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LETTER OF TRANSMITTAL

DATE : October 6, 2023

TO : Ms. Jennifer Meyer
Wisconsin Department of Natural Resources
Southeast Region – Milwaukee Service Center
1027 West St. Paul Avenue
Milwaukee, WI 53233

FROM : Sameer Neve, Ph.D., ENV SP | Staff Environmental Engineer

SUBJECT : Column Sealing Options Report for CWC-East Block

Column Sealing Option Report
Community Within the Corridor – East Block
2748 N. 32nd Street, Milwaukee, WI 53210
BRRTS #: 02-41-263675, FID #: 241025400

COPY TO : 40441B -> Outbox -> 20231004 - Column Sealing Options

We are:

☒ Attaching ☒ Submitting As Requested

Copies	Date	Description
1	10/04/2023	Column Sealing Option Report – CWC East Block (submitted electronically)
1	10/06/2023	$700 check for Technical Assistance Fee

Transmitted For Your:

☐ Information/Records ☒ Review ☒ Approval
☐ Action ☐ Revision/Resubmittal ☐ Distribution

Remarks:
Should you have any questions regarding this submittal or require any additional information, please feel free to contact me via email at sneve@ksinghengineering.com or telephone at (262) 821-1171, ext. 104.

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October 4, 2023

Ms. Jennifer Meyer
Remediation and Redevelopment Program
Wisconsin Department of Natural Resources
1027 West St. Paul Avenue
Milwaukee, WI 53233

Project # 40441B

Subject: **Column Sealing Option Report**
Community Within the Corridor – East Block
2748 N. 32nd Street, Milwaukee, WI 53210
BRRTS #: 02-41-263675, FID #: 241025400

Dear Ms. Meyer:

On behalf of the Community Within the Corridor Limited Partnership (CWC), K. Singh & Associates, Inc. (KSingh) is pleased to submit a Column Sealing Options Report for WDNR's review.

The purpose of this memorandum is to summarize the findings of the monitoring of Trichloroethylene (TCE) vapors diffusing through the cracks of the wooden columns at the Community Within the Corridor (CWC) site and suggest recommendations for next steps. Also, a study was conducted to prepare a biochar-alginate mix which is proposed to mitigate the migration of TCE vapors through the wooden columns in the living space. This study was shared earlier in the Biochar Investigation Report submitted to WDNR on August 24th, 2023. KSingh requests that the WDNR review this report and grant approval to proceed with sealing of the columns using biochar. A Technical Assistance Fee in the amount of $700 is attached with this letter.

Gas Chromatograph (GC) Analysis

Air samples were collected from the cracks or holes in the wooden columns in various areas of the site including the garage area, hallways, utility units, and residential units. The tip of the sampling syringe was inserted in the small opening of the crack to ensure there was no significant exchange of air. The sample was analyzed through a portable GC. The locations of the 94 columns are shown in Figure 1 and the comprehensive data is reported in Table 1. Calibration samples were run prior to operating the GC on the days the samples were collected and the results are referenced in Table 1.

Table 2 shows the historical data trend for selective units that were tested for TCE from the cracks in the columns. The active Vapor Mitigation System has been instrumental in leading to significant improvement in the levels of TCE migrating through the wooden columns. The existing excavation work appears to have resulted in a temporary spike in the values in Unit 1049 that is likely to go down once the contaminated soil is excavated and is filled with a clean structural fill.

Data Analysis and Sealing Options for Columns

As shown in Figure 2 below, out of the 94 columns that were sampled:

- 83% had no detection of TCE
- 12% detected some levels of TCE
- 5% were above the Vapor Action Levels (VALs) of 2.1 $\mu g/m^3$

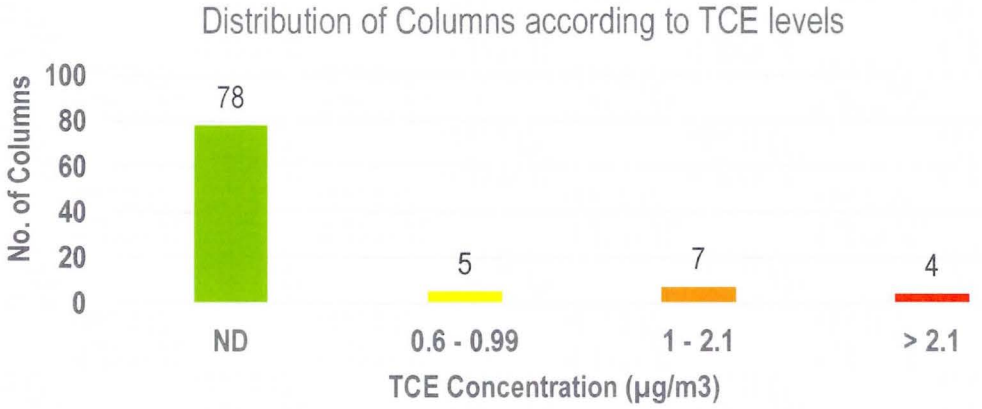


Figure 2. Distribution of Columns according to TCE levels

As seen in Figure 1, all the 16 columns with detections were found in the area that was reported to be a hotspot due to high sub-slab vapor TCE readings or residual contamination. Only 4 out of 94 columns had a TCE concentration exceeding 2.1 µg/m^3. The sealing of these columns would prove to be supplemental to all the other remedial action tasks being conducted. As an additional safeguard, we are also proposing the sealing of 12 columns that had some detection of TCE. This comprehensive approach underscores our commitment to mitigating any potential risks associated with TCE exposure in living spaces. It is proposed that the column sealing operation be conducted in three stages:

- Stage 1: Seal the 4 columns with the values above VALs which are in Units 1049 (1 Column), 1045 (2 Columns), and 1043 (1 Column).
- Stage 2: Seal the 7 columns with the values between 1 and 2.1 µg/m^3 which are in Units 1055 (1 Column), 1053 (2 Columns), 1052 (1 Column), 1050 (1 Column), and 1044 (2 Columns).
- Stage 3: Seal the 5 columns with the values between 0.6 and 1 µg/m^3 which are in Units 1054 (1 Column), 1048 (1 Column), 1043 (2 Column), and the Southwest Garage (1 Column).

As per the previously submitted report to the WDNR, a 15%(w/w) biochar-alginate mix is proposed to be used to seal the cracks in the columns. In order to ensure a proper seal and fill the larger gaps between the wooden columns and supporting steel columns, use of a caulking mix or a putty is proposed. Once all the openings are filled, a fresh coat of paint will be applied to mitigate diffusion of any vapors in the living space.

Proposed Schedule

The proposed schedule for sealing of columns is as follows:
October 16 – 20, 2023: Sealing in Units 1043, 1044, 1045, 1048, and 1049
October 23 – 27, 2023: Sealing in Units 1050, 1052, 1053, 1054, 1055, and SW Garage

Conclusions and Recommendations

The following conclusions were drawn based on the results of this study:

- Biochar application of 15% (w/w) offers an opportunity to adsorb TCE vapors in the columns thereby minimizing the transport of TCE to reach the living spaces.
- Out of the 94 columns on Level 1, less than 5% of them have TCE over the VAL indicating that the migration of TCE through columns into the living space is not a serious concern.
- The Biochar-Alginate Gel is proposed to be applied to the columns in three stages based on the concentration of TCE detected.

- This application will provide an additional safeguard to the already existing VMS systems to attenuate the TCE vapors from entering the living spaces.
- Because of the black color of the mix, the columns may not look aesthetically pleasing. Additionally, the gaps between the wooden columns and the steel support can be filled using a caulking mix or a putty. A fresh coat of paint over the columns would help alleviate this condition.
- Performance evaluation of the sealing option would include periodic inspection of columns and air sampling near the surface of the columns on a quarterly basis for the first year and semi-annual basis from the following year.

Closing

We request WDNR's review and approval of the Column Sealing Option Report for use of biochar as a component of our Remedial Action at CWC East Block. We appreciate WDNR's assistance with this project. Please contact us if you have any questions.

Sincerely,

K. SINGH & ASSOCIATES, INC.

Sameer Neve, Ph.D., ENV SP
Staff Engineer

Robert T. Reineke, PE
Senior Engineer

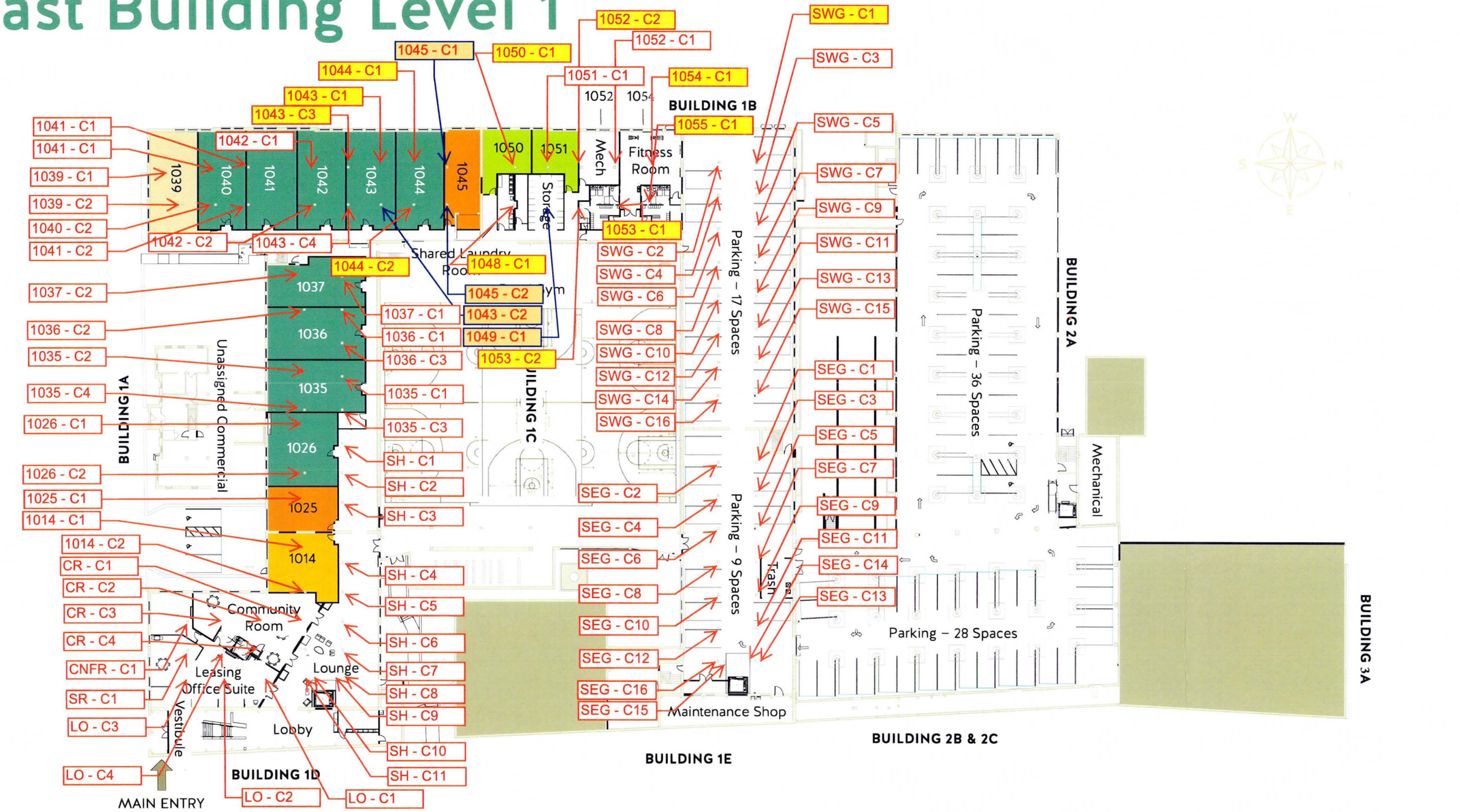
Pratap N. Singh, Ph.D., PE
Principal Engineer

cc: Shane LaFave / Roers Companies
Que El-Amin / Scott Crawford, Inc.
Robert Fedorchak, PE / Patriot Engineering and Environmental, Inc.

Figures, Tables and Pictures

Figure 1 – CWC EB Level 1 Map with Wooden Columns Locations and TCE Levels
Figure 2 – Distribution of Columns according to TCE levels
Table 1 – Results of the GC Analysis
Table 2 – Historic TCE levels in columns in various units
Pictures

East Building Level 1



Column	Non-detect TCE levels (< 0.6 µg/m³)
Column	Detected TCE levels (0.6 - 2.1 µg/m³)
Column	Detected TCE levels (> 2.1 µg/m³)

Figure 1 - CWC EB Level 1 Map with Wooden Columns Locations and TCE Levels

Table 1. Results of the GC Analysis

No.	Location	Time	TCE Reading (µg/m³)
	Calibration (0.5 ppbv)	7:36	0.45 ppbv
1	1055 - C1	8:50	1.67
2	1054 - C1	8:59	0.74
3	1053 - C1	9:10	1.04
4	1053 - C2	9:17	1.32
5	1052 - C1	9:27	<0.6
6	1052 - C2	9:34	1.46
7	1049 - C1	9:42	2.87
8	1048 - C1	9:52	0.68
9	1050 - C1	10:04	1.44
10	1045 - C1	10:12	3.99
11	1045 - C2	10:20	2.99
12	1043 - C1	10:27	0.85
13	1043 - C2	10:35	2.18
14	1043 - C3	10:45	0.81
15	1043 - C4	11:04	<0.6
16	1042 - C1	11:15	<0.6
17	1042 - C2	11:30	<0.6
18	1041 - C1	11:38	<0.6
19	1041 - C2	11:46	<0.6
20	1040 - C1	11:56	<0.6
21	1040 - C2	12:04	<0.6
22	1039 - C1	12:12	<0.6
23	1039 - C2	12:24	<0.6
24	SWG - C1	12:42	0.73
25	SWG - C2	12:51	<0.6
26	SWG - C3	12:59	<0.6
27	SWG - C4	13:07	<0.6
28	SWG - C5	13:14	<0.6
29	SWG - C6	13:23	<0.6
30	SWG - C7	13:32	<0.6
31	SWG - C8	13:41	<0.6
32	SWG - C9	13:51	<0.6
33	SWG - C10	14:03	<0.6
34	SWG - C11	14:11	<0.6
35	SWG - C12	14:20	<0.6
36	SWG - C13	8:50	<0.6
37	SWG - C14	8:59	<0.6
38	SWG - C15	9:10	<0.6

39	SWG - C16	9:17	<0.6
40	SEG - C1	9:27	<0.6
41	SEG - C2	9:34	<0.6
42	SEG - C3	9:42	<0.6
43	SEG - C4	9:52	<0.6
44	SEG - C5	10:04	<0.6
45	SEG - C6	10:12	<0.6
46	SEG - C7	10:20	<0.6
47	SEG - C8	10:27	<0.6
48	SEG - C9	10:35	<0.6
49	SEG - C10	10:45	<0.6
50	SEG - C11	11:04	<0.6
51	SEG - C12	11:15	<0.6
52	SEG - C13	11:30	<0.6
53	SEG - C14	11:38	<0.6
54	SEG - C15	11:46	<0.6
55	SEG - C16	11:56	<0.6
	Calibration (0.5 ppbv)	7:42	0.48 ppbv
56	1037 - C1	7:51	<0.6
57	1037 - C2	8:00	<0.6
58	1036 - C1	8:08	<0.6
59	1036 - C2	8:16	<0.6
60	1036 - C3	8:24	<0.6
61	1036 - C4	8:34	<0.6
62	1035 - C1	8:42	<0.6
63	1035 - C2	8:50	<0.6
64	1035 - C3	8:58	<0.6
65	1035 - C4	9:08	<0.6
66	SH - C1	9:18	<0.6
67	SH - C2	9:28	<0.6
68	1026 - C1	9:35	<0.6
69	1026 - C2	9:44	<0.6
70	1025 - C1	9:52	<0.6
71	1014 - C1	10:00	<0.6
72	1014 - C2	10:13	<0.6
73	CR - C1	10:24	<0.6
74	CR - C2	10:36	<0.6
75	CR - C3	10:45	<0.6
76	1044 - C2	10:53	1.81
77	1044 - C1	11:01	2.06
78	CR - C4	11:09	<0.6
79	LO - C1	11:20	<0.6

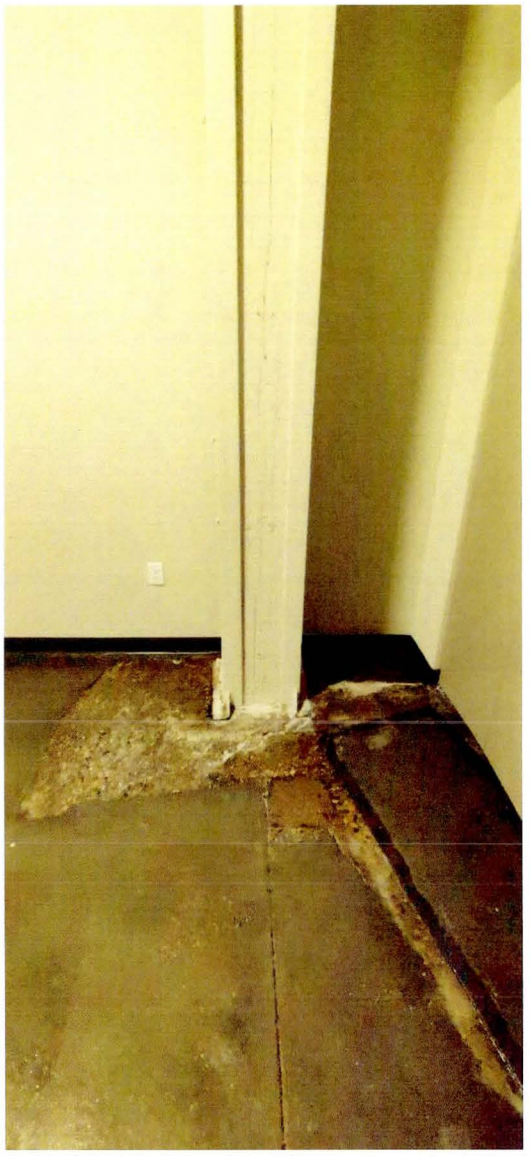
80	LO - C2	11:28	<0.6
81	LO - C3	11:36	<0.6
82	LO - C4	11:44	<0.6
83	SR - C1	11:53	<0.6
84	CNFR - C1	12:01	<0.6
85	SH - C3	12:09	<0.6
86	SH - C4	12:23	<0.6
87	SH - C5	12:30	<0.6
88	SH - C6	12:44	<0.6
89	SH - C7	12:52	<0.6
90	SH - C8	13:00	<0.6
91	SH - C9	13:09	<0.6
92	SH - C10	13:16	<0.6
93	SH - C11	13:25	<0.6
94	SH - C12	13:38	<0.6

** Reporting Limit: 0.6 $\mu g/m^3$

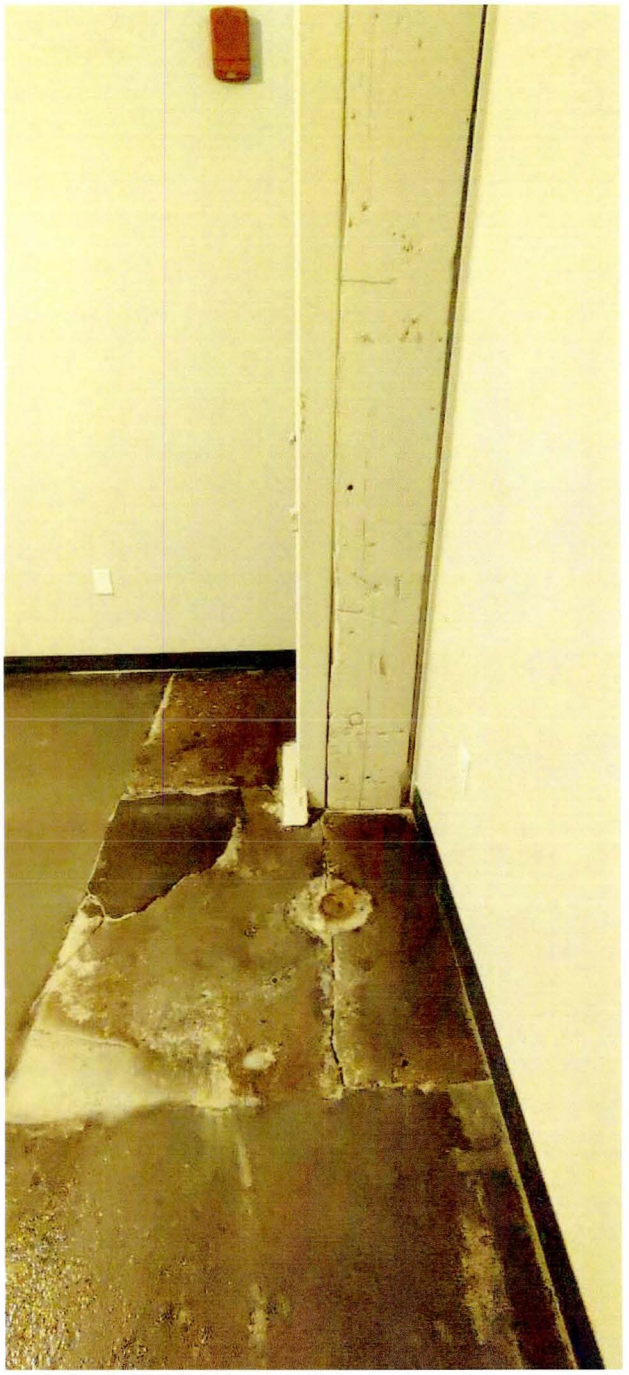
Table 2 – Historic TCE levels in columns in various units

	TCE Concentration (µg/m^3)			
Location	**May**	**June**	**July**	**Sept**
1006		< 0.6		< 0.6
1025		< 0.6		< 0.6
1026	1.67			< 0.6
1036	1.37			< 0.6
1041	13			< 0.6
1042		< 0.6		< 0.6
1044		2.53		< 0.6
1045		22.7	2.99	1.81
1049	159	0.79	1.35	2.87
1050		4.24		1.44
1052	76			1.46
2014		< 0.6		< 0.6
2039		< 0.6		< 0.6
2042	2.46			< 0.6
2045	1.36	< 0.6		< 0.6
3014		< 0.6		< 0.6
3039		< 0.6		< 0.6
3045	< 0.6	< 0.6		< 0.6
	** Reporting Limit: 0.6 µg/m^3			

Picture 1: Unit 1040 – Cracks in wooden pillar and floor in living room



Picture 2: Unit 1036 - Wooden Pillar and cracks in bedroom 1



Picture 3: Unit 1025 - Wooden Pillar and cracks in the bedroom

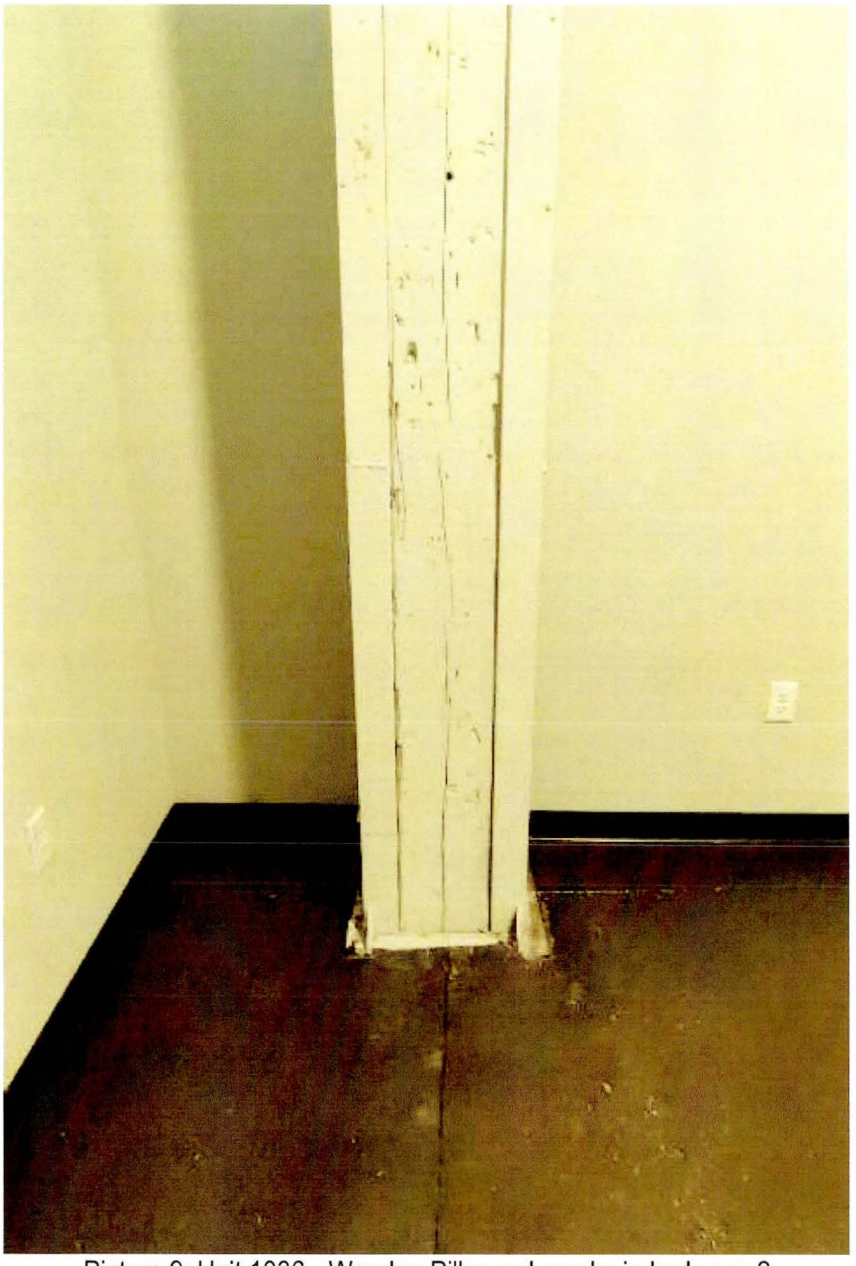
Picture 4: Wooden Pillar in the lobby

Picture 5: Wooden Pillar in the lobby

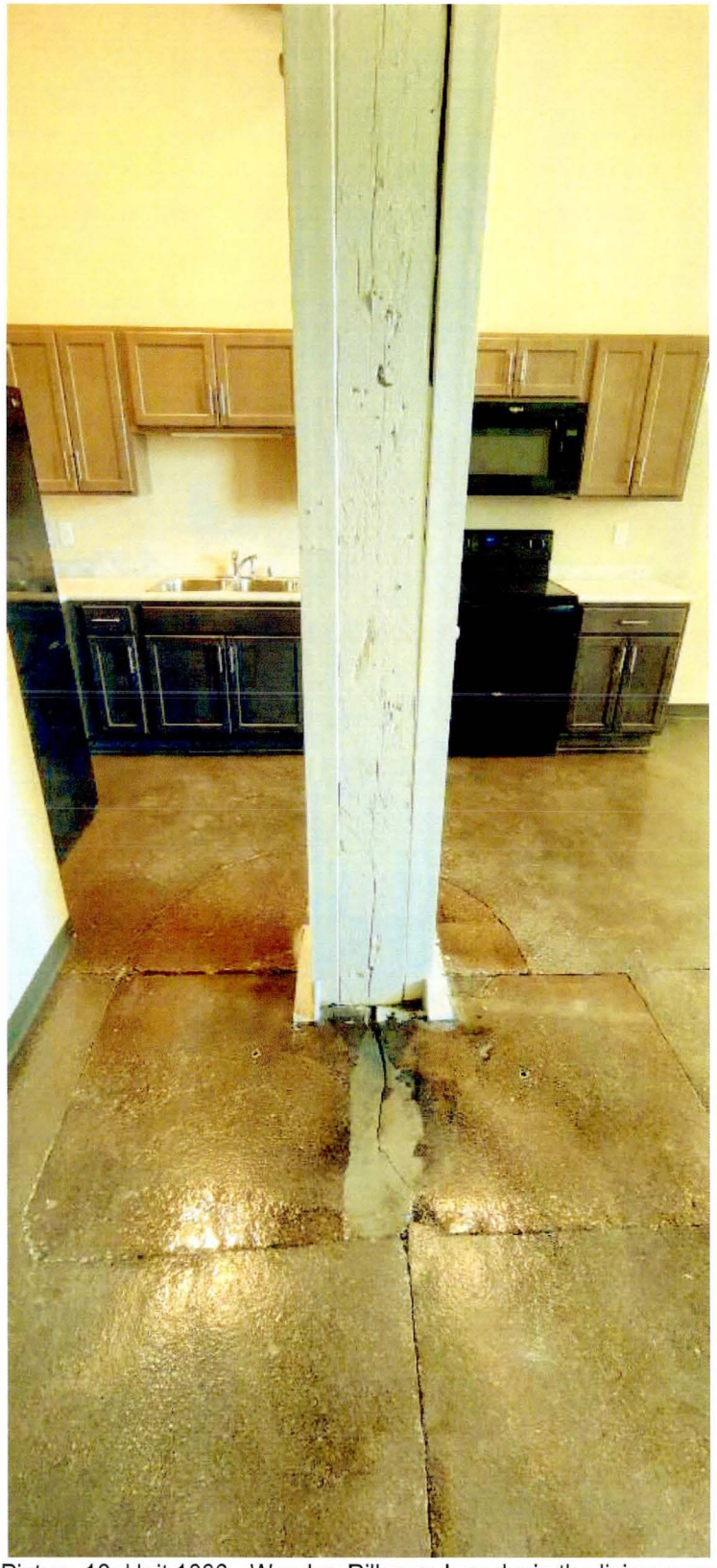
Picture 6: Unit 1014 - Wooden Pillar in the bedroom

Picture 7: Unit 1026 - Wooden Pillar and cracks in the living room

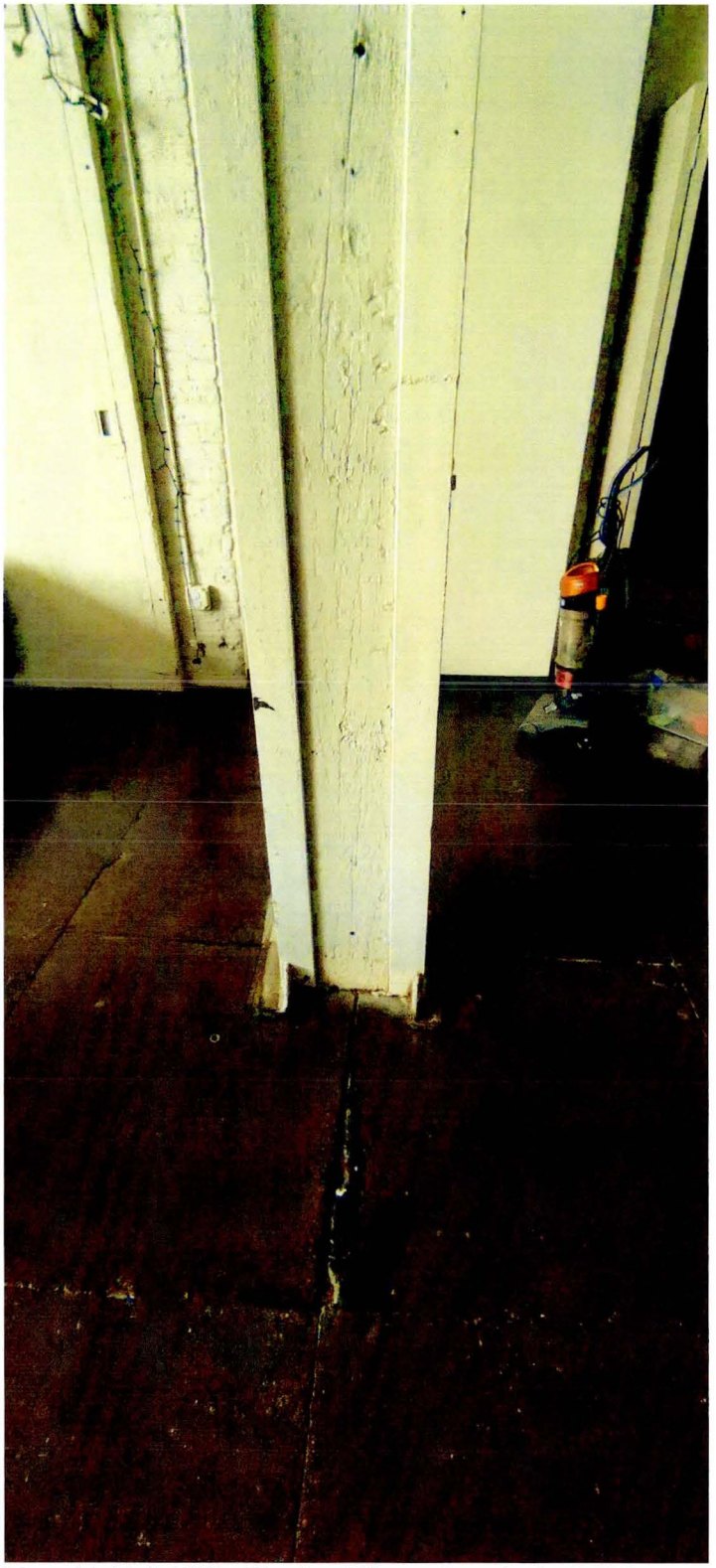
Picture 8: Unit 1036 - Wooden Pillar and cracks in bedroom 1



Picture 9: Unit 1036 - Wooden Pillar and cracks in bedroom 2

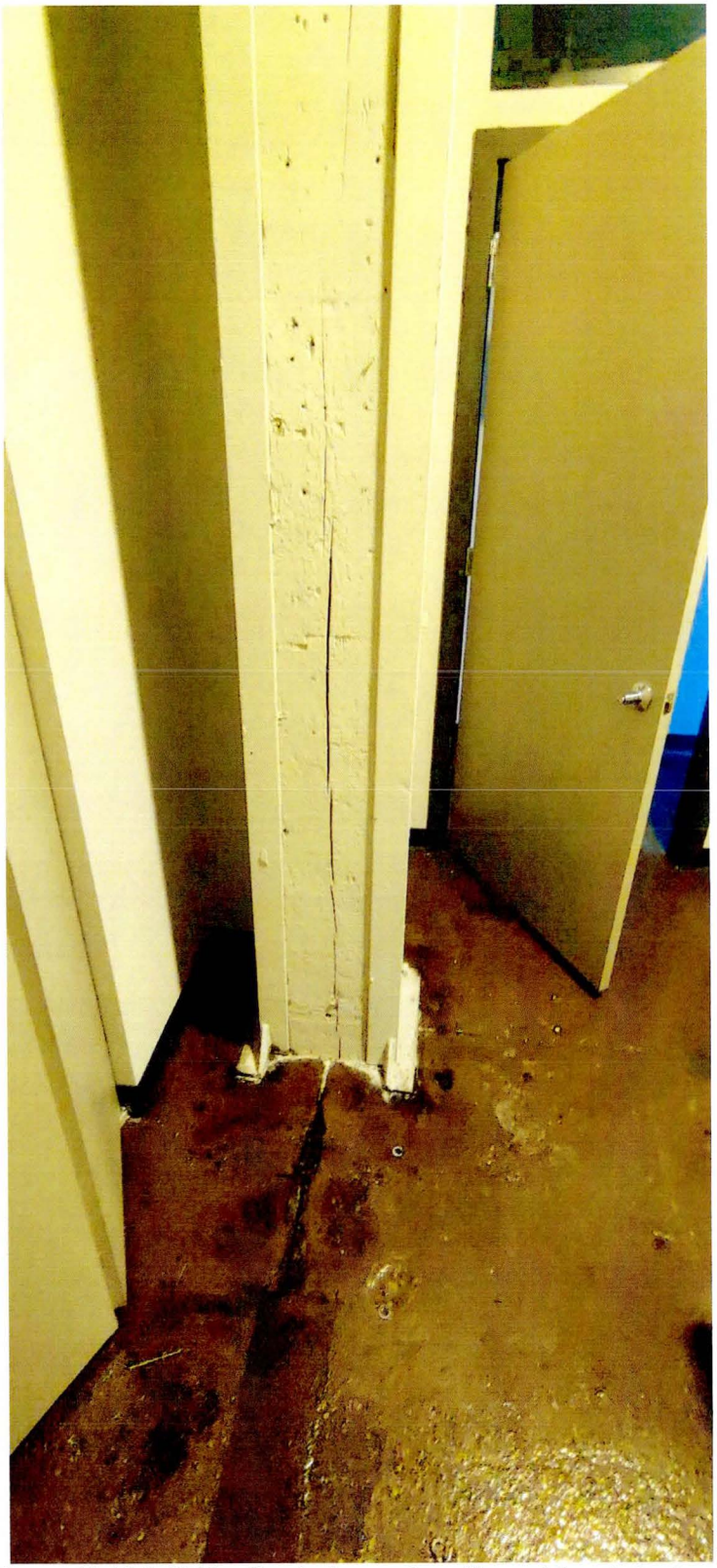


Picture 10: Unit 1036 - Wooden Pillar and cracks in the living room

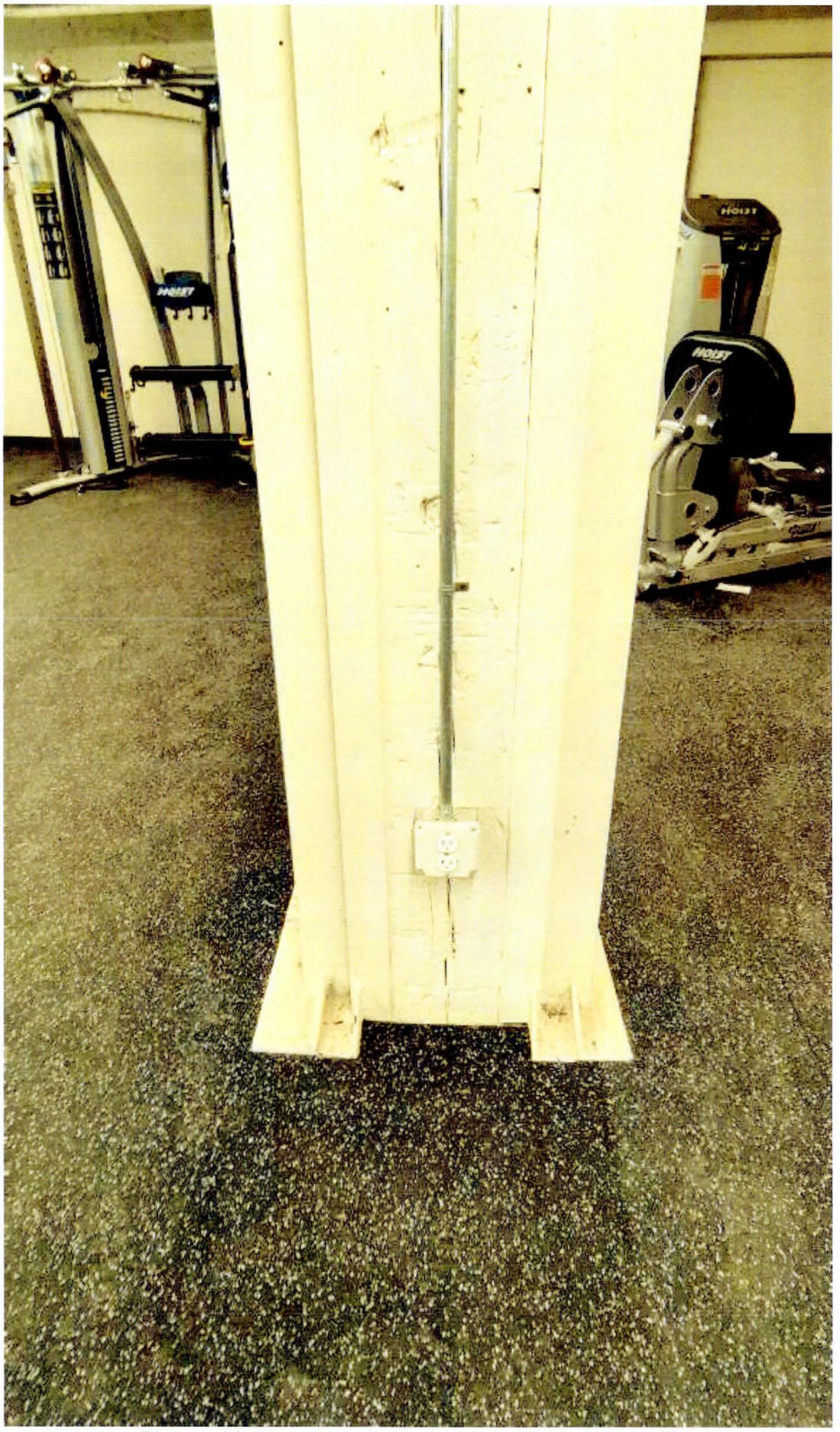


Picture 11: Unit 1037 - Wooden Pillar and cracks in the living room

Picture 12: Unit 1040 – Cracks in wooden pillar and floor in living room



Picture 13: Unit 1040 – Cracks in wooden pillar and floor in bedroom



Picture 14: Fitness center – Cracks in the wooden pillar