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December 5, 2022

**SENT VIA E-MAIL**

[pubcomment-ees.enrd@usdoj.gov](mailto:pubcomment-ees.enrd@usdoj.gov)

Mr. Todd Sunhwae Kim  
Assistant Attorney General, U.S. DOJ – ENRD  
P.O. Box 7611  
Washington, DC 20044-7611

RE: *United States and the State of Missouri v. Union Electric Company d/b/a Ameren Missouri, 22-cv-1038, D.J. Ref. No. 90-11-2-417/6*

Dear Mr. Kim:

Attached to this email please find Ameren Missouri's Public Comment submission in reference to the above matter.

Thank you.

Kind Regards,

A handwritten signature in black ink that reads "Craig J. Giesmann".

Craig J. Giesmann, P.E., P.M.P.  
Director, Environmental Services  
Ameren Missouri

***United States and the State of Missouri v. Union Electric Company d/b/a Ameren Missouri***, 22-cv-1038, D.J. Ref. No. 90-11-2-417/6

Union Electric Company d/b/a Ameren Missouri ("Ameren") submits the following comments in support of the remedy established in USEPA's June 30, 2021, Record of Decision ("ROD")<sup>1</sup> regarding the Findett/Hayford Bridge Road Groundwater Superfund Site Operable Unit 4, as set forth in the proposed Consent Decree in the lawsuit entitled *United States and the State of Missouri v. Union Electric Company d/b/a Ameren Missouri*, Civil Action No. 22-cv-1038. The proposed Consent Decree achieves all objectives of the ROD, and the ROD fulfills all requirements of the National Contingency Plan ("NCP") by protecting public health and the environment while providing several layers of protection for the St. Charles public water supply wells. Moreover, the Consent Decree provides for additional response actions to be determined by EPA, if any are warranted, for the continued protection of water supply wells, considering future circumstances. Specifically, as USEPA notes in its November 2022 Fact Sheet, the selected remedy achieves the following ROD objectives:

- Prevents exposures to Volatile Organic Compounds ("VOCs") above their Maximum Contaminant Levels ("MCLs") in groundwater.
- Prevents future risks to human receptors from inhalation of groundwater VOCs via the vapor intrusion pathway.
- Prevents future migration of groundwater contamination offsite.
- Restores groundwater to beneficial reuse within a reasonable timeframe.

Given this level of protection of human health and the environment, EPA's ROD complies with the NCP and there is no reason for EPA to consider a ROD amendment and/or modification of any kind to the proposed Consent Decree. To the contrary, potential alternative remedies proposed by the City of St. Charles (hereinafter "the City") could not advance under the NCP's Feasibility Study process, because the replacement of water works infrastructure is not warranted to maintain the safety of the water supply and clearly could not comply with the NCP requirement as a cost-effective alternative remedy. Thus, the proposed Consent Decree should be approved in its current form.

## **1. Summary of Ameren's Remedial Actions**

The proposed Consent Decree along with its accompanying Statement of Work (SOW), delineates the extensive and effective remedial work completed by Ameren over the last decade at the Huster Substation (hereinafter "the Site" or "the Substation") to protect the City municipal water supply. Ongoing remedial measures which continue to protect the municipal water supply include the following:

- **Enhanced Bioaugmentation:** use of naturally occurring bacteria to break down VOCs in the groundwater.

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<sup>1</sup> As required, EPA posted notice of the ROD and supporting technical reports for public comment in the federal register. The City participated in that process and provided public comments.

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- **Groundwater Extraction and Treatment System ("GETS"):** groundwater is drawn into three extraction wells located on the northern edge of Ameren's property and then passed through an air stripper to remove VOCs. Importantly, the performance criteria established in the SOW for the GETS has triggers that are all designed to protect the municipal water supply and to ensure the reduction of onsite contaminants. First, before Ameren can seek authorization from EPA to discontinue use, MCLs must be achieved at the extraction well locations for four consecutive quarters. (The extraction wells function as sentinel wells for any groundwater contaminants leaving the property.) Second, the GETS must remain onsite and can be reactivated, if required by EPA, should MCLs be exceeded in groundwater. Third, under the Consent Decree EPA retains the authority to require additional remedial treatment. Finally, before the GETS can be shutdown, Ameren must demonstrate a declining trend in concentration levels across the Site for four consecutive quarters.
- **Ongoing Monitoring:** to confirm VOC breakdown and evaluate need for additional bioaugmentation.
- **Contingency actions:** if an MCL is exceeded in groundwater for any contaminant of concern<sup>2</sup> ("COCs") inside Ameren's Substation property or outside, provided that such contaminants are attributable to the Substation.

The Consent Decree summarizes several contaminant cleanup technologies already implemented by Ameren through a series of pilot studies conducted between 2014 and 2018. Those pilot studies were performed under the supervision of EPA and include successive treatments of zero valent iron and sodium persulfate outside the Substation, and treatments of potassium and/or sodium permanganate (soils), and bioaugmentation inside the Substation. Collectively, such measures successfully reduced VOC concentration levels associated with the cleaning solvent (Mozel) used at the Substation and potential public health impacts to the public water supply. Ameren summarizes below how such measures provide adequate protection to the municipal water supply (a.k.a. the Elm Point Well Field) and is protective of human health and the environment.

First, Ameren's groundwater treatment work performed in response to EPA's 2013 Action memo already has addressed and will continue to reduce contaminants on the Substation property<sup>3</sup>. Second, Ameren's GETS provides hydraulic containment of contaminants that remain on the Substation property, thereby preventing migration towards the municipal water supply. Third, Ameren's additional groundwater treatment and the permeable barriers installed off-site

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<sup>2</sup> The contaminants of concern at the Site include vinyl chloride and cis-1,2-DCE.

<sup>3</sup> The estimated remaining mass of contaminated material trapped in subsurface soils and clays at the 8- acre Site is approximately 4 lbs. The estimated mass prior to remediation was approximately 400 lbs. (LEA 2022). During this period, the groundwater plume associated with such impacts has reduced dramatically and is generally limited to an area in the center area of the Substation. That area continues to receive remedial treatment to accelerate the destruction of VOCs.

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and north of the Substation have virtually eliminated the presence of any contaminants from the Substation that were located beyond the GETS capture zone. **(See Figure 7).**

Each aspect of this work is discussed in more detail below, but data trends established during the past several years confirm that Ameren has satisfied the objectives of the EPA's 2013 Action memo. Importantly, contaminants of concern from the Substation no longer are present above MCLs in the off-site treatment zone area south of Highway 370 and the GETS continues to successfully intercept groundwater from the Substation. Furthermore, contaminant concentrations within the Substation are steadily declining toward EPA cleanup objectives. Further monitoring and treatment, as needed, will guarantee continued success of this work. Importantly, the proposed Consent Decree contains reopener provisions that may require additional work **if** new data emerges indicating that additional investigation and/or remediation measures are necessary to protect human health and the environment due to a new imminent and substantial endangerment.

**A. Treatment Applications Have Virtually Eliminated Offsite Contamination**

To evaluate and address impacted groundwater located north of the Substation, Ameren injected a double *EHC-enhanced ZVI* reactive barrier north of City Well 5 and south of Highway 370. In addition, *sodium persulfate* was injected as groundwater treatment immediately adjacent to City Well 5. *Sodium permanganate* was also injected inside the Substation. In October 2016, Ameren implemented a third and final pilot study targeted towards the areas of highest VOC impact near Transformer 2, located at the center of the Site. Within one year of the reactive barrier installation, concentration levels at PZ 10 (the last monitoring well located immediately after the ZVI reactive barriers on the south side of Highway 370) were below the MCLs. In addition, by May 2015, the injection of sodium persulfate reduced concentration levels to below MCLs at and around City Well 5, located approximately 200 feet from the Site property line.

Below is a chart depicting sampling data at various City production supply wells.

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**Figure 1: Ameren's Historical Analytical Results for City Wells #4, #5 and #6**

Ameren's Historical Analytical Results for City Wells #4, #5 and #6						
City Well #6						
Sample Date	DCE			VC		
	Depth 45'	Depth 70'	Depth 90'	Depth 45'	Depth 70'	Depth 90'
<i>Baseline</i>	ND	-	-	ND	-	-
01/14/2022	2.2	-	-	1.1 J	-	-
01/28/2022	1.4 J	-	-	0.6 J	-	-
02/11/2022	0.5 J	-	-	0.2 J	-	-
02/25/2022	0.5 J	-	-	ND	-	-
03/11/2022	ND	ND	ND	ND	ND	ND
03/25/2022	ND	ND	ND	ND	ND	ND
04/08/2022	ND	ND	ND	ND	ND	ND
04/22/2022	ND	ND	ND	ND	ND	ND
05/09/2022	0.2 J	0.2 J	0.4 J	ND	ND	1.0 J
05/27/2022	ND	0.3 J	0.3 J	ND	ND	1.1 J
06/10/2022	0.2 J	0.3 J	0.4 J	ND	ND	1.3 J
06/24/2022	0.2 J	0.2 J	0.4 J	ND	ND	1.3 J
07/08/2022	0.2 J	0.2 J	0.5 J	ND	ND	1.3 J
07/22/2022	0.2 J	0.6 J	0.5 J	ND	1.6	1.5
08/05/2022	0.3 J	0.6 J	0.6 J	ND	1.6	1.5
08/22/2022	0.2 J	0.2 J	0.4 J	ND	ND	1.1
09/01/2022	0.3 J	0.2 J	0.4 J	ND	ND	1.0
09/16/2022	0.2 J	0.9 J	0.4 J	ND	ND	1.2
10/04/2022	ND	ND	ND	ND	ND	1.4
10/14/2022	0.4 J	ND	0.6 J	ND	ND	1.6

City Well # 5		
Sample Date	DCE	VC
05/24/2016	ND	ND
06/24/2016	ND	ND
07/27/2016	ND	ND
08/17/2016	ND	ND
11/29/2016	ND	ND
03/27/2017	ND	ND
06/07/2017	ND	ND
09/07/2017	ND	ND

City Well #4		
Sample Date	DCE	VC
<i>Baseline (2014)</i>	ND	ND
01/25/2016	ND	ND
02/18/2016	ND	ND
03/22/2016	ND	ND
04/21/2016	ND	ND
05/24/2016	ND	ND
06/24/2016	ND	ND
07/27/2016	ND	ND
08/17/2016	ND	ND
11/29/2016	ND	ND
03/27/2017	ND	ND
06/07/2017	ND	ND
09/07/2017	ND	ND

Treatment application locations along with sampling results, % reduction of contaminants, and monitoring locations where groundwater contaminant concentrations are below MCLs are depicted on **Figure 2** below. Treatment applications occurred both within and outside of the Site and quarterly sampling has been ongoing since 2014.

**Figure 2: Groundwater Treatment Applications**

Well #	2014 CIS	2014 Vinyl Chloride	TREATMENT – ONSITE WELLS			2022 CIS	2022 Vinyl Chloride	% Reduction CIS	% Reduction Vinyl Chloride	Below MCL
			Zero Valent Iron	Potassium or Sodium Permanganate – into clay only	Biomass Injection					
MW 1	15	<2.0		2015		8.2	<0.1	45.3%	100%	X
MW 2	460	19				1.2	<0.1	99.7%	100%	X
MW 3	140	6.4		2015		2.7	1.2	98.1%	81.3%	X
MW 4	0.35	<0.43				<0.2	<0.1	100%	100%	X
MW 5	380	21				51.8	30.1	86.4%		
MW 6	590	21				0.9 J	<0.1	99.8%	100%	X
MW 7	83	5.9				2.9	0.4 J	96.5%	93.2%	X
MW 8	8,210*	390*		2014, 2015, 2018	2015, 2022	32.5	15.4	99.6%	96.1%	
MW 9	9.9*	0.8*		2014, 2015, 2018		0.4 J	<0.1	96.0%	100%	X
MW 10	170*	11.3*		2014, 2015, 2018	2015, 2016	4.9	<0.1	97.1%	100%	X
MW 11	50.3*	4.4*		2014, 2015, 21018	2015, 2016, 2022	5.9	0.5 J	88.3%	88.6%	X
MW 12	319*	21.8*		2014, 2015, 2018	2015, 2016, 2022	37.9	9.6	88.1%	56.0%	
MW 13	10,900*	377*		2014, 2015, 2018	2015, 2016, 2022	97	223	99.1%	40.8%	
MW 14	2,780*	198*		2014, 2015, 2018		<0.2	<0.1	100%	100%	X
MW 39	5,430*	288*		2014, 2015, 2018	2015	2.0 J	<0.1	99.96%	100%	X
MW 40	<500 *	<200*		2014, 2015, 2018	2015	0.3 J	<0.1	99.94%	100%	X
MW 41	27,900*	882*		2014, 2015, 2018		252	196	99.1%	77.8%	

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Well #	2013/14 CIS	2013/14 Vinyl Chloride	TREATMENT OFF-SITE WELLS			2022 CIS	2022 Vinyl Chloride	% Reduction CIS	% Reduction Vinyl Chloride	Below MCL
			Zero Valent Iron (ZVI)	Sodium Persulfate	Biomass Injection (not used outside of Substation)					
PZ 1	0*	<2*				<0.2*	<0.1*	-	-	X
PZ 2	366*	30.9*				1.4 J	<0.1	99.6%	100%	X
PZ 3	0*	<2*				4.1	3.4			
PZ 4	124*	7.4*	10/2014 <sup>A</sup>			2.7	<0.1	97.8%	100%	X
PZ 5	198*	14.4*				2.1	<0.1	98.9%	100%	X
PZ 6	340*	17*				0.6 J	<0.1	99.8%	100%	X
PZ 7	26.7	0.5		2014 <sup>B</sup>		0.9 J	<0.1	96.6%	100%	X
PZ 8	113	10.5		2014 <sup>B</sup>		0.6 J	<0.1	99.4%	100%	X
PZ 9	219	13.4	10/2014 <sup>A</sup>			1.3 J	<0.1	99.4%	100%	X
PZ 10	220	20.4	10/2014 <sup>A</sup>			1.3 J	<0.1	99.4%	100%	X
PZ 11	<5	<2				146	63.6			
PZ 12	<5	<2				<0.2	<0.1	100%	100%	X

<sup>A</sup> ZVI reactive barriers were installed offsite in two linear and parallel locations north of the Substation. PZ well locations were chosen to monitor the effectiveness of the ZVI barriers in reducing COCs. PZ 4 & PZ 9 are located between the ZVI reactive barriers while PZ 10 is located just after 2<sup>nd</sup> barrier. The ZVI treatment barriers are still in place.

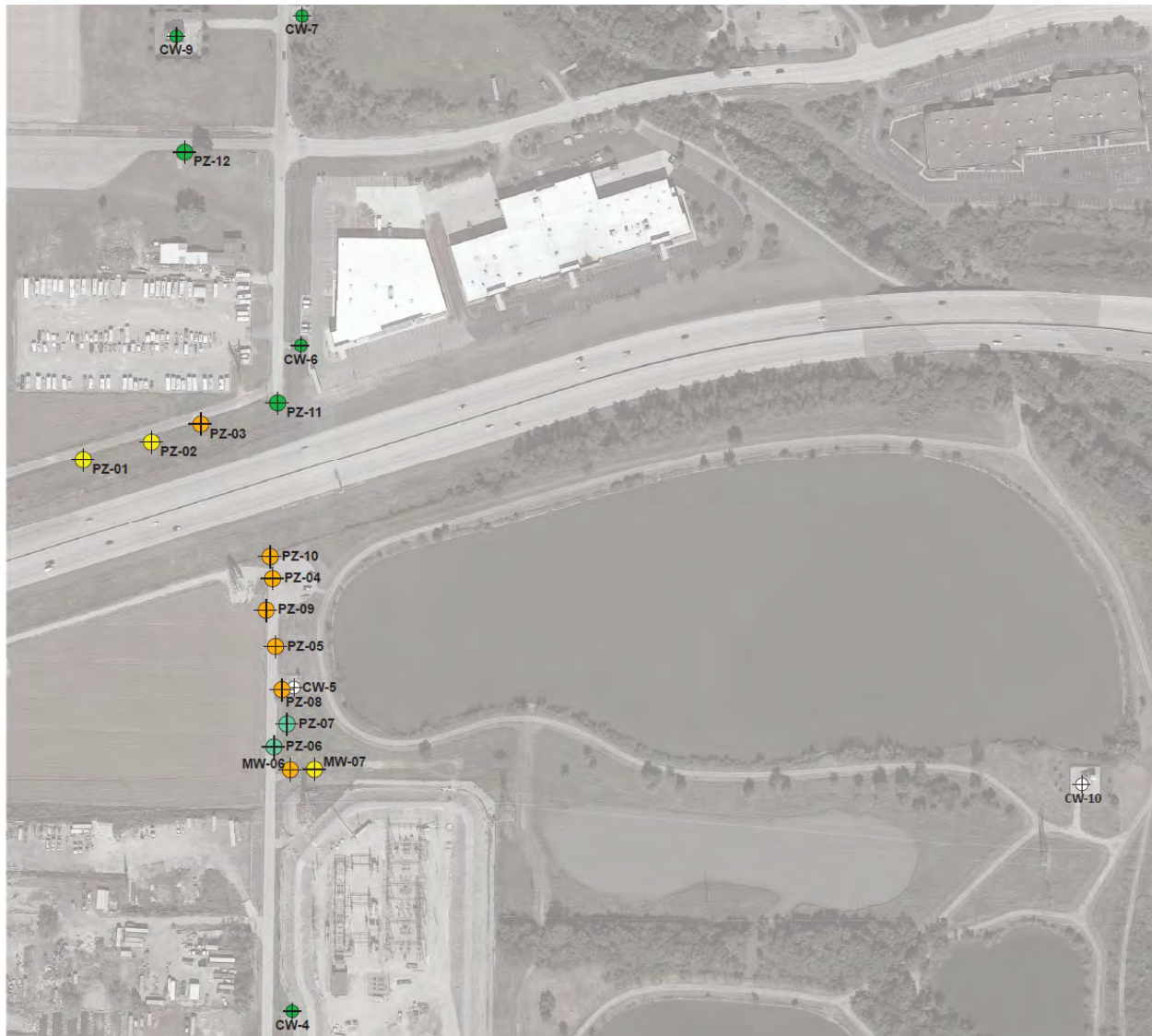
<sup>B</sup> PZ 7 & PZ 8 are located adjacent to City Well 5 and in an area that was treated with sodium persulfate. PZ 8 is located approximately ten (10) feet from City Well 5 and serves as a surrogate for water quality within that municipal well. Sampling at PZ8 reflects concentrations at or below the MCLs since May 2015.

**B. The Groundwater Extraction Treatment System Protects the Municipal Water Supply**

In cooperation with the US EPA and the State of Missouri, Ameren installed an above-ground treatment facility at the northern edge of the Substation in 2014. The system intercepts impacted groundwater through extraction wells (MW 5, 6 and 7), and pumps the captured groundwater through a series of above-ground filters and an aeration system before being discharged as authorized by a Missouri Department of Natural Resources' (MDNR) permit. The GETS is designed to prevent offsite migration of residual contamination located on the Substation property. As provided in the SOW, operation of the GETS will continue until COCs are detected at levels below the MCLs at the extraction wells for four consecutive quarters, and all other onsite monitoring wells demonstrate decreasing Mann Kendall results for four quarters. Collectively, the remedial measures described above, along with the continual operation of the GETS, has been effective in reducing contaminant levels. In fact, groundwater at the Substation has achieved MCL levels within the Site at all but one discrete area. Below are Vinyl Chloride ("VC") and cis-DCE ("cis") monitoring data reflecting the reduction of contaminants from 2014 to 2022, along with a chart depicting the success of the offsite treatment application areas.



**Figure 3: Vinyl Chloride Prior to Treatment: MCL = 2**



\*PZ-07,-08,-09,-10 DATA FROM OCTOBER 2014; PZ-11,-12 FROM DECEMBER 2014

**LEGEND**

- 10 - 100 ug/L
- 2 - 10 ug/L
- = MCL (2 ug/L)
- < 2 ug/L
- No Detection

- SUPPLY WELL
- MONITORING WELL OR PIEZOMETER

0 250 500  
SCALE IN FEET

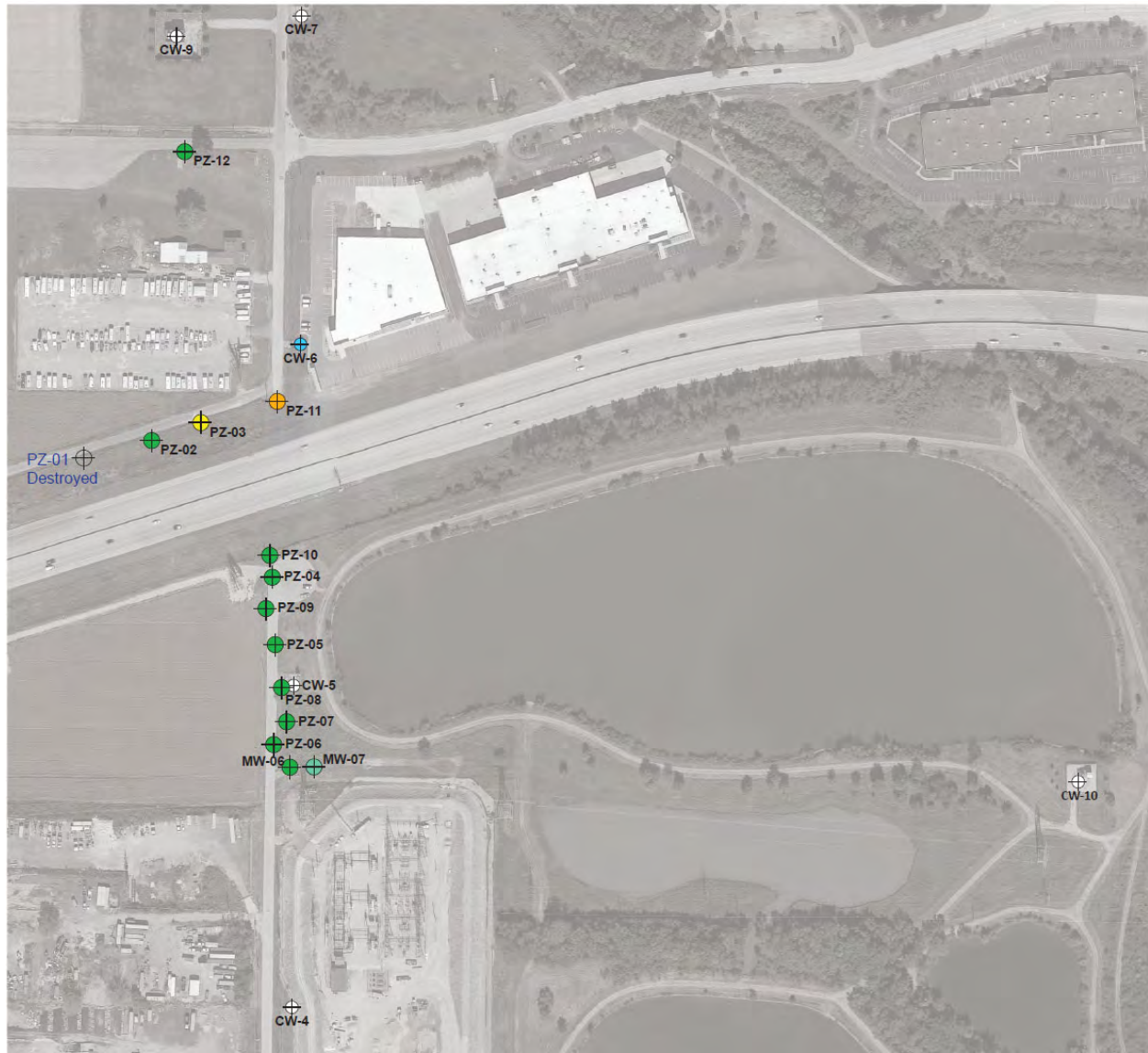
**HALEY  
ALDRICH**

AMEREN CORPORATION  
HUSTER SUBSTATION  
ST. CHARLES, MISSOURI

VINYL CHLORIDE CONCENTRATIONS  
MAXIMUM VALUE 2014

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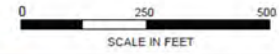
**Figure 4: Vinyl Chloride Post-Treatment Applications: MCL = 2**



**LEGEND**

- 10 - 100 ug/L
- 2 - 10 ug/L
- = MCL (2 ug/L)
- < 2 ug/L
- No Detection

- SUPPLY WELL
- MONITORING WELL OR PIEZOMETER



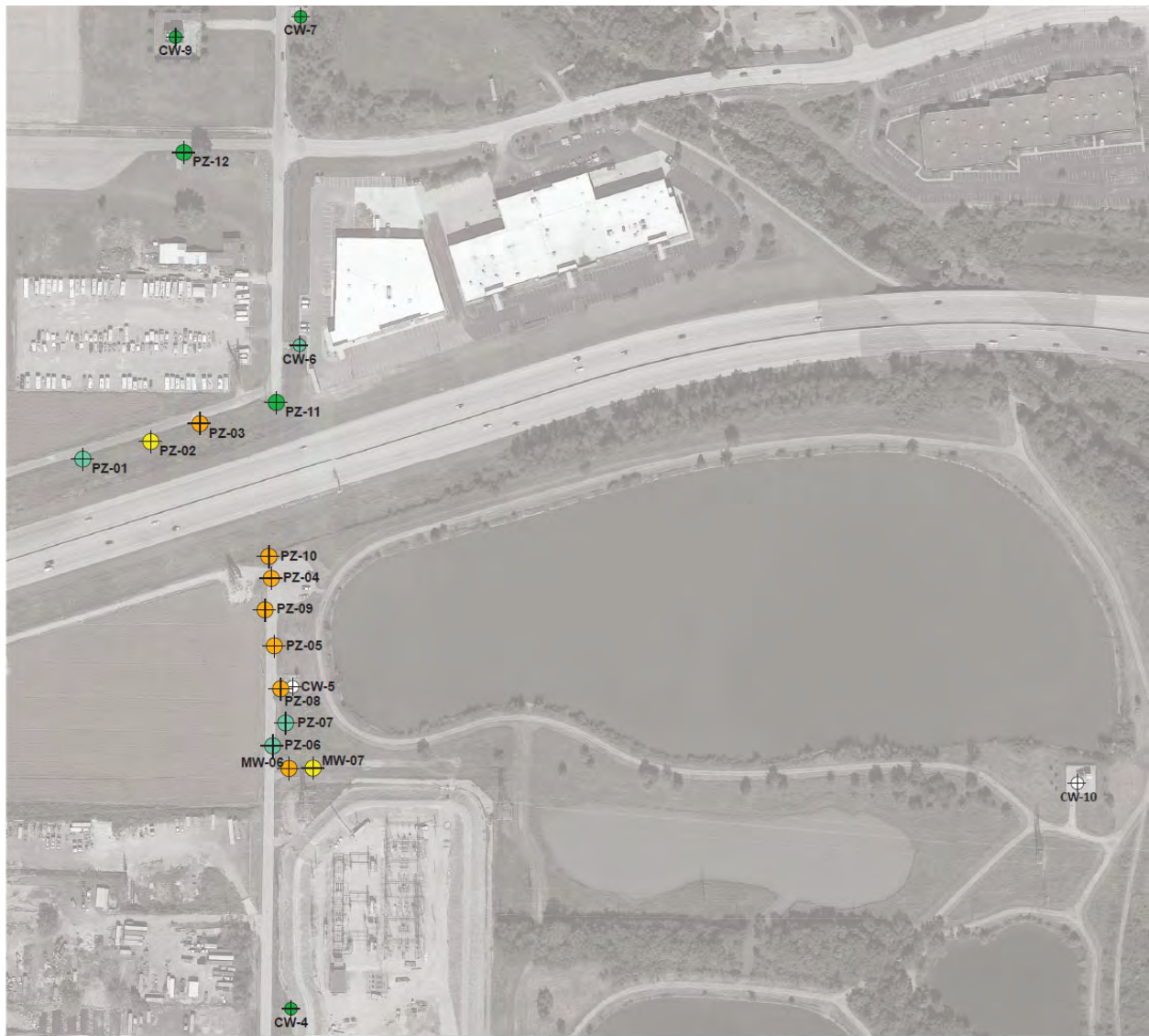
**HALEY ALDRICH** AMEREN CORPORATION  
HUSTER SUBSTATION  
ST. CHARLES, MISSOURI

VINYL CHLORIDE CONCENTRATIONS  
MAXIMUM VALUE 2022



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**Figure 5: cis-DCE Prior to Treatment Applications: MCL = 70**



**LEGEND**

- 100 - 1,000 ug/L
- 70 - 100 ug/L
- = MCL (70 ug/L)
- < 70 ug/L
- No Detection

- + SUPPLY WELL
- + MONITORING WELL OR PIEZOMETER

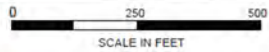
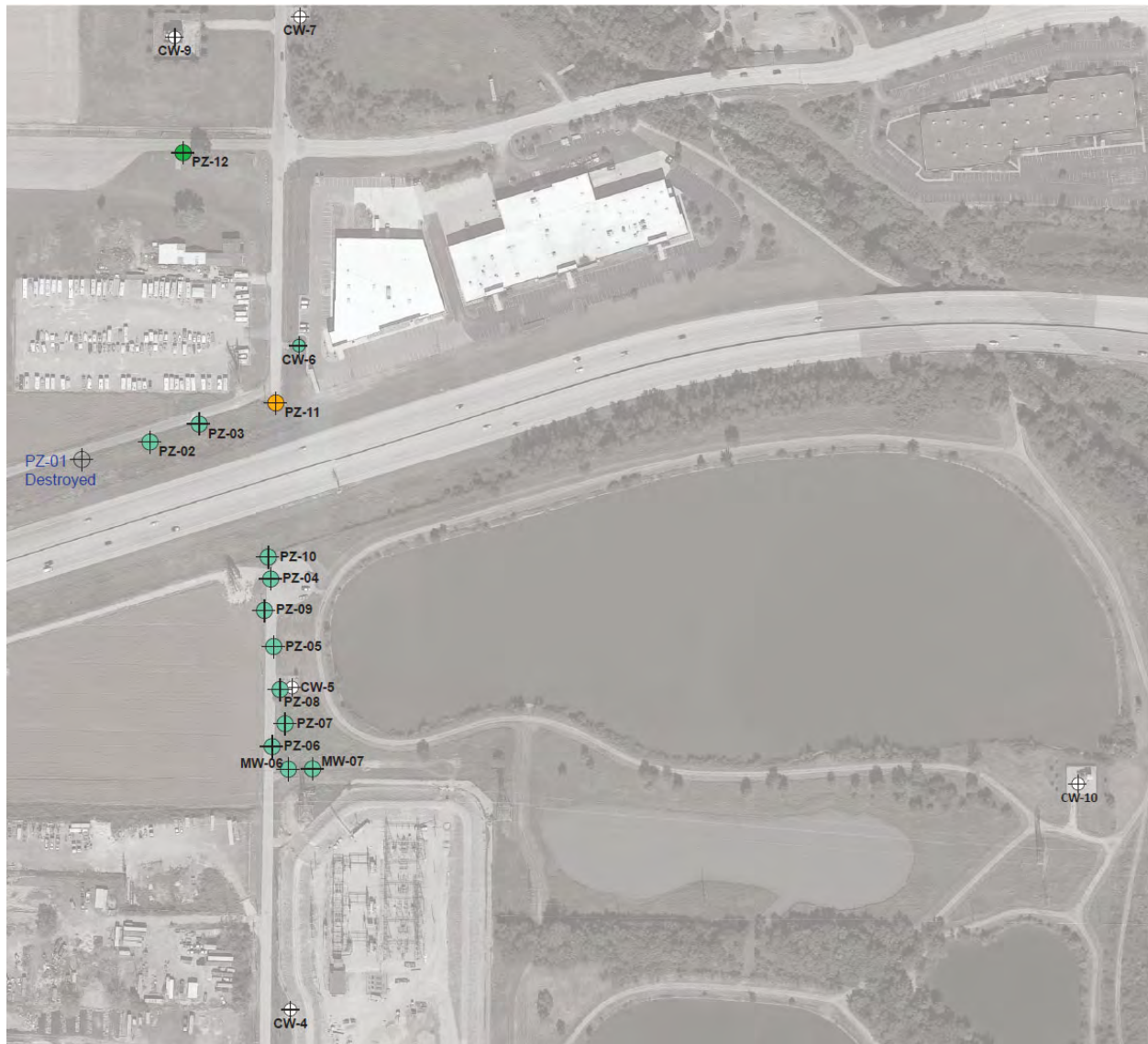
0 250 500  
SCALE IN FEET

**HALEY  
ALDRICH**

AMEREN CORPORATION  
HUSTER SUBSTATION  
ST. CHARLES, MISSOURI

CIS-1,2-DCE CONCENTRATIONS  
MAXIMUM VALUE 2014

**Figure 6: cis-DCE Post-Treatment Applications: MCL = 70**



**LEGEND**

- 100 - 1,000 ug/L
- 70 - 100 ug/L
- = MCL (70 ug/L)
- < 70 ug/L
- No Detection

- + SUPPLY WELL
- + MONITORING WELL OR PIEZOMETER

**HALEY  
ALDRICH**

AMEREN CORPORATION  
HUSTER SUBSTATION  
ST. CHARLES, MISSOURI

CIS-1,2-DCE CONCENTRATIONS  
MAXIMUM VALUE 2022



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**Figure 7: Off-Site Treatment and Monitoring Locations**

Analytical results are in ug/L

Sample Date	DCE											
	PZ-1	PZ-2	PZ-3	PZ-4	PZ-5	PZ-6	PZ-7	PZ-8	PZ-9	PZ-10	PZ-11	PZ-12
Baseline (2013/14)	ND	366	203	301	324	340	26.7	113	324	220	ND	ND
Mar-2019	-	4.1	7.6	10.6	4.3	0.9 J	1.5 J	1.3 J	3.6	4.7	3.8	ND
Aug-2019	-	1.0 J	7.6	5.8	1.9 J	0.5 J	0.9 J	0.9 J	1.2 J	2.1	8.1	ND
Dec-2019	-	1.1 J	6.7	5.0	2.5	0.5 J	ND	0.9 J	0.6 J	1.4 J	6.6	ND
Jun-2020	-	2.9	6.0	4.8	2.7	0.9 J	ND	1.6 J	1.5 J	1.4 J	2.8	ND
Sep-2020	-	0.4 J	7.5	1.6 J	2.6	0.3 J	0.7 J	1.0 J	1.5 J	1.3 J	3.9	ND
Dec-2020	-	0.5 J	4.5	3.0	2.4	0.4 J	1.1 J	2.1	1.4 J	1.0 J	4.8	ND
Mar-2021	-	ND	4.2	1.4 J	1.5 J	0.2 J	0.5 J	0.5 J	0.7 J	0.8 J	5.3	ND
Jun-2021	-	0.2 J	2.6	1.2 J	1.0 J	ND	0.4 J	0.4 J	0.5 J	0.5 J	5.2	ND
Sep-2021	-	ND	1.4 J	1.0 J	0.9 J	ND	0.3 J	0.3 J	0.5 J	0.5 J	4.1	ND
Dec-2021	-	0.7 J	3.0	2.0	1.5 J	0.6 J	0.6 J	0.6 J	1.1 J	1.2 J	61.3	ND
Mar-2022	-	1.2 J	3.9	2.2	2.3	0.7 J	0.3 J	0.5 J	1.3 J	1.5 J	88.6	ND
Jun-2022	-	1.5 J	4.3	2.8	2.5	0.2 J	0.7 J	0.6 J	1.4 J	1.3 J	88.4	ND
Sep-2022	-	1.4 J	4.1	2.7	2.1	0.6 J	0.9 J	0.6 J	1.3 J	1.3 J	146.0	ND
Nov-2022	-	1.7 J	21.5	3.0	2.7	0.7 J	0.6 J	0.6 J	1.5 J	2.3	134.0	ND
Below MCL since:	Sep-2014	Nov-2015	Nov-2014	Jul-2015	Mar-2016	May-2014	Oct-2014	Jan-2015	Nov-2015	Aug-2015	Dec-2014	Dec-2014

Results above DCE Drinking Water Maximum Contaminant Level (MCL) of 70 ug/L are in red

Sample Date	VC											
	PZ-1	PZ-2	PZ-3	PZ-4	PZ-5	PZ-6	PZ-7	PZ-8	PZ-9	PZ-10	PZ-11	PZ-12
Baseline (2013/14)	ND	30.9	ND	20.7	17.0	17.0	0.5 J	10.5	21.9	20.4	ND	ND
Mar-2019	-	ND	0.4 J	ND	ND	ND	ND	ND	ND	ND	0.8 J	ND
Aug-2019	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.9 J	ND
Dec-2019	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Jun-2020	-	0.2 J	0.1 J	ND	ND	ND	ND	ND	ND	0.1 J	ND	ND
Sep-2020	-	ND	0.1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dec-2020	-	ND	ND	ND	ND	ND	ND	ND	ND	0.3 J	ND	ND
Mar-2021	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Jun-2021	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1 J	ND
Sep-2021	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dec-2021	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	37.6	ND
Mar-2022	-	ND	0.8 J	ND	ND	ND	ND	ND	ND	ND	45.0	ND
Jun-2022	-	ND	1.6 J	ND	ND	ND	ND	ND	ND	ND	50.9	ND
Sep-2022	-	ND	3.4	ND	ND	ND	ND	ND	ND	ND	63.6	ND
Nov-2022	-	ND	28.1	ND	ND	ND	ND	ND	ND	ND	27.3	ND
Below MCL since:	Sep-2014	Mar-2018	Nov-2014	Sep-2015	Aug-2016	May-2014	Oct-2014	May-2015	Apr-2016	Oct-2015	Dec-2014	Dec-2014

Results above VC Drinking Water Maximum Contaminant Level (MCL) of 2 ug/L are in red

The above data clearly demonstrates that measures taken by Ameren and supervised by EPA have protected the St. Charles public water supply and met the objectives of EPA’s 2013 Amended Action Memo. The GETS is in continual operation and has been successful in addressing incidental VOCs that could bypass the biological (bacteria) treatment. Air migration is not a factor as there are no occupied facilities on the Site. Migration of contaminants via groundwater from the site has not occurred due to (a) the continuous operation of the GETS and (b) the in-situ injection of biomass and other treatment applications near the remaining areas of onsite contamination. The GETS is sampled monthly and reported to MDNR as required by its permit and maintenance of the system is performed weekly. The Site COCs are treated by either oxidation or reductive means as shown by the pilot studies performed both on-site and off-site. Lastly, the Consent Decree requires an environmental covenant be placed on the Substation

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property to prevent groundwater from being used for drinking water and to ensure proper soil management procedures are in place.<sup>4</sup>

**2. City of St Charles' Municipal Water Supply System**

The Elm Point Well Field is one of two sources of drinking water for the City. Water from the well field is pumped from production wells to a treatment plant where it is treated and blended with water purchased from the City of St. Louis. The City's treatment plant was constructed in 1963 and expanded in 1969 to its current capacity level of 6 MGD. However, output typically falls well below that level and for decades, the City, along with neighboring City of St Peters, has purchased water from St Louis City. Specifically, since at least 1987 the City has purchased between 40% and 60% of its water supply needs from St. Louis and, as recently as 2015, executed a thirty-year (30) supply contract that terminates in 2045. **(Exh. 1)** Below is a chart that depicts historic well usage from 2004-2021. Note that City Well 9, with its multiple radial arms, has the greatest production capacity by far and accounts for an average of 63% of the overall Elm Point Well Field water supply.

**Figure 8: City Well Usage in Elm Point Wellfield**

City Well Usage in Elm Point Wellfield (in million gallons)									
	CW-4	CW-5	CW-6	CW-7	CW-8	CW-9 (radial)	CW-10	Elm Point Annual Production	Annual % Contribution from CW-9
Year Installed:	1969	1969	1977	1988	1998	2005	2015		
2004	133.1	146.6	175.1	112.8	337.7	0.0	-	905.3	-
2005	47.7	282.4	296.2	246.1	258.6	0.0	-	1131.0	-
2006	0.3	4.8	33.1	31.7	28.7	1107.2	-	1205.8	92%
2007	0.0	0.0	18.7	0.0	300.1	918.7	-	1237.5	74%
2008	0.0	0.0	0.0	0.0	0.0	1029.7	-	1029.7	100%
2009	0.0	14.6	150.3	10.5	270.0	943.9	-	1389.3	68%
2010	0.0	164.8	144.2	0.2	511.3	872.2	-	1692.8	52%
2011	0.0	6.2	238.6	0.5	229.4	998.9	-	1473.6	68%
2012	0.0	0.0	195.9	14.2	247.7	808.8	-	1266.7	64%
2013	0.0	0.0	121.8	32.7	199.0	673.6	-	1027.1	66%
2014	0.0	0.0	267.4	31.9	267.4	445.7	-	1012.4	44%
2015	0.0	0.0	0.0	0.0	84.0	1017.3	-	1101.3	92%
2016	0.0	0.0	0.0	0.0	136.0	942.9	146.7	1225.6	77%
2017	0.0	0.0	0.0	0.0	294.1	653.9	420.6	1368.7	48%
2018	0.0	0.0	0.0	0.0	373.5	625.7	565.3	1564.5	40%
2019	0.0	0.0	0.0	113.8	256.1	563.3	438.5	1371.6	41%
2020	0.0	0.0	94.3	99.9	492.7	482.9	380.9	1550.7	31%
2021	0.0	0.0	182.5	127.8	127.8	1022.0	380.9	1840.9	56%
								<b>Average:</b>	<b>63%</b>

<sup>4</sup> To the extent the City at public meetings has suggested that the general public could be drinking groundwater from beneath the Substation, thereby creating an increased cancer exposure risk, such statements are untrue and are contradicted both by the Risk Assessment performed as part of the ROD and the imposition of institutional controls required by the Consent Decree. For there to be "risk", there must be exposure and as the Risk Assessment demonstrates, a completed exposure pathway at the Substation does not exist. (The City and its environmental consultant have presented no technical data or analysis refuting the Risk Assessment.) In fact, 20 years of samples collected at the treatment plant of water distributed to the public confirms there has been no detections of COCs. A copy of the Risk Assessment has been placed on Ameren's Huster website:

<https://www.ameren.com/missouri/company/saint-charles-protecting-groundwater>.

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The City acknowledged in a recent public meeting, that its water purchase contractual arrangement is no longer economically favorable and in 2020 the City commissioned the engineering firm Black & Veatch to evaluate its water needs and existing infrastructure. In a *2020 Water Long Range Plan*, Black & Veatch recommended expansions to the water treatment plant and well field. According to its 2022-2025 Capital Improvement Plan, the City intends to expand the plant to reach a 9 MGD capacity and add two additional supply wells. Construction of the two supply wells is planned for 2025/26 and is estimated to cost \$2.45M. Design for the \$14M plant expansion is scheduled to commence in 2024 with construction occurring in 2025/26.

In 2016, the City installed City Well 10 approximately 500 yards west of the Substation. At the request of EPA, Ameren evaluated through a Conceptual Site Model (CSM) whether contaminants from the Substation could be drawn into that supply well. Modeling assumptions used in the CSM were conservative and assumed neither operation of the GETS or ongoing source reduction. The CSM modeling analysis reflected the following:

- VOCs would **not** reach CW 10 during anticipated and normal operation of the Elm Point Well Field, as reflected in the above chart.
- A *theoretical potential* for capture exists only in an extreme operating configuration. Even then, it would take at least 400 days to reach CW 10 (300 days for CW6). As the water usage table above reflects, the City has never operated under such a hypothetical configuration.

Importantly, the GETS will continue to operate as the Consent Decree and SOW precludes a premature shutdown. EPA cannot approve shutdown of the GETS until MCLs are reached at the Huster extraction wells for a sustained period.

There are no regulatory or public health and safety reasons associated with the Substation that preclude the City from fully utilizing its well system. To the extent the City has voluntarily chosen to restrict its water production capacity at certain wells, such restrictions are not necessitated by environmental conditions associated with the Substation.<sup>5</sup>

With respect to actual exposure to VOCs from the Substation, there is no foreseeable potential for ingestion of Site COCs from the St. Charles water supply. The actively pumped wells are all blended into one tank within the St. Charles Water Treatment Plant, with City Well 9 providing the majority of contribution. PZ 12 is located immediately downgradient and is a surrogate for water quality at City Well 9. Sampling at that location reflects non-detect (ND) for VOCs.<sup>6</sup> By virtue of all well water being commingled at the water treatment plant, there is no foreseeable potential for a detectable amount of any COC to enter the water distribution water

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<sup>5</sup> Contrary to its public positions and statements expressed during a public meeting on November 17, 2022, the City has made statements that it now intends to "start- up" City Wells 4, 5, 6 and 8. Well 8 is located upgradient from the Substation and, according to a recent presentation from Geotechnology, within the Findett plume). (**Exh. 2**)

<sup>6</sup> In 2015, PZ 12 registered 1.2 J value for cis on one occasion.

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lines. In addition, the water treatment plant includes aeration, lime, sodium hypochlorite, and sodium hexametaphosphate treatments. These common water treatment methods easily remove residual VOCs from the water source prior to distribution. Since VOCs are volatile in nature, they would easily be removed from the water during the aeration process at the treatment plant. The City has presented no data contradicting the fact that no environmental conditions diminished the City's option of using all its municipal wells, or some combination of those wells, as needed to maintain sufficient and safe supply and reserves. **Of course, if environmental conditions materially change, the proposed Consent Decree has a reopener provision that will allow US EPA to address any such conditions associated with the Substation, so the proposed Consent Decree should be approved.**

### **3. RECENT AND ONGOING INVESTIGATIONS**

Inexplicably, after 7 years of "clean" data, an increase in the detection of two chemicals occurred at PZ 11 and City Well 6, both located north of Highway 370 and outside the ZVI barrier treatment area. The City's recent and surprising refusal to allow EPA to proceed with its planned investigation has apparently delayed that work until sometime in the spring. EPA still intends to conduct additional investigation in this area to identify the scope and source of such material.<sup>7</sup> A sewer line runs from the Findett Site, along Huster Road and north towards highway 370. The sewer line is approximately 20 feet below grade and could be susceptible to exfiltration/infiltration of contaminants from a surrounding plume or other potential sources of contamination. As such, Ameren supports the investigation of the sewer line to determine the extent to which it may be serving as a source or conduit for contaminants.

Based upon the available technical record, Ameren does not believe that the Substation is the source of such newly found contaminants because:

- A.** While there may have been notable contamination at and downgradient of the Substation back in 2014, the remedial work undertaken by Ameren has essentially eliminated any such off-site contamination that may have origination at the Ameren Site.
- B.** There has been a notable decrease in concentration of contaminants at monitoring locations downgradient from the Ameren site from 2014 to the present as depicted - in Figures 3-6.
- C.** The region north of the Substation has been clear of VOCs for an extended period with sampling uniformly reflecting concentration below MCLs and/or ND. Accordingly, there

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<sup>7</sup> Ameren sought permission from the City for access to conduct additional groundwater investigation in this area, but the City declined. **(Exh. 3)** It is also Ameren's understanding that last week the City made some procedural demands of EPA as a prerequisite to granting EPA access for its investigation resulting in an unfortunate delay (potentially for several months) of the EPA investigation. It is concerning that the City denied EPA's request for access to City property given the clear authority of the federal government to access a Superfund site. The unnecessary delay is not in the best interests of public health and safety and serves only to delay EPA's efforts to address public concerns as quickly and efficiently as possible.

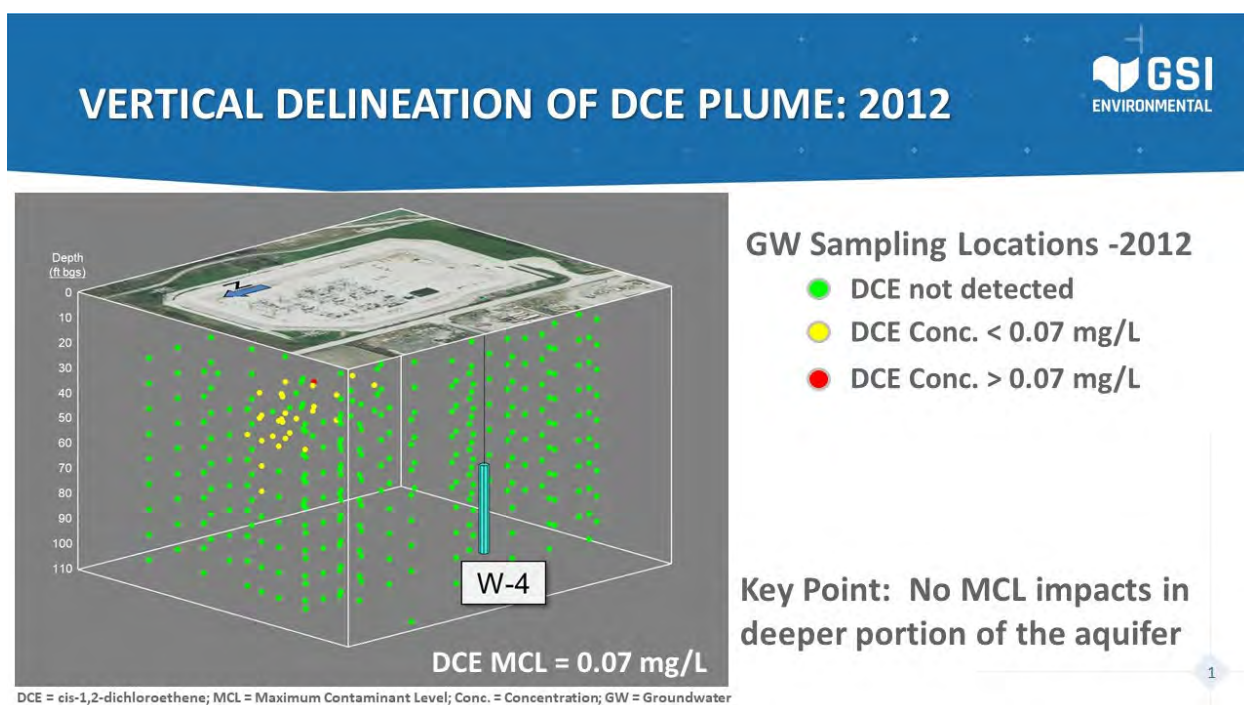


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is no trail of contaminants from the Ameren Site to the area around PZ 11 and CW 6. The lack of a trail strongly suggests that the sudden and recent elevated detections of two chemicals at PZ 11 could be from a new source local to the area around PZ 11.

- D. Importantly, contaminants near City Well 6 are located at a depth of approximately 90 feet and not at more shallow depths. In 2012 and at the direction of EPA, Ameren conducted a site investigation to vertically delineate impacts below its Substation. That investigation was exhaustive and included approximately 44 sampling data points. Based on that investigation, chlorinated solvents at the Huster Substation were generally confined to the area immediately beneath the Substation (30-45 feet) and not within the deeper regions. Below is a depiction of sampling results from 2012 investigation:

**Figure 9: 2012 Vertical Delineation of Groundwater at Substation**



- E. The CSM modeling analysis demonstrates that, **absent operation of the GETS**, it would take approximately one year (300 days) for onsite contaminants to reach CW6. However, the GETS has been in continual operation since 2014 to capture residual contaminants from the Site.

The chemistry of contaminants in PZ 11 and CW 6 differs significantly from that of Mozel, the solvent cleaner used at the Substation. Specifically, hydrocarbons have been identified in sampling data north of Highway 370 but **are not** present at the Substation property or in the Mozel product. **(Exh. 4)**

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In an attempt to "link" the Ameren Substation to the recent PZ 11 and CW 6 sampling data, the City, through a consultant known as 212, has presented intentionally misleading hypothetical plume maps as part of its public campaign. The 212 maps distort the established facts in the following manner:

1. The City's hypothetical plume depiction ignores actual monitoring well data and the ZVI treatment barrier installed by Ameren to protect the city wells. Between the Ameren site and city well CW-6 to the north, there are 9 monitoring wells that show the groundwater to meet the criteria for use as drinking water. However, the 212 hypothetical plume suggests – with no supporting data – that there is a high concentration plume moving north from the Ameren site that somehow bypasses these monitoring wells and arrives at the location of well CW-6. In addition, the 212 theory ignores the presence of the two zero-valent iron (ZVI) permeable barrier walls, located directly in the flow path from Ameren to well CW-6, that serve to intercept the chemicals in the groundwater and protect areas to the north. The 212 map is very misleading in this regard.
2. The City's hypothetical plume shown to extend southeast of the Ameren site cannot be caused by the Ameren site. Water, including groundwater, cannot flow in two directions at the same time, as is suggested on the 212 map, where the plume flows both to the north and to the southeast of the Ameren site. The 212 map connects the Ameren site with contaminated wells located 700 feet to the southeast of the site that are clearly unrelated to Ameren because: i) groundwater does not move in that direction from the Ameren site, and ii) the areas to the south are known to be impacted by a plume from the Findett Superfund Site, not Ameren.
3. The City's hypothetical plume map depicts an unrealistic pattern of groundwater flow and plume movement. The map includes blue and grey contour lines that depict groundwater "topography." Groundwater should flow downhill, crossing perpendicular to these blue and grey lines. However, the 212 depiction ignores their own contour lines and shows a plume to be moving north from the Ameren site when, according to their own map, a plume originating at the Ameren site would move to the west, which is the downhill direction. In addition, the map shows unrealistic behavior for a plume, such as near monitoring wells MW-2 and MW-5, where the highly concentrated plume is shown to squeeze between two wells only 50 feet apart, leaving well MW-2 untouched. This is not physically possible.

**Exh. 5**

**CONCLUSION**

The proposed Consent Decree should be approved. Ameren's actions and the data of record demonstrate Ameren's commitment to the safety of the St. Charles water supply and

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accountability for the impact of its historic Substation operations. The data in the Administrative Record that supports the proposed Consent Decree confirm that the remedial measures in place at the Substation property continues to be protective of the municipal water supply and that supply meets all drinking water standards established by the *Missouri Safe Drinking Water Law* and EPA's *Safe Drinking Water Act*. Ameren's continued operation of the GETS and monitoring obligations set forth in the proposed Consent Decree will continue, as will the separate investigation work that EPA continues to perform in the area. If any unlawful impacts from the Substation to the municipal water supply are detected in the future, the Consent Decree provides EPA with the regulatory mechanism to address any such impacts attributable to the Substation property. If any unlawful impacts to the municipal water supply for which other Operable Units and other potentially responsible parties (PRPs) identified at the Findett Superfund Site are responsible, any such issues are addressed in Consent Decrees applicable to those Operable Units and to those PRPs. Those issues therefore have no legal or factual relevance to the approval of this proposed Consent Decree.

# EXHIBIT 1

United States and the State of Missouri v. Union  
Electric Company d/b/a Ameren Missouri, 22-cv-1038,  
D.J. Ref. No. 90-11-2-417/6

**CONTRACT**

THIS CONTRACT made and entered into this 7<sup>th</sup> day of June, 2012 by and between the City of St. Louis, Missouri, a municipal corporation, also referred to as "CITY" and the Cities of St. Charles, Missouri and St. Peters, Missouri, both Municipal corporations, also referred to herein as "PURCHASERS", witnesseth:

WHEREAS, the PURCHASERS are municipal corporations of the State of Missouri, and are authorized by their charters, or by state law, or by both to operate a municipal water system, and

Whereas, the PURCHASERS intend to continue their Joint Venture Agreement executed on October 2, 1985 for the duration of this CONTRACT with CITY, and

WHEREAS, the CITY is a municipal corporation of the State of Missouri, and is authorized by its charter to maintain waterworks for the furnishing of water to the CITY, its property, its inhabitants, and the places and people along or in the vicinity of the pipes, conduits, or aqueducts constructed or used for that purpose, and

WHEREAS, the Board of Aldermen of the CITY is further authorized to enter into contracts for the supply of water by the CITY and to sell water to persons, public and private, outside the CITY, on terms and conditions the Board of Aldermen finds appropriate, and

WHEREAS, the CITY is further authorized by its charter to enter into intergovernmental agreements for the performance of its duties or for the exercise of powers conferred upon it, and

WHEREAS, Section 70.220 of the Missouri Revised Statutes authorizes units of local government to enter into intergovernmental agreements for the performance of their duties or for the exercise of powers conferred upon them, and

WHEREAS, the CITY has determined that it is in the best interest of its rate payers for the CITY to enter into contracts for the sale of water, and

WHEREAS, the service and commodity provided by the CITY are a special contract service and are not provided by the CITY as a common utility service.

NOW THEREFORE, in consideration of these promises, it is mutually agreed:

**ITEM 1. NATURE OF SERVICE**

CITY agrees to furnish and sell and PURCHASER agrees to purchase water as needed as defined in ITEM 5 at an interconnecting point or points as defined in ITEM 4.

PURCHASERS recognize and agree that it is the duty of the CITY to furnish water at a normal volume and pressure to the CITY and its inhabitants before selling water to PURCHASERS. Historically, however, water sources available to the CITY have been more than sufficient to meet the CITY'S needs, and to provide water for sale to PURCHASERS and others.

CITY agrees to exercise reasonable diligence and foresight to repair, replace, and maintain its water system so as to provide the flow of water as defined in ITEM 5 herein at the point or points of the PURCHASERS' interconnection during the life of this CONTRACT. CITY also agrees that the supply of water to PURCHASERS' shall be reduced only in proportion to the extent the water supply to CITY customers is at the time, inadequate or curtailed. PURCHASERS further recognize and agree that no liability for damages are attached to the CITY hereinunder on account of its failure to accurately anticipate availability of water supply, or because of an actual failure of supply due to Acts of God or other occurrences beyond the reasonable control of the CITY.

**ITEM 2. PRICING**

The PURCHASERS agree to pay for water at a rate based on the CITY'S annual cost of production, as defined in Appendix A, attached hereto and made a part of this Contract, at the City of St. Louis Howard Bend Water Treatment Plant plus the cost of operation and maintenance of the Stacy Park Reservoir and interconnecting conduits, as verified by the CITY'S independent audit. In addition, the rate shall include a component for depreciation of existing Plant and of future capital investments when made by the CITY on these facilities plus Eighteen percent (18%) for return on investment. All audits shall be in accordance with the accounting principles set forth in Appendix A, attached hereto and made a part of this CONTRACT. Costs shall be determined in

accordance with Appendix B for each fiscal year by the CITY's Water Division, based on the number of gallons of water actually produced and expenses incurred at Howard Bend during that given year. In calculating these costs, should the percent of pumping for the year at Howard Bend be less than thirty-three percent (33%) of the total pumpage from the CITY's two treatment facilities, then the value of thirty-three percent (33%) of the total CITY pumpage shall be used in lieu of actual Howard Bend filtered water pumpage in Appendix B, Paragraph VIII, "Total Cost for Howard Bend Water Sales." These costs shall be the basis for determining the rate PURCHASERS will pay during the following calendar year. The applicable rate to be paid by the PURCHASERS shall be \$0.4967 per 100 cubic feet or \$0.6640 per 1000 gallons through December 31, 2012.

PURCHASERS shall have the right to conduct an independent annual audit of the above costs at its own expense. In the event of a dispute between CITY and PURCHASERS concerning audit results and/or the development of water pricing as described herein, the adjudication of such dispute shall be as defined in ITEM 9.

### **ITEM 3. PAYMENT**

PURCHASERS agree to pay the CITY on a monthly basis for all purchases of water under this CONTRACT. PURCHASERS agree that the City of St. Peters shall be billed and shall be responsible for payment of the bill to the CITY. St. Charles agrees to pay St. Peters its proportionate share of the bill. All purchases shall be billed monthly, within fifteen (15) days after rendition of service, and all such bills shall be due and payable without discount within thirty (30) days after date of bill. Should any bill remain unpaid for a period of thirty (30) days after written notice by the CITY to the PURCHASERS that the same is past due, and failure of the PURCHASERS to make such payment within the period of such notice, then the CITY may at its option and upon ten (10) days' written notice to the PURCHASERS, discontinue all service to the PURCHASERS and all bills then delinquent shall carry interest at the rate of ten percent (10%) per annum from the date due. Should a billing dispute arise between PURCHASERS and CITY, CITY agrees that it will not discontinue service during the period of good faith discussions and during any period in which PURCHASERS dispute of said billing is before an administrative or judicial body.

**ITEM 4. CONNECTIONS AND METERING**

Water supplied hereinunder by the CITY to PURCHASERS shall be supplied on CITY'S land, at a point or points of connection on CITY'S Howard Bend Plant property or on the CITY's treated water conduits between the Howard Bend Water Treatment Plant and the Stacy Park Reservoir. In order to permit said delivery:

CITY agrees at its own cost and expense to furnish, install and maintain all necessary meters to be located in facilities constructed or to be constructed by PURCHASERS within the limits of the Howard Bend Water Treatment Plant or on the CITY's right-of-way, at the PURCHASERS' sole cost and expense. PURCHASER has the right at all times to test the meter which registers the amount of water for which the CITY will bill

PURCHASERS. Should said meter test show that said meter is recording with less than ninety-eight percent (98%) accuracy (higher or lower), an adjustment shall be made to the billings to the PURCHASERS for the prior one-year period to either credit or debit the next billing to the PURCHASERS by the amount of the over or under billing.

PURCHASERS agree at its own cost and expense to furnish and install all pipe, valves, fittings and appurtenances necessary to connect its water distribution system with said connection point or points on the CITY'S system, and at its own cost and expense maintain all said pipe, valves, fittings and appurtenances located outside of the limits of the Howard Bend Water Treatment Plant. After inspection and acceptance by the CITY, all pipe, valves, fittings and appurtenances installed by PURCHASERS within the Howard Bend Treatment Plant shall become the property of and shall be maintained by the Water Division of the CITY, at the CITY's own cost and expense.

All pipe, valves, fittings and appurtenances installed within the Howard Bend Water Treatment Plant or on the CITY's right of way shall be designed and constructed in accordance with the recognized industry standards. CITY shall have the right to review and approve all contract plans and specifications of the pipe, valves, fittings and appurtenances installed within the Howard Bend Treatment Plant or on the CITY's right of way.

All work or construction to be performed or undertaken by PURCHASERS within the Howard Bend Water Treatment Plant or on the CITY's right of way between the Howard Bend



Water Treatment Plant and the Stacy Park Reservoir shall be subject to the supervision and prior written approval of the Water Commissioner of the CITY.

**ITEM 5. QUANTITY AND QUALITY OF WATER**

1. The CITY agrees to sell PURCHASERS water, but not to exceed a maximum supply rate of 31 million gallons per day, as PURCHASERS desire to purchase, except the CITY, upon recommendation and approval of the Water Commissioner, may sell to PURCHASERS a higher maximum supply rate.
2. Water supplied by the CITY to PURCHASERS shall meet the treated water quality standards of the Missouri Department of Natural Resources and / or United States Environmental Protection Agency, or such successor agency.
3. Water will be supplied by CITY to PURCHASERS at the pressure residual at the point of interconnection to the CITY'S metering. Pressure at the point of interconnection shall be maintained at 109 psi, minimum as measured in the discharge headers at the Howard Bend Plant.

**ITEM 6. COMMUNICATION BETWEEN CITY AND PURCHASERS**

In order to insure that PURCHASERS have adequate information relative to the operations of the CITY's Water Division, as a minimum, the following documents shall be provided to the PURCHASERS:

1. A portion of the Annual Audit concerning Howard Bend and Stacy Park operations.
2. A portion of the Annual Audit concerning Supply and Purifying allocated management, Power and Pumping allocated management, and Administrative and Finance Cost allocated to Supply and Purification and Power and Pumping.
3. Monthly operating reports consisting of all reports submitted to the State of Missouri Department of Natural Resources and which relate to finished water quality; and
4. Other pertinent documents as mutually agreed.

**ITEM 7. EFFECTIVE DATE OF CONTRACT**

This contract for the sale of water, subject to ITEM 8.1, shall be in full force and effect for a period of thirty (30) years from and after the completion of the existing water purchase agreement that is set to expire on December 26, 2015. PURCHASERS, in the event the CITY

does not give notice as provided in ITEM 8.1 to terminate this Contract, shall thereafter have successive options of extending the Contract for four (4) additional periods of ten (10) years each from the end of the above period, upon six (6) months prior notice to the CITY.

**ITEM 8. TERMINATION**

1. CITY has the right and option to cancel and terminate this CONTRACT upon expiration of the thirty (30) year period or any of the ten (10) year extensions and thereafter all rights and obligations hereunder shall cease, provided CITY provides PURCHASERS three (3) or more years notice of such decision to cancel and terminate upon expiration.
2. The PURCHASERS shall have the right and option, upon one (1) or more years written notice to the CITY, to cancel and terminate this CONTRACT, and thereafter all rights and obligations hereunder shall cease.

**ITEM 9. THIRD PARTY AUDIT**

In the event of disagreement concerning audit results, and/or the calculations necessary for ITEM 2, the parties agree to submit the matter to binding determination to a mutually agreed upon nationally recognized accounting firm not previously engaged in the audit. In the event of inability to mutually agree on any such firm, said firm shall be selected by lot from each party's single nominee.

**ITEM 10. DISPUTES OR CLAIMS**

It is expressly understood between the parties that any disputes or claims arising out of this CONTRACT, other than described in ITEM 9, resulting in a cause of causes of action, shall only be brought in the Missouri Circuit Court, Twenty-Second Judicial Circuit, the City of St. Louis.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first above written.

IN WITNESS WHEREOF, the parties hereunto have executed this Agreement as of the day and year first above written.

CITY OF ST. LOUIS, MISSOURI

BY Fernand May  
Mayor

CITY OF ST. LOUIS, MISSOURI

BY Darlene Green  
Comptroller

Approved as to Form:

Patricia  
City Counselor

Attest: Terrie May  
City Register

CITY OF ST. CHARLES, MISSOURI 5-1-12

BY Sally A. Faith  
SALLY A. FAITH Mayor

By [Signature]  
City Clerk

CITY OF ST. PETERS, MISSOURI

By [Signature]  
Mayor

By Patricia E. Smith  
City Clerk

COMPTROLLER'S OFFICE  
DOCUMENT NUMBER 164162

APPENDIX A  
SUMMARY OF ACCOUNTING POLICIES

- I. Revenues and expenses of the St. Louis City Water Division must be reported in accordance with generally accepted accounting principles.
- II. Direct costs to be included:
  - A. Direct costs of Supply and Purification at the Howard Bend Plant to be summarized as follows:
    1. Labor – actual wages and fringes associated with employees working full time at the Howard Bend Plant.
    2. Support Services – actual water division costs for services provided directly to Supply and Purification at Howard Bend Plant.
    3. Chemicals – actual costs of chemicals utilized at Howard Bend Plant.
    4. Other materials and services – actual cost of materials and services utilized at Howard Bend Plant.
  - B. Direct costs of power and pumping section at Howard Bend Plant to be summarized as follows:
    1. Labor – actual wages and fringes associated with employees working full time at the Howard Bend Plant.
    2. Support Services – actual Water Division costs for services provided directly to Power and Pumping at the Howard Bend Plant.
    3. Power – cost of power for actual pumping at the Howard Bend Plant.
    4. Other materials and services – actual cost for materials and services utilized at the Howard Bend Plant.
  - C. Depreciation of Howard Bend Facilities and Stacy Reservoir Facilities – Amount should be equal to the actual amounts recorded in the accounting records of the water division for these facilities. Depreciation will be calculated under the straight line method utilizing the following useful lives:
    1. Building and Improvements – 50 years.
    2. Pumping Equipment – 33 years.
- III. Allocated costs to be included –
  - A. General Office Expenses –
    1. One third of Supply and Purification general office expense. Charges to this expense category are wages and fringes for the staff that oversees the Supply and Purification function at the Howard Bend Plant and Chain of Rocks Plant and related miscellaneous expenses.
    2. One third Power and Pumping general office expense. Charges to this expense category are wages and fringes for the staff that oversees the Power and Pumping function at Howard Bend and Chain of Rocks and related miscellaneous expense.
  - B. Administration and Finance Expense –
    1. Costs will be allocated by taking one third of the ratio of the total labor costs in Supply and Purification and Power and Pumping to the total labor costs in Supply and Purification, Power and Pumping, Transmission and Distribution, and Customer Accounting and applying this factor to certain Administration and Finance expenses.
    2. Certain Administration and Finance expenses in (1) above include the following:

- a. Labor – actual wages and fringes for employees working in the Administration and Finance Section of the Water Division.
  - b. Workers' Compensation – Workers' Compensation insurance for all employees of the Water Division.
  - c. Support Services – Only those support services directly for the operation of the Administration and Finance Section of the Water Division.
  - d. City Services – City of St. Louis costs allocated to the Water Division according to the "Central Service Cost Allocation Plan." This plan allocates City of St. Louis expenses to various city departments, including the Water Division, based upon each department's relative use of that city service. This allocation must be deemed fair by the Water Division's Certified Public Accountant.
  - e. Other Services and Miscellaneous – charges for utilities, telephone, supplies and other miscellaneous expenses of operating the Administration and Finance Section.
3. Administration and finance expenses specifically excluded from the costs in (2) above are charges for Judgments, Bad Debt Expense and Support Services not directly for the operation of the Administration and Finance Section of the Water Division.
- C. Stacy Reservoir Costs –
1. The City of St. Louis has two reservoirs, Compton and Stacy. The Cities of St. Peters and St. Charles will be served by the Stacy Reservoir. The costs of maintenance of the above reservoirs are not recorded separately by specific reservoir in the City's accounting records.
  2. As a result of the situation in (1) above one half of these costs will be included in the formula.
- IV. Return on Investment – calculated by taking the sum of costs in II and III above, times 18%. This amount includes any and all taxes to be paid to both the Water Division and the City of St. Louis.
- V. St. Peters and St. Charles cost per 1000 gallons – calculated by totaling items II, III, and IV above and dividing this total cost by the actual total gallons of filtered water pumped at Howard Bend including water pumped to St. Peters/St. Charles.
- VI. Specifically excluded costs included the following:
- A. Transmission and Distribution costs.
  - B. Customer Accounting costs.
  - C. Debt Service.
  - D. Any other cost item not specifically included in II, III, or IV above.
- VII. See Appendix B as an example of the above formula for Fiscal Year 2011.
- VIII. The costs per 1000 gallons purchased should be calculated on expenses for years ending June 30, and audited by the Water Divisions' Certified Public Accountant. The cost so calculated will become effective for the subsequent calendar year.
- IX. The Audit Report of the Water Division for the years ending June 30 should separately state the following (as previously defined):
- A. Direct costs of Supply and Purification – Howard Bend.

- B. Direct costs of Power and Pumping – Howard Bend.
  - C. General Office Expenses – Power and Pumping.
  - D. General Office Expenses – Supply and Purification.
  - E. Reservoir Maintenance Expenses.
  - F. Support services charged to Administration and Finance that are directly related to the operation of the Administration and Finance Section of the Water Division.
  - G. Labor Cost used to calculate percent allocation in III B. 1. above.
- X. Water Division personnel will furnish interim Financial Statement information equivalent to that included as Appendix B of this agreement on a quarterly basis.
- XI. St. Peters/St. Charles reserve the right to audit the Water Division records at their own expense.

DETERMINATION OF COST PER M.G. FOR FILTERED WATER PUMPED AT HOWARD BEND FY 2011	FISCAL YEAR ENDING June 30, 2011 EXPENSES	PERCENTAGE CALCULATION OF EXPENSES	ACTUAL COST COLUMN 1 X COLUMN 2
=====			
<b><u>I. PLANT OPERATING EXPENSE - SUPPLY &amp; PURIFYING</u></b>			
a) Howard Bend Plant Labor (Exhibit B-5 & B-6)			
1. Laboratory	\$ 413,253.11	100.00%	\$ 413,253.11
2. Support Services (Service Building)	\$ 1,009,491.86	100.00%	\$ 1,009,491.86
3. Coagulant House	\$ 679,574.27	100.00%	\$ 679,574.27
4. Filter Plant	\$ 869,463.90	100.00%	\$ 869,463.90
5. Plant Office (Personnel Services)	\$ 99,678.70	100.00%	\$ 99,678.70
b) Chemicals	\$ 2,144,654.31	100.00%	\$ 2,144,654.31
c) Miscellaneous Supplies, Materials & Services	\$ 672,027.73	100.00%	\$ 672,027.73
Total	\$ 5,888,143.88		\$ 5,888,143.88
<b><u>II. PLANT OPERATING EXPENSE - POWER &amp; PUMPING SECTION</u></b>			
a) Howard Bend Plant Labor			
1. Primary Pumping	\$ 226,758.23	100.00%	\$ 226,758.23
2. High Service Pumping	\$ 313,149.16	100.00%	\$ 313,149.16
b) Power Cost			
1. Primary Pumping (Exhibit B-10)	\$ 132,067.60	100.00%	\$ 132,067.60
2. High Service Pumping (Exhibit B-11)	\$ 945,862.50	100.00%	\$ 945,862.50
c) Miscellaneous Supplies, Materials & Services	\$ 489,350.42	100.00%	\$ 489,350.42
Total	\$ 2,107,187.91		\$ 2,107,187.91
<b><u>III. GENERAL OFFICE ALLOCATION</u></b>			
a) Supply & Purifying Section allocated management. These personnel have offices at the Chain of Rocks Plant. From Exhibit B-4: Total General Office =	\$ 685,219.46	33.00%	\$ 226,122.42
Based on the Howard Bend Plant being 1/3 of the Total Capacity of Howard Bend and Chain of Rocks allocate 1/3 of the General Office cost to Howard Bend:			
b) Power and Pumping allocated management cost. These Personnel have offices at the Chain of Rocks Plant. From Exhibit B-9: Total General Office =	\$ 834,040.82	33.00%	\$ 275,233.47
Total	\$ 1,519,260.28		\$ 501,355.89

DETERMINATION OF COST PER M.G. FOR  
 FILTERED WATER PUMPED AT HOWARD BEND  
 FY 2011

FISCAL YEAR ENDING	PERCENTAGE	ACTUAL COST
June 30, 2011	CALCULATION	COLUMN 1
EXPENSES	OF EXPENSES	X COLUMN 2

IV. ADMINISTRATIVE AND FINANCE COST

Total Administrative and finance Cost Exhibit B-2 allocate a portion for Supply and Purification and Power and Pumping sections.

See Exhibit B-1 (Operating Expenses)

a) Personnel Services	\$ 970,427.64	16.35%	\$ 158,647.41
b) Workers Compensation (Expenses with Human Resourc	\$ -	0.00%	\$ -
c) Supplies, Materials, Other Services & Other Charges	\$ 289,627.11	16.35%	\$ 47,348.81
d) City Services	\$ 751,659.00	16.35%	\$ 122,882.68
e) Judgements	\$ 287,889.45	0.00%	\$ -
g) Bad Debts	\$ 871,814.31	0.00%	\$ -
g) Support Services-Directly Related To A & F	\$ 537,087.65	16.35%	\$ 87,804.14
<b>Total</b>	<b>\$ 3,708,505.16</b>		<b>\$ 416,683.03</b>

S & P Plus P & P

S & P + P & P + T & D + C & A

Therefore allocate cost of the Administrative & finance Sections Cost to the Supply & Purifying and Power and Pumping Sections. Based on Total Budgeted payroll Positions for fiscal Year 2010 - 2011. Allocate 1/3 of this 49.04% amount to the Howard Bend Plant.

V. DEPRECIATION EXPENSES

a) Howard Bend Plant			
1. Buildings & Structures	\$ 185,754.84	100.00%	\$ 185,754.84
2. Heating Boiler	\$ 3,157.95	100.00%	\$ 3,157.95
3. Pumping Equipment - Part of Building	\$ 41,486.05	100.00%	\$ 41,486.05
4. Pumping Equipment - Pumps Valves Switch Gear	\$ 114,344.40	100.00%	\$ 114,344.40
5. Purification Equipment - Basins	\$ 170,256.34	100.00%	\$ 170,256.34
6. Laboratory Equipment	\$ 79,757.40	33.00%	\$ 26,319.94
b) Stacy Park Reservoir			
1. All Structures in Service other than below	\$ 79,428.61	100.00%	\$ 79,428.61
3. New Roof on North Half	\$ 59,415.94	100.00%	\$ 59,415.94
4. New Roof on South Half	\$ 60,548.16	100.00%	\$ 60,548.16
<b>Total</b>	<b>\$ 794,149.69</b>		<b>\$ 740,712.23</b>

VI. STACY PARK RESERVOIR EXPENSES

Maintenance and Operation cost (See Exhibit B-4) take indicated Percentage of Reservoir Cost.

a) Supplies, Materials, Other Services & Support Services	\$ 27,422.76	100.00%	\$ 27,422.76
b) City Services (Reservoir Cost Centers now Split)	\$ -	0.00%	\$ -
<b>Total</b>	<b>\$ 27,422.76</b>		<b>\$ 27,422.76</b>

\$ 9,681,505.71



DETERMINATION OF COST PER M.G. FOR FILTERED WATER PUMPED AT HOWARD BEND FY 2011	FISCAL YEAR ENDING June 30, 2011 EXPENSES	PERCENTAGE CALCULATION OF EXPENSES	ACTUAL COST COLUMN 1 X COLUMN 2
=====			

VII. RETURN ON INVESTMENT

Return on equity of the City of St. Louis:	18.00%	\$ 1,742,671.03
--	--------	-----------------

a) Calculated by taking the subtotal of costs above times 18%. This amount includes any and all taxes to be paid to both the Water Division and the City of St. Louis.

<u>VIII. TOTAL COST FOR HOWARD BEND WATER SALES</u>	=====
	\$ 11,424,176.73

Filtered Water Pumped in Million Gallon Units	17,204.00	\$664.0419
Cost Per 1000 Gallon Units		\$0.6640
Cost Per 100 Cubic Foot Units		\$0.4967

Filtered Water Pumped Howard Bend Plant	17,204.00	39.69%
Filtered Water Pumped Chain og Rocks Plant	26,141.00	Percent of
Total Pumping in M. Gallon Units	43,345.00	Pumping for Howard Bend

# EXHIBIT 2

United States and the State of Missouri v. Union  
Electric Company d/b/a Ameren Missouri, 22-cv-1038,  
D.J. Ref. No. 90-11-2-417/6



# Monitored Natural Attenuation Evaluation of a Downgradient Plume

**Jessie Goodwin, P.E.**  
**Senior Engineer**  
**Geotechnology**

# Outline

- Site History
- MNA Overview
- MNA System
- Lines of Evidence
- Conclusions

# Site History: Source Area

- Beginning in 1962, the source industrial facility reprocessed heat transfer fluids, hydraulic fluids, solvents, and catalysts
  - Process fluids contained PCBs and VOCs, which were released to the environment (soils and groundwater)
- Late 1970s: PCB handling was reported to USEPA
- Late 1980s: Remedial investigation of source area
- 1991: Begin pump and treat at source area
- Contaminated soils removed in early 2000s

# Site History: Downgradient Plume

- 2001: Downgradient plume to be addressed separately from source area
- 2005: Institutional controls and MNA selected as remedy for the downgradient plume

# MNA Overview

- Monitored Natural Attenuation
  - Physical, Chemical, and Biological Processes
  - Reduce mass, volume, or concentration of contaminants
  - Transport, absorption, biodegradation, volatilization

# MNA Overview

- Reductive dechlorination of perchloroethene (PCE)
  - Produces trichloroethene (TCE), dichloroethene (DCE), vinyl chloride (VC), ethene, and chloride (Cl)



MCLs: PCE: 5 ppb

TCE: 5 ppb

cis-1,2-DCE: 70 ppb

VC: 2 ppb



# MNA System

- 14 perimeter compliance point monitoring wells
- 5 plume interior monitoring wells
- Designated domestic wellfield wells
- Effluent from the domestic water system

# cis-1,2-Dichloroethene Plume Map



## LEGEND

- Well of Domestic Well Field
- ▲ OU1/OU3 Monitoring Well

## cis-1,2-DCE Concentration - MCL = 70 ppb



# Vinyl Chloride Plume Map



## LEGEND

- Well of Domestic Well Field
- ▲ OU1/OU3 Monitoring Well

## Vinyl Chloride Concentration - MCL = 2 ppb



# Lines of Evidence

- Declining PCE and TCE concentrations in the source area
- Parent products are not present in downgradient plume
- Daughter products are present in downgradient plume
- Vinyl chloride is present at the farthest reaches of the plume



# Lines of Evidence

- Presence of methane, ethane, ethene, and chloride
- Presence of Dehalococcoides
  - Dechlorinating microbe
- Oxidation Reduction Potential (ORP, Redox)
  - Negative Values = anaerobic

Reductive Dechlorination Optimal Range = -100 mV to -250 mV



# Lines of Evidence: Geochemistry

- Organic carbon
  - Energy source for bacteria
- Sulfate
  - Sulfate reducing bacteria can replace Cl with H, using  $\text{SO}_4^{2-}$
- Ferrous Iron (Iron II) and Carbon dioxide
  - Iron reducing bacteria can replace Cl with H, producing  $\text{CO}_2$



# Lines of Evidence

Parameter	Range	Value	Assessment	Score
Oxygen	< 0.5 mg/L	3	Yes	3
Oxygen	> 5 mg/L	-3	No	0
Nitrate	< 1 mg/L	2	Yes	2
Iron II	> 1 mg/L	3	Yes	3
Sulfate	< 20 mg/L	2	No	0
Sulfide	> 1 mg/L	3	Not Tested	---
Methane	< 0.5 mg/L	0	Yes	0
BTEX	> 0.1 mg/L	2	Yes	2
PCE	as released	0	No	0
TCE	as released	0	No	0
TCE	daughter product	2	No	0
DCE	as released	0	No	0
DCE	daughter product	2	Yes	2
VC	as released	0	No	0
VC	daughter product	2	Yes	2
1,1,1-Trichloroethane	as released	0	No	0
DCA	daughter product	2	Yes	2
Carbon Tetrachloride	as released	0	No	0
Chloroethane	daughter product	2	No	0
Ethene/Ethane	> 0.01 mg/L	2	(Yes)	---
Ethene/Ethane	> 0.1 mg/L	3	Yes	3
Chloroform	as released	0	No	0
Chloroform	daughter product	2	No	0
Dichloromethane	as released	0	No	0
Dichloromethane	daughter product	2	No	0
<b>Total Score</b>				<b>22</b>

## Interpretation:

0 to 5: Inadequate evidence for anaerobic biodegradation of chlorinated organics.

6 to 14: Limited evidence for anaerobic biodegradation of chlorinated organics.

15 to 20: Adequate evidence for anaerobic biodegradation of chlorinated organics.

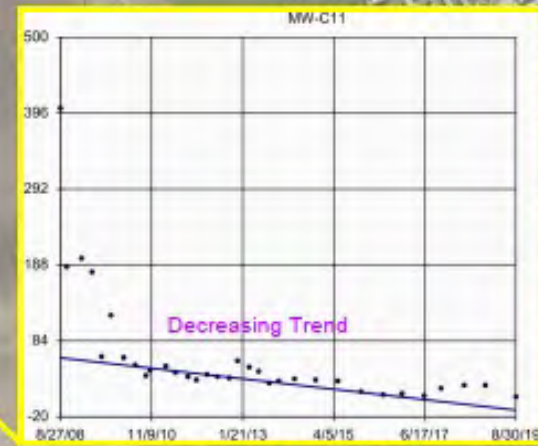
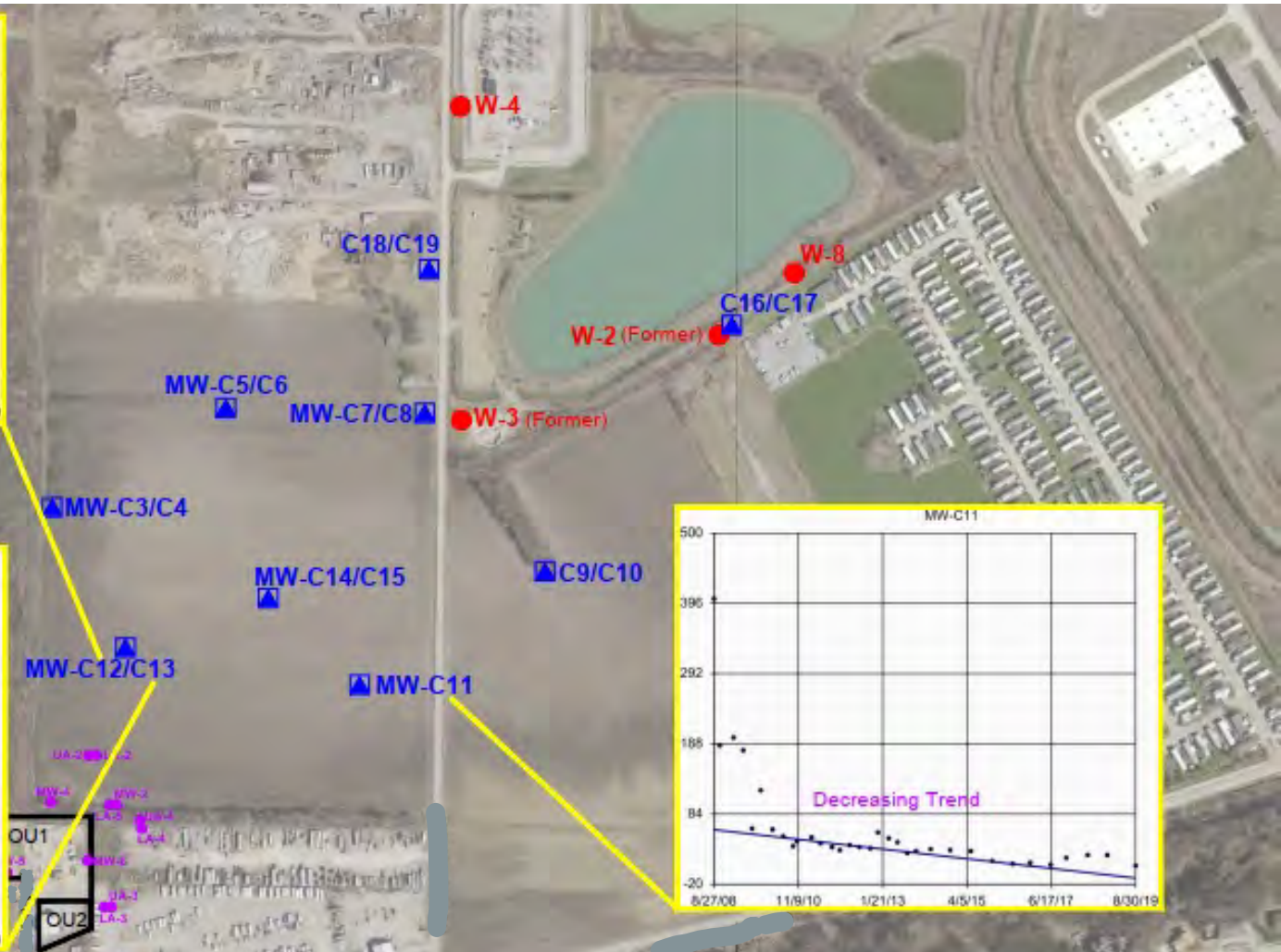
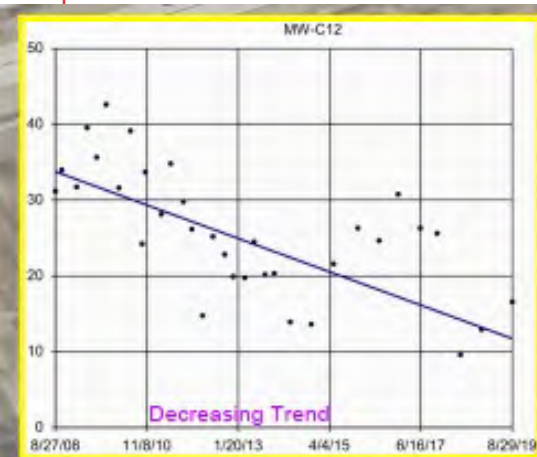
> 20: Strong evidence for anaerobic biodegradation of chlorinated organics.

# Lines of Evidence: Trend Analysis

- Benzene
  - Decreasing at two wells
- Cis-1,2-Dichloroethene
  - Decreasing at two wells
  - Increasing at one well
- Vinyl Chloride
  - Decreasing at two wells
  - Increasing at one well
  - Not trending at three wells



# cis-1,2-Dichloroethene Trends



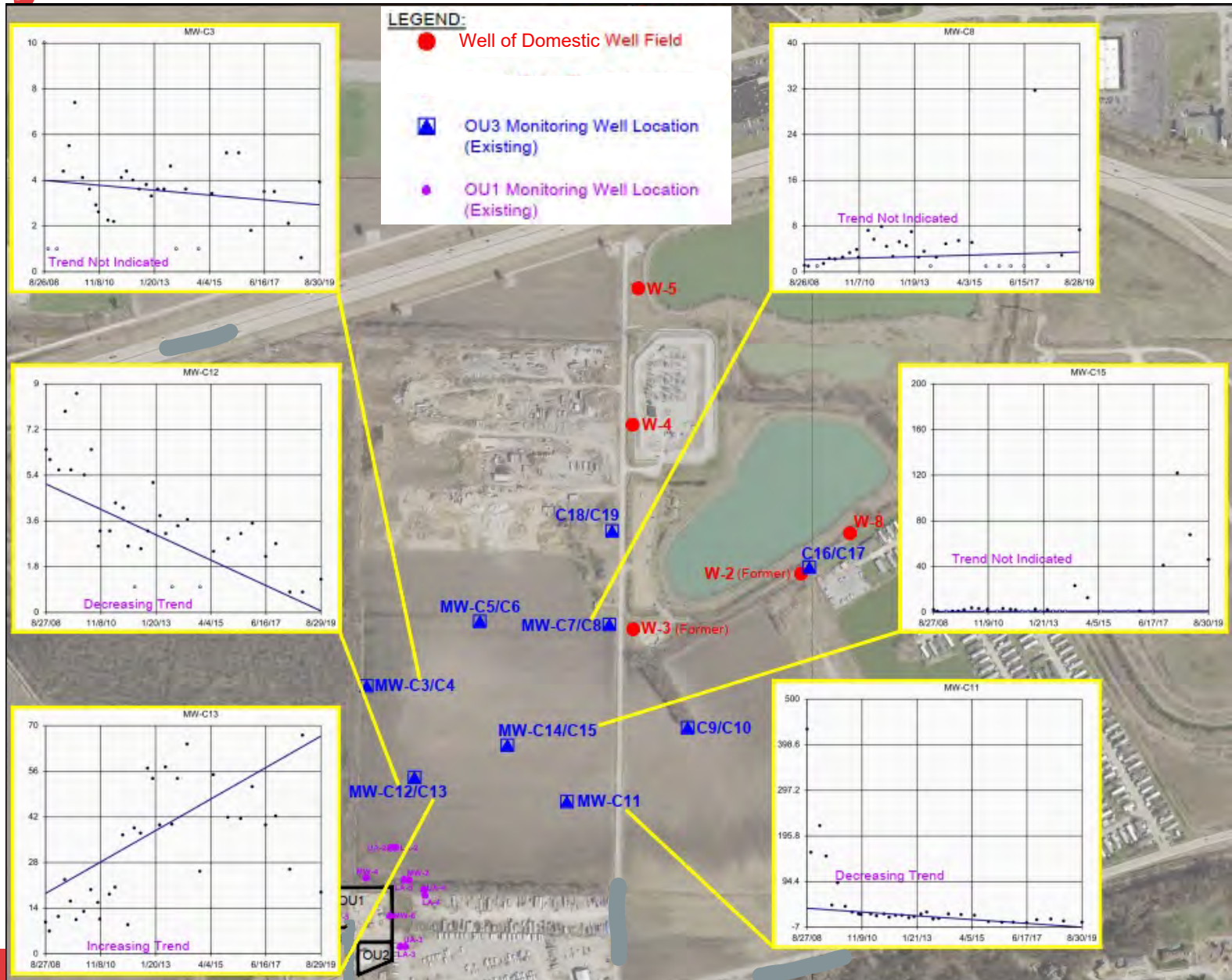
**LEGEND:**

● Well of Domestic Well Field

▲ OU3 Monitoring Well Location (Existing)

● OU1 Monitoring Well Location (Existing)

# Vinyl Chloride Trends



# Conclusions

- A release of PCE and TCE generated a downgradient plume of daughter products
- The selected remedy for the downgradient plume was MNA
- Several lines of evidence support that MNA continues at the site
  - Trends of daughter products
  - Geochemical conditions
  - Presence of dechlorinating bacteria





# GEOTECHNOLOGY INC

FROM THE GROUND UP



# EXHIBIT 3

United States and the State of Missouri v. Union  
Electric Company d/b/a Ameren Missouri, 22-cv-1038,  
D.J. Ref. No. 90-11-2-417/6

*From: Daniel Mann <[Daniel.Mann@stcharlescitymo.gov](mailto:Daniel.Mann@stcharlescitymo.gov)>  
Sent: Friday, April 8, 2022 7:36 PM  
To: Real Estate Permits ROW <[RealEstatePermitsROW@ameren.com](mailto:RealEstatePermitsROW@ameren.com)>  
Cc: Public Works <[Public.Works@stcharlescitymo.gov](mailto:Public.Works@stcharlescitymo.gov)>  
Subject: [EXTERNAL] RE: Permit Request J02JR*

*EXTERNAL SENDER STOP.THINK.QUESTION.  
Verify unexpected requests before opening links or attachments.*

---

*To Whom it May Concern –*

*This permit is denied. No work shall commence prior to issuance of a work permit.*

*Sincerely,*

*Dan Mann, P.E. | Assistant City Engineer  
Department of Engineering  
City of Saint Charles, MO  
O:636-949-3229 | M: 314.728.0517 | [daniel.mann@stcharlescitymo.gov](mailto:daniel.mann@stcharlescitymo.gov)*

# EXHIBIT 4

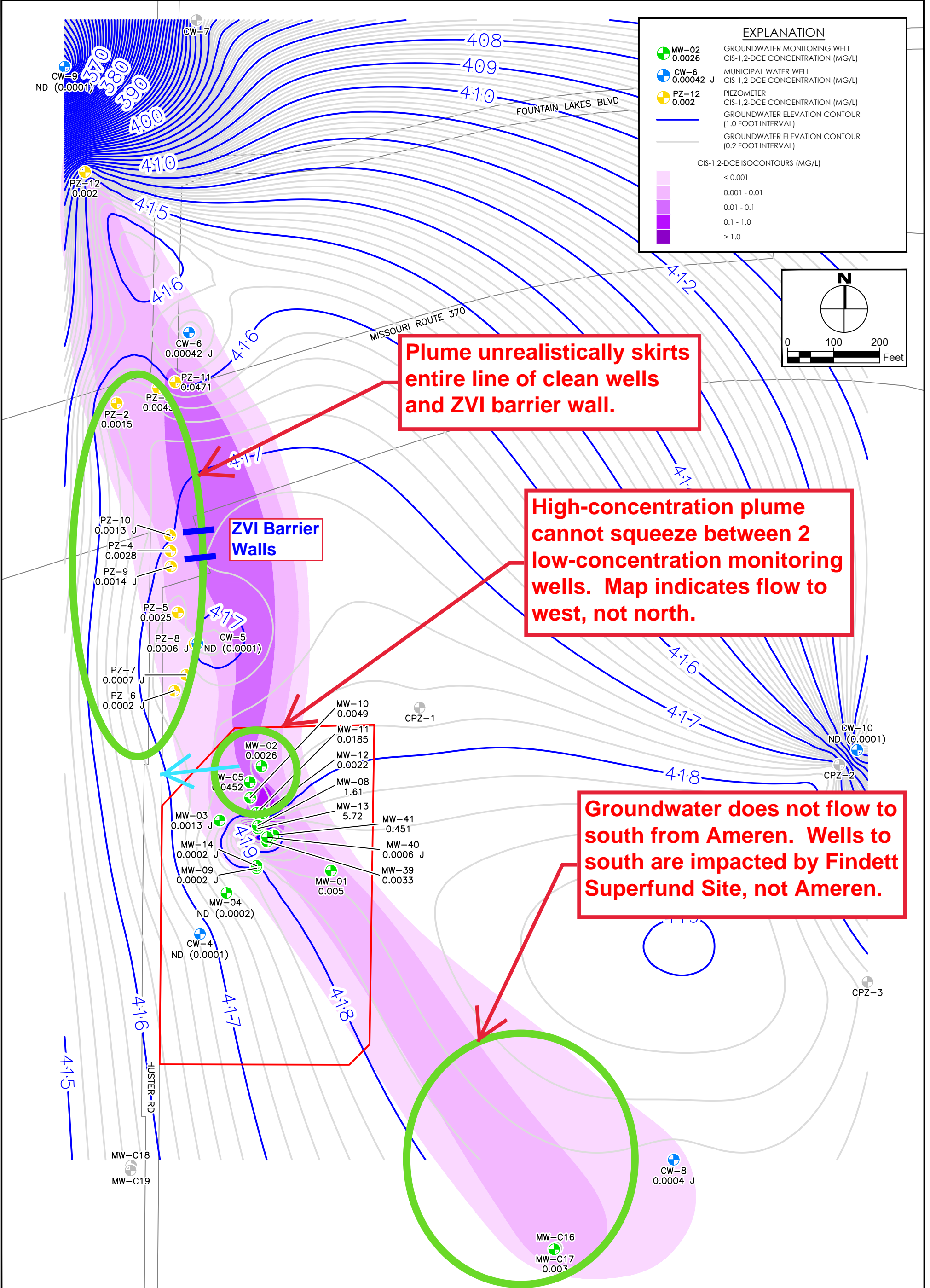
United States and the State of Missouri v. Union  
Electric Company d/b/a Ameren Missouri, 22-cv-1038,  
D.J. Ref. No. 90-11-2-417/6

Location:	Mozel	PZ-11				CW-6												
	Analytical Date:	06/28/12	01/14/22	05/27/22	09/01/22	10/14/22	01/14/22	05/27/22	09/01/22	10/14/22	-	05/27/22	09/01/22	10/14/22	-	05/27/22	09/01/22	10/14/22
Depth Sampled:	N/A	40'				45'				70'			90'					
Analyte	Concentration (mg/L)	Concentration (ug/L)				Concentration (ug/L)				Concentration (ug/L)			Concentration (ug/L)					
1,1-Dichloroethane																		
1,1-Dichloroethene				0.4 J	0.4 J													
1,2,3-Trimethylbenzene	5800 J																	
1,2,4-Trimethylbenzene	10700											0.1 J						
1,3,5-Trimethylbenzene	3900 J																	
<b>2-Butanone</b>							<b>1.2 J</b>				<b>0.6 J</b>	<b>2.4</b>			<b>0.7 J</b>			
<b>4-Methyl-2-pentanone</b>						<b>0.6 J</b>		<b>11</b>	<b>19.3</b>			<b>14</b>	<b>20.6</b>					
Acetone			4.8 J			25.1 B		3.5	5.3 J			8.6 J	5.4 J				2.5 J	
<b>Benzene</b>				<b>0.4 J</b>														
cis-1,2-Dichloroethene		19.3	46.4	147	170	2.2		0.3 J	0.4 J		0.3 J	0.2 J			0.3 J	0.4 J	0.6 J	
<b>Ethylbenzene</b>						<b>0.1 J</b>	<b>1.0 J</b>	<b>2.4</b>			<b>0.1 J</b>	<b>2.8</b>	<b>3.3</b>			<b>0.3 J</b>	<b>0.2 J</b>	
<b>Isopropylbenzene</b>									<b>0.7 J</b>			<b>0.1 J</b>	<b>0.7 J</b>					
<b>m,p-Xylenes</b>					<b>0.2 J</b>	<b>0.5 J</b>	<b>0.9 J</b>	<b>7.1</b>	<b>11.7</b>		<b>0.2 J</b>	<b>8.9</b>	<b>12</b>			<b>0.8 J</b>	<b>0.6 J</b>	
n-Butylbenzene	10800																	
<b>o-Xylene</b>					<b>0.1 J</b>	<b>0.4 J</b>	<b>2.0</b>	<b>7.9</b>	<b>12.5</b>		<b>0.4 J</b>	<b>10</b>	<b>12.1</b>		<b>0.1 J</b>	<b>0.9 J</b>	<b>0.6 J</b>	
Tetrachloroethene	183000							0.2 J	0.2 J	0.3 J		0.3 J	0.4 J					
<b>Tetrahydrofuran</b>			<b>3.6 J</b>					<b>2.0 J</b>			<b>0.9 J</b>	<b>2.2 J</b>			<b>1.2 J</b>			
<b>Toluene</b>				<b>0.2 J</b>				<b>0.2 J</b>	<b>0.1 J</b>			<b>0.2 J</b>	<b>0.1 J</b>					
trans-1,2-Dichloroethene			0.1 J	0.4 J	0.5 J													
Trichloroethene																		
Vinyl chloride		18.4	29.2	57.4	53.8	1.1									1.1 J	1.0	1.6	



# EXHIBIT 5

United States and the State of Missouri v. Union Electric  
Company d/b/a Ameren Missouri, 22-cv-1038, D.J. Ref. No.  
90-11-2-417/6



TITLE:	FIGURE 1. CIS-1,2-DICHLOROETHENE PLUME MAY 2022	1" = 200' SCALE.	21-011-03 PROJECT NO.	09/26/22 DATE.
SITE:	CITY OF ST. CHARLES POTABLE WELL FIELD ST. CHARLES, MISSOURI	NTM DRAWN.	TAA CHECKED.	REV. 1 REVISION.

2021 Auburn Avenue  
Third Floor Suites  
Cincinnati, Ohio 45219