THE SIGMA GROUP
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September 22, 2023

Mr. and Mrs. Livingston
W12599 Sunnyknoll Road
Brandon, WI 53919

SUBJECT: Post-Mitigation Vapor Sampling Results – 106 E. Church St., Oakfield, WI
Contaminant Detected **Below** DNR Action Level

Dear Mr. and Mrs. Livingston:

Included are the findings of a recent investigation on your property conducted by The Sigma Group, Inc. on behalf of the Wisconsin Department of Natural Resources (DNR).

As you are aware, this investigation was conducted because of the potential for contaminant vapors from the nearby Oakfield Properties/201 N. Main Street property to migrate through soils, accumulate beneath the foundation of your home, and possibly enter your indoor air. The contaminant of concern at the Oakfield Properties/201 N. Main Street property is trichloroethene commonly referred to as TCE. The history of this site and the potential concerns to neighboring residents were described in detail in the WDNR's original letter to you, dated April 24, 2023.

Based on the results of the initial sampling event completed at your home in June 2023 which were summarized in our letter to you dated July 10, 2023, a sub-slab depressurization system (SSDS) was installed at your property on July 28, 2023 and modified on August 25, 2023. An operation and maintenance plan associated with the SSDS will be provided to you at a later date. Following installation of the SSDS at your property, Sigma collected additional indoor air samples from each floor of your property between August 25, 2023 and September 7, 2023. The samples were submitted to the Beacon Environmental laboratory, where they underwent laboratory analysis for perchloroethylene (PCE), TCE, cis-1,2-dichloroethylene (cis-1,2-DCE), trans-1,2-dichloroethylene (cis-1,2-DCE) and vinyl chloride (VC).

Your Test Results
The analysis detected TCE in indoor air at a concentration of 0.264 micrograms per cubic meter ($\mu g/m^3$) within the sample collected on the second floor of your property. The DNR's indoor air action level for TCE is 2.1 $\mu g/m^3$. Indoor air samples collected within the basement and first floor of your home did not contain reported concentrations of the other analyzed compounds greater than laboratory reporting limits.

The latest sampling results indicate that the installed SSDS appears to be effectively mitigating the vapor intrusion pathway identified based on the results of the initial June 2023 sampling. Additional sampling needs to be conducted to confirm these results. Sigma will contact you to schedule the additional sampling which we anticipate completing within the mid-November to December time period later this year.

Attached is a table summarizing the results of the samples collected from your indoor air compared to DNR screening levels or action levels. Please see the attached fact sheet, *Understanding Chemical Vapor Intrusion Test Results,* for more information.

Please feel free to contact Robert Hoverman of the DNR at 414-497-0896 or Robert.Hoverman@wisconsin.gov or myself at the number below if you have any questions about these results.

Sincerely,

Stephen Meer, P.E.
Senior Engineer
The Sigma Group, Inc.
414-643-4124

cc: Dr. Jeremiah Yee, DHS -Jeremiah.Yee@dhs.wisconsin.gov
Mr. Robert Hoverman, DNR - Robert.Hoverman@wisconsin.gov
Mr. Dave Neste, DNR – David.Neste@wisconsin.gov
Ms. Jennifer Borski, DNR – Jennifer.Borski@wisconsin.gov

Enc: Table 2 (Sample Results)
Fact Sheet: Understanding Chemical Vapor Intrusion Test Results (DNR Pub RR-977)

Table 2

(Sample Results)

Table 2
Indoor Air Analytical Data
Oakfield Properties - 106 E. Church St., Oakfield, Wisconsin
Sigma Project No. 21801

Sample Type:		Indoor Air Samples					Sump Headspace	VAL for Residential Indoor Air [2]
Sample Identification:		04A_IA01_20230623	04A_IAB_01_20230907	04A_IA02_20230623	04A_IA1_02_20230907	04A_IA2_03_20230907	04A_SUMP01_20230623	
Sample Date(s):		06/12/2023-06/23/2023	08/25/2023-09/07/2023	06/12/2023-06/23/2023	08/25/2023-09/07/2023	08/25/2023-09/07/2023	06/12/2023-06/23/2023	
Sampling/Analysis Method:		TO-17 (Passive)	TO-17 (Passive)	TO-17 (Passive)	TO-17 (Passive)	TO-17 (Passive)	TO-17 (Passive)	
Sample Duration (minutes):		15,758	18,641	15,755	18,638	18,644	15,775	
VOCs								
cis-1,2-Dichloroethene	µg/m^3	8.63	<0.189	2.42	<0.189	<0.189	17.6	42
trans-1,2-Dichloroethene	µg/m^3	0.892 J	<0.189	0.256 J	<0.189	<0.189	1.97	42
Tetrachloroethene (PCE)	µg/m^3	<0;285	<0.241	<0.285	<0.241	<0.241	<0.285	42
Trichloroethene (TCE)	µg/m^3	{ [**10.2**] }	<0.204	**2.57**	<0.204	0.264 J	{ [**16.2**] }	2.1
Vinyl Chloride	µg/m^3	<0.280	<0.237	<0.280	<0.237	<0.236	<0.280	1.7

Notes:

1. Analytical units: µg/m^3 = micrograms per cubic meter

2. VAL for Residential Indoor Air = Vapor Action Level described in WDNR publication RR-800 "Addressing Vapor Intrusion at Remediation & Redevelopment Sites in Wisconsin" (dated January 2018) which in turn references EPA Region 3 Risk-Based Concentrations for **residential** air [Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=1) November 2022] and **residential** air in January 2023 "Wisconsin Vapor Quick Look-Up Table, Indoor Air Vapor Action Levels And Vapor Risk Screening Levels" publication RR-0136. VAL adjusted to 1-in-100,000 increase in lifetime cancer risk for carcinogens per WDNR publication RR-800; VAL is not adjusted for non-carcinogens (i.e., hazard index = 1).

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BOLD = concentration greater than residential Vapor Action Level
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Data entered / updated by: CLE Date: 9/20/223
Data checked by: SRM Date: 9/20/2023

Fact Sheet: Understanding Chemical Vapor Intrusion Test Results

(DNR Pub RR-977)

Understanding Chemical Vapor Intrusion Testing Results

RR-977 October 2014

From the Lab to You

Chemical vapor samples were taken from underneath your house or building and possibly indoors as well. These samples have been tested by a certified laboratory and a report was issued. The Wisconsin Department of Natural Resources (DNR) uses these test results to determine if people in the building are being exposed to chemical vapors coming from nearby contaminated soil or groundwater, and to decide what, if any, action is needed to prevent this exposure.

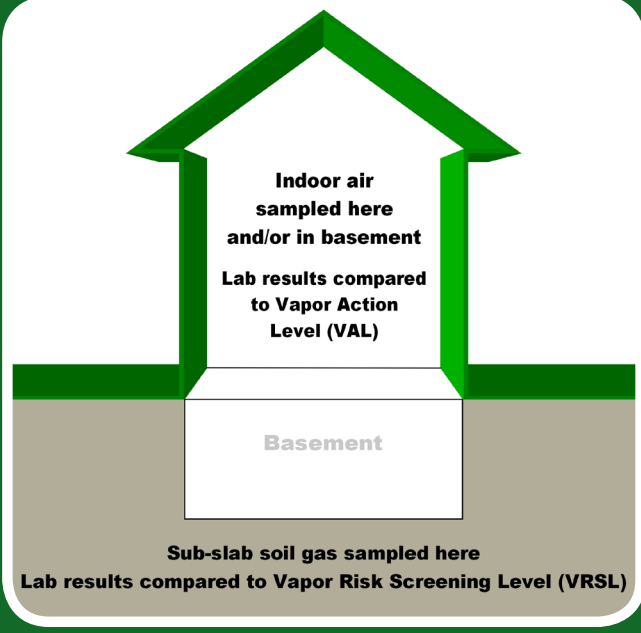
Indoor Air Testing Results

If indoor air samples were collected in your house or building, test results from the lab will be compared to the state Vapor Action Level (VAL) for chemicals of concern. The VAL is a chemical compound's numerical value that represents a health hazard risk to no more than 1 in 100,000 people during a lifetime of exposure. If test results show chemical concentrations in your air below the VAL then adverse health effects are extremely rare, even if you were to breathe the chemical at this concentration for your entire life.

Test results showing chemical concentrations in the air at or above the VAL prompt DNR to recommend that exposure to these chemical vapors be reduced. If test results show concentrations significantly above the VAL, or more than one type of chemical vapor is identified in your indoor air, the risk from exposure increases. If the concentration of any indoor chemical vapor greatly exceeds the VAL, DNR is concerned about even short-term exposure and will typically require immediate action to address the problem.

The VAL for each chemical is set by scientific research. It is protective of all people, including those who are most susceptible to adverse health effects.

If test results identify chemicals in your air that are not present in nearby soil or groundwater contamination, it is likely that these vapors are coming from some product or activity in or near your house or building. Many everyday consumer products (e.g., cleaners, solvents, polish, adhesives, lubricants, aerosols, insect repellants, etc.); combustion processes (e.g., smoking, home heating); fuels in attached garages; dry cleaned clothing or draperies; and occupant activities (e.g., craft hobbies), also release chemical vapors into the air.



The air and soil gas samples from your property are tested at a laboratory. Chemical concentrations are measured and the results are compared to state health-risk numbers.

Sub-slab Soil Gas Testing Results

Soil gas samples were collected from the ground beneath the concrete slab of your building foundation or basement. The lab measured the concentrations of various chemicals in these samples. DNR compares these measurements to the state Vapor Risk Screening Level (VRSL), which identifies the concentration of a chemical in soil gas that scientific research suggests can be a health risk if vapor enters a building. If soil gas measurements exceed the VRSL for a chemical of concern, action to reduce exposure is strongly recommended.

The VRSL is a higher number (higher chemical concentration) than the VAL because it is presumed that concrete building foundations and basement walls will prevent most soil gas from entering a building. Further, any soil gas that does enter a building through cracks, holes, sump pumps, drains, etc., will be diluted to some extent by the indoor air. So, people inside will not be breathing air that includes the full concentration of chemical vapors that exist in the ground.

Wisconsin Department of Natural Resources
P.O. Box 7921, Madison, WI 53707
dnr.wi.gov, search "Brownfields"

DNR generally relies on the test results of the sub-slab soil gas samples when determining what, if any, action should be taken related to chemical vapors coming from nearby soil or groundwater contamination. Indoor air quality is highly variable, and it is difficult to make a definitive decision about vapor intrusion based on indoor air sampling alone.

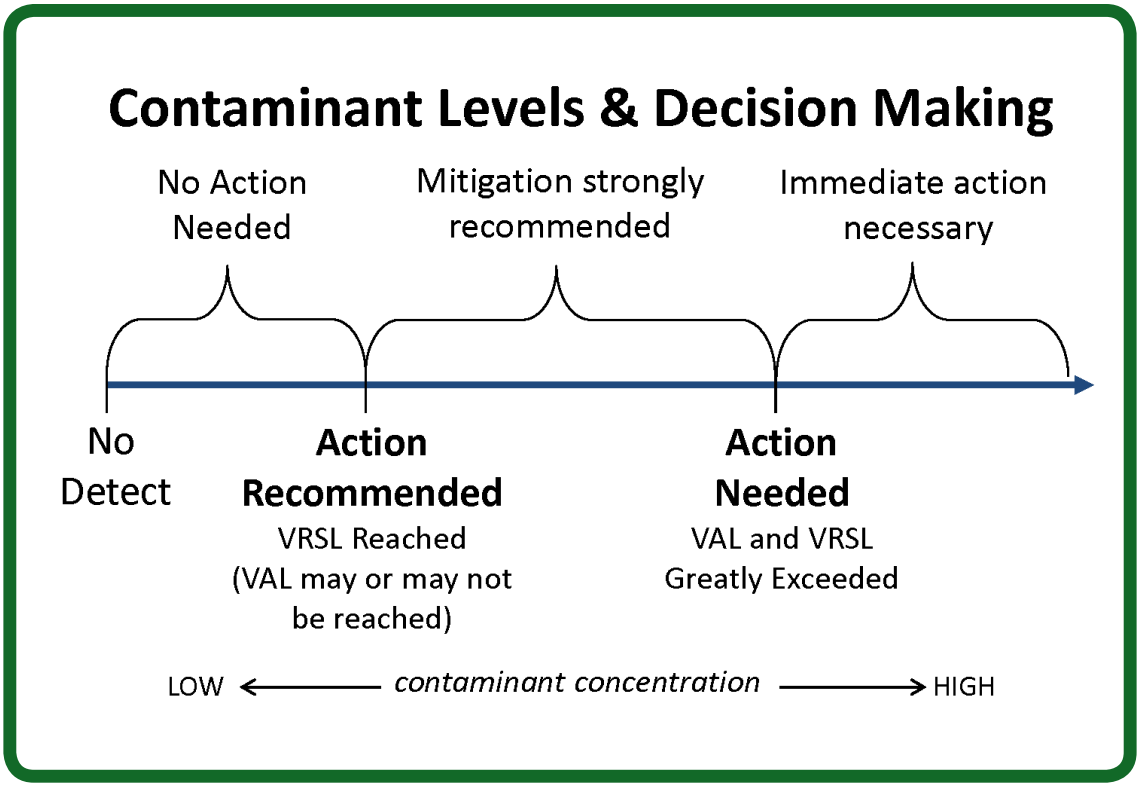
Follow-Up Actions

If your test results are less than a VAL for indoor air, or a VRSL for sub-slab soil gas, then the air in the house or building should not present a health concern. Follow-up sampling and testing may be necessary to confirm the results, but no other action is typically suggested.

When test results show soil gas chemical concentrations above a VRSL, both DNR and the Wisconsin Department of Health Services recommend that owners take action to reduce potential exposure. This typically involves installing a vapor mitigation system that vents chemical vapors from beneath your home or building to the outdoors, similar to a radon mitigation system.

If indoor air concentrations exceed a VAL, but sub-slab concentrations are less than a VRSL, then the chemical vapors are most likely coming from indoor sources. Steps should be taken by the house or building owner to identify the products and practices causing the problem and implement appropriate remedies.

If soil gas mitigation is recommended, a representative of the party who is responsible for the soil or groundwater contamination will contact you to discuss your options.



A Note about Measurement Units: The lab report may include some unfamiliar technical language. The most important point to note is whether or not the test result for a specific chemical exceeds a VAL or VRSL, which are also sometimes referred to, generically, as "screening levels."

The concentration of gaseous pollutants in air is typically described in two different ways: 1) as units of mass per volume, where µg/m3 represents micrograms of gaseous pollutant per cubic meter of ambient air; and 2) as parts per billion by volume (ppbv), where the volume of a gaseous pollutant is compared to a set volume of ambient air. These are the numbers that are compared to the VAL and VRSL.

For more information, visit **dnr.wi.gov/topic/Brownfields/Vapor.html**

This document contains information about certain state statutes and administrative rules but does not necessarily include all of the details found in the statutes and rules. Readers should consult the actual language of the statutes and rules to answer specific questions. The Wisconsin Department of Natural Resources provides equal opportunity in its employment, programs, services, and functions under an Affirmative Action Plan. If you have any questions, please write to Equal Opportunity Office, Department of Interior, Washington, D.C. 20240. This publication is available in alternative format upon request. Please call 608-267-3543 for more information.

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September 22, 2023

Mr. Mark Haasch
106 E. Church Street
Oakfield, WI 53065

SUBJECT: Post-Mitigation Vapor Sampling Results – 106 E. Church St., Oakfield, WI
Contaminant Detected **Below** DNR Action Level

Dear Mr. Haasch:

Included are the findings of a recent investigation on your property conducted by The Sigma Group, Inc. on behalf of the Wisconsin Department of Natural Resources (DNR).

As you are aware, this investigation was conducted because of the potential for contaminant vapors from the nearby Oakfield Properties/201 N. Main Street property to migrate through soils, accumulate beneath the foundation of your home, and possibly enter your indoor air. The contaminant of concern at the Oakfield Properties/201 N. Main Street property is trichloroethene commonly referred to as TCE. The history of this site and the potential concerns to neighboring residents were described in detail in the WDNR's original letter to you, dated April 24, 2023.

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Your Test Results
The analysis detected TCE in indoor air at a concentration of 0.264 micrograms per cubic meter ($\mu g/m^3$) within the sample collected on the second floor of your home. The DNR's indoor air action level for TCE is 2.1 $\mu g/m^3$. Indoor air samples collected within the basement and first floor of your home did not contain reported concentrations of the other analyzed compounds greater than laboratory reporting limits.

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Attached is a table summarizing the results of the samples collected from your indoor air compared to DNR screening levels or action levels. Please see the attached fact sheet, *Understanding Chemical Vapor Intrusion Test Results,* for more information.

Please feel free to contact Robert Hoverman of the DNR at 414-497-0896 or Robert.Hoverman@wisconsin.gov or myself at the number below if you have any questions about these results.

Sincerely,

Stephen Meer, P.E.
Senior Engineer
The Sigma Group, Inc.
414-643-4124

cc: Dr. Jeremiah Yee, DHS -Jeremiah.Yee@dhs.wisconsin.gov
Mr. Robert Hoverman, DNR - Robert.Hoverman@wisconsin.gov
Mr. Dave Neste, DNR – David.Neste@wisconsin.gov
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Sample Date(s):		06/12/2023-06/23/2023	08/25/2023-09/07/2023	06/12/2023-06/23/2023	08/25/2023-09/07/2023	08/25/2023-09/07/2023	06/12/2023-06/23/2023	
Sampling/Analysis Method:		TO-17 (Passive)	TO-17 (Passive)	TO-17 (Passive)	TO-17 (Passive)	TO-17 (Passive)	TO-17 (Passive)	
Sample Duration (minutes):		15,758	18,641	15,755	18,638	18,644	15,775	
VOCs								
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RR-977 October 2014

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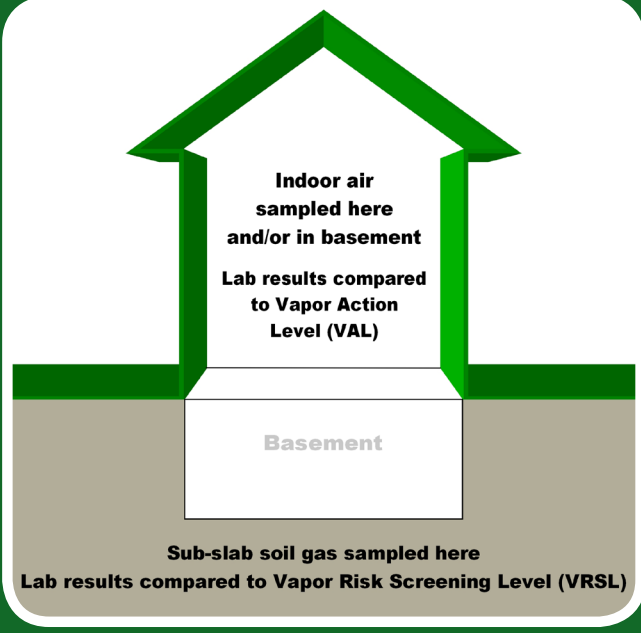

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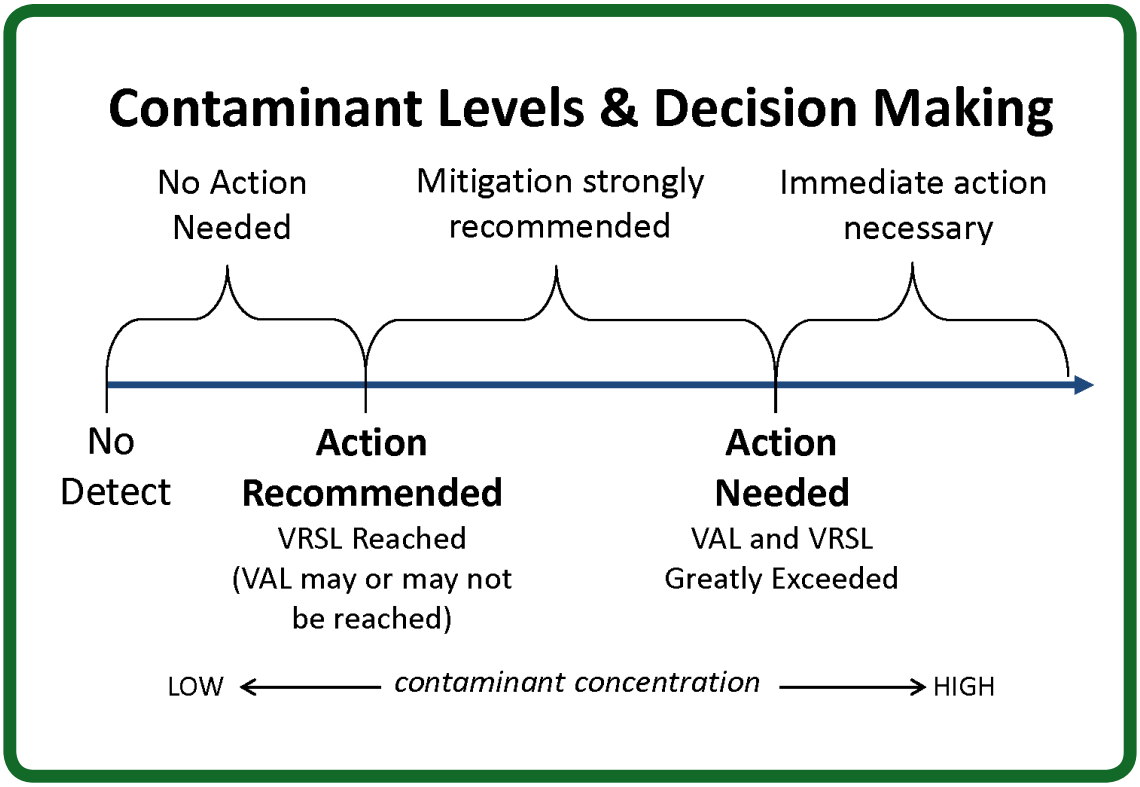

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- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mark Haasch
106 E. Church St.
Oakfield WI 53065

9590 9402 6484 0346 3008 17

2. Article Number *(Transfer from service label)*

7020 1290 0000 7084 1290

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X [signature] ☒ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Mail
- ☐ Mail Restricted Delivery
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

(over $500)

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Livingston
W12599 Sunnyknoll Rd
Brandon, WI
53919

9590 9402 6484 0346 3007 01

2. Article Number *(Transfer from service label)*

7020 1290 0000 7084 1283

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Billy Livingston | C. Date of Delivery 9-27-23

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Mail
- ☐ Mail Restricted Delivery
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

(over $500)

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

William Schaefer
116 E. Church Street
Oakfield, WI 53065

9590 9402 6484 0346 3008 00

2. Article Number *(Transfer from service label)*

7020 1290 0000 7084 1306

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Mail
- ☐ Mail Restricted Delivery
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

(over $500)

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt