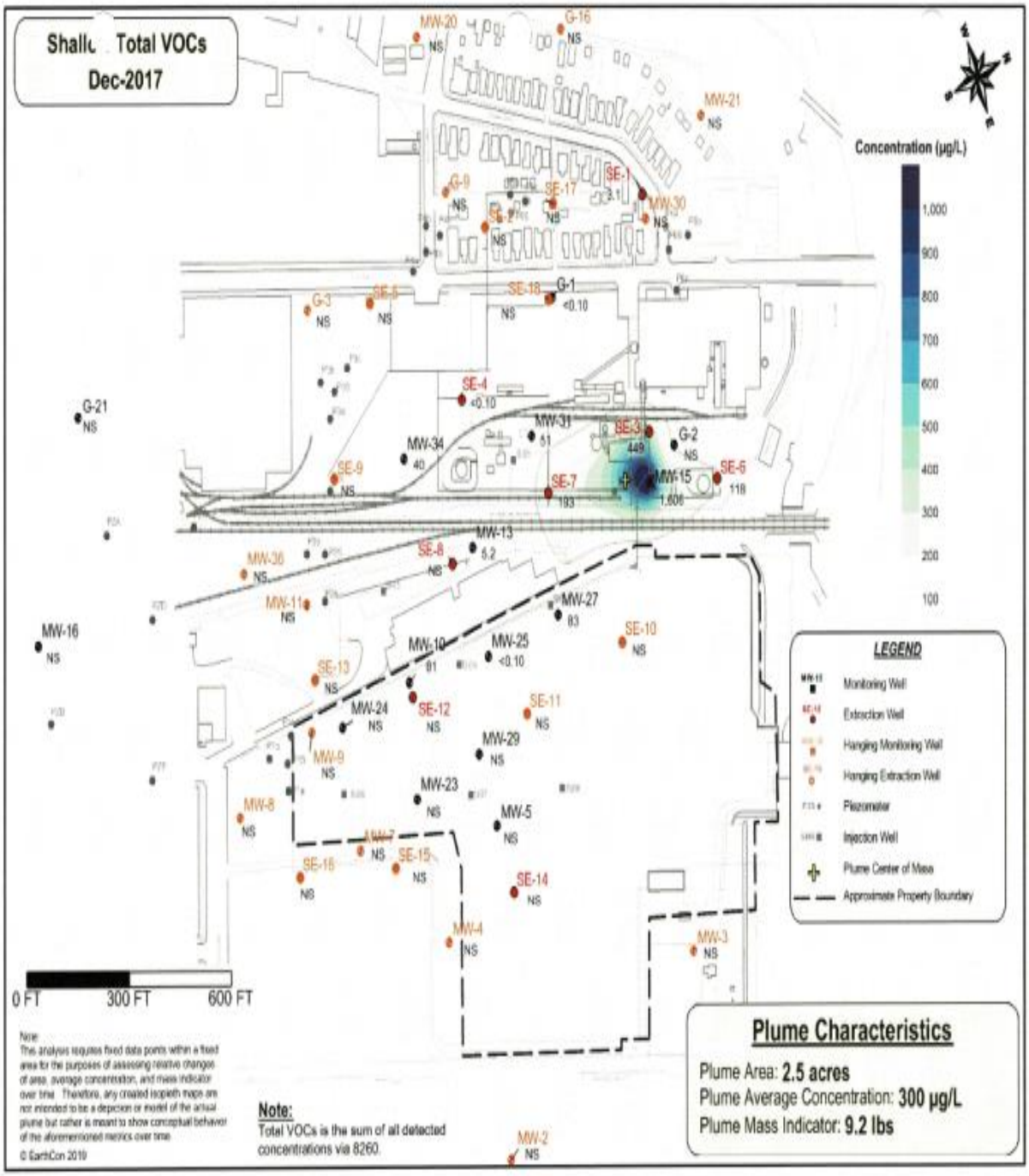

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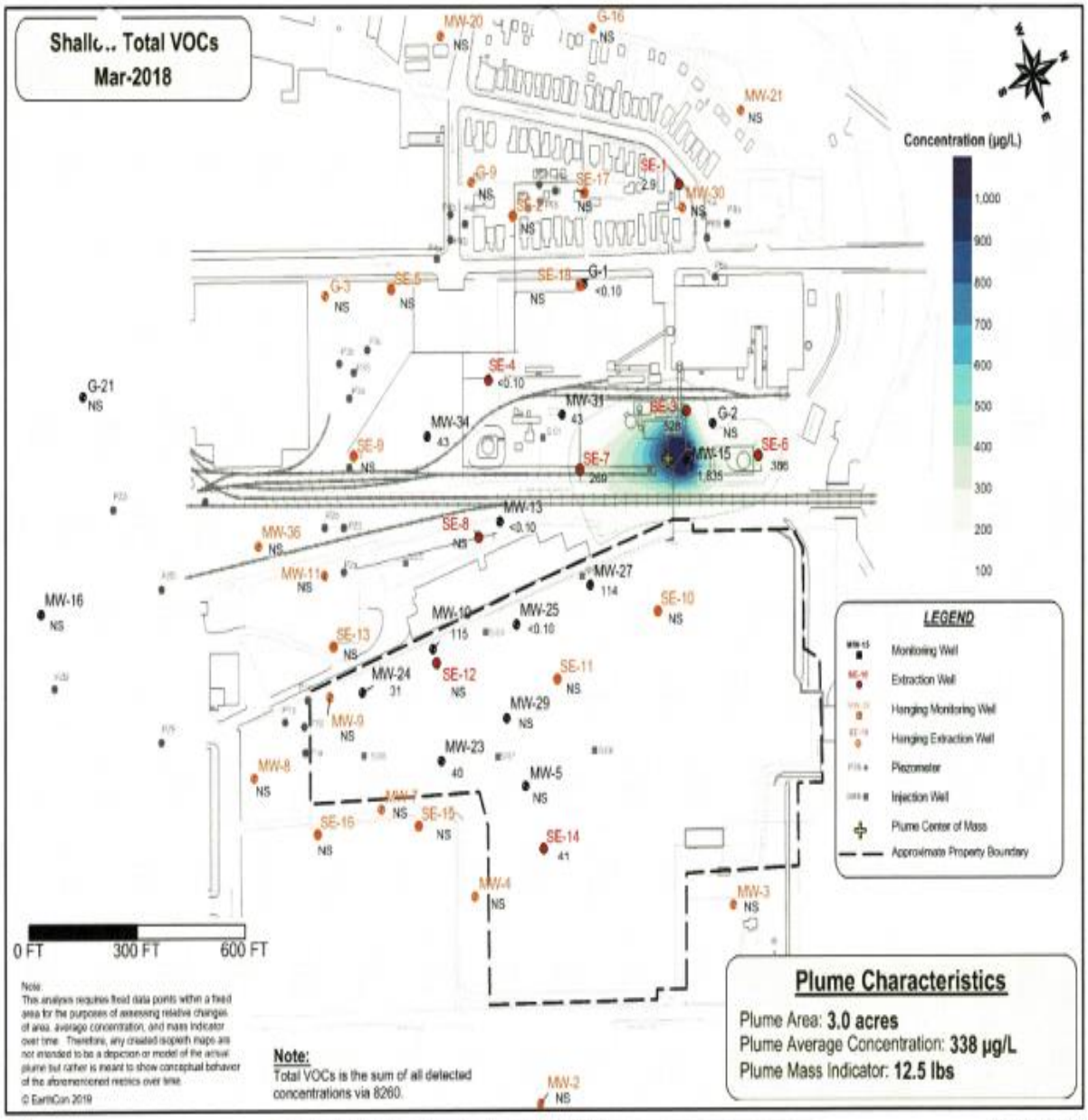

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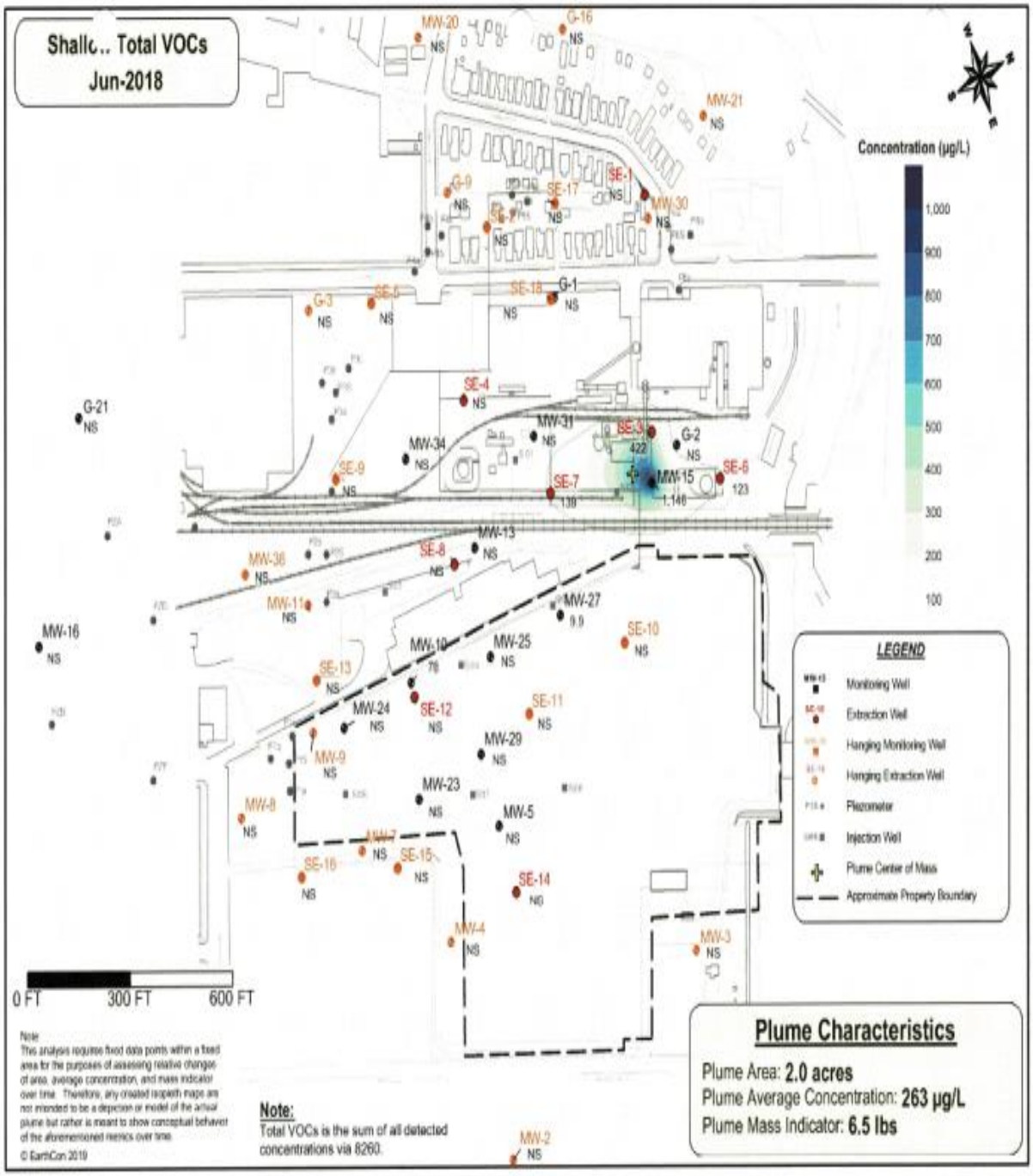

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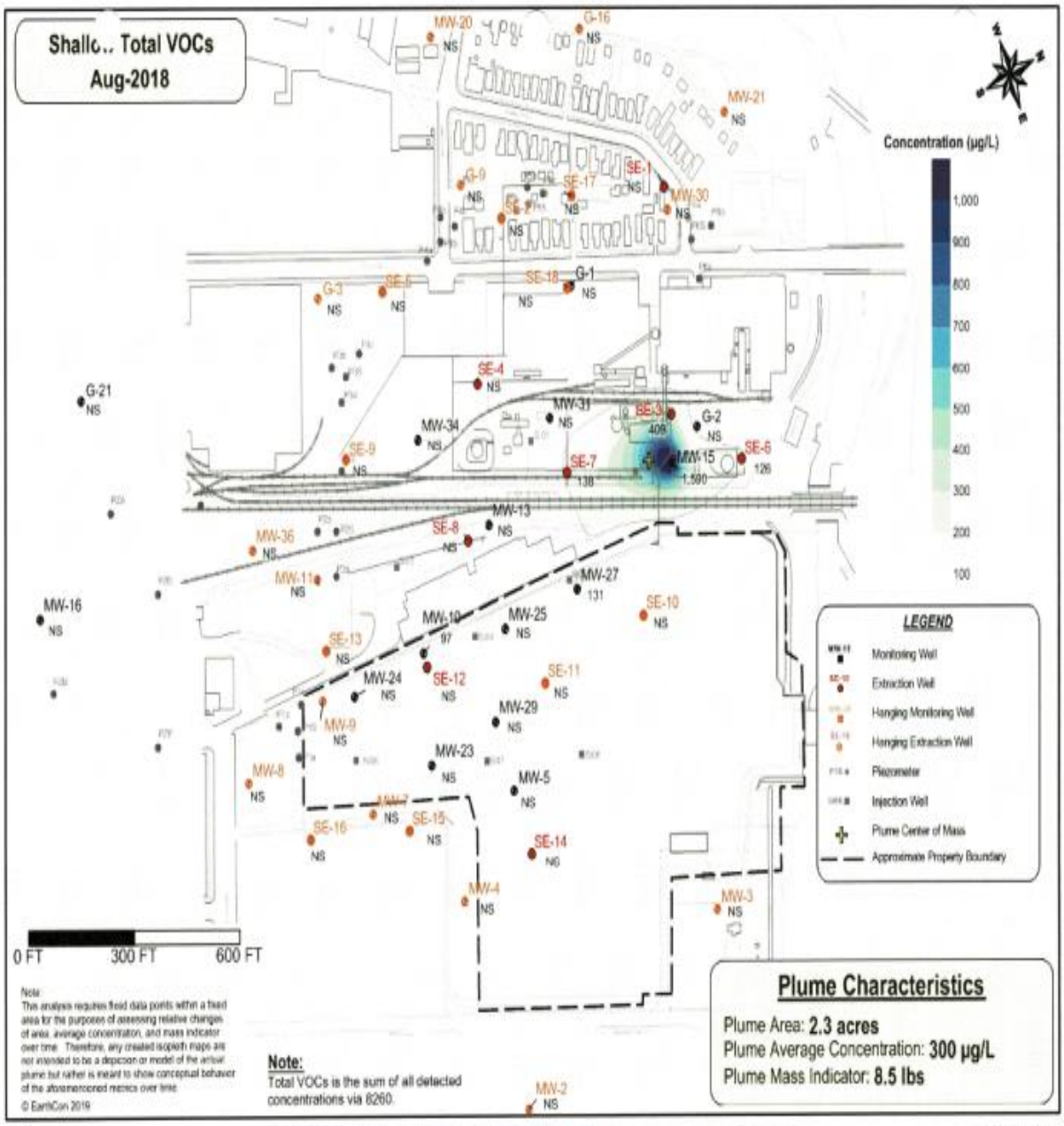

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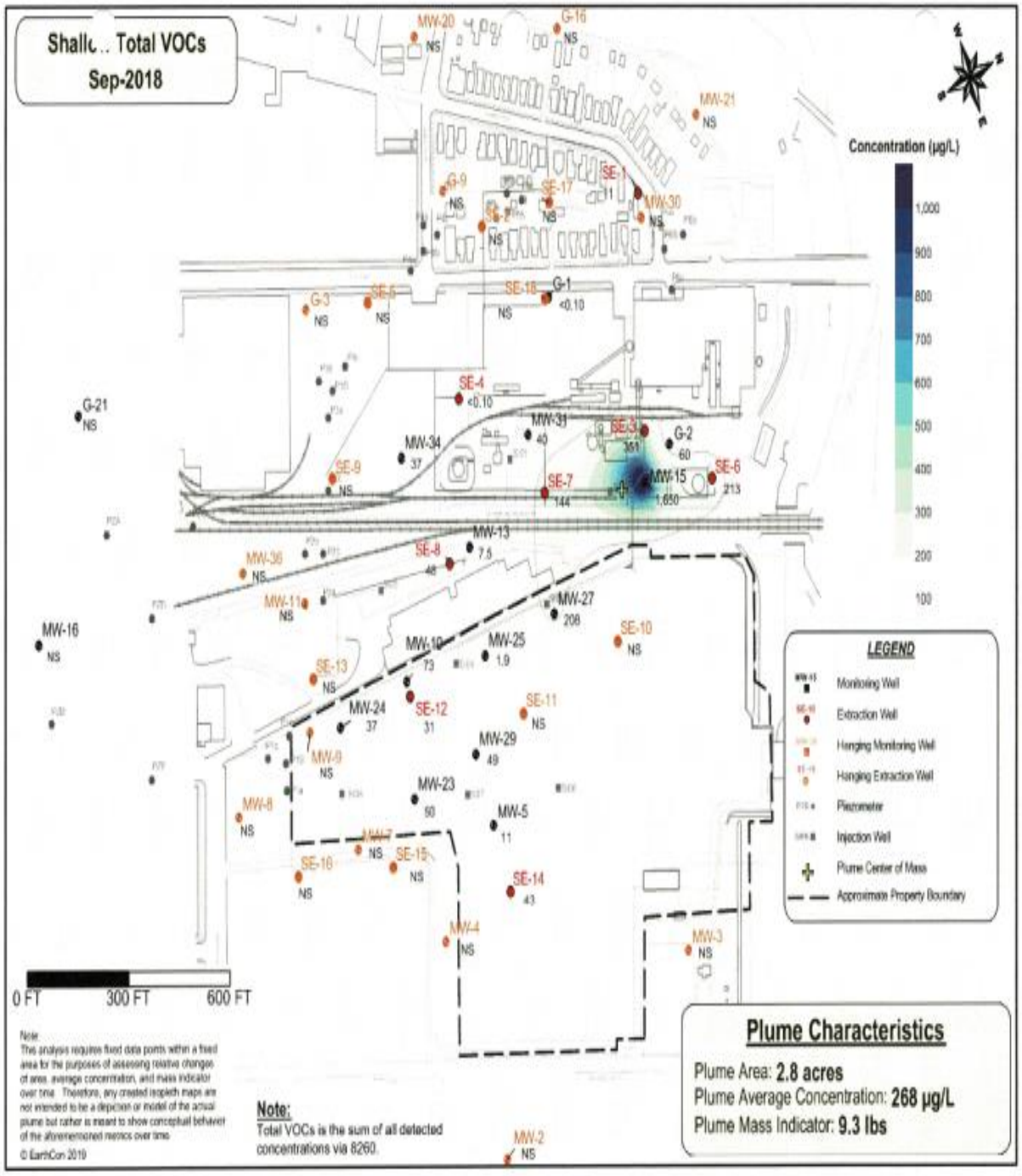

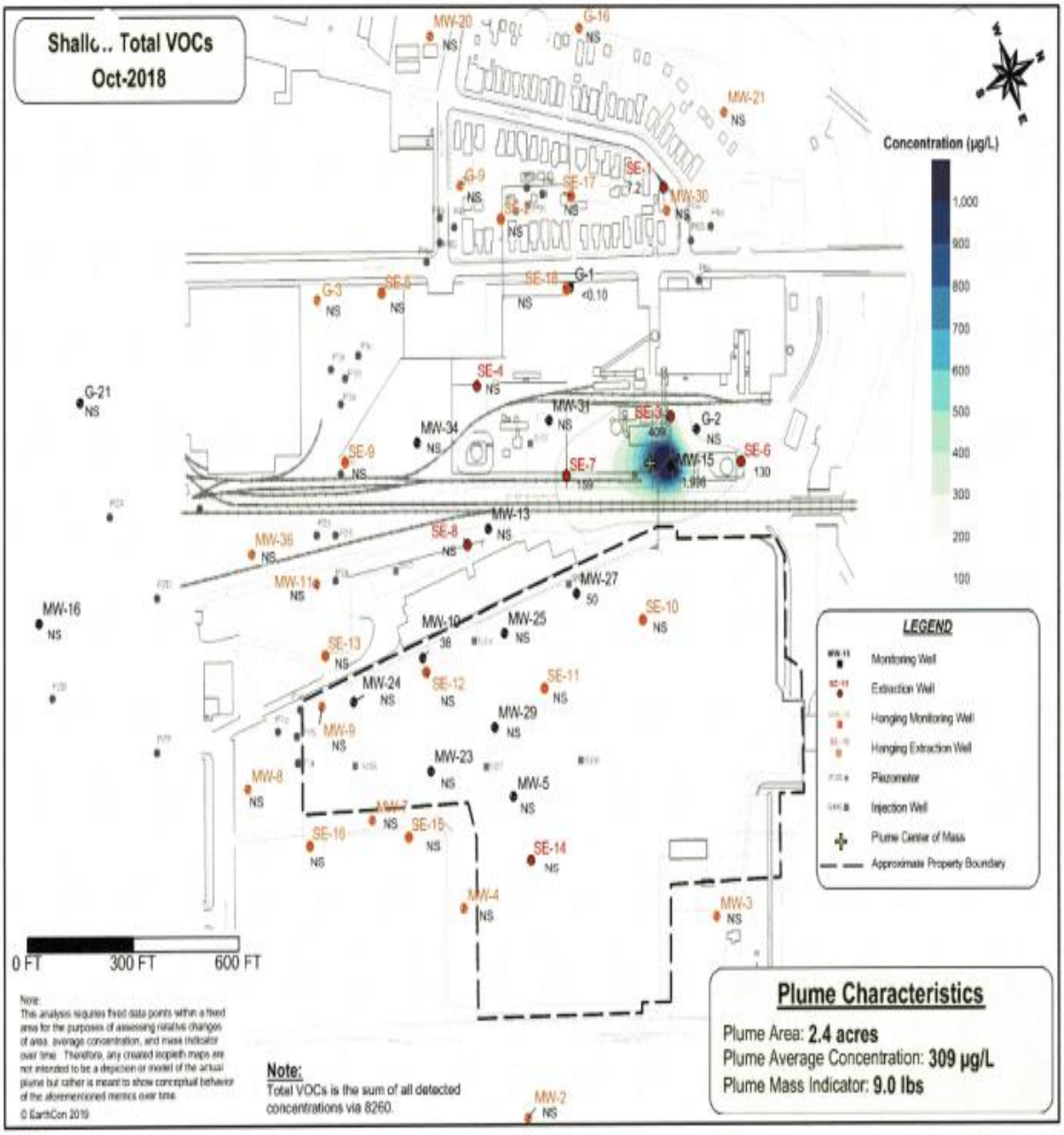

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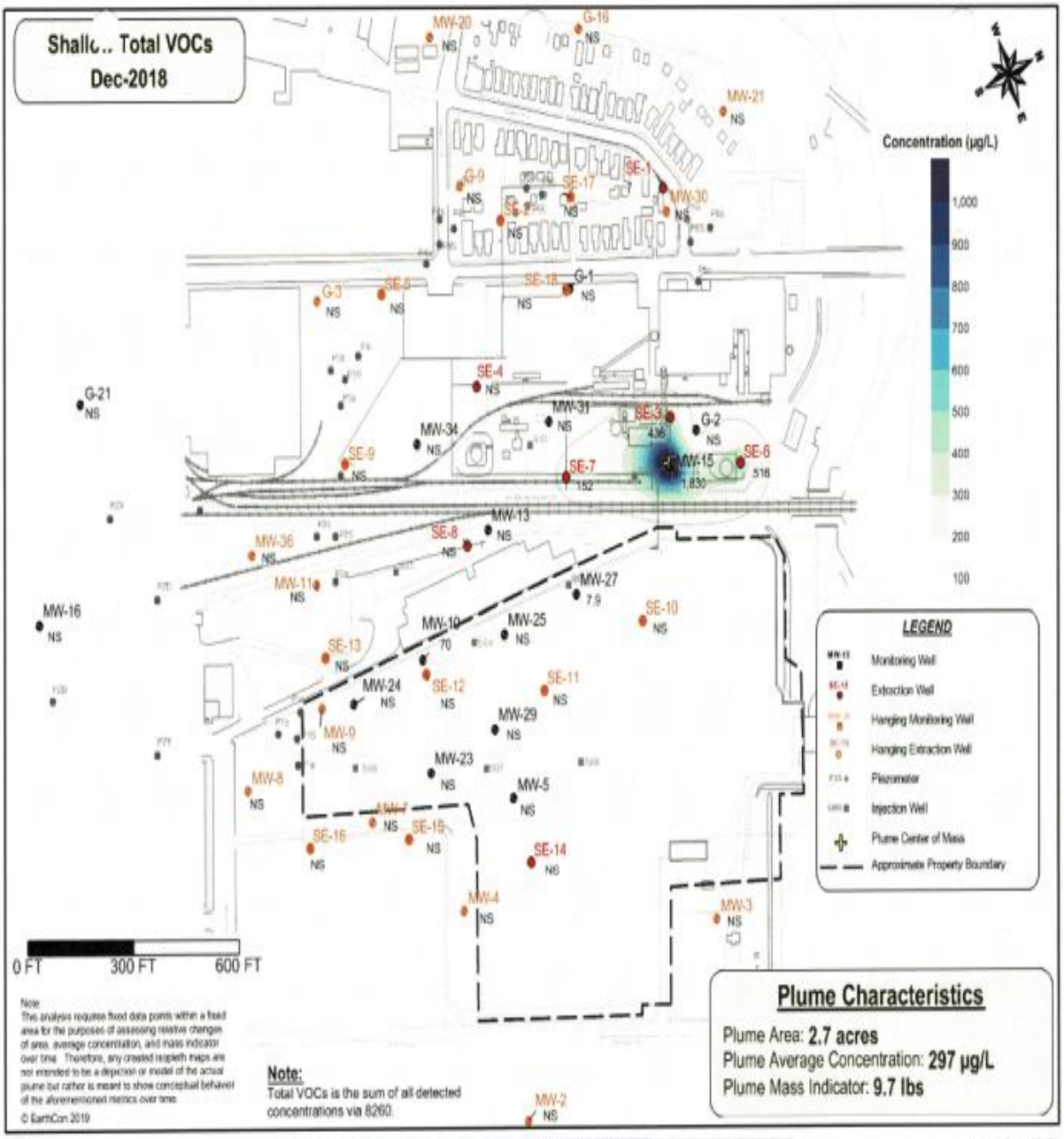

22

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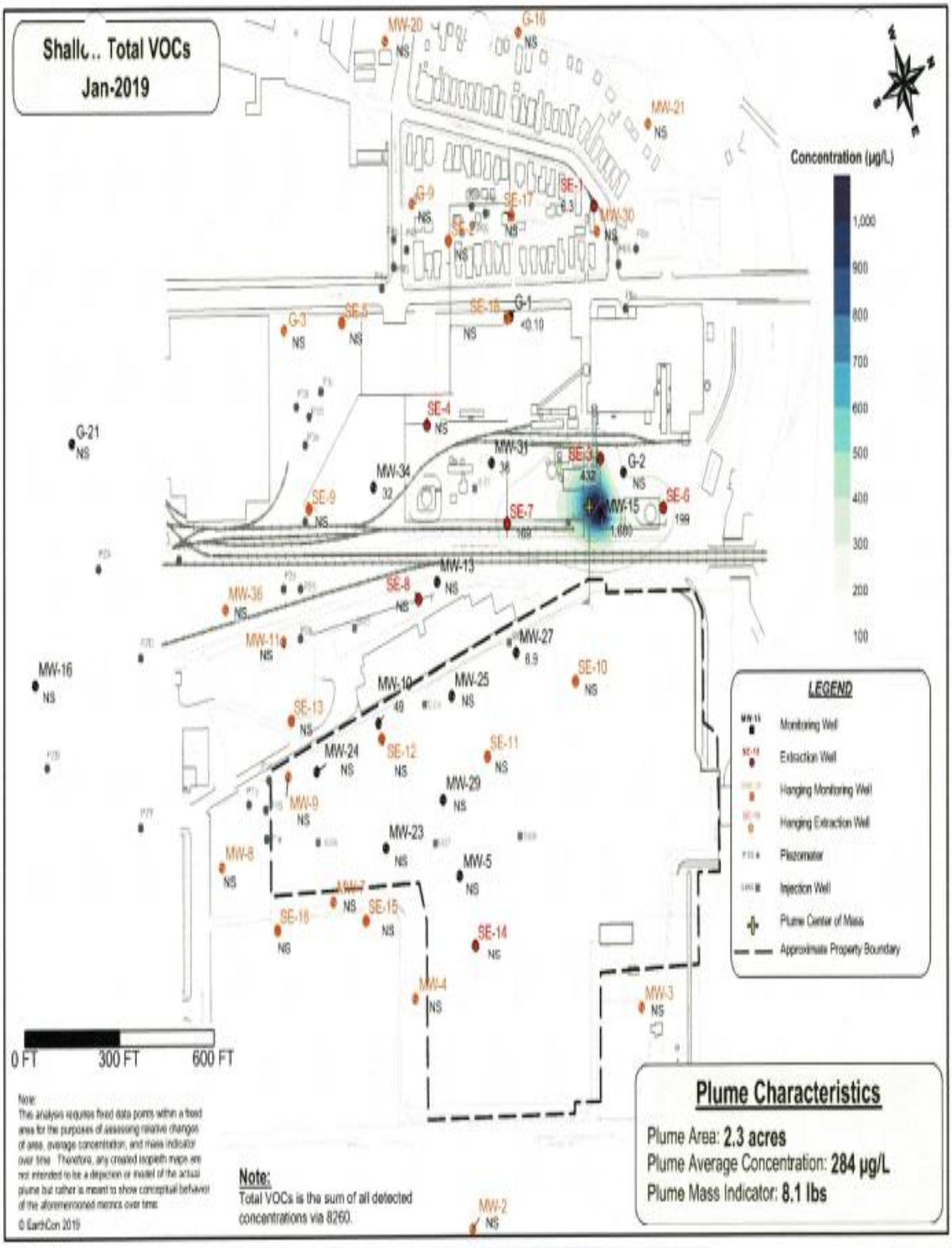

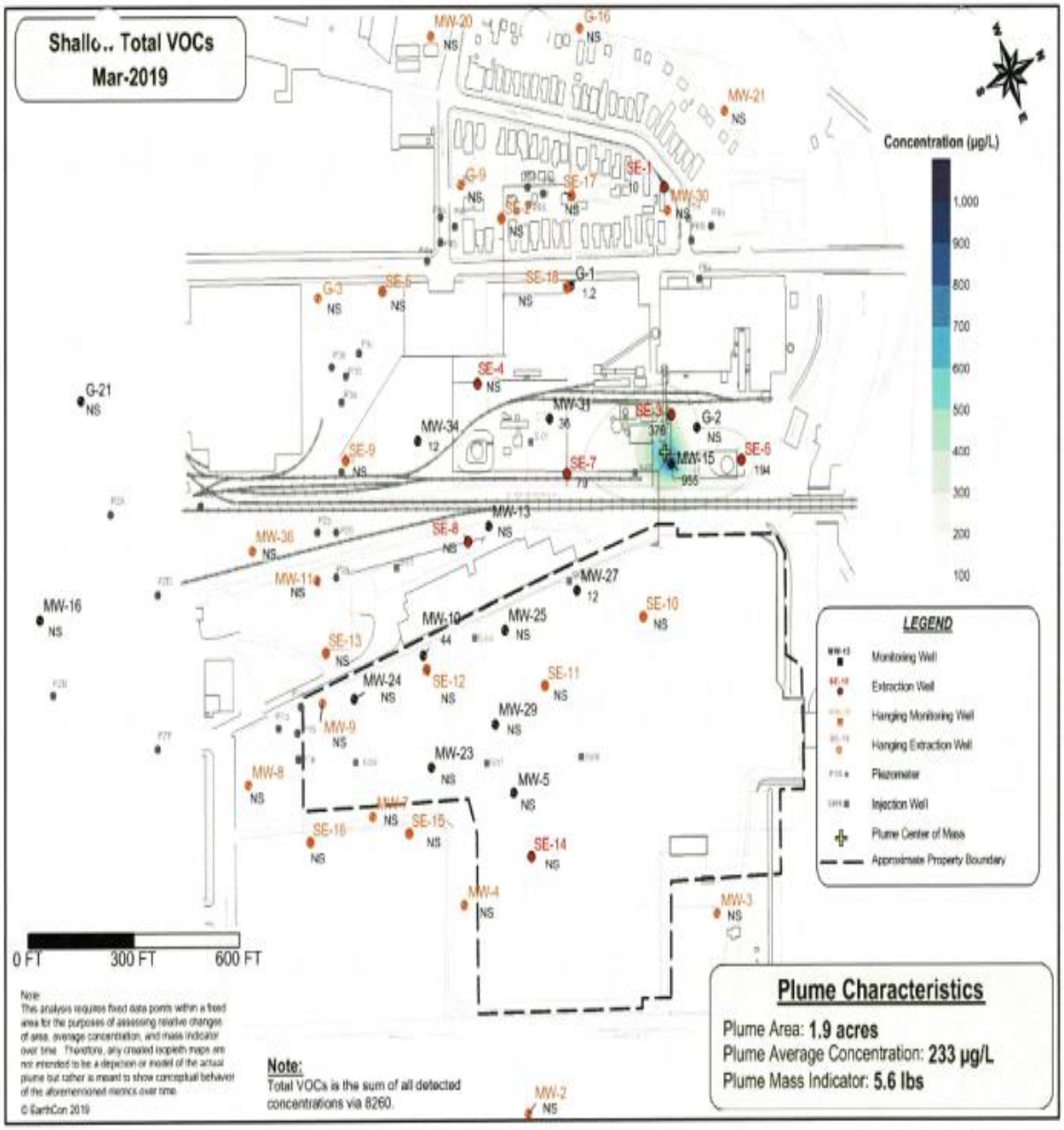

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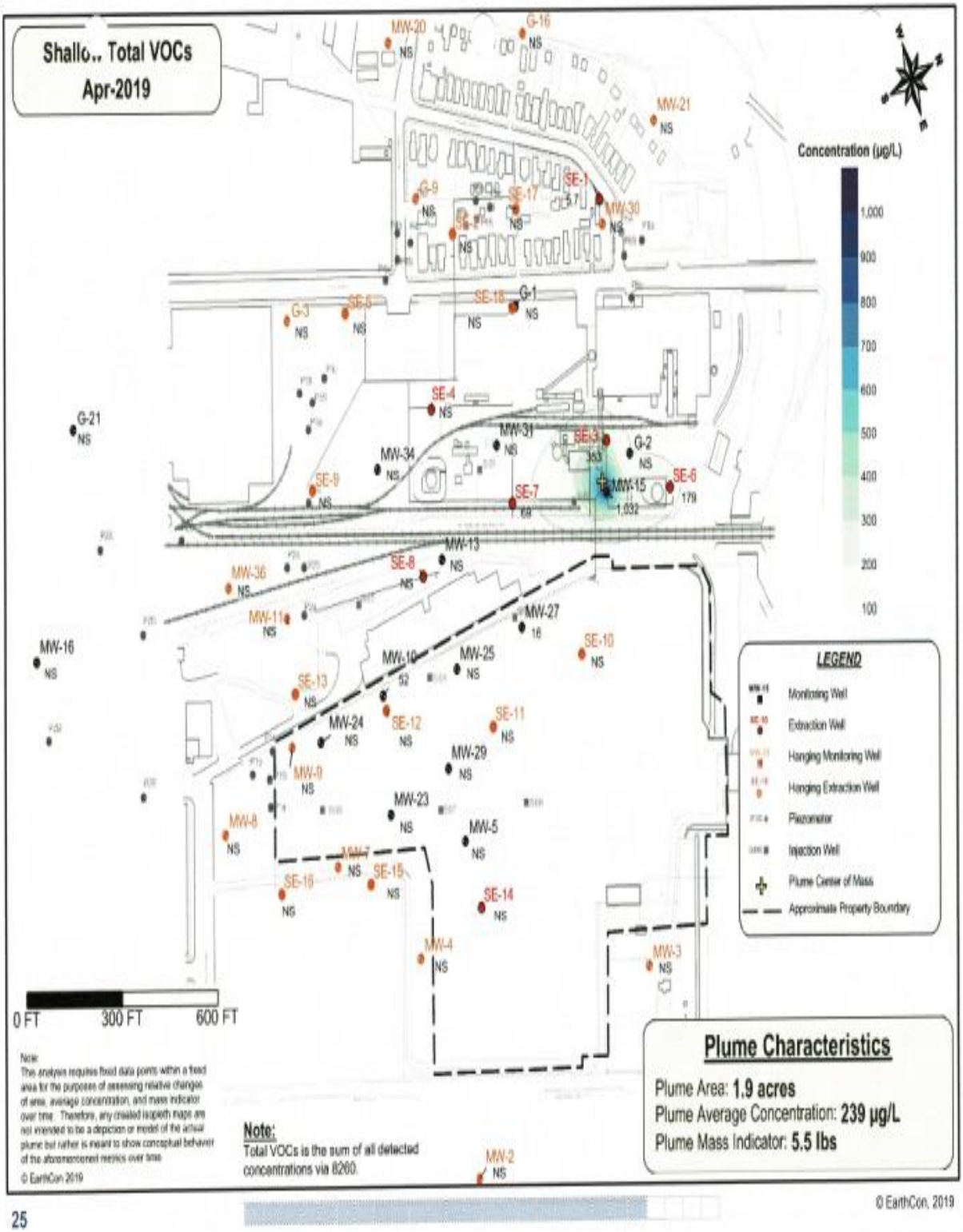
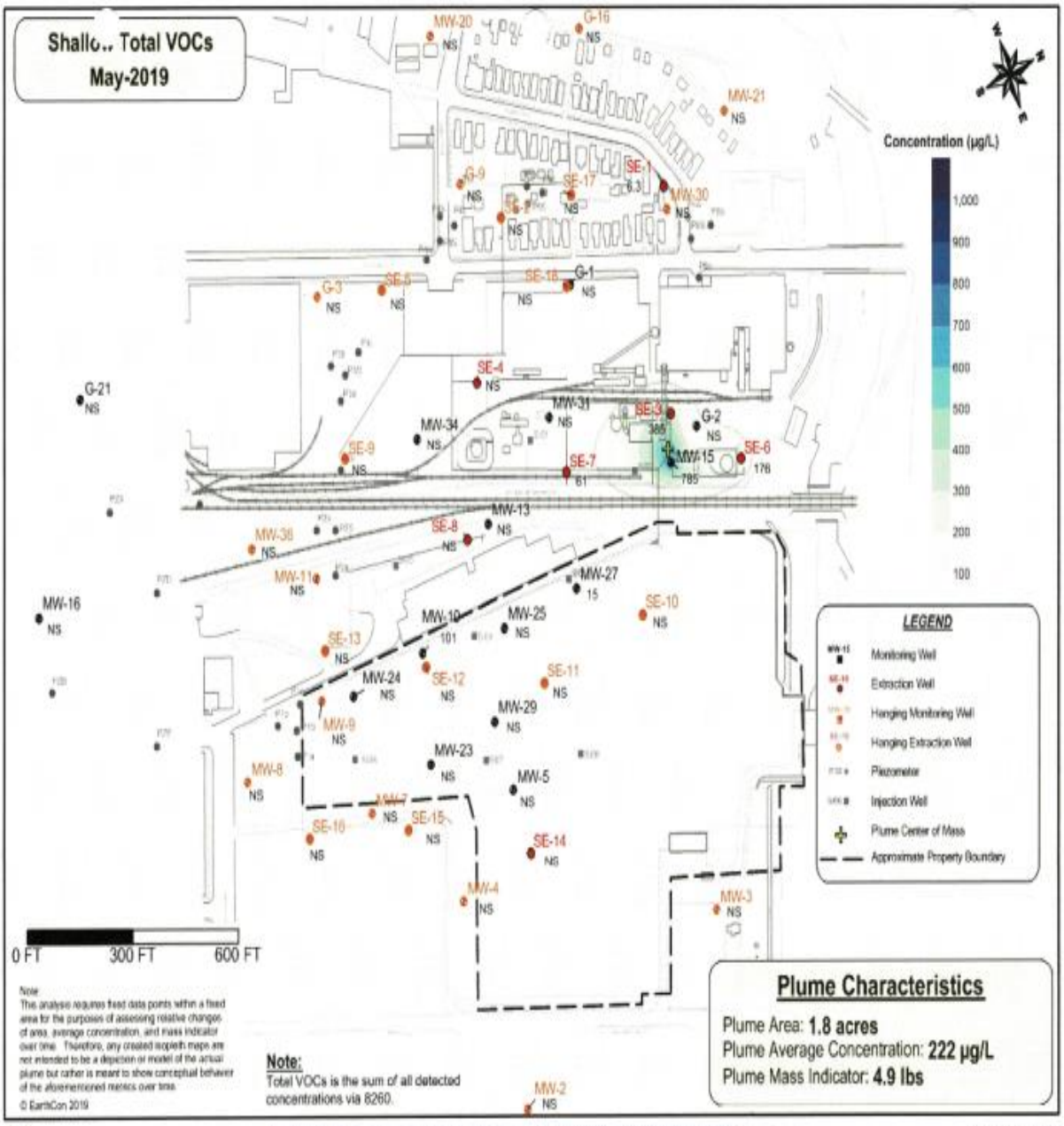

Shallo.. Total VOCs
Apr-2019
Concentration (µg/L)
1,000
900
800
700
600
500
400
300
200
100
LEGEND
Monitoring Well
Extraction Well
Hanging Monitoring Well
Hanging Extraction Well
Piezometer
Injection Well
Plume Center of Mass
Approximate Property Boundary
0 FT
300 FT
600 FT
Note:
Total VOCs is the sum of all detected concentrations via 8260.
Plume Characteristics
Plume Area: 1.9 acres
Plume Average Concentration: 239 µg/L
Plume Mass Indicator: 5.5 lbs
© EarthCon 2019


Shallo.. Total VOCs
May-2019
Concentration (µg/L)
1,000
900
800
700
600
500
400
300
200
100
LEGEND
Monitoring Well
Extraction Well
Hanging Monitoring Well
Hanging Extraction Well
Piezometer
Injection Well
Plume Center of Mass
Approximate Property Boundary
0 FT
300 FT
600 FT
Note:
Total VOCs is the sum of all detected concentrations via 8260.
Plume Characteristics
Plume Area: 1.8 acres
Plume Average Concentration: 222 µg/L
Plume Mass Indicator: 4.9 lbs
© EarthCon 2019

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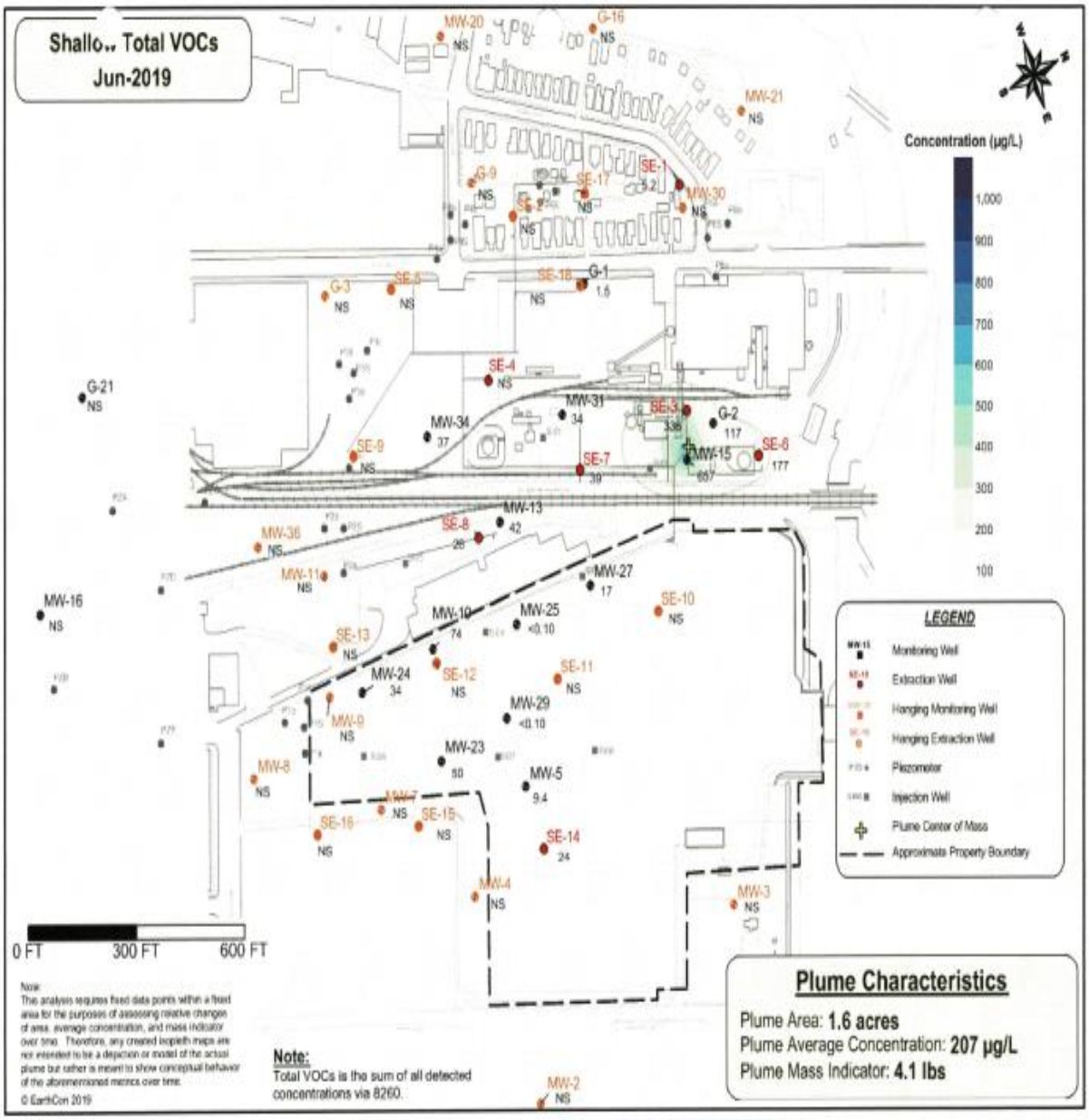

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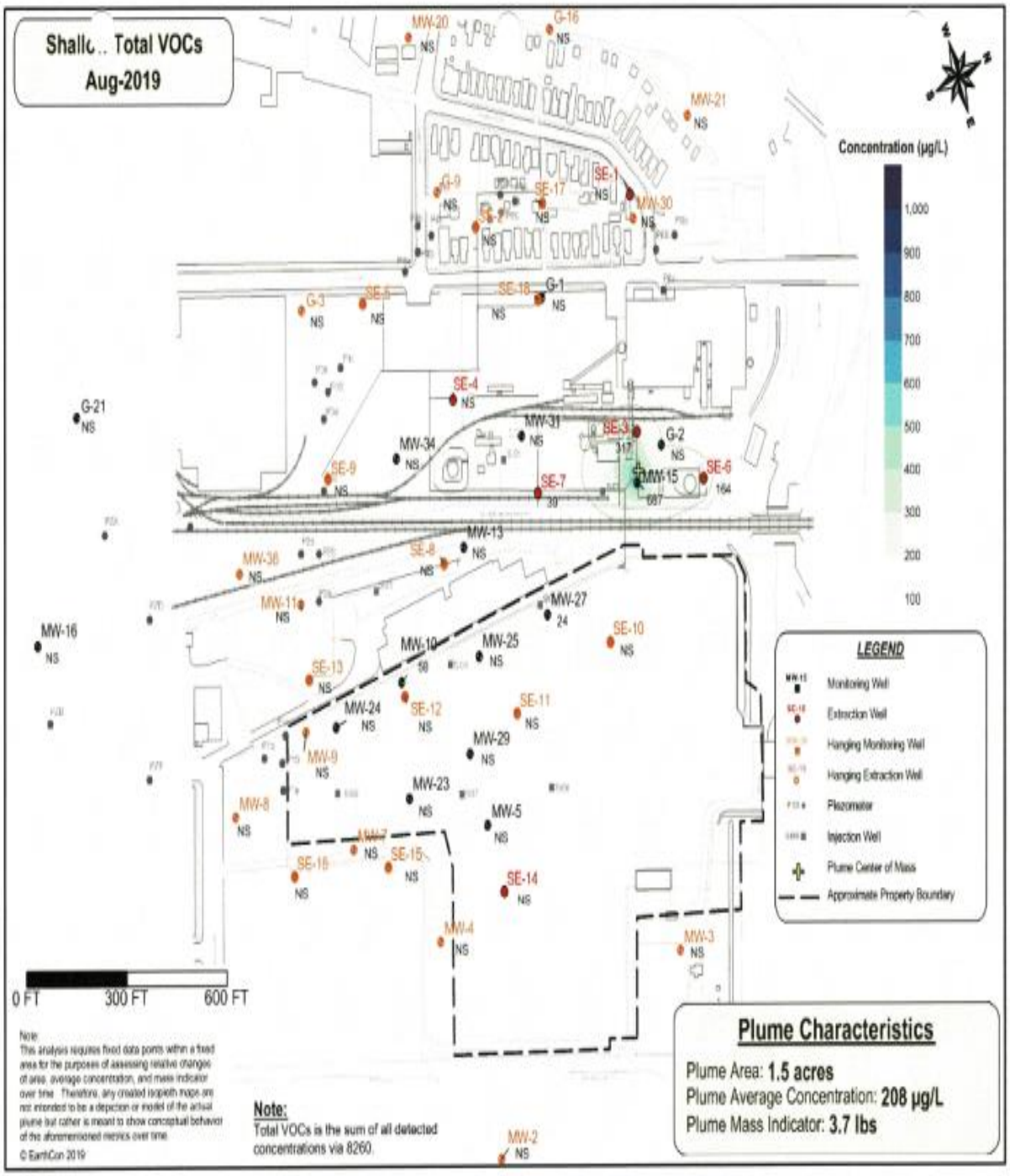

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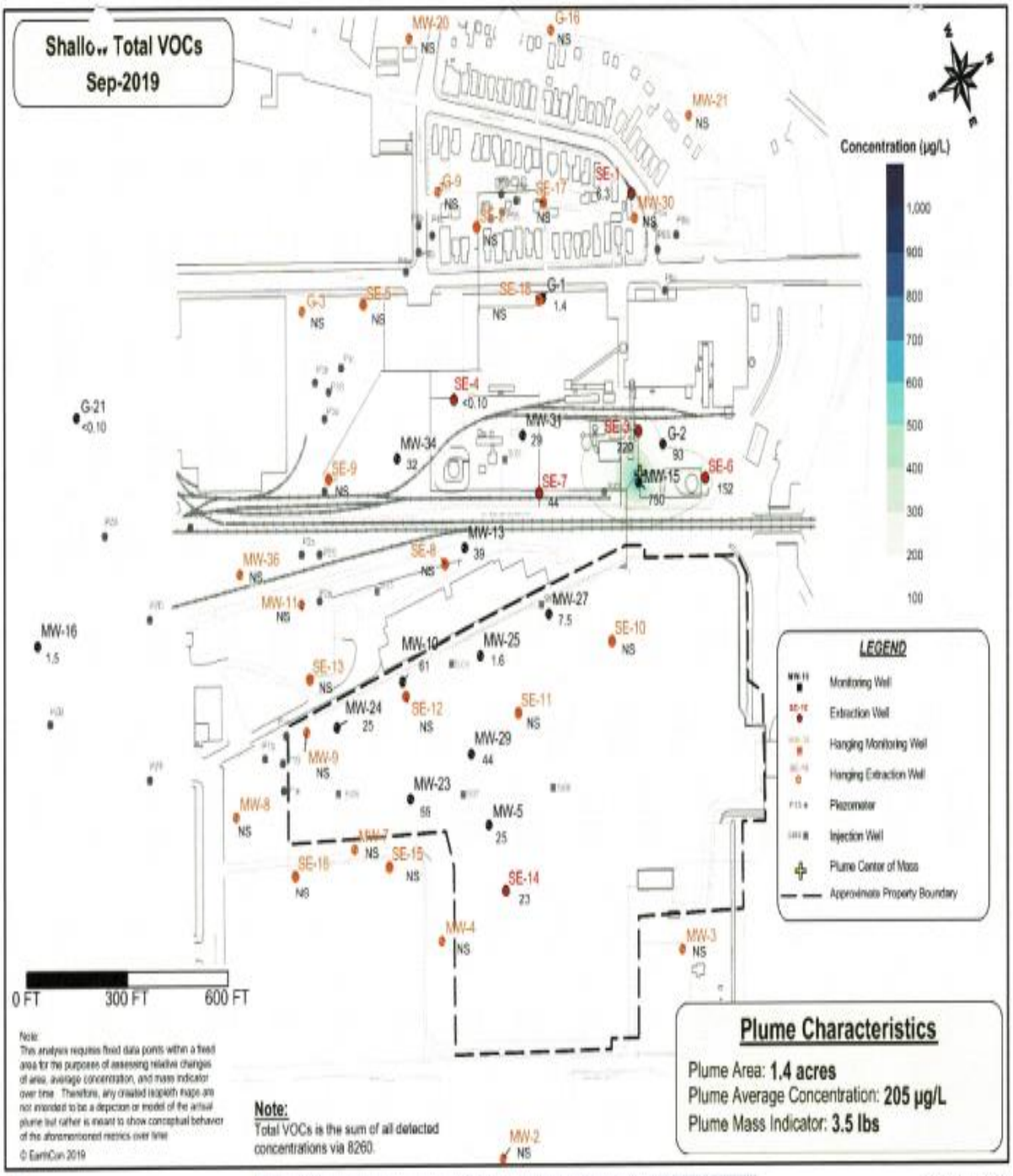

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APPENDIX F

NOTICE TO THE PUBLIC

CORONAVIRUS: THE LATEST

BUTLER COUNTY

Company furloughs 80 Butler County employees

By Eric Schwartzberg and Michael E. Kanell
Staff Writers

A company is furloughing more than 80 employees at its Butler County location next week because of "the unforeseeable COVID-19 pandemic and its resulting economic impact" to its industry and its businesses.

Cox Automotive's facility at 4969 Muhlhauser Road will furlough the employees "on or about May 17," according to a letter sent from Constance Walters, assistant general counsel, employment, to the Ohio Department of Job and Family Service's Rapid Response Unit.

"We don't know that any of these furloughs will be permanent, but it is possible that presently unforeseeable circumstances may cause us to revise our outlook," Walters said in the letter, received today by ODJFS.

Furloughed employees will remain eligible for benefits and Cox Automotive has committed to paying the employee portion of medical, dental, vision, life insurance and long-term disability benefits for those employees previously enrolled in coverage.

The company anticipates the furlough may last up to 16 weeks.

"We are hopeful that the COVID-19 pandemic will improve in the very near future, that current economic conditions will change, and that we will be able to have employees return to work as soon as possible," Walters said. "However, as we cannot predict how long the COVID-19 situation will last, its public health impact, and its effects upon our operations and business, we cannot rule out that furloughs could be longer than initially anticipated."

Cox Automotive is an Atlanta-based business unit of Cox Enterprises, formed in 2014 to consolidate all of Cox's global automotive businesses, including Kelley Blue Book, Xtime, Autotrader.com and Manheim. Cox Enterprises also owns the Journal-News, Dayton Daily News and Springfield News-Sun.

Walters said Cox Automotive was unable to provide notice earlier to ODJFS because the extent of the public health impact of the COVID-19 pandemic and natural disaster/physical calamity, as well as the effects of the resulting, dramatic downturn in business, were "sudden, unforeseeable, and outside of our control."

DeWine

continued from A1

The DeWine administration announced Tuesday that tattoo, body piercing and massage businesses will be allowed to reopen Friday – the same day that hair salons and barbers are permitted to resume business.

Roughly 850,000 K-12 students and their families will automatically receive about $300 a month to purchase food after Ohio received approval from the U.S. Department of Agriculture, DeWine said. The payments are intended to help the one in four Ohio school children who would normally have access to free meals at school.

The Ohio Department of Health reported 23,809 confirmed cases of COVID-19, plus 1,441 probable cases; 4,539 hospitalizations; and 1,303 deaths, plus 133 deaths attributed to probable cases.

Ohio's testing capacity is up to 14,275 tests per day, nearly double what it was last week. So far, nearly 210,000 coronavirus tests have been administered in Ohio.

Facing limited personal protective equipment and testing supplies, Ohio had been restricting tests to front line health care workers and patients in high-risk categories who showed symptoms. However, as the state lined up more testing supplies, the criteria for testing has been loosened.

In some instances the rising case numbers might reflect the uptick in testing in Ohio.

A big chunk of Ohio's probable and confirmed coronavirus cases are in state prisons and nursing homes, where people live in close quarters.

Nursing home staff and residents account for 4,385 cases while Ohio Department of Rehabilitation and Correction reported 4,956 inmates and staff members have tested positive.

DRC conducted comprehensive testing at three facilities, but opted not to do so at other prisons where there are confirmed cases. State prisons incarcerate about 49,000 people.

DeWine said this week that it's unlikely that Ohio will test all nursing home residents and staff, as was recommended by the White House Coronavirus Task Force.

Roughly 70,000 people live in nursing homes and 42,000 in assisted living centers in Ohio.

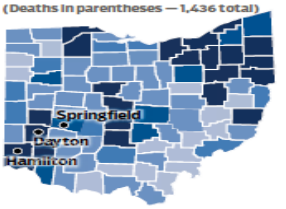
Ohio Medicaid Director Maureen Corcoran said hospitals across the state have partnered with nursing homes to assist them during the pandemic and local infection control strike teams have responded to coronavirus cases inside nursing homes. Visits to nursing home residents have been halted since March 14.

Contact this reporter at 614-224-1624 or email Laura.Bischoff@coxinc.com.

Coronavirus cases in Ohio

Ohio has 25,250 total coronavirus cases as of 2 p.m. May 12. Here's a breakdown by county.

1-10 | 11-50 | 51-100 | 101-200 | More than 200



Adams	6		Huron	39	(1)	Perry	14	(1)
Allen	154	(30)	Jackson	8		Pickaway	1,955	(24)
Ashland	15		Jefferson	56	(2)	Pike	5	
Ashtabula	199	(24)	Knox	20	(1)	Portage	275	(48)
Athens	6	(1)	Lake	203	(8)	Preble	28	(1)
Auglaize	46	(3)	Lawrence	25		Putnam	77	(13)
Belmont	266	(7)	Licking	172	(7)	Richland	130	(2)
Brown	20	(1)	Logan	23		Ross	55	(1)
Butler	496	(14)	Lorain	560	(46)	Sandusky	53	(8)
Carroll	24	(2)	Lucas	1,836	(179)	Scioto	13	
Champaign	19	(1)	Madison	87	(5)	Seneca	14	(1)
Clark	104	(3)	Mahoning	1,150	(132)	Shelby	33	(1)
Clermont	125	(3)	Marion	2,412	(14)	Stark	515	(68)
Clinton	35		Medina	203	(17)	Summit	930	(86)
Columbiana	343	(39)	Meigs	3		Trumbull	413	(36)
Coshocton	19		Mercer	86	(1)	Tuscarawas	223	(1)
Crawford	79	(1)	Miami	314	(28)	Union	28	
Cuyahoga	2,908	(151)	Monroe	22		Van Wert	3	
Darke	90	(15)	Montgomery	433	(10)	Vinton	15	
Defiance	25	(1)	Morgan	5		Warren	213	(13)
Delaware	232	(4)	Morrow	87	(1)	Washington	114	(17)
Erie	85	(3)	Muskingum	31		Wayne	190	(47)
Fairfield	188	(3)	Noble	5		Williams	44	(1)
Fayette	23		Ottawa	49	(2)	Wood	229	(34)
Franklin	4,002	(138)	Paulding	9		Wyandot	26	(2)

Sources: Ohio Department of Health; maps4news.com/HERE STAFF

Elon Musk becomes champion of defying stay-home orders

By Tom Krisher
Associated Press

Tesla CEO Elon Musk has emerged as a champion of defying stay-home orders intended to stop the coronavirus from spreading, picking up support – as well as critics – on social media.

Among the supporters was President Donald Trump, who on Tuesday morning tweeted that Tesla's San Francisco Bay Area factory should be allowed to open despite local health department orders that it stay closed except for minimum basic operations.

"It can be done fast & safely," the president tweeted, joining many of Musk's 34 million Twitter followers who back the defiance.

Among Musk's biggest critics is California Assemblywoman Lorena Gonzalez, who used an expletive to describe the CEO after his threats to relocate his operations to Texas or Nevada. She said the company is disregarding worker safety and bullying public officials.

Tesla's factory reopened Monday with Musk practically daring local authorities to arrest him. The plant apparently continued operations on Tuesday. The company met a Monday deadline to submit a site-specific plan to protect worker safety, which the Alameda County Public Health Department is reviewing, said county spokeswoman Neetu Balram.

The restart defied orders from the county health department, which has deemed the factory a non-essential business that can't fully open under virus restrictions. The department said Monday it warned the company was operating in violation of the county health order, and hoped Tesla will "comply without further enforcement measures" until the county approves a site-specific plan required by the state.

"We look forward to reviewing Tesla's plan and coming to agreement on protocol and a timeline to reopen safely," the statement read.

State law allows a fine of up to $1,000 a day or up to 90 days in jail for operating in violation of health orders.

The plant in Fremont, a city of more than 230,000 people south of San Francisco, had been closed since March 23. It employs about 10,000 workers.

Public health experts have credited the stay-home orders with slowing the spread of novel coronavirus, helping hospitals handle an influx of cases. The coronavirus causes mild or moderate symptoms for most people. But it has killed more than 80,000 people in the U.S., with the death toll rising.